APPENDIX A
Air Permit Application Forms
(Revised November 2012)

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: Highlands Ethanol, LLC	
2. Site Name: Highlands Ethanol	
3. Facility Identification Number: N/A	
4. Facility Location... Street Address or Other Locator: FL SR 70 and FL SR 721 City: East of Brighton County: Highlands Zip Code: 33857	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☐ Yes ☒ No

Application Contact

1. Application Contact Name: Kyle Kekeisen
2. Application Contact Mailing Address. Organization/Firm: BP Biofuels – Highlands Street Address: 2202 N. West Shore Blvd., Suite 200 City: Tampa State: FL Zip Code: 33607
3. Application Contact Telephone Numbers... Telephone: (813) 574 - 0622 ext. Fax: (813) 639 - 7573
4. Application Contact E-mail Address: Kyle.Kekeisen@bp.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

[X] Air construction permit.

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

[ ] Initial Title V air operation permit.

[ ] Title V air operation permit revision.

[ ] Title V air operation permit renewal.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

[ ] Air construction permit and Title V permit revision, incorporating the proposed project.

[ ] Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

[ ] I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Revisions to construction permit #0550061-001-AC/PSD-FL-406 for Highlands Ethanol, expiration date 12/31/14.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
EU001	Feedstock Receiving	AC1A	N/A
EU002	Obsolete, emissions now vented to RTO (formerly liquid/solid separation)	AC1A	N/A
EU003	RTO (includes fermentation, distillation, propagation, liquid/solid separation, product loadout)	AC1A	N/A
EU004	Solids separation, dewatering, and loadout	AC1A	N/A
EU005	Denaturant and Product Storage	AC1A	N/A
EU006	Obsolete, emissions now vented to RTO (formerly Product Loadout)	AC1A	N/A
EU007	Anaerobic Digestion, Biogas Conditioning, and Biogas Backup Flare	AC1A	N/A
EU008	Biomass Boiler	AC1A	N/A
EU009	Obsolete (formerly Biomass Boiler No. 2)	AC1A	N/A
EU010	Peaking Gas Boiler	AC1A	N/A
EU011	Cooling Tower	AC1A	N/A
EU012	Misc. Storage Silos	AC1A	N/A
EU013	Misc. Storage Tanks	AC1A	N/A
EU014	Emergency Generators	AC1A	N/A
EU015	Fire Pump	AC1A	N/A
EU016	Fugitive VOC Equipment Leaks	AC1A	N/A

Application Processing Fee

Check one: ☐ Attached - Amount: $_____ ☒ Not Applicable

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : Dan Warden

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: BP Biofuels NA LLC
   Street Address: 501 Westlake Park Blvd
   City: Houston State: TX Zip Code: 77079

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: (713) 721 - 8678 ext. Fax: (713) 323 - 5226

4. Owner/Authorized Representative E-mail Address: dan.warden@bp.com

5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature

   6 Nov 2012
   Date

APPLICATION INFORMATION

Application Responsible Official Certification (NOT APPLICABLE – AIR CONSTRUCTION PERMIT APPLICATION ONLY)

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively. ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. ☐ The designated representative at an Acid Rain source or CAIR source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
5. Application Responsible Official E-mail Address:

APPLICATION INFORMATION

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

_____ _____

Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: Bradley S. Uhlmann Registration Number: 67917
2. Professional Engineer Mailing Address Organization/Firm: AMEC Environment & Infrastructure Street Address: 1432 Pontiac Place SE City: Atlanta State: GA Zip Code: 30316
3. Professional Engineer Telephone Numbers Telephone: (404) 963-1887 ext. Fax: (352) 333-6622
4. Professional Engineer E-mail Address: brad.uhlmann@amec.com

5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here [X], if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here , if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature

10/18/12

Date

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 493,200 North (km) 3,013,200		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
3. Governmental Facility Code: 0	4. Facility Status Code: C	5. Facility Major Group SIC Code: 28	6. Facility SIC(s): 2869
7. Facility Comment : Revisions to construction permit #0550061-001-AC/PSD-FL-406 for Highlands Ethanol, expiration date 12/31/14.			

Facility Contact

1. Facility Contact Name: Kyle Kekeisen
2. Facility Contact Mailing Address... Organization/Firm: BP Biofuels – Highlands Street Address: 2202 N. West Shore Blvd., Suite 200 City: Tampa State: FL Zip Code: 33607
3. Facility Contact Telephone Numbers: Telephone: (813) 574 - 0622 ext. Fax: (813) 639 - 7573
4. Facility Contact E-mail Address: Kyle.Kekeisen@bp.com

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name: Same as application Responsible Official.
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. [X] Title V Source	
4. [X] Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☐ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. [X] One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. [X] One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment: No synthetic restrictions on operations are being requested other than for the limit on annual natural gas consumption in the two boilers, and for the emergency engines and fire pump, which will be limited by 40 CFR 60, Subpart IIII.	

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
CO	A	
NO_X	A	
PM_{10}	A	
$PM_{2.5}$	A	
SO_2	A	
VOC	A	
NH_3	B	
Pb	B	
Total HAPs	B	
H001 - Acetaldehyde	B	
H006 - Acrolein	B	
H017 - Benzene	B	
H053 - Cumene	B	
H085 - Ethylbenzene	B	
H095 - Formaldehyde	B	
H104 - Hexane	B	

List of Pollutants Emitted by Facility (Continued)

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
H106 - Hydrochloric Acid	B	
H114 - Mercury	B	
H115 – Methanol	B	
H132 - Naphthalene	B	
H151 - Polycyclic Organic Matter	B	
H169 - Toluene	B	
H181 - 2,2,4-Trimethylpentane	B	
H186 - Xylenes	B	

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2.Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4.Hourly Cap (lb/hr)	5.Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:
No facility-wide or multi-unit emissions caps are being requested.

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Appendix C [ ] Previously Submitted, Date:_____

2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Figure 2-2 [ ] Previously Submitted, Date:_____

3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Section 5.3.2.6 [ ] Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location:
   [X] Attached, Document ID: Figure 2-1 [ ] Not Applicable (existing permitted facility)

2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL):
   [X] Attached, Document ID: Section 2.0

3. Rule Applicability Analysis:
   [X] Attached, Document ID: Section 4.0

4. List of Exempt Emissions Units:
   [X] Attached, Document ID: Appendix H [ ] Not Applicable (no exempt units at facility)

5. Fugitive Emissions Identification:
   [X] Attached, Document ID: Section 3.2 [ ] Not Applicable

6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.):
   [X] Attached, Document ID: Section 6 [ ] Not Applicable

7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.):
   [X] Attached, Document ID: Section 6 [ ] Not Applicable

8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.):
   [X] Attached, Document ID: Section 6 [ ] Not Applicable

9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.):
   [X] Attached, Document ID: Section 6.5 [ ] Not Applicable

10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.):
    [ ] Attached, Document ID:_____ [X] Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications (NOT APPLICABLE)

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications (NOT APPLICABLE)

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not a CAIR source)

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: Regenerative Thermal Oxidizer (RTO). The RTO handles emissions from liquid/solid separation, propagation, fermentation distillation, product storage shift tanks, and product loadout.

3. Emissions Unit Identification Number: EU003

4. Emissions Unit Status Code: C	5. Commence Construction Date: N/A	6. Initial Startup Date: N/A	7. Emissions Unit Major Group SIC Code: 28

8. Federal Program Applicability: (Check all that apply) N/A

[ ] Acid Rain Unit

[ ] CAIR Unit

9. Package Unit:
Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Regenerative thermal oxidizer, destruction of process hydrocarbons by combustion
2. Control Device or Method Code: 131

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 4,902 scf/hr (product loadout to flare option) or 14,134 scf/hr (product loadout to RTO option)
2. Maximum Production Rate: 39,420,000 gal/yr of ethanol
3. Maximum Heat Input Rate: 5 million Btu/hr (MMBtu/hr) (product loadout to flare option) or 14.42 MMBtu/hr (product loadout to RTO option)
4. Maximum Incineration Rate: pounds/hr N/A tons/day
5. Requested Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year 8760 hours/year
6. Operating Capacity/Schedule Comment: RTO will use natural gas to combust hydrocarbons from process areas. RTO capacity is 5 MMBtu/hr under the product loadout to flare option, or 14.42 MMBtu/hr under the product loadout to RTO option. It will destroy process VOCs with a destruction efficiency of 99%.

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: RTO	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: RTO stack		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 32.8 feet	7. Exit Diameter: 3 feet
8. Exit Temperature: 90 °F	9. Actual Volumetric Flow Rate: 20,000 acfm	10. Water Vapor: 5 %
11. Maximum Dry Standard Flow Rate: 20,000 dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493,219.07 North (km): 3,013,344	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Ethanol production by fermentation. RTO will use natural gas to combust hydrocarbons from process areas, storage shift tanks and product loadout.		
2. Source Classification Code (SCC): 30125010	3. SCC Units: Tons	
4. Maximum Hourly Rate: 14.8 tons	5. Maximum Annual Rate: 129,771 tons	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.02 gr/scf	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 3
10. Segment Comment:		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM10	**131**	**N/A**	**EL**
PM2.5	**131**	**N/A**	**EL**
SO2	**131**	**N/A**	**EL**
NOx	**131**	**N/A**	**EL**
CO	**131**	**N/A**	**EL**
VOC	**131**	**N/A**	**EL**
Total HAPs	**131**	**N/A**	**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.0110 lb/hour, 0.0482 tons/year (product loadout to flare option) or 0.0317 lb/hour, 0.0601 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0022 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: $PM_{2.5}$	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.0110 lb/hour, 0.0482 tons/year (product loadout to flare option) or 0.0317 lb/hour, 0.0601 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0022 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.0280 lb/hour, 0.1226 tons/year (product loadout to flare option) or 0.0807 lb/hour, 0.153 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0056 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NO_x	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.175 lb/hour, 0.767 tons/year (product loadout to flare option) or 0.505 lb/hour, 0.956 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.035 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 0.185 lb/hour, 0.810 tons/year (product loadout to flare option) or 0.533 lb/hour, 1.011 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.037 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 2.85 lb/hour, 12.47 tons/year (product loadout to flare option) or 7.50 lb/hour, 15.16 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0014 lb/MMBtu Reference: BACT	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: Total HAPs	2. Total Percent Efficiency of Control: 99%
3. Potential Emissions: 1.95 lb/hour, 8.54 tons/year (product loadout to flare option) or 2.29 lb/hour, 8.81 tons/year (product loadout to RTO option)	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: varies by HAP Reference: ASPEN model results; AP-42 Section 1.4 Natural Gas Combustion, July 1998	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 7

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 0.0110 lb/hour, 0.0482 tons/year or 0.0317 lb/hour, 0.0601 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM10 BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2_ of 7__

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 0.0110 lb/hour, 0.0482 tons/year or 0.0317 lb/hour, 0.0601 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM2.5 BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3_ of 7__

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 0.0280 lb/hour, 0.1226 tons/year or 0.0807 lb/hour, 0.153 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed SO2 BACT Emission Limit per 62-212.400(10) F.A.C.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 7

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 0.175 lb/hour, 0.767 tons/year or 0.505 lb/hour, 0.956 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed NOx BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5_ of 7_

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 0.185 lb/hour, 0.810 tons/year or 0.533 lb/hour, 1.011 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6_ of 7_

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 2.85 lb/hour, 12.47 tons/year or 7.50 lb/hour, 15.16 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 7 of 7

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions: Upon permit revision
3. Allowable Emissions and Units: 99% control	4. Equivalent Allowable Emissions: 1.95 lb/hour, 8.54 tons/year or 2.29 lb/hour, 8.81 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed HAPs BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation. N/A

Visible Emissions Limitation: Visible Emissions Limitation __of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring. N/A

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: Figure 2-2 [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: N/A [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Section 5 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   [ ] Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   [X] To be Submitted, Date (if known): After start-up
   Test Date(s)/Pollutant(s) Tested: _____
   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   [ ] Attached, Document ID: _____ [X] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [X] Attached, Document ID: Section 6 [ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [ ] Attached, Document ID:_____ [X] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications N/A

1. Identification of Applicable Requirements: [ ] Attached, Document ID: _____
2. Compliance Assurance Monitoring: [ ] Attached, Document ID: _____ [ ] Not Applicable
3. Alternative Methods of Operation: [ ] Attached, Document ID: _____ [ ] Not Applicable
4. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID: _____ [ ] Not Applicable

Additional Requirements Comment

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III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: Three emergency generators will be used in the event of power supply disruptions. The engines will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year. Emissions listed here are per each engine.

3. Emissions Unit Identification Number: EU014

4. Emissions Unit Status Code: C	5. Commence Construction Date: N/A	6. Initial Startup Date: N/A	7. Emissions Unit Major Group SIC Code: 28

8. Federal Program Applicability: (Check all that apply) N/A

[ ] Acid Rain Unit

[ ] CAIR Unit

9. Package Unit:
Manufacturer: TBD Model Number: TBD

10. Generator Nameplate Rating: 1.5 MW each (total of three units)

11. Emissions Unit Comment: Emergency Generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours each per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions assume maximum operations of 100 hours per year.

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description: None
2. Control Device or Method Code: N/A

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: N/A	
2. Maximum Production Rate: N/A	
3. Maximum Heat Input Rate: 14.59 MMBtu/hr	
4. Maximum Incineration Rate: N/A pounds/hr N/A tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	7 days/week
52 weeks/year	up to 100 hours/year
6. Operating Capacity/Schedule Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: N/A	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates. Zone: 17 East (km): TBD North (km): TBD	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Distillate (Diesel Oil) Reciprocating Internal Combustion Engine		
2. Source Classification Code (SCC): 20200102	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 0.104 each	5. Maximum Annual Rate: 10.42 each	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.0015	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 140
10. Segment Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. The maximum annual rate is based on an assumed maximum operating time of 100 hr/yr.		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM_{10}	N/A	N/A	EL
$PM_{2.5}$	N/A	N/A	EL
SO_2	N/A	N/A	EL
NO_X	N/A	N/A	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
HAPS*	N/A	N/A	NS
H001	N/A	N/A	NS
H006	N/A	N/A	NS
H017	N/A	N/A	NS
H095	N/A	N/A	NS
H169	N/A	N/A	NS
H186	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.661 lb/hour 0.0331 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.2 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years

10. Calculation of Emissions:
See emissions inventory calculations in Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:
The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.661 lb/hour 0.0331 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.2 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years

10. Calculation of Emissions:
See emissions inventory calculations in Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment: PM_{10} is a surrogate for $PM_{2.5}$. The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.0244 lb/hour 0.00122 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0074 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 19.0 lb/hour 0.952 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 5.76 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years

10. Calculation of Emissions:
See emissions inventory calculations in Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:
The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 11.57 lb/hour 0.579 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 3.5 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 2.12 lb/hour 0.106 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.64 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HAPS	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.058 lb/hour 0.0029 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: EPA AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.2 g/kW-hr	4. Equivalent Allowable Emissions: 0.661 lb/hour, 0.0331 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.2 g/kW-hr	4. Equivalent Allowable Emissions: 0.661 lb/hour, 0.0331 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0015% sulfur content	4. Equivalent Allowable Emissions: 0.0244 lb/hour 0.00122 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 5.76 g/kW-hr	4. Equivalent Allowable Emissions: 19.0 lb/hour 0.952 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 3.5 g/kW-hr	4. Equivalent Allowable Emissions: 11.57 lb/hour 0.579 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.64 g/kW-hr	4. Equivalent Allowable Emissions: 2.12 lb/hour 0.106 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring. N/A

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Figure 2-2 [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: NA [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Section 5 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [X] To be Submitted, Date (if known): : _____
   Test Date(s)/Pollutant(s) Tested: After Start-Up
   [ ] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   [ ] Attached, Document ID: _____ [X] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [ ] Attached, Document ID: _____ [X] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

1. Identification of Applicable Requirements: [ ] Attached, Document ID: _____
2. Compliance Assurance Monitoring: [ ] Attached, Document ID: _____ [ ] Not Applicable
3. Alternative Methods of Operation: [ ] Attached, Document ID: _____ [ ] Not Applicable
4. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID: _____ [ ] Not Applicable

Additional Requirements Comment

N/A

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
The diesel pump will be used in the event of a fire. The pump will be tested weekly for approximately 1 hour or less, and will be operationally limited to 100 non-emergency hours per year.

3. Emissions Unit Identification Number: EU015

4. Emissions Unit Status Code: C	5. Commence Construction Date: N/A	6. Initial Startup Date: N/A	7. Emissions Unit Major Group SIC Code: 28

8. Federal Program Applicability: (Check all that apply) N/A

[ ] Acid Rain Unit

[ ] CAIR Unit

9. Package Unit:
Manufacturer: TBD Model Number: TBD

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: The pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: None
2. Control Device or Method Code: N/A

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: N/A
2. Maximum Production Rate: N/A
3. Maximum Heat Input Rate: 6.16 million Btu/hr
4. Maximum Incineration Rate: N/A pounds/hr N/A tons/day
5. Requested Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year up to 100 hours/year
6. Operating Capacity/Schedule Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: N/A	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates. Zone: 17 East (km): TBD North (km): TBD	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Distillate (Diesel Oil) Reciprocating Internal Combustion Engine		
2. Source Classification Code (SCC): 20200102	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 0.0425	5. Maximum Annual Rate: 21.25	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.0015	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 140
10. Segment Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. The maximum annual rate is based on an assumed maximum operating time of 100 hr/yr.		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM_{10}	N/A	N/A	EL
$PM_{2.5}$	N/A	N/A	EL
SO_2	N/A	N/A	EL
NO_X	N/A	N/A	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
HAPS*	N/A	N/A	NS
H001	N/A	N/A	NS
H006	N/A	N/A	NS
H017	N/A	N/A	NS
H095	N/A	N/A	NS
H169	N/A	N/A	NS
H186	N/A	N/A	NS
H132	N/A	N/A	NS
H151	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.279 lb/hour 0.014 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.15 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.279 lb/hour 0.014 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.15 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: PM10 is a surrogate for PM2.5. The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.0103 lb/hour 0.000516 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0055 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 8.05 lb/hour 0.402 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 5.76 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years

10. Calculation of Emissions:
See emissions inventory calculations in Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:
The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 4.89 lb/hour 0.245 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 3.5 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.894 lb/hour 0.0447 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.64 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –

POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HAPS	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.024 lb/hour 0.0012 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: EPA AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 100 hr/yr.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.15 g/hp-hr (filterable)	4. Equivalent Allowable Emissions: 0.279 lb/hour 0.0140 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.15 g/hp-hr	4. Equivalent Allowable Emissions: 0.279 lb/hour 0.0140 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0015% sulfur content 0.0055 g/hp-hr	4. Equivalent Allowable Emissions: 0.0103 lb/hour 0.000516 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -

ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 2.7 g/hp-hr	4. Equivalent Allowable Emissions: 8.05 lb/hour 0.402 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 2.6 g/hp-hr	4. Equivalent Allowable Emissions: 4.89 lb/hour 0.245 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.3 g/hp-hr	4. Equivalent Allowable Emissions: 0.894 lb/hour, 0.0447 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring. N/A

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Figure 2-2 [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: NA [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Section 5 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [X] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [X] To be Submitted, Date (if known): : _____
   Test Date(s)/Pollutant(s) Tested: After Start-Up
   _____
   [ ] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   [ ] Attached, Document ID: _____ [X] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): [X] Attached, Document ID: Section 5 [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [X] Attached, Document ID: Section 6 [ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [ ] Attached, Document ID:_____ [X] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

1. Identification of Applicable Requirements: [ ] Attached, Document ID: _____
2. Compliance Assurance Monitoring: [ ] Attached, Document ID: _____ [ ] Not Applicable
3. Alternative Methods of Operation: [ ] Attached, Document ID: _____ [ ] Not Applicable
4. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID: _____ [ ] Not Applicable

Additional Requirements Comment

N/A

APPENDIX B
Emissions Calculations
(Revised November 2012)

