

**From:** Carolann Knapp  
**To:** [DEQ-ROP](#)  
**Cc:** [Nixon, Shane \(DEQ\)](#); [Rogers, William \(DEQ\)](#); [Steve Niehaus](#)  
**Subject:** N5831 Section 1-ROP Renewal Application  
**Date:** Wednesday, November 14, 2018 3:05:08 PM  
**Attachments:** [image001.png](#)  
[Wild CO2 Renewal App Sub 111418.pdf](#)  
[PTE Calculations Wild CO2 Pit.pdf](#)  
[A-001 MAP Revised.pdf](#)  
[A-001 CAM Revised.pdf](#)  
[N5831 Current Permit Workup for 2019 Renewal.doc](#)

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Hello,

On behalf of Breitburn Operating L.P., we are submitting the ROP renewal application for our Wilderness CO2-Hayes 29, Section 1 in an electronic format with hard copies to follow by mail to Mr. Nixon. Attached you will find the ROP Application Form, ROP Mark-up, PTE Calculations, PM-MAP, and the CAM plan. We hope you find this package administratively complete, should you not, feel free to contact me.

Sincerely,



*Carolann Knapp*

*EH&S Rep*

*Maverick Natural Resources, LLC*

*(Parent of Breitburn Operating L.P.)*

*1165 Elkview Blvd.*

*Gaylord, MI 49735*

*Ph# 989-731-9369*

*Email: [Carolann.knapp@mavresources.com](mailto:Carolann.knapp@mavresources.com)*

*[www.mavresources.com](http://www.mavresources.com)*

*"Live simply, love generously, care deeply, speak kindly, leave the rest to God." Ronald Reagan*

Effective immediately, my email address has changed. Please update your address book accordingly.



Breitburn Operating L.P.  
(a wholly owned subsidiary of  
Maverick Resources, LLC)  
1165 Elkview Drive  
Gaylord, MI 49735

DEQ/AQD Received Date:  
11-19-18  
Renewal Application No.  
201800149

November 14, 2018

Mr. Shane Nixon, MDEQ  
AQD-Cadillac District Supervisor  
120 W. Chapin St.  
Cadillac, MI 49601-2158

Re: #MI-ROP-N5831-2014b  
Wilderness CO2/Hayes 29 Plant (Section 1)

On behalf of Breitburn Operating L.P., we are submitting the ROP Renewal package for the Wilderness CO2/Hayes 29, Section 1. Breitburn would like to request that EUENGINE5 be omitted from the ROP permit as you will see in our ROP markup. EUENGINE5 has been permanently decommissioned since 2014.

Enclosed in the renewal package is the ROP Markup, ROP Application, Potential-to-Emit Calculation, PMMAP, CAM Plans, and Y2017 MAERS Report.

We hope you will find this application complete, should you need anything else please feel free to contact me.

Sincerely,

A handwritten signature in blue ink that reads "Carolann Knapp". The signature is written in a cursive, flowing style.

Carolann Knapp  
EH&S Rep

Cc: Mr. Bill Rogers, MDEQ AQD

**RENEWABLE OPERATING PERMIT  
RENEWAL APPLICATION FORM**

11-19-18

Renewal Application No.

201800149

This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Refer to instructions for additional information to complete the Renewable Operating Permit Renewal Application Form.

**GENERAL INSTRUCTIONS**

This application form should be submitted as part of an administratively complete application package for renewal of a Renewable Operating Permit (ROP). This application form consists of nine parts. Parts A – H must be completed for all applications and must also be completed for each section of a sectioned ROP. Answer all questions in all parts of the form unless directed otherwise. Detailed instructions for this application form can be found at <http://michigan.gov/air> (select the Permits Tab, "Renewable Operating Permits (ROP)/Title V", then "ROP Forms & Templates").

**PART A: GENERAL INFORMATION**

Enter information about the source, owner, contact person and the responsible official.

**SOURCE INFORMATION**

SRN N5831	SIC Code	NAICS Code 211130	Existing ROP Number MI-ROP-N5831-2014b	Section Number (if applicable) Section 1
Source Name Breitburn Operating L.P. - Wilderness CO2-Hayes 29 Central Production Facility				
Street Address 10875 Geronimo Trail				
City Gaylord	State MI	ZIP Code 49735	County Otsego	
Section/Town/Range (if address not available) SEC 29 T29N R04W SW1/4				
Source Description The facility is a natural gas processing facility that treats natural gas to remove carbon dioxide and compress the gas prior to pipeline transport.				
<input type="checkbox"/> Check here if any of the above information is different than what appears in the existing ROP. Identify any changes on the marked-up copy of your existing ROP.				

**OWNER INFORMATION**

Owner Name Breitburn Operating L.P.	Section Number (if applicable) Section 1			
Mailing address ( <input type="checkbox"/> check if same as source address) P.O. Box 1256 1165 Elkview Drive				
City Gaylord	State MI	ZIP Code 49735	County Otsego	Country USA

Check here if any information in this ROP renewal application is confidential. Confidential information should be identified on an Additional Information (AI-001) Form.

**PART A: GENERAL INFORMATION (continued)**

At least one contact and responsible official must be identified. Additional contacts and responsible officials may be included if necessary.

**CONTACT INFORMATION**

Contact 1 Name Carolann Knapp		Title EH&S Rep		
Mailing address ( <input type="checkbox"/> check if same as source address) 1165 Elkview Drive				
City Gaylord	State MI	ZIP Code 49735	County Otsego	Country USA
Phone number 989-732-0020		E-mail address Carolann.knapp@mavresources.com		

Contact 2 Name (optional) Steve Niehaus		Title Regional EH&S Manager		
Mailing address ( <input type="checkbox"/> check if same as source address) 1165 Elkview drive				
City Gaylord	State MI	ZIP Code 49735	County Otsego	Country USA
Phone number 989-732-0020		E-mail address Steve.niehaus@mavresources.com		

**RESPONSIBLE OFFICIAL INFORMATION**

Responsible Official 1 Name Michael Fairbanks		Title Operations Manager		
Mailing address ( <input type="checkbox"/> check if same as source address) PO. Box 1256				
City Gaylord	State MI	ZIP Code 49735	County Otsego	Country County
Phone number 989-732-0020		E-mail address Michael.Fairbanks@mavresources.com		

Responsible Official 2 Name (optional)		Title		
Mailing address ( <input type="checkbox"/> check if same as source address)				
City	State	ZIP Code	County	Country
Phone number		E-mail address		

<input type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part A. Enter AI-001 Form ID:
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**PART B: APPLICATION SUBMITTAL and CERTIFICATION by Responsible Official**

Identify the items that are included as part of your administratively complete application in the checklist below. For your application to be complete, it must include information necessary to evaluate the source and to determine all applicable requirements. Answer the compliance statements as they pertain to all the applicable requirements to which the source is subject. The source's Responsible Official must sign and date this form.

Listing of ROP Application Contents. Check the box for the items included with your application.	
<input checked="" type="checkbox"/> Completed ROP Renewal Application Form (and any AI-001 Forms) (required)	<input type="checkbox"/> Compliance Plan/Schedule of Compliance
<input checked="" type="checkbox"/> Mark-up copy of existing ROP using official version from the AQD website (required)	<input checked="" type="checkbox"/> Stack information
<input type="checkbox"/> Copies of all Permit(s) to Install that have not been incorporated into existing ROP (required)	<input type="checkbox"/> Acid Rain Permit Initial/Renewal Application
<input checked="" type="checkbox"/> HAP/Criteria Pollutant Potential to Emit Calculations	<input type="checkbox"/> Cross State Air Pollution Rule (CSAPR) Information
<input type="checkbox"/> MAERS Forms (to report emissions not previously submitted)	<input type="checkbox"/> Confidential Information
<input type="checkbox"/> Copies of all Consent Order/Consent Judgments that have not been incorporated into existing ROP	<input checked="" type="checkbox"/> Paper copy of all documentation provided (required)
<input checked="" type="checkbox"/> Compliance Assurance Monitoring (CAM) Plan	<input checked="" type="checkbox"/> Electronic documents provided (optional)
<input type="checkbox"/> Other Plans (e.g. Malfunction Abatement, Fugitive Dust, Operation and Maintenance, etc.)	<input type="checkbox"/> Other, explain:

**Compliance Statement**

This source is in compliance with **all** of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.  Yes  No

This source will continue to be in compliance with all of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.  Yes  No

This source will meet in a timely manner applicable requirements that become effective during the permit term.  Yes  No

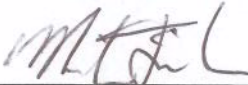
The method(s) used to determine compliance for each applicable requirement is/are the method(s) specified in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and all other applicable requirements not currently contained in the existing ROP.

If any of the above are checked No, identify the emission unit(s) or flexible group(s) affected and the specific condition number(s) or applicable requirement for which the source is or will be out of compliance at the time of issuance of the ROP renewal on an AI-001 Form. Provide a compliance plan and schedule of compliance on an AI-001 Form.

**Name and Title of the Responsible Official (Print or Type)**  
 Michael Fairbanks, Operations Manager

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*As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.*

 11/13/18

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**Signature of Responsible Official** **Date**

### PART C: SOURCE REQUIREMENT INFORMATION

Answer the questions below for specific requirements or programs to which the source may be subject.

<p>C1. Actual emissions and associated data from <b>all</b> emission units with applicable requirements (including those identified in the existing ROP, Permits to Install and other equipment that have not yet been incorporated into the ROP) are required to be reported in MAERS. Are there any emissions and associated data that have <b>not</b> been reported in MAERS for the most recent emissions reporting year? If Yes, identify the emission unit(s) that was/were not reported in MAERS on an AI-001 Form. Applicable MAERS form(s) for unreported emission units must be included with this application.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>C2. Is this source subject to the federal regulations on ozone-depleting substances? (40 CFR Part 82)</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>C3. Is this source subject to the federal Chemical Accident Prevention Provisions? (Section 112(r) of the Clean Air Act Amendments, 40 CFR Part 68) If Yes, a Risk Management Plan (RMP) and periodic updates must be submitted to the USEPA. Has an updated RMP been submitted to the USEPA?</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  <input type="checkbox"/> Yes <input type="checkbox"/> No
<p>C4. Does the source belong to one of the source categories that require quantification of fugitive emissions? If Yes, identify the category on an AI-001 Form and include the fugitive emissions in the PTE calculations for the source. <i>See ROP Renewal Application instructions.</i></p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>C5. Does this stationary source have the potential to emit (PTE) of 100 tons per year or more of any criteria pollutant (PM-10, PM 2.5, VOC, NOx, SO<sub>2</sub>, CO, lead)? If Yes, include potential emission calculations for each identified pollutant on an AI-001 Form.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>C6. Does this stationary source emit any hazardous air pollutants (HAPs) regulated by the federal Clean Air Act, Section 112? If Yes, include potential and actual emission calculations for HAPs on an AI-001 Form. Fugitive emissions <b>must</b> be included in HAP calculations.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>C7. Are any emission units subject to the Cross State Air Pollution Rule (CSAPR)? If Yes, identify the specific emission unit(s) subject to CSAPR on an AI-001 Form.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>C8. Are any emission units subject to the federal Acid Rain Program? If Yes, identify the specific emission unit(s) subject to the Federal Acid Rain Program on an AI-001 Form. Is an Acid Rain Permit Renewal Application included with this application?</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  <input type="checkbox"/> Yes <input type="checkbox"/> No
<p>C9. Are any emission units identified in the existing ROP subject to compliance assurance monitoring (CAM)? If Yes, identify the specific emission unit(s) subject to CAM on an AI-001 Form. <b>If a CAM plan has not been previously submitted to the MDEQ, one must be included with the ROP renewal application on an AI-001 Form.</b> Is a CAM plan included with this application?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>C10. Does the source have any plans such as a malfunction abatement plan, fugitive dust plan, operation/maintenance plan, or any other monitoring plan that is referenced in an existing ROP, Permit to Install requirement, or any other applicable requirement? If Yes, then a copy must be submitted as part of the ROP renewal application.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>C11. Are there any specific requirements that the source proposes to be identified in the ROP as non-applicable? If Yes, then a description of the requirement and justification must be submitted as part of the ROP renewal application on an AI-001 Form.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part C. Enter AI-001 Form ID: <b>AI-</b>	



**PART E: EXISTING ROP INFORMATION**

Review all emission units and applicable requirements (including any source wide requirements) in the existing ROP and answer the questions below as they pertain to **all** emission units and **all** applicable requirements in the existing ROP.

E1. Does the source propose to make any additions, changes or deletions to terms, conditions and underlying applicable requirements as they appear in the existing ROP?  Yes  No  
 If Yes, identify changes and additions on Part F, Part G and/or Part H.

E2. For each emission unit(s) identified in the existing ROP, all stacks with applicable requirements are to be reported in MAERS. Are there any stacks with applicable requirements for emission unit(s) identified in the existing ROP that were not reported in the most recent MAERS reporting year? If Yes, identify the stack(s) that was/were not reported on applicable MAERS form(s).  Yes  No

E3. Have any emission units identified in the existing ROP been modified or reconstructed that required a PTI?  Yes  No  
 If Yes, complete Part F with the appropriate information.

E4. Have any emission units identified in the existing ROP been dismantled? If Yes, identify the emission unit(s) and the dismantle date in the comment area below or on an AI-001 Form.  Yes  No

Comments:  
 E4: EUENGINE5 dismantled November 2014.

Check here if an AI-001 Form is attached to provide more information for Part E. Enter AI-001 Form ID: **AI-**



**PART F: PERMIT TO INSTALL (PTI) INFORMATION**

Review all emission units and applicable requirements at the source and answer the following questions as they pertain to **all** emission units with PTIs. Any PTI(s) identified below must be attached to the application.

F1. Has the source obtained any PTIs where the applicable requirements from the PTI have not been incorporated into the existing ROP? If Yes, complete the following table.  Yes  No  
 If No, go to Part G.

Permit to Install Number	Emission Units/Flexible Group ID(s)	Description (Include Process Equipment, Control Devices and Monitoring Devices)	Date Emission Unit was Installed/Modified/Reconstructed

F2. Do any of the PTIs listed above change, add, or delete terms/conditions to **established emission units** in the existing ROP? If Yes, identify the emission unit(s) or flexible group(s) affected in the comments area below or on an AI-001 Form and identify all changes, additions, and deletions in a mark-up of the existing ROP.  Yes  No

F3. Do any of the PTIs listed above identify **new emission units** that need to be incorporated into the ROP? If Yes, submit the PTIs as part of the ROP renewal application on an AI-001 Form, and include the new emission unit(s) or flexible group(s) in the mark-up of the existing ROP.  Yes  No

F4. Are there any stacks with applicable requirements for emission unit(s) identified in the PTIs listed above that were **not** reported in MAERS for the most recent emissions reporting year? If Yes, identify the stack(s) that were not reported on the applicable MAERS form(s).  Yes  No

F5. Are there any proposed administrative changes to any of the emission unit names, descriptions or control devices in the PTIs listed above for any emission units not already incorporated into the ROP? If Yes, describe the changes on an AI-001 Form.  Yes  No

Comments:

Check here if an AI-001 Form is attached to provide more information for Part F. Enter AI-001 Form ID: **AI-**



**PART H: REQUIREMENTS FOR ADDITION OR CHANGE**

Complete this part of the application form for all proposed additions, changes or deletions to the existing ROP. This includes state or federal regulations that the source is subject to and that must be incorporated into the ROP or other proposed changes to the existing ROP. **Do not include additions or changes that have already been identified in Parts F or G of this application form.** If additional space is needed copy and complete an additional Part H.

Complete a separate Part H for each emission unit with proposed additions and/or changes.

H1. Are there changes that need to be incorporated into the ROP that have not been identified in Parts F and G? If Yes, answer the questions below.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
H2. Are there any proposed administrative changes to any of the existing emission unit names, descriptions or control devices in the ROP? If Yes, describe the changes in questions H8 – H16 below and in the affected Emission Unit Table(s) in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H3. Does the source propose to add a new emission unit or flexible group to the ROP not previously identified in Parts F or G? If Yes, identify and describe the emission unit name, process description, control device(s), monitoring device(s) and applicable requirements in questions H8 – H16 below and in a new Emission Unit Table in the mark-up of the ROP. See instructions on how to incorporate a new emission unit/flexible group into the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H4. Does the source propose to add new state or federal regulations to the existing ROP? If Yes, on an AI-001 Form, identify each emission unit/flexible group that the new regulation applies to and identify <u>each</u> state or federal regulation that should be added. Also, describe the new requirements in questions H8 – H16 below and add the specific requirements to existing emission units/flexible groups in the mark-up of the ROP, create a new Emission Unit/Flexible Group Table, or add an AQD template table for the specific state or federal requirement.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H5. Has a Consent Order/Consent Judgment (CO/CJ) been issued where the requirements were not incorporated into the existing ROP? If Yes, list the CO/CJ number(s) below and add or change the conditions and underlying applicable requirements in the appropriate Emission Unit/Flexible Group Tables in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H6. Does the source propose to add, change and/or delete <b>source-wide</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below. Request to change FGWAUKENGINES to FGWAUKENGINE, as we are requesting to omit one of the two engines at the source.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
H7. Are you proposing to <b>streamline</b> any requirements? If Yes, identify the streamlined and subsumed requirements and the EU ID, and provide a justification for streamlining the applicable requirement below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

<p>H8. Does the source propose to add, change and/or delete <b>emission limit</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Request to delete EUENGINE5 emission limits, as this source has been decommissioned.</p>	
<p>H10. Does the source propose to add, change and/or delete <b>material limit</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H11. Does the source propose to add, change and/or delete <b>process/operational restriction</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Request to change FGWAUKENGINES to FGWAUKENGINE, as we are request one of the two sources to be omitted.</p>	
<p>H12. Does the source propose to add, change and/or delete <b>design/equipment parameter</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H13. Does the source propose to add, change and/or delete <b>testing/sampling</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>V (1) Request to delete testing conditions for EUENGINE5, as this source is decommissioned.</p>	
<p>H14. Does the source propose to add, change and/or delete <b>monitoring/recordkeeping</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Request to change the source name from FGWUAKENGINES to FGWAUKENGINE</p>	
<p>H15. Does the source propose to add, change and/or delete <b>reporting</b> requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Request to change the source name from FGWUAKENGINES to FGWAUKENGINE</p>	

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

H16. Does the source propose to add, change and/or delete **stack/vent restrictions**? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Request to delete SVENGINE5, as engine has been dismantled.

H17. Does the source propose to add, change and/or delete any **other** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

H18. Does the source propose to add terms and conditions for an alternative operating scenario or intra-facility trading of emissions? If Yes, identify the proposed conditions in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Check here if an AI-001 Form is attached to provide more information for Part H. Enter AI-001 Form ID: **AI-**

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

EFFECTIVE DATE: August 4, 2014

REVISION DATES: April 21, 2015, June 5, 2017

ISSUED TO:

**Breitburn Operating, LP – Wilderness CO2 CPF  
and  
Linn Operating, LLC – Hayes 29 CPF**

State Registration Number (SRN): N5831

LOCATED AT:

10875 Geronimo Trail, Gaylord, Otsego County, Michigan 49735

**RENEWABLE OPERATING PERMIT**

Permit Number: MI-ROP-N5831-2014b

Expiration Date: August 4, 2019

Administratively Complete ROP Renewal Application Due Between:  
February 4, 2018 and February 4, 2019

This Renewable Operating Permit (ROP) is issued in accordance with and subject to Section 5506(3) of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Pursuant to Michigan Air Pollution Control Rule 210(1), this ROP constitutes the permittee's authority to operate the stationary source identified above in accordance with the general conditions, special conditions and attachments contained herein. Operation of the stationary source and all emission units listed in the permit are subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

**SOURCE-WIDE PERMIT TO INSTALL**

Permit Number: MI-PTI-N5831-2014b

This Permit to Install (PTI) is issued in accordance with and subject to Section 5505(5) of Act 451. Pursuant to Michigan Air Pollution Control Rule 214a, the terms and conditions herein, identified by the underlying applicable requirement citation of Rule 201(1)(a), constitute a federally enforceable PTI. The PTI terms and conditions do not expire and remain in effect unless the criteria of Rule 201(6) are met. Operation of all emission units identified in the PTI is subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

Michigan Department of Environmental Quality

Shane Nixon, Cadillac District Supervisor

## TABLE OF CONTENTS

<b>AUTHORITY AND ENFORCEABILITY .....</b>	<b>4</b>
<b>SECTION 1 – Breitburn Operating, LP - Wilderness CO2 CPF.....</b>	<b>5</b>
<b>A. GENERAL CONDITIONS.....</b>	<b>6</b>
Permit Enforceability .....	6
General Provisions.....	6
Equipment & Design .....	7
Emission Limits.....	7
Testing/Sampling .....	7
Monitoring/Recordkeeping .....	7
Certification & Reporting .....	8
Permit Shield .....	9
Revisions .....	10
Reopenings.....	10
Renewals .....	10
Stratospheric Ozone Protection .....	10
Risk Management Plan.....	11
Emission Trading .....	11
Permit To Install (PTI) .....	11
<b>B. SOURCE-WIDE CONDITIONS .....</b>	<b>13</b>
<b>C. EMISSION UNIT CONDITIONS .....</b>	<b>16</b>
EMISSION UNIT SUMMARY TABLE.....	16
<b>D. FLEXIBLE GROUP CONDITIONS.....</b>	<b>17</b>
FLEXIBLE GROUP SUMMARY TABLE.....	17
FGCATENGINES.....	18
FGWAUKENGINES.....	22
FGRURALSIRICEMACT.....	27
<b>E. NON-APPLICABLE REQUIREMENTS .....</b>	<b>30</b>
<b>APPENDICES .....</b>	<b>31</b>
Appendix 1. Abbreviations and Acronyms.....	31
Appendix 2. Schedule of Compliance.....	32
Appendix 3. Monitoring Requirements .....	32
Appendix 4. Recordkeeping .....	32
Appendix 5. Testing Procedures .....	32
Appendix 6. Permits to Install.....	32
Appendix 7. Emission Calculations .....	33
Appendix 8. Reporting .....	33
<b>SECTION 2 – LINN Operating, LLC - Hayes 29 CPF.....</b>	<b>34</b>
<b>A. GENERAL CONDITIONS.....</b>	<b>35</b>
Permit Enforceability .....	35
General Provisions.....	35
Equipment & Design .....	36

ROP No: MI-ROP-N5831-2014b  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014b

Emission Limits .....	36
Testing/Sampling .....	36
Monitoring/Recordkeeping .....	37
Certification & Reporting .....	37
Permit Shield .....	38
Revisions .....	39
Reopenings.....	39
Renewals.....	39
Stratospheric Ozone Protection .....	40
Risk Management Plan .....	40
Emission Trading .....	40
Permit To Install (PTI) .....	40
<b>B. SOURCE-WIDE CONDITIONS .....</b>	<b>42</b>
<b>C. EMISSION UNIT CONDITIONS .....</b>	<b>45</b>
EMISSION UNIT SUMMARY TABLE.....	45
EUGLYCOLDEHYDRATOR .....	46
EUENGINEH29 .....	49
EUMACTZZZ.....	53
<b>D. FLEXIBLE GROUP CONDITIONS.....</b>	<b>56</b>
<b>E. NON-APPLICABLE REQUIREMENTS .....</b>	<b>57</b>
<b>APPENDICES .....</b>	<b>58</b>
Appendix 1. Abbreviations and Acronyms.....	58
Appendix 2. Schedule of Compliance.....	59
Appendix 3. Monitoring Requirements .....	59
Appendix 4. Recordkeeping .....	59
Appendix 5. Testing Procedures .....	59
Appendix 6. Permits to Install.....	59
Appendix 7. Emission Calculations .....	59
Appendix 8. Reporting .....	60



ROP No: MI-ROP-N5831-2014b  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014b

## AUTHORITY AND ENFORCEABILITY

For the purpose of this permit, the **permittee** is defined as any person who owns or operates an emission unit at a stationary source for which this permit has been issued. The **department** is defined in Rule 104(d) as the Director of the Michigan Department of Environmental Quality (MDEQ) or his or her designee.

The permittee shall comply with all specific details in the permit terms and conditions and the cited underlying applicable requirements. All terms and conditions in this ROP are both federally enforceable and state enforceable unless otherwise footnoted. Certain terms and conditions are applicable to most stationary sources for which an ROP has been issued. These general conditions are included in Part A of this ROP. Other terms and conditions may apply to a specific emission unit, several emission units which are represented as a flexible group, or the entire stationary source which is represented as a Source-Wide group. Special conditions are identified in Parts B, C, D and/or the appendices.

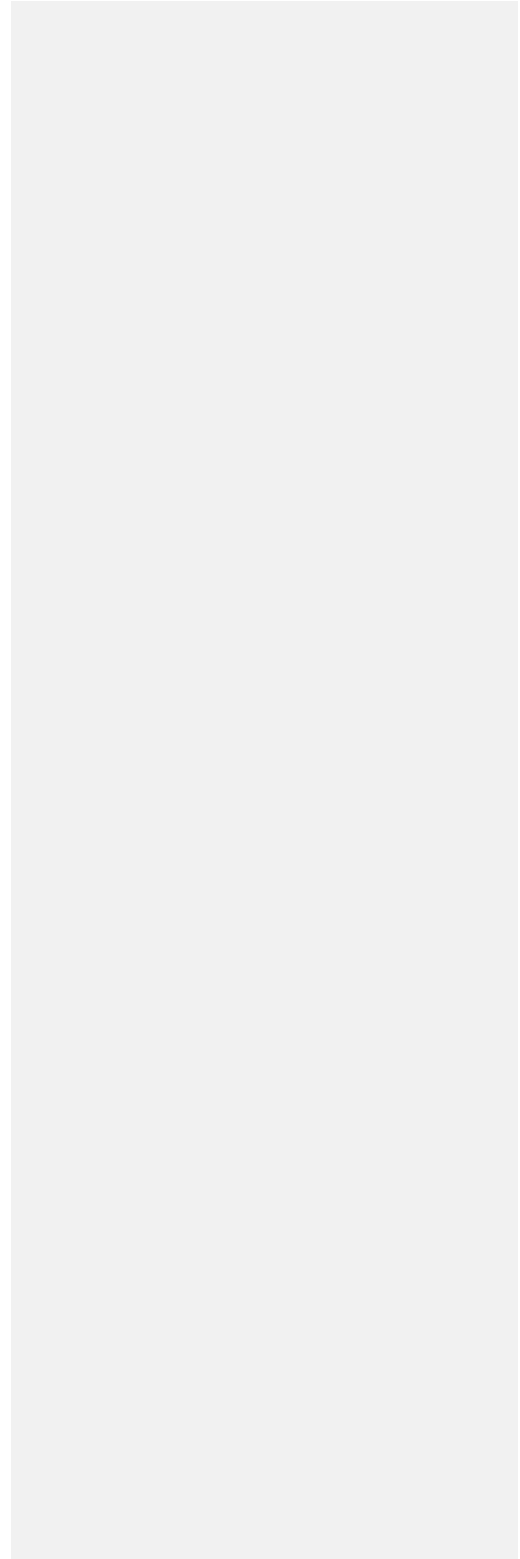
In accordance with Rule 213(2)(a), all underlying applicable requirements are identified for each ROP term or condition. All terms and conditions that are included in a PTI, are streamlined, subsumed and/or are state-only enforceable will be noted as such.

In accordance with Section 5507 of Act 451, the permittee has included in the ROP application a compliance certification, a schedule of compliance, and a compliance plan. For applicable requirements with which the source is in compliance, the source will continue to comply with these requirements. For applicable requirements with which the source is not in compliance, the source will comply with the detailed schedule of compliance requirements that are incorporated as an appendix in this ROP. Furthermore, for any applicable requirements effective after the date of issuance of this ROP, the stationary source will meet the requirements on a timely basis, unless the underlying applicable requirement requires a more detailed schedule of compliance.

Issuance of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

**SECTION 1 – Breitburn Operating, LP - Wilderness CO2 CPF**



## A. GENERAL CONDITIONS

### Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state-only enforceable Source-Wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R 336.1214a(5))**
- Those conditions that are hereby incorporated in a federally enforceable Source-Wide PTI pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

### General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state-only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities: **(R 336.1213(1)(d))**
  - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
  - c. Inspect, at reasonable times, any of the following:
    - i. Any stationary source.
    - ii. Any emission unit.
    - iii. Any equipment, including monitoring and air pollution control equipment.
    - iv. Any work practices or operations regulated or required under the ROP.
  - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.
5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL §15.231 et seq., and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

#### **Equipment & Design**

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

#### **Emission Limits**

11. Unless otherwise specified in this ROP, the permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following: **(R 336.1301(1))**
  - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
  - b. A limit specified by an applicable federal new source performance standard.  
The grading of visible emissions shall be determined in accordance with Rule 303.
12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
  - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.<sup>1</sup> **(R 336.1901(a))**
  - b. Unreasonable interference with the comfortable enjoyment of life and property.<sup>1</sup> **(R 336.1901(b))**

#### **Testing/Sampling**

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**
14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**
15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(5))**

#### **Monitoring/Recordkeeping**

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate: **(R 336.1213(3)(b))**
  - a. The date, location, time, and method of sampling or measurements.
  - b. The dates the analyses of the samples were performed.
  - c. The company or entity that performed the analyses of the samples.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

- d. The analytical techniques or methods used.
  - e. The results of the analyses.
  - f. The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

### Certification & Reporting

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a Responsible Official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A Responsible Official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
- a. For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
  - b. For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.
  - c. For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.
22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following: **(R 336.1213(3)(c))**
- a. Submitting a certification by a Responsible Official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
  - b. Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a Responsible Official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.

23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a Responsible Official in a manner consistent with the CAA. **(R 336.1912)**

#### Permit Shield

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
  - a. The applicable requirements are included and are specifically identified in the ROP.
  - b. The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.

Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.
27. Nothing in this ROP shall alter or affect any of the following:
  - a. The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**
  - b. The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
  - c. The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**
  - d. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:
  - a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
  - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
  - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
  - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
  - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

### Revisions

30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(10))**
33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

### Reopenings

34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
- If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
  - If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**
  - If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
  - If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

### Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(8))**

### Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaiming, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

37. If the permittee is subject to 40 CFR Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

### Risk Management Plan

38. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall comply with the requirements of 40 CFR Part 68, no later than the latest of the following dates as provided in 40 CFR Part 68.10(a):
- June 21, 1999,
  - Three years after the date on which a regulated substance is first listed under 40 CFR Part 68.130, or
  - The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c)). **(40 CFR Part 68)**

### Emission Trading

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

### Permit To Install (PTI)

43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule. <sup>2</sup> **(R 336.1201(1))**
44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA. <sup>2</sup> **(R 336.1201(8), Section 5510 of Act 451)**
45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ. <sup>2</sup> **(R 336.1219)**
46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months, or has been interrupted for 18 months,



ROP No: MI-ROP-N5831-2014<sup>b</sup>

Expiration Date: August 4, 2019

PTI No: MI-PTI-N5831-2014<sup>b</sup>

the applicable terms and conditions from that PTI shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI. <sup>2</sup> **(R 336.1201(4))**

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

## **B. SOURCE-WIDE CONDITIONS**

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.

**SOURCE-WIDE CONDITIONS**

**POLLUTION CONTROL EQUIPMENT:**

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
2. CO	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
3. Each Individual HAP	Less than 10 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R336.1213(2)(d)
4. Total HAPs	Less than 25 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R336.1213(2)(d)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall only burn sweet natural gas in all natural gas fired equipment.<sup>2</sup> (R 336.1205(3))

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years.<sup>2</sup> (R 336.1213(3)(b)(ii))

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month.<sup>2</sup> (R336.1205(3), R 336.213(3))

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO and NOx emission calculation records for the Stationary Source, to demonstrate compliance with Special Conditions (SC) I.1 and I.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R336.1205(3), R 336.213(3))**
3. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period HAP emission calculation records for the Stationary Source, as required in SC I.3 and I.4 above. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R336.1213(2)(d))**

See Appendix 7

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

See Appendix 8

#### **VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
NA	NA	NA	NA

#### **IX. OTHER REQUIREMENT(S)**

NA

#### **Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

### C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

#### EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUENGINE1	Remote 1,085 hp Caterpillar 3516 LE (low emission) reciprocating internal combustion engine (RICE)	11/01/92	FGCATENGINES
EUENGINE2	Remote 1,085 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE3	Remote 1,085 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE4	Remote 1,150 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE5	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE, with 3-way catalytic converter and air to fuel ratio control (AFRC)  On February 23, 2015, the facility revised minor modification application No. 201500014 to consider the engine "shut-in" and would test the engine within 90 days of bringing it back online. EUENGINE5 was shut down and placed in stand-by mode effective November 10, 2014.	11/01/92	FGWAUKENGINES
EUENGINE6	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE, with 3-way catalytic converter and AFRC	11/01/92	FGWAUKENGINES

Commented [CK1]: REQUEST THAT EUENGINE5 BE REMOVED FROM ROP.

### D. FLEXIBLE GROUP CONDITIONS

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

#### FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGCATENGINES	Remote Caterpillar 3516 LE (low emission) reciprocating internal combustion engines (RICE)	EUENGINE1, EUENGINE2, EUENGINE3, and EUENGINE4,
FGWAUKENGINES	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE controlled by 3-way catalytic converters, subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) requirements	EUENGINE5 and EUENGINE6
FGRURALSIRICEMACT	Existing non-emergency Spark Ignition (SI) 4 Stroke Lean Burn (4SLB) and existing non-emergency SI 4 Stroke Rich Burn (4SRB) stationary RICE with site ratings greater than 500 HP located at an area source of HAPs, that meet the definition of remote stationary RICE in 40 CFR 63.6675	EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, <del>EUENGINE5</del> , and EUENGINE6

Commented [CK2]: REQUEST TO REMOVE EUENGES5

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**FGCATENGINES  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

Four remote Caterpillar 3516 LE (low emission) RICE

**Emission Units:** EUENGINE1, EUENGINE2, EUENGINE3, and EUENGINE4

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst (EUENGINE2, EUENGINE3, and EUENGINE4)

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE1	SC V.1 and SC VI.7	R 336.1205(3)
1. CO	20.8 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE1	SC V.1 and SC VI.7	R 336.1205(3)
2. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE2	SC V.1 and SC VI.7	R 336.1205(3)
3. CO	4.5 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE2	SC V.1 and SC VI.7	R 336.1205(3)
4. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE3	SC V.1 and SC VI.7	R 336.1205(3)
5. CO	4.5 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE3	SC V.1 and SC VI.7	R 336.1205(3)
6. NOx	24.4 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE4	SC V.1 and SC VI.7	R 336.1205(3)
7. CO	4.2 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE4	SC V.1 and SC VI.7	R 336.1205(3)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
2. The permittee shall not operate FGCATENGINES unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)**

3. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)**
4. The permittee shall utilize a differential pressure gauge or manometer for any engine with an oxidation catalyst, to monitor the operation of the oxidation catalyst as an indicator of proper operation. The appropriate range defining the proper operation of the oxidation catalyst is identified in the MAP. **(R 336.1213(3)(a)(i))**
5. The permittee shall utilize a temperature gauge or thermocouple for any engine with an oxidation catalyst, to monitor the operation of the oxidation catalyst, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the oxidation catalyst is identified in the MAP. **(R 336.1213(3)(a)(i))**

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall install and calibrate a thermocouple in accordance with the manufacturer's recommendations for any engine with an oxidation catalyst. **(R 336.1213(3)(a)(iii))**



#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall verify NOx and CO emissions from each engine in FGCAENGINES, by testing at owners expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. **(R 336.1205(3), R 336.2001, R336.2003, R336.2004)**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in FGCAENGINES on a monthly basis. **(R 336.1205(3), R 336.1213(3))**
2. The permittee shall monitor and record the differential pressure gauge or monometer on any engine with an oxidation catalyst in FGCAENGINES, on a monthly basis. **(R 336.1213(3)(a)(iii))**
3. The permittee shall monitor and record the inlet temperature and outlet temperature on any engine with an oxidation catalyst in FGCAENGINES, on a daily basis. **(R 336.1213(3)(a)(iii))**
4. The permittee shall maintain a log of all maintenance activities conducted according to the PM/MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)**
5. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device monthly and 12-month rolling time period records of the hours of each engine included in FGCAENGINES is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
6. The permittee shall keep, in a satisfactory manner, monthly fuel use records for each engine included in FGCAENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
7. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for each engine included in FGCAENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
8. If any engine included in FGCAENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(3))**

See Appendix 7

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

4. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3), R 336.1213(3))**
5. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
6. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5), R 336.1213(3))**
7. If any engine included in FGATENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> **(R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)**

See Appendix 8

#### VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVENGINE1	16 <sup>1</sup>	37.5 <sup>1</sup>	<b>R 336.1225</b>
2. SVENGINE2	16 <sup>1</sup>	37.5 <sup>1</sup>	<b>R 336.1225</b>
3. SVENGINE3	16 <sup>1</sup>	37.5 <sup>1</sup>	<b>R 336.1225</b>
4. SVENGINE4	16 <sup>1</sup>	37.5 <sup>1</sup>	<b>R 336.1225</b>

#### IX. OTHER REQUIREMENT(S)

NA

#### Footnotes:

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGWAUKENGINES  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

~~Two~~ remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE

Emission Unit: ~~EUENGINE5~~ and EUENGINE6

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**POLLUTION CONTROL EQUIPMENT:**

3-way catalytic converters

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
<del>1. NOx</del>	<del>24.6 tons<sup>2</sup></del>	<del>12-month rolling time period, as determined at the end of each calendar month</del>	<del>EUENGINE5</del>	<del>SC V.1 and SC VI.11</del>	<del>R 336.1205(3)</del>
<del>2. CO</del>	<del>41.1 tons<sup>2</sup></del>	<del>12-month rolling time period, as determined at the end of each calendar month</del>	<del>EUENGINE5</del>	<del>SC V.1 and SC VI.11</del>	<del>R 336.1205(3)</del>
3. NOx	24.6 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE6	SC V.1 and SC VI.11	R 336.1205(3)
4. CO	41.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE6	SC V.1 and SC VI.11	R 336.1205(3)

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**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

- The permittee shall only burn sweet natural gas in FGWAUKENGINES.<sup>2</sup> (R 336.1205(3))
- The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))

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3. The permittee shall not operate FGWAUKENGINES unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

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If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)

4. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)
5. The permittee shall utilize a differential pressure gauge or manometer for any engine with a catalytic converter, to monitor the operation of the catalytic converter as an indicator of proper operation. The appropriate range defining the proper operation of the catalytic converter is identified in the MAP. (R 336.1213(3)(a)(i))
6. The permittee shall utilize a temperature gauge or thermocouple for any engine with a catalytic converter, to monitor the operation of the catalytic converter, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the catalytic converter is identified in the MAP. (R 336.1213(3)(a)(i))

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall install and calibrate a thermocouple gauge in accordance with the manufacturer's recommendations. (40 CFR 64.3(b)(2)(a), (R 336.1213(3)(a)(iii))

#### V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

- ~~1. The permittee shall verify NOx and CO emissions from EUENGINE5, by testing at owner's expense, within 90 days of start-up, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)~~
2. The permittee shall verify NOx and CO emissions from EUENGINE6, by testing at owner's expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)

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#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in FGWAUKENGINES on a monthly basis. (R 336.1205(3), R 336.1213(3))

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2. The permittee shall utilize a differential pressure gauge or manometer to monitor the operation of the catalytic converter as an indicator of proper operation. The appropriate range defining the proper operation of the catalytic converter is identified in the MAP. **(40 CFR 64.6(c)(1)(i), 40 CFR 64.6(c)(1)(ii), R 336.1213(3)(a)(i))**
3. The permittee shall monitor and record the differential pressure gauge or monometer on ~~EUENGINE5 and~~ EUENGINE6, on a monthly basis. **(40 CFR 64.6(c)(1)(iii), 40 CFR 64.6(c)(3), 40 CFR 64.7(c), R 336.1213(3)(a)(i))**
4. An excursion for NOx and CO shall be a differential pressure gauge or manometer reading of 1.5 inches of water over or under the differential pressure under normal operating conditions identified in the MAP, which is determined when the catalytic converter is installed. **(40 CFR 64.6(c)(2), R 336.1213(3)(a)(i))**
5. The permittee shall utilize a temperature gauge or thermocouple to monitor the operation of the catalytic converter, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the catalytic converter is identified in the MAP. **(40 CFR 64.6(c)(1)(i), 40 CFR 64.6(c)(1)(ii), R 336.1213(3)(a)(i))**
6. The permittee shall monitor and record the inlet temperature and outlet temperature on ~~EUENGINE5 and~~ EUENGINE6, on a daily basis. **(40 CFR 64.6(c)(1)(iii), 40 CFR 64.6(c)(3), 40 CFR 64.7(c), R 336.1213(3)(a)(iii))**
7. An excursion for NOx and CO shall be a temperature gauge or thermocouple reading less than 900°F at the inlet of the catalytic converter, or greater than 1250°F at the outlet of the catalytic converter, or the outlet temperature from the catalytic converter is less than the inlet temperature.<sup>2</sup> **(40 CFR 64.6(c)(2))**
8. The permittee shall maintain a log of all maintenance activities conducted according to the MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3), R 336.1225, R 336.1702(a), R 336.1911)**
9. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device monthly and 12-month rolling time period records of the hours of each engine included in FGWAUKENGINE~~S~~ is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
10. The permittee shall keep, in a satisfactory manner, monthly fuel use records for each engine included in FGWAUKENGINE~~S~~. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
11. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for each engine included in FGWAUKENGINE~~S~~. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
12. If any engine included in FGWAUKENGINE~~S~~ is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(3))**
13. Upon detecting an excursion or exceedance of the differential pressure, the permittee shall check sample lines, check RPM verses differential pressure and compare the reading to previous month's readings, remove the catalyst and replace gaskets, as necessary. Should the differential pressure still indicate an excursion (greater than 1.5 times the normal differential pressure), the catalyst shall be removed and washed or replaced. **(40 CFR 64.7(d))**
14. Upon detecting an excursion or exceedance of the temperature, the permittee shall check loading on the engine, check for a faulty gauge or thermocouple, and check for proper operation of the ignition system.

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ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

Should the above check be performed and the temperatures are still outside the specified ranges, the engine shall be shut down. (40 CFR 64.7(d))

See Appendix 7

### VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. (R 336.1213(4)(c))
4. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. (40 CFR 64.9(a)(2)(i))
5. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. (R 336.12001(3), R 336.1213(3))
6. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. (R 336.2001(4))
7. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. (R 336.2001(5), R 336.1213(3))
8. If any engine included in FGWAUENGINE~~S~~ is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> (R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)

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See Appendix 8

### VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. <del>SVENGINE5</del>	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225
2. SVENGINE6	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225

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ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable requirements of 40 CFR Part 64. **(40 CFR Part 64)**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGRURALSIRICEMACT  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

Existing non-emergency Spark Ignition (SI) 4 Stroke Lean Burn (4SLB) and existing non-emergency SI 4 Stroke Rich Burn (4SRB) stationary RICE with site ratings greater than 500 HP located at an area source of HAPs, that meet the definition of remote stationary RICE in 40 CFR 63.6675.

Compliance date is October 19, 2013

**Emission Unit:** EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, ~~EUENGINE5~~, EUENGINE6

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**POLLUTION CONTROL EQUIPMENT:**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall be in compliance with the emission limitations, operating limitations and other requirements of Subpart ZZZZ of Part 63 at all times after the promulgated compliance date in Subpart ZZZZ of Part 63. **(40 CFR 63.6605(a))**
2. The permittee shall operate and maintain any affected RICE, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. **(40 CFR 63.6605(b))**
3. The permittee shall comply with the following requirements, for each 4SLB and 4SRB remote stationary RICE with a site rating greater than 500 brake HP, by the applicable compliance date. **(40 CFR 63.6603(a) and Table 2d)**
  - a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first, except as allowed in SC III.4.



ROP No: MI-ROP-N5831-2014**b**  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014**b**

- b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
  - c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
4. The permittee may utilize an oil analysis program in order to extend the specified oil change requirement in 40 CFR 63.6603 and as listed in SC III.3. The oil analysis program must be performed at the same frequency as oil changes are required. The analysis program must analyze the parameters and keep records as required in Part 63.6625(j) for SI engines. **(40 CFR 63.6625(j))**

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Table 2d of Subpart ZZZZ, apply. **(40 CFR 63.6625(h))**
2. The permittee shall operate and maintain the stationary RICE according to the manufacturer's emission-related written instructions or develop you own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air-pollution control practice for minimizing emissions. **(40 CFR 63.6640(a), Table 6)**

#### **V. TESTING/SAMPLING**

1. If using the oil analysis program for SI Engine(s), the permittee shall test for Total Acid Number, viscosity and percent water content. **(40 CFR 63.6625(j))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. By the compliance date, and every 12 months thereafter, the permittee must evaluate the status of their existing stationary SI RICE and document that the SI RICE meets the definition of remote stationary RICE in 40 CFR 63.6675. 40 CFR 63.6675 defines Remote stationary RICE as stationary RICE meeting any of the following criteria:
  - a. Stationary RICE located in an offshore area that is beyond the line of ordinary low water along that portion of the coast of the United States that is in direct contact with the open seas and beyond the line marking the seaward limit of inland waters.
  - b. Stationary RICE located on a pipeline segment that meets both of the criteria in paragraphs (b)(i) and (ii) of this definition.
    - i. A pipeline segment with 10 or fewer buildings intended for human occupancy within 220 yards (200 meters) on either side of the centerline of any continuous 1-mile (1.6 kilometers) length of pipeline. Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.
    - ii. The pipeline segment does not lie within 100 yards (91 meters) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12 month period. The days and weeks need not be consecutive. The building or area is considered occupied for a full day if it is occupied for any portion of the day.
    - iii. For purposes of this paragraph (b), the term pipeline segment means all parts of those physical facilities through which gas moves in transportation, including but not limited to pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies. Stationary RICE located within 50 yards (46 m) of the pipeline segment providing power for equipment on a pipeline segment are part of the pipeline segment. Transportation of gas means the gathering, transmission, or distribution of gas by pipeline, or the storage of gas. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

- c. Stationary RICE that are not located on gas pipelines and that have or fewer buildings intended for human occupancy within a 0.25 mile radius around the engine. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans. **(40 CFR 63.6603(f), 63.6675)**
2. The permittee shall keep records of the initial and annual evaluation of the status of the engine required by SC VI.1. **(40 CFR 63.6603(f))**
3. If the evaluation of the status of the engine required by SC VI.1 indicates that the stationary RICE no longer meets the definition of remote stationary RICE in SC VI.1(a) through (c) and 40 CFR 63.6675, the permittee shall comply with all of the applicable requirements in 40 CFR Part 63, Subpart ZZZZ for existing nonemergency SI 4SLB and/or 4SRB stationary RICE with a site rating of more than 500 HP located at area sources of HAP that are not remote stationary RICE within one year of the evaluation. **(40 CFR 63.6603(f))**
4. The permittee shall keep records as required in SC IV.2 to show continuous compliance with each emission or operating limit that applies. **(40 CFR 63.6655(d), 63.6660)**
5. The permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that the permittee operated and maintained the stationary RICE and after-treatment control device (if any) according to the permittee's maintenance plan. **(40 CFR 63.6655(e), 63.6660)**
6. The permittee shall maintain, at a minimum, the following records by the compliance date:
  - a. A copy of each notification and report that is submitted to comply with 40 CFR Part 63, Subpart ZZZZ and the documentation supporting each notification and report. **(40 CFR 63.6655(a)(1))**
  - b. Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment. **(40 CFR 63.6655(a)(2))**
  - c. Records of all required maintenance performed on the air pollution control and monitoring equipment. **(40 CFR 63.6655(a)(4))**
  - d. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation. **(40 CFR 63.6655(a)(5))**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

## **VIII. STACK/VENT RESTRICTION(S)**

NA

## **IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ as they apply to FG-RURALSIRICEMACT. The permittee may choose an alternative compliance method not listed in FG-RURALSIRICEMACT by complying with all applicable provisions required by Subpart ZZZZ for the compliance option chosen. **(40 CFR 70.6(9), 40 CFR 63.9(j), 40 CFR Part 63, Subparts A and ZZZZ)**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

## **E. NON-APPLICABLE REQUIREMENTS**

At the time of the ROP issuance, the AQD has determined that no non-applicable requirements have been identified for incorporation into the permit shield provision set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii).

## APPENDICES

### Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H <sub>2</sub> S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO <sub>2</sub>	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfuction Abatement Plan	VE	Visible Emissions
MDEQ	Michigan Department of Environmental Quality	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 pounds per square inch gauge (psig).

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
 Expiration Date: August 4, 2019  
 PTI No: MI-PTI-N5831-2014<sup>b</sup>

**Appendix 2. Schedule of Compliance**

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. (R 336.1213(4)(a), R 336.1119(a)(ii))

**Appendix 3. Monitoring Requirements**

This source is subject to the compliance assurance monitoring (CAM) program under 40 CFR 64.4(a). The CAM plan for this source is addressed in the malfunction abatement plan (MAP) required in Section D, SC III.1.

**Appendix 4. Recordkeeping**

Specific recordkeeping requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 5. Testing Procedures**

Specific testing requirement plans, procedures, and averaging times are detailed in the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 6. Permits to Install**

The following table lists any PTIs issued or ROP revision applications received since the effective date of the previously issued ROP No. MI-ROP-N5831-2008. Those ROP revision applications that are being issued concurrently with this ROP renewal are identified by an asterisk (\*). Those revision applications not listed with an asterisk were processed prior to this renewal.

Source-Wide PTI No MI-PTI-N5831-2008a is being reissued as Source-Wide PTI No. MI-PTI-N5831-2014.

Permit to Install Number	ROP Revision Application Number	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	200900188	Added oxidation catalyst as control on EUENGINE2, EUENGINE3, and EUEGINE4 (was left out on original ROP)	EUENGINE2, EUENGINE3 and EUENGINE4

The following ROP amendments or modifications were issued after the effective date of ROP No. MI-ROP-N5831-2014.

Permit to Install Number	ROP Revision Application Number/Issuance Date	Description of Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	201500014/ April 21, 2015	On February 23, 2015, the facility revised minor modification application No. 201500014 to consider the engine "shut-in" and would test the engine within 90 days of bringing it back online. EUENGINE5 was shut down and placed in stand-by mode effective November 10, 2014.	EUENGINE5

Commented [CK4]: Request to remove from ROP

## Appendix 7. Emission Calculations

The permittee shall use the following procedure in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in FGCATENGINES, FGWAUKENGINES, and Source-Wide Conditions.

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### Procedures for Calculating Facility NOx and CO Emissions

The permittee shall demonstrate compliance with the NOx and CO emission limits by keeping track of all fuel usage for all equipment using such fuel at this facility and multiplying that fuel usage by an equipment-specific emission factor. The emission factors are typically expressed as a mass weight of pollutant per unit of fuel.

**Each engine included in FGCATENGINES and FGWAUKENGINES:** The permittee shall use emission factors from source specific testing (stack testing) or vendor data, for each engine included in FGCATENGINES and FGWAUKENGINES, including engine(s) from engine change-out(s), and during the hours operated without a catalyst. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

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**Fuel burning equipment at the facility:** The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or stack data is not available. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.