APPENDIX B-1
Emissions Calculations
Product Loadout to Flare Option

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant / CAS No.	PM (tpy)	PM10 (tpy)	PM2.5 (tpy)	SO2 7446-09-5 (tpy)	NOx (tpy)	CO 630-08-0 (tpy)	VOC (tpy)	Total CO2e (tpy)	Non-Bio CO2e (tpy)	HAP (tpy)
POINT EMISSION SOURCES										
REGENERATIVE THERMAL OXIDIZER (RTO)	0.0482	0.0482	0.0482	0.123	0.767	0.810	12.5	158,682	2,582	8.5
PROCESS AREA EMISSIONS	---	---	---	---	---	---	*12.4*	*156,100*	---	*8.5*
BURNER COMBUSTION EMISSIONS	*0.0482*	*0.0482*	*0.0482*	*0.123*	*0.767*	*0.810*	*0.0307*	*2,582*	*2,582*	*0.041*
PRODUCT STORAGE TANK	---	---	---	---	---	---	0.22	---	---	0.0019
DENATURANT STORAGE TANK	---	---	---	---	---	---	0.96	---	---	0.067
PRODUCT LOADOUT FLARE	0.015	0.015	0.015	0.0037	0.42	2.3	5.3	937	937	0.37
MISCELLANEOUS STORAGE SILOS	4.46	4.46	4.46	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	*0.12*	*0.12*	*0.12*	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	*0.12*	*0.12*	*0.12*	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	0.0020	0.0020	0.0020	0.00047	0.055	0.30	0.11	94	94	---
COOLING TOWER	1.5	1.5	1.5	---	---	---	9.2	---	---	0.5
STEAM PRODUCTION	13.5	13.5	13.5	73.3	109	134	6.50	362,291	69,783	7.3
BIOMASS BOILER	*11.8*	*11.8*	*11.8*	*71.0*	*94.6*	*118*	*5.91*	*313,238*	---	*6.6*
GAS BOILER (PEAKING STEAM DEMAND)	*1.66*	*1.66*	*1.66*	*2.33*	*14.6*	*15.4*	*0.583*	*49,054*	---	*0.77*
STATIONARY ENGINES	0.113	0.113	0.113	0.00418	3.26	1.98	0.362	413	413	0.0099
FIRE PUMP	*0.0140*	*0.0140*	*0.0140*	*0.000516*	*0.402*	*0.245*	*0.0447*	*51.0*	*51.0*	*0.0012*
EMERGENCY GENERATOR NO. 1	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
EMERGENCY GENERATOR NO. 2	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
EMERGENCY GENERATOR NO. 3	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
FUGITIVE EMISSION SOURCES										
STILLAGE LOADOUT	---	---	---	---	---	---	8.4	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	19.6	---	---	0.98
ROADWAY FUGITIVES	2.3	0.43	0.057	---	---	---	---	---	---	---
Point Source Total	**19.6**	**19.6**	**19.6**	**73.4**	**113.7**	**139.0**	**35.2**	**522,418**	**73,809**	**16.8**
Fugitive Source Total	**2.3**	**0.43**	**0.057**	**0.0**	**0.0**	**0.0**	**28.0**	**0.0**	**0.0**	**0.98**
Facility Total	**22.0**	**20.1**	**19.7**	**73.4**	**113.7**	**139.0**	**63.2**	**522,418**	**73,809**	**17.8**
Major Source Threshold	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**---**	**100,000**	**25**
Significant Emissions Threshold	**25**	**15**	**10**	**40**	**40**	**100**	**40**	**---**	**75,000**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Acetaldehyde 75-07-0 (tpy)	Acrolein 107-02-8 (tpy)	Arsenic 7440-38-2 4.29E-06	Benzene 71-43-2 (tpy)	Beryllium 7440-41-7 (tpy)	Cadmium 7440-43-9 (tpy)	Chromium 7440-47-3 (tpy)	Cobalt 7440-48-4 (tpy)	Cumene 98-82-8 (tpy)
POINT EMISSION SOURCES									
REGENERATIVE THERMAL OXIDIZER (RTO)	7.0	0.0037	0.0000043	0.000050	0.0000003	0.000024	0.000030	0.0000018	---
PROCESS AREA EMISSIONS	*7.0*	*0.0037*	---	*0.000005*	---	---	---	---	---
BURNER COMBUSTION EMISSIONS	---	---	*0.0000043*	*0.000045*	*0.0000003*	*0.000024*	*0.000030*	*0.0000018*	---
PRODUCT STORAGE TANK	---	---	---	0.00039	---	---	---	---	0.0000028
DENATURANT STORAGE TANK	---	---	---	0.014	---	---	---	---	0.000096
PRODUCT LOADOUT FLARE	---	---	---	0.075	---	---	---	---	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---	---	---
COOLING TOWER	0.46	---	---	---	---	---	---	---	---
STEAM PRODUCTION	---	---	0.00030	0.0031	0.000018	0.0016	0.0021	0.00012	---
BIOMASS BOILER	---	---	*0.00021*	*0.0023*	*0.000013*	*0.0012*	*0.0015*	*0.000090*	---
GAS BOILER (PEAKING STEAM DEMAND)	---	---	*0.000082*	*0.00086*	*0.0000049*	*0.00045*	*0.00057*	*0.000034*	---
STATIONARY ENGINES	0.000063	0.000020	---	0.0019	---	---	---	---	---
FIRE PUMP	*0.0000078*	*0.0000024*	---	*0.00024*	---	---	---	---	---
EMERGENCY GENERATOR NO. 1	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
EMERGENCY GENERATOR NO. 2	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
EMERGENCY GENERATOR NO. 3	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
FUGITIVE EMISSION SOURCES									
STILLAGE LOADOUT	---	---	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	0.98	---	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---	---	---
Point Source Total	**7.5**	**0.0038**	**0.00030**	**0.09**	**0.000018**	**0.0017**	**0.0021**	**0.00013**	**0.000099**
Fugitive Source Total	**0.98**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**8.4**	**0.0038**	**0.00030**	**0.09**	**0.000018**	**0.0017**	**0.0021**	**0.00013**	**0.000099**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Dichlorobenzene 106-46-7 (tpy)	Ethylbenzene 100-41-4 (tpy)	Formaldehyde 50-00-0 (tpy)	n-Hexane 110-54-3 (tpy)	HCl 7647-01-0 (tpy)	Isopropyl Benzene 98-82-8 (tpy)	Lead 7439-92-1 (tpy)
POINT EMISSION SOURCES							
REGENERATIVE THERMAL OXIDIZER (RTO)	0.000039	0.00033	0.0016	0.039	---	---	---
PROCESS AREA EMISSIONS	*0.000013*	*0.00033*	---	---	---	---	---
BURNER COMBUSTION EMISSIONS	*0.000026*	---	*0.0016*	*0.039*	---	---	---
PRODUCT STORAGE TANK	---	0.000017	---	0.0010	---	---	---
DENATURANT STORAGE TANK	---	0.00058	---	0.036	---	---	---
PRODUCT LOADOUT FLARE	---	0.0032	---	0.20	---	0.00053	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---
COOLING TOWER	---	---	---	---	---	---	---
STEAM PRODUCTION	0.0018	---	0.11	2.7	6.4	---	0.057
BIOMASS BOILER	*0.0013*	---	*0.081*	*1.9*	*6.4*	---	*0.057*
GAS BOILER (PEAKING STEAM DEMAND)	*0.00049*	---	*0.031*	*0.73*	---	---	---
STATIONARY ENGINES	---	---	0.00020	---	---	---	---
FIRE PUMP	---	---	*0.000024*	---	---	---	---
EMERGENCY GENERATOR NO. 1	---	---	*0.000058*	---	---	---	---
EMERGENCY GENERATOR NO. 2	---	---	*0.000058*	---	---	---	---
EMERGENCY GENERATOR NO. 3	---	---	*0.000058*	---	---	---	---
FUGITIVE EMISSION SOURCES							
STILLAGE LOADOUT	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---
Point Source Total	**0.0018**	**0.0041**	**0.11**	**2.9**	**6.4**	**0.00053**	**0.057**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.0018**	**0.0041**	**0.11**	**2.9**	**6.4**	**0.00053**	**0.057**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**5**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Manganese 7439-96-5 (tpy)	Mercury 7439-97-6 (tpy)	Methanol 67-56-1 (tpy)	Methyl Bromide 74-83-9 (tpy)	Methyl Chloride 74-87-3 (tpy)	Naphthalene 91-20-3 (tpy)	Nickel 7440-02-0 (tpy)	Total POM --- (tpy)
POINT EMISSION SOURCES								
REGENERATIVE THERMAL OXIDIZER (RTO)	0.0000082	0.0000056	0.039	0.0000060	0.0000025	0.000013	0.000045	0.0000019
PROCESS AREA EMISSIONS	---	---	*0.039*	*0.0000060*	*0.0000025*	---	---	---
BURNER COMBUSTION EMISSIONS	*0.0000082*	*0.0000056*	---	---	---	*0.000013*	*0.000045*	*0.0000019*
PRODUCT STORAGE TANK	---	---	---	---	---	---	---	---
DENATURANT STORAGE TANK	---	---	---	---	---	---	---	---
PRODUCT LOADOUT FLARE	---	---	---	---	---	---	---	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---	---
COOLING TOWER	---	---	---	---	---	---	---	---
STEAM PRODUCTION	0.00056	0.012	---	---	---	0.00090	0.0031	0.17
BIOMASS BOILER	*0.00041*	*0.012*	---	---	---	*0.00065*	*0.0023*	*0.17*
GAS BOILER (PEAKING STEAM DEMAND)	*0.00016*	*0.00011*	---	---	---	*0.00025*	*0.00086*	*0.000036*
STATIONARY ENGINES	---	---	---	---	---	---	---	---
FIRE PUMP	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 1	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 2	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 3	---	---	---	---	---	---	---	---
FUGITIVE EMISSION SOURCES								
STILLAGE LOADOUT	---	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---	---
Point Source Total	**0.00057**	**0.012**	**0.039**	**0.0000060**	**0.0000025**	**0.00092**	**0.0032**	**0.17**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.00057**	**0.012**	**0.039**	**0.0000060**	**0.0000025**	**0.00092**	**0.0032**	**0.17**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Selenium 7782-49-2 (tpy)	Styrene 100-42-5 (tpy)	Toluene 108-88-3 (tpy)	2,2,4-Trimethylpentane 540-84-1 (tpy)	Xylenes 1330-20-7 (tpy)
POINT EMISSION SOURCES					
REGENERATIVE THERMAL OXIDIZER (RTO)	0.0000005	0.00044	0.00011	---	---
PROCESS AREA EMISSIONS	---	*0.00044*	*0.000035*	---	---
BURNER COMBUSTION EMISSIONS	*0.0000005*	---	*0.000073*	---	---
PRODUCT STORAGE TANK	---	---	0.00035	0.00012	0.000011
DENATURANT STORAGE TANK	---	---	0.012	0.0040	0.00038
PRODUCT LOADOUT FLARE	---	---	0.067	0.022	0.0021
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---
COOLING TOWER	---	---	---	---	---
STEAM PRODUCTION	0.000036	---	0.0050	---	---
BIOMASS BOILER	*0.000026*	---	*0.0037*	---	---
GAS BOILER (PEAKING STEAM DEMAND)	*0.0000098*	---	*0.0014*	---	---
STATIONARY ENGINES	---	---	0.0070	---	0.00070
FIRE PUMP	---	---	*0.00086*	---	*0.000087*
EMERGENCY GENERATOR NO. 1	---	---	*0.0020*	---	*0.00020*
EMERGENCY GENERATOR NO. 2	---	---	*0.0020*	---	*0.00020*
EMERGENCY GENERATOR NO. 3	---	---	*0.0020*	---	*0.00020*
FUGITIVE EMISSION SOURCES					
STILLAGE LOADOUT	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---
Point Source Total	**0.000036**	**0.00044**	**0.091**	**0.027**	**0.0032**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.000036**	**0.00044**	**0.091**	**0.027**	**0.0032**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

SOURCE DESCRIPTION

The RTO is fired with natural gas and will be used to control VOC and HAP emissions from several process areas including liquid/solid separation, propagation, fermentation, distillation, product storage shift tanks, and product loadout. This sheet provides the combustion emissions from the RTO's burner. Controlled process VOC emissions are identified on another sheet.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr	
Fuels		Natural Gas, Process Area Hydrocarbons	
Capacity	5	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Capacity	4,902	scf/hr	
Sulfur Content	0.02	gr/scf	from FDEP
Exhaust Flow	20,000	acfm	
Exit Temperature	90	°F	
Exit Diameter	3	ft	
Exit Velocity	47.16	ft/s	

EMISSION CALCULATIONS

Criteria Pollutant and GHG Emission Factors for Natural Gas

Pollutant		lb/MMBtu	Emission Factor Source
PM10		0.0022	BACT
PM2.5		0.0022	BACT
SO2		0.0056	BACT
NOx		0.035	BACT
CO		0.037	BACT
VOC		0.0014	BACT
CO2	1	117.6	AP42, Table 1.4-2
CH4	21	0.00225	AP42, Table 1.4-2
N2O	310	0.000627	AP42, Table 1.4-2

Typical Emissions

Typical = RTO Capacity (5 MMBtu/hr) x Emission Factor (lb/MMBtu)

PM10 = *5 MMBtu/hr * 0.0022 lbs/MMBtu*
0.01100 lbs PM/hr

PM2.5 = *5 MMBtu/hr * 0.0022 lbs/MMBtu*
0.01100 lbs PM/hr

SO2 = *5 MMBtu/hr * 0.0055964 lbs/MMBtu*
0.0280 lbs SO2/hr

NOx = *5 MMBtu/hr * 0.035 lbs/MMBtu*
0.175 lbs NOx/hr

CO = *5 MMBtu/hr * 0.037 lbs/MMBtu*
0.185 lbs CO/hr

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

VOC = *5 MMBtu/hr * 0.0014 lbs/MMBtu*
0.00700 lbs VOC/hr

CO2 = 5 MMBtu/hr x 117.6 lbs/MMBtu
588 lb CO2/hr

CH4 = 5 MMBtu/hr x 0.00225 lbs/MMBtu
0.01127 lb CH4/hr

N2O = 5 MMBtu/hr x 0.000627 lbs/MMBtu
0.00314 lb N2O/hr

CO2e (total) = (588 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.01127 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.00314 lb N2O/hr x 310 lb CO2e/lb N2O)
589 lb CO2e/hr

CO2e (non-biogenic) = (588 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.01127 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.00314 lb N2O/hr x 310 lb CO2e/lb N2O)
589 lb CO2e/hr

Annual Emissions

*Annual = Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

PM10 = *(0.01100 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.0482 TPY Total PM10

PM2.5 = *(0.01100 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.0482 TPY Filterable PM2.5

SO2 = *(0.0280 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.1226 TPY SO2

NOx = *(0.175 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.767 TPY NOx

CO = *(0.185 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.810 TPY CO

VOC = *(0.00700 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.0307 TPY VOC

*CO2e (total) = (589 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
2,582 TPY CO2e

*CO2e (non-biogenic) = (589 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
2,582 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

TOTAL CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	0.01100	0.0482
PM2.5	0.01100	0.0482
SO2	0.0280	0.1226
NOx	0.175	0.767
CO	0.185	0.810
VOC	0.00700	0.0307
CO2e (total)	589	2,582
CO2e (non-biogenic)	589	2,582
total HAP	0.0093	0.041

Dispersion Modeling Emissions Summary

Pollutant		*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}		24-Hour	0.01100	0.001386
$PM_{2.5}$		24-Hour	0.01100	0.001386
SO_2		1-Hour	0.0280	0.00353
SO_2		3-Hour	0.0280	0.00353
SO_2		24-Hour	0.0280	0.00353
SO_2		Annual	0.0280	0.00353
NO_2		1-Hour	0.175	0.0220
NO_2		Annual	0.175	0.0220
CO		1-Hour	0.185	0.0233
CO		8-Hour	0.185	0.0233

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/MMscf	lb/MMBtu	lb/hr	tpy
HAP	1.89E+00	1.85E-03	9.25E-03	4.05E-02
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	8.82E-03	3.86E-02
formaldehyde	7.50E-02	7.35E-05	3.68E-04	1.61E-03
toluene	3.40E-03	3.33E-06	1.67E-05	7.30E-05
benzene	2.10E-03	2.06E-06	1.03E-05	4.51E-05
dichlorobenzene	1.20E-03	1.18E-06	5.88E-06	2.58E-05
naphthalene	6.10E-04	5.98E-07	2.99E-06	1.31E-05
POM Speciation				
total POM	8.82E-05	8.65E-08	4.32E-07	1.89E-06
2-methylnaphthalene	2.40E-05	2.35E-08	1.18E-07	5.15E-07
phenanthrene	1.70E-05	1.67E-08	8.33E-08	3.65E-07
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	7.84E-08	3.44E-07
pyrene	5.00E-06	4.90E-09	2.45E-08	1.07E-07
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	1.76E-08	7.73E-08
fluoranthene	3.00E-06	2.94E-09	1.47E-08	6.44E-08
fluorene	2.80E-06	2.75E-09	1.37E-08	6.01E-08
anthracene	2.40E-06	2.35E-09	1.18E-08	5.15E-08
acenaphthene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
acenaphthylene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
benz(a)anthracene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
chrysene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
3-methylchloranthene	1.80E-06	1.76E-09	8.82E-09	3.86E-08
benzo(a)pyrene	1.20E-06	1.18E-09	5.88E-09	2.58E-08
benzo(g,h,i)perylene	1.20E-06	1.18E-09	5.88E-09	2.58E-08
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	5.88E-09	2.58E-08
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	1.03E-05	4.51E-05
chromium	1.40E-03	1.37E-06	6.86E-06	3.01E-05
cadmium	1.10E-03	1.08E-06	5.39E-06	2.36E-05
manganese	3.80E-04	3.73E-07	1.86E-06	8.16E-06
mercury	2.60E-04	2.55E-07	1.27E-06	5.58E-06
arsenic	2.00E-04	1.96E-07	9.80E-07	4.29E-06
cobalt	8.40E-05	8.24E-08	4.12E-07	1.80E-06
selenium	2.40E-05	2.35E-08	1.18E-07	5.15E-07
beryllium	1.20E-05	1.18E-08	5.88E-08	2.58E-07

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (CONTROLLED PROCESS AREA EMISSIONS)

SOURCE DESCRIPTION

The RTO is fired with natural gas and will be used to control VOC and HAP emissions from several process areas including liquid/solid separation, propagation, fermentation, distillation, product storage shift tanks, and product loadout. CO2 emissions from the propagation and fermentation areas also pass through the RTO. This sheet provides the controlled process area emissions from the RTO. Combustion emissions are identified on another sheet.

OPERATING PARAMETERS

Operating Schedule	8,760 hr/yr
VOC Control Efficiency	99.0%

VOC Emissions

Process Area	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
Liquid/Solid Separation	7.72	33.8	0.077	0.338
Fermentation	211	925	2.11	9.25
Distillation	65.2	285	0.65	2.85
Product Storage Shift Tanks	0.0164	0.0638	0.000164	0.000638
TOTAL	**284**	**1244**	**2.84**	**12.44**

Total CO2e Emissions

Process Area	Emissions (lb/hr)	Emissions (tpy)
Liquid/Solid Separation	0.00	0.00
Fermentation/Propagation	33,353	146,084
Distillation	2,287	10,016
Product Storage Shift Tanks	0.00	0.00
TOTAL	**35,639**	**156,100**

Non-Biogenic CO2e Emissions

Process Area	Emissions (lb/hr)	Emissions (tpy)
Liquid/Solid Separation	0.00	0.00
Fermentation/Propagation	0.00	0.00
Distillation	0.00	0.00
Product Storage Shift Tanks	0.00	0.00
TOTAL	**0.00**	**0.00**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (CONTROLLED PROCESS AREA EMISSIONS)

Total HAP Emissions

Process Area	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
Liquid/Solid Separation	1.96E-23	8.58E-23	1.96E-25	8.58E-25
Fermentation/Propagation	161	705	1.61	7.05
Distillation	33.2	145	0.332	1.45
Product Storage Shift Tanks	0.00	0.00	0.00	0.00
TOTAL	**194**	**850**	**1.94**	**8.50**

Individual HAP Emissions

Pollutant	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
acetaldehyde	160	700	1.60	7.00
methanol	0.881	3.86	0.00881	0.0386
benzene	0.000118	0.000516	0.00000118	0.00000516
toluene	0.000803	0.00352	0.00000803	0.0000352
1,4-dichlorobenzene	0.000297	0.00130	0.00000297	0.0000130
styrene	0.0101	0.0442	0.000101	0.000442
m-xylene	0.00624	0.0273	0.0000624	0.000273
methyl chloride	0.0000581	0.000254	0.000000581	0.00000254
methyl bromide	0.000136	0.000595	0.00000136	0.00000595
acrolein	0.0853	0.374	0.000853	0.00374
ethylbenzene	0.00746	0.0327	0.0000746	0.000327

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
HYDROLYSIS / LIQUID-SOLID SEPARATION

SOURCE DESCRIPTION

VOC and HAP emissions from the hydrolysis and liquid-solid separation areas were estimated by employing process modeling, specifically ASPEN. Emissions presented on this sheet are before RTO control.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

CALCULATED EMISSIONS [1]

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
Total VOC	7.7	34
Total HAP	2.0E-23	8.6E-23
ethanol	1.2E-08	5.1E-08
furfural	0.67	2.9
methylhydroxyfurfural	1.2	5.3
acetaldehyde*	2.0E-23	8.6E-23
ethyl acetate	1.4E-27	6.2E-27
formic acid	0.011	0.048
acetic acid	5.8	26
lactic acid	0.00071	0.0031
isoamyl alcohol	1.5E-17	6.5E-17

REFERENCES/NOTES

1 Based on ASPEN model results.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FERMENTATION

SOURCE DESCRIPTION

VOC and HAP emission factors for the fermentation area were estimated by employing process modeling, specifically ASPEN. The fermentation area is vented first to an absorber, which recovers ethanol and returns it to the process. Removal of most organic constituents by the absorber is assumed to be negligible. Removal of ethanol, acetaldehyde, and ethyl acetate are based on vendor data. The absorber is in turn vented to the RTO, which achieves 99% destruction efficiency.

OPERATING PARAMETERS

Ethanol Production	4500 gal/hr
Operating Hours	8760 hours per year
RTO	99% removal efficiency

CONTROLLED EMISSIONS SUMMARY

VOC Emissions	9.3 tpy
Total HAP Emissions	7.0 tpy

DETAILED EMISSIONS CALCULATIONS

			Uncontrolled Emission Factor (ASPEN)		Uncontrolled Emissions		Ethanol Absorber			RTO	
Constituent	VOC or HAP?		Primary Fermentation Vent (lb/gal)	Secondary Fermentation Vent (lb/gal)	Vent (lb/hr)	Vent (tpy)	Removal Efficiency (%)	Emissions (lb/hr)	Emissions (tpy)	Emissions (lb/hr)	Emissions (tpy)
Ethanol	VOC		7.74E-03	4.39E-02	2.32E+02	1.02E+03	98%	4.65E+00	2.04E+01	4.65E-02	2.04E-01
Acetaldehyde	VOC	HAP	2.65E-02	2.57E-02	2.35E+02	1.03E+03	32%	1.60E+02	7.00E+02	1.60E+00	7.00E+00
Ethyl Acetate	VOC		8.85E-03	2.47E-03	5.10E+01	2.23E+02	16%	4.28E+01	1.87E+02	4.28E-01	1.87E+00
Isobutanol	VOC		3.97E-05	1.64E-04	9.18E-01	4.02E+00	0%	9.18E-01	4.02E+00	9.18E-03	4.02E-02
Isoamyl Alcohol	VOC		6.86E-05	1.42E-04	9.46E-01	4.14E+00	0%	9.46E-01	4.14E+00	9.46E-03	4.14E-02
Methanol	VOC	HAP	1.33E-04	6.25E-05	8.81E-01	3.86E+00	0%	8.81E-01	3.86E+00	8.81E-03	3.86E-02
Furfural	VOC		6.01E-05	5.26E-05	5.07E-01	2.22E+00	0%	5.07E-01	2.22E+00	5.07E-03	2.22E-02
1-Propanol	VOC		1.60E-05	5.72E-05	3.29E-01	1.44E+00	0%	3.29E-01	1.44E+00	3.29E-03	1.44E-02
Isopropanol	VOC		0.00E+00	1.80E-05	8.11E-02	3.55E-01	0%	8.11E-02	3.55E-01	8.11E-04	3.55E-03
Methane			0.00E+00	2.83E-06	1.28E-02	5.58E-02	0%	1.28E-02	5.58E-02	1.28E-04	5.58E-04
Acetone			4.85E-05	3.41E-06	2.33E-01	1.02E+00	0%	2.33E-01	1.02E+00	2.33E-03	1.02E-02
2-Methylheptane	VOC		6.60E-08		2.97E-04	1.30E-03	0%	2.97E-04	1.30E-03	2.97E-06	1.30E-05
Styrene	VOC	HAP	3.68E-08	2.20E-06	1.01E-02	4.42E-02	0%	1.01E-02	4.42E-02	1.01E-04	4.42E-04
1,4-Dichlorobenzene	VOC	HAP	6.60E-08		2.97E-04	1.30E-03	0%	2.97E-04	1.30E-03	2.97E-06	1.30E-05
m-Xylene*	VOC	HAP		1.39E-06	6.24E-03	2.73E-02	0%	6.24E-03	2.73E-02	6.24E-05	2.73E-04
Ethylbenzene	VOC	HAP		1.66E-06	7.46E-03	3.27E-02	0%	7.46E-03	3.27E-02	7.46E-05	3.27E-04
Propylene	VOC			3.11E-07	1.40E-03	6.13E-03	0%	1.40E-03	6.13E-03	1.40E-05	6.13E-05

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FERMENTATION

Propane	VOC			1.11E-07	4.98E-04	2.18E-03	0%	4.98E-04	2.18E-03	4.98E-06	2.18E-05
Undecane	VOC		3.68E-08	3.36E-07	1.68E-03	7.36E-03	0%	1.68E-03	7.36E-03	1.68E-05	7.36E-05
Toluene	VOC	HAP		1.78E-07	8.03E-04	3.52E-03	0%	8.03E-04	3.52E-03	8.03E-06	3.52E-05
Decane	VOC			2.86E-07	1.29E-03	5.63E-03	0%	1.29E-03	5.63E-03	1.29E-05	5.63E-05
1,4-Diethylbenzene	VOC		2.30E-08	2.38E-08	2.11E-04	9.22E-04	0%	2.11E-04	9.22E-04	2.11E-06	9.22E-06
Benzene	VOC	HAP		2.62E-08	1.18E-04	5.16E-04	0%	1.18E-04	5.16E-04	1.18E-06	5.16E-06
1,2,3-Trimethylbenzene	VOC			1.56E-08	7.03E-05	3.08E-04	0%	7.03E-05	3.08E-04	7.03E-07	3.08E-06
1,2,4-Trimethylbenzene (Pseudocumene)	VOC			1.56E-08	7.03E-05	3.08E-04	0%	7.03E-05	3.08E-04	7.03E-07	3.08E-06
1-Butene	VOC			1.09E-08	4.89E-05	2.14E-04	0%	4.89E-05	2.14E-04	4.89E-07	2.14E-06
Methyl Chloride (Chloromethane)		HAP		1.29E-08	5.81E-05	2.54E-04	0%	5.81E-05	2.54E-04	5.81E-07	2.54E-06
1,2-Dichlorobenzene	VOC			2.33E-08	1.05E-04	4.59E-04	0%	1.05E-04	4.59E-04	1.05E-06	4.59E-06
Methyl Bromide (Bromomethane)		HAP		3.02E-08	1.36E-04	5.95E-04	0%	1.36E-04	5.95E-04	1.36E-06	5.95E-06
Isopentane (2-Methylbutane)	VOC			2.30E-09	1.04E-05	4.54E-05	0%	1.04E-05	4.54E-05	1.04E-07	4.54E-07
c-2-Butene	VOC			7.16E-10	3.22E-06	1.41E-05	0%	3.22E-06	1.41E-05	3.22E-08	1.41E-07
t-2-Butene	VOC			6.14E-10	2.76E-06	1.21E-05	0%	2.76E-06	1.21E-05	2.76E-08	1.21E-07
2,2,4-Trimethylpentane	VOC			1.38E-09	6.23E-06	2.73E-05	0%	6.23E-06	2.73E-05	6.23E-08	2.73E-07
Butane	VOC			2.81E-11	1.27E-07	5.54E-07	0%	1.27E-07	5.54E-07	1.27E-09	5.54E-09
Acetic Acid	VOC		1.02E-05	1.02E-05	9.14E-02	4.00E-01	0%	9.14E-02	4.00E-01	9.14E-04	4.00E-03
Acrolein	VOC	HAP	9.48E-06	9.48E-06	8.53E-02	3.74E-01	0%	8.53E-02	3.74E-01	8.53E-04	3.74E-03
Hydrogen Sulfide			5.74E-06	5.74E-06	5.17E-02	2.26E-01	0%	5.17E-02	2.26E-01	5.17E-04	2.26E-03
Other VOC	VOC		9.21E-06	8.16E-06	7.82E-02	3.42E-01	0%	7.82E-02	3.42E-01	7.82E-04	3.42E-03
VOC			4.35E-02	7.26E-02	5.22E+02	2.29E+03		2.11E+02	9.25E+02	2.11E+00	9.25E+00
HAP			2.67E-02	2.58E-02	2.36E+02	1.03E+03		1.61E+02	7.05E+02	1.61E+00	7.05E+00

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DISTILLATION

SOURCE DESCRIPTION

VOC and HAP emissions from the distillation area were estimated by employing process modeling, specifically ASPEN. Emissions presented on this sheet are before RTO control.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

CALCULATED EMISSIONS [1]

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
Total VOC	65.2	285
Total HAP	33.2	145
ethanol	4.08	17.9
acetaldehyde*	33.2	145
ethyl acetate	27.9	122

REFERENCES/NOTES

1 Based on ASPEN model results.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

SOURCE DESCRIPTION

The facility includes 3 product shift tanks and 1 ethanol product storage tank. The product shift tanks will be vented to the ethanol recovery absorber, and the product storage tank will be designed with an internal floating roof. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
Tank Contents	Ethanol	Ethanol	Ethanol	E95
Tank Type	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof	Internal Floating Roof
Tank Diameter (ft)	18	18	18	40
Tank Height (ft)	22	22	22	51
Tank Capacity (gal)	38,500	38,500	38,500	472,000
Throughput (gal/yr)	13,140,000	13,140,000	13,140,000	41,494,737
Turnovers per Year	341	341	341	88
Max Liquid Height (ft)	21	21	21	#N/A
Avg Liquid Height (ft)	21	21	21	#N/A
Heated Tank	No	No	No	No
Underground Tank	No	No	No	No
Self-Supporting Roof	#N/A	#N/A	#N/A	Yes
Columns	#N/A	#N/A	#N/A	#N/A
Effective Column Diameter	#N/A	#N/A	#N/A	#N/A
Internal Shell Condition	#N/A	#N/A	#N/A	Light Rust
External Shell Color	White	White	White	White
External Shell Shade	White	White	White	White
External Shell Condition	Good	Good	Good	Good
Roof Color	White	White	White	White
Roof Shade	White	White	White	White
Roof Paint Condition	Good	Good	Good	Good
Fixed Roof Type	#N/A	#N/A	#N/A	#N/A
Roof Height (ft)	#N/A	#N/A	#N/A	#N/A
Roof Slope (ft/ft)	#N/A	#N/A	#N/A	#N/A
Breather Vent Vacuum (psig)	#N/A	#N/A	#N/A	#N/A
Breather Vent Pressure (psig)	#N/A	#N/A	#N/A	#N/A
Primary Seal	#N/A	#N/A	#N/A	Liquid Mounted
Secondary Seal	#N/A	#N/A	#N/A	Rim Mounted
Deck Type	#N/A	#N/A	#N/A	Welded
Deck Fittings	#N/A	#N/A	#N/A	Typical
Vent Height above grade (ft)	23	23	23	52
Vent Diameter (ft)	0.25	0.25	0.25	0.25
Exit Velocity (ft/s)	10	10	10	10

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

ETHANOL STORAGE TANKS

Nearest Major City	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL
Daily Avg Temp (F)	74.72	74.72	74.72	74.72
Annual Avg Max Temp (F)	82.86	82.86	82.86	82.86
Annual Avg Min Temp (F)	66.58	66.58	66.58	66.58
Avg Wind Speed (mph)	9.61	9.61	9.61	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505	1,505	1,505	1,505
Atmospheric Pressure (psia)	14.747	14.747	14.747	14.747
Liquid Molecular Weight	46.07	46.07	46.07	47.25
Vapor Molecular Weight	46.07	46.07	46.07	49.04
Liquid Density @ 60F (lb/gal)	6.61	6.61	6.61	6.55
Avg Bulk Temp (F)	74.74	74.74	74.74	74.74
Avg Surface Temp (F)	76.75	76.75	76.75	76.75
Vapor Pressure (psia)	1.145	1.145	1.145	1.337

VOC EMISSION CALCULATIONS [1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
EIQ No.				
Standing Loss (lbs/yr)	53.0241	53.0241	53.0241	---
Working Loss (lbs/yr)	4201.4735	4201.4735	4201.4735	---
Rim Seal Loss (lbs/yr)	---	---	---	13.98
Withdrawal Losses (lbs/yr)	---	---	---	228.87
Deck Fitting Losses (lbs/yr)	---	---	---	189.96
Deck Seam Losses (lbs/yr)	---	---	---	0.00
Total Losses (tons/yr)	2.13	2.13	2.13	0.22

ETHANOL EMISSION CALCULATIONS [1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
Standing Loss (lbs/yr)	53.0241	53.0241	53.0241	---
Working Loss (lbs/yr)	4201.4735	4201.4735	4201.4735	---
Rim Seal Loss (lbs/yr)	---	---	---	10.96
Withdrawal Losses (lbs/yr)	---	---	---	217.43
Deck Fitting Losses (lbs/yr)	---	---	---	148.87
Deck Seam Losses (lbs/yr)	---	---	---	0.00
Total Losses (tons/yr)	2.13	2.13	2.13	0.19

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

Emissions Summary (Total Emissions from Product Storage Tank - Vent for Product Shift Tanks is Directed to Ethanol Recovery)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.049	0.052	0.22
HAP	0.00044	0.00093	0.0019
Ethanol	0.043	0.046	0.19

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**8.94E-05**	**1.89E-04**	**3.92E-04**
BUTANE N-	1.81E-03	3.83E-03	7.93E-03
BUTENE CIS-2-	5.26E-05	1.12E-04	2.31E-04
BUTENE TRANS-2-	6.47E-05	1.37E-04	2.83E-04
CIS-2-PENTENE	4.25E-05	9.00E-05	1.86E-04
CYCLOHEXANE	2.73E-05	5.78E-05	1.19E-04
CYCLOPENTANE	3.87E-05	8.20E-05	1.69E-04
DIMETHYLBUTANE 2,2-	6.60E-05	1.40E-04	2.89E-04
DIMETHYLPENTANE 2,4-	2.73E-05	5.78E-05	1.19E-04
ETHANE	4.44E-06	9.41E-06	1.94E-05
ETHYLBENZENE	**3.81E-06**	**8.06E-06**	**1.67E-05**
HEPTANE N-	2.54E-05	5.37E-05	1.11E-04
HEXANE N-	**2.38E-04**	**5.04E-04**	**1.04E-03**
ISOBUTANE	5.29E-04	1.12E-03	2.32E-03
ISOPROPYL BENZENE	**6.34E-07**	**1.34E-06**	**2.78E-06**
METHYLCYCLOHEXANE	7.61E-06	1.61E-05	3.33E-05
METHYLCYCLOPENTANE	8.94E-05	1.89E-04	3.92E-04
METHYLHEPTANE 3-	3.81E-06	8.06E-06	1.67E-05
METHYLHEXANE 3-	2.66E-05	5.64E-05	1.17E-04
METHYLPENTANE 3-	1.26E-04	2.67E-04	5.53E-04
OCTANE N-	1.90E-06	4.03E-06	8.33E-06
PENTANE N-	4.60E-04	9.74E-04	2.01E-03
PENTENE 1-	5.45E-05	1.16E-04	2.39E-04
PROPANE	6.72E-05	1.42E-04	2.94E-04
TOLUENE	**7.93E-05**	**1.68E-04**	**3.47E-04**
TRANS-2-PENTENE	8.69E-05	1.84E-04	3.81E-04
TRIMETHYLBENZENE 1,2,4-	3.17E-06	6.72E-06	1.39E-05
TRIMETHYLBENZENE 1,3,5-	1.27E-06	2.69E-06	5.56E-06
TRIMETHYLPENTANE 2,2,4-	**2.66E-05**	**5.64E-05**	**1.17E-04**
TRIMETHYLPENTANE 2,3,4-	4.44E-06	9.41E-06	1.94E-05
XYLENE O-	**2.54E-06**	**5.37E-06**	**1.11E-05**
UNIDENTIFIED VOC	2.28E-03	4.83E-03	9.99E-03

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.
2 Maximum emissions are based on emissions during the month of July.
3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

SOURCE DESCRIPTION

The facility includes 1 gasoline storage tank. Gasoline is used as a denaturant to render the ethanol undrinkable. The tank is designed with an internal floating roof to minimize VOC (gasoline) emissions. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Denaturant Tank
Tank Contents	Gasoline (RVP12)
Tank Type	Internal Floating Roof
Tank Diameter (ft)	15
Tank Height (ft)	16
Tank Capacity (gal)	13,500
Throughput (gal/yr)	2,074,737
Turnovers per Year	154
Max Liquid Height (ft)	#N/A
Avg Liquid Height (ft)	#N/A
Heated Tank	No
Underground Tank	No
Self-Supporting Roof	Yes
Columns	#N/A
Effective Column Diameter	#N/A
Internal Shell Condition	Light Rust
External Shell Color	White
External Shell Shade	White
External Shell Condition	Good
Roof Color	White
Roof Shade	White
Roof Paint Condition	Good
Fixed Roof Type	#N/A
Roof Height (ft)	#N/A
Roof Slope (ft/ft)	#N/A
Breather Vent Vacuum (psig)	#N/A
Breather Vent Pressure (psig)	#N/A
Primary Seal	Liquid Mounted
Secondary Seal	Rim Mounted
Deck Type	Welded
Deck Fittings	Typical
Vent Height above grade (ft)	17
Vent Diameter (ft)	0.25
Exit Velocity (ft/s)	10
Nearest Major City	West Palm Beach, FL
Daily Avg Temp (F)	74.72
Annual Avg Max Temp (F)	82.86
Annual Avg Min Temp (F)	66.58
Avg Wind Speed (mph)	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505
Atmospheric Pressure (psia)	14.747
Liquid Molecular Weight	92.00
Vapor Molecular Weight	64.00
Liquid Density @ 60F (lb/gal)	5.60
Avg Bulk Temp (F)	74.74
Avg Surface Temp (F)	76.75
Vapor Pressure (psia)	8.63

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

EMISSION CALCULATIONS [1]

Tank ID. No.	Denaturant Tank
Standing Loss (lbs/yr)	---
Working Loss (lbs/yr)	---
Rim Seal Loss (lbs/yr)	74.88
Withdrawal Losses (lbs/yr)	21.74
Deck Fitting Losses (lbs/yr)	1822.14
Deck Seam Losses (lbs/yr)	0.00
Total Losses (tons/yr)	0.96

Emissions Summary (Total VOC Emissions from all tanks)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.22	0.23	0.96
Total HAP	0.015	0.016	0.067

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**3.09E-03**	**3.22E-03**	**1.35E-02**
BUTANE N-	6.25E-02	6.51E-02	2.74E-01
BUTENE CIS-2-	1.82E-03	1.89E-03	7.96E-03
BUTENE TRANS-2-	2.23E-03	2.33E-03	9.79E-03
CIS-2-PENTENE	1.47E-03	1.53E-03	6.43E-03
CYCLOHEXANE	9.42E-04	9.82E-04	4.13E-03
CYCLOPENTANE	1.34E-03	1.39E-03	5.85E-03
DIMETHYLBUTANE 2,2-	2.28E-03	2.37E-03	9.98E-03
DIMETHYLPENTANE 2,4-	9.42E-04	9.82E-04	4.13E-03
ETHANE	1.53E-04	1.60E-04	6.72E-04
ETHYLBENZENE	**1.31E-04**	**1.37E-04**	**5.76E-04**
HEPTANE N-	8.76E-04	9.13E-04	3.84E-03
HEXANE N-	**8.21E-03**	**8.56E-03**	**3.60E-02**
ISOBUTANE	1.83E-02	1.90E-02	8.00E-02
ISOPROPYL BENZENE	**2.19E-05**	**2.28E-05**	**9.59E-05**
METHYLCYCLOHEXANE	2.63E-04	2.74E-04	1.15E-03
METHYLCYCLOPENTANE	3.09E-03	3.22E-03	1.35E-02
METHYLHEPTANE 3-	1.31E-04	1.37E-04	5.76E-04
METHYLHEXANE 3-	9.20E-04	9.59E-04	4.03E-03
METHYLPENTANE 3-	4.36E-03	4.54E-03	1.91E-02
OCTANE N-	6.57E-05	6.85E-05	2.88E-04
PENTANE N-	1.59E-02	1.65E-02	6.96E-02
PENTENE 1-	1.88E-03	1.96E-03	8.25E-03
PROPANE	2.32E-03	2.42E-03	1.02E-02
TOLUENE	**2.74E-03**	**2.85E-03**	**1.20E-02**
TRANS-2-PENTENE	3.00E-03	3.13E-03	1.31E-02
TRIMETHYLBENZENE 1,2,4-	1.10E-04	1.14E-04	4.80E-04
TRIMETHYLBENZENE 1,3,5-	4.38E-05	4.57E-05	1.92E-04
TRIMETHYLPENTANE 2,2,4-	**9.20E-04**	**9.59E-04**	**4.03E-03**
TRIMETHYLPENTANE 2,3,4-	1.53E-04	1.60E-04	6.72E-04
XYLENE O-	**8.76E-05**	**9.13E-05**	**3.84E-04**
UNIDENTIFIED VOC	7.88E-02	8.21E-02	3.45E-01

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.
2 Maximum emissions are based on emissions during the month of July.
3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
PRODUCT LOADOUT

SOURCE DESCRIPTION

The truck loadout flare has a rated capacity of 9.42 MMBtu/hr and provides 98% control efficiency for VOC emissions during loading product (ethanol) into trucks, which will not be in dedicated service.

OPERATING PARAMETERS

Operating Schedule (Pilot)	8,760	hrs/yr	
Design Thruput	36	Mgallons/hr	assume 600 gpm truck filling rate
Annual Thruput	41,495	Mgallons/Yr	E95 (ethanol plus denaturant)
Gasoline Heat Content	20,300	Btu/lb	assumes gasoline vapors displaced from trucks
Heat Rate (Pilot)	0.184	MMBtu/hr	3 scfm natural gas
Heat Rate (Flare)	9.42	MMBtu/hr	calculated
Annual Heat Rate (Flare)	10,854	MMBtu/yr	calculated
Control Device		Flare	
Control Efficiency	98	%	BACT

EMISSION CALCULATIONS

VOC Loading Emissions[1]

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

where:

L = Loading Loss, lb VOC/Mgal of liquid loaded
S = Saturation Factor (AP-42 Table 5.2-1)
P = True Vapor Pressure of Liquid Loaded, psia
M = Molecular Weight of Vapors, lb/lb-mole
T = Temperature of Bulk Liquid Loaded, °R

The values for P, T, and M were obtained from EPA's TANKS 4.09c emissions calculation software, which calculates the annual average bulk product temperature based on the annual average temperatures for the city of West Palm Beach, Florida. The saturation factor is based on submerged loading, dedicated vapor balance service for gasoline. This should be conservative because the vapor pressure of ethanol is less than that for gasoline and because the trucks will not be in dedicated gasoline service.