## Appendix 8. Reporting

### A. Annual, Semiannual, and Deviation Certification Reporting

The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation Report form (EQP 5737) for the annual, semiannual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

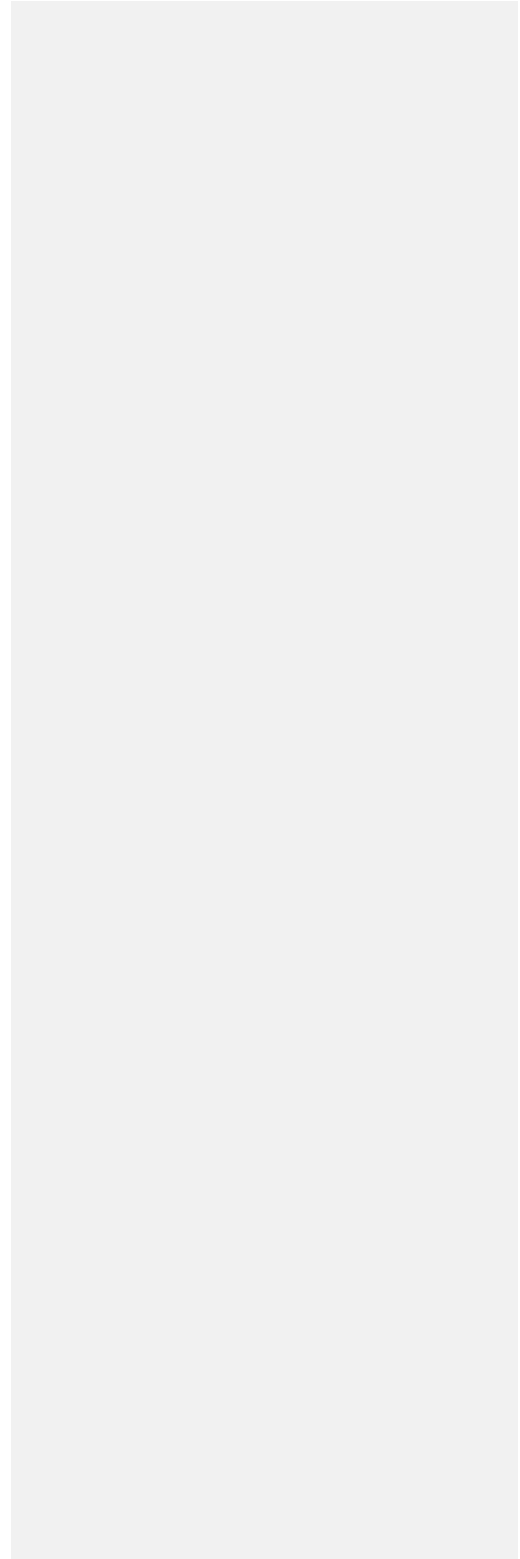
### B. Other Reporting

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.

**Section 2 – LINN Operating, LLC - Hayes 29 CPF**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

**SECTION 2 – LINN Operating, LLC - Hayes 29 CPF**



## A. GENERAL CONDITIONS

### Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state-only enforceable Source-Wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R 336.1214a(5))**
- Those conditions that are hereby incorporated in a federally enforceable Source-Wide PTI pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

### General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state-only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities: **(R 336.1213(1)(d))**
  - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
  - c. Inspect, at reasonable times, any of the following:
    - i. Any stationary source.
    - ii. Any emission unit.
    - iii. Any equipment, including monitoring and air pollution control equipment.
    - iv. Any work practices or operations regulated or required under the ROP.
  - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.



ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL §15.231 et seq., and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**
6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

#### **Equipment & Design**

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

#### **Emission Limits**

11. Unless otherwise specified in this ROP, the permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following: **(R 336.1301(1))**
  - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
  - b. A limit specified by an applicable federal new source performance standard.The grading of visible emissions shall be determined in accordance with Rule 303.
12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
  - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.<sup>1</sup> **(R 336.1901(a))**
  - b. Unreasonable interference with the comfortable enjoyment of life and property.<sup>1</sup> **(R 336.1901(b))**

#### **Testing/Sampling**

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**
14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(5))**

### Monitoring/Recordkeeping

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate: **(R 336.1213(3)(b))**
- The date, location, time, and method of sampling or measurements.
  - The dates the analyses of the samples were performed.
  - The company or entity that performed the analyses of the samples.
  - The analytical techniques or methods used.
  - The results of the analyses.
  - The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

### Certification & Reporting

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a Responsible Official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A Responsible Official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
- For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
  - For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.
  - For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.
22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following: **(R 336.1213(3)(c))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

- a. Submitting a certification by a Responsible Official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
  - b. Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a Responsible Official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.
23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a Responsible Official in a manner consistent with the CAA. **(R 336.1912)**

#### Permit Shield

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
- a. The applicable requirements are included and are specifically identified in the ROP.
  - b. The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.
- Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.
27. Nothing in this ROP shall alter or affect any of the following:
- a. The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**
  - b. The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
  - c. The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**
  - e. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

- a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
  - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
  - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
  - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
  - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**
29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

### Revisions

30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(10))**
33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

### Reopenings

34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
- a. If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
  - b. If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**
  - c. If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
  - d. If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

### Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(8))**

### Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaiming, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.
37. If the permittee is subject to 40 CFR Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

### Risk Management Plan

38. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall comply with the requirements of 40 CFR Part 68, no later than the latest of the following dates as provided in 40 CFR 68.10(a):
- June 21, 1999,
  - Three years after the date on which a regulated substance is first listed under 40 CFR 68.130, or
  - The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c). **(40 CFR Part 68)**

### Emission Trading

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

### Permit To Install (PTI)

43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule. <sup>2</sup> **(R 336.1201(1))**
44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA. <sup>2</sup> **(R 336.1201(8), Section 5510 of Act 451)**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ. <sup>2</sup> **(R 336.1219)**
46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months, or has been interrupted for 18 months, the applicable terms and conditions from that PTI shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI. <sup>2</sup> **(R 336.1201(4))**

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

## **B. SOURCE-WIDE CONDITIONS**

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.

**SOURCE-WIDE CONDITIONS**

**POLLUTION CONTROL EQUIPMENT:**

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
2. CO	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
3. Each Individual HAP	Less than 10 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R 336.1213(2)(d)
4. Total HAPs	Less than 25 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R 336.1213(2)(d)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall only burn sweet natural gas in all natural gas fired equipment.<sup>2</sup> (R 336.1205(3))

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years.<sup>2</sup> (R 336.1213(3)(b)(ii))

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month.<sup>2</sup> (R 336.1205(3), R 336.213(3))



ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO and NOx emission calculation records for the Stationary Source, to demonstrate compliance with Special Conditions (SC) I.1 and I.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.213(3))**
3. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period HAP emission calculation records for the Stationary Source, as required SC I.3 and I.4 above. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(2)(d))**

See Appendix 7

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

See Appendix 8

#### **VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
NA	NA	NA	NA

#### **IX. OTHER REQUIREMENT(S)**

NA

#### **Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
 Expiration Date: August 4, 2019  
 PTI No: MI-PTI-N5831-2014<sup>b</sup>

### C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

#### EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUENGINEH29	Remote 1,085 hp Caterpillar G3516TALE (lean burn) reciprocating internal combustion engine (RICE) with oxidation catalyst	8/20/13	NA
EUGLYCOLDEHYDRATOR	Glycol dehydrator which removes water along with trace hydrocarbons from the gas stream. The water and hydrocarbons are controlled by a condenser.	11/01/92	NA
EUMACTZZZZ	Remote existing non-emergency spark ignition (SI) 4-stroke lean burn (4SLB) RICE (EUENGINEH29) Caterpillar 3516TALE (low emission) rated 1,085 hp located at an area source	08/20/13	NA

**EUGLYCOLDEHYDRATOR  
EMISSION UNIT CONDITIONS**

**DESCRIPTION:**

Glycol dehydrator system which removes water along with trace hydrocarbons from the gas stream.

Flexible Group ID: NA

**POLLUTION CONTROL EQUIPMENT:**

Condenser

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

NA

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. If EUGLYCOLDEHYDRATOR meets the exception criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters (3,001,746 cubic feet) per day, the actual flow rate of natural gas shall be determined using either of the procedures below:
  - a. The permittee shall install and operate a monitoring instrument that directly measures natural gas flow rate to the glycol dehydration unit with an accuracy of plus or minus 2 percent or better. The permittee shall convert annual natural gas flow rate to a daily average by dividing the annual flow rate by the number of days per year the glycol dehydration unit processed natural gas. **(40 CFR 63.772(b)(1)(i))**

ROP No: MI-ROP-N5831-2014b  
 Expiration Date: August 4, 2019  
 PTI No: MI-PTI-N5831-2014b

- b. The permittee shall document, to the AQD District Supervisor's satisfaction, the actual annual average natural gas flow rate to the glycol dehydration unit is less than 85,000 cubic meters per day. **(40 CFR 63.772(b)(1)(ii))**
- 2. As an alternative, if EUGLYCOLDEHYDRATOR meets the exemption criteria in 40 CFR 63.764(e)(1)(ii) for glycol dehydrators with actual average benzene emissions less than 0.90 megagram (0.99 ton) per year, the emissions shall be determined either uncontrolled, or with federally enforceable controls in place and using either of the procedures below:
  - a. The permittee shall determine actual average benzene emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit, and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1). **(40 CFR 63.772(b)(2)(i))**
  - b. The permittee shall determine an average mass rate of benzene emissions in kilograms per hour through direct measurement using the methods in 40 CFR 63.772(a)(1)(i) or (ii), or an alternative method according to 40 CFR 63.7(f). Annual emissions in kilograms per year shall be determined by multiplying the mass rate by the number of hours the unit is operated by year. This result shall be converted to megagrams per year. **(40 CFR 63.772(b)(2)(ii))**
- 3. If EUGLYCOLDEHYDRATOR complies with the exemption criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters (3,001,746 cubic feet) per day, the permittee shall keep records of the actual annual average natural gas throughput (in terms natural gas flow rate to the glycol dehydration unit per day) as determined in accordance with SC VI.1. The permittee shall keep records on file at a location approved by the AQD District Supervisor for a period of at least five years and make it available to the Department upon request. **(40 CFR 63.774(d)(1)(i))**
- 4. As an alternative to SC VI.1, if EUGLYCOLDEHYDRATOR complies with the exemption criteria in 40CFR 63.764(e)(1)(ii) for glycol dehydrators with the actual average benzene emissions less than 0.90 megagram per year, the permittee shall keep records of the actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with SC VI.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor for a period of at least five years and make it available to the Department upon request. **(40 CFR 63.774(d)(1)(ii))**

**VII. REPORTING**

- 1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
- 2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
- 3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
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ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all provisions of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 63, Subpart HH, as they apply to EUGLYCOLDEHYDRATOR. **(40 CFR Part 63, Subpart HH)**

**Footnotes:**

- <sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).  
<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUENGINEH29  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION:**

One remote 1,085 hp Caterpillar G3516TALE (lean burn) RICE

**Emission Unit:** EUENGINEH29

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	24.6 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINEH29	SC V.1 and SC VI.7	R 336.1205(3)
2. CO	41.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINEH29	SC V.1 and SC VI.7	R 336.1205(3)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
2. The permittee shall not operate EUENGINEH29 unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

- e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)

3. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)
4. The permittee shall utilize a differential pressure gauge or manometer to monitor the operation of the oxidation catalyst as an indicator of proper operation. The appropriate range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))
5. The permittee shall utilize a temperature gauge or thermocouple to monitor the operation of the oxidation catalyst, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall install and calibrate a thermocouple gauge in accordance with the manufacturer's recommendations. (R 336.1213(3)(a)(iii))

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall verify NO<sub>x</sub> and CO emissions from EUENGINEH29, by testing at owner's expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in EUENGINEH29 on a monthly basis. (R 336.1205(3), R 336.1213(3))
2. The permittee shall monitor and record the differential pressure gauge or monometer on EUENGINEH29, on a monthly basis. (R 336.1213(3)(a)(iii))
3. The permittee shall monitor and record the inlet temperature and outlet temperature on EUENGINEH29, on a daily basis. (R 336.1213(3)(a)(iii))
4. The permittee shall maintain a log of all maintenance activities conducted according to the MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> (R 336.1205(3), R 336.1213(3), R 336.1225, R 336.1702(a), R 336.1911)
5. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device, monthly and 12-month rolling time period records of the hours of EUENGINEH29 is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

6. The permittee shall keep, in a satisfactory manner, monthly fuel use records for EUENGINEH29. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
7. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for EUENGINEH29. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
8. If EUENGINEH29 is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(3))**

See Appendix 7

## VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3), R 336.1213(3))**
5. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
6. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5), R 336.1213(3))**
7. If EUENGINEH29 is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> **(R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)**

See Appendix 8



ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
SVENGINEH29	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUMACTZZZZ**  
**EUMACTZZZZ CONDITIONS**

**DESCRIPTION:**

An existing remote, non-emergency spark ignition (SI) four stroke lean burn (4SLB), natural gas-fired reciprocating internal combustion compressor engine (RICE) with a site-rating of 1,085 horsepower at an area source

**Emission Unit:** EUENGINEH29

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. **(40 CFR 63.6625 (e), 40 CFR 63.6605 (a)(b))**
2. The permittee shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in 40 CFR Part 63, Subpart ZZZZ Table 2d apply. **(40 CFR 63.6625 (h))**

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

**VI. MONITORING/RECORDKEEPING**

1. Except for monitor malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the Permittee shall monitor continuously at all times that the stationary RICE is operating. **(40 CFR 63.6635 (a)(b))**
2. The Permittee shall not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels; however shall use all the valid data collected during all other periods. **(40 CFR 63.663(c))**
3. The Permittee shall keep maintain the following records, which shall be made available to the Administrator upon request: **(40 CFR 63.6655(a)(b)(d)(e))**
  - a. A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirement in 40 CFR 63.10(b)(2)(xiv).
  - b. Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.
  - c. Records of applicable performance tests and performance evaluations as required in §63.10(b)(2)(viii).
  - d. Records of all required maintenance performed on the air pollution control and monitoring equipment.
  - e. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.
4. The permittee shall keep the records required in 40 CFR Part 63, Subpart ZZZZ Table 6 of this subpart to show continuous compliance with each applicable emission or operating limitation that applies.
5. The permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to the Malfunction Abatement Plan for EUENGINEH29 subject to management practices as shown in 40 CFR Part 63, Subpart ZZZZ, Table 2d to this subpart.

**VII. REPORTING**

1. The Permittee shall report each instance in which the requirements in 40 CFR Part 63, Subpart ZZZZ Table 8 were not met. **(40 CFR 63.6640(e))**

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
SVMACTZZZZ	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall evaluate the status of their stationary RICE every 12 months. **(40 CFR 63.6603(a))**
2. The permittee shall keep records of the initial and annual evaluation of the status of the engine. If the evaluation indicates that the stationary RICE no longer meets the definition of remote stationary RICE in 40 CFR 63.6675, Subpart ZZZZ, the owner or operator must comply with all of the requirements that are not remote stationary RICE within 1 year of the evaluation. **(40 CFR 63.6603(f))**

ROP No: MI-ROP-N5831-2014<sup>b</sup>

Expiration Date: August 4, 2019

PTI No: MI-PTI-N5831-2014<sup>b</sup>

3. The permittee shall within 1 year of the evaluation comply with 40 CFR 63.6640 if the remote stationary RICE is reconstructed or rebuilt. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a). **(40 CFR 63.6640(d))**
4. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines. **(40 CFR Part 63, Subparts A and ZZZZ)**

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

## **D. FLEXIBLE GROUP CONDITIONS**

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

### E. NON-APPLICABLE REQUIREMENTS

At the time of the ROP issuance, the AQD has determined that the requirements identified in the table below are not applicable to the specified emission unit(s) and/or flexible group(s). This determination is incorporated into the permit shield provisions set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii). If the permittee makes a change that affects the basis of the non-applicability determination, the permit shield established as a result of that non-applicability decision is no longer valid for that emission unit or flexible group.

Emission Unit/Flexible Group ID	Non-Applicable Requirement	Justification
EUENGINEH29	40 CFR Part 60, Subpart JJJJ	The Caterpillar 3516TALE RICE was manufactured prior to January 1, 2008, but installed at its current location on August 20, 2013, therefore 40 CFR Part 60, Subpart JJJJ is not applicable.

## APPENDICES

### Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H <sub>2</sub> S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO <sub>2</sub>	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfuction Abatement Plan	VE	Visible Emissions
MDEQ	Michigan Department of Environmental Quality	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 pounds per square inch gauge (psig).

ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

## Appendix 2. Schedule of Compliance

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. (R 336.1213(4)(a), R 336.1119(a)(ii))

## Appendix 3. Monitoring Requirements

Specific monitoring requirement procedures, methods or specifications are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

## Appendix 4. Recordkeeping

Specific recordkeeping requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

## Appendix 5. Testing Procedures

Specific testing requirement plans, procedures, and averaging times are detailed in the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

## Appendix 6. Permits to Install

The following table lists any PTIs issued or ROP revision applications received since the effective date of the previously issued ROP No. MI-ROP-N5831-2008. Those ROP revision applications that are being issued concurrently with this ROP renewal are identified by an asterisk (\*). Those revision applications not listed with an asterisk were processed prior to this renewal.

Source-Wide PTI No MI-PTI-N5831-2008a is being reissued as Source-Wide PTI No. MI-PTI-N5831-2014.

Permit to Install Number	ROP Revision Application Number	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	NA	NA	NA

## Appendix 7. Emission Calculations

The permittee shall use the following procedure in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in EUENGINEH29 and Source-Wide Conditions.

### Procedures for Calculating Facility NOx and CO Emissions

The permittee shall demonstrate compliance with the NOx and CO emission limits by keeping track of all fuel usage for all equipment using such fuel at this facility and multiplying that fuel usage by equipment-specific emission factor. The emission factors are typically expressed as a mass weight of pollutant per unit of fuel.

**EUENGINEH29:** The permittee shall use emission factors from source specific testing (stack testing) or vendor data, for EUENGINEH29, including an engine from an engine change-out. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.



ROP No: MI-ROP-N5831-2014<sup>b</sup>  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014<sup>b</sup>

**Fuel burning equipment at the facility:** The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or stack data is not available. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.

## **Appendix 8. Reporting**

### **A. Annual, Semiannual, and Deviation Certification Reporting**

The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation Report form (EQP 5737) for the annual, semiannual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

### **B. Other Reporting**

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.



# RENEWABLE OPERATING PERMIT APPLICATION

## AI-001: ADDITIONAL INFORMATION

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.*

SRN: 5831

Section Number (if applicable): 1

1. Additional Information ID

AI-CAM

### Additional Information

2. Is This Information Confidential?

Yes  No

Attached is a Compliance Assurance Monitoring Applicability summary for EUENGINE6.

Page of

**Compliance Assurance Monitoring (CAM) Plan  
Breitburn Operating Company, L.P.  
Wilderness/Hayes 29 Facility  
EUENGINE6**

**I. BACKGROUND**

**Emission Units**

Description: Waukesha L 7042 GSI compressor engine, rated at 1,478 hp, and equipped with a 3-way catalyst to control emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOCs).

Identification: EUENGINE6

Facility: Breitburn Operating Company, L.P. (Breitburn) – Wilderness/Hayes 29 Facility  
Section 29, T29N, R4W  
Hayes Township, Otsego County, Michigan

**Applicable Regulation, Emission Limit, Monitoring Requirements**

MI-ROP-N5831-014b FGWAWKENGINES FLEXIBLE GROUP CONIDITONS. I, lists the applicable regulations as R336.1205(3), R336.1225, R336.1702(a), and R336.1910.

Emission Limits:

EUENGINE6  
NO<sub>x</sub>: 24.6 tons/year  
CO: 41.1 tons/year

**Control Technology**

A 3-way catalyst is used to control NO<sub>x</sub>, CO, and VOC emissions from the Waukesha compressor engine. The pre-control device potential emissions of NO<sub>x</sub> and CO are greater than 100 tons per year for the Waukesha engine, which makes this unit subject to the CAM requirements. However, the pre-control device potential VOC emissions from the unit are less than 100 tpy.

**II. MONITORING APPROACH**

Pressure drop across the 3-way catalyst, and inlet and outlet temperatures are all monitored. These parameters represent the most important parameters for proper operation of the catalytic converter. The compliance assurance monitoring approach is summarized in Table 1.

**Table 1**

<b>Device Description</b>	<b>Operating Variable</b>	<b>Monitoring Method</b>	<b>Frequency</b>	<b>Normal Operating Range</b>	<b>Excursion Indicator</b>	<b>Remedial Action</b>
Catalyst	2" WC Change in $\Delta P$ @ normal operating conditions	Gauge or manometer	Monthly	Varies by engine. Recorded in database	2.5 times the $\Delta P$ @ normal operating conditions	Check sample lines, check rpm verses $\Delta P$ and compare to previous months readings, remove catalyst and replace gaskets as necessary; if still 1.5 times the normal range then catalyst would be removed and washed. Also see Table 2 of the approved PM/MAP
Catalyst	Inlet and Outlet temperatures	Thermocouple	Daily	Must be below 1350 degrees F. For 3-way catalysts only: Outlet temperature must be equal to or greater than the catalytic inlet temperature.	Temperature less than 800°F  Differential temperature greater than 150°F above normal (not to exceed 1350°F)	Check loading on engine, check for faulty gauge or temperature probe, and check for proper operation of the ignition system  Automatic engine shutdown  Also see Table 2 of the approved PM/MAP

Appendix A, attached to this CAM Plan, describes the inlet and outlet catalyst temperature data that will be recorded on a daily basis.

No in-situ continuous emission monitoring systems are employed to measure actual emissions from this engine.

Quality assurance and quality control will include following the approved preventative maintenance/malfunction abatement plan (PM/MAP) developed for the engine and catalytic converter. The PM/MAP for this facility requires periodic replacement of various components within specified times. Manufacturer recommendations will be followed to ensure proper operation of the engine and control device.

### **III. JUSTIFICATION**

The Monitoring Approach described above was determined during extensive communication between the MDEQ-AQD, the control equipment vendor, and the oil and gas industry regarding proper compliance assurance monitoring of the catalytic converter. It was determined that the pressure drop across the catalyst bed, and the inlet and outlet temperatures are critical parameters necessary to measure catalytic converter performance. The parameter ranges listed in Table 1 are used to determine that the catalytic converter is being operated and maintained to achieve the targeted control efficiencies for NO<sub>x</sub> and CO, and therefore provide the compliance assurance required. A high pressure drop may be an indication of plugging of the catalyst, and a very low one may indicate the catalyst bed has leakage around or through it. A high outlet temperature may also be an indication of the need to shut down the unit to prevent burnout of the catalyst. Typical operating temperature ranges for 3-way catalysts are 750 degrees F to 1350 degrees F. The PM/MAP requires certain actions to be taken in the event that there would be a monitored parameter outside of the values indicated in the above table.

Regarding the oxygen sensor for the AFRC, Breitburn has determined that the oxygen sensor is difficult to predict for any range that would define an excursion point. The same sensor can vary considerably depending on the engine's RPM, loading, and other factors, and for this reason it is not practical, nor value added, to identify any range that would identify excursion point(s). The PM/MAP for the facility's engines successfully addresses the requirements for proper operation of the AFRC, and associated oxygen sensor, for this engine. For this reason, it is not practical to identify an excursion level for the AFRC's oxygen sensor. Even if the oxygen sensor experiences difficulties, monitoring the catalytic converter using the pressure differential and temperatures as indicators are more important as monitoring parameters.

Therefore, Breitburn has determined that sufficient monitoring is being performed to satisfy the requirement pursuant to the CAM regulations and requirements, 40 CFR Part 64.

# **Appendix A**

## **Breitburn Operating Company, L.P. Exhaust Emissions Field Report**



**ENGINE EMISSIONS ANALYSIS**

Customer: BreitBurn Engine CID: 0  
 Location: 0 Engine RPM: 0  
 Unit: 0 BMEP Calc: #DIV/0!  
 Serial Number: 0 Amb Temp F: 0  
 Engine Model: 0 Date of Test: 01/00/00  
 Engine Timing: 0

**DATA OBSERVED**

ENGINE		CONVERTER	
NOx Observed - PPM	0	NOx Observed - PPM	0
CO Observed - PPM	0	CO Observed - PPM	0
O2 Observed - %	0.0		
Engine Horsepower	0		
Fuel Used - cu-ft/hr	0		
Fuel Analysis - BTU/cu-ft	0		

**CALCULATED RESULTS**

	g/BHP-Hr	lbs/hr	TPY
ENGINE NOx	#DIV/0!	0.00	0.00
ENGINE CO	#DIV/0!	0.00	0.00
CONVERTER NOx	#DIV/0!	0.00	0.00
CONVERTER CO	#DIV/0!	0.00	0.00

NOx CONVERSION	CO CONVERSION	RATIO: NO / NO2
#DIV/0!	#DIV/0!	#DIV/0! / #DIV/0!

Calculated results are derived from a series of emissions readings from the identified engine at the conditions listed. Test instrument reads NO and NO2 separately with NOx based on the combined total and calculated as NO2. Concentrations in PPMv are given at the observed O2 levels with no correction factor made. Engine loading is confirmed using WPI proprietary software and / or driven equipment loading. Test instrument is spanned with known gas concentrations before each series of tests. Printout of the raw data is attached. Test instrument is an electro-chemical cell type. Method of calculation is per EPA Method 19 based on fuel usage and analysis.

PRE NOx Lbs/Hr = 0.00 lb/hr g/BHP-Hr #DIV/0!  
 PRE CO Lbs/Hr = 0.00 #DIV/0!  
 POST NOx Lbs/Hr = 0.00 #DIV/0!  
 POST CO Lbs/Hr = 0.00 #DIV/0!  
 BMEP = #DIV/0!

DATA INPUT AREA	
Customer:	BreitBurn
Location:	
Unit:	
Engine Serial Number:	
Engine Model:	
Engine CID:	
Engine RPM:	
Ambient Temp - deg F:	
Test Date - m/d/yr	
Engine NO Observed - PPM:	
Engine NO2 Observed - PPM:	
Engine CO Observed - PPM:	
Exhaust O2 Observed - %:	
Engine Horsepower:	
Fuel Flow - cu-ft/hr	
Fuel Analysis - BTU/cu-ft	
Converter NO Observed - PPM:	
Converter NO2 Observed - PPM:	
Converter CO Observed - PPM:	
Engine Timing:	
<b>Permit Limits;</b>	
NOx; 90%	CO; 80%
<b>Catalyst temps;</b>	
In;	
Out;	
Diff;	0
<b>Catalyst pressure;</b>	
In;	
Out;	
Diff;	0
<b>Exhaust Flow</b>	
<b>O2 Target</b>	
<b>Catalyst Model:</b>	



# RENEWABLE OPERATING PERMIT APPLICATION

## AI-001: ADDITIONAL INFORMATION

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.*

SRN: 5831

Section Number (if applicable): 1

1. Additional Information ID  
**AI-MAP**

### Additional Information

2. Is This Information Confidential?

Yes  No

Revised PM MAP to reflect the omission of EUENGINE5

Page of



**Preventative Maintenance and  
Malfunction Abatement Plan**

**BreitBurn Operating, LP**

**Facility: Wilderness CO2pf  
SRN: N5831**

Revised to remove EUENGINE5 from ROP 6/27/18

Revised July 31, 2013

**Submission date: August 20, 2012**

**Revised to reflect company names change**

**Effective Date 11/1/2007**

<b>PM/MAP Content Checklist</b> <b><u>Reference Appendices C, D, and E.</u></b>		Where included	
		Page	Section or Table
1	Contact Person		<i>Cover Letter</i>
<b>ENGINES</b>			
2	<u>Engine Identification</u> : Include the engine make/model and type of engine (i.e. rich or lean burn). Identify engines with add on control and AFRC. If add on control is present, identify type of control.		<i>Appendix A &amp; Appendix C</i>
3	<u>Engine Operating Variables To Be Monitored</u> . Include a copy of the normal engine maintenance log.	4	<i>Table 1 &amp; Appendix B</i>
4	<u>Corrective procedures or operational changes</u> that will be taken in the event of a malfunction.	2, 6	<i>Table 2, Appendix D &amp; Appendix E</i>
5	<u>Major parts replacement</u> inventory for engines.	2	
<b>Add On Controls</b>			
6	<u>Catalytic Converter &amp; Oxidation Catalyst operating variables to be monitored</u> . Include the method and frequency of monitoring these variables; provide the normal operating range of these variables.	4-5	<i>Table 1</i>
7	<u>Corrective actions to be taken in event of malfunction of the catalytic converter</u> .	6	<i>Table 2</i>
8	<u>AFRC O<sub>2</sub> Sensor replacement schedule or operating variables to be monitored</u>	5	<i>Table 1</i>
9	<u>Corrective actions to be taken in event of malfunction of the AFRC</u>	6	<i>Table 2</i>
10	<u>Emission testing</u> utilizing portable analyzer	5	<i>Table 1</i>
11	<u>Scheduled maintenance of control equipment</u>	4-5	<i>Table 1</i>
12	<u>Major parts replacement</u> inventory for add on control.	2	
13	<u>Identify supervisory personnel</u> responsible for overseeing inspection, maintenance and repair of add on controls.	6	<i>Table 2</i>
14	<u>Recordkeeping and retention of records</u> .	2-3	
15	<u>Updates of PM/MAP</u> as necessary.	3	

## TABLE OF CONTENTS

	<b>Page No.</b>
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>2.0 ENGINES AND CATALYTIC CONTROL UNITS</b>	<b>1</b>
<b>3.0 RECORDKEEPING</b>	<b>2</b>
<b>4.0 UPDATES</b>	<b>3</b>

### APPENDICES

- Appendix A – List of Facility Specific Equipment Covered by this PM/MAP**
- Appendix B – Engine Field Report Form**
- Appendix C – Compressor Specification Sheet**
- Appendix D – Maintenance Record (Revised 11/2008)**
- Appendix E – Portable Analyzer Record**

## **1.0 INTRODUCTION**

BreitBurn Operating, LP (BreitBurn) operates numerous natural gas central processing facilities (CPFs) in Michigan. The CPFs receive gas from natural gas wells and dehydrate (if necessary) and compress the gas prior to pipeline transport. All of these CPFs have natural gas fired internal combustion engines. BreitBurn uses both rich burn and lean burn engines. Some of the rich burn engines are equipped with 3-way catalytic control systems. Generally there is no add-on control for BreitBurn lean burn engines. However, a few of BreitBurn's lean burn engines are equipped with oxidation catalytic control systems. The text of this PM/MAP is uniform for all of BreitBurn's facilities. The cover page and the specific engine, catalyst and AFRC information shown in Appendix A will be unique to each facility.

## **2.0 ENGINES AND CATALYTIC CONTROL UNITS**

### **2.1 Description**

Three-way catalytic converters, used on rich-burn engines, provide an overall control efficiency of 90 percent for NO<sub>x</sub>, 80 percent for CO and 50 percent for VOCs. Some of BreitBurn's rich burn engines operate with an air to fuel ratio controller (AFRC), others do not. Oxidation catalysts used on lean-burn engines reduce CO, VOC and trace organic toxic air contaminants (TACs), which include hazardous air pollutants (HAPs) and TACs emissions. Appendix A identifies the BreitBurn-operated engine(s) that are equipped with add-on control devices. This information is stored and updated on a BreitBurn database or spreadsheet. Appendix B also lists the operating variables of the engines.

### **2.2 Operation of Catalytic Converters**

For both 3-way and oxidation catalysts, the hot exhaust gases from the engine pass through a catalytic reduction bed, where the reduction and oxidation occur. An oxidation catalyst requires higher oxygen levels to allow the converter bed to oxidize the CO, VOC and trace organic TACs/HAPs. The exhaust gases then pass out a stack.

### **2.3 Critical Criteria**

The preventative maintenance of the engines is primarily done to keep the engine operating properly and to extend its useful life. Any major malfunction of the engine will lead to its being taken out of service for repair. Each engine has a control panel that will indicate critical malfunctions, and will initiate an engine shutdown if necessary. In the event of a shutdown, a third party mechanic is called out to repair the engine and a record of the event is made.

The critical criteria for the operation of the catalytic converter are the oxygen content of the incoming gases, the pressure drop across the catalyst bed and the inlet and outlet temperature. If the oxygen content is too high for a 3-way catalytic converter, the NO<sub>x</sub> reduction reaction will not yield the desired 90 percent decrease in concentration. Similarly, for oxidation catalysts, if the oxygen level drops too low, the proper oxidation of CO, VOC and trace TACs/HAPs will decrease. For lean burn engines, the oxygen level should be enough to ensure that the oxygen content of the exhaust gases will remain adequate to allow proper oxidation. A high pressure drop may be an indication of plugging of the catalyst, and a very

low one may indicate the catalyst bed has leakage around or through it. A high outlet temperature may also be an indication of the need to shut down the unit to prevent burnout of the catalyst. Typical operating temperature ranges for 3-way catalysts are 750 deg. F to 1350 deg. F.

#### **2.4 Catalyst Inspections and Maintenance**

In order to reduce the chance of fouling problems with either 3-way and oxidation catalysts, if an engine is new or major maintenance is performed, the engine may run for up to 100 hours without the catalyst installed. The engine may run without the catalytic converter a maximum of 200 hours per year. Records will be maintained of the engine hours of operation without the catalyst insert installed. All catalysts will be equipped with pre- and post-catalyst temperature sensors. All engines equipped with catalysts will automatically shut down in the event that the sensors indicate that the post-catalyst temperature exceeds 1350 degrees F. If the post-catalyst temperature on a 3-way catalyst is less than the pre-catalyst temperature, a mechanic will be called out to investigate. Temperature rise will not be used as a measure of oxidation catalyst performance. The preventative maintenance schedule for BreitBurn engines and catalysts is included as Table 1. A log of all inspections and maintenance work will be maintained in a BreitBurn database or spreadsheet. A schedule is maintained for each engine and its add-on control devices.

#### **2.5 Spare Parts**

Spare washed catalyst elements and engine parts will be maintained in a third party warehouse for use when a catalyst has been removed for maintenance. Each spare insert will be washed in accordance with the Table 2 schedule. Catalyst insert kits, oxygen sensors for air fuel ratio controllers, and extra temperature probes, stepper motor as well as a harness will be supplied by a third party.

#### **2.6 Key Operating Variables and Corrective Procedures in the Event of a Malfunction**

See Table 2 for a summary of the key operating variables and corrective actions for each malfunction.

### **3.0 RECORDKEEPING**

Records of engine operating hours and maintenance are maintained and updated on BreitBurn's data server in a database or in spreadsheet form.

BreitBurn will keep all records necessary for demonstrating compliance with this PM/MAP. Records will be made available within two weeks from the date of request by the MDEQ.

#### **4.0 UPDATES**

If BreitBurn experiences a malfunction that is not properly addressed in this Preventative Maintenance and Malfunction Abatement Plan, it will be updated and submitted to the AQD District Supervisor for review and approval.

<b>Table 1 – BreitBurn Engine and Catalysts Preventative Maintenance Schedule</b>			
<b>Item</b>	<b>Activity</b>	<b>Equipment Status</b>	<b>Frequency</b>
Engine	Mini Service ✓Check and adjust valves ✓Check engine compression ✓Check timing ✓Check fuel pressure ✓Check air filter ✓Change pre air filter ✓Check all kill devices ✓Inspect hoses and belts ✓ Inspect spark plugs	Off line	Every 60-90 days
Engine	Major Service ✓Perform mini service as listed above, and ✓Change motor oil and filter, as necessary, by sampling oil every 30 days, and submitting for an oil analysis	Off line	Approximately every 2,160 hours of engine operation, or if oil analysis indicates need.
Engine	Swing/overhaul ✓Replace existing engine with new/refurbished engine.  ☞ When new/rebuilt engine is installed or major maintenance is performed, the unit will be run without the catalyst, if applicable, for up to 100 hours per event. This prevents the catalyst from becoming damaged due to lubricants left in the engine and gives the valves and piston rings time to seat and seal.	Off line	Approximately every 75,000 hours of engine operation, or as needed.
Catalyst	Check differential pressure across catalyst.  Establish baseline $\Delta P$ each time a new or cleaned CC insert is installed at normal operating conditions (rpm's). Check monthly. If greater than baseline $\Delta P$ by 2" WC @80-100percent max rpm, then inspect catalyst and take actions based on findings.	On line	Monthly
Catalyst	Check inlet and outlet temperatures across catalyst. ☞ If the pre-catalyst temperature is less than 750°F, or other minimum temperature established through testing, a mechanic will be called out to investigate. ☞ If the post-catalyst temperature exceeds 1350°F, the engine will be shut down. ☞ If the $\Delta T$ across CC is negative, mechanic will evaluate cause and determine a resolution, based on history and degree of change. May	On line	Daily

**Table 1 – BreitBurn Engine and Catalysts Preventative Maintenance Schedule**

Item	Activity	Equipment Status	Frequency
	establish engine specific $\Delta T$ through testing. Must document conclusions, and actions.		
Catalyst	<p>The catalytic converter shall be removed, inspected and cleaned at least once per 12-18 months. Cleaning will consist of vacuuming or blowing clean the catalyst face and clearing fouling and built-up ash.</p> <p>If the catalyst does not respond to the annual vacuum or blowing treatment, the catalyst will be removed, shipped to the manufacturer, and washed. A “washed swing” catalyst insert shall be used until a new or refurbished catalyst is installed.</p> <p>The used catalyst will not be returned to service unless it can be rejuvenated.</p> <p>Replace the gaskets (typically at the same time the catalyst is washed or serviced).</p>	Off line	Every 12 -18 months of catalyst operating time, or in the event of an engine malfunction where foreign fluids cause engine shutdown.
Catalyst	<p>Remove catalyst insert and wash in chemical solution to remove surface contamination.</p> <p>☞ Replace with clean or fresh “swing” insert during cleaning process.</p>	Off line	Every 18-24 months of operation.
Catalyst	Replace catalyst insert.	Off line	If not functioning properly after vendor cleaning, or in lieu of vendor cleaning.
AFRC	Replace oxygen sensor.	On or off line	After 90-110 days of operation or if AFRC unit or lifetime sensor indicates need.
Emission Reduction Testing	For CO and NO <sub>x</sub> . BreitBurn will do one of the following: a) inlet and outlet testing and estimate destruction efficiency; b) outlet testing and check for gm/hp-hr compared to levels used for permitting; or c) outlet testing and use the uncontrolled vendor data to establish a destruction efficiency.	On line	Whenever new or refurbished catalyst inserted. Typically every 12-18 months when insert is serviced. Also as needed to identify alternate operating conditions.
Portable Emission Analyzer	Maintenance and calibration.	On or off line	As required by mfg’r manuals.



Table 2 – BreitBurn Operating Variables and Remedial Actions

Device Description	Operating Variable	Monitoring Method	Frequency	Normal Operating Range	Corrective Procedure or Operational Change in the Event of a Malfunction	Responsible Supervisor
AFRC Oxygen Sensor	Oxygen content of exhaust gases	Gauge or digital reading	Monthly	0-1 percent O <sub>2</sub>	Re-synchronize the engine and the AFRC. If O <sub>2</sub> level does not come into line, replace oxygen sensor within 5 days and readjust engine.	Third Party Mechanic
Catalyst	2.5" WC Change in ΔP @ normal operating conditions	Gauge or manometer	Monthly	Established with installation of new or cleaned CC insert that a 2.5" WC Change in ΔP @ normal operating conditions. Varies by engine. Recorded in database	Remove and inspect catalyst insert within 3 days. Clean or replace if necessary.	Third Party Mechanic
Catalyst	Inlet and Outlet temperatures	Thermocouple	Daily	Must be below 1350 degrees F. For 3-way catalysts only: Outlet temperature must be equal to or greater than the catalytic inlet temperature	Engine will automatically shut down at 1350 degrees F. For 3-way catalysts: If outlet temperature is less than inlet temperature, a mechanic will investigate and make appropriate repairs.	Third Party Mechanic
Thermocouple	Temperature	Temperature read-outs. Check with independent thermocouple.	As needed	0 to 1400 °F	Inspect thermocouple. Clean, recheck, or replace if not functioning.	Third Party Mechanic

**Appendix A  
Wilderness CO2 Equipment Information**

Facility	PTI	SRN	AQD ID	BB Unit Number	Type of Control	AFRC (yes/no)	Baseline DP	Engine Model	Rich or Lean Burn
WILDERNESS CO2	86-05A	N5831	EUENGINE6	CO2 - 1	CC	YES	2.3	Waukesha L-7042 GSI	RB
WILDERNESS CO2	86-05A	N5831	EUENGINE1	831	NA	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE2	856	OC	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE3	885	OC	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE4	907	OC	YES	NA	Caterpillar 3516	LB

**EUENGINE6 BASELINE DP CHANGE (HISTORICAL)**

3/3/2014 5.7  
8/8/2014 2.1

**2/6/2015 VACCUMMED & INSPECTED**

2/9/2015 2.5  
7/27/2015 3.0  
3/29/2016 Tested & DP is the same (3.0), no revision sent  
10/30/2017 2.3  
6/27/2018 Remove EUENGINE5 from MAP

**EUENGINE5**

SHUT IN 11/10/14

# Appendix B

## BreitBurn Operating L.P.

Preventative Maintenance and Malfunction Abatement Plan

### Field Report

Location: \_\_\_\_\_ Month & Year: \_\_\_\_\_

Unit #: \_\_\_\_\_ Location: \_\_\_\_\_ Equipment: \_\_\_\_\_

Engine Model & S.N.: \_\_\_\_\_ / \_\_\_\_\_ Comp. Model & S.N.: \_\_\_\_\_

#### Compressor

Date:	RPM	Oil Press	Oil Temp	Oil Level	Water Temp	Water Level	Suct Press	#1 int Press	#2 int Press	#3 int Press	Disch Press	#1 int Temp	#2 int Temp	#3 int Temp	Disch Temp	Oil Press	Oil Temp	Oil Level	Mech Initial	Exhaust Temp	
1																					
2																					
3																					
4																					
5																					
6																					
7																					
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**BreitBurn Operating Company, L.P.**  
**Preventative Maintenance and Malfunction Abatement Plan**  
**COMPRESSOR SPECIFICATION SHEET**

Facility/Unit #:	Packager:	Year Built:
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Engine		
Manufacturer:	Model:	Serial Number:
Horsepower:	RPM:	Spec/Arrangement:
Ignition/Make?:	Starter/Make?:	Governor/Make?:
Low Emission (LE)?	AFRC/Make-Model?	Catalytic Converter-Make/Model?
Stack Height:	Exhaust Diameter:	

Compressor		
Manufacturer:	Model:	Serial Number:
Throws:	Stages:	Stroke:
RPM:	Horsepower:	Rod Load Rating:


Cylinders						
Stage/Cyl#	Bore	Class	MAWP	Serial Number	VVP/Plug/Plain	VVP S/N

Cooler					
Manufacturer:	Model:			Serial Number:	
Section	MAWP	Number of Tubes	Number of Rows	Louvers?	Year
EJW					
TAW					
IC-1					
IC-2					
IC-3					
AC					



<b>Archrock</b>	North America Operations Services			Ticket Number:
	<b>General Service Ticket</b>			
Employee Name:		W.O. Number:		
Employee ID:		W.O. Type:		
Unit Number:		Business Unit:		
Date:		Asset Group:		
Customer Name:			Engine	Compressor
Lease Name:		Make		
Service Billable to Customer? (Y/N)	No	Model		
		Serial Number		
		Hour Meter		

<b>Time Clock</b>		Note: Select Asset Group first, then Exterran or Customer Downtime Code and Event	<b>Customer Downtime Code</b>	<b>Hrs Down</b>
Activity Start Time				
Activity Finish Time	12:00 AM		<b>Exterran Downtime Code</b>	<b>Hrs Down</b>
<b>Direct Time</b>		<b>Activity No.</b>	<b>Event - Code Description</b>	<b>Worked Hrs or Blowdown Events</b>
Work (hours)		1		
Travel (hours)		2		
Standby (hours)		3		
Total Miles Traveled		4		
Weather Condition				
Total Direct Hours	0.00			
<b>Others Operations Activities (MOB, DEMOB, etc)</b>		<b>Activity No.</b>	<b>Description</b>	<b>Worked Hrs</b>
		1		
		2		

<b>Indirect Time</b>		(Enter your comments here.)	
Description/Code	Hours		
Total Indirect Hours	0.00		

<b>Meal Hours</b>	
Description	Hours
Total Meal Hours	0.00

Qty	Part Number	Description	Warehouse	Qty	Part Number	Description	Warehouse
0				0			
0				0			
0				0			
0				0			
0				0			
0				0			

0	Days at	\$ -	Per Diem =	\$ -	0	Nights at	\$ -	Per Night =	\$ -
---	---------	------	------------	------	---	-----------	------	-------------	------

Is Job Complete? (Y/N)	Yes	Customer acknowledges and agrees all travel and living expenses shall be invoiced with labor charges per Exterran's Published Rate Sheet unless other terms are agreed to prior to commencement of service
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Employee Signature:	Employee Name: (print)
Customer Signature:	Customer Name: (print)

**BREITBURN OPERATING LP  
APPENDIX E  
EMISSIONS TESTING EXAMPLE**



**ENGINE EMISSIONS ANALYSIS**

Customer:	BreitBurn	Engine CID:	0
Location:	0	Engine RPM:	0
Unit:	0	BMEP Calc:	#DIV/0!
Serial Number:	0	Amb Temp F:	0
Engine Model:	0	Date of Test:	01/00/00
		Engine Timing:	0

**DATA OBSERVED**

ENGINE		CONVERTER	
NOx Observed - PPM	0	NOx Observed - PPM	0
CO Observed - PPM	0	CO Observed - PPM	0
O2 Observed - %	0.0		
Engine Horsepower	0		
Fuel Used - cu-ft/hr	0		
Fuel Analysis - BTU/cu-ft	0		

**CALCULATED RESULTS**

	g/BHP-Hr	lbs/hr	TPY
<b>ENGINE NOx</b>	#DIV/0!	0.00	0.00
<b>ENGINE CO</b>	#DIV/0!	0.00	0.00
<b>CONVERTER NOx</b>	#DIV/0!	0.00	0.00
<b>CONVERTER CO</b>	#DIV/0!	0.00	0.00

NOx CONVERSION	CO CONVERSION
#DIV/0!	#DIV/0!

RATIO:	NO	/	NO2
	#DIV/0!	/	#DIV/0!

Calculated results are derived from a series of emissions readings from the identified engine at the conditions listed. Test instrument reads NO and NO2 separately with NOx based on the combined total and calculated as NO2. Concentrations in PPMv are given at the observed O2 levels with no correction factor made. Engine loading is confirmed using WPI proprietary software and / or driven equipment loading. Test instrument is spanned with known gas concentrations before each series of tests. Printout of the raw data is attached. Test instrument is an electro-chemical cell type. Method of calculation is per EPA Method 19 based on fuel usage and analysis.



**Natural Gas Fired RICE Specifications**

Engine Parameter	Parameter Units	Parameter Value					
		EUENGINE1	EUENGINE2	EUENGINE3	EUENGINE4	EUENGINE6	
Breitbart ID		831	856	885	907	CO2-1	
Engine Make		Caterpillar	Caterpillar	Caterpillar	Caterpillar	Waukesha	
Engine Model		3516 TALE	3516 TALE	3516 TALE	3516 TALE	L 7042 GSI	
Engine Serial No.		3RC00254	4EK01389	4EK01593	4EK00222	362289	
Type of Fuel		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	
Rated Engine Power at 100% Load	bhp	1,085	1,085	1,085	1,150	1,478	
Design Heat Input Rating, LHV	MM Btu/hour	8.08	8.08	8.08	8.53	11.56	
Design Heat Input Rating, HHV	MM Btu/hour	8.89	8.89	8.89	9.39	12.72	
Fuel Heating Value, LHV	Btu/scf	927	927	927	927	927	
Fuel Heating Value, HHV	Btu/scf	1,020	1,020	1,020	1,020	1,020	
Fuel Flow	scf/hour	8,717	8,717	8,717	9,202	12,471	
Control Technologies	NA	Lean Burn	Lean Burn	Lean Burn	Lean Burn	3-way Catalyst	
<b>Exhaust Gas Parameters</b>	<b>Units</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	
Exhaust Gas Flowrate	acfm, wet	5,956	5,956	5,956	6,200	6,567	
Exhaust Gas Flowrate	scfm, 68F	2,415	2,415	2,415	2,524	2,188	
Exhaust Gas Temperature	F	842	842	842	837	1,125	
Stack Inner Diameter	inches	12	12	12	12	12	
Stack Area	ft <sup>2</sup>	0.79	0.79	0.79	0.79	0.79	
Stack Discharge Velocity	feet/second	126.39	126.39	126.39	131.57	139.35	
Stack Height Above Ground Level	feet	16	16	16	16	24	

**Natural Gas Fired Heaters Specifications**

Boiler/Process Heater Specifications	Parameter Units	Parameter Value					
		EULNEHEATERS	EUSTAGEIHEATERS	EUHEATERP1-S2	EUHEATERP2-S2	EUHEATERUOP	
Type of Fuel	NA	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	
Number of Units	NA	2	3	2	0	2	
Design Heat Input Rating, HHV	MM Btu/hr	1,50	1,00	0.50	0.50	0.50	
Fuel Heating Value, HHV	Btu/scf	1,020	1,020	1,020	1,020	1,020	
Fuel Flow	scf/hour	1,471	980	490	490	490	
Control Technologies	NA	None	None	None	None	None	
<b>Exhaust Gas Parameters</b>	<b>Units</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	
Exhaust Gas Flowrate	acfm	771	392	196	196	196	
Exhaust Gas Flowrate	scfm, 68°F	323	215	108	108	108	
Exhaust Gas Temperature	°F	800	500	500	500	500	
Stack Inner Diameter	inches	16	12	8	12	8	
Stack Area	ft <sup>2</sup>	1.40	0.79	0.35	0.79	0.35	
Stack Discharge Velocity	feet/second	9.21	8.31	9.35	4.16	9.35	
Stack Height Above Ground Level	feet	24	24	24	24	24	

<sup>1</sup> The scfm flow rates for the boilers/process heaters assume 750 lbs air/MM Btu heat input at zero percent excess air, 20% excess air at actual conditions, and that the fuel flow rate is directly additive to the combustion by-products.

**Wilderness CO<sub>2</sub> Plant - Criteria Emissions**

**Table B-1a. Caterpillar 3516 TALE (1,085 HP) Emission Factors and Short Term Emission Rates**

Pollutant	Uncontrolled Emission Factor <sup>1</sup>	Controlled Emission Factor	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rate <sup>3</sup> (lb/hr)
NO <sub>x</sub>	2.00	NA	g/bhp-hr	Vendor Data	4.78
CO	1.80	NA	g/bhp-hr	Vendor Data	4.31
PM <sub>10</sub> Total	9.99E-03	NA	lb/MM Btu	AP-42, T 3.2-2	0.089
SO <sub>2</sub>	5.88E-04	NA	lb/MM Btu	AP-42, T 3.2-2	5.23E-03
VOC	0.48	NA	g/bhp-hr	Vendor Data	1.15

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,085 bhp or 8.89 MM Btu/hr - HHV basis).

**Table B-1b. Caterpillar 3516 TALE (1,085 HP) Short Term and Long Term Emission Rates**

Pollutant	Per Unit Emission Estimates		Total Emission Estimates (3 Units)	
	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>
NO <sub>x</sub>	4.78	20.95	14.35	62.86
CO	4.31	18.86	12.92	56.58
PM <sub>10</sub> Total	0.09	0.39	0.27	1.17
SO <sub>2</sub>	5.23E-03	2.29E-02	1.57E-02	6.87E-02
VOC	1.15	5.03	3.44	15.09

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,085 bhp or 8.89 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

**Wilderness CO<sub>2</sub> Plant - Criteria Emissions**

**Table B-2a. Caterpillar 3516 TALE (1,150 HP) Emission Factors and Short Term Emission Rates**

Pollutant	Uncontrolled Emission Factor <sup>1</sup>	Controlled Emission Factor	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rate <sup>3</sup> (lb/hr)
NO <sub>x</sub>	2.00	NA	g/bhp-hr	Vendor Data	5.07
CO	1.57	NA	g/bhp-hr	Vendor Data	3.98
PM <sub>10</sub> Total	9.99E-03	NA	lb/MM Btu	AP-42, T 3.2-2	0.09
SO <sub>2</sub>	5.88E-04	NA	lb/MM Btu	AP-42, T 3.2-2	5.52E-03
VOC	2.94	NA	g/bhp-hr	Vendor Data	7.45

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,150 bhp or 9.39 MM Btu/hr - HHV basis).

**Table B-2b. Caterpillar 3516 TALE (1,150 HP) Short Term and Long Term Emission Rates**

Pollutant	Per Unit Emission Estimates		Total Emission Estimates (1 Unit)	
	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>
NO <sub>x</sub>	5.07	22.21	5.07	22.21
CO	3.98	17.43	3.98	17.43
PM <sub>10</sub> Total	0.09	0.41	0.09	0.41
SO <sub>2</sub>	5.52E-03	2.42E-02	5.52E-03	2.42E-02
VOC	7.45	32.65	7.45	32.65

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,150 bhp or 9.39 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

**Wilderness CO<sub>2</sub> Plant - Criteria Emissions**

**Table B-3a. Waukesha L 7042 GSI Emission Factors and Short Term Emission Rates**

Pollutant	Uncontrolled Emission Factor <sup>1</sup>	Controlled Emission Factor <sup>1, 2</sup>	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rate <sup>3</sup> (lb/hr)
NO <sub>x</sub>	13.00	1.30	g/bhp-hr	Vendor Data	4.24
CO	12.00	2.40	g/bhp-hr	Vendor Data	7.82
PM <sub>10</sub> Total	1.94E-02	1.94E-02	lb/MM Btu	AP-42, T 3.2-3	0.25
SO <sub>2</sub>	5.88E-04	5.88E-04	lb/MM Btu	AP-42, T 3.2-3	7.48E-03
VOC	0.35	0.18	g/bhp-hr	Vendor Data	0.57

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>2</sup> The controlled emission factors are based upon catalytic converter removal efficiencies (by weight) of 90% for NO<sub>x</sub>, 80% for CO and 50% for VOCs.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,478 bhp or 12.72 MM Btu/hr - HHV basis).

**Table B-3b. Waukesha L 7042 GSI Short Term and Long Term Emission Rates**

Pollutant	Per Unit Emission Estimates		Total Emission Estimates (1 Unit)	
	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>
NO <sub>x</sub>	4.24	18.55	4.24	18.55
CO	7.82	34.25	7.82	34.25
PM <sub>10</sub> Total	0.25	1.08	0.25	1.08
SO <sub>2</sub>	7.48E-03	3.28E-02	7.48E-03	3.28E-02
VOC	0.57	2.50	0.57	2.50

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,478 bhp or 12.72 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

**Wilderness CO<sub>2</sub> Plant - Criteria Emissions**

**Table B-6a. Natural Gas Fired Boilers/Process Heaters Emission Factors and Short Term Emission Rates**

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rates <sup>1</sup> (lb/hr)	
				1.5 MM Btu/hr	1.0 MM Btu/hr
NO <sub>x</sub>	100.0	lb/MM scf	AP-42, T 1.4-1	0.15	0.10
CO	84.0	lb/MM scf	AP-42, T 1.4-1	0.12	0.08
PM <sub>10</sub> Total	7.6	lb/MM scf	AP-42, T 1.4-2	1.12E-02	7.45E-03
SO <sub>2</sub>	0.6	lb/MM scf	AP-42, T 1.4-2	8.82E-04	5.88E-04
VOC	5.5	lb/MM scf	AP-42, T 1.4-2	8.09E-03	5.39E-03
Lead	5.00E-04	lb/MM scf	AP-42, T 1.4-2	7.35E-07	4.90E-07

<sup>1</sup> The per unit emission rates have been determined based upon a natural gas heating value of 1,020 Btu/scf.

**Natural Gas Fired Boilers - Short Term and Long Term Emission Rates**

Pollutant	Annual Emission Rates Per Unit (tpy) <sup>1</sup>		Totals for All Units (9 Units) <sup>2</sup>	
	1.5 MM Btu/hr	1.0 MM Btu/hr	0.5 MM Btu/hr	(tpy)
NO <sub>x</sub>	0.64	0.43	0.21	3.86
CO	0.54	0.36	0.18	3.25
PM <sub>10</sub> Total	0.05	0.03	0.02	0.29
SO <sub>2</sub>	3.86E-03	2.58E-03	1.29E-03	0.02
VOC	0.04	0.02	0.01	0.21
Lead	3.22E-06	2.15E-06	1.07E-06	1.93E-05

<sup>1</sup> Annual emission rates are based upon continuous operation at rated capacity.

<sup>2</sup> The total emission rates are based upon three (3) 1.5 MM Btu/hr units, three (3) 1.0 MM Btu/hr units, and three (3) 0.5 MM Btu/hr units.

**Potential Facility Short Term & Annual Emission Rates - Wilderness CO<sub>2</sub> Plant**

Pollutant	All RICE Engines		All Process Heaters		Storage Vessel		All Equipment	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy) See E&P Run	(lb/hr)	(tpy)	
NO <sub>x</sub>	23.66	103.63	0.88	3.86		24.54	107.49	
CO	24.72	108.26	0.74	3.25		25.46	111.51	
PM <sub>10</sub> Total	0.61	2.66	0.07	0.29		0.67	2.95	
SO <sub>2</sub>	0.03	0.13	0.01	0.02		0.03	0.15	
VOC	11.47	50.23	0.05	0.21	0.53	11.52	50.97	
Lead	-----	-----	4.41E-06	1.93E-05		4.41E-06	1.93E-05	
Max. Single HAP (Toluene)						0.00	0.00	
Aggregate HAPs	0.51	2.23	0.02	0.07		0.52	2.30	

**Quicksilver Resources Incorporated**  
**Analysis of Engine Controls Needed to Be a Minor Source of HAP**

Uncontrolled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (5 Units) (lb/hr)	(tpy)
Formaldehyde	50-00-0	1.79	7.86	0.63	2.78	0.08	0.36	2.51	10.99
<b>HAP Totals</b>		2.31	10.12	0.82	3.57	0.16	0.69	3.28	14.39

Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (1 Controlled 1085 HP Unit)

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (5 Units) (lb/hr)	(tpy)
Formaldehyde	50-00-0	1.50	6.55	0.63	2.78	0.08	0.36	2.21	9.68
<b>HAP Totals</b>		2.01	8.81	0.82	3.57	0.16	0.69	2.99	13.08

Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (2 Controlled 1085 HP Units)

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (5 Units) (lb/hr)	(tpy)
Formaldehyde	50-00-0	1.20	5.24	0.63	2.78	0.08	0.36	1.91	8.37
<b>HAP Totals</b>		1.71	7.50	0.82	3.57	0.16	0.69	2.69	11.77

Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (3 Controlled 1085 HP Units)

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (1 Unit) (lb/hr)	(tpy)	Emission Rates (5 Units) (lb/hr)	(tpy)
Formaldehyde	50-00-0	0.90	3.93	0.63	2.78	0.08	0.36	1.61	7.06
<b>HAP Totals</b>		1.41	6.19	0.82	3.57	0.16	0.69	2.39	10.46

Wilderness CO<sub>2</sub> Plant RICE Engine HAP/TAC Emissions

HAP Emission Factors and Emission Rates for Natural Gas Fired RICE

Hazardous Air Pollutant	CAS Registry Number	Engine & Emission Factor <sup>1</sup> (lb/MMBtu)		
		2-Stroke Lean-Burn	4-Stroke Lean-Burn	4-Stroke Rich-Burn
1,1,2,2-Tetrachloroethane	79-34-5	6.63E-05	4.00E-05	2.53E-05
1,1,2-Trichloroethane	79-00-5	2.57E-05	3.18E-05	1.53E-05
<i>1,1-Dichloroethane</i>	<i>75-34-3</i>	<i>3.91E-05</i>	<i>2.36E-05</i>	<i>1.13E-05</i>
<i>1,2,3-Trimethylbenzene</i>	<i>526-73-8</i>	<i>3.54E-05</i>	<i>2.30E-05</i>	
<i>1,2,4-Trimethylbenzene</i>	<i>95-36-3</i>	<i>1.11E-04</i>	<i>1.43E-05</i>	
<i>1,2-Dichloroethane</i>	<i>107-06-2</i>	<i>4.22E-05</i>	<i>2.36E-05</i>	<i>1.13E-05</i>
<i>1,2-Dichloropropane</i>	<i>78-87-5</i>	<i>4.46E-05</i>	<i>2.69E-05</i>	<i>1.13E-05</i>
<i>1,3,3-Trimethylbenzene</i>	<i>108-67-8</i>	<i>1.80E-05</i>	<i>3.38E-05</i>	
1,3-Butadiene	106-99-0	8.20E-04	2.67E-04	6.63E-04
1,3-Dichloropropene	542-75-6	4.38E-05	2.64E-05	1.27E-05
2,2,4-Trimethylpentane	540-84-1	8.46E-04	2.50E-04	
2-Methylnaphthalene	91-57-6	2.14E-05	3.32E-05	
Acenaphthene	83-32-9	1.33E-06	1.25E-06	
Acenaphthylene	208-96-8	3.17E-06	5.53E-06	
Acetaldehyde	75-07-0	7.76E-03	8.36E-03	2.79E-03
Acrolein	107-02-8	7.78E-03	5.14E-03	2.63E-03
Anthracene	120-12-7	7.18E-07		
Benz(a)anthracene	56-55-3	3.36E-07		
Benzene	71-43-2	1.94E-03	4.40E-04	1.58E-03
Benzo(a)pyrene	50-32-8	5.68E-09		
Benzo(b)fluoranthene	205-99-2	8.51E-09	1.66E-07	
Benzo(e)pyrene	192-97-2	2.34E-08	4.15E-07	
Benzo(g,h,i)perylene	191-24-2	2.48E-08	4.14E-07	
Benzo(k)fluoranthene	205-82-3	4.26E-09		
Biphenyl	92-52-4	3.95E-06	2.12E-04	
<i>Butane</i>	<i>106-97-8</i>	<i>4.73E-03</i>	<i>5.41E-04</i>	
<i>Butyl/Isobutyraldehyde</i>	<i>23-72-8/78-84-</i>	<i>4.37E-04</i>	<i>1.01E-04</i>	
Carbon Tetrachloride	56-23-5	6.07E-05	3.67E-05	1.77E-05
Chlorobenzene	108-90-7	4.44E-05	3.04E-05	1.29E-05
<i>Chloroethane</i>	<i>75-00-3</i>		<i>1.87E-06</i>	
Chloroform	67-66-3	4.71E-05	2.85E-05	1.37E-05
Chrysene	218-01-9	6.72E-07	6.93E-07	
<i>Cyclohexane</i>		<i>3.08E-04</i>		
<i>Cyclopentane</i>	<i>287-92-3</i>	<i>9.47E-05</i>	<i>2.27E-04</i>	
<i>Ethane</i>	<i>74-84-0</i>	<i>7.09E-02</i>	<i>1.05E-01</i>	<i>7.04E-02</i>
Ethylbenzene	100-41-4	1.08E-04	3.97E-05	2.48E-05
Ethylene Dibromide	106-93-4	7.34E-05	4.43E-05	2.13E-05
Fluoranthene	206-44-0	3.61E-07	1.11E-06	
Fluorene	86-73-7	1.69E-06	5.67E-06	
Formaldehyde	50-00-0	5.52E-02	5.28E-02	2.05E-02
Formaldehyde (Wauk 7042 GSI) <sup>3</sup>	50-00-0	-----	-----	5.00E-02
Formaldehyde (CAT 3516) <sup>4</sup>	50-00-0	-----	2.50E-01	-----
Indeno(1,2,3-c,d)pyrene	193-39-5	9.93E-09		
<i>Isobutane</i>		<i>3.75E-03</i>		
Methanol	67-56-1	2.48E-03	2.50E-03	3.06E-03
<i>Methylcyclohexane</i>	<i>108-87-2</i>	<i>3.38E-04</i>	<i>1.23E-03</i>	
Methylene Chloride	75-09-2	1.47E-04	2.00E-05	4.12E-05
n-Hexane	110-54-3	4.45E-04	1.11E-03	
<i>n-Nonane</i>	<i>111-84-2</i>	<i>3.08E-05</i>	<i>1.10E-04</i>	
<i>n-Octane</i>	<i>111-65-9</i>	<i>7.44E-05</i>	<i>3.51E-04</i>	
<i>n-Pentane</i>	<i>109-66-0</i>	<i>1.53E-03</i>	<i>2.60E-03</i>	
Naphthalene	91-20-3	9.63E-05	7.44E-05	9.71E-05
PAH	85-01-8	1.34E-04	2.69E-05	1.41E-04
Perylene	198-55-0	4.47E-09		
Phenanthrene	85-01-8	3.53E-06	1.04E-05	
Phenol	108-95-2	4.21E-05	2.40E-05	
<i>Propane</i>	<i>74-98-6</i>	<i>2.87E-02</i>	<i>4.19E-02</i>	
Pyrene	129-00-0	5.84E-07	1.36E-06	
Styrene	100-42-5	5.48E-05	2.36E-05	1.19E-05
Tetrachloroethane	630-20-6		2.48E-06	
Toluene	108-88-3	9.63E-04	4.08E-04	5.58E-04
Vinyl Chloride	75-01-4	2.47E-05	1.49E-05	7.18E-06
Xylene	1330-20-7	2.68E-04	1.84E-04	1.95E-04
<b>HAP Totals (AP-42)</b>	<b>-----</b>	<b>7.95E-02</b>	<b>7.22E-02</b>	<b>3.24E-02</b>

<sup>1</sup> The HAP emission factors are based upon the Trace Organic Compound emissions factors of AP-42 Chapter 3.2. Specifically, the emission factors represent 2-stroke lean-burn, 4-stroke lean-burn, and 4-stroke rich-burn natural gas fired reciprocating engines, and the factors are taken from the AP-42 document (7/00 revision), Tables 3.2-1, 3.2-2, and 3.2-3, respectively.

<sup>2</sup> The compounds that are italicized represent those that are classified as TACs pursuant to Michigan Rule 336.1120(f), but are not classified as HAPs. All other compounds represent those that are classified as both HAPs and TACs.

<sup>3</sup> This is a vendor (Waukesha) supplied emission factor; the unit of the factor is g/bhp-hr.

<sup>4</sup> This is a vendor (Caterpillar) supplied emission factor for the lean burn 3516 engines; the unit of the factor is g/bhp-hr.

**Wilderness CO<sub>2</sub> Plant RICE Engine HAP/TAC Emissions**

Engine Make	Caterpillar	Caterpillar	Waukesha	
Engine Model	3516 TALE	3516 TALE	L 7042 GSI	
Rated Output Per RICE	1085	1150	1478	horsepower
Rated Heat Input Per RICE	8.89	9.39	12.72	MM Btu/hour (HHV basis)
Natural Gas Heating Value	1,020	1,020	1,020	Btu/scf
Number of RICE	3	1	1	unitless
Annual Operation Per RICE	8,760	8,760	8,760	hours/year
Catalytic Converter	No	No	Yes	unitless
Generic HAP Removal Eff.	0%	0%	50%	% by weight
RICE Engine Configuration	2	2	3	1 = 2-stroke lean-burn, 2 = 4-stroke lean-burn, and 3 = 4-stroke rich-burn

**Table B-5. HAP and TAC Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines**

Hazardous Air Pollutant/ Toxic Air Contaminant <sup>1</sup>	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates <sup>2,3</sup> (3 Units) (lb/hr)	(tpy)	Emission Rates <sup>2,3</sup> (1 Unit) (lb/hr)	(tpy)	Emission Rates <sup>2,3</sup> (3 Units) (lb/hr)	(tpy)	Emission Rates (6 Units) (lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	79-34-5	1.07E-03	4.67E-03	3.75E-04	1.64E-03	1.61E-04	7.05E-04	1.60E-03	7.02E-03
1,1,2-Trichloroethane	79-00-5	8.48E-04	3.72E-03	2.98E-04	1.31E-03	9.73E-05	4.26E-04	1.24E-03	5.45E-03
<i>1,1-Dichloroethane</i>	<i>75-34-3</i>	<i>6.30E-04</i>	<i>2.76E-03</i>	<i>2.22E-04</i>	<i>9.70E-04</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>9.23E-04</i>	<i>4.04E-03</i>
<i>1,2,3-Trimethylbenzene</i>	<i>526-73-8</i>	<i>6.14E-04</i>	<i>2.69E-03</i>	<i>2.16E-04</i>	<i>9.46E-04</i>			<i>8.29E-04</i>	<i>3.63E-03</i>
<i>1,2,4-Trimethylbenzene</i>	<i>95-36-3</i>	<i>3.81E-04</i>	<i>1.67E-03</i>	<i>1.34E-04</i>	<i>5.88E-04</i>			<i>5.16E-04</i>	<i>2.26E-03</i>
<i>1,2-Dichloroethane</i>	<i>107-06-2</i>	<i>6.30E-04</i>	<i>2.76E-03</i>	<i>2.22E-04</i>	<i>9.70E-04</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>9.23E-04</i>	<i>4.04E-03</i>
<i>1,2-Dichloropropane</i>	<i>78-87-5</i>	<i>7.18E-04</i>	<i>3.14E-03</i>	<i>2.52E-04</i>	<i>1.11E-03</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>1.04E-03</i>	<i>4.56E-03</i>
<i>1,3,5-Trimethylbenzene</i>	<i>108-67-8</i>	<i>9.02E-04</i>	<i>3.95E-03</i>	<i>3.17E-04</i>	<i>1.39E-03</i>			<i>1.22E-03</i>	<i>5.34E-03</i>
1,3-Butadiene	106-99-0	7.12E-03	3.12E-02	2.51E-03	1.10E-02	4.22E-03	1.85E-02	1.38E-02	6.06E-02
1,3-Dichloropropene	542-75-6	7.04E-04	3.08E-03	2.48E-04	1.09E-03	8.08E-05	3.54E-04	1.03E-03	4.52E-03
2,2,4-Trimethylpentane	540-84-1	6.67E-03	2.92E-02	2.35E-03	1.03E-02			9.02E-03	3.95E-02
2-Methylnaphthalene	91-57-6	8.86E-04	3.88E-03	3.12E-04	1.36E-03			1.20E-03	5.24E-03
Acenaphthene	83-32-9	3.33E-05	1.46E-04	1.17E-05	5.14E-05			4.51E-05	1.97E-04
Acenaphthylene	208-96-8	1.48E-04	6.46E-04	5.19E-05	2.27E-04			1.99E-04	8.73E-04
Acetaldehyde	75-07-0	2.23E-01	9.77E-01	7.85E-02	3.44E-01	1.77E-02	7.77E-02	3.19E-01	1.40E+00
Acrolein	107-02-8	1.37E-01	6.01E-01	4.82E-02	2.11E-01	1.67E-02	7.33E-02	2.02E-01	8.85E-01
Anthracene	120-12-7								
Benz(a)anthracene	56-55-3								
Benzene	71-43-2	1.17E-02	5.14E-02	4.13E-03	1.81E-02	1.00E-02	4.40E-02	2.59E-02	1.14E-01
Benzo(a)pyrene	50-32-8								
Benzo(b)fluoranthene	205-99-2	4.43E-06	1.94E-05	1.56E-06	6.82E-06			5.99E-06	2.62E-05
Benzo(e)pyrene	192-97-2	1.11E-05	4.85E-05	3.90E-06	1.71E-05			1.50E-05	6.55E-05
Benzo(g,h,i)perylene	191-24-2	1.10E-05	4.84E-05	3.89E-06	1.70E-05			1.49E-05	6.54E-05
Benzo(k)fluoranthene	205-82-3								
Biphenyl	92-52-4	5.66E-03	2.48E-02	1.99E-03	8.72E-03			7.64E-03	3.35E-02
<i>Butane</i>	<i>106-97-8</i>	<i>1.44E-02</i>	<i>6.32E-02</i>	<i>5.08E-03</i>	<i>2.22E-02</i>			<i>1.95E-02</i>	<i>8.54E-02</i>
<i>Butyr/Isobutyraldehyde</i>	<i>123-72-8/ 78-84-2</i>	<i>2.69E-03</i>	<i>1.18E-02</i>	<i>9.48E-04</i>	<i>4.15E-03</i>			<i>3.64E-03</i>	<i>1.60E-02</i>
Carbon Tetrachloride	56-23-5	9.79E-04	4.29E-03	3.44E-04	1.51E-03	1.13E-04	4.93E-04	1.44E-03	6.29E-03
Chlorobenzene	108-90-7	8.11E-04	3.55E-03	2.85E-04	1.25E-03	8.20E-05	3.59E-04	1.18E-03	5.16E-03
<i>Chloroethane</i>	<i>75-00-3</i>	<i>4.99E-05</i>	<i>2.18E-04</i>	<i>1.76E-05</i>	<i>7.69E-05</i>			<i>6.74E-05</i>	<i>2.95E-04</i>
Chloroform	67-66-3	7.60E-04	3.33E-03	2.68E-04	1.17E-03	8.71E-05	3.82E-04	1.11E-03	4.88E-03
Chrysene	218-01-9	1.85E-05	8.10E-05	6.50E-06	2.85E-05			2.50E-05	1.09E-04
<i>Cyclohexane</i>									
<i>Cyclopentane</i>	<i>287-92-3</i>	<i>6.06E-03</i>	<i>2.65E-02</i>	<i>2.13E-03</i>	<i>9.33E-03</i>			<i>8.19E-03</i>	<i>3.59E-02</i>
<i>Ethane</i>	<i>74-84-0</i>	<i>2.80E+00</i>	<i>1.23E+01</i>	<i>9.86E-01</i>	<i>4.32E+00</i>	<i>4.48E-01</i>	<i>1.96E+00</i>	<i>4.23E+00</i>	<i>1.85E+01</i>
Ethylbenzene	100-41-4	1.06E-03	4.64E-03	3.73E-04	1.63E-03	1.58E-04	6.91E-04	1.59E-03	6.96E-03
Ethylene Dibromide	106-93-4	1.18E-03	5.18E-03	4.16E-04	1.82E-03	1.35E-04	5.93E-04	1.73E-03	7.59E-03
Fluoranthene	206-44-0	2.96E-05	1.30E-04	1.04E-05	4.56E-05			4.00E-05	1.75E-04
Fluorene	86-73-7	1.51E-04	6.62E-04	5.32E-05	2.33E-04			2.04E-04	8.96E-04
Formaldehyde	50-00-0	1.79	7.86	0.63	2.78	0.08	0.36	2.51	10.99
Indeno(1,2,3-c,d)pyrene	193-39-5								
<i>Isobutane</i>									
Methanol	67-56-1	6.67E-02	2.92E-01	2.35E-02	1.03E-01	1.95E-02	8.52E-02	1.10E-01	4.80E-01
<i>Methylcyclohexane</i>	<i>108-87-2</i>	<i>3.28E-02</i>	<i>1.44E-01</i>	<i>1.15E-02</i>	<i>5.06E-02</i>			<i>4.44E-02</i>	<i>1.94E-01</i>
Methylene Chloride	75-09-2	5.33E-04	2.34E-03	1.88E-04	8.22E-04	2.62E-04	1.15E-03	9.83E-04	4.31E-03
n-Hexane	110-54-3	2.96E-02	1.30E-01	1.04E-02	4.56E-02			4.00E-02	1.75E-01
<i>n-Nonane</i>	<i>111-84-2</i>	<i>2.93E-02</i>	<i>1.29E-02</i>	<i>1.03E-03</i>	<i>4.52E-03</i>			<i>3.97E-03</i>	<i>1.74E-02</i>
<i>n-Octane</i>	<i>111-65-9</i>	<i>9.36E-03</i>	<i>4.10E-02</i>	<i>3.29E-03</i>	<i>1.44E-02</i>			<i>1.27E-02</i>	<i>5.54E-02</i>
<i>n-Pentane</i>	<i>109-66-0</i>	<i>6.94E-02</i>	<i>3.04E-01</i>	<i>2.44E-02</i>	<i>1.07E-01</i>			<i>9.38E-02</i>	<i>4.11E-01</i>
Naphthalene	91-20-3	1.98E-03	8.69E-03	6.98E-04	3.06E-03	6.18E-04	2.70E-03	3.30E-03	1.45E-02
PAH	85-01-8	7.18E-04	3.14E-03	2.52E-04	1.11E-03	8.97E-04	3.93E-03	1.87E-03	8.18E-03
Perylene	198-55-0								
Phenanthrene	85-01-8	2.77E-04	1.22E-03	9.76E-05	4.28E-04			3.75E-04	1.64E-03
Phenol	108-95-2	6.40E-04	2.80E-03	2.25E-04	9.87E-04			8.65E-04	3.79E-03
<i>Propane</i>	<i>74-98-6</i>	<i>1.12E+00</i>	<i>4.90E+00</i>	<i>3.93E-01</i>	<i>1.72E+00</i>			<i>1.51E+00</i>	<i>6.62E+00</i>
Pyrene	129-00-0	3.63E-05	1.59E-04	1.28E-05	5.59E-05			4.90E-05	2.15E-04
Styrene	100-42-5	6.30E-04	2.76E-03	2.22E-04	9.70E-04	7.57E-05	3.32E-04	9.27E-04	4.06E-03
Tetrachloroethane	630-20-6	6.62E-05	2.90E-04	2.33E-05	1.02E-04			8.94E-05	3.92E-04
Toluene	108-88-3	1.09E-02	4.77E-02	3.83E-03	1.68E-02	3.55E-03	1.55E-02	1.83E-02	8.00E-02
Vinyl Chloride	75-01-4	3.97E-04	1.74E-03	1.40E-04	6.13E-04	4.57E-05	2.00E-04	5.83E-04	2.55E-03
Xylene	1330-20-7	4.91E-03	2.15E-02	1.73E-03	7.56E-03	1.24E-03	5.43E-03	7.88E-03	3.45E-02
<b>HAP Totals</b>	<b>----</b>	<b>2.31</b>	<b>10.12</b>	<b>0.82</b>	<b>3.57</b>	<b>0.16</b>	<b>0.69</b>	<b>3.28</b>	<b>14.39</b>

<sup>1</sup> The compounds that are italicized represent those that are classified as TACs pursuant to Michigan Rule 336.1120(f), but are not classified as HAPs.

All other compounds represent those that are classified as both HAPs and TACs.

<sup>2</sup> The lb/hr emission rates are for multiple similar units and based upon the maximum rated capacity of the engines, on a higher heating value basis.

<sup>3</sup> Annual emission rates are based upon continuous operation at rated capacity.



## Summary of Potential Natural Gas-Fired Heater HAP Emissions

### Wilderness CO<sub>2</sub> - HAP Emission Estimates from Natural Gas Fired Heaters

Rated Heat Input Per Boiler	8.00	MM Btu/hour
Natural Gas Heating Value	1,020	Btu/scf
Annual Operation Per Boiler	8,760	hours/year

#### Natural Gas Fired Boiler (Heater) HAP Emission Factors<sup>1</sup> and Emission Rates

Hazardous Air Pollutant	CAS Registry Number	Emission Factor <sup>1</sup> (lb/MM scf)	Potential Emission Rate (lb/hour)	Potential Emission Rate (tons/year)
2-Methylnaphthalene	91-57-6	2.40E-05	1.88E-07	8.24E-07
3-Methylchloroanthrene	56-49-5	1.80E-06	1.41E-08	6.18E-08
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.25E-07	5.50E-07
Acenaphthene	83-32-9	1.80E-06	1.41E-08	6.18E-08
Acenaphthylene	203-96-8	1.80E-06	1.41E-08	6.18E-08
Anthracene	120-12-7	2.40E-06	1.88E-08	8.24E-08
Benz(a)anthracene	56-55-3	1.80E-06	1.41E-08	6.18E-08
Benzene	71-43-2	2.10E-03	1.65E-05	7.21E-05
Benzo(a)pyrene	50-32-8	1.20E-06	9.41E-09	4.12E-08
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.41E-08	6.18E-08
Benzo(g,h,i)perylene	191-24-2	1.20E-06	9.41E-09	4.12E-08
Benzo(k)fluoroanthene	205-82-3	1.80E-06	1.41E-08	6.18E-08
<b>Butane</b>	<b>106-97-8</b>	<b>2.10E+00</b>	<b>1.65E-02</b>	<b>7.21E-02</b>
Chrysene	218-01-9	1.80E-06	1.41E-08	6.18E-08
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	9.41E-09	4.12E-08
Dichlorobenzene	25321-22-6	1.20E-03	9.41E-06	4.12E-05
<b>Ethane</b>	<b>74-84-0</b>	<b>3.10E+00</b>	<b>2.43E-02</b>	<b>1.06E-01</b>
Fluoranthene	206-44-0	3.00E-06	2.35E-08	1.03E-07
Fluorene	86-73-7	2.80E-06	2.20E-08	9.62E-08
Formaldehyde	50-00-0	7.50E-02	5.88E-04	2.58E-03
Hexane	110-54-3	1.80E+00	1.41E-02	6.18E-02
Indeno(1,2,3-c,d)pyrene	193-39-5	1.80E-06	1.41E-08	6.18E-08
Naphthalene	91-20-3	6.10E-04	4.78E-06	2.10E-05
<b>Pentane</b>	<b>109-66-0</b>	<b>2.60E+00</b>	<b>2.04E-02</b>	<b>8.93E-02</b>
Phenanthrene	85-01-8	1.70E-05	1.33E-07	5.84E-07
<b>Propane</b>	<b>74-98-6</b>	<b>1.60E+00</b>	<b>1.25E-02</b>	<b>5.50E-02</b>
Pyrene	129-00-0	5.00E-06	3.92E-08	1.72E-07
Toluene	108-88-3	3.40E-03	2.67E-05	1.17E-04
Arsenic	7440-38-2	2.00E-04	1.57E-06	6.87E-06
<b>Barium</b>	<b>7440-39-3</b>	<b>4.40E-03</b>	<b>3.45E-05</b>	<b>1.51E-04</b>
Beryllium	7440-41-7	1.20E-05	9.41E-08	4.12E-07
Cadmium	7440-43-9	1.10E-03	8.63E-06	3.78E-05
Chromium	16065-83-1	1.40E-03	1.10E-05	4.81E-05
Cobalt	7440-48-4	8.40E-05	6.59E-07	2.89E-06
<b>Copper</b>	<b>7440-50-8</b>	<b>8.50E-04</b>	<b>6.67E-06</b>	<b>2.92E-05</b>
Lead	7439-92-1	5.00E-04	3.92E-06	1.72E-05
Manganese	7439-96-5	3.80E-04	2.98E-06	1.31E-05
Mercury	7439-97-6	2.60E-04	2.04E-06	8.93E-06
<b>Molybdenum</b>	<b>7439-98-7</b>	<b>1.10E-03</b>	<b>8.63E-06</b>	<b>3.78E-05</b>
Nickel	7440-02-0	2.10E-03	1.65E-05	7.21E-05
Selenium	7782-49-2	2.40E-05	1.88E-07	8.24E-07
<b>Vanadium</b>	<b>7440-62-2</b>	<b>2.30E-03</b>	<b>1.80E-05</b>	<b>7.90E-05</b>
<b>Zinc</b>	<b>7440-66-6</b>	<b>2.90E-02</b>	<b>2.27E-04</b>	<b>9.96E-04</b>
<b>Total HAP Emissions</b>	-----	<b>1.888</b>	<b>0.015</b>	<b>0.065</b>

<sup>1</sup> The boiler HAP emission factors are based upon the AP-42 document (7/98 revision). Specifically, the organic emission factors are from Table 1.4-3, while the metallic emission factors are from Table 1.4-4.

E&P Tanks - Partitioning Calculations for Flashing and W&S VOC Emissions  
 Hayes 29 PTE Calculation - Tanks

From  
 E&P Tanks  
 Output:

No.	Component	MW (lb/lbmol)	LP Oil Mole %	Flash Oil Mole %	Sale Oil Mole %	Flash Gas Mole %	W&S Gas Mole %	Total Emissions Mole %	Flash Gas Weight %	W&S Gas Weight %
1	H2S	34.8	0	0	0	0	0	0	-	-
2	O2	32	0	0	0	0	0	0	-	-
3	CO2	44.01	0.023	0.0068	0	0.5318	0.0001	0.4171	0.5613	0.0001
4	N2	28.01	0.042	0.0016	0	1.3153	0.0001	1.0317	0.8835	0.0000
5	C1	16.04	0.371	0.0521	0	10.4096	0.0001	8.165	4.0041	0.0000
6	C2	30.07	1.853	0.9722	0	29.5803	0.0001	23.2019	21.3304	0.0000
7	C3	44.1	4.981	4.1005	0	32.7002	0	25.649	34.5822	-
8	i-C4	58.12	2.598	2.4344	0	7.7475	0	6.0769	10.7982	-
9	n-C4	58.12	5.018	4.8506	1.2058	10.2876	26.9759	13.8861	14.3385	21.7002
10	i-C5	72.15	4.61	4.6373	3.4343	3.7504	31.5364	9.742	6.4890	31.4928
11	n-C5	72.15	3.741	3.7884	3.189	2.2484	21.8852	6.4828	3.8902	21.8549
12	C6	84	2.77	2.8419	3.025	0.5071	6.5264	1.8051	1.0215	7.5878
13	Benzene	78.11	0.45	0.4624	0.5055	0.0606	0.7986	0.2197	0.1135	0.8634
14	Toluene	92.14	1.823	1.8788	2.1645	0.0675	0.9727	0.2627	0.1491	1.2405
15	E-Benzene	106.17	0.688	0.7096	0.8288	0.0083	0.1256	0.0336	0.0211	0.1846
16	Xylenes	106.17	2.134	2.2011	2.5735	0.0219	0.3385	0.0901	0.0558	0.4974
17	n-C6	86.18	2.657	2.7264	2.9084	0.4733	6.1972	1.7075	0.9782	7.3920
18	224Trimethylp	114.23	0.021	0.0216	0.0245	0.0014	0.0194	0.0053	0.0038	0.0307
19	Pseudo Comp1	111.19	25.5793	26.3828	30.8224	0.2865	4.582	1.2127	0.7639	7.0515
20	Pseudo Comp2	172.7	16.727	17.2583	20.2975	0.0023	0.0417	0.0108	0.0095	0.0997
21	Pseudo Comp3	252.37	11.2636	11.6214	13.6692	0	0.0001	0	-	0.0003
22	Pseudo Comp4	350.06	7.7914	8.0389	9.4554	0	0	0	-	-
23	Pseudo Comp5	551.71	4.8586	5.013	5.8963	0	0	0	-	-
<b>Totals:</b>			100.00	100.00	100.00	100.00	100.00	100.00	99.99	100.00

VOC Weight % = **73.21**  
 VOC tpy = **0.53**

	LP Oil	Flash oil	Sales oil	Flash Gas	W&S gas	Total Emission
MW (lb/lbmol):	162.79	166.64	185.19	41.7	72.25	48.28
Stream Mole Ratio:	1	0.9692	0.9607	0.0308	0.0085	0.0393
Stream Weight Ratio:	162.79	161.51	177.92	1.28	0.61	1.9
Total Emission (ton):				0.729	0.347	1.076
Heating Value (BTU/scf):				2348.9	3960.01	2696.31
Gas Gravity (Gas/Air):				1.44	2.49	1.67
Bubble Pt. @100F (psia):	44.95	21.6	2.36			
RVP @100F (psia):	136.62	98.9	15.52			
Spec. Gravity @100F:	0.85	0.85	0.87			

HAYES 29 PTE

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\*\*\*\*\*

\* Project Setup Information

\*\*\*\*\*  
\*\*\*\*\*

Project File : S:\MICHIGAN\Air Quality\E&P Tank Runs\HAYES 29.ept3  
 Flowsheet Selection : Oil Tank with Separator  
 Calculation Method : AP42  
 Control Efficiency : 0.00%  
 Known Separator Stream : Low Pressure Oil  
 Entering Air Composition : No  
 Component Group : C10+

Filed Name : HAYES 29 - WILD CO2 TANK  
 Well Name : HAYES 29 TANK  
 Permit Number : N5831  
 Date : 2018.10.18

\*\*\*\*\*  
\*\*\*\*\*

\* Data Input

\*\*\*\*\*  
\*\*\*\*\*

Separator Pressure (psia) : 30.00 *Actual Conditions,*  
 Separator Temperature (F) : 75.0 *per operator.*  
 C10+ SG : 0.89  
 C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil

No.	Component	Mole%	wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0230	0.0062
4	N2	0.0420	0.0072
5	C1	0.3710	0.0363
6	C2	1.8530	0.3395
7	C3	4.9810	1.3383
8	i-C4	2.5980	0.9200
9	n-C4	5.0180	1.7769
10	i-C5	4.6100	2.0265
11	n-C5	3.7410	1.6445
12	C6	2.7700	1.4541
13	C7	8.0450	4.9114
14	C8	7.7830	5.4168
15	C9	5.2050	4.0681
16	C10+	45.1870	71.5815
17	Benzene	0.4500	0.2142
18	Toluene	1.8230	1.0233
19	E-Benzene	0.6880	0.4450
20	Xylenes	2.1340	1.3804
21	n-C6	2.6570	1.3951
22	224Trimethylp	0.0210	0.0146

-- Sales Oil

Production Rate (bbl/day) : 2.00  
 Days of Annual Operation : 365

HAYES 29 PTE

API Gravity : 46.00  
Reid Vapor Pressure (psia) : 7.70  
Bulk Temperature : 80.0

-- Tank and Shell Data

-----  
Diameter (ft) : 21.00  
Shell Height (ft) : 16.00  
Cone Roof Slope : 0.06  
Average Liquid Height (ft) : 8.00  
Vent Pressure Range (psia) : 0.06  
Solar Absorbance : 0.54

Page 1----- E&P TANK

-- Meteorological Data

-----  
City : Homer, AK  
Min Ambient Temperature (F) : 29.5  
Max Ambient Temperature (F) : 43.6  
Total Solar Insolation (F) : 831.00  
Ambient Pressure (psia) : 14.70  
Ambient Temperature (F) : 70.0

\*\*\*\*\*  
\*\*\*\*\*  
\* Calculation Results  
\*  
\*\*\*\*\*  
\*\*\*\*\*

-- Emission Summary

-----  
Uncontrolled  
ton  
Total HAPS 0.0450  
Total HC 1.0660  
VOCs, C2+ 1.0370  
VOCs, C3+ 0.8810  
CO2 0.0040  
CH4 0.0290

Uncontrolled Recovery Information:

Vapor(mscfd): 0.0463  
HC Vapor(mscfd): 0.0456  
CO2(mscfd): 0.0000  
CH4(mscfd): 0.0000  
GOR(SCF/STB): 23.1450

-- Emission Composition

-----  
NoComponent Uncontrolled  
ton  
1 H2S 0.0000  
2 O2 0.0000  
3 CO2 0.0040  
4 N2 0.0060  
5 C1 0.0290  
6 C2 0.1560  
7 C3 0.2520  
8 i-C4 0.0790  
9 n-C4 0.1800

HAYES 29 PTE

10	i-C5	0.1570
11	n-C5	0.1040
12	C6	0.0340
13	Benzene	0.0040
14	Toluene	0.0050
15	E-Benzene	0.0010
16	Xylenes	0.0020
17	n-C6	0.0330
18	224Trimethylp	0.0000
19	Pseudo Comp1	0.0300
20	Pseudo Comp2	0.0000
21	Pseudo Comp3	0.0000
22	Pseudo Comp4	0.0000
23	Pseudo Comp5	0.0000
24	Total	1.0760

-- Stream Data

NoComponent	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S
Gas	Total Emission					
%	lb/lbmol	mole %	mole %	mole %	mole %	mole
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000					
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000					
3 CO2	44.01	0.0230	0.0068	0.0000	0.5318	
0.0001	0.4171					
4 N2	28.01	0.0420	0.0016	0.0000	1.3153	
0.0001	1.0317					
5 C1	16.04	0.3710	0.0521	0.0000	10.4096	
0.0001	8.1650					
6 C2	30.07	1.8530	0.9722	0.0000	29.5803	
0.0001	23.2019					
Page 2	----- E&P TANK					
7 C3	44.10	4.9810	4.1005	0.0000	32.7002	
0.0000	25.6490					
8 i-C4	58.12	2.5980	2.4344	0.0000	7.7475	
0.0000	6.0769					
9 n-C4	58.12	5.0180	4.8506	1.2058	10.2876	
26.9759	13.8861					
10 i-C5	72.15	4.6100	4.6373	3.4343	3.7504	
31.5364	9.7420					
11 n-C5	72.15	3.7410	3.7884	3.1890	2.2484	
21.8852	6.4828					
12 C6	84.00	2.7700	2.8419	3.0250	0.5071	
6.5264	1.8051					
13 Benzene	78.11	0.4500	0.4624	0.5055	0.0606	
0.7986	0.2197					
14 Toluene	92.14	1.8230	1.8788	2.1645	0.0675	
0.9727	0.2627					
15 E-Benzene	106.17	0.6880	0.7096	0.8288	0.0083	
0.1256	0.0336					
16 Xylenes	106.17	2.1340	2.2011	2.5735	0.0219	
0.3385	0.0901					
17 n-C6	86.18	2.6570	2.7264	2.9084	0.4733	
6.1972	1.7075					
18 224Trimethylp	114.23	0.0210	0.0216	0.0245	0.0014	
0.0194	0.0053					
19 Pseudo Comp1	111.19	25.5793	26.3828	30.8224	0.2865	
4.5820	1.2127					

		HAYES 29 PTE				
20 Pseudo Comp2	172.70	16.7270	17.2583	20.2975	0.0023	
0.0417	0.0108					
21 Pseudo Comp3	252.37	11.2636	11.6214	13.6692	0.0000	
0.0001	0.0000					
22 Pseudo Comp4	350.06	7.7914	8.0389	9.4554	0.0000	
0.0000	0.0000					
23 Pseudo Comp5	551.71	4.8586	5.0130	5.8963	0.0000	
0.0000	0.0000					
		LP oil	Flash oil	Sales oil	Flash Gas	w&s
Gas Total Emission						
MW (lb/lbmol):	48.28	162.79	166.64	185.19	41.70	72.25
Stream Mole Ratio:		1.0000	0.9692	0.9607	0.0308	
0.0085	0.0393					
Stream Weight Ratio:		162.79	161.51	177.92	1.28	0.61
1.90						
Total Emission (ton):					0.729	0.347
1.076						
Heating Value (BTU/scf):					2348.90	
3960.01	2696.31					
Gas Gravity (Gas/Air):					1.44	2.49
1.67						
Bubble Pt. @100F (psia):		44.95	21.60	2.36		
RVP @100F (psia):		136.62	98.90	15.52		
Spec. Gravity @100F:		0.85	0.85	0.87		



Certificate of Analysis  
Number: 1030-15110484-001A

Houston Laboratories  
8820 Interchange Drive  
Houston, TX 77054  
Phone 713-660-0901

Steve Niehaus  
BreitBurn Operating  
P.O. Box 1256  
Gaylord, MI 49734-1256

Dec. 01, 2015

Station Name: Parr 1-30 *NIAGRAN GAS REP.*  
Sample Point: CS 3 A-1-30 Parr Pipe to Storage Tank  
Cylinder No: 004780  
Analyzed: 11/13/2015 11:56:29

Sampled By: GL  
Sample Of: Liquid Spot  
Sample Date: 11/05/2015  
Sample Conditions: 28 psig. @ 65 °F  
Method: GPA 2103M

Analytical Data

Components	Mol. %	MW	Wt. %	Sp. Gravity	L.V. %
Nitrogen	0.042	28.013	0.007	0.807	0.007
Methane	0.371	16.043	0.035	0.300	0.094
Carbon Dioxide	0.023	44.010	0.006	0.817	0.006
Ethane	1.853	30.069	0.328	0.356	0.741
Propane	4.981	44.096	1.293	0.507	2.050
Iso-Butane	2.598	58.122	0.889	0.563	1.269
n-Butane	5.018	58.122	1.717	0.584	2.363
Iso-Pentane	4.610	72.149	1.958	0.625	2.518
n-Pentane	3.741	72.149	1.589	0.631	2.025
i-Hexanes	2.770	85.181	1.389	0.667	1.675
n-Hexane	2.657	86.175	1.348	0.664	1.632
2,2,4-Trimethylpentane	0.021	114.231	0.014	0.697	0.016
Benzene	0.450	78.114	0.207	0.885	0.188
Heptanes	8.045	96.207	4.557	0.709	5.168
Toluene	1.823	92.141	0.989	0.872	0.911
Octanes	7.783	110.485	5.062	0.728	5.592
Ethylbenzene	0.688	106.167	0.430	0.872	0.396
Xylenes	2.134	106.167	1.334	0.872	1.229
Nonanes	5.205	127.121	3.895	0.740	4.233
Decanes Plus	45.187	274.224	72.953	0.864	67.887
	100.000		100.000		100.000

Physical Properties	Total	C10+
Specific Gravity at 60°F	0.8039	0.8638
API Gravity at 60°F	44.526	32.311
Molecular Weight	169.858	274.224
Pounds per Gallon (in Vacuum)	6.702	7.202
Pounds per Gallon (in Air)	6.695	7.194
Cu. Ft. Vapor per Gallon @ 14.73 psia	14.938	9.943

*Chris Staley*

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.



Certificate of Analysis  
 Number: 1030-15110484-001A

Houston Laboratories  
 8820 Interchange Drive  
 Houston, TX 77054  
 Phone 713-660-0901

Steve Niehaus  
 BreitBurn Operating  
 P.O. Box 1256  
 Gaylord, MI 49734-1256

Dec. 01, 2015

Station Name: Parr 1-30  
 Sample Point: CS 3 A-1-30 Parr Pipe to Storage Tank  
 Cylinder No: 004780

Sampled By: GL  
 Sample Of: Liquid Spot  
 Sample Date: 11/05/2015  
 Sample Conditions: 28 psig. @ 65 °F

**Analytical Data**

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Shrinkage Factor	Proprietary	0.9848			SM	11/16/2015
Flash Factor	Proprietary	17.6105	Cu.Ft./STBbl.		SM	11/16/2015
Color Visual	Proprietary	Straw			SM	11/16/2015
API Gravity @ 60° F	ASTM D-4052	42.76	°		MM	11/19/2015

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.



**Natural Gas Fired RICE Specifications**

Engine Parameter	Parameter Units	Parameter Value					
		EUENGINE1	EUENGINE2	EUENGINE3	EUENGINE4	EUENGINE6	
Breitbart ID		831	856	885	907	CO2-1	
Engine Make		Caterpillar	Caterpillar	Caterpillar	Caterpillar	Waukesha	
Engine Model		3516 TALE	3516 TALE	3516 TALE	3516 TALE	L 7042 GSI	
Engine Serial No.		3RC00254	4EK01389	4EK01593	4EK00222	362289	
Type of Fuel		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	
Rated Engine Power at 100% Load	bhp	1,085	1,085	1,085	1,150	1,478	
Design Heat Input Rating, LHV	MM Btu/hour	8.08	8.08	8.08	8.53	11.56	
Design Heat Input Rating, HHV	MM Btu/hour	8.89	8.89	8.89	9.39	12.72	
Fuel Heating Value, LHV	Btu/scf	927	927	927	927	927	
Fuel Heating Value, HHV	Btu/scf	1,020	1,020	1,020	1,020	1,020	
Fuel Flow	scf/hour	8,717	8,717	8,717	9,202	12,471	
Control Technologies	NA	Lean Burn	Lean Burn	Lean Burn	Lean Burn	3-way Catalyst	
<b>Exhaust Gas Parameters</b>	<b>Units</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	
Exhaust Gas Flowrate	acfm, wet	5,956	5,956	5,956	6,200	6,567	
Exhaust Gas Flowrate	scfm, 68F	2,415	2,415	2,415	2,524	2,188	
Exhaust Gas Temperature	F	842	842	842	837	1,125	
Stack Inner Diameter	inches	12	12	12	12	12	
Stack Area	ft <sup>2</sup>	0.79	0.79	0.79	0.79	0.79	
Stack Discharge Velocity	feet/second	126.39	126.39	126.39	131.57	139.35	
Stack Height Above Ground Level	feet	16	16	16	16	24	

**Natural Gas Fired Heaters Specifications**

Boiler/Process Heater Specifications	Parameter Units	Parameter Value					
		EULNEHEATERS	EUSTAGEIHEATERS	EUHEATERP1-S2	EUHEATERP2-S2	EUHEATERUOP	
Type of Fuel	NA	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	
Number of Units	NA	2	3	2	0	2	
Design Heat Input Rating, HHV	MM Btu/hr	1,50	1,00	0.50	0.50	0.50	
Fuel Heating Value, HHV	Btu/scf	1,020	1,020	1,020	1,020	1,020	
Fuel Flow	scf/hour	1,471	980	490	490	490	
Control Technologies	NA	None	None	None	None	None	
<b>Exhaust Gas Parameters</b>	<b>Units</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	<b>Value</b>	
Exhaust Gas Flowrate	acfm	771	392	196	196	196	
Exhaust Gas Flowrate	scfm, 68°F	323	215	108	108	108	
Exhaust Gas Temperature	°F	800	500	500	500	500	
Stack Inner Diameter	inches	16	12	8	12	8	
Stack Area	ft <sup>2</sup>	1.40	0.79	0.35	0.79	0.35	
Stack Discharge Velocity	feet/second	9.21	8.31	9.35	4.16	9.35	
Stack Height Above Ground Level	feet	24	24	24	24	24	

<sup>1</sup> The scfm flow rates for the boilers/process heaters assume 750 lbs air/MM Btu heat input at zero percent excess air, 20% excess air at actual conditions, and that the fuel flow rate is directly additive to the combustion by-products.

## Wilderness CO<sub>2</sub> Plant - Criteria Emissions

**Table B-1a. Caterpillar 3516 TALE (1,085 HP) Emission Factors and Short Term Emission Rates**

Pollutant	Uncontrolled Emission Factor <sup>1</sup>	Controlled Emission Factor	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rate <sup>3</sup> (lb/hr)
NO <sub>x</sub>	2.00	NA	g/bhp-hr	Vendor Data	4.78
CO	1.80	NA	g/bhp-hr	Vendor Data	4.31
PM <sub>10</sub> Total	9.99E-03	NA	lb/MM Btu	AP-42, T 3.2-2	0.089
SO <sub>2</sub>	5.88E-04	NA	lb/MM Btu	AP-42, T 3.2-2	5.23E-03
VOC	0.48	NA	g/bhp-hr	Vendor Data	1.15

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,085 bhp or 8.89 MM Btu/hr - HHV basis).

**Table B-1b. Caterpillar 3516 TALE (1,085 HP) Short Term and Long Term Emission Rates**

Pollutant	Per Unit Emission Estimates		Total Emission Estimates (3 Units)	
	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>
NO <sub>x</sub>	4.78	20.95	14.35	62.86
CO	4.31	18.86	12.92	56.58
PM <sub>10</sub> Total	0.09	0.39	0.27	1.17
SO <sub>2</sub>	5.23E-03	2.29E-02	1.57E-02	6.87E-02
VOC	1.15	5.03	3.44	15.09

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,085 bhp or 8.89 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

**Wilderness CO<sub>2</sub> Plant - Criteria Emissions**

**Table B-2a. Caterpillar 3516 TALE (1,150 HP) Emission Factors and Short Term Emission Rates**

<b>Pollutant</b>	<b>Uncontrolled Emission Factor<sup>1</sup></b>	<b>Controlled Emission Factor</b>	<b>Emission Factor Units</b>	<b>Emission Factor Basis</b>	<b>Per Unit Emission Rate<sup>3</sup> (lb/hr)</b>
NO <sub>x</sub>	2.00	NA	g/bhp-hr	Vendor Data	5.07
CO	1.57	NA	g/bhp-hr	Vendor Data	3.98
PM <sub>10</sub> Total	9.99E-03	NA	lb/MM Btu	AP-42, T 3.2-2	0.09
SO <sub>2</sub>	5.88E-04	NA	lb/MM Btu	AP-42, T 3.2-2	5.52E-03
VOC	2.94	NA	g/bhp-hr	Vendor Data	7.45

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,150 bhp or 9.39 MM Btu/hr - HHV basis).