Saturation Factor(s)	1
Annual Thruput	41,495 Mgal/yr
Vapor Molecular Weight (MW)	64.00 lb/lb-mole
Product Temperature (T)	534.33 °R
True Vapor Pressure (P)	8.63 psia *(based on RVP 12 gasoline)*

VOC Emission Factor

*L = (12.46 * 1 * 8.6339 psia * 64 lb/lb-mole) / 534.33 R*

12.89 lb VOC/Mgal

Uncontrolled Emissions

*VOC = 12.89 lb VOC/Mgal * 36 Mgal /hr*

463.87 lb/hr VOC gasoline vapors displaced
9.42 MMBtu/hr VOC heat rate of gasoline vapors displaced

VOC = 12.89 lb VOC/Mgal * 41,495 Mgal /yr

267.34 tpy VOC

Controlled VOC Emissions

*Avg = 463.87 lbs/hr * (1-98/100) DRE*

9.28 lb/hr VOC 0.99 lb/MMBtu, calculated VOC emission factor

*Ann = 12.89 lbs/Mgal * 41,495 Mgal/yr * (1-98/100)/ 2,000 lbs/ton*
5.35 TPY VOC

Combustion Emissions[2]

Emission Factor	GWP	lb/MMBtu	µg/l	
SOx		0.00059		
NOx		0.068		
CO		0.37		
THC		0.14		
PM		0.0024	40	lightly smoking
CO2 (nat. gas)	1	117		
CH4 (nat. gas)	21	0.0022		
N2O (nat. gas)	320	0.00022		
CO2 (gasoline)	1	155		
CH4 (gasoline)	21	0.0066		
N2O (gasoline)	320	0.00132		

Emissions During Flare Operation, Combustion of Gasoline Vapors

*Avg = Heat Input (9.42 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*SOx = 9.42 MMBtu/hr * 0.00059 lb/MMBtu*
0.0055 lb/hr SOx

*NOx = 9.42 MMBtu/hr * 0.068 lb/MMBtu*
0.64 lb/hr NOx

*CO = 9.42 MMBtu/hr * 0.370 lb/MMBtu*
3.5 lb/hr CO

*PM = 9.42 MMBtu/hr * 0.0024 lb/MMBtu*
0.023 lb/hr PM

*CO2 = 9.42 MMBtu/hr * 155 lb/MMBtu*
1,458 lb/hr CO2

*CH4 = 9.42 MMBtu/hr * 0.0066 lb/MMBtu*
0.062 lb/hr CH4

*N2O = 9.42 MMBtu/hr * 0.00132 lb/MMBtu*
0.012 lb/hr CH4

CO2e (total) = (1,458 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.06 lb CH4/hr x 21 lb CO2e/lb CH4)
+ (0.012 lb N2O/hr x 320 lb CO2e/lb N2O)
1,463 lb CO2e/hr

CO2e (non-biogenic) = CO2e (total)
1,463 lb CO2e/hr

Annual Emissions - Pilot and Flare Operation Combined

*Annual = [Pilot Input (0.18 MMBtu/hr) * EF (lbs/MMBtu)*
*+ Flare Heat Input (10,854 MMBtu/yr) * Emission Factor (lbs/MMBtu)] / 2,000 lbs/ton*

*SO2 = {[0.18 MMBtu/hr * 0.00059 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.00059 lb/MMBtu]} / 2,000 lbs/ton*
0.0037 TPY SOx

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
PRODUCT LOADOUT

*NOx = {[0.18 MMBtu/hr * 0.068 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.068 lb/MMBtu]}/ 2,000 lbs/ton*
0.42 TPY NOx

*CO = {[0.18 MMBtu/hr * 0.37 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.37 lb/MMBtu]} / 2,000 lbs/ton*
2.3 TPY CO

*PM = {[0.18 MMBtu/hr * 0.0024 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.0024 lb/MMBtu]} / 2,000 lbs/ton*
0.015 TPY PM

*CO2 = {[0.18 MMBtu/hr * 117 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 155 lb/MMBtu]} / 2,000 lbs/ton*
934 TPY CO2

*CH4 = {[0.18 MMBtu/hr * 0.0022 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.0066 lb/MMBtu]} / 2,000 lbs/ton*
0.0377 TPY CH4

*N2O = {[0.18 MMBtu/hr * 0.00022 lb/MMBtu * 8,760 hr/yr] + [10,854 MMBtu/yr * 0.00132 lb/MMBtu]} / 2,000 lbs/ton*
0.00736 TPY N2O

CO2e (total) = (934 ton CO2/yr x 1 ton CO2e/ton CO2) + (0.0377 ton CH4/yr x 21 ton CO2e/ton CH4) + (0.00736 ton N2O/yr x 320 ton CO2e/ton N2O)
937 TPY CO2e

CO2e (non-biogenic) = CO2e (total)
937 TPY CO2e

Emissions Summary (Controlled)

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
PM	0.023	0.015
SO2	0.0055	0.0037
NOx	0.64	0.42
CO	3.5	2.3
VOC	9.3	5.3
CO2e (total)	1463	937
CO2e (non-biogenic)	1463	937
HAP	0.64	0.37

HAP Emissions[4]	lb/hr	tpy
benzene	0.13	0.075
ethylbenzene	0.0056	0.0032
n-hexane	0.35	0.20
isopropyl benzene	0.00093	0.00053
toluene	0.12	0.067
2,2,4-trimethylpentane	0.039	0.022
o-xylene	0.0037	0.0021

REFERENCES/NOTES

1 Based on EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids, January 1995.
2 Based on EPA AP-42, Section 13.5, Industrial Flares, January 1995. GHG emissions based on 40 CFR 98.
3 Maximum emissions are assumed to be 120% of average emissions.
4 HAP emissions based on speciation shown for denaturant storage, conservatively assuming gasoline vapors.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
MISCELLANEOUS STORAGE SILOS

SOURCE DESCRIPTION

A number of silos are used to handle dry materials. These materials include a number of nutrients for the propagation area and a number of materials associated with the biomass boilers. The vents for each of these silos will be controlled by a bin vent filter that meets BACT emission requirements.

OPERATING PARAMETERS

Emission Source	Stack Height (feet)	Exit Diameter (feet)	Exhaust Flow (acfm)	Exit Velocity (ft/s)	Exhaust Temperature (°F)	BACT Emission Rate (gr/scf)	BACT Emission Rate (lb/hr)	BACT Emission Rate (tpy)
Wheat Bran	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Powdered Cellulose	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Ammonium Sulfate	40	1.0	2,500	53.05	80	0.005	0.11	0.47
Potassium Phosphate	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Bulk Urea	40	1.0	2,500	53.05	80	0.005	0.11	0.47
Discrete Wheat Bran Transfers	35	0.5	650	55.17	70	0.005	0.03	0.12
Discrete Urea Transfers	35	0.5	650	55.17	70	0.005	0.03	0.12
Ash	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Hydrated Lime	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Sand	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Limestone	34	1.5	2,500	23.58	77	0.005	0.1	0.47
						total	1.0	4.5

Notes:
Stack heights referenced as above ground level (AGL).
Stack locations assumed at center of silo.
PM emission rates from dust collector baghouses are based on gr/dscf BACT and exhaust flow.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOGAS BACKUP FLARE

SOURCE DESCRIPTION

A flare is used for combusting methane generated by anaerobic digestion and has a rated capacity of 100 MMBtu/hr. The flare will use natural gas for the pilot and will be limited to combust biogas only when the biomass boiler is shut down. Hence, annual potential emissions include only the pilot because emissions for biogas combustion are accounted for by the biomass boilers.

OPERATING PARAMETERS

Operating Schedule (Pilot)	8,760	hrs/yr	
Natural Gas Heat Rate (Pilot)	0.18	MMBtu/hr	3 scfm gas
Biogas Heat Rate (Flare)	100.0	MMBtu/hr	
H2S Controlled	5.4	lb/hr	scrubber prior to flare
H2S Flare Reduction (minimum)	98%		

EMISSION CALCULATIONS

Combustion Emissions[1]

Emission Factor		lb/MMBtu	µg/l	
H2S (max)		0.0011		
SO2 (max)		0.10		assumes 100% conversion
SO2 (nat. gas)		0.00059		
NOx		0.068		
CO		0.37		
THC		0.14		
PM		0.0024	40	lightly smoking
CO2	1	117		
CH4	21	0.0022		
N2O	320	0.00022		

Emissions During Flare Operation

*Avg = Heat Input (100.0 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*H2S = 100.0 MMBtu/hr * 0.00108 lb/MMBtu*
0.108 lb/hr H2S

*SO2 = 100.0 MMBtu/hr * 0.102 lb/MMBtu*
10.2 lb/hr SO2

*NOx = 100.0 MMBtu/hr * 0.068 lb/MMBtu*
6.8 lb/hr NOx

*CO = 100.0 MMBtu/hr * 0.37 lb/MMBtu*
37 lb/hr CO

*PM = 100.0 MMBtu/hr * 0.0024 lb/MMBtu*
0.24 lb/hr PM

*THC = 100.0 MMBtu/hr * 0.14 lb/MMBtu*
14.0 lb/hr THC

*CO2 = 100.0 MMBtu/hr * 117 lb/MMBtu*
11,689 lb/hr CO2

*CH4 = 100.0 MMBtu/hr * 0.0022 lb/MMBtu*
0.22 lb/hr CH4

*N2O = 100.0 MMBtu/hr * 0.00022 lb/MMBtu*
0.022 lb/hr CH4

CO2e (total) = (11,689 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.22 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.022 lb N2O/hr x 320 lb CO2e/lb N2O)
11,701 lb CO2e/hr

CO2e (non-biogenic) = (0.220 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.0220 lb N2O/hr x 320 lb CO2e/lb N2O)
11.7 lb CO2e/hr

Annual Emissions - Pilot Operation

*Annual = [Pilot Input (0.18 MMBtu/hr) * EF (lbs/MMBtu)] / 2,000 lbs/ton*

*SO2 = [0.18 MMBtu/hr * 0.00059 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.00047 TPY SOx

*NOx = [0.18 MMBtu/hr * 0.068 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.055 TPY NOx

*CO = [0.18 MMBtu/hr * 0.37 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.30 TPY CO

*PM = [0.18 MMBtu/hr * 0.0024 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.0020 TPY PM

*THC = [0.18 MMBtu/hr * 0.14 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.11 TPY THC

*CO2 = [0.18 MMBtu/hr * 117 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
94 TPY CO2

*CH4 = [0.18 MMBtu/hr * 0.0022 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.0018 TPY CH4

*N2O = [0.18 MMBtu/hr * 0.00022 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.00018 TPY N2O

CO2e (total) = (94 ton CO2/yr x 1 ton CO2e/ton CO2) + (0.0018 ton CH4/yr x 21 ton CO2e/ton CH4) + (0.00018 ton N2O/yr x 320 ton CO2e/ton N2O)
94 TPY CO2e

CO2e (non-biogenic) = CO2e (total)
94 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOGAS BACKUP FLARE

Emissions Summary

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
PM	0.24	0.0020
SO2	10	0.00047
NOx	6.8	0.055
CO	37	0.30
VOC[3]	14.0	0.11
CO2e (total)	11,701	94
CO2e (non-biogenic)	11.7	94

REFERENCES/NOTES

1 Based on EPA AP-42, Section 13.5, Industrial Flares, January 1995.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
COOLING TOWER

SOURCE DESCRIPTION

Cooling for equipment within the facility will be provided by an induced draft cooling tower.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Cells	4	
Water Flow (total)	25,038,000	lb/hr cooling water
Water Density	8.346	lb/gal
Water Flow (total)	50,000	gallons/minute (GPM) cooling water
Drift Losses	0.0005	%
TDS [1]	2,750	mg/L
Air Flow (total)	25,282,963	lb/hr air flow
Air Exit Temperature	94.3	°F
Air Density	0.07165	lb/ft3
Air Flow (total)	5,881,420	acfm
Air Flow (each cell)	1,470,355	acfm
Exit Diameter (each cell)	32.8	ft
Exit Velocity (each cell)	28.9	ft/s

EMISSION CALCULATIONS [1]

PM Emissions

*Drift Loss (gal/hr) = 50,000 GPM * 60 mins/hr * 0.0005 %drift*

15.00 gals/hr Drift Loss

Average Emissions

*Average = 15.0 gal/hr loss * 2,750 mg/L * 3.7854 L/gal / 453,600 mg/lb*

0.34 lb PM10/hr

Annual Emissions

*Total = 0.34 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*

1.51 TPY PM10

VOC Emissions

SCAQMD Guidance (2006)

Average Emissions

*Average = 50,000 GPM * 0.00144 MGD/GPM * 0.7 lb VOC/MGD / 24 hr/day*

2.10 lb VOC/hr

Annual Emissions

*Total = 2.10 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*

9.20 TPY VOC

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
COOLING TOWER

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*	
PM10	0.34	1.5	
PM2.5	0.34	1.5	assume equal to PM10
VOC	2.1	9.2	
HAP [2]	0.11	0.5	

Dispersion Modeling Emissions Summary, Each Cooling Tower Cell

Pollutant	*Averaging Period*	*Emissions (lb/hr)*
PM_{10}	24-Hour	0.086
PM_{10}	Annual	0.086

REFERENCES/NOTES

1 Based on facility supplied information.
2 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOMASS BOILER

SOURCE DESCRIPTION

The project includes a single fluidized bed biomass boiler with a rated capacity of 270 MMBtu/hr. The unit will burn stillage cake, biosolids, biogas and natural gas, and will supply baseload process steam to the facility. Some of the steam produced by the boiler will be used to produce 7.6 MW of power. The unit will utilize best available control technology (BACT) to minimize emissions. Specifically, the boiler will be equipped with a baghouse to control PM emissions, selective non-catalytic reduction (SNCR) to control NOx emissions, and limestone injection and a scrubber to control SO2 emissions. Good combustion practices will be used to minimize CO and VOC emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	Hrs/yr	
Total Capacity	270	MMBtu/hr	
Natural Gas Capacity	250	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Exhaust Flow	75,073	acfm	
Exit Temperature	175	°F	
Exit Diameter	7	ft	
Exit Velocity	32.5	ft/s	

EMISSION CALCULATIONS

Emission Factors[1]		lbs/MMBtu	
PM10 (filterable)		0.01	
PM10 (total)		0.05	
PM2.5 (filterable)		0.01	
PM2.5 (total)		0.05	
SO_2		0.06	30-day rolling average
SO_2		0.12	short-term average (24-hour)
SO_2		0.14	short-term average (3-hour)
NOx		0.08	30-day rolling average
NOx		0.1	short-term average (24-hour)
CO		0.1	30-day rolling average
CO		0.2	short-term average (8-hour)
VOC		0.005	
CO2 (stillage)	1	260.5	40 CFR 98, Table C-1
CO2 (nat. gas)	1	117.6	AP42, Table 1.4-2
CH4 (stillage)	21	0.0705	40 CFR 98, Table C-1
CH4 (nat. gas)	21	0.00225	AP42, Table 1.4-2
N2O (stillage)	310	0.00926	40 CFR 98, Table C-1
N2O (nat. gas)	310	0.000627	AP42, Table 1.4-2
HCl		0.0054	
Pb		0.000048	
Hg		0.00001	
NH3		0.013	

Typical Emissions

Typical = Boiler Capacity (270 MMBtu/hr) x Emission Factor (lb/MMBtu)

Filterable PM10 = 270 MMBtu/hr x 0.01 lb/MMBtu
2.70 lb Filterable PM10/hr

Total PM10 = 270 MMBtu/hr x 0.05 lb/MMBtu
13.5 lb Total PM10/hr

Filterable PM2.5 = 270 MMBtu/hr x 0.01 lb/MMBtu
2.70 lb Filterable PM2.5/hr

Total PM2.5 = 270 MMBtu/hr x 0.05 lb/MMBtu
13.5 lb Total PM2.5/hr

SO2 = 270 MMBtu/hr x 0.06 lbs/MMBtu
16.2 lb SO2/hr

NOx = 270 MMBtu/hr x 0.08 lbs/MMBtu
21.6 lb NOx/hr

CO = 270 MMBtu/hr x 0.1 lbs/MMBtu
27.0 lb CO/hr

VOC = 270 MMBtu/hr x 0.005 lbs/MMBtu
1.35 lb VOC/hr

CO2 = 270 MMBtu/hr x 260.5 lbs/MMBtu
70,340 lb CO2/hr

CH4 = 270 MMBtu/hr x 0.071 lbs/MMBtu
19.0 lb CH4/hr

N2O = 270 MMBtu/hr x 0.0093 lbs/MMBtu
2.50 lb N2O/hr

CO2e (total) = (70,340 lb CO2/hr x 1 lb CO2e/lb CO2) + (19.0 lb CH4/hr x 21 lb CO2e/lb CH4 + (2.50 lb N2O/hr x 310 lb CO2e/lb N2O)
71,515 lb CO2e/hr

HCl = 270 MMBtu/hr x 0.0054 lbs/MMBtu
1.46 lb HCl/hr

Pb = 270 MMBtu/hr x 0.000048 lbs/MMBtu
1.30E-02 lb Pb/hr

Hg = 270 MMBtu/hr x 0.00001 lbs/MMBtu
2.70E-03 lb Hg/hr

NH3 = 270 MMBtu/hr x 0.013 lbs/MMBtu
3.44 lb NH3/hr

Annual Emissions

*Annual = Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

*Filterable PM10 = (2.70 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
11.8 TPY Filterable PM10

*Total PM10 = (13.5 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
59.1 TPY Total PM10

*Filterble PM2.5 = (2.70 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
11.8 TPY Filterable PM2.5

*Total PM2.5 = (13.5 lbs/hr) * (75,073 hrs/yr) / (2,000 lbs/ton)*
59.1 TPY Total PM2.5

*SO2 = (16.2 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
71.0 TPY SO2

*NOx = (21.6 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
95 TPY NOx

*CO = (27.0 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
118 TPY CO

*VOC = (1.35 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
5.91 TPY VOC

*CO2e (total) = (71,515 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
313,238 TPY CO2e

*HCl = (1.46 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
6.39 TPY HCl

*Pb = (0.01296 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
5.68E-02 TPY Pb

*Hg = (0.0027 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
1.18E-02 TPY Hg

*NH3 = (3.44 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
15.1 TPY Hg

EMISSION SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
Filterable PM10	2.70	11.8
Total PM10	13.5	59.1
Filterable PM2.5	2.70	11.8
Total PM2.5	13.5	59.1
SO_2	16.2	71.0
NOx	21.6	95
CO	27.0	118
VOC	1.35	5.91
CO2e (total)	71,515	313,238
HCl	1.46	6.39
Pb	0.0130	0.0568
Hg	0.00270	0.0118
total HAPs	1.50	6.57
NH3	3.44	15.1

Dispersion Modeling Emissions Summary

Pollutant	*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}	24-Hour	13.5	1.70
PM_{10}	Annual	13.5	1.70
$PM_{2.5}$	24-Hour	13.5	1.70
$PM_{2.5}$	Annual	13.5	1.70
SO_2	1-Hour	37.8	4.76
SO_2	3-Hour	37.8	4.76
SO_2	24-Hour	37.8	4.76
SO_2	Annual	37.8	4.76
NO_2	1-Hour	27.0	3.40
NO_2	Annual	27.0	3.40
CO	1-Hour	54.0	6.80
CO	8-Hour	54.0	6.80

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOMASS BOILER

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[2,3]

The maximum potential HAP emissions of biomass or natural gas are used for purposes of calculating potential emissions. For example, total potential HAP emissions are greater for biomass combustion than for natural gas combustion, so in the case of total HAPs the maximum potential emissions are based on biomass combustion. In contrast, maximum potential n-hexane emissions are greater for natural gas combustion, so in the case of n-hexane the maximum potential emissions are based on natural gas combustion. Because of this conservative approach, individual HAP potential emissions will not sum to equal total HAP potential emissions.

HAP Emissions, Biomass Combustion

	lb/MMBtu	lb/hr	tpy
HCl	5.40E-03	1.46E+00	6.39E+00
Hg	1.00E-05	2.70E-03	1.18E-02
POM	1.43E-04	3.86E-02	1.69E-01
Total HAPs (biomass)	5.55E-03	1.50E+00	6.57E+00

HAP Emissions, Natural Gas Combustion

	lb/MMscf	lb/MMBtu	lb/hr	tpy
Total HAPs (natural gas)	1.89E+00	1.85E-03	4.63E-01	2.03E+00
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	4.41E-01	1.93E+00
formaldehyde	7.50E-02	7.35E-05	1.84E-02	8.05E-02
toluene	3.40E-03	3.33E-06	8.33E-04	3.65E-03
benzene	2.10E-03	2.06E-06	5.15E-04	2.25E-03
dichlorobenzene	1.20E-03	1.18E-06	2.94E-04	1.29E-03
naphthalene	6.10E-04	5.98E-07	1.50E-04	6.55E-04
POM Speciation				
total POM	8.82E-05	8.65E-08	2.16E-05	9.47E-05
2-methylnaphthalene	2.40E-05	2.35E-08	5.88E-06	2.58E-05
phenanthrene	1.70E-05	1.67E-08	4.17E-06	1.83E-05
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	3.92E-06	1.72E-05
pyrene	5.00E-06	4.90E-09	1.23E-06	5.37E-06
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	8.82E-07	3.86E-06
fluoranthene	3.00E-06	2.94E-09	7.35E-07	3.22E-06
fluorene	2.80E-06	2.75E-09	6.86E-07	3.01E-06
anthracene	2.40E-06	2.35E-09	5.88E-07	2.58E-06
acenaphthene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
acenaphthylene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
benz(a)anthracene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
chrysene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
3-methylchloranthene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
benzo(a)pyrene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
benzo(g,h,i)perylene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	5.15E-04	2.25E-03
chromium	1.40E-03	1.37E-06	3.43E-04	1.50E-03
cadmium	1.10E-03	1.08E-06	2.70E-04	1.18E-03
manganese	3.80E-04	3.73E-07	9.31E-05	4.08E-04
mercury	2.60E-04	2.55E-07	6.37E-05	2.79E-04
arsenic	2.00E-04	1.96E-07	4.90E-05	2.15E-04
cobalt	8.40E-05	8.24E-08	2.06E-05	9.02E-05
selenium	2.40E-05	2.35E-08	5.88E-06	2.58E-05
beryllium	1.20E-05	1.18E-08	2.94E-06	1.29E-05

REFERENCES/NOTES

1 Emission factors based on proposed BACT emission limits.

2 HAP emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate except for HCl and Hg.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

SOURCE DESCRIPTION

The gas boiler is fired with natural gas and will be used to provide steam to the facility processes during peak demand periods. The boiler is conservatively assumed to operate at full capacity year-round. The unit will utilize best available control technology (BACT) to minimize emissions. Specifically, the boiler will be equipped with ultra-low NOx burners to control NOx emissions. Good combustion practices will be used to minimize CO and VOC emissions. Natural gas is inherently low in sulfur and produces little PM emissions.