**Table B-2b. Caterpillar 3516 TALE (1,150 HP) Short Term and Long Term Emission Rates**

<b>Pollutant</b>	<b>Per Unit Emission Estimates</b>		<b>Total Emission Estimates (1 Unit)</b>	
	<b>(lb/hr)<sup>1</sup></b>	<b>(tpy)<sup>2</sup></b>	<b>(lb/hr)<sup>1</sup></b>	<b>(tpy)<sup>2</sup></b>
NO <sub>x</sub>	5.07	22.21	5.07	22.21
CO	3.98	17.43	3.98	17.43
PM <sub>10</sub> Total	0.09	0.41	0.09	0.41
SO <sub>2</sub>	5.52E-03	2.42E-02	5.52E-03	2.42E-02
VOC	7.45	32.65	7.45	32.65

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,150 bhp or 9.39 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

## Wilderness CO<sub>2</sub> Plant - Criteria Emissions

**Table B-3a. Waukesha L 7042 GSI Emission Factors and Short Term Emission Rates**

Pollutant	Uncontrolled Emission Factor <sup>1</sup>	Controlled Emission Factor <sup>1,2</sup>	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rate <sup>3</sup> (lb/hr)
NO <sub>x</sub>	13.00	1.30	g/bhp-hr	Vendor Data	4.24
CO	12.00	2.40	g/bhp-hr	Vendor Data	7.82
PM <sub>10</sub> Total	1.94E-02	1.94E-02	lb/MM Btu	AP-42, T 3.2-3	0.25
SO <sub>2</sub>	5.88E-04	5.88E-04	lb/MM Btu	AP-42, T 3.2-3	7.48E-03
VOC	0.35	0.18	g/bhp-hr	Vendor Data	0.57

<sup>1</sup> All lb/MM Btu emission factors are on a HHV basis and are applied to the HHV rated heat input capacity of the engine.

<sup>2</sup> The controlled emission factors are based upon catalytic converter removal efficiencies (by weight) of 90% for NO<sub>x</sub>, 80% for CO and 50% for VOCs.

<sup>3</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,478 bhp or 12.72 MM Btu/hr - HHV basis).

**Table B-3b. Waukesha L 7042 GSI Short Term and Long Term Emission Rates**

Pollutant	Per Unit Emission Estimates		Total Emission Estimates (1 Unit)	
	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>	(lb/hr) <sup>1</sup>	(tpy) <sup>2</sup>
NO <sub>x</sub>	4.24	18.55	4.24	18.55
CO	7.82	34.25	7.82	34.25
PM <sub>10</sub> Total	0.25	1.08	0.25	1.08
SO <sub>2</sub>	7.48E-03	3.28E-02	7.48E-03	3.28E-02
VOC	0.57	2.50	0.57	2.50

<sup>1</sup> The lb/hr emission rates are based upon the maximum rated capacity of the engine (1,478 bhp or 12.72 MM Btu/hr - HHV basis).

<sup>2</sup> Annual emission rates are based upon continuous operation at rated capacity.

## Wilderness CO<sub>2</sub> Plant - Criteria Emissions

**Table B-6a. Natural Gas Fired Boilers/Process Heaters Emission Factors and Short Term Emission Rates**

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Basis	Per Unit Emission Rates <sup>1</sup> (lb/hr)		
				1.5 MM Btu/hr	1.0 MM Btu/hr	0.5 MM Btu/hr
NO <sub>x</sub>	100.0	lb/MM scf	AP-42, T 1.4-1	0.15	0.10	0.05
CO	84.0	lb/MM scf	AP-42, T 1.4-1	0.12	0.08	0.04
PM <sub>10</sub> Total	7.6	lb/MM scf	AP-42, T 1.4-2	1.12E-02	7.45E-03	3.73E-03
SO <sub>2</sub>	0.6	lb/MM scf	AP-42, T 1.4-2	8.82E-04	5.88E-04	2.94E-04
VOC	5.5	lb/MM scf	AP-42, T 1.4-2	8.09E-03	5.39E-03	2.70E-03
Lead	5.00E-04	lb/MM scf	AP-42, T 1.4-2	7.35E-07	4.90E-07	2.45E-07

<sup>1</sup> The per unit emission rates have been determined based upon a natural gas heating value of 1,020 Btu/scf.

**Natural Gas Fired Boilers - Short Term and Long Term Emission Rates**

Pollutant	Annual Emission Rates Per Unit (tpy) <sup>1</sup>			Totals for All Units (9 Units) <sup>2</sup>	
	1.5 MM Btu/hr	1.0 MM Btu/hr	0.5 MM Btu/hr	(lb/hr)	(tpy)
NO <sub>x</sub>	0.64	0.43	0.21	0.88	3.86
CO	0.54	0.36	0.18	0.74	3.25
PM <sub>10</sub> Total	0.05	0.03	0.02	0.07	0.29
SO <sub>2</sub>	3.86E-03	2.58E-03	1.29E-03	0.01	0.02
VOC	0.04	0.02	0.01	0.05	0.21
Lead	3.22E-06	2.15E-06	1.07E-06	4.41E-06	1.93E-05

<sup>1</sup> Annual emission rates are based upon continuous operation at rated capacity.

<sup>2</sup> The total emission rates are based upon three (3) 1.5 MM Btu/hr units, three (3) 1.0 MM Btu/hr units, and three (3) 0.5 MM Btu/hr units.

**Potential Facility Short Term & Annual Emission Rates - Wilderness CO<sub>2</sub> Plant**

Pollutant	All RICE Engines		All Process Heaters		Storage Vessel (tpy) See E&P Run	All Equipment	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)		(lb/hr)	(tpy)
NO <sub>x</sub>	23.66	103.63	0.88	3.86		24.54	107.49
CO	24.72	108.26	0.74	3.25		25.46	111.51
PM <sub>10</sub> Total	0.61	2.66	0.07	0.29		0.67	2.95
SO <sub>2</sub>	0.03	0.13	0.01	0.02		0.03	0.15
VOC	11.47	50.23	0.05	0.21	0.53	11.52	50.97
Lead	-----	-----	4.41E-06	1.93E-05		4.41E-06	1.93E-05
Max. Single HAP (Toluene)						0.00	0.00
Aggregate HAPs	0.51	2.23	0.02	0.07		0.52	2.30

**Quicksilver Resources Incorporated**  
**Analysis of Engine Controls Needed to Be a Minor Source of HAP**

**Uncontrolled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines**

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units)		Emission Rates (1 Unit)		Emission Rates (1 Units)		Emission Rates (5 Units)	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Formaldehyde	50-00-0	1.79	7.86	0.63	2.78	0.08	0.36	2.51	<b>10.99</b>
<b>HAP Totals</b>	---	2.31	10.12	0.82	3.57	0.16	0.69	3.28	<b>14.39</b>

**Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (1 Controlled 1085 HP Unit)**

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units)		Emission Rates (1 Unit)		Emission Rates (1 Units)		Emission Rates (5 Units)	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Formaldehyde	50-00-0	1.50	6.55	0.63	2.78	0.08	0.36	2.21	<b>9.68</b>
<b>HAP Totals</b>		2.01	8.81	0.82	3.57	0.16	0.69	2.99	<b>13.08</b>

**Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (2 Controlled 1085 HP Units)**

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units)		Emission Rates (1 Unit)		Emission Rates (1 Units)		Emission Rates (5 Units)	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Formaldehyde	50-00-0	1.20	5.24	0.63	2.78	0.08	0.36	1.91	<b>8.37</b>
<b>HAP Totals</b>		1.71	7.50	0.82	3.57	0.16	0.69	2.69	<b>11.77</b>

**Controlled HAP Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines (3 Controlled 1085 HP Units)**

Hazardous Air Pollutant	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates (3 Units)		Emission Rates (1 Unit)		Emission Rates (1 Units)		Emission Rates (5 Units)	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Formaldehyde	50-00-0	0.90	3.93	0.63	2.78	0.08	0.36	1.61	<b>7.06</b>
<b>HAP Totals</b>		1.41	6.19	0.82	3.57	0.16	0.69	2.39	<b>10.46</b>

Wilderness CO<sub>2</sub> Plant RICE Engine HAP/TAC Emissions

HAP Emission Factors and Emission Rates for Natural Gas Fired RICE

Hazardous Air Pollutant	CAS Registry Number	Engine & Emission Factor <sup>1</sup> (lb/MMBtu)		
		2-Stroke Lean-Burn	4-Stroke Lean-Burn	4-Stroke Rich-Burn
1,1,2,2-Tetrachloroethane	79-34-5	6.63E-05	4.00E-05	2.53E-05
1,1,2-Trichloroethane	79-00-5	2.57E-05	3.18E-05	1.53E-05
<i>1,1-Dichloroethane</i>	<i>75-34-3</i>	<i>3.91E-05</i>	<i>2.36E-05</i>	<i>1.13E-05</i>
<i>1,2,3-Trimethylbenzene</i>	<i>526-73-8</i>	<i>3.54E-05</i>	<i>2.30E-05</i>	
<i>1,2,4-Trimethylbenzene</i>	<i>95-36-3</i>	<i>1.11E-04</i>	<i>1.43E-05</i>	
<i>1,2-Dichloroethane</i>	<i>107-06-2</i>	<i>4.22E-05</i>	<i>2.36E-05</i>	<i>1.13E-05</i>
<i>1,2-Dichloropropane</i>	<i>78-87-5</i>	<i>4.46E-05</i>	<i>2.69E-05</i>	<i>1.13E-05</i>
<i>1,3,3-Trimethylbenzene</i>	<i>108-67-8</i>	<i>1.80E-05</i>	<i>3.38E-05</i>	
1,3-Butadiene	106-99-0	8.20E-04	2.67E-04	6.63E-04
1,3-Dichloropropene	542-75-6	4.38E-05	2.64E-05	1.27E-05
2,2,4-Trimethylpentane	540-84-1	8.46E-04	2.50E-04	
2-Methylnaphthalene	91-57-6	2.14E-05	3.32E-05	
Acenaphthene	83-32-9	1.33E-06	1.25E-06	
Acenaphthylene	208-96-8	3.17E-06	5.53E-06	
Acetaldehyde	75-07-0	7.76E-03	8.36E-03	2.79E-03
Acrolein	107-02-8	7.78E-03	5.14E-03	2.63E-03
Anthracene	120-12-7	7.18E-07		
Benz(a)anthracene	56-55-3	3.36E-07		
Benzene	71-43-2	1.94E-03	4.40E-04	1.58E-03
Benzo(a)pyrene	50-32-8	5.68E-09		
Benzo(b)fluoranthene	205-99-2	8.51E-09	1.66E-07	
Benzo(e)pyrene	192-97-2	2.34E-08	4.15E-07	
Benzo(g,h,i)perylene	191-24-2	2.48E-08	4.14E-07	
Benzo(k)fluoranthene	205-82-3	4.26E-09		
Biphenyl	92-52-4	3.95E-06	2.12E-04	
<i>Butane</i>	<i>106-97-8</i>	<i>4.73E-03</i>	<i>5.41E-04</i>	
<i>Butyl/Isobutyraldehyde</i>	<i>23-72-8/78-84-</i>	<i>4.37E-04</i>	<i>1.01E-04</i>	
Carbon Tetrachloride	56-23-5	6.07E-05	3.67E-05	1.77E-05
Chlorobenzene	108-90-7	4.44E-05	3.04E-05	1.29E-05
<i>Chloroethane</i>	<i>75-00-3</i>		<i>1.87E-06</i>	
Chloroform	67-66-3	4.71E-05	2.85E-05	1.37E-05
Chrysene	218-01-9	6.72E-07	6.93E-07	
<i>Cyclohexane</i>		<i>3.08E-04</i>		
<i>Cyclopentane</i>	<i>287-92-3</i>	<i>9.47E-05</i>	<i>2.27E-04</i>	
<i>Ethane</i>	<i>74-84-0</i>	<i>7.09E-02</i>	<i>1.05E-01</i>	<i>7.04E-02</i>
Ethylbenzene	100-41-4	1.08E-04	3.97E-05	2.48E-05
Ethylene Dibromide	106-93-4	7.34E-05	4.43E-05	2.13E-05
Fluoranthene	206-44-0	3.61E-07	1.11E-06	
Fluorene	86-73-7	1.69E-06	5.67E-06	
Formaldehyde	50-00-0	5.52E-02	5.28E-02	2.05E-02
Formaldehyde (Wauk 7042 GSI) <sup>3</sup>	50-00-0	-----	-----	5.00E-02
Formaldehyde (CAT 3516) <sup>4</sup>	50-00-0	-----	2.50E-01	-----
Indeno(1,2,3-c,d)pyrene	193-39-5	9.93E-09		
<i>Isobutane</i>		<i>3.75E-03</i>		
Methanol	67-56-1	2.48E-03	2.50E-03	3.06E-03
<i>Methylcyclohexane</i>	<i>108-87-2</i>	<i>3.38E-04</i>	<i>1.23E-03</i>	
Methylene Chloride	75-09-2	1.47E-04	2.00E-05	4.12E-05
n-Hexane	110-54-3	4.45E-04	1.11E-03	
<i>n-Nonane</i>	<i>111-84-2</i>	<i>3.08E-05</i>	<i>1.10E-04</i>	
<i>n-Octane</i>	<i>111-65-9</i>	<i>7.44E-05</i>	<i>3.51E-04</i>	
<i>n-Pentane</i>	<i>109-66-0</i>	<i>1.53E-03</i>	<i>2.60E-03</i>	
Naphthalene	91-20-3	9.63E-05	7.44E-05	9.71E-05
PAH	85-01-8	1.34E-04	2.69E-05	1.41E-04
Perylene	198-55-0	4.47E-09		
Phenanthrene	85-01-8	3.53E-06	1.04E-05	
Phenol	108-95-2	4.21E-05	2.40E-05	
<i>Propane</i>	<i>74-98-6</i>	<i>2.87E-02</i>	<i>4.19E-02</i>	
Pyrene	129-00-0	5.84E-07	1.36E-06	
Styrene	100-42-5	5.48E-05	2.36E-05	1.19E-05
Tetrachloroethane	630-20-6		2.48E-06	
Toluene	108-88-3	9.63E-04	4.08E-04	5.58E-04
Vinyl Chloride	75-01-4	2.47E-05	1.49E-05	7.18E-06
Xylene	1330-20-7	2.68E-04	1.84E-04	1.95E-04
<b>HAP Totals (AP-42)</b>	<b>-----</b>	<b>7.95E-02</b>	<b>7.22E-02</b>	<b>3.24E-02</b>

<sup>1</sup> The HAP emission factors are based upon the Trace Organic Compound emissions factors of AP-42 Chapter 3.2. Specifically, the emission factors represent 2-stroke lean-burn, 4-stroke lean-burn, and 4-stroke rich-burn natural gas fired reciprocating engines, and the factors are taken from the AP-42 document (7/00 revision), Tables 3.2-1, 3.2-2, and 3.2-3, respectively.

<sup>2</sup> The compounds that are italicized represent those that are classified as TACs pursuant to Michigan Rule 336.1120(f), but are not classified as HAPs. All other compounds represent those that are classified as both HAPs and TACs.

<sup>3</sup> This is a vendor (Waukesha) supplied emission factor; the unit of the factor is g/bhp-hr.

<sup>4</sup> This is a vendor (Caterpillar) supplied emission factor for the lean burn 3516 engines; the unit of the factor is g/bhp-hr.

**Wilderness CO<sub>2</sub> Plant RICE Engine HAP/TAC Emissions**

Engine Make	Caterpillar	Caterpillar	Waukesha	
Engine Model	3516 TALE	3516 TALE	L 7042 GSI	
Rated Output Per RICE	1085	1150	1478	horsepower
Rated Heat Input Per RICE	8.89	9.39	12.72	MM Btu/hour (HHV basis)
Natural Gas Heating Value	1,020	1,020	1,020	Btu/scf
Number of RICE	3	1	1	unitless
Annual Operation Per RICE	8,760	8,760	8,760	hours/year
Catalytic Converter	No	No	Yes	unitless
Generic HAP Removal Eff.	0%	0%	50%	% by weight
RICE Engine Configuration	2	2	3	1 = 2-stroke lean-burn, 2 = 4-stroke lean-burn, and 3 = 4-stroke rich-burn

**Table B-5. HAP and TAC Emission Rates for the Wilderness CO<sub>2</sub> Plant RICE Engines**

Hazardous Air Pollutant/ Toxic Air Contaminant <sup>1</sup>	CAS Registry Number	CAT 3516 (1085 HP)		CAT 3516 (1150 HP)		Waukesha L7042GSI		Total Potential	
		Emission Rates <sup>2,3</sup> (3 Units) (lb/hr)	(tpy)	Emission Rates <sup>2,3</sup> (1 Unit) (lb/hr)	(tpy)	Emission Rates <sup>2,3</sup> (3 Units) (lb/hr)	(tpy)	Emission Rates (6 Units) (lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	79-34-5	1.07E-03	4.67E-03	3.75E-04	1.64E-03	1.61E-04	7.05E-04	1.60E-03	7.02E-03
1,1,2-Trichloroethane	79-00-5	8.48E-04	3.72E-03	2.98E-04	1.31E-03	9.73E-05	4.26E-04	1.24E-03	5.45E-03
<i>1,1-Dichloroethane</i>	<i>75-34-3</i>	<i>6.30E-04</i>	<i>2.76E-03</i>	<i>2.22E-04</i>	<i>9.70E-04</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>9.23E-04</i>	<i>4.04E-03</i>
<i>1,2,3-Trimethylbenzene</i>	<i>526-73-8</i>	<i>6.14E-04</i>	<i>2.69E-03</i>	<i>2.16E-04</i>	<i>9.46E-04</i>			<i>8.29E-04</i>	<i>3.63E-03</i>
<i>1,2,4-Trimethylbenzene</i>	<i>95-36-3</i>	<i>3.81E-04</i>	<i>1.67E-03</i>	<i>1.34E-04</i>	<i>5.88E-04</i>			<i>5.16E-04</i>	<i>2.26E-03</i>
<i>1,2-Dichloroethane</i>	<i>107-06-2</i>	<i>6.30E-04</i>	<i>2.76E-03</i>	<i>2.22E-04</i>	<i>9.70E-04</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>9.23E-04</i>	<i>4.04E-03</i>
<i>1,2-Dichloropropane</i>	<i>78-87-5</i>	<i>7.18E-04</i>	<i>3.14E-03</i>	<i>2.52E-04</i>	<i>1.11E-03</i>	<i>7.19E-05</i>	<i>3.15E-04</i>	<i>1.04E-03</i>	<i>4.56E-03</i>
<i>1,3,5-Trimethylbenzene</i>	<i>108-67-8</i>	<i>9.02E-04</i>	<i>3.95E-03</i>	<i>3.17E-04</i>	<i>1.39E-03</i>			<i>1.22E-03</i>	<i>5.34E-03</i>
1,3-Butadiene	106-99-0	7.12E-03	3.12E-02	2.51E-03	1.10E-02	4.22E-03	1.85E-02	1.38E-02	6.06E-02
1,3-Dichloropropene	542-75-6	7.04E-04	3.08E-03	2.48E-04	1.09E-03	8.08E-05	3.54E-04	1.03E-03	4.52E-03
2,2,4-Trimethylpentane	540-84-1	6.67E-03	2.92E-02	2.35E-03	1.03E-02			9.02E-03	3.95E-02
2-Methylnaphthalene	91-57-6	8.86E-04	3.88E-03	3.12E-04	1.36E-03			1.20E-03	5.24E-03
Acenaphthene	83-32-9	3.33E-05	1.46E-04	1.17E-05	5.14E-05			4.51E-05	1.97E-04
Acenaphthylene	208-96-8	1.48E-04	6.46E-04	5.19E-05	2.27E-04			1.99E-04	8.73E-04
Acetaldehyde	75-07-0	2.23E-01	9.77E-01	7.85E-02	3.44E-01	1.77E-02	7.77E-02	3.19E-01	1.40E+00
Acrolein	107-02-8	1.37E-01	6.01E-01	4.82E-02	2.11E-01	1.67E-02	7.33E-02	2.02E-01	8.85E-01
Anthracene	120-12-7								
Benz(a)anthracene	56-55-3								
Benzene	71-43-2	1.17E-02	5.14E-02	4.13E-03	1.81E-02	1.00E-02	4.40E-02	2.59E-02	1.14E-01
Benzo(a)pyrene	50-32-8								
Benzo(b)fluoranthene	205-99-2	4.43E-06	1.94E-05	1.56E-06	6.82E-06			5.99E-06	2.62E-05
Benzo(e)pyrene	192-97-2	1.11E-05	4.85E-05	3.90E-06	1.71E-05			1.50E-05	6.55E-05
Benzo(g,h,i)perylene	191-24-2	1.10E-05	4.84E-05	3.89E-06	1.70E-05			1.49E-05	6.54E-05
Benzo(k)fluoranthene	205-82-3								
Biphenyl	92-52-4	5.66E-03	2.48E-02	1.99E-03	8.72E-03			7.64E-03	3.35E-02
<i>Butane</i>	<i>106-97-8</i>	<i>1.44E-02</i>	<i>6.32E-02</i>	<i>5.08E-03</i>	<i>2.22E-02</i>			<i>1.95E-02</i>	<i>8.54E-02</i>
<i>Butyr/Isobutyraldehyde</i>	<i>123-72-8/ 78-84-2</i>	<i>2.69E-03</i>	<i>1.18E-02</i>	<i>9.48E-04</i>	<i>4.15E-03</i>			<i>3.64E-03</i>	<i>1.60E-02</i>
Carbon Tetrachloride	56-23-5	9.79E-04	4.29E-03	3.44E-04	1.51E-03	1.13E-04	4.93E-04	1.44E-03	6.29E-03
Chlorobenzene	108-90-7	8.11E-04	3.55E-03	2.85E-04	1.25E-03	8.20E-05	3.59E-04	1.18E-03	5.16E-03
<i>Chloroethane</i>	<i>75-00-3</i>	<i>4.99E-05</i>	<i>2.18E-04</i>	<i>1.76E-05</i>	<i>7.69E-05</i>			<i>6.74E-05</i>	<i>2.95E-04</i>
Chloroform	67-66-3	7.60E-04	3.33E-03	2.68E-04	1.17E-03	8.71E-05	3.82E-04	1.11E-03	4.88E-03
Chrysene	218-01-9	1.85E-05	8.10E-05	6.50E-06	2.85E-05			2.50E-05	1.09E-04
<i>Cyclohexane</i>									
<i>Cyclopentane</i>	<i>287-92-3</i>	<i>6.06E-03</i>	<i>2.65E-02</i>	<i>2.13E-03</i>	<i>9.33E-03</i>			<i>8.19E-03</i>	<i>3.59E-02</i>
<i>Ethane</i>	<i>74-84-0</i>	<i>2.80E+00</i>	<i>1.23E+01</i>	<i>9.86E-01</i>	<i>4.32E+00</i>	<i>4.48E-01</i>	<i>1.96E+00</i>	<i>4.23E+00</i>	<i>1.85E+01</i>
Ethylbenzene	100-41-4	1.06E-03	4.64E-03	3.73E-04	1.63E-03	1.58E-04	6.91E-04	1.59E-03	6.96E-03
Ethylene Dibromide	106-93-4	1.18E-03	5.18E-03	4.16E-04	1.82E-03	1.35E-04	5.93E-04	1.73E-03	7.59E-03
Fluoranthene	206-44-0	2.96E-05	1.30E-04	1.04E-05	4.56E-05			4.00E-05	1.75E-04
Fluorene	86-73-7	1.51E-04	6.62E-04	5.32E-05	2.33E-04			2.04E-04	8.96E-04
Formaldehyde	50-00-0	1.79	7.86	0.63	2.78	0.08	0.36	2.51	10.99
Indeno(1,2,3-c,d)pyrene	193-39-5								
<i>Isobutane</i>									
Methanol	67-56-1	6.67E-02	2.92E-01	2.35E-02	1.03E-01	1.95E-02	8.52E-02	1.10E-01	4.80E-01
<i>Methylcyclohexane</i>	<i>108-87-2</i>	<i>3.28E-02</i>	<i>1.44E-01</i>	<i>1.15E-02</i>	<i>5.06E-02</i>			<i>4.44E-02</i>	<i>1.94E-01</i>
Methylene Chloride	75-09-2	5.33E-04	2.34E-03	1.88E-04	8.22E-04	2.62E-04	1.15E-03	9.83E-04	4.31E-03
n-Hexane	110-54-3	2.96E-02	1.30E-01	1.04E-02	4.56E-02			4.00E-02	1.75E-01
<i>n-Nonane</i>	<i>111-84-2</i>	<i>2.93E-02</i>	<i>1.29E-02</i>	<i>1.03E-03</i>	<i>4.52E-03</i>			<i>3.97E-03</i>	<i>1.74E-02</i>
<i>n-Octane</i>	<i>111-65-9</i>	<i>9.36E-03</i>	<i>4.10E-02</i>	<i>3.29E-03</i>	<i>1.44E-02</i>			<i>1.27E-02</i>	<i>5.54E-02</i>
<i>n-Pentane</i>	<i>109-66-0</i>	<i>6.94E-02</i>	<i>3.04E-01</i>	<i>2.44E-02</i>	<i>1.07E-01</i>			<i>9.38E-02</i>	<i>4.11E-01</i>
Naphthalene	91-20-3	1.98E-03	8.69E-03	6.98E-04	3.06E-03	6.18E-04	2.70E-03	3.30E-03	1.45E-02
PAH	85-01-8	7.18E-04	3.14E-03	2.52E-04	1.11E-03	8.97E-04	3.93E-03	1.87E-03	8.18E-03
Perylene	198-55-0								
Phenanthrene	85-01-8	2.77E-04	1.22E-03	9.76E-05	4.28E-04			3.75E-04	1.64E-03
Phenol	108-95-2	6.40E-04	2.80E-03	2.25E-04	9.87E-04			8.65E-04	3.79E-03
<i>Propane</i>	<i>74-98-6</i>	<i>1.12E+00</i>	<i>4.90E+00</i>	<i>3.93E-01</i>	<i>1.72E+00</i>			<i>1.51E+00</i>	<i>6.62E+00</i>
Pyrene	129-00-0	3.63E-05	1.59E-04	1.28E-05	5.59E-05			4.90E-05	2.15E-04
Styrene	100-42-5	6.30E-04	2.76E-03	2.22E-04	9.70E-04	7.57E-05	3.32E-04	9.27E-04	4.06E-03
Tetrachloroethane	630-20-6	6.62E-05	2.90E-04	2.33E-05	1.02E-04			8.94E-05	3.92E-04
Toluene	108-88-3	1.09E-02	4.77E-02	3.83E-03	1.68E-02	3.55E-03	1.55E-02	1.83E-02	8.00E-02
Vinyl Chloride	75-01-4	3.97E-04	1.74E-03	1.40E-04	6.13E-04	4.57E-05	2.00E-04	5.83E-04	2.55E-03
Xylene	1330-20-7	4.91E-03	2.15E-02	1.73E-03	7.56E-03	1.24E-03	5.43E-03	7.88E-03	3.45E-02
<b>HAP Totals</b>	<b>----</b>	<b>2.31</b>	<b>10.12</b>	<b>0.82</b>	<b>3.57</b>	<b>0.16</b>	<b>0.69</b>	<b>3.28</b>	<b>14.39</b>

<sup>1</sup> The compounds that are italicized represent those that are classified as TACs pursuant to Michigan Rule 336.1120(f), but are not classified as HAPs.

All other compounds represent those that are classified as both HAPs and TACs.

<sup>2</sup> The lb/hr emission rates are for multiple similar units and based upon the maximum rated capacity of the engines, on a higher heating value basis.

<sup>3</sup> Annual emission rates are based upon continuous operation at rated capacity.



## Summary of Potential Natural Gas-Fired Heater HAP Emissions

### Wilderness CO<sub>2</sub> - HAP Emission Estimates from Natural Gas Fired Heaters

Rated Heat Input Per Boiler	8.00	MM Btu/hour
Natural Gas Heating Value	1,020	Btu/scf
Annual Operation Per Boiler	8,760	hours/year

#### Natural Gas Fired Boiler (Heater) HAP Emission Factors<sup>1</sup> and Emission Rates

Hazardous Air Pollutant	CAS Registry Number	Emission Factor <sup>1</sup> (lb/MM scf)	Potential Emission Rate (lb/hour)	Potential Emission Rate (tons/year)
2-Methylnaphthalene	91-57-6	2.40E-05	1.88E-07	8.24E-07
3-Methylchloroanthrene	56-49-5	1.80E-06	1.41E-08	6.18E-08
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.25E-07	5.50E-07
Acenaphthene	83-32-9	1.80E-06	1.41E-08	6.18E-08
Acenaphthylene	203-96-8	1.80E-06	1.41E-08	6.18E-08
Anthracene	120-12-7	2.40E-06	1.88E-08	8.24E-08
Benz(a)anthracene	56-55-3	1.80E-06	1.41E-08	6.18E-08
Benzene	71-43-2	2.10E-03	1.65E-05	7.21E-05
Benzo(a)pyrene	50-32-8	1.20E-06	9.41E-09	4.12E-08
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.41E-08	6.18E-08
Benzo(g,h,i)perylene	191-24-2	1.20E-06	9.41E-09	4.12E-08
Benzo(k)fluoroanthene	205-82-3	1.80E-06	1.41E-08	6.18E-08
<b>Butane</b>	<b>106-97-8</b>	<b>2.10E+00</b>	<b>1.65E-02</b>	<b>7.21E-02</b>
Chrysene	218-01-9	1.80E-06	1.41E-08	6.18E-08
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	9.41E-09	4.12E-08
Dichlorobenzene	25321-22-6	1.20E-03	9.41E-06	4.12E-05
<b>Ethane</b>	<b>74-84-0</b>	<b>3.10E+00</b>	<b>2.43E-02</b>	<b>1.06E-01</b>
Fluoranthene	206-44-0	3.00E-06	2.35E-08	1.03E-07
Fluorene	86-73-7	2.80E-06	2.20E-08	9.62E-08
Formaldehyde	50-00-0	7.50E-02	5.88E-04	2.58E-03
Hexane	110-54-3	1.80E+00	1.41E-02	6.18E-02
Indeno(1,2,3-c,d)pyrene	193-39-5	1.80E-06	1.41E-08	6.18E-08
Naphthalene	91-20-3	6.10E-04	4.78E-06	2.10E-05
<b>Pentane</b>	<b>109-66-0</b>	<b>2.60E+00</b>	<b>2.04E-02</b>	<b>8.93E-02</b>
Phenanthrene	85-01-8	1.70E-05	1.33E-07	5.84E-07
<b>Propane</b>	<b>74-98-6</b>	<b>1.60E+00</b>	<b>1.25E-02</b>	<b>5.50E-02</b>
Pyrene	129-00-0	5.00E-06	3.92E-08	1.72E-07
Toluene	108-88-3	3.40E-03	2.67E-05	1.17E-04
Arsenic	7440-38-2	2.00E-04	1.57E-06	6.87E-06
<b>Barium</b>	<b>7440-39-3</b>	<b>4.40E-03</b>	<b>3.45E-05</b>	<b>1.51E-04</b>
Beryllium	7440-41-7	1.20E-05	9.41E-08	4.12E-07
Cadmium	7440-43-9	1.10E-03	8.63E-06	3.78E-05
Chromium	16065-83-1	1.40E-03	1.10E-05	4.81E-05
Cobalt	7440-48-4	8.40E-05	6.59E-07	2.89E-06
<b>Copper</b>	<b>7440-50-8</b>	<b>8.50E-04</b>	<b>6.67E-06</b>	<b>2.92E-05</b>
Lead	7439-92-1	5.00E-04	3.92E-06	1.72E-05
Manganese	7439-96-5	3.80E-04	2.98E-06	1.31E-05
Mercury	7439-97-6	2.60E-04	2.04E-06	8.93E-06
<b>Molybdenum</b>	<b>7439-98-7</b>	<b>1.10E-03</b>	<b>8.63E-06</b>	<b>3.78E-05</b>
Nickel	7440-02-0	2.10E-03	1.65E-05	7.21E-05
Selenium	7782-49-2	2.40E-05	1.88E-07	8.24E-07
<b>Vanadium</b>	<b>7440-62-2</b>	<b>2.30E-03</b>	<b>1.80E-05</b>	<b>7.90E-05</b>
<b>Zinc</b>	<b>7440-66-6</b>	<b>2.90E-02</b>	<b>2.27E-04</b>	<b>9.96E-04</b>
<b>Total HAP Emissions</b>	-----	<b>1.888</b>	<b>0.015</b>	<b>0.065</b>

<sup>1</sup> The boiler HAP emission factors are based upon the AP-42 document (7/98 revision). Specifically, the organic emission factors are from Table 1.4-3, while the metallic emission factors are from Table 1.4-4.

E&P Tanks - Partitioning Calculations for Flashing and W&S VOC Emissions  
 Hayes 29 PTE Calculation - Tanks

From  
 E&P Tanks  
 Output:

No.	Component	MW (lb/lbmol)	LP Oil Mole %	Flash Oil Mole %	Sale Oil Mole %	Flash Gas Mole %	W&S Gas Mole %	Total Emissions Mole %	Flash Gas Weight %	W&S Gas Weight %
1	H2S	34.8	0	0	0	0	0	0	-	-
2	O2	32	0	0	0	0	0	0	-	-
3	CO2	44.01	0.023	0.0068	0	0.5318	0.0001	0.4171	0.5613	0.0001
4	N2	28.01	0.042	0.0016	0	1.3153	0.0001	1.0317	0.8835	0.0000
5	C1	16.04	0.371	0.0521	0	10.4096	0.0001	8.165	4.0041	0.0000
6	C2	30.07	1.853	0.9722	0	29.5803	0.0001	23.2019	21.3304	0.0000
7	C3	44.1	4.981	4.1005	0	32.7002	0	25.649	34.5822	-
8	i-C4	58.12	2.598	2.4344	0	7.7475	0	6.0769	10.7982	-
9	n-C4	58.12	5.018	4.8506	1.2058	10.2876	26.9759	13.8861	14.3385	21.7002
10	i-C5	72.15	4.61	4.6373	3.4343	3.7504	31.5364	9.742	6.4890	31.4928
11	n-C5	72.15	3.741	3.7884	3.189	2.2484	21.8852	6.4828	3.8902	21.8549
12	C6	84	2.77	2.8419	3.025	0.5071	6.5264	1.8051	1.0215	7.5878
13	Benzene	78.11	0.45	0.4624	0.5055	0.0606	0.7986	0.2197	0.1135	0.8634
14	Toluene	92.14	1.823	1.8788	2.1645	0.0675	0.9727	0.2627	0.1491	1.2405
15	E-Benzene	106.17	0.688	0.7096	0.8288	0.0083	0.1256	0.0336	0.0211	0.1846
16	Xylenes	106.17	2.134	2.2011	2.5735	0.0219	0.3385	0.0901	0.0558	0.4974
17	n-C6	86.18	2.657	2.7264	2.9084	0.4733	6.1972	1.7075	0.9782	7.3920
18	224Trimethylp	114.23	0.021	0.0216	0.0245	0.0014	0.0194	0.0053	0.0038	0.0307
19	Pseudo Comp1	111.19	25.5793	26.3828	30.8224	0.2865	4.582	1.2127	0.7639	7.0515
20	Pseudo Comp2	172.7	16.727	17.2583	20.2975	0.0023	0.0417	0.0108	0.0095	0.0997
21	Pseudo Comp3	252.37	11.2636	11.6214	13.6692	0	0.0001	0	-	0.0003
22	Pseudo Comp4	350.06	7.7914	8.0389	9.4554	0	0	0	-	-
23	Pseudo Comp5	551.71	4.8586	5.013	5.8963	0	0	0	-	-
<b>Totals:</b>			100.00	100.00	100.00	100.00	100.00	100.00	99.99	100.00

VOC Weight % = **Flash Gas** / **Flash Gas + W&S Gas**  
 = **73.21** / **100.00**  
 = **0.53**  
 VOC tpy = **0.35**

	LP Oil	Flash oil	Sales oil	Flash Gas	W&S gas	Total Emission
MW (lb/lbmol):	162.79	166.64	185.19	41.7	72.25	48.28
Stream Mole Ratio:	1	0.9692	0.9607	0.0308	0.0085	0.0393
Stream Weight Ratio:	162.79	161.51	177.92	1.28	0.61	1.9
Total Emission (ton):				0.729	0.347	1.076
Heating Value (BTU/scf):				2348.9	3960.01	2696.31
Gas Gravity (Gas/Air):				1.44	2.49	1.67
Bubble Pt. @100F (psia):	44.95	21.6	2.36			
RVP @100F (psia):	136.62	98.9	15.52			
Spec. Gravity @100F:	0.85	0.85	0.87			

HAYES 29 PTE

\*\*\*\*\*  
\*\*\*\*\*

\* Project Setup Information

\*  
\*\*\*\*\*  
\*\*\*\*\*

Project File : S:\MICHIGAN\Air Quality\E&P Tank Runs\HAYES 29.ept3  
 Flowsheet Selection : Oil Tank with Separator  
 Calculation Method : AP42  
 Control Efficiency : 0.00%  
 Known Separator Stream : Low Pressure Oil  
 Entering Air Composition : No  
 Component Group : C10+

Filed Name : HAYES 29 - WILD CO2 TANK  
 Well Name : HAYES 29 TANK  
 Permit Number : N5831  
 Date : 2018.10.18

\*\*\*\*\*  
\*\*\*\*\*

\* Data Input

\*  
\*\*\*\*\*  
\*\*\*\*\*

Separator Pressure (psia) : 30.00 *Actual Conditions,*  
 Separator Temperature (F) : 75.0 *per operator.*  
 C10+ SG : 0.89  
 C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil

No.	Component	Mole%	wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0230	0.0062
4	N2	0.0420	0.0072
5	C1	0.3710	0.0363
6	C2	1.8530	0.3395
7	C3	4.9810	1.3383
8	i-C4	2.5980	0.9200
9	n-C4	5.0180	1.7769
10	i-C5	4.6100	2.0265
11	n-C5	3.7410	1.6445
12	C6	2.7700	1.4541
13	C7	8.0450	4.9114
14	C8	7.7830	5.4168
15	C9	5.2050	4.0681
16	C10+	45.1870	71.5815
17	Benzene	0.4500	0.2142
18	Toluene	1.8230	1.0233
19	E-Benzene	0.6880	0.4450
20	Xylenes	2.1340	1.3804
21	n-C6	2.6570	1.3951
22	224Trimethylp	0.0210	0.0146

-- Sales Oil

Production Rate (bbl/day) : 2.00  
 Days of Annual Operation : 365

HAYES 29 PTE

API Gravity : 46.00
Reid Vapor Pressure (psia) : 7.70
Bulk Temperature : 80.0

-- Tank and Shell Data

Diameter (ft) : 21.00
Shell Height (ft) : 16.00
Cone Roof Slope : 0.06
Average Liquid Height (ft) : 8.00
Vent Pressure Range (psia) : 0.06
Solar Absorbance : 0.54

Page 1----- E&P TANK

-- Meteorological Data

City : Homer, AK
Min Ambient Temperature (F) : 29.5
Max Ambient Temperature (F) : 43.6
Total Solar Insolation (F) : 831.00
Ambient Pressure (psia) : 14.70
Ambient Temperature (F) : 70.0

\*\*\*\*\*
\*\*\*\*\*
\* Calculation Results
\*
\*\*\*\*\*
\*\*\*\*\*

-- Emission Summary

Uncontrolled
ton
Total HAPS 0.0450
Total HC 1.0660
VOCs, C2+ 1.0370
VOCs, C3+ 0.8810
CO2 0.0040
CH4 0.0290

Uncontrolled Recovery Information:

Vapor(mscfd): 0.0463
HC Vapor(mscfd): 0.0456
CO2(mscfd): 0.0000
CH4(mscfd): 0.0000
GOR(SCF/STB): 23.1450

-- Emission Composition

NoComponent Uncontrolled
ton
1 H2S 0.0000
2 O2 0.0000
3 CO2 0.0040
4 N2 0.0060
5 C1 0.0290
6 C2 0.1560
7 C3 0.2520
8 i-C4 0.0790
9 n-C4 0.1800

HAYES 29 PTE

10	i-C5	0.1570
11	n-C5	0.1040
12	C6	0.0340
13	Benzene	0.0040
14	Toluene	0.0050
15	E-Benzene	0.0010
16	Xylenes	0.0020
17	n-C6	0.0330
18	224Trimethylp	0.0000
19	Pseudo Comp1	0.0300
20	Pseudo Comp2	0.0000
21	Pseudo Comp3	0.0000
22	Pseudo Comp4	0.0000
23	Pseudo Comp5	0.0000
24	Total	1.0760

-- Stream Data

NoComponent	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S
Gas	Total Emission					
%	lb/lbmol	mole %	mole %	mole %	mole %	mole
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000					
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000					
3 CO2	44.01	0.0230	0.0068	0.0000	0.5318	
0.0001	0.4171					
4 N2	28.01	0.0420	0.0016	0.0000	1.3153	
0.0001	1.0317					
5 C1	16.04	0.3710	0.0521	0.0000	10.4096	
0.0001	8.1650					
6 C2	30.07	1.8530	0.9722	0.0000	29.5803	
0.0001	23.2019					
Page 2	----- E&P TANK					
7 C3	44.10	4.9810	4.1005	0.0000	32.7002	
0.0000	25.6490					
8 i-C4	58.12	2.5980	2.4344	0.0000	7.7475	
0.0000	6.0769					
9 n-C4	58.12	5.0180	4.8506	1.2058	10.2876	
26.9759	13.8861					
10 i-C5	72.15	4.6100	4.6373	3.4343	3.7504	
31.5364	9.7420					
11 n-C5	72.15	3.7410	3.7884	3.1890	2.2484	
21.8852	6.4828					
12 C6	84.00	2.7700	2.8419	3.0250	0.5071	
6.5264	1.8051					
13 Benzene	78.11	0.4500	0.4624	0.5055	0.0606	
0.7986	0.2197					
14 Toluene	92.14	1.8230	1.8788	2.1645	0.0675	
0.9727	0.2627					
15 E-Benzene	106.17	0.6880	0.7096	0.8288	0.0083	
0.1256	0.0336					
16 Xylenes	106.17	2.1340	2.2011	2.5735	0.0219	
0.3385	0.0901					
17 n-C6	86.18	2.6570	2.7264	2.9084	0.4733	
6.1972	1.7075					
18 224Trimethylp	114.23	0.0210	0.0216	0.0245	0.0014	
0.0194	0.0053					
19 Pseudo Comp1	111.19	25.5793	26.3828	30.8224	0.2865	
4.5820	1.2127					

		HAYES 29 PTE				
20 Pseudo Comp2	172.70	16.7270	17.2583	20.2975	0.0023	
0.0417	0.0108					
21 Pseudo Comp3	252.37	11.2636	11.6214	13.6692	0.0000	
0.0001	0.0000					
22 Pseudo Comp4	350.06	7.7914	8.0389	9.4554	0.0000	
0.0000	0.0000					
23 Pseudo Comp5	551.71	4.8586	5.0130	5.8963	0.0000	
0.0000	0.0000					
		LP oil	Flash oil	Sales oil	Flash Gas	w&s
Gas Total Emission						
MW (lb/lbmol):	48.28	162.79	166.64	185.19	41.70	72.25
Stream Mole Ratio:		1.0000	0.9692	0.9607	0.0308	
0.0085	0.0393					
Stream Weight Ratio:		162.79	161.51	177.92	1.28	0.61
1.90						
Total Emission (ton):					0.729	0.347
1.076						
Heating Value (BTU/scf):					2348.90	
3960.01	2696.31					
Gas Gravity (Gas/Air):					1.44	2.49
1.67						
Bubble Pt. @100F (psia):		44.95	21.60	2.36		
RVP @100F (psia):		136.62	98.90	15.52		
Spec. Gravity @100F:		0.85	0.85	0.87		



Certificate of Analysis  
 Number: 1030-15110484-001A

Houston Laboratories  
 8820 Interchange Drive  
 Houston, TX 77054  
 Phone 713-660-0901

Steve Niehaus  
 BreitBurn Operating  
 P.O. Box 1256  
 Gaylord, MI 49734-1256

Dec. 01, 2015

Station Name: Parr 1-30  
 Sample Point: CS 3 A-1-30 Parr Pipe to Storage Tank  
 Cylinder No: 004780  
 Analyzed: 11/13/2015 11:56:29

*NIAGRAN GAS REP.*

Sampled By: GL  
 Sample Of: Liquid Spot  
 Sample Date: 11/05/2015  
 Sample Conditions: 28 psig. @ 65 °F  
 Method: GPA 2103M

**Analytical Data**

Components	Mol. %	MW	Wt. %	Sp. Gravity	L.V. %
Nitrogen	0.042	28.013	0.007	0.807	0.007
Methane	0.371	16.043	0.035	0.300	0.094
Carbon Dioxide	0.023	44.010	0.006	0.817	0.006
Ethane	1.853	30.069	0.328	0.356	0.741
Propane	4.981	44.096	1.293	0.507	2.050
Iso-Butane	2.598	58.122	0.889	0.563	1.269
n-Butane	5.018	58.122	1.717	0.584	2.363
Iso-Pentane	4.610	72.149	1.958	0.625	2.518
n-Pentane	3.741	72.149	1.589	0.631	2.025
i-Hexanes	2.770	85.181	1.389	0.667	1.675
n-Hexane	2.657	86.175	1.348	0.664	1.632
2,2,4-Trimethylpentane	0.021	114.231	0.014	0.697	0.016
Benzene	0.450	78.114	0.207	0.885	0.188
Heptanes	8.045	96.207	4.557	0.709	5.168
Toluene	1.823	92.141	0.989	0.872	0.911
Octanes	7.783	110.485	5.062	0.728	5.592
Ethylbenzene	0.688	106.167	0.430	0.872	0.396
Xylenes	2.134	106.167	1.334	0.872	1.229
Nonanes	5.205	127.121	3.895	0.740	4.233
Decanes Plus	45.187	274.224	72.953	0.864	67.887
	100.000		100.000		100.000

Physical Properties	Total	C10+
Specific Gravity at 60°F	0.8039	0.8638
API Gravity at 60°F	44.526	32.311
Molecular Weight	169.858	274.224
Pounds per Gallon (in Vacuum)	6.702	7.202
Pounds per Gallon (in Air)	6.695	7.194
Cu. Ft. Vapor per Gallon @ 14.73 psia	14.938	9.943

*Chris Staley*

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.



Certificate of Analysis  
 Number: 1030-15110484-001A

Houston Laboratories  
 8820 Interchange Drive  
 Houston, TX 77054  
 Phone 713-660-0901

Steve Niehaus  
 BreitBurn Operating  
 P.O. Box 1256  
 Gaylord, MI 49734-1256

Dec. 01, 2015

Station Name: Parr 1-30  
 Sample Point: CS 3 A-1-30 Parr Pipe to Storage Tank  
 Cylinder No: 004780

Sampled By: GL  
 Sample Of: Liquid Spot  
 Sample Date: 11/05/2015  
 Sample Conditions: 28 psig. @ 65 °F

**Analytical Data**

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Shrinkage Factor	Proprietary	0.9848			SM	11/16/2015
Flash Factor	Proprietary	17.6105	Cu.Ft./STBbl.		SM	11/16/2015
Color Visual	Proprietary	Straw			SM	11/16/2015
API Gravity @ 60° F	ASTM D-4052	42.76	°		MM	11/19/2015

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.





# RENEWABLE OPERATING PERMIT APPLICATION

## AI-001: ADDITIONAL INFORMATION

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.*

SRN: 5831

Section Number (if applicable): 1

1. Additional Information ID

AI-CAM

### Additional Information

2. Is This Information Confidential?

Yes  No

Attached is a Compliance Assurance Monitoring Applicability summary for EUENGINE6.

Page of

**Compliance Assurance Monitoring (CAM) Plan  
Breitburn Operating Company, L.P.  
Wilderness/Hayes 29 Facility  
EUENGINE6**

**I. BACKGROUND**

**Emission Units**

Description: Waukesha L 7042 GSI compressor engine, rated at 1,478 hp, and equipped with a 3-way catalyst to control emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOCs).

Identification: EUENGINE6

Facility: Breitburn Operating Company, L.P. (Breitburn) – Wilderness/Hayes 29 Facility  
Section 29, T29N, R4W  
Hayes Township, Otsego County, Michigan

**Applicable Regulation, Emission Limit, Monitoring Requirements**

MI-ROP-N5831-014b FGWAWKENGINES FLEXIBLE GROUP CONIDITONS. I, lists the applicable regulations as R336.1205(3), R336.1225, R336.1702(a), and R336.1910.

Emission Limits:

EUENGINE6  
NO<sub>x</sub>: 24.6 tons/year  
CO: 41.1 tons/year

**Control Technology**

A 3-way catalyst is used to control NO<sub>x</sub>, CO, and VOC emissions from the Waukesha compressor engine. The pre-control device potential emissions of NO<sub>x</sub> and CO are greater than 100 tons per year for the Waukesha engine, which makes this unit subject to the CAM requirements. However, the pre-control device potential VOC emissions from the unit are less than 100 tpy.

**II. MONITORING APPROACH**

Pressure drop across the 3-way catalyst, and inlet and outlet temperatures are all monitored. These parameters represent the most important parameters for proper operation of the catalytic converter. The compliance assurance monitoring approach is summarized in Table 1.

**Table 1**

<b>Device Description</b>	<b>Operating Variable</b>	<b>Monitoring Method</b>	<b>Frequency</b>	<b>Normal Operating Range</b>	<b>Excursion Indicator</b>	<b>Remedial Action</b>
Catalyst	2" WC Change in $\Delta P$ @ normal operating conditions	Gauge or manometer	Monthly	Varies by engine. Recorded in database	2.5 times the $\Delta P$ @ normal operating conditions	Check sample lines, check rpm verses $\Delta P$ and compare to previous months readings, remove catalyst and replace gaskets as necessary; if still 1.5 times the normal range then catalyst would be removed and washed. Also see Table 2 of the approved PM/MAP
Catalyst	Inlet and Outlet temperatures	Thermocouple	Daily	Must be below 1350 degrees F. For 3-way catalysts only: Outlet temperature must be equal to or greater than the catalytic inlet temperature.	Temperature less than 800°F  Differential temperature greater than 150°F above normal (not to exceed 1350°F)	Check loading on engine, check for faulty gauge or temperature probe, and check for proper operation of the ignition system  Automatic engine shutdown  Also see Table 2 of the approved PM/MAP

Appendix A, attached to this CAM Plan, describes the inlet and outlet catalyst temperature data that will be recorded on a daily basis.

No in-situ continuous emission monitoring systems are employed to measure actual emissions from this engine.

Quality assurance and quality control will include following the approved preventative maintenance/malfunction abatement plan (PM/MAP) developed for the engine and catalytic converter. The PM/MAP for this facility requires periodic replacement of various components within specified times. Manufacturer recommendations will be followed to ensure proper operation of the engine and control device.

### **III. JUSTIFICATION**

The Monitoring Approach described above was determined during extensive communication between the MDEQ-AQD, the control equipment vendor, and the oil and gas industry regarding proper compliance assurance monitoring of the catalytic converter. It was determined that the pressure drop across the catalyst bed, and the inlet and outlet temperatures are critical parameters necessary to measure catalytic converter performance. The parameter ranges listed in Table 1 are used to determine that the catalytic converter is being operated and maintained to achieve the targeted control efficiencies for NO<sub>x</sub> and CO, and therefore provide the compliance assurance required. A high pressure drop may be an indication of plugging of the catalyst, and a very low one may indicate the catalyst bed has leakage around or through it. A high outlet temperature may also be an indication of the need to shut down the unit to prevent burnout of the catalyst. Typical operating temperature ranges for 3-way catalysts are 750 degrees F to 1350 degrees F. The PM/MAP requires certain actions to be taken in the event that there would be a monitored parameter outside of the values indicated in the above table.

Regarding the oxygen sensor for the AFRC, Breitburn has determined that the oxygen sensor is difficult to predict for any range that would define an excursion point. The same sensor can vary considerably depending on the engine's RPM, loading, and other factors, and for this reason it is not practical, nor value added, to identify any range that would identify excursion point(s). The PM/MAP for the facility's engines successfully addresses the requirements for proper operation of the AFRC, and associated oxygen sensor, for this engine. For this reason, it is not practical to identify an excursion level for the AFRC's oxygen sensor. Even if the oxygen sensor experiences difficulties, monitoring the catalytic converter using the pressure differential and temperatures as indicators are more important as monitoring parameters.

Therefore, Breitburn has determined that sufficient monitoring is being performed to satisfy the requirement pursuant to the CAM regulations and requirements, 40 CFR Part 64.

# **Appendix A**

## **Breithurn Operating Company, L.P. Exhaust Emissions Field Report**



**ENGINE EMISSIONS ANALYSIS**

Customer:	BreitBurn	Engine CID:	0
Location:	0	Engine RPM:	0
Unit:	0	BMEP Calc:	#DIV/0!
Serial Number:	0	Amb Temp F:	0
Engine Model:	0	Date of Test:	01/00/00
		Engine Timing:	0

DATA OBSERVED		CONVERTER	
ENGINE		NOx Observed - PPM	0
NOx Observed - PPM	0	NOx Observed - PPM	0
CO Observed - PPM	0	CO Observed - PPM	0
O2 Observed - %	0.0		
Engine Horsepower	0		
Fuel Used - cu-ft/hr	0		
Fuel Analysis - BTU/cu-ft	0		

CALCULATED RESULTS		lbs/hr		TPY
		g/BHP-Hr		
ENGINE NOx	#DIV/0!	0.00	0.00	0.00
ENGINE CO	#DIV/0!	0.00	0.00	0.00
CONVERTER NOx	#DIV/0!	0.00	0.00	0.00
CONVERTER CO	#DIV/0!	0.00	0.00	0.00

NOx CONVERSION	CO CONVERSION	RATIO: NO / NO2
#DIV/0!	#DIV/0!	#DIV/0! / #DIV/0!

Calculated results are derived from a series of emissions readings from the identified engine at the conditions listed. Test instrument reads NO and NO2 separately with NOx based on the combined total and calculated as NO2. Concentrations in PPMv are given at the observed O2 levels with no correction factor made. Engine loading is confirmed using WPI proprietary software and / or driven equipment loading. Test instrument is spanned with known gas concentrations before each series of tests. Printout of the raw data is attached. Test instrument is an electro-chemical cell type. Method of calculation is per EPA Method 19 based on fuel usage and analysis.

lb/hr g/BHP-Hr  
 PRE NOx Lbs/Hr = 0.00 #DIV/0!  
 PRE CO Lbs/Hr = 0.00 #DIV/0!  
 POST NOx Lbs/Hr = 0.00 #DIV/0!  
 POST CO Lbs/Hr = 0.00 #DIV/0!  
 BMEP = #DIV/0!

DATA INPUT AREA	
Customer:	BreitBurn
Location:	
Unit:	
Engine Serial Number:	
Engine Model:	
Engine CID:	
Engine RPM:	
Ambient Temp - deg F:	
Test Date - m/d/yr	
Engine NO Observed - PPM:	
Engine NO2 Observed - PPM:	
Engine CO Observed - PPM:	
Exhaust O2 Observed - %:	
Engine Horsepower:	
Fuel Flow - cu-ft/hr	
Fuel Analysis - BTU/cu-ft	
Converter NO Observed - PPM:	
Converter NO2 Observed - PPM:	
Converter CO Observed - PPM:	
Engine Timing:	

Permit Limits:	NOx: 90% CO: 80%
----------------	------------------

Catalyst temps:	In: Out: Diff: 0
-----------------	------------------

Catalyst pressure:	In: Out: Diff: 0
--------------------	------------------

Exhaust Flow	In: Out: Diff: 0
--------------	------------------

O2 Target	
-----------	--

Catalyst Model:	
-----------------	--



# RENEWABLE OPERATING PERMIT APPLICATION

## AI-001: ADDITIONAL INFORMATION

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.*

SRN: 5831

Section Number (if applicable): 1

1. Additional Information ID  
**AI-MAP**

### Additional Information

2. Is This Information Confidential?

Yes  No

Revised PM MAP to reflect the omission of EUENGINE5

Page of

**Preventative Maintenance and  
Malfunction Abatement Plan**

**BreitBurn Operating, LP**

**Facility: Wilderness CO2pf  
SRN: N5831**

Revised to remove EUENGINE5 from ROP 6/27/18

Revised July 31, 2013

**Submission date: August 20, 2012**

**Revised to reflect company names change**

**Effective Date 11/1/2007**



<b>PM/MAP Content Checklist</b> <u><b>Reference Appendices C, D, and E.</b></u>		Where included	
		Page	Section or Table
1	Contact Person		<i>Cover Letter</i>
<b>ENGINES</b>			
2	<u>Engine Identification</u> : Include the engine make/model and type of engine (i.e. rich or lean burn). Identify engines with add on control and AFRC. If add on control is present, identify type of control.		<i>Appendix A &amp; Appendix C</i>
3	<u>Engine Operating Variables To Be Monitored</u> . Include a copy of the normal engine maintenance log.	4	<i>Table 1 &amp; Appendix B</i>
4	<u>Corrective procedures or operational changes</u> that will be taken in the event of a malfunction.	2, 6	<i>Table 2, Appendix D &amp; Appendix E</i>
5	<u>Major parts replacement</u> inventory for engines.	2	
<b>Add On Controls</b>			
6	<u>Catalytic Converter &amp; Oxidation Catalyst operating variables to be monitored</u> . Include the method and frequency of monitoring these variables; provide the normal operating range of these variables.	4-5	<i>Table 1</i>
7	<u>Corrective actions to be taken in event of malfunction of the catalytic converter</u> .	6	<i>Table 2</i>
8	<u>AFRC O<sub>2</sub> Sensor replacement schedule or operating variables to be monitored</u>	5	<i>Table 1</i>
9	<u>Corrective actions to be taken in event of malfunction of the AFRC</u>	6	<i>Table 2</i>
10	<u>Emission testing</u> utilizing portable analyzer	5	<i>Table 1</i>
11	<u>Scheduled maintenance of control equipment</u>	4-5	<i>Table 1</i>
12	<u>Major parts replacement</u> inventory for add on control.	2	
13	<u>Identify supervisory personnel</u> responsible for overseeing inspection, maintenance and repair of add on controls.	6	<i>Table 2</i>
14	<u>Recordkeeping and retention of records</u> .	2-3	
15	<u>Updates of PM/MAP</u> as necessary.	3	

## TABLE OF CONTENTS

	<b>Page No.</b>
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>2.0 ENGINES AND CATALYTIC CONTROL UNITS</b>	<b>1</b>
<b>3.0 RECORDKEEPING</b>	<b>2</b>
<b>4.0 UPDATES</b>	<b>3</b>

### APPENDICES

- Appendix A – List of Facility Specific Equipment Covered by this PM/MAP**
- Appendix B – Engine Field Report Form**
- Appendix C – Compressor Specification Sheet**
- Appendix D – Maintenance Record (Revised 11/2008)**
- Appendix E – Portable Analyzer Record**

## **1.0 INTRODUCTION**

BreitBurn Operating, LP (BreitBurn) operates numerous natural gas central processing facilities (CPFs) in Michigan. The CPFs receive gas from natural gas wells and dehydrate (if necessary) and compress the gas prior to pipeline transport. All of these CPFs have natural gas fired internal combustion engines. BreitBurn uses both rich burn and lean burn engines. Some of the rich burn engines are equipped with 3-way catalytic control systems. Generally there is no add-on control for BreitBurn lean burn engines. However, a few of BreitBurn's lean burn engines are equipped with oxidation catalytic control systems. The text of this PM/MAP is uniform for all of BreitBurn's facilities. The cover page and the specific engine, catalyst and AFRC information shown in Appendix A will be unique to each facility.

## **2.0 ENGINES AND CATALYTIC CONTROL UNITS**

### **2.1 Description**

Three-way catalytic converters, used on rich-burn engines, provide an overall control efficiency of 90 percent for NO<sub>x</sub>, 80 percent for CO and 50 percent for VOCs. Some of BreitBurn's rich burn engines operate with an air to fuel ratio controller (AFRC), others do not. Oxidation catalysts used on lean-burn engines reduce CO, VOC and trace organic toxic air contaminants (TACs), which include hazardous air pollutants (HAPs) and TACs emissions. Appendix A identifies the BreitBurn-operated engine(s) that are equipped with add-on control devices. This information is stored and updated on a BreitBurn database or spreadsheet. Appendix B also lists the operating variables of the engines.

### **2.2 Operation of Catalytic Converters**

For both 3-way and oxidation catalysts, the hot exhaust gases from the engine pass through a catalytic reduction bed, where the reduction and oxidation occur. An oxidation catalyst requires higher oxygen levels to allow the converter bed to oxidize the CO, VOC and trace organic TACs/HAPs. The exhaust gases then pass out a stack.

### **2.3 Critical Criteria**

The preventative maintenance of the engines is primarily done to keep the engine operating properly and to extend its useful life. Any major malfunction of the engine will lead to its being taken out of service for repair. Each engine has a control panel that will indicate critical malfunctions, and will initiate an engine shutdown if necessary. In the event of a shutdown, a third party mechanic is called out to repair the engine and a record of the event is made.

The critical criteria for the operation of the catalytic converter are the oxygen content of the incoming gases, the pressure drop across the catalyst bed and the inlet and outlet temperature. If the oxygen content is too high for a 3-way catalytic converter, the NO<sub>x</sub> reduction reaction will not yield the desired 90 percent decrease in concentration. Similarly, for oxidation catalysts, if the oxygen level drops too low, the proper oxidation of CO, VOC and trace TACs/HAPs will decrease. For lean burn engines, the oxygen level should be enough to ensure that the oxygen content of the exhaust gases will remain adequate to allow proper oxidation. A high pressure drop may be an indication of plugging of the catalyst, and a very

low one may indicate the catalyst bed has leakage around or through it. A high outlet temperature may also be an indication of the need to shut down the unit to prevent burnout of the catalyst. Typical operating temperature ranges for 3-way catalysts are 750 deg. F to 1350 deg. F.

#### **2.4 Catalyst Inspections and Maintenance**

In order to reduce the chance of fouling problems with either 3-way and oxidation catalysts, if an engine is new or major maintenance is performed, the engine may run for up to 100 hours without the catalyst installed. The engine may run without the catalytic converter a maximum of 200 hours per year. Records will be maintained of the engine hours of operation without the catalyst insert installed. All catalysts will be equipped with pre- and post-catalyst temperature sensors. All engines equipped with catalysts will automatically shut down in the event that the sensors indicate that the post-catalyst temperature exceeds 1350 degrees F. If the post-catalyst temperature on a 3-way catalyst is less than the pre-catalyst temperature, a mechanic will be called out to investigate. Temperature rise will not be used as a measure of oxidation catalyst performance. The preventative maintenance schedule for BreitBurn engines and catalysts is included as Table 1. A log of all inspections and maintenance work will be maintained in a BreitBurn database or spreadsheet. A schedule is maintained for each engine and its add-on control devices.

#### **2.5 Spare Parts**

Spare washed catalyst elements and engine parts will be maintained in a third party warehouse for use when a catalyst has been removed for maintenance. Each spare insert will be washed in accordance with the Table 2 schedule. Catalyst insert kits, oxygen sensors for air fuel ratio controllers, and extra temperature probes, stepper motor as well as a harness will be supplied by a third party.

#### **2.6 Key Operating Variables and Corrective Procedures in the Event of a Malfunction**

See Table 2 for a summary of the key operating variables and corrective actions for each malfunction.

### **3.0 RECORDKEEPING**

Records of engine operating hours and maintenance are maintained and updated on BreitBurn's data server in a database or in spreadsheet form.

BreitBurn will keep all records necessary for demonstrating compliance with this PM/MAP. Records will be made available within two weeks from the date of request by the MDEQ.

#### **4.0 UPDATES**

If BreitBurn experiences a malfunction that is not properly addressed in this Preventative Maintenance and Malfunction Abatement Plan, it will be updated and submitted to the AQD District Supervisor for review and approval.

**Table 1 – BreitBurn Engine and Catalysts Preventative Maintenance Schedule**

Item	Activity	Equipment Status	Frequency
Engine	Mini Service ✓ Check and adjust valves ✓ Check engine compression ✓ Check timing ✓ Check fuel pressure ✓ Check air filter ✓ Change pre air filter ✓ Check all kill devices ✓ Inspect hoses and belts ✓ Inspect spark plugs	Off line	Every 60-90 days
Engine	Major Service ✓ Perform mini service as listed above, and ✓ Change motor oil and filter, as necessary, by sampling oil every 30 days, and submitting for an oil analysis	Off line	Approximately every 2,160 hours of engine operation, or if oil analysis indicates need.
Engine	Swing/overhaul ✓ Replace existing engine with new/refurbished engine.  ☞ When new/rebuilt engine is installed or major maintenance is performed, the unit will be run without the catalyst, if applicable, for up to 100 hours per event. This prevents the catalyst from becoming damaged due to lubricants left in the engine and gives the valves and piston rings time to seat and seal.	Off line	Approximately every 75,000 hours of engine operation, or as needed.
Catalyst	Check differential pressure across catalyst.  Establish baseline $\Delta P$ each time a new or cleaned CC insert is installed at normal operating conditions (rpm's). Check monthly. If greater than baseline $\Delta P$ by 2" WC @80-100percent max rpm, then inspect catalyst and take actions based on findings.	On line	Monthly
Catalyst	Check inlet and outlet temperatures across catalyst. ☞ If the pre-catalyst temperature is less than 750°F, or other minimum temperature established through testing, a mechanic will be called out to investigate. ☞ If the post-catalyst temperature exceeds 1350°F, the engine will be shut down. ☞ If the $\Delta T$ across CC is negative, mechanic will evaluate cause and determine a resolution, based on history and degree of change. May	On line	Daily

**Table 1 – BreitBurn Engine and Catalysts Preventative Maintenance Schedule**

<b>Item</b>	<b>Activity</b>	<b>Equipment Status</b>	<b>Frequency</b>
	establish engine specific $\Delta T$ through testing. Must document conclusions, and actions.		
Catalyst	<p>The catalytic converter shall be removed, inspected and cleaned at least once per 12-18 months. Cleaning will consist of vacuuming or blowing clean the catalyst face and clearing fouling and built-up ash.</p> <p>If the catalyst does not respond to the annual vacuum or blowing treatment, the catalyst will be removed, shipped to the manufacturer, and washed. A “washed swing” catalyst insert shall be used until a new or refurbished catalyst is installed.</p> <p>The used catalyst will not be returned to service unless it can be rejuvenated.</p> <p>Replace the gaskets (typically at the same time the catalyst is washed or serviced).</p>	Off line	Every 12 -18 months of catalyst operating time, or in the event of an engine malfunction where foreign fluids cause engine shutdown.
Catalyst	<p>Remove catalyst insert and wash in chemical solution to remove surface contamination.</p> <p>☞ Replace with clean or fresh “swing” insert during cleaning process.</p>	Off line	Every 18-24 months of operation.
Catalyst	Replace catalyst insert.	Off line	If not functioning properly after vendor cleaning, or in lieu of vendor cleaning.
AFRC	Replace oxygen sensor.	On or off line	After 90-110 days of operation or if AFRC unit or lifetime sensor indicates need.
Emission Reduction Testing	For CO and NO <sub>x</sub> . BreitBurn will do one of the following: a) inlet and outlet testing and estimate destruction efficiency; b) outlet testing and check for gm/hp-hr compared to levels used for permitting; or c) outlet testing and use the uncontrolled vendor data to establish a destruction efficiency.	On line	Whenever new or refurbished catalyst inserted. Typically every 12-18 months when insert is serviced. Also as needed to identify alternate operating conditions.
Portable Emission Analyzer	Maintenance and calibration.	On or off line	As required by mfg’r manuals.

Table 2 – BreitBurn Operating Variables and Remedial Actions

Device Description	Operating Variable	Monitoring Method	Frequency	Normal Operating Range	Corrective Procedure or Operational Change in the Event of a Malfunction	Responsible Supervisor
AFRC Oxygen Sensor	Oxygen content of exhaust gases	Gauge or digital reading	Monthly	0-1 percent O <sub>2</sub>	Re-synchronize the engine and the AFRC. If O <sub>2</sub> level does not come into line, replace oxygen sensor within 5 days and readjust engine.	Third Party Mechanic
Catalyst	2.5" WC Change in $\Delta P$ @ normal operating conditions	Gauge or manometer	Monthly	Established with installation of new or cleaned CC insert that a 2.5" WC Change in $\Delta P$ @ normal operating conditions. Varies by engine. Recorded in database	Remove and inspect catalyst insert within 3 days. Clean or replace if necessary.	Third Party Mechanic
Catalyst	Inlet and Outlet temperatures	Thermocouple	Daily	Must be below 1350 degrees F. For 3-way catalysts only: Outlet temperature must be equal to or greater than the catalytic inlet temperature	Engine will automatically shut down at 1350 degrees F. For 3-way catalysts: If outlet temperature is less than inlet temperature, a mechanic will investigate and make appropriate repairs.	Third Party Mechanic
Thermocouple	Temperature	Temperature read-outs. Check with independent thermocouple.	As needed	0 to 1400 °F	Inspect thermocouple. Clean, recheck, or replace if not functioning.	Third Party Mechanic



**Appendix A  
Wilderness CO2 Equipment Information**

Facility	PTI	SRN	AQD ID	BB Unit Number	Type of Control	AFRC (yes/no)	Baseline DP	Engine Model	Rich or Lean Burn
WILDERNESS CO2	86-05A	N5831	EUENGINE6	CO2 - 1	CC	YES	2.3	Waukesha L-7042 GSI	RB
WILDERNESS CO2	86-05A	N5831	EUENGINE1	831	NA	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE2	856	OC	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE3	885	OC	YES	NA	Caterpillar 3516	LB
WILDERNESS CO2	86-05A	N5831	EUENGINE4	907	OC	YES	NA	Caterpillar 3516	LB

EUENGINE6 BASELINE DP CHANGE (HISTORICAL)

3/3/2014 5.7

8/8/2014 2.1

2/6/2015 VACCUMMED & INSPECTED

2/9/2015 2.5

7/27/2015 3.0

3/29/2016 Tested & DP is the same (3.0), no revision sent

10/30/2017 2.3

6/27/2018 Remove EUENGINE5 from MAP

EUENGINE5

SHUT IN 11/10/14

# Appendix B

## BreitBurn Operating L.P.

Preventative Maintenance and Malfunction Abatement Plan

### Field Report

Location: \_\_\_\_\_ Month & Year: \_\_\_\_\_

Unit #: \_\_\_\_\_ Location: \_\_\_\_\_ Equipment: \_\_\_\_\_

Engine Model & S.N.: \_\_\_\_\_ / \_\_\_\_\_ Comp. Model & S.N.: \_\_\_\_\_

#### Compressor

Date:	RPM	Oil Press	Oil Temp	Oil Level	Water Temp	Water Level	Suct Press	#1 int Press	#2 int Press	#3 int Press	Disch Press	#1 int Temp	#2 int Temp	#3 int Temp	Disch Temp	Oil Press	Oil Temp	Oil Level	Mech Initial	Exhaust Temp	
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
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18																					
19																					
20																					



**BreitBurn Operating Company, L.P.**  
**Preventative Maintenance and Malfunction Abatement Plan**  
**COMPRESSOR SPECIFICATION SHEET**

Facility/Unit #:	Packager:	Year Built:
------------------	-----------	-------------

Engine		
Manufacturer:	Model:	Serial Number:
Horsepower:	RPM:	Spec/Arrangement:
Ignition/Make?:	Starter/Make?:	Governor/Make?:
Low Emission (LE)?	AFRC/Make-Model?	Catalytic Converter-Make/Model?
Stack Height:	Exhaust Diameter:	

Compressor		
Manufacturer:	Model:	Serial Number:
Throws:	Stages:	Stroke:
RPM:	Horsepower:	Rod Load Rating:

Cylinders						
Stage/Cyl#	Bore	Class	MAWP	Serial Number	VVP/Plug/Plain	VVP S/N

Cooler					
Manufacturer:	Model:			Serial Number:	
Section	MAWP	Number of Tubes	Number of Rows	Louvers?	Year
EJW					
TAW					
IC-1					
IC-2					
IC-3					
AC					



<b>Archrock</b>	North America Operations Services			Ticket Number:
	<b>General Service Ticket</b>			
Employee Name:		W.O. Number:		
Employee ID:		W.O. Type:		
Unit Number:		Business Unit:		
Date:		Asset Group:		
Customer Name:			Engine	Compressor
Lease Name:		Make		
Service Billable to Customer? (Y/N)	No	Model		
		Serial Number		
		Hour Meter		

<b>Time Clock</b>		Note: Select Asset Group first, then Exterran or Customer Downtime Code and Event	<b>Customer Downtime Code</b>	<b>Hrs Down</b>
Activity Start Time				
Activity Finish Time	12:00 AM		<b>Exterran Downtime Code</b>	<b>Hrs Down</b>
<b>Direct Time</b>		<b>Activity No.</b>	<b>Event - Code Description</b>	<b>Worked Hrs or Blowdown Events</b>
Work (hours)				
Travel (hours)				
Standby (hours)		1		
Total Miles Traveled		2		
Weather Condition		3		
Total Direct Hours	0.00	4		
<b>Others Operations Activities (MOB, DEMOB, etc)</b>		<b>Activity No.</b>	<b>Description</b>	<b>Worked Hrs</b>
		1		
		2		

<b>Indirect Time</b>		Explanation of Work Performed (Enter your comments here.)
Description/Code	Hours	
Total Indirect Hours	0.00	

<b>Meal Hours</b>	
Description	Hours
Total Meal Hours	0.00

Qty	Part Number	Description	Warehouse	Qty	Part Number	Description	Warehouse
0				0			
0				0			
0				0			
0				0			
0				0			
0				0			

0	Days at	\$ -	Per Diem =	\$ -	0	Nights at	\$ -	Per Night =	\$ -
---	---------	------	------------	------	---	-----------	------	-------------	------

Is Job Complete? (Y/N)	Yes	Customer acknowledges and agrees all travel and living expenses shall be invoiced with labor charges per Exterran's Published Rate Sheet unless other terms are agreed to prior to commencement of service
------------------------	-----	--

Employee Signature:	Employee Name: (print)
Customer Signature:	Customer Name: (print)

**BREITBURN OPERATING LP  
APPENDIX E  
EMISSIONS TESTING EXAMPLE**



**ENGINE EMISSIONS ANALYSIS**

Customer:	BreitBurn	Engine CID:	0
Location:	0	Engine RPM:	0
Unit:	0	BMEP Calc:	#DIV/0!
Serial Number:	0	Amb Temp F:	0
Engine Model:	0	Date of Test:	01/00/00
		Engine Timing:	0

**DATA OBSERVED**

ENGINE		CONVERTER	
NOx Observed - PPM	0	NOx Observed - PPM	0
CO Observed - PPM	0	CO Observed - PPM	0
O2 Observed - %	0.0		
Engine Horsepower	0		
Fuel Used - cu-ft/hr	0		
Fuel Analysis - BTU/cu-ft	0		

<b>CALCULATED RESULTS</b>			
	<b>g/BHP-Hr</b>	<b>lbs/hr</b>	<b>TPY</b>
<b>ENGINE NOx</b>	#DIV/0!	0.00	0.00
<b>ENGINE CO</b>	#DIV/0!	0.00	0.00
<b>CONVERTER NOx</b>	#DIV/0!	0.00	0.00
<b>CONVERTER CO</b>	#DIV/0!	0.00	0.00

<b>NOx CONVERSION</b>	<b>CO CONVERSION</b>
#DIV/0!	#DIV/0!

<b>RATIO:</b>	<b>NO</b>	<b>/</b>	<b>NO2</b>
	#DIV/0!	/	#DIV/0!

Calculated results are derived from a series of emissions readings from the identified engine at the conditions listed. Test instrument reads NO and NO2 separately with NOx based on the combined total and calculated as NO2. Concentrations in PPMv are given at the observed O2 levels with no correction factor made. Engine loading is confirmed using WPI proprietary software and / or driven equipment loading. Test instrument is spanned with known gas concentrations before each series of tests. Printout of the raw data is attached. Test instrument is an electro-chemical cell type. Method of calculation is per EPA Method 19 based on fuel usage and analysis.



NASDAQ:LINE

226A East 16<sup>th</sup> Street  
Traverse City, Michigan 49684  
Phone: (231) 922-7302  
Fax: (231) 922-0892

DEQ/AQD Received Date: 11-19-18  
Renewal Application No. 201800149

Shane Nixon  
Michigan Department of Environmental Quality  
Air Quality Division  
2100 West M-32  
Gaylord, Michigan 49735-9282

January 7, 2019

Re: Permit Renewal Application  
Hayes 29 CPF  
MI-PTI-N5831-2014 (EUENGINE29)

Dear Shane:

Enclosed with this cover letter is the ROP Permit renewal package for the above referenced facility. The package consists of the ROP application, the permit markup, the PMMAP, and the 2017 MAERS report. Please note the MAERS report was submitted by Breitburn Operating L.P. The emission sources applicable to this permit application are EUENGINE29 and EUDEHY.

Please contact me at (231)941-4772 if you have any questions or need additional information regarding the application.

Sincerely,

A handwritten signature in blue ink, appearing to read "Diane Lundin".

Diane Lundin  
EHS Advisor

Enclosures

Xc: Bill Rogers – MDEQ, Gaylord  
Edward Nam - EPA Region 5 Air Quality



**ROP Permit Application**

DEQ/AQD Received Date:  
11-19-18  
Renewal Application No.  
201800149

Michigan Department of Environmental Quality - Air Quality Division



## RENEWABLE OPERATING PERMIT RENEWAL APPLICATION FORM

This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Refer to instructions for additional information to complete the Renewable Operating Permit Renewal Application Form.

### GENERAL INSTRUCTIONS

This application form should be submitted as part of an administratively complete application package for renewal of a Renewable Operating Permit (ROP). This application form consists of nine parts. Parts A – H must be completed for all applications and must also be completed for each section of a sectioned ROP. Answer all questions in all parts of the form unless directed otherwise. Detailed instructions for this application form can be found at <http://michigan.gov/air> (select the Permits Tab, "Renewable Operating Permits (ROP)/Title V", then "ROP Forms & Templates").

### PART A: GENERAL INFORMATION

Enter information about the source, owner, contact person and the responsible official.

#### SOURCE INFORMATION

SRN N5831	SIC Code	NAICS Code 211111	Existing ROP Number MI-ROP-N5831-2014b	Section Number (if applicable) 2
Source Name LINN Operating, LLC- Hayes 29 CPF				
Street Address 10875 Geronimo Trail				
City Gaylord	State MI	ZIP Code 49735	County Otsego	
Section/Town/Range (if address not available) Section 29 T29N R04W SW1/4				
Source Description Natural gas processing facility that treats natural gas.				
<input type="checkbox"/> Check here if any of the above information is different than what appears in the existing ROP. Identify any changes on the marked-up copy of your existing ROP.				

#### OWNER INFORMATION

Owner Name LINN Operating, LLC- Hayes 29 CPF	Section Number (if applicable) 2			
Mailing address ( <input type="checkbox"/> check if same as source address) 226 E. Sixteenth St.				
City Traverse City	State MI	ZIP Code 49686	County Grand Traverse	Country USA

Check here if any information in this ROP renewal application is confidential. Confidential information should be identified on an Additional Information (AI-001) Form.

SRN: N5831

Section Number (if applicable): 2

**PART A: GENERAL INFORMATION (continued)**

At least one contact and responsible official must be identified. Additional contacts and responsible officials may be included if necessary.

**CONTACT INFORMATION**

Contact 1 Name Diane Lundin		Title EHS Advisor		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address) 226 E. Sixteenth St.				
City Traverse City	State MI	ZIP Code 49686	County Grand Traverse	Country USA
Phone number 231.941.4772		E-mail address DLundin@rvraresources.com		

Contact 2 Name (optional)		Title		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address)				
City	State	ZIP Code	County	Country
Phone number		E-mail address		

**RESPONSIBLE OFFICIAL INFORMATION**

Responsible Official 1 Name Allan Rambur		Title Production Manager		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address) 600 Travis St., Suite 5100				
City Houston	State TX	ZIP Code 77002	County	Country USA
Phone number 281.840.4262		E-mail address arambur@rvraresources.com		

Responsible Official 2 Name (optional)		Title		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address)				
City	State	ZIP Code	County	Country
Phone number		E-mail address		

Check here if an AI-001 Form is attached to provide more information for Part A. Enter AI-001 Form ID:

**PART B: APPLICATION SUBMITTAL and CERTIFICATION by Responsible Official**

Identify the items that are included as part of your administratively complete application in the checklist below. For your application to be complete, it must include information necessary to evaluate the source and to determine all applicable requirements. Answer the compliance statements as they pertain to all the applicable requirements to which the source is subject. The source's Responsible Official must sign and date this form.

**Listing of ROP Application Contents. Check the box for the items included with your application.**

<input checked="" type="checkbox"/> Completed ROP Renewal Application Form (and any AI-001 Forms) (required)	<input type="checkbox"/> Compliance Plan/Schedule of Compliance
<input checked="" type="checkbox"/> Mark-up copy of existing ROP using official version from the AQD website (required)	<input type="checkbox"/> Stack information
<input type="checkbox"/> Copies of all Permit(s) to Install (PTIs) that have not been incorporated into existing ROP (required)	<input type="checkbox"/> Acid Rain Permit Initial/Renewal Application
<input type="checkbox"/> Criteria Pollutant/Hazardous Air Pollutant (HAP) Potential to Emit Calculations	<input type="checkbox"/> Cross-State Air Pollution Rule (CSAPR) Information
<input type="checkbox"/> MAERS Forms (to report emissions not previously submitted)	<input type="checkbox"/> Confidential Information
<input type="checkbox"/> Copies of all Consent Order/Consent Judgments that have not been incorporated into existing ROP	<input checked="" type="checkbox"/> Paper copy of all documentation provided (required)
<input type="checkbox"/> Compliance Assurance Monitoring (CAM) Plan	<input checked="" type="checkbox"/> Electronic documents provided (optional)
<input type="checkbox"/> Other Plans (e.g., Malfunction Abatement, Fugitive Dust, Operation and Maintenance, etc.)	<input checked="" type="checkbox"/> Other, explain: AI-001 PMMAP

**Compliance Statement**

This source is in compliance with **all** of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.

Yes  No

This source will continue to be in compliance with all of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.

Yes  No

This source will meet in a timely manner applicable requirements that become effective during the permit term.

Yes  No

The method(s) used to determine compliance for each applicable requirement is/are the method(s) specified in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and all other applicable requirements not currently contained in the existing ROP.

If any of the above are checked No, identify the emission unit(s) or flexible group(s) affected and the specific condition number(s) or applicable requirement for which the source is or will be out of compliance at the time of issuance of the ROP renewal on an AI-001 Form. Provide a compliance plan and schedule of compliance on an AI-001 Form.

**Name and Title of the Responsible Official (Print or Type)**

ALLAN RAMBUR PRODUCTION MANAGER

**As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.**

  
Signature of Responsible Official

12/4/18  
Date

**PART C: SOURCE REQUIREMENT INFORMATION**

Answer the questions below for specific requirements or programs to which the source may be subject.

C1. Actual emissions and associated data from <b>all</b> emission units with applicable requirements (including those identified in the existing ROP, Permits to Install and other equipment that have not yet been incorporated into the ROP) are required to be reported in MAERS. Are there any emissions and associated data that have <b>not</b> been reported in MAERS for the most recent emissions reporting year? If <b>Yes</b> , identify the emission unit(s) that was/were not reported in MAERS on an AI-001 Form. Applicable MAERS form(s) for unreported emission units must be included with this application.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C2. Is this source subject to the federal regulations on ozone-depleting substances? (40 CFR Part 82)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C3. Is this source subject to the federal Chemical Accident Prevention Provisions? (Section 112(r) of the Clean Air Act Amendments, 40 CFR Part 68) If <b>Yes</b> , a Risk Management Plan (RMP) and periodic updates must be submitted to the USEPA. Has an updated RMP been submitted to the USEPA?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
C4. Has this stationary source <b>added or modified</b> equipment since the last ROP renewal that changes the potential to emit (PTE) for criteria pollutant (CO, NOx, PM10, PM2.5, SO2, VOC, lead) emissions? If <b>Yes</b> , include potential emission calculations (or the PTI and/or ROP revision application numbers, or other references for the PTE demonstration) for the added or modified equipment on an AI-001 Form. If <b>No</b> , criteria pollutant potential emission calculations do not need to be included.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C5. Has this stationary source <b>added or modified</b> equipment since the last ROP renewal that changes the PTE for hazardous air pollutants (HAPs) regulated by Section 112 of the federal Clean Air Act? If <b>Yes</b> , include potential emission calculations (or the PTI and/or ROP revision application numbers or other references for the PTE demonstration) for the added or modified equipment on an AI-001 Form. Fugitive emissions <b>must</b> be included in HAP emission calculations. If <b>No</b> , HAP potential emission calculations do not need to be included.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C6. Are any emission units subject to the Cross-State Air Pollution Rule (CSAPR)? If <b>Yes</b> , identify the specific emission unit(s) subject to CSAPR on an AI-001 Form.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C7. Are any emission units subject to the federal Acid Rain Program? If <b>Yes</b> , identify the specific emission unit(s) subject to the federal Acid Rain Program on an AI-001 Form. Is an Acid Rain Permit Renewal Application included with this application?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C8. Are any emission units identified in the existing ROP subject to compliance assurance monitoring (CAM)? If <b>Yes</b> , identify the specific emission unit(s) subject to CAM on an AI-001 Form. If a CAM plan has not been previously submitted to the MDEQ, one must be included with the ROP renewal application on an AI-001 Form. If the CAM Plan has been updated, include an updated copy. Is a CAM plan included with this application? If a CAM Plan is included, check the type of proposed monitoring included in the Plan: 1. Monitoring proposed by the source based on performance of the control device, or 2. Presumptively Acceptable Monitoring, if eligible	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> <input type="checkbox"/>
C9. Does the source have any plans such as a malfunction abatement plan, fugitive dust plan, operation/maintenance plan, or any other monitoring plan that is referenced in an existing ROP, Permit to Install requirement, or any other applicable requirement? If <b>Yes</b> , then a copy must be submitted as part of the ROP renewal application.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C10. Are there any specific requirements that the source proposes to be identified in the ROP as non-applicable? If <b>Yes</b> , then a description of the requirement and justification must be submitted as part of the ROP renewal application on an AI-001 Form.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part C. Enter AI-001 Form ID: AI- PMMAP	



**PART E: EXISTING ROP INFORMATION**

Review all emission units and applicable requirements (including any source wide requirements) in the existing ROP and answer the questions below as they pertain to all emission units and all applicable requirements in the existing ROP.

E1. Does the source propose to make any additions, changes or deletions to terms, conditions and underlying applicable requirements as they appear in the existing ROP?  Yes  No

If Yes, identify changes and additions on Part F, Part G and/or Part H.

E2. For each emission unit(s) identified in the existing ROP, all stacks with applicable requirements are to be reported in MAERS. Are there any stacks with applicable requirements for emission unit(s) identified in the existing ROP that were not reported in the most recent MAERS reporting year? If Yes, identify the stack(s) that was/were not reported on applicable MAERS form(s).  Yes  No

E3. Have any emission units identified in the existing ROP been modified or reconstructed that required a PTI?  Yes  No

If Yes, complete Part F with the appropriate information.

E4. Have any emission units identified in the existing ROP been dismantled? If Yes, identify the emission unit(s) and the dismantle date in the comment area below or on an AI-001 Form.  Yes  No

Comments:

Check here if an AI-001 Form is attached to provide more information for Part E. Enter AI-001 Form ID: AI-

**PART F: PERMIT TO INSTALL (PTI) INFORMATION**

Review all emission units and applicable requirements at the source and answer the following questions as they pertain to **all** emission units with PTIs. Any PTI(s) identified below must be attached to the application.

F1. Has the source obtained any PTIs where the applicable requirements from the PTI have not been incorporated into the existing ROP? If Yes, complete the following table.  Yes  No  
 If No, go to Part G.

Permit to Install Number	Emission Units/Flexible Group ID(s)	Description (Include Process Equipment, Control Devices and Monitoring Devices)	Date Emission Unit was Installed/ Modified/ Reconstructed

F2. Do any of the PTIs listed above change, add, or delete terms/conditions to **established emission units** in the existing ROP? If Yes, identify the emission unit(s) or flexible group(s) affected in the comments area below or on an AI-001 Form and identify all changes, additions, and deletions in a mark-up of the existing ROP.  Yes  No

F3. Do any of the PTIs listed above identify **new emission units** that need to be incorporated into the ROP? If Yes, submit the PTIs as part of the ROP renewal application on an AI-001 Form, and include the new emission unit(s) or flexible group(s) in the mark-up of the existing ROP.  Yes  No

F4. Are there any stacks with applicable requirements for emission unit(s) identified in the PTIs listed above that were not reported in MAERS for the most recent emissions reporting year? If Yes, identify the stack(s) that were not reported on the applicable MAERS form(s).  Yes  No

F5. Are there any proposed administrative changes to any of the emission unit names, descriptions or control devices in the PTIs listed above for any emission units not already incorporated into the ROP? If Yes, describe the changes on an AI-001 Form.  Yes  No

Comments:

Check here if an AI-001 Form is attached to provide more information for Part F. Enter AI-001 Form ID: AI-



**PART G: EMISSION UNITS MEETING THE CRITERIA OF RULES 281(2)(h), 285(2)(r)(iv), 287(2)(c), OR 290**

Review all emission units and applicable requirements at the source and answer the following questions.

G1. Does the source have any new and/or existing emission units which do not already appear in the existing ROP and which meet the criteria of Rules 281(2)(h), 285(2)(r)(iv), 287(2)(c), or 290.  
 If Yes, identify the emission units in the table below. If No, go to Part H.  Yes  No  
*Note: If several emission units were installed under the same rule above, provide a description of each and an installation/modification/reconstruction date for each.*

Origin of Applicable Requirements	Emission Unit Description – Provide Emission Unit ID and a description of Process Equipment, Control Devices and Monitoring Devices	Date Emission Unit was Installed/ Modified/ Reconstructed
<input type="checkbox"/> Rule 281(2)(h) or 285(2)(r)(iv) cleaning operation		
<input type="checkbox"/> Rule 287(2)(c) surface coating line		
<input type="checkbox"/> Rule 290 process with limited emissions		

Comments:

Check here if an AI-001 Form is attached to provide more information for Part G. Enter AI-001 Form ID: AI-

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE**

Complete this part of the application form for all proposed additions, changes or deletions to the existing ROP. This includes state or federal regulations that the source is subject to and that must be incorporated into the ROP or other proposed changes to the existing ROP. **Do not include additions or changes that have already been identified in Parts F or G of this application form.** If additional space is needed copy and complete an additional Part H.

Complete a separate Part H for each emission unit with proposed additions and/or changes.

H1. Are there changes that need to be incorporated into the ROP that have not been identified in Parts F and G? If <u>Yes</u> , answer the questions below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H2. Are there any proposed administrative changes to any of the existing emission unit names, descriptions or control devices in the ROP? If <u>Yes</u> , describe the changes in questions H8 – H16 below and in the affected Emission Unit Table(s) in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H3. Does the source propose to add a new emission unit or flexible group to the ROP not previously identified in Parts F or G? If <u>Yes</u> , identify and describe the emission unit name, process description, control device(s), monitoring device(s) and applicable requirements in questions H8 – H16 below and in a new Emission Unit Table in the mark-up of the ROP. See instructions on how to incorporate a new emission unit/flexible group into the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H4. Does the source propose to add new state or federal regulations to the existing ROP? If <u>Yes</u> , on an AI-001 Form, identify each emission unit/flexible group that the new regulation applies to and identify <u>each</u> state or federal regulation that should be added. Also, describe the new requirements in questions H8 – H16 below and add the specific requirements to existing emission units/flexible groups in the mark-up of the ROP, create a new Emission Unit/Flexible Group Table, or add an AQD template table for the specific state or federal requirement.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H5. Has a Consent Order/Consent Judgment (CO/CJ) been issued where the requirements were not incorporated into the existing ROP? If <u>Yes</u> , list the CO/CJ number(s) below and add or change the conditions and underlying applicable requirements in the appropriate Emission Unit/Flexible Group Tables in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H6. Does the source propose to add, change and/or delete <b>source-wide</b> requirements? If <u>Yes</u> , identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H7. Are you proposing to <b>streamline</b> any requirements? If <u>Yes</u> , identify the streamlined and subsumed requirements and the EU ID, and provide a justification for streamlining the applicable requirement below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

<p>H8. Does the source propose to add, change and/or delete <b>emission limit</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H9. Does the source propose to add, change and/or delete <b>material limit</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H10. Does the source propose to add, change and/or delete <b>process/operational restriction</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H11. Does the source propose to add, change and/or delete <b>design/equipment parameter</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H12. Does the source propose to add, change and/or delete <b>testing/sampling</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below. Verify NOx and CO emissions via alternative methods.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>H13. Does the source propose to add, change and/or delete <b>monitoring/recordkeeping</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>H14. Does the source propose to add, change and/or delete <b>reporting</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

<p>H15. Does the source propose to add, change and/or delete <b>stack/vent restrictions</b>? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>H16. Does the source propose to add, change and/or delete any <b>other</b> requirements? If <u>Yes</u>, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>H17. Does the source propose to add terms and conditions for an alternative operating scenario or intra-facility trading of emissions? If <u>Yes</u>, identify the proposed conditions in a mark-up of the corresponding section of the ROP and provide a justification below.</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><input type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part H. Enter AI-001 Form ID: <b>AI-Testing</b></p>	



## RENEWABLE OPERATING PERMIT APPLICATION AI-001: ADDITIONAL INFORMATION

This information is required by Article II, Chapter 1, part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.

SRN: N5831

Section Number (if applicable): 2

1. Additional Information ID

AI-PMMAP

### Additional Information

2. Is This Information Confidential?

Yes  No

Question C9.- Please find attached a Preventative Maintenance/ Malfunction Abatement Plan for the Caterpillar 3516 LE compressor engine. The engine is an existing 1085 horsepower lean burn with an oxidation catalyst.

Page of 1

## **ROP Permit Markup**

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

EFFECTIVE DATE: August 4, ~~2014~~2019

REVISION DATES: April 21, ~~2015~~2020, June 5, ~~2017~~2022

ISSUED TO:

**Breitburn Operating, LP – Wilderness CO2 CPF  
and  
Linn Operating, LLC – Hayes 29 CPF**

State Registration Number (SRN): N5831

LOCATED AT:

10875 Geronimo Trail, Gaylord, Otsego County, Michigan 49735

**RENEWABLE OPERATING PERMIT**

Permit Number: MI-ROP-N5831-~~2014b~~2019c

Expiration Date: August 4, ~~2019~~2024

Administratively Complete ROP Renewal Application Due Between:  
February 4, 2018 and February 4, 2019

This Renewable Operating Permit (ROP) is issued in accordance with and subject to Section 5506(3) of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Pursuant to Michigan Air Pollution Control Rule 210(1), this ROP constitutes the permittee's authority to operate the stationary source identified above in accordance with the general conditions, special conditions and attachments contained herein. Operation of the stationary source and all emission units listed in the permit are subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

**SOURCE-WIDE PERMIT TO INSTALL**

Permit Number: MI-PTI-N5831-~~2014b~~2019c

This Permit to Install (PTI) is issued in accordance with and subject to Section 5505(5) of Act 451. Pursuant to Michigan Air Pollution Control Rule 214a, the terms and conditions herein, identified by the underlying applicable requirement citation of Rule 201(1)(a), constitute a federally enforceable PTI. The PTI terms and conditions do not expire and remain in effect unless the criteria of Rule 201(6) are met. Operation of all emission units identified in the PTI is subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

Michigan Department of Environmental Quality

Shane Nixon, Cadillac District Supervisor

2014b2019c  
20192024  
2014b2019c

ROP No: MI-ROP-N5831-  
Expiration Date: August 4,  
PTI No: MI-PTI-N5831-

## TABLE OF CONTENTS

<b>AUTHORITY AND ENFORCEABILITY .....</b>	<b>4</b>
<b>SECTION 1 – Breitburn Operating, LP - Wilderness CO2 CPF .....</b>	<b>5</b>
<b>A. GENERAL CONDITIONS .....</b>	<b>6</b>
Permit Enforceability.....	6
General Provisions .....	6
Equipment & Design .....	7
Emission Limits.....	7
Testing/Sampling.....	7
Monitoring/Recordkeeping.....	7
Certification & Reporting.....	8
Permit Shield .....	9
Revisions.....	10
Reopenings .....	10
Renewals.....	10
Stratospheric Ozone Protection .....	10
Risk Management Plan.....	11
Emission Trading.....	11
Permit To Install (PTI).....	11
<b>B. SOURCE-WIDE CONDITIONS .....</b>	<b>13</b>
<b>C. EMISSION UNIT CONDITIONS .....</b>	<b>16</b>
EMISSION UNIT SUMMARY TABLE .....	16
<b>D. FLEXIBLE GROUP CONDITIONS .....</b>	<b>17</b>
FLEXIBLE GROUP SUMMARY TABLE.....	17
FGCATENGINES .....	18
FGWAUKENGINES.....	22
FGRURALSIRICEMACT .....	27
<b>E. NON-APPLICABLE REQUIREMENTS .....</b>	<b>30</b>
<b>APPENDICES .....</b>	<b>31</b>
Appendix 1. Abbreviations and Acronyms.....	31
Appendix 2. Schedule of Compliance .....	32
Appendix 3. Monitoring Requirements .....	32
Appendix 4. Recordkeeping.....	32
Appendix 5. Testing Procedures .....	32
Appendix 6. Permits to Install .....	32
Appendix 7. Emission Calculations .....	33
Appendix 8. Reporting .....	33
<b>SECTION 2 – LINN Operating, LLC - Hayes 29 CPF .....</b>	<b>34</b>
<b>A. GENERAL CONDITIONS .....</b>	<b>35</b>
Permit Enforceability.....	35



2014b2019c

20192024

2014b2019c

General Provisions .....	35
Equipment & Design .....	36
Emission Limits.....	36
Testing/Sampling.....	36
Monitoring/Recordkeeping.....	37
Certification & Reporting.....	37
Permit Shield .....	38
Revisions.....	39
Reopenings .....	39
Renewals.....	4039
Stratospheric Ozone Protection .....	40
Risk Management Plan.....	40
Emission Trading.....	4140
Permit To Install (PTI).....	4140
<b>B. SOURCE-WIDE CONDITIONS .....</b>	<b>42</b>
<b>C. EMISSION UNIT CONDITIONS .....</b>	<b>45</b>
EMISSION UNIT SUMMARY TABLE .....	45
EUGLYCOLDEHYDRATOR .....	46
EUENGINEH29 .....	49
EUMACTZZZZ.....	5453
<b>D. FLEXIBLE GROUP CONDITIONS .....</b>	<b>5756</b>
<b>E. NON-APPLICABLE REQUIREMENTS.....</b>	<b>5857</b>
<b>APPENDICES .....</b>	<b>5958</b>
Appendix 1. Abbreviations and Acronyms.....	5958
Appendix 2. Schedule of Compliance .....	6059
Appendix 3. Monitoring Requirements .....	6059
Appendix 4. Recordkeeping.....	6059
Appendix 5. Testing Procedures.....	6059
Appendix 6. Permits to Install .....	6059
Appendix 7. Emission Calculations .....	6059
Appendix 8. Reporting .....	6160

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

2014b2019c

20192024

2014b2019c

## AUTHORITY AND ENFORCEABILITY

For the purpose of this permit, the **permittee** is defined as any person who owns or operates an emission unit at a stationary source for which this permit has been issued. The **department** is defined in Rule 104(d) as the Director of the Michigan Department of Environmental Quality (MDEQ) or his or her designee.

The permittee shall comply with all specific details in the permit terms and conditions and the cited underlying applicable requirements. All terms and conditions in this ROP are both federally enforceable and state enforceable unless otherwise footnoted. Certain terms and conditions are applicable to most stationary sources for which an ROP has been issued. These general conditions are included in Part A of this ROP. Other terms and conditions may apply to a specific emission unit, several emission units which are represented as a flexible group, or the entire stationary source which is represented as a Source-Wide group. Special conditions are identified in Parts B, C, D and/or the appendices.

In accordance with Rule 213(2)(a), all underlying applicable requirements are identified for each ROP term or condition. All terms and conditions that are included in a PTI, are streamlined, subsumed and/or are state-only enforceable will be noted as such.

In accordance with Section 5507 of Act 451, the permittee has included in the ROP application a compliance certification, a schedule of compliance, and a compliance plan. For applicable requirements with which the source is in compliance, the source will continue to comply with these requirements. For applicable requirements with which the source is not in compliance, the source will comply with the detailed schedule of compliance requirements that are incorporated as an appendix in this ROP. Furthermore, for any applicable requirements effective after the date of issuance of this ROP, the stationary source will meet the requirements on a timely basis, unless the underlying applicable requirement requires a more detailed schedule of compliance.