OPERATING PARAMETERS

Boiler

Operating Schedule	8,760	hrs/yr	
Fuels		Natural Gas	
Capacity	95	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Capacity	93,137	scf/hr	
Sulfur Content	0.02	gr/scf	from FDEP
F-Factor	10,610	scf/MMBtu	from 40 CFR 60 Method 19
Exhaust Flow	29,590	acfm	
Exit Temperature	350	°F	
Exit Diameter	4	ft	
Exit Velocity	39.24	ft/s	

EMISSION CALCULATIONS

Criteria Pollutant and GHG Emission Factors for Natural Gas

Pollutant		lb/MMBtu	Emission Factor Source
PM10		0.004	BACT
PM2.5		0.004	BACT
SO2		0.0056	BACT
NOx		0.035	BACT
CO		0.037	BACT
VOC		0.0014	BACT
CO2	1	117.6	AP42, Table 1.4-2
CH4	21	0.00225	AP42, Table 1.4-2
N2O	310	0.000627	AP42, Table 1.4-2

Typical Emissions

Typical = Boiler Capacity (95 MMBtu/hr) x Emission Factor (lb/MMBtu)

PM10 = *95 MMBtu/hr * 0.004 lbs/MMBtu*
0.380 lbs PM/hr

PM2.5 = *95 MMBtu/hr * 0.004 lbs/MMBtu*
0.380 lbs PM/hr

SO2 = *95 MMBtu/hr * 0.0055964 lbs/MMBtu*
0.532 lbs SO2/hr

NOx = *95 MMBtu/hr * 0.035 lbs/MMBtu*
3.33 lbs NOx/hr

CO = *95 MMBtu/hr * 0.037 lbs/MMBtu*
3.52 lbs CO/hr

VOC = *95 MMBtu/hr * 0.0014 lbs/MMBtu*
0.133 lbs VOC/hr

CO2 = *95 MMBtu/hr x 117.6 lbs/MMBtu*
11,176 lb CO2/hr

CH4 = *95 MMBtu/hr x 0.00225 lbs/MMBtu*
0.214 lb CH4/hr

N2O = *95 MMBtu/hr x 0.000627 lbs/MMBtu*
0.0596 lb N2O/hr

CO2e (total) = *(11,176 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.214 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.0596 lb N2O/hr x 310 lb CO2e/lb N2O)*
11,199 lb CO2e/hr

Annual Emissions

Annual = *Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

PM10 = *(0.380 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
1.664 TPY Total PM10

PM2.5 = *(0.380 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
1.664 TPY Filterable PM2.5

SO2 = *(0.532 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
2.33 TPY SO2

NOx = *(3.33 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
14.6 TPY NOx

CO = *(3.52 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
15.4 TPY CO

VOC = *(0.133 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.583 TPY VOC

CO2e (total) = *(11,199 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
49,054 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	0.380	1.664
PM2.5	0.380	1.664
SO2	0.532	2.33
NOx	3.33	14.6
CO	3.52	15.4
VOC	0.133	0.583
CO2e (total)	11,199	49,054
total HAP	0.176	0.770

Dispersion Modeling Emissions Summary

Pollutant		*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}		24-Hour	0.380	0.0479
$PM_{2.5}$		24-Hour	0.380	0.0479
SO_2		1-Hour	0.532	0.0670
SO_2		3-Hour	0.532	0.0670
SO_2		24-Hour	0.532	0.0670
SO_2		Annual	0.532	0.0670
NO_2		1-Hour	3.325	0.419
NO_2		Annual	3.33	0.419
CO		1-Hour	3.52	0.443
CO		8-Hour	3.52	0.443

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/MMscf	lb/MMBtu	lb/hr	tpy
HAP	1.89E+00	1.85E-03	1.76E-01	7.70E-01
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	1.68E-01	7.34E-01
formaldehyde	7.50E-02	7.35E-05	6.99E-03	3.06E-02
toluene	3.40E-03	3.33E-06	3.17E-04	1.39E-03
benzene	2.10E-03	2.06E-06	1.96E-04	8.57E-04
dichlorobenzene	1.20E-03	1.18E-06	1.12E-04	4.90E-04
naphthalene	6.10E-04	5.98E-07	5.68E-05	2.49E-04
POM Speciation				
total POM	8.82E-05	8.65E-08	8.21E-06	3.60E-05
2-methylnaphthalene	2.40E-05	2.35E-08	2.24E-06	9.79E-06
phenanthrene	1.70E-05	1.67E-08	1.58E-06	6.94E-06
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	1.49E-06	6.53E-06
pyrene	5.00E-06	4.90E-09	4.66E-07	2.04E-06
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	3.35E-07	1.47E-06
fluoranthene	3.00E-06	2.94E-09	2.79E-07	1.22E-06
fluorene	2.80E-06	2.75E-09	2.61E-07	1.14E-06
anthracene	2.40E-06	2.35E-09	2.24E-07	9.79E-07
acenaphthene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
acenaphthylene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
benz(a)anthracene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
chrysene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
3-methylchloranthene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
benzo(a)pyrene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
benzo(g,h,i)perylene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	1.96E-04	8.57E-04
chromium	1.40E-03	1.37E-06	1.30E-04	5.71E-04
cadmium	1.10E-03	1.08E-06	1.02E-04	4.49E-04
manganese	3.80E-04	3.73E-07	3.54E-05	1.55E-04
mercury	2.60E-04	2.55E-07	2.42E-05	1.06E-04
arsenic	2.00E-04	1.96E-07	1.86E-05	8.16E-05
cobalt	8.40E-05	8.24E-08	7.82E-06	3.43E-05
selenium	2.40E-05	2.35E-08	2.24E-06	9.79E-06
beryllium	1.20E-05	1.18E-08	1.12E-06	4.90E-06

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

ANNUAL NON-BIOGENIC GREENHOUSE GAS EMISSIONS - BOILERS

SOURCE DESCRIPTION

Highlands Ethanol proposes to limit annual natural gas consumption in the two boilers. The limit is being proposed to ensure that the facility will be a synthetic minor source of non-biogenic GHG emissions. The limit is being proposed as a bubble limit over both boilers, which will allow the facility flexibility in determining the best use of natural gas over a 12-month period. This limit does not have an impact on the potential emissions of criteria pollutants or HAPs because the maximum potential emissions of those pollutants occurs under a scenario where the biomass boiler operates at full capacity exclusively on stillage and biogas while the peaking boiler operates at full capacity on natural gas. Likewise, potential total GHG emissions (biogenic plus non-biogenic) are greatest under that scenario. However, non-biogenic GHG emissions - the GHG emissions compared to the PSD permitting threshold - are greatest when natural gas consumption is maximized. Therefore, this calculation sheet focuses exclusively on potential non-biogenic GHG emissions.

OPERATING PARAMETERS

Boilers

Fuel		Natural Gas	
Natural Gas HHV	1,020	Btu/scf	from AP42
Proposed Natural Gas Limit	1,085	million scf/yr	
Proposed Natural Gas Limit	1,106,700	MMBtu/yr	
Total Heat Input Capacity	3,197,400	MMBtu/yr, both boilers (including biomass fuel)	

EMISSION CALCULATIONS

GHG Emission Factors for Natural Gas

Pollutant	GWP	lb/MMBtu	Emission Factor Source
CO2	1	117.6	AP42, Table 1.4-2; GWP from 40 CFR 98
CH4	21	0.00225	AP42, Table 1.4-2; GWP from 40 CFR 98
N2O	310	0.000627	AP42, Table 1.4-2; GWP from 40 CFR 98

GHG Emission Factors for Stillage

CH4	21	0.0705
N2O	310	0.00926

Annual Emissions

Annual Potential Emissions = Proposed Annual Gas Consumption Limit (1,106,700 MMBtu/yr) x Emission Factor (lb/MMBtu) / 2000 lb/ton

+ Stillage Combustion Emissions of CH4 and N2O for balance of heat input

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

ANNUAL NON-BIOGENIC GREENHOUSE GAS EMISSIONS - BOILERS

CO2 = 1,106,700 MMBtu/yr x 117.6 lbs/MMBtu / 2000 lb/ton

65,100 tpy CO2

CH4 (natural gas) = 1,106,700 MMBtu/yr x 0.00225 lbs/MMBtu / 2000 lb/ton

1.25 tpy CH4

N2O (natural gas) = 1,106,700 MMBtu/yr x 0.000627 lbs/MMBtu / 2000 lb/ton

0.35 tpy N2O

CH4 (stillage) = (3,197,400 MMBtu/yr - 1,106,700 MMBtu/yr) x 0.0705 lbs/MMBtu / 2000 lb/ton

73.7 tpy CH4

N2O (stillage) = (3,197,400 MMBtu/yr - 1,106,700 MMBtu/yr) x 0.00926 lbs/MMBtu / 2000 lb/ton

9.68 tpy N2O

CO2e (total) = (65,100 ton CO2/yr x 1 ton CO2e/ton CO2) + (75.00 ton CH4/yr x 21 ton CO2e/ton CH4) + (10.03 ton N2O/yr x 310 ton CO2e/ton N2O)

69,783 tpy CO2e

CO2e (non-biogenic) = (65,100 ton CO2/yr x 1 ton CO2e/ton CO2) + (75.00 ton CH4/yr x 21 ton CO2e/ton CH4) + (10.03 ton N2O/yr x 310 ton CO2e/ton N2O)

69,783 tpy CO2e

TOTAL GHG POLLUTANT EMISSIONS SUMMARY

Pollutant	***Annual (TPY)***
CO2e (total)	69,783
CO2e (non-biogenic)	69,783

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FIRE PUMP

SOURCE DESCRIPTION

The diesel pump will be used in the event of a fire. The pump will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 100 hours per year.

OPERATING PARAMETERS

Operating Schedule	100	hrs/yr
Capacity	850	hp
	6.16	MMBtu/hr
Primary Fuel	#2 Diesel (ULSD)	
Sulfur Content	15	ppm (ULSD)

EMISSION CALCULATIONS

Pollutant	g/kW-hr [1]	GWP	Pollutant	lb/MMBtu [2]
PM10	0.2		Acetaldehyde	0.0000252
SOx	0.00738		Acrolein	0.00000788
NOx	5.76		Benzene	0.000776
CO	3.5		Formaldehyde	0.0000789
VOC	0.64		Propylene	0.00279
CO2*	165	1	Toluene	0.000281
CH4*	0.0066	21	Xylene	0.000193
N2O*	0.00132	310		

*Emission factors for GHGs are lb/MMBtu. For CO2, EFs are from AP-42 Section 3.4. For CH4 and N2O, EFs from Part 98 Table C-2.

Average Emissions - Criteria Pollutants

*Average = Capacity (kW) * Emission Factor (g/kW-hr) * (1 lb/453.5924 g)*

*PM = 634 kW * 0.2 g/kW-hr * (1 lb/453.5924 g)*

0.279 lb PM10/hr

*SO2 = 634 kW * 0.0074 g/kW-hr * (1 lb/453.5924 g)*

0.0103 lb SO2/hr

*NOx = 634 kW * 5.76 g/kW-hr * (1 lb/453.5924 g)*

8.05 lb NOx/hr

*CO = 634 kW * 3.5 g/kW-hr * (1 lb/453.5924 g)*

4.89 lb CO/hr

*VOC = 634 kW * 0.64 g/kW-hr * (1 lb/453.5924 g)*

0.894 lb VOC/hr

CO2 = *6.16 MMBtu/hr * 165 lb/MMBtu*

1,017 lb CO2/hr

CH4 = *6.16 MMBtu/hr * 0.0066 lb/MMBtu*

0.0407 lb CH4/hr

N2O = *6.16 MMBtu/hr * 0.00132 lb/MMBtu*

0.00814 lb N2O/hr

CO2e = *(1,017 lb CO2/hr x lb CO2e/lb) + (0.0407 lb CH4/hr x lb CO2e/lb CH4) + (0.00814 lb N2O/hr x 1 lb CO2e/lb N2O)*
1,020 lb CO2e/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (6.16 MMBtu/hr) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 6.16 MMBtu/hr * 0.0000252 lb/MMBtu*
0.00016 lb Acetaldehyde/hr

*Acrolein = 6.16 MMBtu/hr * 0.0000079 lb/MMBtu*
0.000049 lb Acrolein/hr

*Benzene = 6.16MMBtu/hr * 0.000776 lb/MMBtu*
0.0048 lb Benzene/hr

*Formaldehyde = 6.16 MMBtu/hr * 0.0000789 lb/MMBtu*
0.00049 lb Formaldehyde/hr

*Propylene = 6.16 MMBtu/hr * 0.002790 lb/MMBtu*
0.017 lb Propylene/hr

*Toluene = 6.16 MMBtu/hr * 0.000281 lb/MMBTu*
0.0017 lb Toluene/hr

*Xylene = 6.16 MMBtu/hr * 0.000193 lb/MMBtu*
0.0012 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.28 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0140 TPY PM10

*SO2 = 0.01 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000516 TPY SO2

*NOx = 8.05 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.402 TPY NOx

*CO = 4.89 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.245 TPY CO

*VOC = 0.89 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0447 TPY VOC

CO2e = *1,020 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
51.0 TPY CO2e

*Acetaldehyde = 0.00016 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0000078 TPY Acetaldehyde

*Acrolein = 0.00005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0000024 TPY Acrolein

*Benzene = 0.005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00024 TPY Benzene

*Formaldehyde = 0.0005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000024 TPY Formaldehyde

*Propylene = 0.0012 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000059 TPY Propylene

*Toluene = 0.017 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00086 TPY Toluene

*Xylene = 0.0017 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000087 TPY Xylene

Emissions Summary

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
PM10	0.279	0.0140
PM2.5	0.279	0.0140
SOx	0.0103	0.000516
NOx	8.05	0.402
CO	4.89	0.245
Total VOC	0.894	0.0447
CO2e	1,020	51.0
HAPs	0.024	0.0012
Acetaldehyde	0.00016	0.0000078
Acrolein	0.000049	0.0000024
Benzene	0.0048	0.00024
Formaldehyde	0.00049	0.000024
Propylene	0.0012	0.000059
Toluene	0.017	0.00086
Xylene	0.0017	0.000087

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII

2 Emission factor based on AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
EMERGENCY GENERATORS

SOURCE DESCRIPTION

Three emergency generators will be used in the event of power supply disruptions. The engines will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 100 hours per year. Emissions listed here are per each engine.

OPERATING PARAMETERS, EACH ENGINE

Operating Schedule	100	hrs/yr	
Capacity	2,012	hp	1500 ekW
	14.59	MMBtu/hr	104.2 gal/hr
Primary Fuel	#2 Diesel (ULSD)		
Sulfur Content	15	ppm (ULSD)	

EMISSION CALCULATIONS, EACH ENGINE

Pollutant	g/kW-hr [1]	GWP	Pollutant	lb/MMBtu [2]
PM10	0.2		Acetaldehyde	0.0000252
SOx	0.00738		Acrolein	0.00000788
NOx	5.76		Benzene	0.000776
CO	3.5		Formaldehyde	0.0000789
VOC	0.64		Propylene	0.00279
CO2*	165	1	Toluene	0.000281
CH4*	0.0066	21	Xylene	0.000193
N2O*	0.00132	310		

*Emission factors for GHGs are lb/MMBtu. For CO2, EFs are from AP-42 Section 3.4. For CH4 and N2O, EFs from Part 98 Table C-2.

Average Emissions - Criteria Pollutants

*Average = Capacity (kW) * Emission Factor (g/kW-hr) * (1 lb/453.5924 g)*

*PM = 1,500 kW * 0.2 g/kW-hr * (1 lb/453.5924 g)*
0.661 lb PM10/hr

*SO2 = 1,500 kW * 0.0074 g/kW-hr * (1 lb/453.5924 g)*
0.0244 lb SO2/hr

*NOx = 1,500 kW * 5.76 g/kW-hr * (1 lb/453.5924 g)*
19.0 lb NOx/hr

*CO = 1,500 kW * 3.5 g/kW-hr * (1 lb/453.5924 g)*
11.6 lb CO/hr

*VOC = 1,500 kW * 0.64 g/kW-hr * (1 lb/453.5924 g)*
2.12 lb VOC/hr

CO2 = *14.59 MMBtu/hr * 165 lb/MMBtu*
2,407 lb CO2/hr

CH4 = *14.59 MMBtu/hr * 0.0066 lb/MMBtu*
0.0963 lb CH4/hr

N2O = *14.59 MMBtu/hr * 0.00132 lb/MMBtu*
0.0193 lb N2O/hr

CO2e = *(2,407 lb CO2/hr x lb CO2e/lb) + (0.0963 lb CH4/hr x lb CO2e/lb CH4)*
+ (0.01925 lb N2O/hr x 1 lb CO2e/lb N2O)
2,415 lb CO2e/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (14.59 MMBtu/hr) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 14.59 MMBtu/hr * 0.0000252 lb/MMBtu*
0.00037 lb Acetaldehyde/hr

*Acrolein = 14.59 MMBtu/hr * 0.0000079 lb/MMBtu*
0.00011 lb Acrolein/hr

*Benzene = 14.59MMBtu/hr * 0.000776 lb/MMBtu*
0.011 lb Benzene/hr

*Formaldehyde = 14.59 MMBtu/hr * 0.0000789 lb/MMBtu*
0.0012 lb Formaldehyde/hr

*Propylene = 14.59 MMBtu/hr * 0.002790 lb/MMBtu*
0.041 lb Propylene/hr

*Toluene = 14.59 MMBtu/hr * 0.000281 lb/MMBTu*
0.0041 lb Toluene/hr

*Xylene = 14.59 MMBtu/hr * 0.000193 lb/MMBtu*
0.0028 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.66 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0331 TPY PM10

*SO2 = 0.02 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00122 TPY SO2

*NOx = 19.05 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.952 TPY NOx

*CO = 11.57 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.579 TPY CO

*VOC = 2.12 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.106 TPY VOC

CO2e = *2,415 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
121 TPY CO2e

*Acetaldehyde = 0.00037 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000018 TPY Acetaldehyde

*Acrolein = 0.00011 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0000057 TPY Acrolein

*Benzene = 0.011 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00057 TPY Benzene

*Formaldehyde = 0.0012 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000058 TPY Formaldehyde

*Propylene = 0.0028 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00014 TPY Propylene

*Toluene = 0.041 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0020 TPY Toluene

*Xylene = 0.0041 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00020 TPY Xylene

Emissions Summary - Each Engine

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
PM10	0.661	0.0331
PM2.5	0.661	0.0331
SOx	0.02440	0.00122
NOx	19.0	0.952
CO	11.57	0.579
Total VOC	2.12	0.106
CO2e	2,415	121
HAPs	0.058	0.0029
Acetaldehyde	0.00037	0.000018
Acrolein	0.00011	0.0000057
Benzene	0.011	0.00057
Formaldehyde	0.0012	0.000058
Propylene	0.0028	0.00014
Toluene	0.041	0.0020
Xylene	0.0041	0.00020

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII

2 Emission factor based on AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
STILLAGE LOADOUT (FUGITIVE VOC)

SOURCE DESCRIPTION

Stillage is removed from the beer stripper distillation column, centrifuged to remove some of the water fraction, and conveyed to the biomass boiler. The stillage will not be dried. Stillage will be generated at a rate of 11 dry tons per hour and will consist primarily of lignin fibers and secondarily of unhydrolyzed cellulose fibers with a moisture content between 50 and 60 percent. Emissions will occur from the conveyor and the centrifuges used for dewatering. Based on the consistency and moisture content of the material, PM emissions are expected to be negligible. VOC emissions will occur from the evaporation of organics dissolved in the water fraction and escaping the conveyor as fugitive emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Ethanol Production	39,420,000	gal/yr

EMISSION CALCULATIONS [1]

VOC Emission Factor	0.0004262	lb/gal

VOC Emissions

*Average Emissions = VOC Emission Factor (0.00043 lb/gal) * Ethanol Production (39,420,000 gal/yr) / Operating Hours (8,760 hrs/yr)*

Average VOC Emission Rate	1.918	lbs/hr

*Annual Emissions = Average VOC Emission Rate (1.92 lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Annual VOC Emission Rate	8.40	tons/yr

Emissions Speciation [2]

Pollutant	CAS No.	Percent	HAP
Acetic Acid	64-19-7	66.5%	No
Hydroxymethylfurfural	67-47-0	16.9%	No
Ethanol	64-17-5	12.4%	No
Furfural	98-01-1	4.2%	No

Speciated Emissions

Pollutant	Average (lb/hr)	Annual (tpy)
Acetic Acid	1.275	5.586
Hydroxymethylfurfural	0.324	1.420
Ethanol	0.238	1.042
Furfural	0.081	0.353

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
STILLAGE LOADOUT (FUGITIVE VOC)

Emissions Summary

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
Total VOC	1.9	8.4
Acetic Acid	1.3	5.6
Hydroxymethylfurfural	0.3	1.4
Ethanol	0.2	1.0
Furfural	0.1	0.4

REFERENCES/NOTES

1 Emission factor based on the procedure used for the permitting of the Pacific Ethanol Facility located in Madera, California. Three emission calculation procedures were identified and the one that resulted in the greatest VOC emission rate was selected. The emission factor was then doubled for an additional margin of safety. See Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004. AMEC in turn tripled the resulting emissions factor to provide for an additional margin of safety.