Issuance of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

A. GENERAL CONDITIONS

**SECTION 1 – Breitburn Operating, LP - Wilderness CO2 CPF**

1. The Contractor shall comply with all applicable laws, rules, regulations, codes, standards, and ordinances, including but not limited to, the Michigan Environmental Protection Act (1994 PA 443), the Michigan Environmental Response Act (1991 PA 287), and the Michigan Environmental Assessment Act (1984 PA 207), and all other laws, rules, regulations, codes, standards, and ordinances that may apply to the performance of the work under this contract. The Contractor shall also comply with all applicable laws, rules, regulations, codes, standards, and ordinances that may apply to the performance of the work under this contract, including but not limited to, the Michigan Environmental Protection Act (1994 PA 443), the Michigan Environmental Response Act (1991 PA 287), and the Michigan Environmental Assessment Act (1984 PA 207).
2. The Contractor shall be responsible for obtaining all necessary permits, licenses, and approvals from the appropriate regulatory agencies, including but not limited to, the Michigan Department of Environmental Quality (MDEQ), the Michigan Department of Natural Resources (MDNR), and the Michigan Department of Transportation (MDOT). The Contractor shall also be responsible for maintaining all permits, licenses, and approvals in good standing throughout the term of the contract.
3. The Contractor shall be responsible for the design, construction, operation, and maintenance of the Wilderness CO2 CPF. The Contractor shall also be responsible for the safety of the facility and the surrounding area, and for the protection of the environment. The Contractor shall also be responsible for the disposal of all waste materials in accordance with applicable laws, rules, regulations, codes, standards, and ordinances.
4. The Contractor shall be responsible for the procurement of all materials, equipment, and services necessary for the performance of the work under this contract. The Contractor shall also be responsible for the management of the project budget, and for the timely completion of the work.
5. The Contractor shall be responsible for the coordination of all activities related to the performance of the work under this contract, including but not limited to, the coordination of the work with other contractors, the coordination of the work with the owner, and the coordination of the work with the regulatory agencies.
6. The Contractor shall be responsible for the maintenance of accurate records of all activities related to the performance of the work under this contract, including but not limited to, the maintenance of accurate records of the work schedule, the maintenance of accurate records of the work progress, and the maintenance of accurate records of the work costs.
7. The Contractor shall be responsible for the provision of all necessary training and safety instruction to all personnel involved in the performance of the work under this contract. The Contractor shall also be responsible for the implementation of a comprehensive safety program, and for the maintenance of a safe working environment.
8. The Contractor shall be responsible for the implementation of an environmental management system, and for the maintenance of an accurate record of all environmental activities. The Contractor shall also be responsible for the implementation of a quality management system, and for the maintenance of an accurate record of all quality management activities.
9. The Contractor shall be responsible for the implementation of a risk management system, and for the maintenance of an accurate record of all risk management activities. The Contractor shall also be responsible for the implementation of a communication management system, and for the maintenance of an accurate record of all communication management activities.
10. The Contractor shall be responsible for the implementation of a document management system, and for the maintenance of an accurate record of all document management activities. The Contractor shall also be responsible for the implementation of a change management system, and for the maintenance of an accurate record of all change management activities.

## A. GENERAL CONDITIONS

### Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state-only enforceable Source-Wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R 336.1214a(5))**
- Those conditions that are hereby incorporated in a federally enforceable Source-Wide PTI pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

### General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state-only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities: **(R 336.1213(1)(d))**
  - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
  - c. Inspect, at reasonable times, any of the following:
    - i. Any stationary source.
    - ii. Any emission unit.
    - iii. Any equipment, including monitoring and air pollution control equipment.
    - iv. Any work practices or operations regulated or required under the ROP.
  - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.
5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL §15.231 et seq., and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**

6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

### **Equipment & Design**

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

### **Emission Limits**

11. Unless otherwise specified in this ROP, the permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following: **(R 336.1301(1))**
  - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
  - b. A limit specified by an applicable federal new source performance standard.  
The grading of visible emissions shall be determined in accordance with Rule 303.
12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
  - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.<sup>1</sup> **(R 336.1901(a))**
  - b. Unreasonable interference with the comfortable enjoyment of life and property.<sup>1</sup> **(R 336.1901(b))**

### **Testing/Sampling**

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**
14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**
15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(5))**

### **Monitoring/Recordkeeping**

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate: **(R 336.1213(3)(b))**
  - a. The date, location, time, and method of sampling or measurements.
  - b. The dates the analyses of the samples were performed.
  - c. The company or entity that performed the analyses of the samples.

- d. The analytical techniques or methods used.
  - e. The results of the analyses.
  - f. The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

## **Certification & Reporting**

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a Responsible Official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A Responsible Official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
- a. For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
  - b. For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.
  - c. For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.
22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following: **(R 336.1213(3)(c))**
- a. Submitting a certification by a Responsible Official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
  - b. Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a Responsible Official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be

certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.

23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a Responsible Official in a manner consistent with the CAA. **(R 336.1912)**

#### **Permit Shield**

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
  - a. The applicable requirements are included and are specifically identified in the ROP.
  - b. The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.

Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.

27. Nothing in this ROP shall alter or affect any of the following:
  - a. The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**
  - b. The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
  - c. The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**
  - d. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:
  - a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
  - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
  - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
  - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
  - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**

29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

### Revisions

30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(10))**
33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

### Reopenings

34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
- If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
  - If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**
  - If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
  - If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

### Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(8))**

### Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaiming, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.



37. If the permittee is subject to 40 CFR Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

### **Risk Management Plan**

38. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall comply with the requirements of 40 CFR Part 68, no later than the latest of the following dates as provided in 40 CFR Part 68.10(a):
- June 21, 1999,
  - Three years after the date on which a regulated substance is first listed under 40 CFR Part 68.130, or
  - The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c). **(40 CFR Part 68)**

### **Emission Trading**

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

### **Permit To Install (PTI)**

43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule. <sup>2</sup> **(R 336.1201(1))**
44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA. <sup>2</sup> **(R 336.1201(8), Section 5510 of Act 451)**
45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ. <sup>2</sup> **(R 336.1219)**
46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months, or has been interrupted for 18 months,

ROP No: MI-ROP-N5831-2014b  
Expiration Date: August 4, 2019  
PTI No: MI-PTI-N5831-2014b

the applicable terms and conditions from that PTI shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI. <sup>2</sup> (R 336.1201(4))

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

## B. SOURCE-WIDE CONDITIONS

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.

Condition ID	Condition Description	Applicable	Notes
1	...	NA	...
2	...	NA	...
3	...	NA	...
4	...	NA	...

Condition ID	Condition Description	Applicable	Notes
5	...	NA	...
6	...	NA	...

## SOURCE-WIDE CONDITIONS

### POLLUTION CONTROL EQUIPMENT:

#### I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
2. CO	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
3. Each Individual HAP	Less than 10 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R336.1213(2)(d)
4. Total HAPs	Less than 25 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R336.1213(2)(d)

#### II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn sweet natural gas in all natural gas fired equipment.<sup>2</sup> (R 336.1205(3))

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

#### V. TESTING/SAMPLING

NA

#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years.<sup>2</sup> (R 336.1213(3)(b)(ii))

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month.<sup>2</sup> (R336.1205(3), R 336.213(3))

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO and NOx emission calculation records for the Stationary Source, to demonstrate compliance with Special Conditions (SC) I.1 and I.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R336.1205(3), R 336.213(3))
3. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period HAP emission calculation records for the Stationary Source, as required in SC I.3 and I.4 above. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. (R336.1213(2)(d))

See Appendix 7

**VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. (R 336.1213(4)(c))

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

### C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

#### EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUENGINE1	Remote 1,085 hp Caterpillar 3516 LE (low emission) reciprocating internal combustion engine (RICE)	11/01/92	FGCATENGINES
EUENGINE2	Remote 1,085 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE3	Remote 1,085 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE4	Remote 1,150 hp Caterpillar 3516 LE (low emission) RICE with oxidation catalyst	03/20/06	FGCATENGINES
EUENGINE5	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE, with 3-way catalytic converter and air to fuel ratio control (AFRC)  On February 23, 2015, the facility revised minor modification application No. 201500014 to consider the engine "shut-in" and would test the engine within 90 days of bringing it back online. EUENGINE5 was shut down and placed in stand-by mode effective November 10, 2014.	11/01/92	FGWAUKENGINES
EUENGINE6	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE, with 3-way catalytic converter and AFRC	11/01/92	FGWAUKENGINES

### D. FLEXIBLE GROUP CONDITIONS

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

#### FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGCATENGINES	Remote Caterpillar 3516 LE (low emission) reciprocating internal combustion engines (RICE)	EUENGINE1, EUENGINE2, EUENGINE3, and EUENGINE4,
FGWAUKENGINES	Remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE controlled by 3-way catalytic converters, subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) requirements	EUENGINE5 and EUENGINE6
FGRURALSIRICEMACT	Existing non-emergency Spark Ignition (SI) 4 Stroke Lean Burn (4SLB) and existing non-emergency SI 4 Stroke Rich Burn (4SRB) stationary RICE with site ratings greater than 500 HP located at an area source of HAPs, that meet the definition of remote stationary RICE in 40 CFR 63.6675	EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, EUENGINE5, and EUENGINE6

**FGCATENGINES  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

Four remote Caterpillar 3516 LE (low emission) RICE

**Emission Units:** EUENGINE1, EUENGINE2, EUENGINE3, and EUENGINE4

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst (EUENGINE2, EUENGINE3, and EUENGINE4)

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE1	SC V.1 and SC VI.7	R 336.1205(3)
1. CO	20.8 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE1	SC V.1 and SC VI.7	R 336.1205(3)
2. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE2	SC V.1 and SC VI.7	R 336.1205(3)
3. CO	4.5 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE2	SC V.1 and SC VI.7	R 336.1205(3)
4. NOx	23.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE3	SC V.1 and SC VI.7	R 336.1205(3)
5. CO	4.5 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE3	SC V.1 and SC VI.7	R 336.1205(3)
6. NOx	24.4 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE4	SC V.1 and SC VI.7	R 336.1205(3)
7. CO	4.2 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE4	SC V.1 and SC VI.7	R 336.1205(3)



**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))
2. The permittee shall not operate FGCATENGINES unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)

3. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)
4. The permittee shall utilize a differential pressure gauge or manometer for any engine with an oxidation catalyst, to monitor the operation of the oxidation catalyst as an indicator of proper operation. The appropriate range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))
5. The permittee shall utilize a temperature gauge or thermocouple for any engine with an oxidation catalyst, to monitor the operation of the oxidation catalyst, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall install and calibrate a thermocouple in accordance with the manufacturer's recommendations for any engine with an oxidation catalyst. (R 336.1213(3)(a)(iii))

## **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall verify NOx and CO emissions from each engine in FGCATENGINES, by testing at owners expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R336.2003, R336.2004)

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in FGCATENGINES on a monthly basis. (R 336.1205(3), R 336.1213(3))
2. The permittee shall monitor and record the differential pressure gauge or monometer on any engine with an oxidation catalyst in FGCATENGINES, on a monthly basis. (R 336.1213(3)(a)(iii))
3. The permittee shall monitor and record the inlet temperature and outlet temperature on any engine with an oxidation catalyst in FGCATENGINES, on a daily basis. (R 336.1213(3)(a)(iii))
4. The permittee shall maintain a log of all maintenance activities conducted according to the PM/MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> (R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)
5. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device monthly and 12-month rolling time period records of the hours of each engine included in FGCATENGINES is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))
6. The permittee shall keep, in a satisfactory manner, monthly fuel use records for each engine included in FGCATENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R 336.1205(3), R 336.1213(3))
7. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for each engine included in FGCATENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R 336.1205(3), R 336.1213(3))
8. If any engine included in FGCATENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. (R 336.1213(3))

See Appendix 7

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. (R 336.1213(4)(c))

4. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3), R 336.1213(3))**
5. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
6. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5), R 336.1213(3))**
7. If any engine included in FGCATENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> **(R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVENGINE1	16 <sup>1</sup>	37.5 <sup>1</sup>	R 336.1225
2. SVENGINE2	16 <sup>1</sup>	37.5 <sup>1</sup>	R 336.1225
3. SVENGINE3	16 <sup>1</sup>	37.5 <sup>1</sup>	R 336.1225
4. SVENGINE4	16 <sup>1</sup>	37.5 <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGWAUKENGINES  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

Two remote 1,478 hp Waukesha L-7042 GSI (rich burn) RICE

Emission Unit: EUENGINE5 and EUENGINE6

**POLLUTION CONTROL EQUIPMENT:**

3-way catalytic converters

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	24.6 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE5	SC V.1 and SC VI.11	R 336.1205(3)
2. CO	41.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE5	SC V.1 and SC VI.11	R 336.1205(3)
3. NOx	24.6 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE6	SC V.1 and SC VI.11	R 336.1205(3)
4. CO	41.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINE6	SC V.1 and SC VI.11	R 336.1205(3)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall only burn sweet natural gas in FGWAUKENGINES.<sup>2</sup> (R 336.1205(3))
2. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))

3. The permittee shall not operate FGWAUKENGINES unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)

4. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)
5. The permittee shall utilize a differential pressure gauge or manometer for any engine with a catalytic converter, to monitor the operation of the catalytic converter as an indicator of proper operation. The appropriate range defining the proper operation of the catalytic converter is identified in the MAP. (R 336.1213(3)(a)(i))
6. The permittee shall utilize a temperature gauge or thermocouple for any engine with a catalytic converter, to monitor the operation of the catalytic converter, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the catalytic converter is identified in the MAP. (R 336.1213(3)(a)(i))

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall install and calibrate a thermocouple gauge in accordance with the manufacturer's recommendations. (40 CFR 64.3(b)(2)(a), (R 336.1213(3)(a)(iii))

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall verify NO<sub>x</sub> and CO emissions from EUENGINE5, by testing at owner's expense, within 90 days of start-up, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)
2. The permittee shall verify NO<sub>x</sub> and CO emissions from EUENGINE6, by testing at owner's expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in FGWAUKENGINES on a monthly basis. (R 336.1205(3), R 336.1213(3))

2. The permittee shall utilize a differential pressure gauge or manometer to monitor the operation of the catalytic converter as an indicator of proper operation. The appropriate range defining the proper operation of the catalytic converter is identified in the MAP. **(40 CFR 64.6(c)(1)(i)), 40 CFR 64.6(c)(1)(ii), R 336.1213(3)(a)(i))**
3. The permittee shall monitor and record the differential pressure gauge or monometer on EUENGINE5 and EUENGINE6, on a monthly basis. **(40 CFR 64.6(c)(1)(iii), 40 CFR 64.6(c)(3), 40 CFR 64.7(c), R 336.1213(3)(a)(i))**
4. An excursion for NOx and CO shall be a differential pressure gauge or manometer reading of 1.5 inches of water over or under the differential pressure under normal operating conditions identified in the MAP, which is determined when the catalytic converter is installed. **(40 CFR 64.6(c)(2), R 336.1213(3)(a)(i))**
5. The permittee shall utilize a temperature gauge or thermocouple to monitor the operation of the catalytic converter, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the catalytic converter is identified in the MAP. **(40 CFR 64.6(c)(1)(i)), 40 CFR 64.6(c)(1)(ii), R 336.1213(3)(a)(i))**
6. The permittee shall monitor and record the inlet temperature and outlet temperature on EUENGINE5 and EUENGINE6, on a daily basis. **(40 CFR 64.6(c)(1)(iii), 40 CFR 64.6(c)(3), 40 CFR 64.7(c), R 336.1213(3)(a)(iii))**
7. An excursion for NOx and CO shall be a temperature gauge or thermocouple reading less than 900°F at the inlet of the catalytic converter, or greater than 1250°F at the outlet of the catalytic converter, or the outlet temperature from the catalytic converter is less than the inlet temperature.<sup>2</sup> **(40 CFR 64.6(c)(2))**
8. The permittee shall maintain a log of all maintenance activities conducted according to the MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3), R 336.1225, R 336.1702(a), R 336.1911)**
9. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device monthly and 12-month rolling time period records of the hours of each engine included in FGWAUKENGINES is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
10. The permittee shall keep, in a satisfactory manner, monthly fuel use records for each engine included in FGWAUKENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
11. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for each engine included in FGWAUKENGINES. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
12. If any engine included in FGWAUKENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(3))**
13. Upon detecting an excursion or exceedance of the differential pressure, the permittee shall check sample lines, check RPM verses differential pressure and compare the reading to previous month's readings, remove the catalyst and replace gaskets, as necessary. Should the differential pressure still indicate an excursion (greater than 1.5 times the normal differential pressure), the catalyst shall be removed and washed or replaced. **(40 CFR 64.7(d))**
14. Upon detecting an excursion or exceedance of the temperature, the permittee shall check loading on the engine, check for a faulty gauge or thermocouple, and check for proper operation of the ignition system.

Should the above check be performed and the temperatures are still outside the specified ranges, the engine shall be shut down. **(40 CFR 64.7(d))**

See Appendix 7

**VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
5. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3), R 336.1213(3))**
6. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
7. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5), R 336.1213(3))**
8. If any engine included in FGWAUKENGINES is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> **(R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVENGINE5	16 <sup>1</sup>	40 <sup>1</sup>	<b>R 336.1225</b>
2. SVENGINE6	16 <sup>1</sup>	40 <sup>1</sup>	<b>R 336.1225</b>

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable requirements of 40 CFR Part 64. **(40 CFR Part 64)**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).



**FGRURALSIRICEMACT  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION:**

Existing non-emergency Spark Ignition (SI) 4 Stroke Lean Burn (4SLB) and existing non-emergency SI 4 Stroke Rich Burn (4SRB) stationary RICE with site ratings greater than 500 HP located at an area source of HAPs, that meet the definition of remote stationary RICE in 40 CFR 63.6675.

Compliance date is October 19, 2013

**Emission Unit:** EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6

**POLLUTION CONTROL EQUIPMENT:**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall be in compliance with the emission limitations, operating limitations and other requirements of Subpart ZZZZ of Part 63 at all times after the promulgated compliance date in Subpart ZZZZ of Part 63. **(40 CFR 63.6605(a))**
2. The permittee shall operate and maintain any affected RICE, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. **(40 CFR 63.6605(b))**
3. The permittee shall comply with the following requirements, for each 4SLB and 4SRB remote stationary RICE with a site rating greater than 500 brake HP, by the applicable compliance date. **(40 CFR 63.6603(a) and Table 2d)**
  - a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first, except as allowed in SC III.4.

- b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
  - c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
4. The permittee may utilize an oil analysis program in order to extend the specified oil change requirement in 40 CFR 63.6603 and as listed in SC III.3. The oil analysis program must be performed at the same frequency as oil changes are required. The analysis program must analyze the parameters and keep records as required in Part 63.6625(j) for SI engines. **(40 CFR 63.6625(j))**

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Table 2d of Subpart ZZZZ, apply. **(40 CFR 63.6625(h))**
2. The permittee shall operate and maintain the stationary RICE according to the manufacturer's emission-related written instructions or develop you own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air-pollution control practice for minimizing emissions. **(40 CFR 63.6640(a), Table 6)**

#### **V. TESTING/SAMPLING**

1. If using the oil analysis program for SI Engine(s), the permittee shall test for Total Acid Number, viscosity and percent water content. **(40 CFR 63.6625(j))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. By the compliance date, and every 12 months thereafter, the permittee must evaluate the status of their existing stationary SI RICE and document that the SI RICE meets the definition of remote stationary RICE in 40 CFR 63.6675. 40 CFR 63.6675 defines Remote stationary RICE as stationary RICE meeting any of the following criteria:
- a. Stationary RICE located in an offshore area that is beyond the line of ordinary low water along that portion of the coast of the United States that is in direct contact with the open seas and beyond the line marking the seaward limit of inland waters.
  - b. Stationary RICE located on a pipeline segment that meets both of the criteria in paragraphs (b)(i) and (ii) of this definition.
    - i. A pipeline segment with 10 or fewer buildings intended for human occupancy within 220 yards (200 meters) on either side of the centerline of any continuous 1-mile (1.6 kilometers) length of pipeline. Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.
    - ii. The pipeline segment does not lie within 100 yards (91 meters) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12 month period. The days and weeks need not be consecutive. The building or area is considered occupied for a full day if it is occupied for any portion of the day.
    - iii. For purposes of this paragraph (b), the term pipeline segment means all parts of those physical facilities through which gas moves in transportation, including but not limited to pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies. Stationary RICE located within 50 yards (46 m) of the pipeline segment providing power for equipment on a pipeline segment are part of the pipeline segment. Transportation of gas means the gathering, transmission, or distribution of gas by pipeline, or the storage of gas. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.

- c. Stationary RICE that are not located on gas pipelines and that have or fewer buildings intended for human occupancy within a 0.25 mile radius around the engine. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans. **(40 CFR 63.6603(f), 63.6675)**
2. The permittee shall keep records of the initial and annual evaluation of the status of the engine required by SC VI.1. **(40 CFR 63.6603(f))**
3. If the evaluation of the status of the engine required by SC VI.1 indicates that the stationary RICE no longer meets the definition of remote stationary RICE in SC VI.1(a) through (c) and 40 CFR 63.6675, the permittee shall comply with all of the applicable requirements in 40 CFR Part 63, Subpart ZZZZ for existing nonemergency SI 4SLB and/or 4SRB stationary RICE with a site rating of more than 500 HP located at area sources of HAP that are not remote stationary RICE within one year of the evaluation. **(40 CFR 63.6603(f))**
4. The permittee shall keep records as required in SC IV.2 to show continuous compliance with each emission or operating limit that applies. **(40 CFR 63.6655(d), 63.6660)**
5. The permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that the permittee operated and maintained the stationary RICE and after-treatment control device (if any) according to the permittee's maintenance plan. **(40 CFR 63.6655(e), 63.6660)**
6. The permittee shall maintain, at a minimum, the following records by the compliance date:
  - a. A copy of each notification and report that is submitted to comply with 40 CFR Part 63, Subpart ZZZZ and the documentation supporting each notification and report. **(40 CFR 63.6655(a)(1))**
  - b. Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment. **(40 CFR 63.6655(a)(2))**
  - c. Records of all required maintenance performed on the air pollution control and monitoring equipment. **(40 CFR 63.6655(a)(4))**
  - d. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation. **(40 CFR 63.6655(a)(5))**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

## **VIII. STACK/VENT RESTRICTION(S)**

NA

## **IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ as they apply to FG-RURALSIRICEMACT. The permittee may choose an alternative compliance method not listed in FG-RURALSIRICEMACT by complying with all applicable provisions required by Subpart ZZZZ for the compliance option chosen. **(40 CFR 70.6(9), 40 CFR 63.9(j), 40 CFR Part 63, Subparts A and ZZZZ)**

## **E. NON-APPLICABLE REQUIREMENTS**

At the time of the ROP issuance, the AQD has determined that no non-applicable requirements have been identified for incorporation into the permit shield provision set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii).

## APPENDICES

### Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H <sub>2</sub> S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO <sub>2</sub>	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfunction Abatement Plan	VE	Visible Emissions
MDEQ	Michigan Department of Environmental Quality	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 pounds per square inch gauge (psig).

**Appendix 2. Schedule of Compliance**

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. (R 336.1213(4)(a), R 336.1119(a)(ii))

**Appendix 3. Monitoring Requirements**

This source is subject to the compliance assurance monitoring (CAM) program under 40 CFR 64.4(a). The CAM plan for this source is addressed in the malfunction abatement plan (MAP) required in Section D, SC III.1.

**Appendix 4. Recordkeeping**

Specific recordkeeping requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 5. Testing Procedures**

Specific testing requirement plans, procedures, and averaging times are detailed in the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 6. Permits to Install**

The following table lists any PTIs issued or ROP revision applications received since the effective date of the previously issued ROP No. MI-ROP-N5831-2008. Those ROP revision applications that are being issued concurrently with this ROP renewal are identified by an asterisk (\*). Those revision applications not listed with an asterisk were processed prior to this renewal.

Source-Wide PTI No MI-PTI-N5831-2008a is being reissued as Source-Wide PTI No. MI-PTI-N5831-2014.

Permit to Install Number	ROP Revision Application Number	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	200900188	Added oxidation catalyst as control on EUENGINE2, EUENGINE3, and EUEGINE4 (was left out on original ROP)	EUENGINE2, EUENGINE3 and EUENGINE4

The following ROP amendments or modifications were issued after the effective date of ROP No. MI-ROP-N5831-2014.

Permit to Install Number	ROP Revision Application Number/Issuance Date	Description of Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	201500014/ April 21, 2015	On February 23, 2015, the facility revised minor modification application No. 201500014 to consider the engine "shut-in" and would test the engine within 90 days of bringing it back online. EUENGINE5 was shut down and placed in stand-by mode effective November 10, 2014.	EUENGINE5

## **Appendix 7. Emission Calculations**

The permittee shall use the following procedure in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in FGCATENGINES, FGWAUKENGINES, and Source-Wide Conditions.

### **Procedures for Calculating Facility NOx and CO Emissions**

The permittee shall demonstrate compliance with the NOx and CO emission limits by keeping track of all fuel usage for all equipment using such fuel at this facility and multiplying that fuel usage by an equipment-specific emission factor. The emission factors are typically expressed as a mass weight of pollutant per unit of fuel.

**Each engine included in FGCATENGINES and FGWAUKENGINES:** The permittee shall use emission factors from source specific testing (stack testing) or vendor data, for each engine included in FGCATENGINES and FGWAUKENGINES, including engine(s) from engine change-out(s), and during the hours operated without a catalyst. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

**Fuel burning equipment at the facility:** The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or stack data is not available. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.

## **Appendix 8. Reporting**

### **A. Annual, Semiannual, and Deviation Certification Reporting**

The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation Report form (EQP 5737) for the annual, semiannual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

### **B. Other Reporting**

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

2014b2019c

**Section 2 – LINN Operating, LLC - Hayes 29 CPF**

20192024

2014b2019c

## **SECTION 2 – LINN Operating, LLC - Hayes 29 CPF**



2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

## A. GENERAL CONDITIONS

### Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state-only enforceable Source-Wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R 336.1214a(5))**
- Those conditions that are hereby incorporated in a federally enforceable Source-Wide PTI pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

### General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state-only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities: **(R 336.1213(1)(d))**
  - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
  - c. Inspect, at reasonable times, any of the following:
    - i. Any stationary source.
    - ii. Any emission unit.
    - iii. Any equipment, including monitoring and air pollution control equipment.
    - iv. Any work practices or operations regulated or required under the ROP.
  - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL §15.231 et seq., and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**
6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

### Equipment & Design

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

### Emission Limits

11. Unless otherwise specified in this ROP, the permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following: **(R 336.1301(1))**
  - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
  - b. A limit specified by an applicable federal new source performance standard.

The grading of visible emissions shall be determined in accordance with Rule 303.

12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
  - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.<sup>1</sup> **(R 336.1901(a))**
  - b. Unreasonable interference with the comfortable enjoyment of life and property.<sup>1</sup> **(R 336.1901(b))**

### Testing/Sampling

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**

ROP No: MI-ROP-N5831-

~~2014b2019c~~

Expiration Date: August 4,

~~20192024~~

PTI No: MI-PTI-N5831-

~~2014b2019c~~

14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**
15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(5))**

### **Monitoring/Recordkeeping**

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate: **(R 336.1213(3)(b))**
  - a. The date, location, time, and method of sampling or measurements.
  - b. The dates the analyses of the samples were performed.
  - c. The company or entity that performed the analyses of the samples.
  - d. The analytical techniques or methods used.
  - e. The results of the analyses.
  - f. The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

### **Certification & Reporting**

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a Responsible Official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A Responsible Official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
  - a. For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
  - b. For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

- c. For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.
22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following: **(R 336.1213(3)(c))**
    - a. Submitting a certification by a Responsible Official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
    - b. Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a Responsible Official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.
  23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
  24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
  25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a Responsible Official in a manner consistent with the CAA. **(R 336.1912)**

## Permit Shield

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
  - a. The applicable requirements are included and are specifically identified in the ROP.
  - b. The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.
27. Nothing in this ROP shall alter or affect any of the following:
  - a. The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**

ROP No: MI-ROP-N5831-

2014b2019c

Expiration Date: August 4,

20192024

PTI No: MI-PTI-N5831-

2014b2019c

- b. The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
  - c. The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**
  - e. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:
- a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
  - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
  - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
  - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
  - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**
29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

## Revisions

30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(10))**
33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

## Reopenings

34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
- a. If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
  - b. If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

- c. If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
- d. If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

## Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(8))**

## Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaiming, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.
37. If the permittee is subject to 40 CFR Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

## Risk Management Plan

38. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall comply with the requirements of 40 CFR Part 68, no later than the latest of the following dates as provided in 40 CFR 68.10(a):
  - a. June 21, 1999,
  - b. Three years after the date on which a regulated substance is first listed under 40 CFR 68.130, or
  - c. The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c)). **(40 CFR Part 68)**

2014b2019c

20192024

2014b2019c

### Emission Trading

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

### Permit To Install (PTI)

43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule. <sup>2</sup> **(R 336.1201(1))**
44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA. <sup>2</sup> **(R 336.1201(8), Section 5510 of Act 451)**
45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ. <sup>2</sup> **(R 336.1219)**
46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months, or has been interrupted for 18 months, the applicable terms and conditions from that PTI shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI. <sup>2</sup> **(R 336.1201(4))**

### Footnotes:

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

## **B. SOURCE-WIDE CONDITIONS**

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.



2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

## SOURCE-WIDE CONDITIONS

### POLLUTION CONTROL EQUIPMENT:

#### I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
2. CO	224 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.2	R 336.1205(3)
3. Each Individual HAP	Less than 10 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R 336.1213(2)(d)
4. Total HAPs	Less than 25 tons per year	12-month rolling time period, as determined at the end of each calendar month	NA	SC VI.3	R 336.1213(2)(d)

#### II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn sweet natural gas in all natural gas fired equipment.<sup>2</sup> (R 336.1205(3))

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

#### V. TESTING/SAMPLING

NA

#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years.<sup>2</sup> (R 336.1213(3)(b)(ii))

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month.<sup>2</sup> (R 336.1205(3), R 336.213(3))

2014b2019c

20192024

2014b2019c

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO and NOx emission calculation records for the Stationary Source, to demonstrate compliance with Special Conditions (SC) I.1 and I.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> (R 336.1205(3), R 336.213(3))
3. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period HAP emission calculation records for the Stationary Source, as required SC I.3 and I.4 above. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. (R 336.1213(2)(d))

See Appendix 7

**VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. (R 336.1213(4)(c))

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

### C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

#### EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUENGINEH29	Remote 1,085 hp Caterpillar G3516TALE (lean burn) reciprocating internal combustion engine (RICE) with oxidation catalyst	8/20/13	NA
EUGLYCOLDEHYDRATOR	Glycol dehydrator which removes water along with trace hydrocarbons from the gas stream. The water and hydrocarbons are controlled by a condenser.	11/01/92	NA
EUMACTZZZZ	Remote existing non-emergency spark ignition (SI) 4-stroke lean burn (4SLB) RICE (EUENGINEH29) Caterpillar 3516TALE (low emission) rated 1,085 hp located at an area source	08/20/13	NA

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~~20192024~~

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**EUGLYCOLDEHYDRATOR  
EMISSION UNIT CONDITIONS**

**DESCRIPTION:**

Glycol dehydrator system which removes water along with trace hydrocarbons from the gas stream.

Flexible Group ID: NA

**POLLUTION CONTROL EQUIPMENT:**

Condenser

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

NA

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. If EUGLYCOLDEHYDRATOR meets the exception criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters (3,001,746 cubic feet) per day, the actual flow rate of natural gas shall be determined using either of the procedures below:
  - a. The permittee shall install and operate a monitoring instrument that directly measures natural gas flow rate to the glycol dehydration unit with an accuracy of plus or minus 2 percent or better. The permittee shall

2014b2019c

20192024

2014b2019c

convert annual natural gas flow rate to a daily average by dividing the annual flow rate by the number of days per year the glycol dehydration unit processed natural gas. **(40 CFR 63.772(b)(1)(i))**

- b. The permittee shall document, to the AQD District Supervisor's satisfaction, the actual annual average natural gas flow rate to the glycol dehydration unit is less than 85,000 cubic meters per day. **(40 CFR 63.772(b)(1)(ii))**
2. As an alternative, if EUGLYCOLDEHYDRATOR meets the exemption criteria in 40 CFR 63.764(e)(1)(ii) for glycol dehydrators with actual average benzene emissions less than 0.90 megagram (0.99 ton) per year, the emissions shall be determined either uncontrolled, or with federally enforceable controls in place and using either of the procedures below:
    - a. The permittee shall determine actual average benzene emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit, and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1). **(40 CFR 63.772(b)(2)(i))**
    - b. The permittee shall determine an average mass rate of benzene emissions in kilograms per hour through direct measurement using the methods in 40 CFR 63.772(a)(1)(i) or (ii), or an alternative method according to 40 CFR 63.7(f). Annual emissions in kilograms per year shall be determined by multiplying the mass rate by the number of hours the unit is operated by year. This result shall be converted to megagrams per year. **(40 CFR 63.772(b)(2)(ii))**
  3. If EUGLYCOLDEHYDRATOR complies with the exemption criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters (3,001,746 cubic feet) per day, the permittee shall keep records of the actual annual average natural gas throughput (in terms natural gas flow rate to the glycol dehydration unit per day) as determined in accordance with SC VI.1. The permittee shall keep records on file at a location approved by the AQD District Supervisor for a period of at least five years and make it available to the Department upon request. **(40 CFR 63.774(d)(1)(i))**
  4. As an alternative to SC VI.1, if EUGLYCOLDEHYDRATOR complies with the exemption criteria in 40CFR 63.764(e)(1)(ii) for glycol dehydrators with the actual average benzene emissions less than 0.90 megagram per year, the permittee shall keep records of the actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with SC VI.2. The permittee shall keep all records on file at a location approved by the AQD District Supervisor for a period of at least five years and make it available to the Department upon request. **(40 CFR 63.774(d)(1)(ii))**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**

See Appendix 8

## **VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all provisions of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 63, Subpart HH, as they apply to EUGLYCOLDEHYDRATOR. (40 CFR Part 63, Subpart HH)

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

<b>EUENGINEH29</b> <b>EMISSION UNIT CONDITIONS</b>
---

**DESCRIPTION:**

One remote 1,085 hp Caterpillar G3516TALE (lean burn) RICE

**Emission Unit:** EUENGINEH29

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	24.6 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINEH29	SC V.1 and SC VI.7	R 336.1205(3)
2. CO	41.1 tons <sup>2</sup>	12-month rolling time period, as determined at the end of each calendar month	EUENGINEH29	SC V.1 and SC VI.7	R 336.1205(3)

**II. MATERIAL LIMIT(S)**

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the malfunction abatement plan (MAP), (pursuant to SC III.2). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a))
2. The permittee shall not operate EUENGINEH29 unless the MAP, approved by the AQD District Supervisor, is implemented and maintained. The MAP shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the MAP shall include:
  - a. Identification of the equipment and, if applicable, air-cleaning device; and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b. Description of the items or conditions to be inspected and frequency of the inspections or repairs.

2014b2019c201920242014b2019c

- c. Description of the equipment and, if applicable, air-cleaning device; operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
- d. Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
- e. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the MAP within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the District Supervisor may request modification of the plan to address those inadequacies.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912)

3. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as provided in SC III.1. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.2.<sup>2</sup> (R 336.1205(3), R 336.1225, R 336.1702(a), R 336.1910)
4. The permittee shall utilize a differential pressure gauge or manometer to monitor the operation of the oxidation catalyst as an indicator of proper operation. The appropriate range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))
5. The permittee shall utilize a temperature gauge or thermocouple to monitor the operation of the oxidation catalyst, as an indicator of proper operation. The appropriate temperature range defining the proper operation of the oxidation catalyst is identified in the MAP. (R 336.1213(3)(a)(i))

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall install and calibrate a thermocouple gauge in accordance with the manufacturer's recommendations. (R 336.1213(3)(a)(iii))

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall verify NOx and CO emissions from EUENGINEH29, by testing at owner's expense, within nine months of issuance of this permit, and thereafter within every five years, in accordance with Department requirements. (R 336.1205(3), R 336.2001, R 336.2003, R 336.2004)

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall monitor, in a satisfactory manner, the natural gas usage from each engine included in EUENGINEH29 on a monthly basis. (R 336.1205(3), R 336.1213(3))
2. The permittee shall monitor and record the differential pressure gauge or monometer on EUENGINEH29, on a monthly basis. (R 336.1213(3)(a)(iii))
3. The permittee shall monitor and record the inlet temperature and outlet temperature on EUENGINEH29, on a daily basis. (R 336.1213(3)(a)(iii))



2014b2019c

20192024

2014b2019c

4. The permittee shall maintain a log of all maintenance activities conducted according to the MAP. The permittee shall keep this log on file at a location approved by the district supervisor and make it available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3), R 336.1225, R 336.1702(a), R 336.1911)**
5. The permittee shall keep, in satisfactory manner, for any engine equipped with an add-on control device, monthly and 12-month rolling time period records of the hours of EUENGINEH29 is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1225, R 336.1702(a))**
6. The permittee shall keep, in a satisfactory manner, monthly fuel use records for EUENGINEH29. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
7. The permittee shall keep, in a satisfactory manner, monthly and 12-monthly rolling time period NOx and CO emission calculation records, using the emission factors from the most recent performance test or vendor data if the vendor data is higher, for EUENGINEH29. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request.<sup>2</sup> **(R 336.1205(3), R 336.1213(3))**
8. If EUENGINEH29 is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall maintain records of the engine make, model, serial number, horsepower and year manufactured for the replacement engine. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available upon request. **(R 336.1213(3))**

See Appendix 7

## VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3), R 336.1213(3))**
5. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
6. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5), R 336.1213(3))**

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

| 2014b2019c

| 20192024

| 2014b2019c

7. If EUENGINEH29 is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting.<sup>2</sup> (R 336.1205(3), R 336.1231(3), R 336.1225, R 336.1702(a), R 336.1911)

See Appendix 8

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
SVENGINEH29	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

2014b2019c

20192024

2014b2019c

**EUMACTZZZZ**  
**EUMACTZZZZ CONDITIONS**

**DESCRIPTION:**

An existing remote, non-emergency spark ignition (SI) four stroke lean burn (4SLB), natural gas-fired reciprocating internal combustion compressor engine (RICE) with a site-rating of 1,085 horsepower at an area source

Emission Unit: EUENGINEH29

**POLLUTION CONTROL EQUIPMENT:**

Oxidation Catalyst

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. (40 CFR 63.6625 (e), 40 CFR 63.6605 (a)(b))
2. The permittee shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in 40 CFR Part 63, Subpart ZZZZ Table 2d apply. (40 CFR 63.6625 (h))

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

NA

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

**VI. MONITORING/RECORDKEEPING**

1. Except for monitor malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the Permittee shall monitor continuously at all times that the stationary RICE is operating. **(40 CFR 63.6635 (a)(b))**
2. The Permittee shall not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels; however shall use all the valid data collected during all other periods. **(40 CFR 63.663(c))**
3. The Permittee shall keep maintain the following records, which shall be made available to the Administrator upon request: **(40 CFR 63.6655(a)(b)(d)(e))**
  - a. A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirement in 40 CFR 63.10(b)(2)(xiv).
  - b. Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.
  - c. Records of applicable performance tests and performance evaluations as required in §63.10(b)(2)(viii).
  - d. Records of all required maintenance performed on the air pollution control and monitoring equipment.
  - e. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.
4. The permittee shall keep the records required in 40 CFR Part 63, Subpart ZZZZ Table 6 of this subpart to show continuous compliance with each applicable emission or operating limitation that applies.
5. The permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to the Malfunction Abatement Plan for EUENGINEH29 subject to management practices as shown in 40 CFR Part 63, Subpart ZZZZ, Table 2d to this subpart.

**VII. REPORTING**

1. The Permittee shall report each instance in which the requirements in 40 CFR Part 63, Subpart ZZZZ Table 8 were not met. **(40 CFR 63.6640(e))**

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
SVMACTZZZZ	16 <sup>1</sup>	40 <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall evaluate the status of their stationary RICE every 12 months. **(40 CFR 63.6603(a))**
2. The permittee shall keep records of the initial and annual evaluation of the status of the engine. If the evaluation indicates that the stationary RICE no longer meets the definition of remote stationary RICE in

ROP No: MI-ROP-N5831-

2014b2019c

Expiration Date: August 4,

20192024

PTI No: MI-PTI-N5831-

2014b2019c

40 CFR 63.6675, Subpart ZZZZ, the owner or operator must comply with all of the requirements that are not remote stationary RICE within 1 year of the evaluation. **(40 CFR 63.6603(f))**

3. The permittee shall within 1 year of the evaluation comply with 40 CFR 63.6640 if the remote stationary RICE is reconstructed or rebuilt. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a). **(40 CFR 63.6640(d))**
4. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines. **(40 CFR Part 63, Subparts A and ZZZZ)**

| 2014b2019c

| 20192024

| 2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

## D. FLEXIBLE GROUP CONDITIONS

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

Condition Type	Condition Description	Applicable to Emission Unit(s)

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

## E. NON-APPLICABLE REQUIREMENTS

At the time of the ROP issuance, the AQD has determined that the requirements identified in the table below are not applicable to the specified emission unit(s) and/or flexible group(s). This determination is incorporated into the permit shield provisions set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii). If the permittee makes a change that affects the basis of the non-applicability determination, the permit shield established as a result of that non-applicability decision is no longer valid for that emission unit or flexible group.

Emission Unit/Flexible Group ID	Non-Applicable Requirement	Justification
EUENGINEH29	40 CFR Part 60, Subpart JJJJ	The Caterpillar 3516TALE RICE was manufactured prior to January 1, 2008, but installed at its current location on August 20, 2013, therefore 40 CFR Part 60, Subpart JJJJ is not applicable.



2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

## APPENDICES

### Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H <sub>2</sub> S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO <sub>2</sub>	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfunction Abatement Plan	VE	Visible Emissions
MDEQ	Michigan Department of Environmental Quality	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

2014b2019c

20192024

2014b2019c

ROP No: MI-ROP-N5831-

Expiration Date: August 4,

PTI No: MI-PTI-N5831-

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 pounds per square inch gauge (psig).

**Appendix 2. Schedule of Compliance**

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. (R 336.1213(4)(a), R 336.1119(a)(ii))

**Appendix 3. Monitoring Requirements**

Specific monitoring requirement procedures, methods or specifications are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 4. Recordkeeping**

Specific recordkeeping requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 5. Testing Procedures**

Specific testing requirement plans, procedures, and averaging times are detailed in the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 6. Permits to Install**

The following table lists any PTIs issued or ROP revision applications received since the effective date of the previously issued ROP No. MI-ROP-N5831-2008. Those ROP revision applications that are being issued concurrently with this ROP renewal are identified by an asterisk (\*). Those revision applications not listed with an asterisk were processed prior to this renewal.

Source-Wide PTI No MI-PTI-N5831-2008a is being reissued as Source-Wide PTI No. MI-PTI-N5831-2014.

Permit to Install Number	ROP Revision Application Number	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	NA	NA	NA

**Appendix 7. Emission Calculations**

The permittee shall use the following procedure in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in EUENGINEH29 and Source-Wide Conditions.

**Procedures for Calculating Facility NOx and CO Emissions**

The permittee shall demonstrate compliance with the NOx and CO emission limits by keeping track of all fuel usage for all equipment using such fuel at this facility and multiplying that fuel usage by equipment-specific emission factor. The emission factors are typically expressed as a mass weight of pollutant per unit of fuel.

2014b2019c

ROP No: MI-ROP-N5831-

20192024

Expiration Date: August 4,

2014b2019c

PTI No: MI-PTI-N5831-

**EUENGINEH29:** The permittee shall use emission factors from source specific testing (stack testing) or vendor data, for EUENGINEH29, including an engine from an engine change-out. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

**Fuel burning equipment at the facility:** The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or stack data is not available. If other emission source values are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.

## **Appendix 8. Reporting**

### **A. Annual, Semiannual, and Deviation Certification Reporting**

The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation Report form (EQP 5737) for the annual, semiannual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

### **B. Other Reporting**

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.

**PMMAP**

# **LINN OPERATING, LLC**

## **PREVENTATIVE MAINTENANCE/ MALFUNCTION ABATEMENT PLAN AND EPA 40 CFR, Part 63 Subpart ZZZZ MAINTENANCE PLAN**

**For**

**HAYES 29  
CENTRAL PRODUCTION FACILITY  
HAYES TOWNSHIP, OTSEGO COUNTY, MI  
SRN 5831**

**January 7, 2019**

### **Compressor Engine Identification**

<b>Engines (make/model):</b>	Caterpillar 3516 LE
<b>Unit No.</b>	3956
	Low Emission/ Lean Burn
<b>Horsepower:</b>	1085
<b>Control</b>	Oxidation Catalyst and AFRC

### **Purpose of Oxidation Catalyst**

Oxidation catalysts used on lean burn engines reduce carbon monoxide (CO), volatile organic compounds (VOCs) and trace toxic air contaminants, which include hazardous air pollutants (HAPs) emissions.

### **Engine Operating Variables To Be Monitored**

A copy of the normal field maintenance report and the compressor monthly operating reports are identified as Attachment 1a and 1b, respectively.

### **Malfunction Corrective Procedures**

The engine will be shut down immediately if a malfunction event occurs. Repair work will be completed, the amount of time the engine is down, and the repairs performed will be recorded on the Field Maintenance Report. The catalyst (if impacted) will be inspected prior to engine start up. Note that new engines, or engines that have been recently overhauled or major repairs performed, should be run at the maximum available load for a period of at least 100 hours, before the catalyst element is installed. This allows the new engine components to break in and most major problems associated with engine start up to be resolved, protecting the catalyst element. If major engine work occurs, LINN should document the amount of time the engine is operated without the catalyst on the attached log in Attachment 2.

### **Major Parts Replacement Inventory**

Major replacement parts (including a spare catalyst element) are kept in inventory for quick replacement in the event it is required. Parts inventory is maintained by a subcontractor.

### **Oxidation Catalyst Operating Variables to Be Monitored**

#### **Unit 3956**

<b>Operating Variable</b>	<b>Normal Range*</b>	<b>Method of inspections</b>	<b>Frequency</b>
Catalyst Inlet Temperature	>750° F	Visual inspection (thermocouple reading)	Daily
Catalyst Outlet Temperature	>750° F <1,350° F	Visual inspection (thermocouple reading)	Daily
Pressure Differential across Catalyst	5.4" of water column#	Visual inspection (gauge reading)	Monthly

\*Catalyst inlet and outlet temperature and calibrated pressure differential ranges have been substantiated by utilizing a portable analyzer on three separate occasions. Maintenance and analyzer data is available in Attachment 3. The analyzer will be utilized to verify (when applicable) the CO reduction is at least 80%.

#Currently, a new baseline is being established based upon observed readings. The current actionable pressure differential is 7.4" w.c., or 2" w.c. above the substantiated range.

### **Corrective Procedures in the Event of a Malfunction**

If an operating variable listed above is out of the specified range the following steps will be taken:

1. Within 5 days check emissions reduction efficiencies for CO and NOx with a portable emissions analyzer. If efficiencies are within manufacturer's specifications (80% for CO 0% for NOx) nothing more will be done. LINN may submit the Change in Oxidation Catalyst Operating Variable Notification Form (Attachment 4) to the MDEQ District Supervisor to revise the catalyst operating variable range, if applicable. If efficiencies are not within manufacturer's specifications, proceed to step 2.
2. Within 5 days after step 1 above is completed, the catalyst will be removed and cleaned by vacuuming the catalyst face or using clean compressed air over the catalyst face. The catalyst gasket will also be replaced. The catalyst will be returned to service and emissions re-checked. If the catalyst still does not meet efficiency goals, remove the catalyst and send to vendor for cleaning. Install a replacement catalyst during vendor cleaning process.

### **AFRC O<sub>2</sub> Sensor Replacement Schedule**

O<sub>2</sub> sensors for the AFRC will be replaced quarterly. Records shall be kept of the O<sub>2</sub> sensor replacements.

### **Emission Checks- Use of a Portable Emissions Analyzer**

- a. The analyzer will be calibrated as required by the manufacturer. Records of calibration will be kept on file and made available to the Air Quality District Supervisor upon request.
- b. The analyzer will be used only for CO and NO<sub>x</sub>.
- c. The analyzer will be used monthly, and, to either (1) check the performance of a catalyst if a monitored parameter is out of range (as discussed above); or (2) when a cleaned catalyst is installed, typically every 12 to 18 months.
- d. LINN will conduct catalyst inlet and outlet checks to estimate destruction efficiency.
- e. Records shall be kept of destruction efficiency analysis.

### **Scheduled Maintenance**

- a. The catalyst will be inspected and cleaned by vacuuming the catalyst face or blowing with clean compressed air every 12-18 months unless the operating variables specified above are out of their respective ranges.
- b. After inspection and cleaning, the catalyst shall be returned to service and emission reduction testing shall be performed. If the catalyst does not respond to the field cleaning, it will be sent to the manufacturer for a chemical cleaning. A replacement catalyst media will be used during the cleaning process in the interim.
- c. The oxidation catalyst gasket will be replaced when the catalyst is serviced (typically every 12-18 months).
- d. The catalyst will be replaced if it is demonstrated that it is not functioning properly after the vendor cleaning, or in lieu of vendor cleaning.



**Scheduled Maintenance as indicated in Table 2d to Subpart ZZZZ:**

<b>8. Non-Emergency, non-black start 4SLB remote stationary RICE &gt;500 HP</b>	a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first; <sup>1</sup>
	b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary;
	c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary;

**§63.6625(i)** If you own or operate a stationary engine that is subject to the work, operation or management practices in items 1, 2, or 4 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. **§63.6625(j)** If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil before continuing to use the engine. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

<sup>1</sup> Sources have the option to utilize an oil analysis program as described in section 63.6625 (i) and (j) in order to extend the specified oil change requirement in Table 2d of this Subpart ZZZZ.

**Supervisory Personnel Responsible for Maintenance of the Control Equipment**

Christopher Zimmerman  
Production Foreman  
4890 Airport Road  
Lewiston, MI 49756  
Office Phone: 989.786.7592  
Cell Phone: 989.370.7654

**Retention of Records**

Records shall be kept on file and retained as described in the permit.

**Updates of PM/MAP**

Updates of the plan will be submitted to the AQD District Supervisor for written approval. If an operating variable range is modified using the Change in Oxidation Catalyst Operating Variable Notification Form, the PM/MAP will be updated to reflect the new range, as necessary. See Attachment 4.

Attachment 1a

### Compressor Monthly Operating Report

UNIT# \_\_\_\_\_  
OPERATOR \_\_\_\_\_

LOCATION \_\_\_\_\_  
MONTH/YEAR \_\_\_\_\_

ENGINE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
RPM																															
Eng JW temp																															
Eng oil pres																															
Eng oil temp																															
Eng hours																															
Manifold pres																															
Turbo temp																															
Pre-catalyst temp																															
Post-catalyst temp																															
Compressor																															
Suction pres																															
1ST int pres																															
2ND int pres																															
3RD int pres																															
Disch pres																															
Suction temp																															
1st disch temp																															
2ND Suc temp																															
2ND dis temp																															
3RD Suc temp																															
3RD dis temp																															
4TH Suc temp																															
Disch temp																															
Comp oil pres																															
Comp oil temp																															
Fluid levels																															
Down time hrs																															

REASON FOR DOWNTIME

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Attachment 2

**Hayes 29  
Unit #3956**

**Year:** \_\_\_\_\_

**Record of Time Engine Operated Without the Catalytic Converter**

Total allowable per unit is 200 hours in 12 month period (not calendar year).

<b>Time/Date of Engine Malfunction</b>	<b>Time/Date of Engine Repair</b>	<b>Reason</b>	<b>Total Hours Down</b>	<b>Total Hours 12 Month Time Period</b>

Only record time engine operated without catalytic converter, not amount of time engine was shut down

Operator Signature \_\_\_\_\_

Submit to Chris Zimmerman monthly.

**CATALYST MONTHLY OPERATING REPORT**

UNIT#	LOCATION	CUSTOMER	DATE OF SERVICE	PRE TEMP	POST TEMP	TEMP DIFF	DIFFERENTIAL PRESSURE IN W.C	SUCTION	DISCHARGE PRESSURE	RPM	COMMENTS
3956	Hayes 29	LINN									
ESTABLISHED BASELINE 8/20/13							ESTABLISHED BASELINE 1/14/13				
TEMP DIFF BASELINE		48	0				W/C DIFF	4.6			
			9/20/2013	837	814	-23	1.5	-1.4	990	1027	
			9/25/2013	881	855	-26	6.5	2.8	980	1177	
			9/30/2013	886	864	-22	6	-1.4	990	1167	
			10/2/2013	882	860	-22	6.5	-1.8	980	1170	
			10/8/2013	867	845	-22	6.4	-1.5	1000	1120	
			10/10/2013	870	848	-22	6.5	-1.3	985	1120	
			10/12/2013	870	848	-22	6.5	-1.3	985	1120	
			10/14/2013	880	856	-24	6.5	-1.9	985	1163	
			10/18/2013	870	848	32	11	-1.7	990	1165	
			10/22/2013	872	850	-22	6	-1.9	985	1167	
			10/24/2013	874	852	-22	6	-2	990	1158	
			10/28/2013	860	838	-22	6	-2.2	995	1168	
			10/29/2013	859	837	-22	6	-2.5	990	1170	
			10/31/2013	852	830	-22	6	2.5	1010	1163	
ESTABLISHED BASELINE 11/1/13							ESTABLISHED BASELINE 1/14/13				
TEMP DIFF BASELINE		-24	0				W/C DIFF	5.5			
			11/5/2013	851	831	-20	6	-2.5	995	1166	
			11/7/2013	858	839	-19	6	-0.1	990	1200	
			11/15/2013	834	813	-21	4.5	-2.2	995	1133	
			11/19/2013	819	796	-23	2.5	-3.9	990	1019	
			11/21/2013	829	810	-19	4.5	-2.5	985	1118	
			11/26/2013	821	800	-21	4	-2.3	995	1089	

Attachment 4

**LINN Operating, LLC**  
**CHANGE IN CATALYTIC CONVERTER OPERATING VARIABLE**  
**NOTIFICATION FORM**

**FACILITY NAME** \_\_\_\_\_

**SRN No.** \_\_\_\_\_

**PERMIT No.** \_\_\_\_\_

**UNIT No.** \_\_\_\_\_

DATE	CATALYST OPERATING VARIABLE	OLD RANGE	NEW RANGE

Description of why/how range was modified. Include testing data to document range modifications.

If a range is changed the PM/MAP will be updated and submitted to DEQ District Supervisor.

## **2017 MAERS Report**



**Michigan Air Emissions Reporting System (MAERS)**  
**Source Summary Report - AQD Source ID (SRN) N5831**

**Reporting Year : 2017**

**S-101 SOURCE INFORMATION**

<b>Source Name</b> Breitburn_Linn Operating, LLC - Hayes 29 CPF		<b>NAICS Code</b> 211130		<b>Portable No</b>	
<b>Address</b> 10875 Geronimo Trail, SW4 T29N R4W SEC 29					
<b>County</b> OTSEGO		<b>City</b> GAYLORD		<b>Zip Code</b> 49735	
<b>District</b> Gaylord					
<b>Latitude</b>	<b>Longitude</b>	<b>Horizontal Collection Method</b>	<b>Source Map Scale</b>	<b>Horizontal Accuracy Measure</b>	<b>Horizontal Reference Datum</b>
44.87298486	-84.8273659	001	50000	25 Meter(s)	03
<b>Reference Point Code</b>	<b>Principal Product</b>	<b>Number of Employees</b>	<b>Employer Federal ID Number</b>		
102	NATURAL GAS	2	113785529		

**OWNER INFORMATION**

<b>Owner Name</b> Breitburn Operating LP					
<b>Mailing Address</b> 1165 Elkview dr		<b>Address Continued</b> P.O. Box 1256			
<b>City</b> Gaylord		<b>State/Province</b> MI	<b>Country</b> USA	<b>Zip/Postal Code</b> 49735	

**S-102 CONTACT INFORMATION**

**Emission Inventory Contact Information**  
**(Primary)**

<b>Contact Name</b> CAROLANN KNAPP	<b>Mailing Address</b> BREITBURN OPERATING LP
<b>Contact Title</b> EH&S REP	<b>Address Continued</b> 1165 ELKVIEW DR
	<b>City</b> GAYLORD
<b>E-Mail Address</b> carolann.knapp@breitburn.com	<b>State/Province</b> MI
<b>Telephone Number</b> (989)7320020	<b>Country</b> USA
<b>Fax Number</b>	<b>Zip or Postal Code</b> 49734

**Emission Inventory Contact Information**  
**(Secondary)**

<b>Contact Name</b>	<b>Mailing Address</b>
<b>Contact Title</b>	<b>Address Continued</b>
	<b>City</b>
<b>E-Mail Address</b>	<b>State/Province MI</b>
<b>Telephone Number</b>	<b>Country USA</b>
<b>Fax Number</b>	<b>Zip or Postal Code</b>

**Fee Invoice Contact Information**

<b>Contact Name</b> CAROLANN KNAPP	<b>Mailing Address</b> BREITBURN OPERATING LP
<b>Contact Title</b> EH&S REP	<b>Address Continued</b> P.O. BOX 1256
	<b>City</b> GAYLORD
<b>E-Mail Address</b> carolann.knapp@breitburn.com	<b>State/Province</b> MI
<b>Telephone Number</b> (989)7320020	<b>Country</b> USA
<b>Fax Number</b>	<b>Zip or Postal Code</b> 49734

**P-101 PREPARER'S INFORMATION**

<b>Preparer's First Name</b> Carolann	<b>Preparer's Last Name</b> Knapp	<b>Preparer's Title</b> Regional EH&S Rep
	<b>Mailing Address</b> 1165 Elkview Drive	<b>Address Continued</b> P.O. Box 1256
<b>City</b> Gaylord	<b>State/Province</b> MI	<b>Country</b> USA
<b>Email Address</b> carolann.knapp@breitburn.com	<b>Telephone Number</b> (989)7320020 Ext.369	<b>Zip/Postal Code</b> 49734
		<b>Fax Number</b>

**SV-101 STACK INFORMATION**

<b>Stack ID</b> SVENGINE6	<b>AQD Stack ID</b> SV0007	<b>Dismantle Date</b>
<b>Stack Description</b> Stack for engine #6 with catalytic converter		
<b>Actual Stk Height</b> Above 40 FT Ground	<b>Inside Stack Diameter</b> 12 IN	<b>Stack Orientation</b> Vertical
<b>Exit Gas Temperature</b> 1125 F	<b>Actual Exit Gas Flow Rate</b> 6567 FT3/MIN	<b>Exit Velocity of Gas</b> 139.356 FT/SEC
<b>Latitude</b> 44.87298486	<b>Longitude</b> -84.8273659	<b>Horizontal Collection Method</b> 001

Source Map Scale 50000

Horizontal Accuracy 25 Meter(s)

Horizontal Reference Datum 03

Reference Point Code 102

Bypass Stack Only N

If Yes, Main Stack ID

---

Stack ID SVENGINEH29

AQD Stack ID SV0008

Dismantle Date

Stack Description Stack for engine #H29 with oxidation catalyst

Actual Stk Height Above Ground 40 FT

Inside Stack Diameter 12 IN

Stack Orientation Vertical

Exit Gas Temperature 1125 F

Actual Exit Gas Flow Rate 6567 FT3/MIN

Exit Velocity of Gas 139.356 FT/SEC

Latitude 44.87298486

Longitude -84.8273659

Horizontal Collection Method 001

Source Map Scale 50000

Horizontal Accuracy 25 Meter(s)

Horizontal Reference Datum 03

Reference Point Code 102

Bypass Stack Only N

If Yes, Main Stack ID

---

Stack ID SVENGINE5

AQD Stack ID SV0009

Dismantle Date

Stack Description Stack for engine #5 with catalytic converter

Actual Stk Height Above Ground 40 FT

Inside Stack Diameter 12 IN

Stack Orientation Vertical

Exit Gas Temperature 1125 F

Actual Exit Gas Flow Rate 6567 FT3/MIN

Exit Velocity of Gas 139.356 FT/SEC

Latitude 44.87298486

Longitude -84.8273659

Horizontal Collection Method 001

Source Map Scale 50000

Horizontal Accuracy 25 Meter(s)

Horizontal Reference Datum 03

Reference Point Code 102

Bypass Stack Only N

If Yes, Main Stack ID

---

Stack ID SVENGINE1

AQD Stack ID SV0010

Dismantle Date

Stack Description Stack for engine #1

Actual Stk Height Above Ground 37.5

Inside Stack Diameter 16

Stack Orientation Vertical

Exit Gas Temperature 852

Actual Exit Gas Flow Rate 7516

Exit Velocity of Gas 89.7156 FT/SEC

Latitude 44.87298486

Longitude -84.8273659

Horizontal Collection Method 001

Source Map Scale 50000

Horizontal Accuracy 25 Meter(s)

Horizontal Reference Datum 03

Reference Point Code 102

Bypass Stack Only N

If Yes, Main Stack ID

---

Stack ID SVENGINE2

AQD Stack ID SV0011

Dismantle Date

**Stack Description** Stack for engine #2 with oxidation catalyst

**Actual Stk Height** Above 37.5  
Ground

**Inside Stack Diameter** 16

**Stack Orientation** Vertical

**Exit Gas Temperature** 852

**Actual Exit Gas Flow Rate** 7416

**Exit Velocity of Gas** 88.522 FT/SEC

**Latitude** 44.87298486

**Longitude** -84.8273659

**Horizontal Collection Method** 001

**Source Map Scale** 50000

**Horizontal Accuracy** 25 Meter(s)

**Horizontal Reference Datum** 03

**Reference Point Code** 102

**Bypass Stack Only** N

**If Yes, Main Stack ID**

---

**Stack ID** SVENGINE3

**AQD Stack ID** SV0012

**Dismantle Date**

**Stack Description** Stack for engine #3 with oxidation catalyst

**Actual Stk Height** Above 37.5  
Ground

**Inside Stack Diameter** 16

**Stack Orientation** Vertical

**Exit Gas Temperature** 852

**Actual Exit Gas Flow Rate** 7416

**Exit Velocity of Gas** 88.522 FT/SEC

**Latitude** 44.87298486

**Longitude** -84.8273659

**Horizontal Collection Method** 001

**Source Map Scale** 50000

**Horizontal Accuracy** 25 Meter(s)

**Horizontal Reference Datum** 03

**Reference Point Code** 102

**Bypass Stack Only** N

**If Yes, Main Stack ID**

---

**Stack ID** SVENGINE4

**AQD Stack ID** SV0013

**Dismantle Date**

**Stack Description** Stack for engine #4 with oxidation catalyst

**Actual Stk Height** Above 37.5  
Ground

**Inside Stack Diameter** 16

**Stack Orientation** Vertical

**Exit Gas Temperature** 852

**Actual Exit Gas Flow Rate** 7416

**Exit Velocity of Gas** 88.522 FT/SEC

**Latitude** 44.87298486

**Longitude** -84.8273659

**Horizontal Collection Method** 001

**Source Map Scale** 50000

**Horizontal Accuracy** 25 Meter(s)

**Horizontal Reference Datum** 03

**Reference Point Code** 102

**Bypass Stack Only** N

**If Yes, Main Stack ID**

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#### EU-101 EMISSION UNIT INFORMATION

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0002	EUENGINE2	211130	N	11/01/1992	
<b>Preparer's Description</b>	ENGINE WITH OXIDATION CATALYST - 1085 HP				

Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1085	HP	HR		N	N
<b>If Rule 201 exempt, Rule Number</b>	<b>If Rule 201 exempt, is throughput below reporting Thresholds?</b>	<b>Permit?</b>	<b>If Permitted, Permit Number</b>	<b>Is this Emission Unit required to report emissions to MAERS for this reporting year?</b>	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

**Control Device Code**  
CATALYTIC OXIDR

**EMISSION UNIT STACK(S)**

**Stack ID**  
SVENGINE2

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE2**

Source Classification Code (SCC) 2-02-002-54  
 Preparer's SCC Comment LB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

SEASONAL MATERIAL USAGE SCHEDULE				OPERATING SCHEDULE			
Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code NATURAL GAS Material Throughput 72.67 Unit Code MILLION CUBIC FEET  
 Preparer's material description NATURAL GAS  
 VOC Content Density 0.04 POUNDS PER CUBIC FOOT  
 BTUs (fuel) 1020 BRITISH THERMAL UNITS PER CUBIC FOOT  
 Sulfur Content (fuel) 0.01 weight percent  
 Ash Content (fuel) 0 weight percent

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE2 SCC Code 2-02-002-54**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	7180	POUNDS	Other	98.8		MILLION CUBIC FEET	80	
NOX	39891	POUNDS	Other	548.9		MILLION CUBIC FEET		
PM10,PRIMARY	5.74	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
PM2.5,PRIMRY	5.74	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
SO2	43.59	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	4787	POUNDS	Other	65.87		MILLION CUBIC FEET	50	

**ATTACHMENT FOR EU/RG ID EUENGINE2 SCC Code 2-02-002-54**

Document Name: 3516 Cat 1085hp

File Name: 3516 CAT 1085hp (Foster 28).pdf

**EU-101 EMISSION UNIT INFORMATION**

<b>AQD Emission Unit ID</b>	<b>Emission Unit ID</b>	<b>NAICS Code</b>	<b>Remove from MAERS</b>	<b>Installation Date</b>	<b>Dismantle Date</b>
EU0003	EUFUGITIVES	211130	N	11/01/1992	
<b>Preparer's Description</b>	Fugitive emissions from valves etc.				
<b>Design Capacity</b>	<b>Design Capacity Unit Numerator</b>	<b>Design Capacity Unit Denominator</b>	<b>Maximum Nameplate Capacity</b>	<b>Rule 201 Grandfathered?</b>	<b>Rule 201 Exempted?</b>
				N	N
<b>If Rule 201 exempt, Rule Number</b>	<b>If Rule 201 exempt, is throughput below reporting Thresholds?</b>	<b>Permit?</b>	<b>If Permitted, Permit Number</b>	<b>Is this Emission Unit required to report emissions to MAERS for this reporting year?</b>	
		Y	86-05A	Y	

### A-101 ACTIVITY INFORMATION EU/RG ID EUFUGITIVES

**Source Classification Code (SCC)** 3-10-888-01  
**Preparer's SCC Comment** FUGITIVES

#### SEASONAL MATERIAL USAGE SCHEDULE

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

SEASONAL MATERIAL USAGE SCHEDULE				OPERATING SCHEDULE			
Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

### MATERIAL INFORMATION

**Material Code** VALVE  
**Material Throughput** 640  
**Unit Code** EACH YEAR ACTIVITY  
**Preparer's material description** FUGITIVES  
**VOC Content**  
**Density**  
**BTUs (fuel)**  
**Sulfur Content (fuel)**  
**Ash Content (fuel)**

### E-101 EMISSION INFORMATION EU/RG ID EUFUGITIVES SCC Code 3-10-888-01

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
VOC	9216	POUNDS	MAERS EF	3.6	0	EACH YEAR ACTIVITY		

### EU-101 EMISSION UNIT INFORMATION

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0005	EUENGINE3	211130	N	11/01/1992	
<b>Preparer's Description</b>	ENGINE WITH OXIDATION CATALYST - 1085 HP				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1085	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code  
CATALYTIC OXIDR

**EMISSION UNIT STACK(S)**

Stack ID  
SVENGINE3



**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE3**

Source Classification Code (SCC)      Preparer's SCC Comment  
 2-02-002-54                                      LB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS &gt;0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code      NATURAL GAS      Material Throughput      76.47      Unit Code      MILLION CUBIC FEET  
 Preparer's material description      NATURAL GAS  
 VOC Content      Density      BTUs (fuel)      Sulfur Content (fuel)      Ash Content (fuel)  
                                  0.04 POUNDS PER CUBIC FOOT      1020 BRITISH THERMAL UNITS PER CUBIC FOOT      0.01 weight percent      0 weight percent

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE3 SCC Code 2-02-002-54**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	7556	POUNDS	Other	98.8		MILLION CUBIC FEET	80	
NOX	41976	POUNDS	Other	548.9		MILLION CUBIC FEET		
PM10,PRIMARY	6.04	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
PM2.5,PRIMRY	6.04	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
SO2	45.87	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	5037	POUNDS	Other	65.87		MILLION CUBIC FEET	50	

**ATTACHMENT FOR EU/RG ID EUENGINE3 SCC Code 2-02-002-54**

Document Name: Cat 3516 1085hp

File Name: 3516 CAT 1085hp (Foster 28).pdf

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0010	EUENGINE1	211130	N	01/01/1992	
<b>Preparer's Description</b>	ENGINE WITH NO CONTROL - 1085 HP				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1085	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code

**EMISSION UNIT STACK(S)**

Stack ID

SVENGINE1

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE1**

Source Classification Code (SCC)      Preparer's SCC Comment  
 2-02-002-54                                      LB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code	NATURAL GAS	Material Throughput	71.71	Unit Code	MILLION CUBIC FEET
Preparer's material description	NATURAL GAS				
VOC Content	Density	BTUs (fuel)	Sulfur Content (fuel)	Ash Content (fuel)	
	0.04 POUNDS PER CUBIC FOOT	1020 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent	0 weight percent	

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE1 SCC Code 2-02-002-54**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	35427	POUNDS	Other	494.01		MILLION CUBIC FEET		
NOX	39363	POUNDS	Other	548.9		MILLION CUBIC FEET		
PM10,PRIMARY	5.67	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
PM2.5,PRIMRY	5.67	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
SO2	43.01	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	9447	POUNDS	Other	131.74		MILLION CUBIC FEET		

**ATTACHMENT FOR EU/RG ID EUENGINE1 SCC Code 2-02-002-54**

Document Name: 3516 Cat 3516 1085hp

File Name: 3516 CAT 1085hp (Foster 28).pdf

**EU-101 EMISSION UNIT INFORMATION**

<b>AQD Emission Unit ID</b>	<b>Emission Unit ID</b>	<b>NAICS Code</b>	<b>Remove from MAERS</b>	<b>Installation Date</b>	<b>Dismantle Date</b>
EU0011	EUGLYCOLDEHY	211130	N	01/01/1980	
<b>Preparer's Description</b>	GLYCOL DEHYDRATOR - ANTRIM (HAYES 29 DEHY)				
<b>Design Capacity</b>	<b>Design Capacity Unit Numerator</b>	<b>Design Capacity Unit Denominator</b>	<b>Maximum Nameplate Capacity</b>	<b>Rule 201 Grandfathered?</b>	<b>Rule 201 Exempted?</b>
200000	BTU	HR		N	Y
<b>If Rule 201 exempt, Rule Number</b>	<b>If Rule 201 exempt, is throughput below reporting Thresholds?</b>	<b>Permit?</b>	<b>If Permitted, Permit Number</b>	<b>Is this Emission Unit required to report emissions to MAERS for this reporting year?</b>	
Rule 282(b)(i)	N	Y	86-05A	Y	

**A-101 ACTIVITY INFORMATION EU/RG ID EUGLYCOLDEHY**

<b>Source Classification Code (SCC)</b>	<b>Preparer's SCC Comment</b>
3-10-003-23	GLYCOL DEHYDRATOR - ANTRIM

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

SEASONAL MATERIAL USAGE SCHEDULE				OPERATING SCHEDULE			
Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

<b>Material Code</b>	GLYCOL	<b>Material Throughput</b>	0.11	<b>Unit Code</b>	YEAR-GALLON/MINUTE
<b>Preparer's material description</b>	GLYCOL DEHYDRATORS-ANTRIM				
<b>VOC Content</b>	<b>Density</b>	<b>BTUs (fuel)</b>	<b>Sulfur Content (fuel)</b>	<b>Ash Content (fuel)</b>	
			0 weight percent		

**E-101 EMISSION INFORMATION EU/RG ID EUGLYCOLDEHY SCC Code 3-10-003-23**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
VOC	10.12	POUNDS	MAERS EF	9.2	1	YEAR-GALLON/MINUTE		

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0012	EUTANKS	211130	N	01/01/1980	
<b>Preparer's Description</b>	OIL STORAGE TANKS				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
				N	Y
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
Rule 284(e)	N	Y	86-05A	Y	

**A-101 ACTIVITY INFORMATION EU/RG ID EUTANKS**

Source Classification Code (SCC) 4-04-003-01  
Preparer's SCC Comment FIXED ROOF TANK-BREATHING LOSS

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

SEASONAL MATERIAL USAGE SCHEDULE				OPERATING SCHEDULE			
Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code CRUDE OIL  
Material Throughput 20.16  
Unit Code 1000 GALLON YEARS  
Preparer's material description CRUDE OIL  
VOC Content Density BTUs (fuel) Sulfur Content (fuel) Ash Content (fuel)  
0 weight percent

**E-101 EMISSION INFORMATION EU/RG ID EUTANKS SCC Code 4-04-003-01**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
VOC	725.76	POUNDS	MAERS EF	3.6	1	1000 GALLON YEARS		

**A-101 ACTIVITY INFORMATION EU/RG ID EUTANKS**

Source Classification Code (SCC)  
4-04-003-02

Preparer's SCC Comment  
FIXED ROOF TANK-WORKING LOSS

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code	CRUDE OIL	Material Throughput	10.64	Unit Code	1000 GALLONS
Preparer's material description	CRUDE OIL				
VOC Content	Density	BTUs (fuel)	Sulfur Content (fuel)	Ash Content (fuel)	
		0 weight percent			

**E-101 EMISSION INFORMATION**    EU/RG ID EUTANKS    SCC Code 4-04-003-02

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
VOC	11.7	POUNDS	MAERS EF	1.1	0	1000 GALLONS		

**A-101 ACTIVITY INFORMATION**    EU/RG ID EUTANKS

Source Classification Code (SCC)    Preparer's SCC Comment  
4-06-001-32    TRUCKLOADING

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code	CRUDE OIL	Material Throughput	10.64	Unit Code	1000 GALLONS
Preparer's material description	CRUDE OIL TRUCKLOADING				
VOC Content	Density	BTUs (fuel)	Sulfur Content (fuel)	Ash Content (fuel)	

**E-101 EMISSION INFORMATION    EU/RG ID    EUTANKS    SCC Code    4-06-001-32**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
VOC	21.28	POUNDS	MAERS EF	2	0	1000 GALLONS		

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0015	EUENGINE6	211130	N	11/01/1992	
<b>Preparer's Description</b>	ENGINE WITH CATALYTIC CONVERTER - 1478 HP				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Namplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1478	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code  
AFTER,CAT CONV

**EMISSION UNIT STACK(S)**

Stack ID  
SVENGINE6

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE6**

<b>Source Classification Code (SCC)</b>	<b>Preparer's SCC Comment</b>
2-02-002-53	RB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS &gt;0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

<b>Material Code</b>	NATURAL GAS	<b>Material Throughput</b>	85.64	<b>Unit Code</b>	MILLION CUBIC FEET
<b>Preparer's material description</b>	NATURAL GAS				
<b>VOC Content</b>	<b>Density</b>	<b>BTUs (fuel)</b>	<b>Sulfur Content (fuel)</b>	<b>Ash Content (fuel)</b>	
	0.04 POUNDS PER CUBIC FOOT	1020 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent	0 weight percent	

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE6 SCC Code 2-02-002-53**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	59086	POUNDS	Other	689.79		MILLION CUBIC FEET	80	
NOX	32014	POUNDS	Other	373.64		MILLION CUBIC FEET	90	
PM10,PRIMARY	829.85	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
PM2.5,PRIMRY	829.85	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
SO2	51.37	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	4308	POUNDS	Other	50.3		MILLION CUBIC FEET	50	

**ATTACHMENT FOR EU/RG ID EUENGINE6 SCC Code 2-02-002-53**

Document Name: Waukesha 7042 1478hp

File Name: F7042 Emissions levels.pdf

**EU-101 EMISSION UNIT INFORMATION**



AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0013	EUENGINE4	211130	N	11/01/1992	
<b>Preparer's Description</b>	ENGINE WITH OXIDATION CATALYST - 1150 HP				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1150	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code  
CATALYTIC OXIDR

**EMISSION UNIT STACK(S)**

Stack ID  
SVENGINE4

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE4**

<b>Source Classification Code (SCC)</b>	<b>Preparer's SCC Comment</b>
2-02-002-54	LB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS &gt;0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

<b>Material Code</b>	NATURAL GAS	<b>Material Throughput</b>	71.77	<b>Unit Code</b>	MILLION CUBIC FEET
<b>Preparer's material description</b>	NATURAL GAS				
<b>VOC Content</b>	<b>Density</b>	<b>BTUs (fuel)</b>	<b>Sulfur Content (fuel)</b>	<b>Ash Content (fuel)</b>	
	0.04 POUNDS PER CUBIC FOOT	1020 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent	0 weight percent	

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE4 SCC Code 2-02-002-54**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	7844	POUNDS	Other	109.18		MILLION CUBIC FEET	80	
NOX	32655	POUNDS	Other	454.9		MILLION CUBIC FEET		
PM10,PRIMARY	5.67	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
PM2.5,PRIMRY	5.67	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
SO2	43.05	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	5444	POUNDS	Other	75.82		MILLION CUBIC FEET	50	

**ATTACHMENT FOR EU/RG ID EUENGINE4 SCC Code 2-02-002-54**

Document Name: Cat 3516 11150hp

File Name: G3500 Engine Performance 1150hp.pdf

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0014	EUENGINE5	211130	N	11/01/1992	
<b>Preparer's Description</b>	ENGINE WITH CATALYTIC CONVERTER - 1478 HP				
Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1478	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code  
AFTER,CAT CONV

**EMISSION UNIT STACK(S)**

Stack ID  
SVENGINE5

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINE5**

<b>Source Classification Code (SCC)</b>	<b>Preparer's SCC Comment</b>
2-02-002-53	RB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS &gt;0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

<b>Material Code</b>	NATURAL GAS	<b>Material Throughput</b>	0	<b>Unit Code</b>	MILLION CUBIC FEET
<b>Preparer's material description</b>	NATURAL GAS				
<b>VOC Content</b>	<b>Density</b>	<b>BTUs (fuel)</b>	<b>Sulfur Content (fuel)</b>	<b>Ash Content (fuel)</b>	
	0.04 POUNDS PER CUBIC FOOT	1020 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent	0 weight percent	

**E-101 EMISSION INFORMATION EU/RG ID EUENGINE5 SCC Code 2-02-002-53**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	0	POUNDS	MAERS EF	3.794	3	MILLION CUBIC FEET		
NOX	0	POUNDS	MAERS EF	2.254	3	MILLION CUBIC FEET		
PM10,PRIMARY	0	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
PM2.5,PRIMRY	0	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
SO2	0	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	0	POUNDS	MAERS EF	3.019	1	MILLION CUBIC FEET		

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0016	EUENGINEH29	211130	N	11/01/1992	09/17/2013

<b>Preparer's Description</b>	ENGINE WITH CATALYTIC CONVERTER - 1478 HP LOCATED AT HAYES 29 FACILITY, PTI 86-05A COVERS THIS ENGINE				
<b>Design Capacity</b>	<b>Design Capacity Unit Numerator</b>	<b>Design Capacity Unit Denominator</b>	<b>Maximum Nameplate Capacity</b>	<b>Rule 201 Grandfathered?</b>	<b>Rule 201 Exempted?</b>
1478	HP	HR		N	N
<b>If Rule 201 exempt, Rule Number</b>	<b>If Rule 201 exempt, is throughput below reporting Thresholds?</b>	<b>Permit?</b>	<b>If Permitted, Permit Number</b>	<b>Is this Emission Unit required to report emissions to MAERS for this reporting year?</b>	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

**Control Device Code**  
AFTER,CAT CONV

**EMISSION UNIT STACK(S)**

**Stack ID**  
SVENGINEH29

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINEH29**

<b>Source Classification Code (SCC)</b>	<b>Preparer's SCC Comment</b>
2-02-002-53	RB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS &gt;0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

<b>Material Code</b>	NATURAL GAS	<b>Material Throughput</b>	0	<b>Unit Code</b>	MILLION CUBIC FEET
<b>Preparer's material description</b>	NATURAL GAS				
<b>VOC Content</b>	<b>Density</b>	<b>BTUs (fuel)</b>	<b>Sulfur Content (fuel)</b>	<b>Ash Content (fuel)</b>	
	0.04 POUNDS PER CUBIC FOOT	1020 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent	0 weight percent	

**E-101 EMISSION INFORMATION EU/RG ID EUENGINEH29 SCC Code 2-02-002-53**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	0	POUNDS	MAERS EF	3.794	3	MILLION CUBIC FEET		
NOX	0	POUNDS	MAERS EF	2.254	3	MILLION CUBIC FEET		
PM10,PRIMARY	0	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
PM2.5,PRIMRY	0	POUNDS	MAERS EF	9.69	0	MILLION CUBIC FEET		
SO2	0	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	0	POUNDS	MAERS EF	3.019	1	MILLION CUBIC FEET		

**EU-101 EMISSION UNIT INFORMATION**

AQD Emission Unit ID	Emission Unit ID	NAICS Code	Remove from MAERS	Installation Date	Dismantle Date
EU0017	EUENGINEH29 NEW	211130	N	09/18/2013	

Preparer's Description LB ENGINE WITH OXIDATION CATALYST-1085hp (REPLACES EUENGINEH29)

Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit Denominator	Maximum Nameplate Capacity	Rule 201 Grandfathered?	Rule 201 Exempted?
1085	HP	HR		N	N
If Rule 201 exempt, Rule Number	If Rule 201 exempt, is throughput below reporting Thresholds?	Permit?	If Permitted, Permit Number	Is this Emission Unit required to report emissions to MAERS for this reporting year?	
		Y	86-05A	Y	

**CONTROL DEVICE(S)**

Control Device Code  
CATALYTIC OXIDR

**A-101 ACTIVITY INFORMATION EU/RG ID EUENGINEH29 NEW**

Source Classification Code (SCC)      Preparer's SCC Comment  
 2-02-002-54                                      LB ENGINE

**SEASONAL MATERIAL USAGE SCHEDULE**

IF THROUGHPUT IS >0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%

**OPERATING SCHEDULE**

Winter (Dec,Jan,Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)	Hours per Day	Days per Week	Days per Year	Hours/Year
25	25	25	25	24	7	365	8760

**MATERIAL INFORMATION**

Material Code	NATURAL GAS	Material Throughput	69.9	Unit Code	MILLION CUBIC FEET
Preparer's material description	NATURAL GAS				
VOC Content	Density	BTUs (fuel)	Sulfur Content (fuel)	Ash Content (fuel)	
	0.04 POUNDS PER CUBIC FOOT	916 BRITISH THERMAL UNITS PER CUBIC FOOT	0.01 weight percent		

**E-101 EMISSION INFORMATION EU/RG ID EUENGINEH29 NEW SCC Code 2-02-002-54**

Pollutant Code	Annual Emissions	Unit code	Emission Basis	List Emission Factor	Exponent	Emission Factor Unit Code	Control Efficiency %	Comment
CO	6820	POUNDS	Other	512.52		MILLION CUBIC FEET	80	
NOX	35880	POUNDS	Other	542.35		MILLION CUBIC FEET		
PM10,PRIMARY	5.52	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
PM2.5,PRIMRY	5.52	POUNDS	MAERS EF	7.9	-2	MILLION CUBIC FEET		
SO2	41.93	POUNDS	MAERS EF	5.998	-1	MILLION CUBIC FEET		
VOC	3860	POUNDS	Other	116.605		MILLION CUBIC FEET	50	

**ATTACHMENT FOR EU/RG ID EUENGINEH29 NEW SCC Code 2-02-002-54**

Document Name: Linn's Engine Spec Sample

File Name: LINN Sample Eng. Spec. Emis. Calcs. -.pdf

**SOURCE EMISSION FACTOR SUBSET REPORT**



SCC Code	Pollutant Code	Pollutant Unit Code	Factor Type	Factor	Exponent	Material Code	Material Unit Code	Control Device 1	Code	Control Device Code 2
2-02-200-53										
	ACETALDEHYDE	LB	Generic	2.846	0	NATURAL GAS	MMCF			
	ACROLEIN	LB	Generic	2.683	0	NATURAL GAS	MMCF			
	AMMONIA	LB	Generic	1.8	1	NATURAL GAS	MMCF	INJCTN,CARBON		
	AMMONIA	LB	Generic	9.1	0	NATURAL GAS	MMCF	SCR		
	BENZENE	LB	Generic	1.612	0	NATURAL GAS	MMCF			
	BUTADIENE,13	LB	Generic	6.763	-1	NATURAL GAS	MMCF			
	CARBON TETRA	LB	Generic	1.805	-2	NATURAL GAS	MMCF			
	CHLOROBENZ	LB	Generic	1.316	-2	NATURAL GAS	MMCF			
	CHLOROFORM	LB	Generic	1.397	-2	NATURAL GAS	MMCF			
	CO	LB	Generic	3.794	3	NATURAL GAS	MMCF			
	CO2	LB	Generic	1.122	5	NATURAL GAS	MMCF			
	DIBROMOET,12	LB	Generic	2.173	-2	NATURAL GAS	MMCF			
	DICHLORETH12	LB	Generic	1.153	-2	NATURAL GAS	MMCF			
	DICLETH,11-	LB	Generic	1.153	-2	NATURAL GAS	MMCF			
	DICLPROPE,13	LB	Generic	1.295	-2	NATURAL GAS	MMCF			
	ETHYLBENZENE	LB	Generic	2.53	-2	NATURAL GAS	MMCF			
	FORMALDEHYDE	LB	Generic	2.091	1	NATURAL GAS	MMCF			
	METHANE	LB	Generic	2.346	2	NATURAL GAS	MMCF			
	METHANOL	LB	Generic	3.121	0	NATURAL GAS	MMCF			
	METHYLENE CL	LB	Generic	4.202	-2	NATURAL GAS	MMCF			
	NAPHTHALENE	LB	Generic	9.904	-2	NATURAL GAS	MMCF			
	NOX	LB	Generic	2.254	3	NATURAL GAS	MMCF			
	PAH	LB	Generic	1.438	-1	NATURAL GAS	MMCF			
	PM10,PRIMARY	LB	Generic	9.69	0	NATURAL GAS	MMCF			
	PM2.5,PRIMRY	LB	Generic	9.69	0	NATURAL GAS	MMCF			
	PRPLENE DICH	LB	Generic	1.326	-2	NATURAL GAS	MMCF			
	SO2	LB	Generic	5.998	-1	NATURAL GAS	MMCF			

STYRENE	LB	Generic	1.214	-2	NATURAL GAS	MMCF
TETCLET,1122	LB	Generic	2.581	-2	NATURAL GAS	MMCF
TOLUENE	LB	Generic	5.692	-1	NATURAL GAS	MMCF
TRICLETH,112	LB	Generic	1.561	-2	NATURAL GAS	MMCF
VINYL CHLOR	LB	Generic	7.324	-3	NATURAL GAS	MMCF
VOC	LB	Generic	3.019	1	NATURAL GAS	MMCF
XYLENES ISO	LB	Generic	1.989	-1	NATURAL GAS	MMCF

2-02-200-54

	LB	Generic	4.274	1	NATURAL GAS	MMCF	
	LB	Generic	5.518	-1	NATURAL GAS	MMCF	
ACENAPHTHEN	LB	Generic	1.275	-3	NATURAL GAS	MMCF	
ACENAPHTHYL	LB	Generic	5.641	-3	NATURAL GAS	MMCF	
ACETALDEHYDE	LB	Generic	8.527	0	NATURAL GAS	MMCF	
ACROLEIN	LB	Generic	5.243	0	NATURAL GAS	MMCF	
AMMONIA	LB	Generic	1.8	1	NATURAL GAS	MMCF	INJCTN,CARBON
AMMONIA	LB	Generic	9.1	0	NATURAL GAS	MMCF	SCR
BENZ(GHI)PE	LB	Generic	4.223	-4	NATURAL GAS	MMCF	
BENZENE	LB	Generic	4.488	-1	NATURAL GAS	MMCF	
BENZO(B)FLUO	LB	Generic	1.693	-4	NATURAL GAS	MMCF	
BENZO(E)PYRE	LB	Generic	4.233	-4	NATURAL GAS	MMCF	
BIPHENYL	LB	Generic	2.162	-1	NATURAL GAS	MMCF	
BUTADIENE,13	LB	Generic	2.723	-1	NATURAL GAS	MMCF	
CARBON TETRA	LB	Generic	3.743	-2	NATURAL GAS	MMCF	
CHLOROBENZ	LB	Generic	3.101	-2	NATURAL GAS	MMCF	
CHLOROETHANE	LB	Generic	1.907	-3	NATURAL GAS	MMCF	
CHLOROFORM	LB	Generic	2.907	-2	NATURAL GAS	MMCF	
CHRYSENE	LB	Generic	7.069	-4	NATURAL GAS	MMCF	
CO	LB	Generic	5.68	2	NATURAL GAS	MMCF	
CO2	LB	Generic	1.122	5	NATURAL GAS	MMCF	
DIBROMOET,12	LB	Generic	4.519	-2	NATURAL GAS	MMCF	

DICHLORETH12	LB	Generic	2.407	-2	NATURAL GAS	MMCF
DICLETH,11-	LB	Generic	2.407	-2	NATURAL GAS	MMCF
DICLPROPE,13	LB	Generic	2.693	-2	NATURAL GAS	MMCF
ETHYLBENZENE	LB	Generic	4.049	-2	NATURAL GAS	MMCF
FLUORANTHENE	LB	Generic	1.132	-3	NATURAL GAS	MMCF
FLUORENE	LB	Generic	5.783	-3	NATURAL GAS	MMCF
FORMALDEHYDE	LB	Generic	5.386	1	NATURAL GAS	MMCF
HEXANE	LB	Generic	1.132	0	NATURAL GAS	MMCF
METHANE	LB	Generic	1.275	3	NATURAL GAS	MMCF
METHANOL	LB	Generic	2.55	0	NATURAL GAS	MMCF
METHYLENE CL	LB	Generic	2.04	-2	NATURAL GAS	MMCF
METHYLNAPHT2	LB	Generic	3.386	-2	NATURAL GAS	MMCF
NAPHTHALENE	LB	Generic	7.589	-2	NATURAL GAS	MMCF
NOX	LB	Generic	4.162	3	NATURAL GAS	MMCF
PAH	LB	Generic	2.744	-2	NATURAL GAS	MMCF
PERC	LB	Generic	2.53	-3	NATURAL GAS	MMCF
PHENANTHRENE	LB	Generic	1.061	-2	NATURAL GAS	MMCF
PHENOL	LB	Generic	2.448	-2	NATURAL GAS	MMCF
PM10,PRIMARY	LB	Generic	7.9	-2	NATURAL GAS	MMCF
PM2.5,PRIMRY	LB	Generic	7.9	-2	NATURAL GAS	MMCF
PRPLENE DICH	LB	Generic	2.744	-2	NATURAL GAS	MMCF
PYRENE	LB	Generic	1.387	-3	NATURAL GAS	MMCF
SO2	LB	Generic	5.998	-1	NATURAL GAS	MMCF
STYRENE	LB	Generic	2.407	-2	NATURAL GAS	MMCF
TETCLET,1122	LB	Generic	4.08	-2	NATURAL GAS	MMCF
TOLUENE	LB	Generic	4.162	-1	NATURAL GAS	MMCF
TRICLETH,112	LB	Generic	3.244	-2	NATURAL GAS	MMCF
TRIME-PENTAN	LB	Generic	2.55	-1	NATURAL GAS	MMCF
VINYL CHLOR	LB	Generic	1.52	-2	NATURAL GAS	MMCF
VOC	LB	Generic	1.204	2	NATURAL GAS	MMCF

<b>3-10-000-23</b>	XYLENES ISO	LB	Generic	1.877	-1	NATURAL GAS	MMCF
<b>3-10-088-01</b>	VOC	LB	State Specific Factors	9.2	1	GLYCOL	YR-GPM
<b>4-04-400-01</b>	VOC	LB	State Specific Factors	1.44	1	VALVE	EACH-YR
<b>4-04-400-02</b>	VOC	LB	Generic	3.6	1	CRUDE OIL	KGAL-YR
<b>4-06-600-32</b>	VOC	LB	Generic	1.1	0	CRUDE OIL	E3 GAL
	VOC	LB	Generic	2	0	CRUDE OIL	E3 GAL



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Source Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>	
Form Type	Source
AQD Source ID (SRN)	N5831

<b>SOURCE IDENTIFICATION</b>			
Source Name	Breitburn_Linn Operating, LLC - Hayes 29 CPF		
NAICS Code	211130	Portable	No
Physical Address (Street Address 1)	10875 Geronimo Trail		
Physical Address (Street Address 2)	SW4 T29N R4W SEC 29		
County	OTSEGO	City	GAYLORD
		Zip Code	49735-
Latitude	44.87298486 Decimal Degrees	Longitude	-84.8273659 Decimal Degrees
Horizontal Collection Method	001		
Source Map Scale Number	50000	Horizontal Accuracy Measure	25 Meters
Horizontal Reference Datum Code	03	Reference Point Code	102
Principal Product	NATURAL GAS	Number of Employees	2
Employer Federal Identification Number	113785529		

<b>OWNER INFORMATION</b>			
Owner Name	Breitburn Operating LP		
Mailing Address (Street Address 1)	1165 Elkview dr		
Mailing Address (Street Address 2)	P.O. Box 1256		
City	Gaylord	State/Pro vince	MI
Country	USA	Zip or Postal Code	49735-



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Contact Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

**FORM REFERENCE**

Form Type	Contact	AQD Source ID (SRN)	N5831
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**EMISSION INVENTORY CONTACT (PRIMARY) INFORMATION**

Contact First Name, Middle Initial	CAROLANN	Contact Last Name	KNAPP				
Contact Title	EH&S REP						
Mailing Address (Street Address 1)	BREITBURN OPERATING LP						
Mailing Address (Street Address 2)	1165 ELKVIEW DR						
City	GAYLORD	State/Province	MI	Country	USA	Zip Code	49734
E-Mail Address (if available)	carolann.knapp@breitburn.com						
Telephone Number	(989) 7320020	Telephone Extension					
Fax Number	()						

**EMISSION INVENTORY CONTACT (SECONDARY) INFORMATION**

Contact First Name, Middle Initial	Contact Last Name				
Contact Title					
Mailing Address (Street Address 1)					
Mailing Address (Street Address 2)					
City	State/Province	MI	Country	USA	Zip Code
E-Mail Address (if available)					
Telephone Number	()	Telephone Extension			
Fax Number	()				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Contact Form

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<b>FORM REFERENCE</b>			
Form Type	Contact	AQD Source ID (SRN)	N5831

<b>FEE INVOICE CONTACT INFORMATION (Fee Subject Facilities Only)</b>					
Contact First Name, Middle Initial	CAROLANN			Contact Last Name	KNAPP
Contact Title	EH&S REP				
Mailing Address (Street Address 1)	BREITBURN OPERATING LP				
Mailing Address (Street Address 2)	P.O. BOX 1256				
City	GAYLORD	State/Province	MI	Country	USA
				Zip Code	49734
E-Mail Address (if available)	carolann.knapp@breitburn.com				
Telephone Number	(989) 7320020			Telephone Extension	
Fax Number	()				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0007</b>	Stack ID	<b>SVENGINE6</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #6 with catalytic converter</b>			
Actual Stack Height Above Ground	<b>40</b>	feet	Inside Stack Diameter <b>12</b> inches
Exit Gas Temperature	<b>1125</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>6567</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number <b>50000</b>	Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

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<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0008</b>	Stack ID	<b>SVENGINEH29</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #H29 with oxidation catalyst</b>			
Actual Stack Height Above Ground	<b>40</b>	feet	Inside Stack Diameter <b>12</b> inches
Exit Gas Temperature	<b>1125</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>6567</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number	<b>50000</b> Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

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<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0009</b>	Stack ID	<b>SVENGINE5</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #5 with catalytic converter</b>			
Actual Stack Height Above Ground	<b>40</b>	feet	Inside Stack Diameter <b>12</b> inches
Exit Gas Temperature	<b>1125</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>6567</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number <b>50000</b>	Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Stack	AQD Source ID (SRN)	N5831

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	SV0010	Stack ID	SVENGINE1
Dismantle Date (MM/DD/YYYY)			
Stack Description		Stack for engine #1	
Actual Stack Height Above Ground	37.5	feet	Inside Stack Diameter 16 inches
Exit Gas Temperature	852	degrees Fahrenheit	Actual Exit Gas Flow Rate 7516 cubic feet per minute
Stack Orientation		Vertical	
Latitude	44.87298486	Decimal Degrees	Longitude -84.8273659 Decimal Degrees
Horizontal Collection Method	001	Source Map Scale Number	50000 Horizontal Accuracy Measure 25 Meters
Horizontal Reference Datum Code	03	Reference Point Code	102
Bypass Stack Only	N	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

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<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0011</b>	Stack ID	<b>SVENGINE2</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #2 with oxidation catalyst</b>			
Actual Stack Height Above Ground	<b>37.5</b>	feet	Inside Stack Diameter <b>16</b> inches
Exit Gas Temperature	<b>852</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>7416</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number <b>50000</b>	Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0012</b>	Stack ID	<b>SVENGINE3</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #3 with oxidation catalyst</b>			
Actual Stack Height Above Ground	<b>37.5</b>	feet	Inside Stack Diameter <b>16</b> inches
Exit Gas Temperature	<b>852</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>7416</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number <b>50000</b>	Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Stack Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Stack</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>STACK IDENTIFICATION</b>			
AQD Stack ID	<b>SV0013</b>	Stack ID	<b>SVENGINE4</b>
Dismantle Date (MM/DD/YYYY)			
Stack Description <b>Stack for engine #4 with oxidation catalyst</b>			
Actual Stack Height Above Ground	<b>37.5</b>	feet	Inside Stack Diameter <b>16</b> inches
Exit Gas Temperature	<b>852</b>	degrees Fahrenheit	Actual Exit Gas Flow Rate <b>7416</b> cubic feet per minute
Stack Orientation <b>Vertical</b>			
Latitude	<b>44.87298486</b>	Decimal Degrees	Longitude <b>-84.8273659</b> Decimal Degrees
Horizontal Collection Method	<b>001</b>	Source Map Scale Number <b>50000</b>	Horizontal Accuracy Measure <b>25</b> Meters
Horizontal Reference Datum Code	<b>03</b>	Reference Point Code	<b>102</b>
Bypass Stack Only	<b>N</b>	If yes, Stack ID of main stack	



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0002	EU ID	EUENGINE2
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	11/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		ENGINE WITH OXIDATION CATALYST - 1085 HP	
Design Capacity	1085	Design Capacity Numerator	HP
		Design Capacity Denominator	HR
Maximum Nameplate Capacity	Megawatts		

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

<b>CONTROL DEVICE(S)</b>			
21. Control Device Code	CATALYTIC OXIDR		
<b>EMISSION UNIT STACK(S)</b>			
22. Stack ID	SVENGINE2		



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0003	EU ID	EUFUGITIVES
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	11/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		Fugitive emissions from valves etc.	
Design Capacity	Design Capacity Numerator	Design Capacity Denominator	
Maximum Nameplate Capacity		Megawatts	

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

<b>CONTROL DEVICE(S)</b>			

<b>EMISSION UNIT STACK(S)</b>			





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0005	EU ID	EUENGINE3
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	11/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		ENGINE WITH OXIDATION CATALYST - 1085 HP	
Design Capacity	1085	Design Capacity Numerator	HP
		Design Capacity Denominator	HR
Maximum Nameplate Capacity		Megawatts	

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

<b>CONTROL DEVICE(S)</b>	
21. Control Device Code	CATALYTIC OXIDR
<b>EMISSION UNIT STACK(S)</b>	
22. Stack ID	SVENGINE3



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0010	EU ID	EUENGINE1
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	01/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		ENGINE WITH NO CONTROL - 1085 HP	
Design Capacity	1085	Design Capacity Numerator	HP
		Design Capacity Denominator	HR
Maximum Nameplate Capacity		Megawatts	

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number 86-05A	
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

<b>CONTROL DEVICE(S)</b>	
21. Control Device Code	

<b>EMISSION UNIT STACK(S)</b>	
22. Stack ID	SVENGINE1



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

FORM REFERENCE			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

EMISSION UNIT IDENTIFICATION			
AQD Emission Unit ID	EJ0011	EU ID	EUGLYCOLDEHY
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	01/01/1980	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)	GLYCOL DEHYDRATOR - ANTRIM (HAYES 29 DEHY)		
Design Capacity	200000	Design Capacity Numerator	BTU
		Design Capacity Denominator	HR
Maximum Nameplate Capacity	Megawatts		

RULE 201 APPLICABILITY			
Grandfathered?	N		
Exempt from Rule 201?	Y	If Yes, Rule Number	Rule 282(i)
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?	N		
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?	Y		

<b>CONTROL DEVICE(S)</b>
<b>EMISSION UNIT STACK(S)</b>



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

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<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0012	EU ID	EUTANKS
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	01/01/1980	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		OIL STORAGE TANKS	
Design Capacity	Design Capacity Numerator	Design Capacity Denominator	
Maximum Nameplate Capacity	Megawatts		

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	Y	If Yes, Rule Number	Rule 284(e)
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?		N	
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

<b>CONTROL DEVICE(S)</b>			

<b>EMISSION UNIT STACK(S)</b>			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	EU0015	EU ID	EUENGINE6
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	11/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		ENGINE WITH CATALYTIC CONVERTER - 1478 HP	
Design Capacity	1478	Design Capacity Numerator	HP
		Design Capacity Denominator	HR
Maximum Nameplate Capacity		Megawatts	

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number 86-05A	
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year? Y			

<b>CONTROL DEVICE(S)</b>			
21. Control Device Code	AFTER,CAT CONV		
<b>EMISSION UNIT STACK(S)</b>			
22. Stack ID	SVENGINE6		



**Michigan Department of Environmental Quality - Air Quality Division**

**Michigan Air Emissions Reporting System (MAERS)**

**2017 Emission Unit Form**

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Emission Unit</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	<b>EU0013</b>	EU ID	<b>EUENGINE4</b>
NAICS Code (if different from Source Form)	<b>211130</b>		
Installation Date MM/DD/YYYY	<b>11/01/1992</b>	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		<b>ENGINE WITH OXIDATION CATALYST - 1150 HP</b>	
Design Capacity	<b>1150</b>	Design Capacity Numerator	<b>HP</b>
		Design Capacity Denominator	<b>HR</b>
Maximum Nameplate Capacity		Megawatts	

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	<b>N</b>		
Exempt from Rule 201?	<b>N</b>	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	<b>Y</b>	If Yes, Enter the Permit Number	<b>86-05A</b>
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			<b>Y</b>

<b>CONTROL DEVICE(S)</b>	
21. Control Device Code	<b>CATALYTIC OXIDR</b>

<b>EMISSION UNIT STACK(S)</b>	
22. Stack ID	<b>SVENGINE4</b>



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

FORM REFERENCE			
Form Type	Emission Unit	AQD Source ID (SRN)	N5831

EMISSION UNIT IDENTIFICATION			
AQD Emission Unit ID	EU0014	EU ID	EUENGINE5
NAICS Code (if different from Source Form)	211130		
Installation Date MM/DD/YYYY	11/01/1992	Dismantle Date MM/DD/YYYY	
Emission Unit Description - (Include Process Equipment and Control Devices)		ENGINE WITH CATALYTIC CONVERTER - 1478 HP	
Design Capacity	1478	Design Capacity Numerator	HP
		Design Capacity Denominator	HR
Maximum Nameplate Capacity	Megawatts		

RULE 201 APPLICABILITY			
Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

CONTROL DEVICE(S)	
21. Control Device Code	AFTER,CAT CONV
EMISSION UNIT STACK(S)	
22. Stack ID	SVENGINE5



**Michigan Department of Environmental Quality - Air Quality Division**

**Michigan Air Emissions Reporting System (MAERS)**

**2017 Emission Unit Form**

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Emission Unit</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>EMISSION UNIT IDENTIFICATION</b>			
AQD Emission Unit ID	<b>EU0016</b>	EU ID	<b>EUENGINEH29</b>
NAICS Code (if different from Source Form)	<b>211130</b>		
Installation Date MM/DD/YYYY	<b>11/01/1992</b>	Dismantle Date MM/DD/YYYY	<b>09/17/2013</b>
Emission Unit Description - (Include Process Equipment and Control Devices)	<b>ENGINE WITH CATALYTIC CONVERTER - 1478 HP LOCATED AT HAYES 29 FACILITY, PTI 86-05A COVERS THIS ENGINE</b>		
Design Capacity	<b>1478</b>	Design Capacity Numerator	<b>HP</b>
		Design Capacity Denominator	<b>HR</b>
Maximum Nameplate Capacity	<b>Megawatts</b>		