2 ASPEN modeling of the water fraction of the stillage cake shows constituents that are consistent in properties with those identified in the Pacific Ethanol analysis. The speciation shown is based on the ASPEN modeling and shows only those components that EPA's WATER9 model shows to be volatile.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FUGITIVE VOC EQUIPMENT LEAKS

SOURCE DESCRIPTION

Equipment components in VOC service are subject to 40 CFR Part 60 Subpart VV; therefore components are monitored monthly. Control effectiveness is allowed for components subject to an LDAR program.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

EMISSION CALCULATIONS [1]

*Average (Lbs/hr) = Component Count x Emission Factor (lb/hr/source) * (1 - Control Effectiveness/100)*

*Annual (TPY) = Average (lbs VOC/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Component Type	Service	Component Count	Emission Factors (kg/hr/source) [1]	Weighted Average VOC Content [2]	Subpart VV Control Effectiveness [3]	Emissions		
						Avg (lbs/hr)	Max (lbs/hr)	Tons/Yr
Valves	Gas/Vapor	50	0.00597	100%	87%	8.56E-02	1.03E-01	3.75E-01
Valves	Light Liquid	400	0.00403	96%	84%	5.46E-01	6.55E-01	2.39E+00
Valves	Heavy Liquid	200	0.00023	5%	0%	5.07E-03	6.08E-03	2.22E-02
Sealless Valves	Light Liquid	400	4.90E-07	96%	84%	6.64E-05	7.96E-05	2.91E-04
Sealless Valves	Heavy Liquid	200	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Light Liquid	0	0.0199	96%	69%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Heavy Liquid	0	0.00862	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals, Dual Mech.	Light Liquid	100	7.50E-06	96%	69%	4.92E-04	5.90E-04	2.16E-03
Pump Seals, Dual Mech.	Heavy Liquid	20	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Agitator Seals	Light Liquid	20	0.0199	96%	69%	2.61E-01	3.13E-01	1.14E+00
Agitator Seals	Heavy Liquid	20	0.00862	5%	0%	1.90E-02	2.28E-02	8.32E-02
Compressor Seals	Gas/Vapor	0	0.228	100%	0%	0.00E+00	0.00E+00	0.00E+00
Pressure Relief Valves	Gas/Vapor	0	0.104	100%	0%	0.00E+00	0.00E+00	0.00E+00
Connectors	All	2500	0.00183	30%	0%	3.03E+00	3.63E+00	1.33E+01
Open-Ended Lines	All	120	0.0017	30%	0%	1.35E-01	1.62E-01	5.91E-01
Sampling Connections	All	40	0.015	30%	0%	3.97E-01	4.76E-01	1.74E+00
					TOTAL	**4.5**	**5.4**	**19.6**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FUGITIVE VOC EQUIPMENT LEAKS

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
VOC	4.5	19.6
HAP[4]	0.22	0.98

REFERENCES/NOTES:

1 Table 2-1, SOCMI Average Emission Factors; or Table 2-11, Default-Zero Values: SOCMI Process Units; or Table 5-1, Summary of Equipment Modifications; Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

2 For components in liquid service, approximately 75% are associated with liquids containing less than 5% VOC, 20% are associated with liquids containing less than 95% VOC, and 5% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 30%. For components in light liquid service, approximately 80% are associated with liquids containing less than 95% VOC, and 20% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 96%.

3 Table 5-2, Control Effectiveness for an LDAR Program at a SOCMI Process Unit, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

4 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
VEHICLE FUGITIVES (PAVED ROADS)

SOURCE DESCRIPTION

Approximately 60 trucks per day will be used to deliver feedstock to the feedstock hopper, and an additional 127 vehicles per day will drive on the plant roads. All roads will be paved with asphalt.

OPERATING PARAMETERS

Operating Schedule 8,760 hr/yr

Vehicle Traffic	Vehicles/Day	Miles/Vehicle	VMT/Day	VMT/Year
Feedstock Delivery	60	0.17	10.23	3,733
Employee Vehicles	60	0.73	43.78	15,979
Product Tankers	21	0.66	13.93	5,084
Denaturant Tankers	1	0.66	0.66	242
Fuel Delivery Trucks	2	1.24	2.47	903
Chemical Delivery Trucks	9	1.10	9.87	3,604
Ash Disposal Trucks	2	1.24	2.47	903
Process Waste Trucks	20	1.10	21.94	8,009
Vendors/Deliveries	5	1.10	5.49	2,002
Miscellaneous	7	1.10	7.68	2,803
TOTAL			**118.53**	**43,264**

EMISSION CALCULATIONS [1]

$$E = k\,(sL)^{0.91} * (W)^{1.02}$$

$$E_{est} = E\ (lbs/VMT) * [1-(P/4N)]$$

where:

E = particulate emission factor (lb/VMT)

	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	particle size multiplier (Table 13.2.1-1)
sL =	0.6	0.6	0.6	road surface silt loading (g/m2, Table 13.2.1-3)
W =	15	15	15	avg weight of the vehicles traveling the road (tons)
P =	120	120	120	Days rainfall > 0.01" (Figure 13.2.1-2)
N =	365	365	365	days in averaging period

Emission Factor

$E = 0.011 * (0.6)^{0.91} * (15)^{1.02}$

0.11 lbs PM/VMT

$E = 0.0022 * (0.6)^{0.91} * (15)^{1.02}$

0.022 lbs PM10/VMT

$E = 0.00054 * (0.6)^{0.91} * (15)^{1.02}$

0.003 lbs PM2.5/VMT

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
VEHICLE FUGITIVES (PAVED ROADS)

Adjusted for Rainfall

E_{est} = *0.11 lbs/VMT * {1-[120/(4*365)]}*

0.11 lbs PM/VMT

E_{est} = *0.02 lbs/VMT * {1-[120/(4*365)]}*

0.020 lbs PM10/VMT

E_{est} = *0.00 lbs/VMT * {1-[120/(4*365)]}*

0.003 lbs PM2.5/VMT

Emission Calculations

*Average PM (Lbs/Hr) = 0.11 lbs PM/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.5 lb/hr PM

*Annual PM (TPY) = Avg (lbs/hr) * 9 hrs/yr / 2,000 lbs/ton*

2.3 tpy PM

*Average PM10 (Lbs/Hr) = 0.020 lbs PM10/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.10 lb/hr PM10

*Annual PM10 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.43 tpy PM10

*Average PM2.5 (Lbs/Hr) = 0.0026 lbs PM10/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.013 lb/hr PM2.5

*Annual PM2.5 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.057 tpy PM2.5

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
PM	0.5	2.3
PM10	0.1	0.4
PM2.5	0.01	0.06

REFERENCES/NOTES:

1 EPA, AP-42, Section 13.2.1, Paved Roads, January 2011.

APPENDIX B-2
Emissions Calculations
Product Loadout to RTO Option

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant / CAS No.	PM (tpy)	PM10 (tpy)	PM2.5 (tpy)	SO2 7446-09-5 (tpy)	NOx (tpy)	CO 630-08-0 (tpy)	VOC (tpy)	Total CO2e (tpy)	Non-Bio CO2e (tpy)	HAP (tpy)
POINT EMISSION SOURCES										
REGENERATIVE THERMAL OXIDIZER (RTO)	0.0601	0.0601	0.0601	0.153	0.956	1.011	15.2	159,525	3,425	8.8
PROCESS AREA EMISSIONS	---	---	---	---	---	---	*15.1*	*156,100*	---	*8.7*
BURNER COMBUSTION EMISSIONS	*0.0601*	*0.0601*	*0.0601*	*0.153*	*0.956*	*1.011*	*0.0383*	*3,425*	*3,425*	*0.12*
PRODUCT STORAGE TANK	---	---	---	---	---	---	0.22	---	---	0.0019
DENATURANT STORAGE TANK	---	---	---	---	---	---	0.96	---	---	0.067
MISCELLANEOUS STORAGE SILOS	4.46	4.46	4.46	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	*0.12*	*0.12*	*0.12*	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	*0.12*	*0.12*	*0.12*	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*							
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	*0.47*	*0.47*	*0.47*	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	0.0020	0.0020	0.0020	0.00047	0.055	0.30	0.11	94	94	---
COOLING TOWER	1.5	1.5	1.5	---	---	---	9.2	---	---	0.5
STEAM PRODUCTION	13.5	13.5	13.5	73.3	109	134	6.50	362,291	69,783	7.3
BIOMASS BOILER	*11.8*	*11.8*	*11.8*	*71.0*	*94.6*	*118*	*5.91*	*313,238*	---	*6.6*
GAS BOILER (PEAKING STEAM DEMAND)	*1.66*	*1.66*	*1.66*	*2.33*	*14.6*	*15.4*	*0.583*	*49,054*	---	*0.77*
STATIONARY ENGINES	0.113	0.113	0.113	0.00418	3.26	1.98	0.362	413	413	0.0099
FIRE PUMP	*0.0140*	*0.0140*	*0.0140*	*0.000516*	*0.402*	*0.245*	*0.0447*	*51*	*51*	*0.0012*
EMERGENCY GENERATOR NO. 1	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
EMERGENCY GENERATOR NO. 2	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
EMERGENCY GENERATOR NO. 3	*0.0331*	*0.0331*	*0.0331*	*0.00122*	*0.952*	*0.579*	*0.106*	*121*	*121*	*0.0029*
FUGITIVE EMISSION SOURCES										
STILLAGE LOADOUT	---	---	---	---	---	---	8.4	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	19.6	---	---	0.98
ROADWAY FUGITIVES	2.3	0.43	0.057	---	---	---	---	---	---	---
Point Source Total	**19.6**	**19.6**	**19.6**	**73.4**	**113.4**	**136.9**	**32.5**	**522,323**	**73,715**	**16.7**
Fugitive Source Total	**2.3**	**0.43**	**0.057**	**0.0**	**0.0**	**0.0**	**28.0**	**0.0**	**0.0**	**0.98**
Facility Total	**22.0**	**20.1**	**19.7**	**73.4**	**113.4**	**136.9**	**60.5**	**522,323**	**73,715**	**17.7**
Major Source Threshold	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**---**	**100,000**	**25**
Significant Emissions Threshold	**25**	**15**	**10**	**40**	**40**	**100**	**40**	**---**	**75,000**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Acetaldehyde 75-07-0 (tpy)	Acrolein 107-02-8 (tpy)	Arsenic 7440-38-2 1.24E-05	Benzene 71-43-2 (tpy)	Beryllium 7440-41-7 (tpy)	Cadmium 7440-43-9 (tpy)	Chromium 7440-47-3 (tpy)	Cobalt 7440-48-4 (tpy)	Cumene 98-82-8 (tpy)
POINT EMISSION SOURCES									
REGENERATIVE THERMAL OXIDIZER (RTO)	7.0	0.0037	0.000012	0.038	0.0000007	0.000068	0.000087	0.0000052	---
PROCESS AREA EMISSIONS	*7.0*	*0.0037*	---	*0.038*	---	---	---	---	---
BURNER COMBUSTION EMISSIONS	---	---	*0.000012*	*0.00013*	*0.0000007*	*0.000068*	*0.000087*	*0.0000052*	---
PRODUCT STORAGE TANK	---	---	---	0.00039	---	---	---	---	0.0000028
DENATURANT STORAGE TANK	---	---	---	0.014	---	---	---	---	0.000096
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---	---	---
COOLING TOWER	0.46	---	---	---	---	---	---	---	---
STEAM PRODUCTION	---	---	0.00030	0.0031	0.000018	0.0016	0.0021	0.00012	---
BIOMASS BOILER	---	---	*0.00021*	*0.0023*	*0.000013*	*0.0012*	*0.0015*	*0.000090*	---
GAS BOILER (PEAKING STEAM DEMAND)	---	---	*0.000082*	*0.00086*	*0.000005*	*0.00045*	*0.00057*	*0.000034*	---
STATIONARY ENGINES	0.000063	0.000020	---	0.0019	---	---	---	---	---
FIRE PUMP	*0.0000078*	*0.0000024*	---	*0.00024*	---	---	---	---	---
EMERGENCY GENERATOR NO. 1	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
EMERGENCY GENERATOR NO. 2	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
EMERGENCY GENERATOR NO. 3	*0.000018*	*0.0000057*	---	*0.00057*	---	---	---	---	---
FUGITIVE EMISSION SOURCES									
STILLAGE LOADOUT	---	---	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	0.98	---	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---	---	---
Point Source Total	**7.5**	**0.0038**	**0.00031**	**0.057**	**0.000019**	**0.0017**	**0.0022**	**0.00013**	**0.000099**
Fugitive Source Total	**0.98**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**8.4**	**0.0038**	**0.00031**	**0.057**	**0.000019**	**0.0017**	**0.0022**	**0.00013**	**0.000099**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	---	---	---	---	---	---	---	---	---

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Dichlorobenzene 106-46-7 (tpy)	Ethylbenzene 100-41-4 (tpy)	Formaldehyde 50-00-0 (tpy)	n-Hexane 110-54-3 (tpy)	HCl 7647-01-0 (tpy)	Isopropyl Benzene 98-82-8 (tpy)	Lead 7439-92-1 (tpy)
POINT EMISSION SOURCES							
REGENERATIVE THERMAL OXIDIZER (RTO)	0.000087	0.0019	0.0046	0.21	---	0.00027	---
PROCESS AREA EMISSIONS	*0.000013*	*0.0019*	---	*0.10*	---	*0.00027*	---
BURNER COMBUSTION EMISSIONS	*0.000074*	---	*0.0046*	*0.11*	---	---	---
PRODUCT STORAGE TANK	---	0.000017	---	0.0010	---	---	---
DENATURANT STORAGE TANK	---	0.00058	---	0.036	---	---	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---
COOLING TOWER	---	---	---	---	---	---	---
STEAM PRODUCTION	0.0018	---	0.11	2.7	6.4	---	0.057
BIOMASS BOILER	*0.0013*	---	*0.081*	*1.9*	*6.4*	---	*0.057*
GAS BOILER (PEAKING STEAM DEMAND)	*0.00049*	---	*0.031*	*0.73*	---	---	---
STATIONARY ENGINES	---	---	0.00020	---	---	---	---
FIRE PUMP	---	---	*0.000024*	---	---	---	---
EMERGENCY GENERATOR NO. 1	---	---	*0.000058*	---	---	---	---
EMERGENCY GENERATOR NO. 2	---	---	*0.000058*	---	---	---	---
EMERGENCY GENERATOR NO. 3	---	---	*0.000058*	---	---	---	---
FUGITIVE EMISSION SOURCES							
STILLAGE LOADOUT	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---
Point Source Total	**0.0019**	**0.0025**	**0.12**	**2.9**	**6.4**	**0.00027**	**0.057**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.0019**	**0.0025**	**0.12**	**2.9**	**6.4**	**0.00027**	**0.057**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**5**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Manganese 7439-96-5 (tpy)	Mercury 7439-97-6 (tpy)	Methanol 67-56-1 (tpy)	Methyl Bromide 74-83-9 (tpy)	Methyl Chloride 74-87-3 (tpy)	Naphthalene 91-20-3 (tpy)	Nickel 7440-02-0 (tpy)	Total POM --- (tpy)
POINT EMISSION SOURCES								
REGENERATIVE THERMAL OXIDIZER (RTO)	0.000024	0.000016	0.039	0.0000060	0.0000025	0.000038	0.00013	0.0000055
PROCESS AREA EMISSIONS	---	---	*0.039*	*0.0000060*	*0.0000025*	---	---	---
BURNER COMBUSTION EMISSIONS	*0.000024*	*0.000016*	---	---	---	*0.000038*	*0.00013*	*0.0000055*
PRODUCT STORAGE TANK	---	---	---	---	---	---	---	---
DENATURANT STORAGE TANK	---	---	---	---	---	---	---	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---	---	---	---
COOLING TOWER	---	---	---	---	---	---	---	---
STEAM PRODUCTION	0.00056	0.012	---	---	---	0.00090	0.0031	0.17
BIOMASS BOILER	*0.00041*	*0.012*	---	---	---	*0.00065*	*0.0023*	*0.17*
GAS BOILER (PEAKING STEAM DEMAND)	*0.00016*	*0.00011*	---	---	---	*0.00025*	*0.00086*	*0.000036*
STATIONARY ENGINES	---	---	---	---	---	---	---	---
FIRE PUMP	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 1	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 2	---	---	---	---	---	---	---	---
EMERGENCY GENERATOR NO. 3	---	---	---	---	---	---	---	---
FUGITIVE EMISSION SOURCES								
STILLAGE LOADOUT	---	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---	---
Point Source Total	**0.00059**	**0.012**	**0.039**	**0.0000060**	**0.0000025**	**0.00094**	**0.0032**	**0.17**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.00059**	**0.012**	**0.039**	**0.0000060**	**0.0000025**	**0.00094**	**0.0032**	**0.17**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
SUMMARY OF EMISSIONS

Pollutant CAS No.	Selenium 7782-49-2 (tpy)	Styrene 100-42-5 (tpy)	Toluene 108-88-3 (tpy)	2,2,4-Trimethylpentane 540-84-1 (tpy)	Xylenes 1330-20-7 (tpy)
POINT EMISSION SOURCES					
REGENERATIVE THERMAL OXIDIZER (RTO)	0.0000015	0.00044	0.034	0.011	0.0013
PROCESS AREA EMISSIONS	---	*0.00044*	*0.033*	*0.011*	*0.0013*
BURNER COMBUSTION EMISSIONS	*0.0000015*	---	*0.00021*	---	---
PRODUCT STORAGE TANK	---	---	0.00035	0.00012	0.000011
DENATURANT STORAGE TANK	---	---	0.012	0.0040	0.00038
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---
WHEAT BRAN (PROPAGATION NUTRIENT)	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---
BULK UREA (PROPAGATION NUTRIENT)	---	---	---	---	---
DISCRETE WHEAT BRAN TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---
DISCRETE UREA TRANSFERS (PROPAGATION NUTRIENT)	---	---	---	---	---
ASH (BIOMASS BOILER)	---	---	---	---	---
HYDRATED LIME SILO (DRY SCRUBBER FOR BIOMASS BOILER)	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILER)	---	---	---	---	---
BIOGAS BACKUP FLARE (accounts for biogas burned in biomass boiler)	---	---	---	---	---
COOLING TOWER	---	---	---	---	---
STEAM PRODUCTION	0.000036	---	0.0050	---	---
BIOMASS BOILER	*0.000026*	---	*0.0037*	---	---
GAS BOILER (PEAKING STEAM DEMAND)	*0.0000098*	---	*0.0014*	---	---
STATIONARY ENGINES	---	---	0.0070	---	0.00070
FIRE PUMP	---	---	*0.00086*	---	*0.000087*
EMERGENCY GENERATOR NO. 1	---	---	*0.0020*	---	*0.00020*
EMERGENCY GENERATOR NO. 2	---	---	*0.0020*	---	*0.00020*
EMERGENCY GENERATOR NO. 3	---	---	*0.0020*	---	*0.00020*
FUGITIVE EMISSION SOURCES					
STILLAGE LOADOUT	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---
Point Source Total	**0.000037**	**0.00044**	**0.058**	**0.015**	**0.0024**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.000037**	**0.00044**	**0.058**	**0.015**	**0.0024**
Major Source Threshold	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**---**	**---**	**---**	**---**	**---**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

SOURCE DESCRIPTION

The RTO is fired with natural gas and will be used to control VOC and HAP emissions from several process areas including liquid/solid separation, propagation, fermentation, distillation, product storage shift tanks, and product loadout. This sheet provides the combustion emissions from the RTO's burner. Controlled process VOC emissions are identified on another sheet.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr		
Fuels		Natural Gas, Process Area Hydrocarbons		
Heat Rate (Total)	14.42	MMBtu/hr	54,654	MMBtu/yr
Heat Rate (Natural Gas)	5.00	MMBtu/hr	43,800	MMBtu/yr
Heat Rate (Gasoline)	9.42	MMBtu/hr	10,854	MMBtu/yr
Natural Gas HHV	1,020	Btu/scf	from AP42	
Capacity	14,134	scf/hr		
Sulfur Content	0.02	gr/scf	from FDEP	
Exhaust Flow	20,000	acfm		
Exit Temperature	90	°F		
Exit Diameter	3	ft		
Exit Velocity	47.16	ft/s		

EMISSION CALCULATIONS

Criteria Pollutant and GHG Emission Factors for Natural Gas

Pollutant		lb/MMBtu	Emission Factor Source
PM10		0.0022	BACT
PM2.5		0.0022	BACT
SO2		0.0056	BACT
NOx		0.035	BACT
CO		0.037	BACT
VOC		0.0014	BACT
CO2 (nat. gas)	1	117.6	AP42, Table 1.4-2
CH4 (nat. gas)	21	0.00225	AP42, Table 1.4-2
N2O (nat. gas)	310	0.000627	AP42, Table 1.4-2
CO2 (gasoline)	1	155	40 CFR 98, Tables C-1 & C-2
CH4 (gasoline)	21	0.0066	40 CFR 98, Tables C-1 & C-2
N2O (gasoline)	320	0.00132	40 CFR 98, Tables C-1 & C-2