<b>RULE 201 APPLICABILITY</b>			
Grandfathered?	<b>N</b>		
Exempt from Rule 201?	<b>N</b>	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	<b>Y</b>	If Yes, Enter the Permit Number	<b>86-05A</b>
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			<b>Y</b>

<b>CONTROL DEVICE(S)</b>	
21. Control Device Code	<b>AFTER,CAT CONV</b>

<b>EMISSION UNIT STACK(S)</b>	
22. Stack ID	<b>SVENGINEH29</b>





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emission Unit Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

**FORM REFERENCE**

Form Type	Emission Unit	AQD Source ID (SRN)	N5831
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**EMISSION UNIT IDENTIFICATION**

AQD Emission Unit ID	EU0017	EU ID	EUENGINEH29 NEW		
NAICS Code (if different from Source Form)	211130				
Installation Date MM/DD/YYYY	09/18/2013	Dismantle Date MM/DD/YYYY			
Emission Unit Description - (Include Process Equipment and Control Devices)	LB ENGINE WITH OXIDATION CATALYST-1085hp (REPLACES EUENGINEH29)				
Design Capacity	1085	Design Capacity Numerator	HP	Design Capacity Denominator	HR
Maximum Nameplate Capacity	Megawatts				

**RULE 201 APPLICABILITY**

Grandfathered?	N		
Exempt from Rule 201?	N	If Yes, Rule Number	
If Rule 201 Exempt, Is Throughput Below Reporting Thresholds?			
Permit?	Y	If Yes, Enter the Permit Number	86-05A
Is This Emission Unit Required To Report Emissions To MAERS For This Reporting Year?			Y

**CONTROL DEVICE(S)**

21. Control Device Code	CATALYTIC OXIDR
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**EMISSION UNIT STACK(S)**

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Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

**FORM REFERENCE**

Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUENGINE2
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	20200254
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SCC Comment	LB ENGINE
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
24	7	365

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
NATURAL GAS	72.67	MMCF

Material Description	NATURAL GAS
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VOC Content (coatings or solvent)	% by Weight	Density	0.04 LB/FT3
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BTUs (fuel)	1020 BTU/FT3
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Sulfur Content (fuel)	0.01 % by Weight	Ash Content (fuel)	0 % by Weight
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**ATTACHMENT:**

Document Name: 3516 Cat 1085hp

File Name: 3516 CAT 1085hp (Foster 28).pdf



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUFUGITIVES
<b>ACTIVITY INFORMATION</b>					
Source Classification Code(SCC)	31088801				
SCC Comment	FUGITIVES				
<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>					
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)		
25	25	25	25		
<b>OPERATING SCHEDULE</b>					
Hours per Day	Days per Week	Days per Year			
24	7	365			
<b>MATERIAL INFORMATION</b>					
Material Code	Material Throughput	Unit Code			
VALVE	640	EACH-YR			
Material Description	FUGITIVES				
VOC Content (coatings or solvent)	% by Weight	Density			
BTUs (fuel)					
Sulfur Content (fuel)	% by Weight	Ash Content (fuel)	% by Weight		



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

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**FORM REFERENCE**

Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUENGINE3
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	20200254
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SCC Comment	LB ENGINE
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
24	7	365

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
NATURAL GAS	76.47	MMCF

Material Description	NATURAL GAS
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VOC Content (coatings or solvent)	% by Weight	Density	0.04 LB/FT3
-----------------------------------	-------------	---------	-------------

BTUs (fuel)	1020 BTU/FT3
-------------	--------------

Sulfur Content (fuel)	0.01 % by Weight	Ash Content (fuel)	0 % by Weight
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**ATTACHMENT:**

Document Name: Cat 3516 1085hp

File Name: 3516 CAT 1085hp (Foster 28).pdf



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Activity</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE1</b>

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	<b>20200254</b>
SCC Comment	<b>LB ENGINE</b>

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
<b>24</b>	<b>7</b>	<b>365</b>

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
<b>NATURAL GAS</b>	<b>71.71</b>	<b>MMCF</b>
Material Description <b>NATURAL GAS</b>		
VOC Content (coatings or solvent)	<b>% by Weight</b>	Density <b>0.04 LB/FT3</b>
BTUs (fuel)	<b>1020 BTU/FT3</b>	
Sulfur Content (fuel)	<b>0.01 % by Weight</b>	Ash Content (fuel) <b>0 % by Weight</b>

ATTACHMENT:

Document Name: **3516 Cat 3516 1085hp**

File Name: **3516 CAT 1085hp (Foster 28).pdf**



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

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**FORM REFERENCE**

Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUGLYCOLDEHY
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	31000323
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SCC Comment	GLYCOL DEHYDRATOR - ANTRIM
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
24	7	365

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
GLYCOL	0.11	YR-GPM

Material Description	GLYCOL DEHYDRATORS-ANTRIM
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VOC Content (coatings or solvent)	% by Weight	Density
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BTUs (fuel)
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Sulfur Content (fuel)	0 % by Weight	Ash Content (fuel)	% by Weight
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Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Activity</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUTANKS</b>

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	<b>40400301</b>
SCC Comment	<b>FIXED ROOF TANK-BREATHING LOSS</b>

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
<b>24</b>	<b>7</b>	<b>365</b>

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
<b>CRUDE OIL</b>	<b>20.16</b>	<b>KGAL-YR</b>
Material Description	<b>CRUDE OIL</b>	
VOC Content (coatings or solvent)	<b>% by Weight</b>	Density
BTUs (fuel)		
Sulfur Content (fuel)	<b>0 % by Weight</b>	Ash Content (fuel) <b>% by Weight</b>



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUTANKS

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	40400302
SCC Comment	FIXED ROOF TANK-WORKING LOSS

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
24	7	365

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
CRUDE OIL	10.64	E3 GAL
Material Description	CRUDE OIL	
VOC Content (coatings or solvent)	% by Weight	Density
BTUs (fuel)		
Sulfur Content (fuel)	0 % by Weight	Ash Content (fuel) % by Weight





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUTANKS

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	40600132
SCC Comment	TRUCKLOADING

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
24	7	365

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
CRUDE OIL	10.64	E3 GAL
Material Description	CRUDE OIL TRUCKLOADING	
VOC Content (coatings or solvent)	% by Weight	Density
BTUs (fuel)		
Sulfur Content (fuel)	% by Weight	Ash Content (fuel) % by Weight



**Michigan Department of Environmental Quality - Air Quality Division**

**Michigan Air Emissions Reporting System (MAERS)**

**2017 Activity Form**

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

**FORM REFERENCE**

Form Type	<b>Activity</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE6</b>
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	<b>20200253</b>
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SCC Comment	<b>RB ENGINE</b>
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
<b>24</b>	<b>7</b>	<b>365</b>

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
<b>NATURAL GAS</b>	<b>85.64</b>	<b>MMCF</b>

Material Description	<b>NATURAL GAS</b>
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VOC Content (coatings or solvent)	<b>% by Weight</b>	Density	<b>0.04 LB/FT3</b>
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BTUs (fuel)	<b>1020 BTU/FT3</b>
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Sulfur Content (fuel)	<b>0.01 % by Weight</b>	Ash Content (fuel)	<b>0 % by Weight</b>
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**ATTACHMENT:**

Document Name: **Waukesha 7042 1478hp**

File Name: **F7042 Emissions levels.pdf**



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUENGINE4

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	20200254
SCC Comment	LB ENGINE

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
24	7	365

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
NATURAL GAS	71.77	MMCF
Material Description	NATURAL GAS	
VOC Content (coatings or solvent)	% by Weight	Density
		0.04 LB/FT3
BTUs (fuel)	1020 BTU/FT3	
Sulfur Content (fuel)	0.01 % by Weight	Ash Content (fuel)
		0 % by Weight

ATTACHMENT:

Document Name: Cat 3516 11150hp

File Name: G3500 Engine Performance 1150hp.pdf



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

**FORM REFERENCE**

Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUENGINE5
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	20200253
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SCC Comment	RB ENGINE
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
24	7	365

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
NATURAL GAS	0	MMCF

Material Description	NATURAL GAS
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VOC Content (coatings or solvent)	% by Weight	Density	0.04 LB/FT3
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BTUs (fuel)	1020 BTU/FT3
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Sulfur Content (fuel)	0.01 % by Weight	Ash Content (fuel)	0 % by Weight
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**Michigan Department of Environmental Quality - Air Quality Division**

**Michigan Air Emissions Reporting System (MAERS)**

**2017 Activity Form**

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Activity</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINEH29</b>

<b>ACTIVITY INFORMATION</b>	
Source Classification Code(SCC)	<b>20200253</b>
SCC Comment	<b>RB ENGINE</b>

<b>SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS &gt; 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%</b>			
Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

<b>OPERATING SCHEDULE</b>		
Hours per Day	Days per Week	Days per Year
<b>24</b>	<b>7</b>	<b>365</b>

<b>MATERIAL INFORMATION</b>		
Material Code	Material Throughput	Unit Code
<b>NATURAL GAS</b>	<b>0</b>	<b>MMCF</b>
Material Description <b>NATURAL GAS</b>		
VOC Content (coatings or solvent)	<b>% by Weight</b>	Density <b>0.04 LB/FT3</b>
BTUs (fuel)	<b>1020 BTU/FT3</b>	
Sulfur Content (fuel)	<b>0.01 % by Weight</b>	Ash Content (fuel) <b>0 % by Weight</b>



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Activity Form

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**FORM REFERENCE**

Form Type	Activity	AQD Source ID (SRN)	N5831	EU ID	EUENGINEH29 NEW
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**ACTIVITY INFORMATION**

Source Classification Code(SCC)	20200254
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SCC Comment	LB ENGINE
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**SEASONAL MATERIAL USAGE SCHEDULE, IF THROUGHPUT IS > 0, THEN SEASONAL PERCENTAGES MUST TOTAL 100%**

Winter (Jan, Feb, Dec)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
25	25	25	25

**OPERATING SCHEDULE**

Hours per Day	Days per Week	Days per Year
24	7	365

**MATERIAL INFORMATION**

Material Code	Material Throughput	Unit Code
NATURAL GAS	69.9	MMCF

Material Description	NATURAL GAS
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VOC Content (coatings or solvent)	% by Weight	Density	0.04 LB/FT3
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BTUs (fuel)	916 BTU/FT3
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Sulfur Content (fuel)	0.01 % by Weight	Ash Content (fuel)	% by Weight
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**ATTACHMENT:**

Document Name: Linn's Engine Spec Sample

File Name: LINN Sample Eng. Spec. Emis. Calcs. -.pdf



## Michigan Department of Environmental Quality - Air Quality Division

## Michigan Air Emissions Reporting System (MAERS)

## 2017 Emissions Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE2</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>CO</b>	Annual Emissions	<b>7180 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>98.80</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>80 %</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>39891 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>548.90</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>5.74 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>5.74 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE2</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>43.59 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>4787 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>65.87</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>50 %</b>
Comment			





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUFUGITIVES</b>
SCC	<b>31088801</b>	Material Code	<b>VALVE</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>9216 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>3.60</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / EACH-YR</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUGLYCOLDEHY</b>
SCC	<b>31000323</b>	Material Code	<b>GLYCOL</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>10.12 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.20</b>	Exponent	<b>1</b>
Emission Factor Unit Code	<b>LB / YR-GPM</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	Emissions	AQD Source ID (SRN)	N5831	EU ID	EUTANKS
SCC	40400301	Material Code	CRUDE OIL		

<b>EMISSION INFORMATION</b>				
Pollutant Code	VOC	Annual Emissions	725.76 LB	
Emission Basis	MAERS EF			
List Emission Factor	3.60	Exponent	1	
Emission Factor Unit Code	LB / KGAL-YR	Control Efficiency	%	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>			
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>
		EU ID	<b>EUENGINE1</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>CO</b>	Annual Emissions	<b>35427 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>494.01</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>39363 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>548.90</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>5.67 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>5.67 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE1</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>43.01 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>9447 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>131.74</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUTANKS</b>
SCC	<b>40400302</b>	Material Code	<b>CRUDE OIL</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>11.7 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>1.10</b>	Exponent	<b>0</b>	
Emission Factor Unit Code	<b>LB / E3 GAL</b>	Control Efficiency	<b>%</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUTANKS</b>
SCC	<b>40600132</b>	Material Code	<b>CRUDE OIL</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>21.28 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>2.00</b>	Exponent	<b>0</b>	
Emission Factor Unit Code	<b>LB / E3 GAL</b>	Control Efficiency	<b>%</b>	
Comment				



## Michigan Department of Environmental Quality - Air Quality Division

## Michigan Air Emissions Reporting System (MAERS)

## 2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE3</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>CO</b>	Annual Emissions	<b>7556 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>98.80</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>80 %</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>41976 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>548.90</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>6.04 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>6.04 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE3</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>45.87 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>5037 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>65.87</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>50 %</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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**FORM REFERENCE**

Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE4</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

**EMISSION INFORMATION**

Pollutant Code	<b>CO</b>	Annual Emissions	<b>7844 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>109.18</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>80 %</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>NOX</b>	Annual Emissions	<b>32655 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>454.90</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>5.67 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>5.67 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE4</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>43.05 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>5444 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>75.82</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>50 %</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE5</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>CO</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>3.79</b>	Exponent	<b>3</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>2.25</b>	Exponent	<b>3</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE5</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>0 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>0 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>3.02</b>	Exponent	<b>1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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**FORM REFERENCE**

Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE6</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

**EMISSION INFORMATION**

Pollutant Code	<b>CO</b>	Annual Emissions	<b>59086 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>689.79</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>80 %</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>NOX</b>	Annual Emissions	<b>32014 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>373.64</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>90 %</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>829.85 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

**EMISSION INFORMATION**

Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>829.85 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINE6</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>51.37 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>4308 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>50.30</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>50 %</b>	
Comment				



**Michigan Department of Environmental Quality - Air Quality Division**

**Michigan Air Emissions Reporting System (MAERS)**

**2017 Emissions Form**

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINEH29</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>CO</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>3.79</b>	Exponent	<b>3</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>2.25</b>	Exponent	<b>3</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>0 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>9.69</b>	Exponent	<b>0</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			





Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINEH29</b>
SCC	<b>20200253</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>0 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>0 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>3.02</b>	Exponent	<b>1</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

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<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINEH29 NEW</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>CO</b>	Annual Emissions	<b>6820 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>512.52</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>80 %</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>NOX</b>	Annual Emissions	<b>35880 LB</b>	
Emission Basis	<b>Other</b>			
List Emission Factor	<b>542.35</b>	Exponent		
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>PM10,PRIMARY</b>	Annual Emissions	<b>5.52 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				

<b>EMISSION INFORMATION</b>				
Pollutant Code	<b>PM2.5,PRIMRY</b>	Annual Emissions	<b>5.52 LB</b>	
Emission Basis	<b>MAERS EF</b>			
List Emission Factor	<b>7.90</b>	Exponent	<b>-2</b>	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>	
Comment				



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Emissions Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>					
Form Type	<b>Emissions</b>	AQD Source ID (SRN)	<b>N5831</b>	EU ID	<b>EUENGINEH29 NEW</b>
SCC	<b>20200254</b>	Material Code	<b>NATURAL GAS</b>		

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>SO2</b>	Annual Emissions	<b>41.93 LB</b>
Emission Basis	<b>MAERS EF</b>		
List Emission Factor	<b>6.00</b>	Exponent	<b>-1</b>
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>%</b>
Comment			

<b>EMISSION INFORMATION</b>			
Pollutant Code	<b>VOC</b>	Annual Emissions	<b>3860 LB</b>
Emission Basis	<b>Other</b>		
List Emission Factor	<b>116.61</b>	Exponent	
Emission Factor Unit Code	<b>LB / MMCF</b>	Control Efficiency	<b>50 %</b>
Comment			



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Preparer Form

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	Preparer	AQD Source ID (SRN)	N5831

<b>PREPARER'S INFORMATION</b>			
Preparer's First Name, Middle Initial	Carolann	Preparer's Last Name	Knapp
Preparer's Title	Regional EH&S Rep		
Mailing Address (Street Address 1)	1165 Elkview Drive		
Mailing Address (Street Address 2)	P.O. Box 1256		
City	Gaylord	State/Province	MI
Country	USA	Zip Code	49734
E-Mail Address (if available)	carolann.knapp@breitburn.com		
Telephone Number	(989) 7320020	Telephone Extension	369
Fax Number	()		

<b>PREPARER'S ID (only complete this area if you have more than one preparer)</b>



Michigan Department of Environmental Quality - Air Quality Division

Michigan Air Emissions Reporting System (MAERS)

2017 Submittal Form

(Required Form)

Authorized under 1994 P.A. 451, as amended. Completion of information is required. Civil and/or criminal penalties possible for providing false information.

<b>FORM REFERENCE</b>			
Form Type	<b>Submittal</b>	AQD Source ID (SRN)	<b>N5831</b>

<b>SOURCE IDENTIFICATION</b>			
Source Name	<b>Breitburn_Linn Operating, LLC - Hayes 29 CPF</b>		
Mailing Address (Street Address 1)	<b>10875 Geronimo Trail</b>		
Mailing Address (Street Address 2)	<b>SW4 T29N R4W SEC 29</b>		
County	<b>OTSEGO</b>	City	<b>GAYLORD</b>
		Zip Code	<b>49735-</b>
Submittal Method	<b>Electronic</b>		Amended Submittal

<b>PRIMARY PREPARER'S AUTHORIZATION</b>			
Based on information and belief formed after reasonable inquiry, the statements and information in this submittal are true, accurate, and complete.			
Primary Preparer	<b>Carolann Knapp</b>		
Telephone Number	<b>(989)7320020</b>	Telephone Extension	<b>(989)7320020</b>
E-Mail Address (if available)	<b>carolann.knapp@breitburn.com</b>		
Signature		Date	

# **LINN OPERATING, LLC**

## **PREVENTATIVE MAINTENANCE/ MALFUNCTION ABATEMENT PLAN AND EPA 40 CFR, Part 63 Subpart ZZZZ MAINTENANCE PLAN**

**For**

**HAYES 29  
CENTRAL PRODUCTION FACILITY  
HAYES TOWNSHIP, OTSEGO COUNTY, MI  
SRN 5831**

**January 7, 2019**

### **Compressor Engine Identification**

<b>Engines (make/model):</b>	Caterpillar 3516 LE
<b>Unit No.</b>	3956
	Low Emission/ Lean Burn
<b>Horsepower:</b>	1085
<b>Control</b>	Oxidation Catalyst and AFRC

### **Purpose of Oxidation Catalyst**

Oxidation catalysts used on lean burn engines reduce carbon monoxide (CO), volatile organic compounds (VOCs) and trace toxic air contaminants, which include hazardous air pollutants (HAPs) emissions.

### **Engine Operating Variables To Be Monitored**

A copy of the normal field maintenance report and the compressor monthly operating reports are identified as Attachment 1a and 1b, respectively.

### **Malfunction Corrective Procedures**

The engine will be shut down immediately if a malfunction event occurs. Repair work will be completed, the amount of time the engine is down, and the repairs performed will be recorded on the Field Maintenance Report. The catalyst (if impacted) will be inspected prior to engine start up. Note that new engines, or engines that have been recently overhauled or major repairs performed, should be run at the maximum available load for a period of at least 100 hours, before the catalyst element is installed. This allows the new engine components to break in and most major problems associated with engine start up to be resolved, protecting the catalyst element. If major engine work occurs, LINN should document the amount of time the engine is operated without the catalyst on the attached log in Attachment 2.

### **Major Parts Replacement Inventory**

Major replacement parts (including a spare catalyst element) are kept in inventory for quick replacement in the event it is required. Parts inventory is maintained by a subcontractor.

## **Oxidation Catalyst Operating Variables to Be Monitored**

### **Unit 3956**

<b>Operating Variable</b>	<b>Normal Range*</b>	<b>Method of inspections</b>	<b>Frequency</b>
Catalyst Inlet Temperature	>750° F	Visual inspection (thermocouple reading)	Daily
Catalyst Outlet Temperature	>750° F <1,350° F	Visual inspection (thermocouple reading)	Daily
Pressure Differential across Catalyst	5.4” of water column#	Visual inspection (gauge reading)	Monthly

\*Catalyst inlet and outlet temperature and calibrated pressure differential ranges have been substantiated by utilizing a portable analyzer on three separate occasions. Maintenance and analyzer data is available in Attachment 3. The analyzer will be utilized to verify (when applicable) the CO reduction is at least 80%.

#Currently, a new baseline is being established based upon observed readings. The current actionable pressure differential is 7.4” w.c., or 2” w.c. above the substantiated range.

## **Corrective Procedures in the Event of a Malfunction**

If an operating variable listed above is out of the specified range the following steps will be taken:

1. Within 5 days check emissions reduction efficiencies for CO and NO<sub>x</sub> with a portable emissions analyzer. If efficiencies are within manufacturer’s specifications (80% for CO 0% for NO<sub>x</sub>) nothing more will be done. LINN may submit the Change in Oxidation Catalyst Operating Variable Notification Form (Attachment 4) to the MDEQ District Supervisor to revise the catalyst operating variable range, if applicable. If efficiencies are not within manufacturer’s specifications, proceed to step 2.
2. Within 5 days after step 1 above is completed, the catalyst will be removed and cleaned by vacuuming the catalyst face or using clean compressed air over the catalyst face. The catalyst gasket will also be replaced. The catalyst will be returned to service and emissions re-checked. If the catalyst still does not meet efficiency goals, remove the catalyst and send to vendor for cleaning. Install a replacement catalyst during vendor cleaning process.



### **AFRC O<sub>2</sub> Sensor Replacement Schedule**

O<sub>2</sub> sensors for the AFRC will be replaced quarterly. Records shall be kept of the O<sub>2</sub> sensor replacements.

### **Emission Checks- Use of a Portable Emissions Analyzer**

- a. The analyzer will be calibrated as required by the manufacturer. Records of calibration will be kept on file and made available to the Air Quality District Supervisor upon request.
- b. The analyzer will be used only for CO and NO<sub>x</sub>.
- c. The analyzer will be used monthly, and, to either (1) check the performance of a catalyst if a monitored parameter is out of range (as discussed above); or (2) when a cleaned catalyst is installed, typically every 12 to 18 months.
- d. LINN will conduct catalyst inlet and outlet checks to estimate destruction efficiency.
- e. Records shall be kept of destruction efficiency analysis.

### **Scheduled Maintenance**

- a. The catalyst will be inspected and cleaned by vacuuming the catalyst face or blowing with clean compressed air every 12-18 months unless the operating variables specified above are out of their respective ranges.
- b. After inspection and cleaning, the catalyst shall be returned to service and emission reduction testing shall be performed. If the catalyst does not respond to the field cleaning, it will be sent to the manufacturer for a chemical cleaning. A replacement catalyst media will be used during the cleaning process in the interim.
- c. The oxidation catalyst gasket will be replaced when the catalyst is serviced (typically every 12-18 months).
- d. The catalyst will be replaced if it is demonstrated that it is not functioning properly after the vendor cleaning, or in lieu of vendor cleaning.

**Scheduled Maintenance as indicated in Table 2d to Subpart ZZZZ:**

<b>8. Non-Emergency, non-black start 4SLB remote stationary RICE &gt;500 HP</b>	a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first; <sup>1</sup>
	b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary;
	c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary;

**§63.6625(i)** If you own or operate a stationary engine that is subject to the work, operation or management practices in items 1, 2, or 4 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. **§63.6625(j)** If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil before continuing to use the engine. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

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<sup>1</sup> Sources have the option to utilize an oil analysis program as described in section 63.6625 (i) and (j) in order to extend the specified oil change requirement in Table 2d of this Subpart ZZZZ.

**Supervisory Personnel Responsible for Maintenance of the Control Equipment**

Christopher Zimmerman  
Production Foreman  
4890 Airport Road  
Lewiston, MI 49756  
Office Phone: 989.786.7592  
Cell Phone: 989.370.7654

**Retention of Records**

Records shall be kept on file and retained as described in the permit.

**Updates of PM/MAP**

Updates of the plan will be submitted to the AQD District Supervisor for written approval. If an operating variable range is modified using the Change in Oxidation Catalyst Operating Variable Notification Form, the PM/MAP will be updated to reflect the new range, as necessary. See Attachment 4.

# Compressor Monthly Operating Report

UNIT# \_\_\_\_\_

LOCATION \_\_\_\_\_

OPERATOR \_\_\_\_\_

MONTH/YEAR \_\_\_\_\_

ENGINE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
RPM																															
Eng JW temp																															
Eng oil pres																															
Eng oil temp																															
Eng hours																															
Manifold pres																															
Turbo temp																															
Pre-catalyst temp																															
Post-catalyst temp																															
Compressor																															
Suction pres																															
1ST int pres																															
2ND int pres																															
3RD int pres																															
Disch pres																															
Suction temp																															
1st disch temp																															
2ND Suc temp																															
2ND dis temp																															
3RD Suc temp																															
3RD dis temp																															
4TH Suc temp																															
Disch temp																															
Comp oil pres																															
Comp oil temp																															
Fluid levels																															
Down time hrs																															

REASON FOR DOWNTIME

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**Hayes 29**  
**Unit #3956**

Year: \_\_\_\_\_

**Record of Time Engine Operated Without the Catalytic Converter**

Total allowable per unit is 200 hours in 12 month period (not calendar year).

<b>Time/Date of Engine Malfunction</b>	<b>Time/Date of Engine Repair</b>	<b>Reason</b>	<b>Total Hours Down</b>	<b>Total Hours 12 Month Time Period</b>

Only record time engine operated without catalytic converter, not amount of time engine was shut down

Operator Signature \_\_\_\_\_

Submit to Chris Zimmerman monthly.

CATALYST MONTHLY OPERATING REPORT

UNIT#	LOCATION	CUSTOMER	DATE OF SERVICE	PRE TEMP	POST TEMP	TEMP DIFF	DIFFERENTIAL PRESSURE IN W.C	SUCTION	DISCHARGE PRESSURE	RPM	COMMENTS
3956	Hayes 29	LINN									
ESTABLISHED BASELINE 8/20/13							ESTABLISHED BASELINE 1/14/13				
TEMP DIFF BASELINE		48	0				W/C DIFF	4.6			
			9/20/2013	837	814	-23	1.5	-1.4	990	1027	
			9/25/2013	881	855	-26	6.5	2.8	980	1177	
			9/30/2013	886	864	-22	6	-1.4	990	1167	
			10/2/2013	882	860	-22	6.5	-1.8	980	1170	
			10/8/2013	867	845	-22	6.4	-1.5	1000	1120	
			10/10/2013	870	848	-22	6.5	-1.3	985	1120	
			10/12/2013	870	848	-22	6.5	-1.3	985	1120	
			10/14/2013	880	856	-24	6.5	-1.9	985	1163	
			10/18/2013	870	848	32	11	-1.7	990	1165	
			10/22/2013	872	850	-22	6	-1.9	985	1167	
			10/24/2013	874	852	-22	6	-2	990	1158	
			10/28/2013	860	838	-22	6	-2.2	995	1168	
			10/29/2013	859	837	-22	6	-2.5	990	1170	
			10/31/2013	852	830	-22	6	2.5	1010	1163	
ESTABLISHED BASELINE 11/1/13							ESTABLISHED BASELINE 1/14/13				
TEMP DIFF BASELINE		-24	0				W/C DIFF	5.5			
			11/5/2013	851	831	-20	6	-2.5	995	1166	
			11/7/2013	858	839	-19	6	-0.1	990	1200	
			11/15/2013	834	813	-21	4.5	-2.2	995	1133	
			11/19/2013	819	796	-23	2.5	-3.9	990	1019	
			11/21/2013	829	810	-19	4.5	-2.5	985	1118	
			11/26/2013	821	800	-21	4	-2.3	995	1089	

Attachment 4

**LINN Operating, LLC**  
CHANGE IN CATALYTIC CONVERTER OPERATING VARIABLE  
NOTIFICATION FORM

**FACILITY NAME** \_\_\_\_\_

**SRN No.** \_\_\_\_\_

**PERMIT No.** \_\_\_\_\_

**UNIT No.** \_\_\_\_\_

DATE	CATALYST OPERATING VARIABLE	OLD RANGE	NEW RANGE

Description of why/how range was modified. Include testing data to document range modifications.

If a range is changed the PM/MAP will be updated and submitted to DEQ District Supervisor.





## RENEWABLE OPERATING PERMIT M-001: RULE 215 CHANGE NOTIFICATION RULE 216 AMENDMENT/MODIFICATION APPLICATION

*This information is required by Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment.*

1. SRN N5831	2. ROP Number MI-ROP-N5831-2014b	3. County Otsego
4. Stationary Source Name Riverside Energy Michigan-Hayes 29 Cpf, Section 2		
5. Location Address 10875 Geronimo Trail		6. City Gaylord
<p>7. Submittal Type - <i>The submittal must meet the criteria for the box checked below. Check only one box. Attach a mark-up of the affected ROP pages for applications for Rule 216 changes.</i></p> <p><input type="checkbox"/> Rule 215(1) Notification of change. <i>Complete Items 8 – 10 and 14</i></p> <p><input type="checkbox"/> Rule 215(2) Notification of change. <i>Complete Items 8 – 10 and 14</i></p> <p><input type="checkbox"/> Rule 215(3) Notification of change. <i>Complete Items 8 – 11 and 14</i></p> <p><input checked="" type="checkbox"/> Rule 215(5) Notification of change. <i>Complete Items 8 – 10 and 14</i></p> <p><input checked="" type="checkbox"/> Rule 216(1)(a)(i)-(iv) Administrative Amendment. <i>Complete Items 8 – 10 and 14</i></p> <p><input type="checkbox"/> Rule 216(1)(a)(v) Administrative Amendment. <i>Complete Items 8 – 14. Results of testing, monitoring &amp; recordkeeping must be submitted. See detailed instructions.</i></p> <p><input type="checkbox"/> Rule 216(2) Minor Modification. <i>Complete Items 8 – 12 and 14</i></p> <p><input type="checkbox"/> Rule 216(3) Significant Modification. <i>Complete Items 8 – 12 and 14, and provide any additional information needed on ROP application forms. See detailed instructions.</i></p> <p><input type="checkbox"/> Rule 216(4) State-Only Modification. <i>Complete Items 8 – 12 and 14</i></p>		
8. Effective date of the change. (MM/DD/YYYY) <i>See detailed instructions.</i> 08/01/2019		9. Change in emissions? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p>10. Description of Change - <i>Describe any changes or additions to the ROP, including any changes in emissions and/or pollutants that will occur. If additional space is needed, complete an Additional Information form (AI-001).</i></p> <p>Request to change Hayes 29 ownership name from Riveria Resources to Riverside Energy Michigan. And also to request that James Schramski be our Responsible Official.</p>		
11. New Source Review Permit(s) to Install (PTI) associated with this application? If Yes, enter the PTI Number(s) _____		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
12. Compliance Status - <i>A narrative compliance plan, including a schedule for compliance, must be submitted using an AI-001 if any of the following are checked No.</i>		
a. Is the change identified above in compliance with the associated applicable requirement(s)?		<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Will the change identified above continue to be in compliance with the associated applicable requirement(s)?		<input type="checkbox"/> Yes <input type="checkbox"/> No
c. If the change includes a future applicable requirement(s), will timely compliance be achieved?		<input type="checkbox"/> Yes <input type="checkbox"/> No
13. Operator's Additional Information ID - <i>Create an Additional Information (AI) ID for the associated AI-001 form used to provide supplemental information.</i>		AI
14. Contact Name Carolann Knapp	Telephone No. 231-631-2995	E-mail Address Cknapp@riversideem.com
15. This submittal also updates the ROP renewal application submitted on ____/____/____ <i>(If yes, a mark-up of the affected pages of the ROP must be attached.)</i>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A

**NOTE: A CERTIFICATION FORM (C-001) SIGNED BY A RESPONSIBLE OFFICIAL MUST ACCOMPANY ALL SUBMITTALS**

For Assistance  
Contact: 800-662-9278

[www.michigan.gov/egle](http://www.michigan.gov/egle)

EQP 5775 (Rev.04-2019)



## RENEWABLE OPERATING PERMIT APPLICATION C-001: CERTIFICATION

*This information is required by Article II, Chapter 1, part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to provide this information may result in civil and/or criminal penalties. Please type or print clearly.*


**This form is completed and included as part of Renewable Operating Permit (ROP) initial and renewal applications, notifications of change, amendments, modifications, and additional information.**

Form Type C-001	SRN N5831
-----------------	-----------

Stationary Source Name Riverside Energy Michigan-Hayes 29 Cpf, Section 2	
City Gaylord, MI	County Otsego

<b>SUBMITTAL CERTIFICATION INFORMATION</b>	
1. Type of Submittal <i>Check only one box.</i>	
<input type="checkbox"/> Initial Application (Rule 210)	<input checked="" type="checkbox"/> Notification / Administrative Amendment / Modification (Rules 215/216)
<input type="checkbox"/> Renewal (Rule 210)	<input type="checkbox"/> Other, describe on AI-001
2. If this ROP has more than one Section, list the Section(s) that this Certification applies to <u>2</u>	
3. Submittal Media <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Disk <input type="checkbox"/> Paper	
4. Operator's Additional Information ID - Create an Additional Information (AI) ID that is used to provide supplemental information on AI-001 regarding a submittal.	
AI	

<b>CONTACT INFORMATION</b>	
Contact Name Carolann Knapp	Title Compliance Coordinator
Phone number 231-631-2995	E-mail address cknapp@riversideem.com

<b>This form must be signed and dated by a Responsible Official.</b>				
Responsible Official Name James Schramski			Title VP Operations	
Mailing address 10691 E. Carter Rd				
City Traverse City	State MI	ZIP Code 49684	County Grand Traverse	Country USA
<b>As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this submittal are true, accurate and complete.</b>				
 _____ Signature of Responsible Official			<u>8/13/19</u> _____ Date	



RECEIVED

NOV 12 2019

## RENEWABLE OPERATING PERMIT APPLICATION C-001: CERTIFICATION

This information is required by Article II, Chapter 1, part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to provide this information may result in civil and/or criminal penalties. Please type or print clearly.

MAERS FILE MAERS


**This form is completed and included as part of Renewable Operating Permit (ROP) initial and renewal applications, notifications of change, amendments, modifications, and additional information.**

Form Type <b>C-001</b>	SRN N5831
------------------------	-----------

Stationary Source Name Riverside Energy Michigan-Hayes 29 CPF	
City Gaylord	County Otsego

<b>SUBMITTAL CERTIFICATION INFORMATION</b>	
1. Type of Submittal <i>Check only one box.</i>	
<input type="checkbox"/> Initial Application (Rule 210)	<input type="checkbox"/> Notification / Administrative Amendment / Modification (Rules 215/216)
<input type="checkbox"/> Renewal (Rule 210)	<input checked="" type="checkbox"/> Other, describe on AI-001
2. If this ROP has more than one Section, list the Section(s) that this Certification applies to <u>2</u>	
3. Submittal Media <input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Disk <input checked="" type="checkbox"/> Paper	
4. Operator's Additional Information ID - Create an Additional Information (AI) ID that is used to provide supplemental information on AI-001 regarding a submittal. <b>AI PMPAP</b>	

<b>CONTACT INFORMATION</b>	
Contact Name Carolann Knapp	Title Compliance Coordinator
Phone number 231-995-4130	E-mail address cknapp@riversideem.com

<b>This form must be signed and dated by a Responsible Official.</b>				
Responsible Official Name James Schramski			Title VP Operations	
Mailing address 10691 E. Carter Rd., Ste 201				
City Traverse City	State MI	ZIP Code 49684	County Grand Traverse	Country USA
<b>As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this submittal are true, accurate and complete.</b>				
 Signature of Responsible Official			<u>11/8/19</u> Date	



# RENEWABLE OPERATING PERMIT APPLICATION

## AI-001: ADDITIONAL INFORMATION

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.*

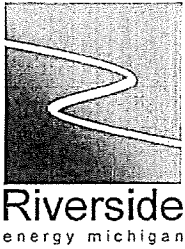
SRN: N5831	Section Number (if applicable): 2
------------	-----------------------------------

1. Additional Information ID <b>AI</b> -PMMAP
--

### Additional Information

2. Is This Information Confidential?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
--------------------------------------	---

Submitting a revised Preventative Maintenance & Malfunction Abatement Plan for Riverside Energy Michigan



10691 East Carter Road  
Suite 201  
Traverse City, MI 49684

T: +1 231 995 4000  
F: +1 231 943 2129  
www.RiversideEM.com

RECEIVED  
AQD

NOV 12 2019

November 7, 2019

Department of Environmental Quality  
Air Quality Division  
120 W. Chapin St.  
Cadillac, MI 49601-2158

MACES \_\_\_\_\_ MAERS \_\_\_\_\_  
FILE \_\_\_\_\_

Attn: Jodi Lindgren

Re: Preventative Maintenance/Malfunction Abatement Plan for the Hayes 29 CPF  
Permit #MI-ROP-N5831 Section 2

Dear Jodi,

Attached please find the Preventative Maintenance & Malfunction Abatement Plan for Riverside's Section 2 of the Hayes 29 CPF, referenced above. And per your direction, you will also find enclosed a signed and completed C-001 Certification Form as well as an A-001 form that are required documents for the application renewal process.

If you have any questions regarding this PM/MAP, please call (231) 995-4130 or reach me at [cknapp@riversideem.com](mailto:cknapp@riversideem.com).

Sincerely,

A handwritten signature in cursive script that reads "Carolann Knapp".

Carolann Knapp  
Compliance Coordinator

Enclosures



10691 East Carter Road  
Suite 201  
Traverse City, MI 49684

T: +1 231 995 4000  
F: +1 231 943 2129  
www.RiversideEM.com

RECEIVED  
AQD

> NOV 12 2019

MACES  MAERS \_\_\_\_\_  
FILE MAP

November 7, 2019

Department of Environmental Quality  
Air Quality Division  
120 W. Chapin St.  
Cadillac, MI 49601-2158

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Re: Preventative Maintenance/Malfunction Abatement Plan for the Hayes 29 CPF  
Permit #MI-ROP-N5831 Section 2

Dear Jodi,

Attached please find the Preventative Maintenance & Malfunction Abatement Plan for Riverside's Section 2 of the Hayes 29 CPF, referenced above. And per your direction, you will also find enclosed a signed and completed C-001 Certification Form as well as an A-001 form that are required documents for the application renewal process.

If you have any questions regarding this PM/MAP, please call (231) 995-4130 or reach me at [cknapp@riversideem.com](mailto:cknapp@riversideem.com).

Sincerely,

A handwritten signature in blue ink that reads "Carolann Knapp".

Carolann Knapp  
Compliance Coordinator

Enclosures



**PREVENTATIVE MAINTENANCE &  
MALFUNCTION ABATEMENT PLAN**

**RIVERSIDE ENERGY MICHIGAN, LLC**

**HAYES 29 CPF  
MI-ROP-N5831**

**10875 GERONIMO TRAIL  
GAYLORD, MI 49735  
OTSEGO COUNTY**

**November 7, 2019**

## TABLE OF CONTENTS

	<b>Page No.</b>
1.0 INTRODUCTION	3
2.0 ENGINES AND CATALYTIC CONTROL UNITS	3
3.0 RECORDKEEPING	4
4.0 UPDATES	5

### **APPENDIXES:**

Appendix A – List of Facility Specific Equipment Covered by this PM/MAP

Appendix B – Monthly Operating Report

Appendix C – Catalyst Monthly Operating Report



## **1.0 INTRODUCTION**

Central Production Facility (CPF) receives gas from natural gas wells in the area. Gas is dehydrated and compressed prior to flowing to sales points. Riverside Energy Michigan, LLC (Riverside) uses both rich burn and lean burn engines at its facilities. Generally, there are no add-on control devices for lean burn engines. However, a few of Riverside's lean burn engines are equipped with oxidation catalytic control systems. The text of this PM/MAP is uniform for all of Riverside's facilities.

The text of this PM/MAP is uniform for all of Riverside's facilities. The cover page and the specific engine and catalyst information (if applicable) shown in Appendix A will be unique to each facility.

### **1.1 CONTACT PERSON**

Any questions regarding this PM/MAP should be directed to Mr. Chris Matts, Operations Supervisor – Special Projects, at 989-732-4146, ext. 4112, or Ms. Natalie Schrader, Compliance Coordinator, at 231-995-4076.

## **2.0 ENGINES AND CATALYTIC CONTROL UNITS**

### **2.1 Description**

Hayes 29 CPF has (1) natural gas fired combustion engine which is identified in Appendix A. It is equipped with a Oxidation Catalyst. Oxidation Catalysts used on lean-burn engines reduce CO, VOC and trace organic toxic air contaminants (TACs), which include hazardous air pollutants (HAPS). Information on all on-site engines is stored and updated in a compressor database and/or spreadsheet.

### **2.2 Operation of Catalytic Converters**

For both 3-way catalysts and oxidation catalysts, the hot exhaust gases from the engine pass through a catalytic reduction bed where the reduction and oxidation occur. An oxidation catalyst requires higher oxygen levels to allow the converter bed to oxidize the CO, VOC and trace organic TACs/HAPs. The exhaust gases then pass out a stack.

### **2.3 Critical Criteria**

Preventive maintenance of the engines is done to keep the engines operating properly and to extend their life span. Any major malfunction of the engine will cause it to automatically shut down and activate the alarm, leading to its being taken out of service for repair. Each engine has a control panel that will indicate critical malfunctions and will initiate an engine shutdown if necessary. In the event of a shutdown, the contract mechanic is called out to repair the engine and a record of the event is made. Records are kept in Riverside's database.

The critical criteria for the operation of the catalytic converter are the oxygen content of the incoming gases, the pressure drop across the catalyst bed and the inlet and outlet temperatures. If the oxygen content is too high for a 3-way catalytic converter, the NO<sub>x</sub> reduction reaction will not yield the desired 90% decrease in concentration. Similarly, for oxidation catalysts, if the oxygen level drops to low, the proper oxidation of CO, VOC and trace TACs/HAPs will decrease. For lean burn engines, the oxygen level should be enough to ensure that the oxygen content of the exhaust gases will remain adequate to allow proper oxidation.

A high-pressure drop may be an indication of plugging of the catalyst, and a very low one may indicate the catalyst bed has leakage around or through it. A high outlet temperature may also be an indication of the need to shut down the unit to prevent burnout of the catalyst. Typical operating temperature ranges for a 3-way catalyst is 750° F to 1350° F. But is not uncommon for an oxidation catalyst to perform as inverted temperatures, with the proper reduction still performing.

## **2.4 Catalyst Inspections and Maintenance**

To reduce the chance of fouling problems with a 3-way catalyst and oxidation catalysts, if an engine is new or major maintenance is performed, the engine could run for up to 100 hours without the catalyst installed. The engine may run without the catalytic converter for a maximum of 200 hours per year (per permit conditions). Records will be maintained of the engine hours of operation without the catalyst. All catalysts will be equipped with pre-and post-catalyst temperature sensors. If the post-catalyst temperature on a 3-way catalyst is less than the pre-catalyst temperature, a service person will be called out to investigate. Temperature rise will not be used as a measure of oxidation catalyst performance.

Preventative maintenance schedule for Riverside engines and catalysts is included in Table 1. A log of all inspections and maintenance work will be maintained in a database or spreadsheet. A schedule is maintained for each engine and its add-on control devices (see Table 2 “Operating Variables and Remedial Actions”).

Third party compressor maintenance personnel are responsible for overseeing inspection, maintenance and repair of all add-on control devices.

## **2.5 Spare / Replacement Parts**

All engine replacement parts, catalyst insert kits and extra temperature probes will be maintained by the contracted maintenance service company. No spare or major replacement parts will be kept on site.

## **2.6 Key Operating Variables and Corrective Procedures in the Event of a Malfunction**

See Table 2 for a summary of the key operating variables and corrective actions for each malfunction.

### **3.0 RECORDKEEPING**

Records of engine operating hours and maintenance are kept and updated on Riverside's date server in a database or in a spreadsheet form. Appendix B is an example of data recorded each month by a contract service company; hard copy records of these reports are sent to the Riverside office at the end of each month. Appendix C is an example catalyst maintenance log. This data is recorded in a database or spreadsheet. All required records will be retained for a period of 5 years per permit conditions.

Riverside will keep all records necessary for demonstrating compliance with this PM/MAP. Records will be made available within two weeks from the date of request by the EGLE.

### **4.0 UPDATES**

If Riverside engines experience a malfunction that is not properly addressed in this Preventative Maintenance and Malfunction Abatement Plan, it will be updated and submitted to the EGLE District Supervisor for review and approval.

**Table 1  
Engine & Catalytic Converter Preventative Maintenance Schedule**

<b>Item</b>	<b>Activity</b>	<b>Equipment Status</b>	<b>Frequency</b>
Engine	Service * Check and adjust valves * Check engine compression * Check timing * Check fuel pressure * Check air filter * Change pre-air filter * Check all kill devices	Off line	Every 60-90 days
Engine	Major Service * Perform service as listed above * Change motor oil and filter	Off line	Approximately every 3,000 hours of engine operation.
Engine	Swing/Overhaul * Replace existing engine with rebuilt engine * When new/rebuilt engine is installed, or major maintenance is performed, the unit will be run without the catalyst, if applicable, for up to 100 hours per event. This prevents the catalyst from becoming damaged.	Off line	Approximately every 85,000 hours of engine operation, or as needed.
Catalyst	* Check Differential pressure across catalyst * Establish baseline $\Delta P$ each time a new CC or cleaned CC insert is installed at normal operating conditions (rpm's). Check monthly. If greater than baseline $\Delta P$ by 4" WC @ 80-100% max rpm, then inspect catalyst and take actions based on findings. * Check inlet and outlet temperatures across the catalyst * If the pre-catalyst temp. is less than 750°F, or another min. temp established through testing, a service person will be called out to investigate. * If the post-catalytic temp. exceeds 1350°F, the engine will be shut down. * If the $\Delta T$ across CC is negative, a service person will evaluate cause and determine a resolution, based on history and degree of change and	Online	Monthly

	establish engine specific $\Delta T$ through testing.		
--	---	--	--

**Table 1 Continued**  
**Engine and Catalytic Converter Preventative Maintenance Schedule**

<b>Item</b>	<b>Activity</b>	<b>Equipment Status</b>	<b>Frequency</b>
Catalyst	<ul style="list-style-type: none"> <li>* The catalytic converter shall be removed, inspected and cleaned at least once per 12-18 months. Cleaning will consist of vacuuming the catalyst face and washing the fouling and built up ash.</li> <li>* If the catalyst does not respond to the annual vacuum blowing treatment or washing, the catalyst will be shipped to the manufacturer and washed. A replacement catalyst insert shall be used.</li> <li>* Replace the gaskets (typically done when the catalyst is removed for any servicing).</li> <li>* Establish baseline.</li> </ul>	Offline	Every 12-18 months of catalyst operating time, or in the event of an engine malfunction where foreign fluids cause engine shutdown
Catalyst	<ul style="list-style-type: none"> <li>* Remove catalyst insert and wash in chemical solution to remove surface contamination</li> <li>* Replace with clean or fresh insert</li> <li>* Establish baseline.</li> </ul>	Offline	Every 18-24 months of operation
Portable Emission Analyzer	* Maintenance and calibration	On or offline	Testing will be done by Riverside or contract company on a 5-year schedule

**Appendix A  
Equipment Information**

<b>Facility</b>	<b>AQD</b>	<b>Unit #</b>	<b>Type</b>	<b>AFRC (Yes/No)</b>	<b>Model</b>	<b>Lean Burn or Standard</b>
HAYES 29	EUENGINEH 29	3956	OXIDATION	Yes	CATERPILLAR 3516, 1085 HP	Lean Burn

**Table 2 – Operating Variables and Remedial Actions**

<b>Device Description</b>	<b>Operating Variable</b>	<b>Monitoring Method</b>	<b>Frequency</b>	<b>Normal Operating Range</b>	<b>Corrective Procedure or operational Change in the Event of a Malfunction</b>	<b>Responsible Supervisor</b>
Catalyst	0-4" WC Change in $\Delta P$ @ normal operating conditions	Gauge or manometer	Monthly	Varies by engine. Recorded in database.	Remove and inspect catalyst insert within 3 days. Clean or replace if necessary, within 5 days.	Operations Manager, Contract Service Vendor
Catalyst	Inlet and Outlet temperatures	Thermocouple	Monthly or as Needed	Must be below 1350 degrees F. For 3-way catalysts only: Outlet temp. must be equal or greater than the catalytic inlet temp.	Engine will be shut down at 1200° F or greater. For 3-way catalysts: if outlet temperature is less than the inlet temperature, a mechanic will investigate within 3 days and make appropriate repairs within 5 days.	Operations Manager, Contract Service Vendor
Engine			As needed		Engine will be shut down	Operations Manager, Contract Service Vendor







## Puite, Tammie (EGLE)

---

**From:** Lindgren, Jodi (EGLE)  
**Sent:** Wednesday, November 20, 2019 4:28 PM  
**To:** Puite, Tammie (EGLE)  
**Subject:** FW: ROP Renewal Update  
**Attachments:** doc00046320191031153712.pdf

I keep forgetting to ask you about this. Remember when we were talking about the Riviera to Riverside name change for the Hayes section of the Wilderness/Hayes ROP? You had not seen the request yet. I did email Carolann concerning the need for the update. She responded saying she did submit the C-001 and M-001 forms requesting the change. The forms are attached. Is this what she needed to do? Are the original forms MIA or have they found their way to your desk since we spoke? Let me know if I need to request anything else from Riverside/Carolann.

Thank you!!

Jodi Lindgren  
Environmental Quality Analyst  
Air Quality Division / Cadillac District Office  
Michigan Department of Environment, Great Lakes, and Energy  
231-942-2863 | [LindgrenJ2@michigan.gov](mailto:LindgrenJ2@michigan.gov)  
**Follow Us | Michigan.gov/EGLE**

---

**From:** Carolann Knapp <[cknapp@riversideem.com](mailto:cknapp@riversideem.com)>  
**Sent:** Thursday, October 31, 2019 4:42 PM  
**To:** Lindgren, Jodi (EGLE) <[LindgrenJ2@michigan.gov](mailto:LindgrenJ2@michigan.gov)>  
**Subject:** FW: ROP Renewal Update

I had sent an M-001 & C-001 (attached) to Shane already, was that not the right form?

**From:** Lindgren, Jodi (EGLE) <[LindgrenJ2@michigan.gov](mailto:LindgrenJ2@michigan.gov)>  
**Sent:** Thursday, October 31, 2019 4:25 PM  
**To:** Carolann Knapp <[cknapp@riversideem.com](mailto:cknapp@riversideem.com)>  
**Subject:** ROP Renewal Update

Afternoon Carolann!

We need paperwork to reflect the correct ownership name in the renewal permit. We did get a notification letter stating that Riverside has taken ownership of Riviera holdings. However, we need the ROP renewal application updated as well. You can do this by resubmitting pages 1-3 (or others I may have missed with "Riviera") of the renewal application or you can submit forms C-001 and M-001 for an administrative modification. Please let me know if you have any questions.

Thank you!

Jodi Lindgren  
Environmental Quality Analyst  
Air Quality Division / Cadillac District Office  
Michigan Department of Environment, Great Lakes, and Energy

231-942-2863 | [LindgrenJ2@michigan.gov](mailto:LindgrenJ2@michigan.gov)

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