Typical Emissions

Typical = RTO Capacity (14.4 MMBtu/hr) x Emission Factor (lb/MMBtu)

PM10 = *14.4 MMBtu/hr * 0.0022 lbs/MMBtu*
0.0317 lbs PM/hr

PM2.5 = *14.4 MMBtu/hr * 0.0022 lbs/MMBtu*
0.0317 lbs PM/hr

SO2 = *14.4 MMBtu/hr * 0.0056 lbs/MMBtu*
0.0807 lbs SO2/hr

NOx = *14.4 MMBtu/hr * 0.035 lbs/MMBtu*
0.505 lbs NOx/hr

CO = *14.4 MMBtu/hr * 0.037 lbs/MMBtu*
0.533 lbs CO/hr

VOC = *14.4 MMBtu/hr * 0.0014 lbs/MMBtu*
0.0202 lbs VOC/hr

CO2 = 5.0 MMBtu/hr x 117.6 lbs/MMBtu + 9.4 MMBtu/hr x 154.8 lbs/MMBtu
2,046 lb CO2/hr

CH4 = 5.0 MMBtu/hr x 0.00225 lbs/MMBtu + 9.4 MMBtu/hr x 0.0066 lbs/MMBtu
0.0736 lb CH4/hr

N2O = 5.0 MMBtu/hr x 0.000627 lbs/MMBtu + 9.4 MMBtu/hr x 0.00132 lbs/MMBtu
0.00905 lb N2O/hr

CO2e (total) = (2,046 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.0736 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.00905 lb N2O/hr x 310 lb CO2e/lb N2O)
2,050 lb CO2e/hr

CO2e (non-biogenic) = 2,050 lb CO2e/hr

Annual Emissions

*Annual = Annual Heat Input Rate (54,654 MMBtu/yr) * Emission Factor (lb/MMBtu) / 2,000 lbs/ton*

PM10 = *(54,654 MMBtu/yr) * (0.0022 lb/MMBtu) / (2,000 lbs/ton)*
0.0601 TPY Total PM10

PM2.5 = *(54,654 MMBtu/yr) * (0.0022 lb/MMBtu) / (2,000 lbs/ton)*
0.0601 TPY Filterable PM2.5

SO2 = *(54,654 MMBtu/yr) * (0.0056 lb/MMBtu) / (2,000 lbs/ton)*
0.153 TPY SO2

NOx = *(54,654 MMBtu/yr) * (0.035 lb/MMBtu) / (2,000 lbs/ton)*
0.956 TPY NOx

CO = *(54,654 MMBtu/yr) * (0.037 lb/MMBtu) / (2,000 lbs/ton)*
1.011 TPY CO

VOC = *(54,654 MMBtu/yr) * (0.0014 lb/MMBtu) / (2,000 lbs/ton)*
0.0383 TPY VOC

*CO2 = [(43,800 MMBtu/yr) * (117.6 lb/MMBtu) + (10,854 MMBtu/yr) * (154.8 lb/MMBtu)] / (2,000 lbs/ton)*
3,417 TPY CO2

*CH4 = [(54,654 MMBtu/yr) * (0.00225 lb/MMBtu) + (10,854 MMBtu/yr) * (0.0066 lb/MMBtu)] / (2,000 lbs/ton)*
0.0853 TPY CH4

*N2O = [(54,654 MMBtu/yr) * (0.000627 lb/MMBtu) + (10,854 MMBtu/yr) * (0.00132 lb/MMBtu)] / (2,000 lbs/ton)*
0.0209 TPY N2O

CO2e (total) = (3,417 ton CO2/yr x 1.0 lb CO2e/lb CO2) + (0.0853 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.0209 lb N2O/hr x 310 lb CO2e/lb N2O)
3,425 TPY CO2e

CO2e (non-biogenic) = 3,425 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

TOTAL CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	0.0317	0.0601
PM2.5	0.0317	0.0601
SO2	0.0807	0.153
NOx	0.505	0.956
CO	0.533	1.011
VOC	0.0202	0.0383
CO2e (total)	2,050	3,425
CO2e (non-biogenic)	2,050	3,425
total HAP	0.0267	0.117

Dispersion Modeling Emissions Summary

Pollutant		*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}		24-Hour	0.0317	0.00400
$PM_{2.5}$		24-Hour	0.0317	0.00400
SO_2		1-Hour	0.0807	0.01017
SO_2		3-Hour	0.0807	0.01017
SO_2		24-Hour	0.0807	0.01017
SO_2		Annual	0.0807	0.01017
NO_2		1-Hour	0.505	0.0636
NO_2		Annual	0.505	0.0636
CO		1-Hour	0.533	0.0672
CO		8-Hour	0.533	0.0672

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

REGENERATIVE THERMAL OXIDIZER (COMBUSTION EMISSIONS)

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/MMscf	lb/MMBtu	lb/hr	tpy
HAP	1.89E+00	1.85E-03	2.67E-02	1.17E-01
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	2.54E-02	1.11E-01
formaldehyde	7.50E-02	7.35E-05	1.06E-03	4.64E-03
toluene	3.40E-03	3.33E-06	4.81E-05	2.10E-04
benzene	2.10E-03	2.06E-06	2.97E-05	1.30E-04
dichlorobenzene	1.20E-03	1.18E-06	1.70E-05	7.43E-05
naphthalene	6.10E-04	5.98E-07	8.62E-06	3.78E-05
POM Speciation				
total POM	8.82E-05	8.65E-08	1.25E-06	5.46E-06
2-methylnaphthalene	2.40E-05	2.35E-08	3.39E-07	1.49E-06
phenanthrene	1.70E-05	1.67E-08	2.40E-07	1.05E-06
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	2.26E-07	9.91E-07
pyrene	5.00E-06	4.90E-09	7.07E-08	3.10E-07
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	5.09E-08	2.23E-07
fluoranthene	3.00E-06	2.94E-09	4.24E-08	1.86E-07
fluorene	2.80E-06	2.75E-09	3.96E-08	1.73E-07
anthracene	2.40E-06	2.35E-09	3.39E-08	1.49E-07
acenaphthene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
acenaphthylene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
benz(a)anthracene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
chrysene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
3-methylchloranthene	1.80E-06	1.76E-09	2.54E-08	1.11E-07
benzo(a)pyrene	1.20E-06	1.18E-09	1.70E-08	7.43E-08
benzo(g,h,i)perylene	1.20E-06	1.18E-09	1.70E-08	7.43E-08
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	1.70E-08	7.43E-08
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	2.97E-05	1.30E-04
chromium	1.40E-03	1.37E-06	1.98E-05	8.67E-05
cadmium	1.10E-03	1.08E-06	1.55E-05	6.81E-05
manganese	3.80E-04	3.73E-07	5.37E-06	2.35E-05
mercury	2.60E-04	2.55E-07	3.67E-06	1.61E-05
arsenic	2.00E-04	1.96E-07	2.83E-06	1.24E-05
cobalt	8.40E-05	8.24E-08	1.19E-06	5.20E-06
selenium	2.40E-05	2.35E-08	3.39E-07	1.49E-06
beryllium	1.20E-05	1.18E-08	1.70E-07	7.43E-07

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (CONTROLLED PROCESS AREA EMISSIONS)

SOURCE DESCRIPTION

The RTO is fired with natural gas and will be used to control VOC and HAP emissions from several process areas including liquid/solid separation, propagation, fermentation, distillation, product storage shift tanks, and product loadout. CO2 emissions from the propagation and fermentation areas also pass through the RTO. This sheet provides the controlled process area emissions from the RTO. Combustion emissions are identified on another sheet.

OPERATING PARAMETERS

Operating Schedule	8,760 hr/yr
VOC Control Efficiency	99.0%

VOC Emissions

Process Area	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
Liquid/Solid Separation	7.72	33.8	0.077	0.338
Fermentation	211	925	2.11	9.25
Distillation	65.2	285	0.65	2.85
Product Storage Shift Tanks	0.0164	0.0638	0.000164	0.000638
Product Loadout	464	267	4.64	2.67
TOTAL	**748**	**1512**	**7.48**	**15.12**

Total CO2e Emissions

Process Area	Emissions (lb/hr)	Emissions (tpy)
Liquid/Solid Separation	0.00	0.00
Fermentation/Propagation	33,353	146,084
Distillation	2,287	10,016
Product Storage Shift Tanks	0.00	0.00
Product Loadout	0.00	0.00
TOTAL	**35,639**	**156,100**

Non-Biogenic CO2e Emissions

Process Area	Emissions (lb/hr)	Emissions (tpy)
Liquid/Solid Separation	0.00	0.00
Fermentation/Propagation	0.00	0.00
Distillation	0.00	0.00
Product Storage Shift Tanks	0.00	0.00
Product Loadout	0.00	0.00
TOTAL	**0.00**	**0.00**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
REGENERATIVE THERMAL OXIDIZER (CONTROLLED PROCESS AREA EMISSIONS)

Total HAP Emissions

Process Area	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
Liquid/Solid Separation	1.96E-23	8.58E-23	1.96E-25	8.58E-25
Fermentation/Propagation	161	705	1.61	7.05
Distillation	33.2	145	0.332	1.45
Product Storage Shift Tanks	0.00	0.00	0.00	0.00
Product Loadout	32.2	18.6	0.322	0.186
TOTAL	**226**	**869**	**2.26**	**8.69**

Individual HAP Emissions

Pollutant	Pre-Control Emissions (lb/hr)	Pre-Control Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
acetaldehyde	160	700	1.6	7.0
methanol	0.88	3.9	0.0088	0.039
n-hexane	17	10	0.17	0.10
benzene	6.5	3.8	0.065	0.038
toluene	5.8	3.3	0.058	0.033
1,4-dichlorobenzene	0.00030	0.0013	0.0000030	0.000013
styrene	0.010	0.044	0.00010	0.00044
m-xylene	0.0062	0.027	0.000062	0.00027
methyl chloride	0.000058	0.00025	0.00000058	0.0000025
2,2,4-trimethylpentane	1.9	1.1	0.019	0.011
methyl bromide	0.00014	0.00060	0.0000014	0.0000060
acrolein	0.085	0.37	0.00085	0.0037
ethylbenzene	0.29	0.19	0.0029	0.0019
o-xylene	0.19	0.11	0.0019	0.0011
isopropyl benzene	0.046	0.027	0.00046	0.00027

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
HYDROLYSIS / LIQUID-SOLID SEPARATION

SOURCE DESCRIPTION

VOC and HAP emissions from the hydrolysis and liquid-solid separation areas were estimated by employing process modeling, specifically ASPEN. Emissions presented on this sheet are before RTO control.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

CALCULATED EMISSIONS [1]

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
Total VOC	7.7	34
Total HAP	2.0E-23	8.6E-23
ethanol	1.2E-08	5.1E-08
furfural	0.67	2.9
methylhydroxyfurfural	1.2	5.3
acetaldehyde*	2.0E-23	8.6E-23
ethyl acetate	1.4E-27	6.2E-27
formic acid	0.011	0.048
acetic acid	5.8	26
lactic acid	0.00071	0.0031
isoamyl alcohol	1.5E-17	6.5E-17

REFERENCES/NOTES

1 Based on ASPEN model results.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FERMENTATION

SOURCE DESCRIPTION

VOC and HAP emission factors for the fermentation area were estimated by employing process modeling, specifically ASPEN. The fermentation area is vented first to an absorber, which recovers ethanol and returns it to the process. Removal of most organic constituents by the absorber is assumed to be negligible. Removal of ethanol, acetaldehyde, and ethyl acetate are based on vendor data. The absorber is in turn vented to the RTO, which achieves 99% destruction efficiency.

OPERATING PARAMETERS

Ethanol Production	4500 gal/hr
Operating Hours	8760 hours per year
RTO	99% removal efficiency

CONTROLLED EMISSIONS SUMMARY

VOC Emissions	9.3 tpy
Total HAP Emissions	7.0 tpy

DETAILED EMISSIONS CALCULATIONS

			Uncontrolled Emission Factor (ASPEN)		Uncontrolled Emissions		Ethanol Absorber			RTO	
Constituent	VOC or HAP?		Primary Fermentation Vent (lb/gal)	Secondary Fermentation Vent (lb/gal)	Vent (lb/hr)	Vent (tpy)	Removal Efficiency (%)	Emissions (lb/hr)	Emissions (tpy)	Emissions (lb/hr)	Emissions (tpy)
Ethanol	VOC		7.74E-03	4.39E-02	2.32E+02	1.02E+03	98%	4.65E+00	2.04E+01	4.65E-02	2.04E-01
Acetaldehyde	VOC	HAP	2.65E-02	2.57E-02	2.35E+02	1.03E+03	32%	1.60E+02	7.00E+02	1.60E+00	7.00E+00
Ethyl Acetate	VOC		8.85E-03	2.47E-03	5.10E+01	2.23E+02	16%	4.28E+01	1.87E+02	4.28E-01	1.87E+00
Isobutanol	VOC		3.97E-05	1.64E-04	9.18E-01	4.02E+00	0%	9.18E-01	4.02E+00	9.18E-03	4.02E-02
Isoamyl Alcohol	VOC		6.86E-05	1.42E-04	9.46E-01	4.14E+00	0%	9.46E-01	4.14E+00	9.46E-03	4.14E-02
Methanol	VOC	HAP	1.33E-04	6.25E-05	8.81E-01	3.86E+00	0%	8.81E-01	3.86E+00	8.81E-03	3.86E-02
Furfural	VOC		6.01E-05	5.26E-05	5.07E-01	2.22E+00	0%	5.07E-01	2.22E+00	5.07E-03	2.22E-02
1-Propanol	VOC		1.60E-05	5.72E-05	3.29E-01	1.44E+00	0%	3.29E-01	1.44E+00	3.29E-03	1.44E-02
Isopropanol	VOC		0.00E+00	1.80E-05	8.11E-02	3.55E-01	0%	8.11E-02	3.55E-01	8.11E-04	3.55E-03
Methane			0.00E+00	2.83E-06	1.28E-02	5.58E-02	0%	1.28E-02	5.58E-02	1.28E-04	5.58E-04
Acetone			4.85E-05	3.41E-06	2.33E-01	1.02E+00	0%	2.33E-01	1.02E+00	2.33E-03	1.02E-02
2-Methylheptane	VOC		6.60E-08		2.97E-04	1.30E-03	0%	2.97E-04	1.30E-03	2.97E-06	1.30E-05
Styrene	VOC	HAP	3.68E-08	2.20E-06	1.01E-02	4.42E-02	0%	1.01E-02	4.42E-02	1.01E-04	4.42E-04
1,4-Dichlorobenzene	VOC	HAP	6.60E-08		2.97E-04	1.30E-03	0%	2.97E-04	1.30E-03	2.97E-06	1.30E-05
m-Xylene*	VOC	HAP		1.39E-06	6.24E-03	2.73E-02	0%	6.24E-03	2.73E-02	6.24E-05	2.73E-04
Ethylbenzene	VOC	HAP		1.66E-06	7.46E-03	3.27E-02	0%	7.46E-03	3.27E-02	7.46E-05	3.27E-04
Propylene	VOC			3.11E-07	1.40E-03	6.13E-03	0%	1.40E-03	6.13E-03	1.40E-05	6.13E-05

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FERMENTATION

Propane	VOC			1.11E-07	4.98E-04	2.18E-03	0%	4.98E-04	2.18E-03	4.98E-06	2.18E-05
Undecane	VOC		3.68E-08	3.36E-07	1.68E-03	7.36E-03	0%	1.68E-03	7.36E-03	1.68E-05	7.36E-05
Toluene	VOC	HAP		1.78E-07	8.03E-04	3.52E-03	0%	8.03E-04	3.52E-03	8.03E-06	3.52E-05
Decane	VOC			2.86E-07	1.29E-03	5.63E-03	0%	1.29E-03	5.63E-03	1.29E-05	5.63E-05
1,4-Diethylbenzene	VOC		2.30E-08	2.38E-08	2.11E-04	9.22E-04	0%	2.11E-04	9.22E-04	2.11E-06	9.22E-06
Benzene	VOC	HAP		2.62E-08	1.18E-04	5.16E-04	0%	1.18E-04	5.16E-04	1.18E-06	5.16E-06
1,2,3-Trimethylbenzene	VOC			1.56E-08	7.03E-05	3.08E-04	0%	7.03E-05	3.08E-04	7.03E-07	3.08E-06
1,2,4-Trimethylbenzene (Pseudocumene)	VOC			1.56E-08	7.03E-05	3.08E-04	0%	7.03E-05	3.08E-04	7.03E-07	3.08E-06
1-Butene	VOC			1.09E-08	4.89E-05	2.14E-04	0%	4.89E-05	2.14E-04	4.89E-07	2.14E-06
Methyl Chloride (Chloromethane)		HAP		1.29E-08	5.81E-05	2.54E-04	0%	5.81E-05	2.54E-04	5.81E-07	2.54E-06
1,2-Dichlorobenzene	VOC			2.33E-08	1.05E-04	4.59E-04	0%	1.05E-04	4.59E-04	1.05E-06	4.59E-06
Methyl Bromide (Bromomethane)		HAP		3.02E-08	1.36E-04	5.95E-04	0%	1.36E-04	5.95E-04	1.36E-06	5.95E-06
Isopentane (2-Methylbutane)	VOC			2.30E-09	1.04E-05	4.54E-05	0%	1.04E-05	4.54E-05	1.04E-07	4.54E-07
c-2-Butene	VOC			7.16E-10	3.22E-06	1.41E-05	0%	3.22E-06	1.41E-05	3.22E-08	1.41E-07
t-2-Butene	VOC			6.14E-10	2.76E-06	1.21E-05	0%	2.76E-06	1.21E-05	2.76E-08	1.21E-07
2,2,4-Trimethylpentane	VOC			1.38E-09	6.23E-06	2.73E-05	0%	6.23E-06	2.73E-05	6.23E-08	2.73E-07
Butane	VOC			2.81E-11	1.27E-07	5.54E-07	0%	1.27E-07	5.54E-07	1.27E-09	5.54E-09
Acetic Acid	VOC		1.02E-05	1.02E-05	9.14E-02	4.00E-01	0%	9.14E-02	4.00E-01	9.14E-04	4.00E-03
Acrolein	VOC	HAP	9.48E-06	9.48E-06	8.53E-02	3.74E-01	0%	8.53E-02	3.74E-01	8.53E-04	3.74E-03
Hydrogen Sulfide			5.74E-06	5.74E-06	5.17E-02	2.26E-01	0%	5.17E-02	2.26E-01	5.17E-04	2.26E-03
Other VOC	VOC		9.21E-06	8.16E-06	7.82E-02	3.42E-01	0%	7.82E-02	3.42E-01	7.82E-04	3.42E-03
VOC			4.35E-02	7.26E-02	5.22E+02	2.29E+03		2.11E+02	9.25E+02	2.11E+00	9.25E+00
HAP			2.67E-02	2.58E-02	2.36E+02	1.03E+03		1.61E+02	7.05E+02	1.61E+00	7.05E+00

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DISTILLATION

SOURCE DESCRIPTION

VOC and HAP emissions from the distillation area were estimated by employing process modeling, specifically ASPEN. Emissions presented on this sheet are before RTO control.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

CALCULATED EMISSIONS [1]

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
Total VOC	65.2	285
Total HAP	33.2	145
ethanol	4.08	17.9
acetaldehyde*	33.2	145
ethyl acetate	27.9	122

REFERENCES/NOTES

1 Based on ASPEN model results.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

SOURCE DESCRIPTION

The facility includes 3 product shift tanks and 1 ethanol product storage tank. The product shift tanks will be vented to the ethanol recovery absorber, and the product storage tank will be designed with an internal floating roof. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
Tank Contents	Ethanol	Ethanol	Ethanol	E95
Tank Type	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof	Internal Floating Roof
Tank Diameter (ft)	18	18	18	40
Tank Height (ft)	22	22	22	51
Tank Capacity (gal)	38,500	38,500	38,500	472,000
Throughput (gal/yr)	13,140,000	13,140,000	13,140,000	41,494,737
Turnovers per Year	341	341	341	88
Max Liquid Height (ft)	21	21	21	#N/A
Avg Liquid Height (ft)	21	21	21	#N/A
Heated Tank	No	No	No	No
Underground Tank	No	No	No	No
Self-Supporting Roof	#N/A	#N/A	#N/A	Yes
Columns	#N/A	#N/A	#N/A	#N/A
Effective Column Diameter	#N/A	#N/A	#N/A	#N/A
Internal Shell Condition	#N/A	#N/A	#N/A	Light Rust
External Shell Color	White	White	White	White
External Shell Shade	White	White	White	White
External Shell Condition	Good	Good	Good	Good
Roof Color	White	White	White	White
Roof Shade	White	White	White	White
Roof Paint Condition	Good	Good	Good	Good
Fixed Roof Type	#N/A	#N/A	#N/A	#N/A
Roof Height (ft)	#N/A	#N/A	#N/A	#N/A
Roof Slope (ft/ft)	#N/A	#N/A	#N/A	#N/A
Breather Vent Vacuum (psig)	#N/A	#N/A	#N/A	#N/A
Breather Vent Pressure (psig)	#N/A	#N/A	#N/A	#N/A
Primary Seal	#N/A	#N/A	#N/A	Liquid Mounted
Secondary Seal	#N/A	#N/A	#N/A	Rim Mounted
Deck Type	#N/A	#N/A	#N/A	Welded
Deck Fittings	#N/A	#N/A	#N/A	Typical
Vent Height above grade (ft)	23	23	23	52
Vent Diameter (ft)	0.25	0.25	0.25	0.25
Exit Velocity (ft/s)	10	10	10	10

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

ETHANOL STORAGE TANKS

Nearest Major City	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL
Daily Avg Temp (F)	74.72	74.72	74.72	74.72
Annual Avg Max Temp (F)	82.86	82.86	82.86	82.86
Annual Avg Min Temp (F)	66.58	66.58	66.58	66.58
Avg Wind Speed (mph)	9.61	9.61	9.61	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505	1,505	1,505	1,505
Atmospheric Pressure (psia)	14.747	14.747	14.747	14.747
Liquid Molecular Weight	46.07	46.07	46.07	47.25
Vapor Molecular Weight	46.07	46.07	46.07	49.04
Liquid Density @ 60F (lb/gal)	6.61	6.61	6.61	6.55
Avg Bulk Temp (F)	74.74	74.74	74.74	74.74
Avg Surface Temp (F)	76.75	76.75	76.75	76.75
Vapor Pressure (psia)	1.145	1.145	1.145	1.337

VOC EMISSION CALCULATIONS [1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
EIQ No.				
Standing Loss (lbs/yr)	53.0241	53.0241	53.0241	---
Working Loss (lbs/yr)	4201.4735	4201.4735	4201.4735	---
Rim Seal Loss (lbs/yr)	---	---	---	13.98
Withdrawal Losses (lbs/yr)	---	---	---	228.87
Deck Fitting Losses (lbs/yr)	---	---	---	189.96
Deck Seam Losses (lbs/yr)	---	---	---	0.00
Total Losses (tons/yr)	2.13	2.13	2.13	0.22

ETHANOL EMISSION CALCULATIONS [1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Product Shift Tank No.3	Product Storage Tank
Standing Loss (lbs/yr)	53.0241	53.0241	53.0241	---
Working Loss (lbs/yr)	4201.4735	4201.4735	4201.4735	---
Rim Seal Loss (lbs/yr)	---	---	---	10.96
Withdrawal Losses (lbs/yr)	---	---	---	217.43
Deck Fitting Losses (lbs/yr)	---	---	---	148.87
Deck Seam Losses (lbs/yr)	---	---	---	0.00
Total Losses (tons/yr)	2.13	2.13	2.13	0.19

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

Emissions Summary (Total Emissions from Product Storage Tank - Vent for Product Shift Tanks is Directed to Ethanol Recovery)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.049	0.052	0.22
HAP	0.00044	0.00093	0.0019
Ethanol	0.043	0.046	0.19

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ETHANOL STORAGE TANKS

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**8.94E-05**	**1.89E-04**	**3.92E-04**
BUTANE N-	1.81E-03	3.83E-03	7.93E-03
BUTENE CIS-2-	5.26E-05	1.12E-04	2.31E-04
BUTENE TRANS-2-	6.47E-05	1.37E-04	2.83E-04
CIS-2-PENTENE	4.25E-05	9.00E-05	1.86E-04
CYCLOHEXANE	2.73E-05	5.78E-05	1.19E-04
CYCLOPENTANE	3.87E-05	8.20E-05	1.69E-04
DIMETHYLBUTANE 2,2-	6.60E-05	1.40E-04	2.89E-04
DIMETHYLPENTANE 2,4-	2.73E-05	5.78E-05	1.19E-04
ETHANE	4.44E-06	9.41E-06	1.94E-05
ETHYLBENZENE	**3.81E-06**	**8.06E-06**	**1.67E-05**
HEPTANE N-	2.54E-05	5.37E-05	1.11E-04
HEXANE N-	**2.38E-04**	**5.04E-04**	**1.04E-03**
ISOBUTANE	5.29E-04	1.12E-03	2.32E-03
ISOPROPYL BENZENE	**6.34E-07**	**1.34E-06**	**2.78E-06**
METHYLCYCLOHEXANE	7.61E-06	1.61E-05	3.33E-05
METHYLCYCLOPENTANE	8.94E-05	1.89E-04	3.92E-04
METHYLHEPTANE 3-	3.81E-06	8.06E-06	1.67E-05
METHYLHEXANE 3-	2.66E-05	5.64E-05	1.17E-04
METHYLPENTANE 3-	1.26E-04	2.67E-04	5.53E-04
OCTANE N-	1.90E-06	4.03E-06	8.33E-06
PENTANE N-	4.60E-04	9.74E-04	2.01E-03
PENTENE 1-	5.45E-05	1.16E-04	2.39E-04
PROPANE	6.72E-05	1.42E-04	2.94E-04
TOLUENE	**7.93E-05**	**1.68E-04**	**3.47E-04**
TRANS-2-PENTENE	8.69E-05	1.84E-04	3.81E-04
TRIMETHYLBENZENE 1,2,4-	3.17E-06	6.72E-06	1.39E-05
TRIMETHYLBENZENE 1,3,5-	1.27E-06	2.69E-06	5.56E-06
TRIMETHYLPENTANE 2,2,4-	**2.66E-05**	**5.64E-05**	**1.17E-04**
TRIMETHYLPENTANE 2,3,4-	4.44E-06	9.41E-06	1.94E-05
XYLENE O-	**2.54E-06**	**5.37E-06**	**1.11E-05**
UNIDENTIFIED VOC	2.28E-03	4.83E-03	9.99E-03

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.
2 Maximum emissions are based on emissions during the month of July.
3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

SOURCE DESCRIPTION

The facility includes 1 gasoline storage tank. Gasoline is used as a denaturant to render the ethanol undrinkable. The tank is designed with an internal floating roof to minimize VOC (gasoline) emissions. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Denaturant Tank
Tank Contents	Gasoline (RVP12)
Tank Type	Internal Floating Roof
Tank Diameter (ft)	15
Tank Height (ft)	16
Tank Capacity (gal)	13,500
Throughput (gal/yr)	2,074,737
Turnovers per Year	154
Max Liquid Height (ft)	#N/A
Avg Liquid Height (ft)	#N/A
Heated Tank	No
Underground Tank	No
Self-Supporting Roof	Yes
Columns	#N/A
Effective Column Diameter	#N/A
Internal Shell Condition	Light Rust
External Shell Color	White
External Shell Shade	White
External Shell Condition	Good
Roof Color	White
Roof Shade	White
Roof Paint Condition	Good
Fixed Roof Type	#N/A
Roof Height (ft)	#N/A
Roof Slope (ft/ft)	#N/A
Breather Vent Vacuum (psig)	#N/A
Breather Vent Pressure (psig)	#N/A
Primary Seal	Liquid Mounted
Secondary Seal	Rim Mounted
Deck Type	Welded
Deck Fittings	Typical
Vent Height above grade (ft)	17
Vent Diameter (ft)	0.25
Exit Velocity (ft/s)	10
Nearest Major City	West Palm Beach, FL
Daily Avg Temp (F)	74.72
Annual Avg Max Temp (F)	82.86
Annual Avg Min Temp (F)	66.58
Avg Wind Speed (mph)	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505
Atmospheric Pressure (psia)	14.747
Liquid Molecular Weight	92.00
Vapor Molecular Weight	64.00
Liquid Density @ 60F (lb/gal)	5.60
Avg Bulk Temp (F)	74.74
Avg Surface Temp (F)	76.75
Vapor Pressure (psia)	8.63

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

EMISSION CALCULATIONS [1]

Tank ID. No.	Denaturant Tank
Standing Loss (lbs/yr)	---
Working Loss (lbs/yr)	---
Rim Seal Loss (lbs/yr)	74.88
Withdrawal Losses (lbs/yr)	21.74
Deck Fitting Losses (lbs/yr)	1822.14
Deck Seam Losses (lbs/yr)	0.00
Total Losses (tons/yr)	0.96

Emissions Summary (Total VOC Emissions from all tanks)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.22	0.23	0.96
Total HAP	0.015	0.016	0.067

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
DENATURANT STORAGE TANK

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**3.09E-03**	**3.22E-03**	**1.35E-02**
BUTANE N-	6.25E-02	6.51E-02	2.74E-01
BUTENE CIS-2-	1.82E-03	1.89E-03	7.96E-03
BUTENE TRANS-2-	2.23E-03	2.33E-03	9.79E-03
CIS-2-PENTENE	1.47E-03	1.53E-03	6.43E-03
CYCLOHEXANE	9.42E-04	9.82E-04	4.13E-03
CYCLOPENTANE	1.34E-03	1.39E-03	5.85E-03
DIMETHYLBUTANE 2,2-	2.28E-03	2.37E-03	9.98E-03
DIMETHYLPENTANE 2,4-	9.42E-04	9.82E-04	4.13E-03
ETHANE	1.53E-04	1.60E-04	6.72E-04
ETHYLBENZENE	**1.31E-04**	**1.37E-04**	**5.76E-04**
HEPTANE N-	8.76E-04	9.13E-04	3.84E-03
HEXANE N-	**8.21E-03**	**8.56E-03**	**3.60E-02**
ISOBUTANE	1.83E-02	1.90E-02	8.00E-02
ISOPROPYL BENZENE	**2.19E-05**	**2.28E-05**	**9.59E-05**
METHYLCYCLOHEXANE	2.63E-04	2.74E-04	1.15E-03
METHYLCYCLOPENTANE	3.09E-03	3.22E-03	1.35E-02
METHYLHEPTANE 3-	1.31E-04	1.37E-04	5.76E-04
METHYLHEXANE 3-	9.20E-04	9.59E-04	4.03E-03
METHYLPENTANE 3-	4.36E-03	4.54E-03	1.91E-02
OCTANE N-	6.57E-05	6.85E-05	2.88E-04
PENTANE N-	1.59E-02	1.65E-02	6.96E-02
PENTENE 1-	1.88E-03	1.96E-03	8.25E-03
PROPANE	2.32E-03	2.42E-03	1.02E-02
TOLUENE	**2.74E-03**	**2.85E-03**	**1.20E-02**
TRANS-2-PENTENE	3.00E-03	3.13E-03	1.31E-02
TRIMETHYLBENZENE 1,2,4-	1.10E-04	1.14E-04	4.80E-04
TRIMETHYLBENZENE 1,3,5-	4.38E-05	4.57E-05	1.92E-04
TRIMETHYLPENTANE 2,2,4-	**9.20E-04**	**9.59E-04**	**4.03E-03**
TRIMETHYLPENTANE 2,3,4-	1.53E-04	1.60E-04	6.72E-04
XYLENE O-	**8.76E-05**	**9.13E-05**	**3.84E-04**
UNIDENTIFIED VOC	7.88E-02	8.21E-02	3.45E-01

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.
2 Maximum emissions are based on emissions during the month of July.
3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
PRODUCT LOADOUT

SOURCE DESCRIPTION

Denatured ethanol product will be loaded onto trucks which will not be in dedicated service. Emissions from the process will be directed to the plant RTO for control. The RTO provides 99% control efficiency.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr	
Design Thruput	36	Mgallons/hr	assume 600 gpm truck filling rate
Annual Thruput	41,495	Mgallons/Yr	E95 (ethanol plus denaturant)
Gasoline Heat Content	20,300	Btu/lb	assumes gasoline vapors displaced from trucks
Heat Rate	9.42	MMBtu/hr	calculated
Annual Heat Rate	10,854	MMBtu/yr	calculated
Control Device		RTO	
RTO Control Efficiency	99.0	%	BACT

EMISSION CALCULATIONS

VOC Loading Emissions [1]

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

where:

L = Loading Loss, lb VOC/Mgal of liquid loaded
S = Saturation Factor (AP-42 Table 5.2-1)
P = True Vapor Pressure of Liquid Loaded, psia
M = Molecular Weight of Vapors, lb/lb-mole
T = Temperature of Bulk Liquid Loaded, °R

The values for P, T, and M were obtained from EPA's TANKS 4.09c emissions calculation software, which calculates the annual average bulk product temperature based on the annual average temperatures for the city of West Palm Beach, Florida. The saturation factor is based on submerged loading, dedicated vapor balance service for gasoline. This should be conservative because the vapor pressure of ethanol is less than that for gasoline and because the trucks will not be in dedicated gasoline service.

Saturation Factor(s)	1	
Annual Thruput	41,495	Mgal/yr
Vapor Molecular Weight (MW)	64.00	lb/lb-mole
Product Temperature (T)	534.33	°R
True Vapor Pressure (P)	8.63	psia *(based on RVP 12 gasoline)*

VOC Emission Factor

*L = (12.46 * 1 * 8.6339 psia * 64 lb/lb-mole) / 534.33 R*

12.89 lb VOC/Mgal

Uncontrolled Emissions

*VOC = 12.89 lb VOC/Mgal * 36 Mgal /hr*

463.87 lb/hr VOC — gasoline vapors displaced
9.42 MMBtu/hr VOC — heat rate of gasoline vapors displaced

VOC = 12.89 lb VOC/Mgal * 41,495 Mgal /yr

267.34 tpy VOC

Controlled VOC Emissions

*Avg = 463.87 lbs/hr * (1-99/100) DRE*

4.64 lb/hr VOC 0.49 lb/MMBtu, calculated VOC emission factor

*Ann = 12.89 lbs/Mgal * 41,495 Mgal/yr * (1-99/100)/ 2,000 lbs/ton*

2.67 TPY VOC

Combustion Emissions[2]

Emission Factor	GWP	lb/MMBtu	
SOx		0.0030	AP42, diesel @ 30 ppm S
NOx		0.14	AP42, diesel
CO		0.036	AP42, diesel
PM		0.024	AP42, diesel
CO2 (gasoline)	1	155	40 CFR 98, gasoline
CH4 (gasoline)	21	0.0066	40 CFR 98, gasoline
N2O (gasoline)	320	0.00132	40 CFR 98, gasoline

Emissions From RTO Combustion of Gasoline Vapors

*Avg = Heat Input (9.42 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*SOx = 9.42 MMBtu/hr * 0.00304 lb/MMBtu*

0.0287 lb/hr SOx

*NOx = 9.42 MMBtu/hr * 0.143 lb/MMBtu*

1.35 lb/hr NOx

*CO = 9.42 MMBtu/hr * 0.036 lb/MMBtu*

0.3 lb/hr CO

*PM = 9.42 MMBtu/hr * 0.0236 lb/MMBtu*

0.222 lb/hr PM

*CO2 = 9.42 MMBtu/hr * 155 lb/MMBtu*

1,458 lb/hr CO2

*CH4 = 9.42 MMBtu/hr * 0.0066 lb/MMBtu*

0.062 lb/hr CH4

*N2O = 9.42 MMBtu/hr * 0.00132 lb/MMBtu*

0.012 lb/hr CH4

CO2e (total) = (1,458 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.06 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.012 lb N2O/hr x 320 lb CO2e/lb N2O)

1,463 lb CO2e/hr

CO2e (non-biogenic) = CO2e (total)

1,463 lb CO2e/hr

Annual Emissions

*Annual = Annual Heat Rate (10,854 MMBtu/yr) * Emission Factor (lbs/MMBtu)] / 2,000 lbs/ton*

*SO2 = [10,854 MMBtu/yr * 0.00304 lb/MMBtu] / 2,000 lbs/ton*

0.0165 TPY SOx

*NOx = [10,854 MMBtu/yr * 0.143 lb/MMBtu] / 2,000 lbs/ton*

0.78 TPY NOx

*CO = [10,854 MMBtu/yr * 0.04 lb/MMBtu] / 2,000 lbs/ton*
0.2 TPY CO

*PM = [10,854 MMBtu/yr * 0.0236 lb/MMBtu] / 2,000 lbs/ton*
0.128 TPY PM

*CO2 = [10,854 MMBtu/yr * 155 lb/MMBtu] / 2,000 lbs/ton*
840 TPY CO2

*CH4 = [10,854 MMBtu/yr * 0.0066 lb/MMBtu] / 2,000 lbs/ton*
0.036 TPY CH4

*N2O = [10,854 MMBtu/yr * 0.00132 lb/MMBtu] / 2,000 lbs/ton*
0.0072 TPY N2O

CO2e (total) = (840 ton CO2/yr x 1 ton CO2e/ton CO2) + (0.0359 ton CH4/yr x 21 ton CO2e/ton CH4) + (0.00718 ton N2O/yr x 320 ton CO2e/ton N2O)
843 TPY CO2e

CO2e (non-biogenic) = CO2e (total)
843 TPY CO2e

Emissions Summary (Controlled)

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
PM	0.22	0.13
SO2	0.029	0.017
NOx	1.3	0.78
CO	0.34	0.19
VOC	4.6	2.7
CO2e (total)	1,463	843
CO2e (non-biogenic)	1,463	843
HAP	0.32	0.19

	Uncontrolled		Controlled	
HAP Emissions [2]	lb/hr	tpy	lb/hr	tpy
benzene	6.5	3.8	0.065	0.038
ethylbenzene	0.28	0.16	0.0028	0.0016
n-hexane	17	10	0.17	0.10
isopropyl benzene	0.046	0.027	0.00046	0.00027
toluene	5.8	3.3	0.058	0.033
2,2,4-trimethylpentane	1.9	1.1	0.019	0.011
o-xylene	0.19	0.11	0.0019	0.0011
Total	32	19	0.32	0.19

REFERENCES/NOTES

1 Based on EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids, January 1995.

2 HAP emissions based on speciation shown for denaturant storage, conservatively assuming gasoline vapors.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
MISCELLANEOUS STORAGE SILOS

SOURCE DESCRIPTION

A number of silos are used to handle dry materials. These materials include a number of nutrients for the propagation area and a number of materials associated with the biomass boilers. The vents for each of these silos will be controlled by a bin vent filter that meets BACT emission requirements.

OPERATING PARAMETERS

Emission Source	Stack Height (feet)	Exit Diameter (feet)	Exhaust Flow (acfm)	Exit Velocity (ft/s)	Exhaust Temperature (°F)	BACT Emission Rate (gr/scf)	BACT Emission Rate (lb/hr)	BACT Emission Rate (tpy)
Wheat Bran	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Powdered Cellulose	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Ammonium Sulfate	40	1.0	2,500	53.05	80	0.005	0.11	0.47
Potassium Phosphate	48	1.0	2,500	53.05	80	0.005	0.11	0.47
Bulk Urea	40	1.0	2,500	53.05	80	0.005	0.11	0.47
Discrete Wheat Bran Transfers	35	0.5	650	55.17	70	0.005	0.03	0.12
Discrete Urea Transfers	35	0.5	650	55.17	70	0.005	0.03	0.12
Ash	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Hydrated Lime	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Sand	34	1.5	2,500	23.58	77	0.005	0.1	0.47
Limestone	34	1.5	2,500	23.58	77	0.005	0.1	0.47
						total	1.0	4.5

Notes:

Stack heights referenced as above ground level (AGL).

Stack locations assumed at center of silo.

PM emission rates from dust collector baghouses are based on gr/dscf BACT and exhaust flow.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOGAS BACKUP FLARE

SOURCE DESCRIPTION

A flare is used for combusting methane generated by anaerobic digestion and has a rated capacity of 100 MMBtu/hr. The flare will use natural gas for the pilot and will be limited to combust biogas only when the biomass boiler is shut down. Hence, annual potential emissions include only the pilot because emissions for biogas combustion are accounted for by the biomass boilers.

OPERATING PARAMETERS

Operating Schedule (Pilot)	8,760	hrs/yr	
Natural Gas Heat Rate (Pilot)	0.18	MMBtu/hr	3 scfm gas
Biogas Heat Rate (Flare)	100.0	MMBtu/hr	
H2S Controlled	5.4	lb/hr	scrubber prior to flare
H2S Flare Reduction (minimum)	98%		

EMISSION CALCULATIONS

Combustion Emissions[1]

Emission Factor		lb/MMBtu	µg/l	
H2S (max)		0.0011		
SO2 (max)		0.10		assumes 100% conversion
SO2 (nat. gas)		0.00059		
NOx		0.068		
CO		0.37		
THC		0.14		
PM		0.0024	40	lightly smoking
CO2	1	117		
CH4	21	0.0022		
N2O	320	0.00022		

Emissions During Flare Operation

*Avg = Heat Input (100.0 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*H2S = 100.0 MMBtu/hr * 0.00108 lb/MMBtu*
0.108 lb/hr H2S

*SO2 = 100.0 MMBtu/hr * 0.102 lb/MMBtu*
10.2 lb/hr SO2

*NOx = 100.0 MMBtu/hr * 0.068 lb/MMBtu*
6.8 lb/hr NOx

*CO = 100.0 MMBtu/hr * 0.37 lb/MMBtu*
37 lb/hr CO

*PM = 100.0 MMBtu/hr * 0.0024 lb/MMBtu*
0.24 lb/hr PM

*THC = 100.0 MMBtu/hr * 0.14 lb/MMBtu*
14.0 lb/hr THC

*CO2 = 100.0 MMBtu/hr * 117 lb/MMBtu*
11,689 lb/hr CO2

*CH4 = 100.0 MMBtu/hr * 0.0022 lb/MMBtu*
0.22 lb/hr CH4

*N2O = 100.0 MMBtu/hr * 0.00022 lb/MMBtu*
0.022 lb/hr CH4

CO2e (total) = (11,689 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.22 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.022 lb N2O/hr x 320 lb CO2e/lb N2O)
11,701 lb CO2e/hr

CO2e (non-biogenic) = (0.220 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.0220 lb N2O/hr x 320 lb CO2e/lb N2O)
11.7 lb CO2e/hr

Annual Emissions - Pilot Operation

*Annual = [Pilot Input (0.18 MMBtu/hr) * EF (lbs/MMBtu)] / 2,000 lbs/ton*

*SO2 = [0.18 MMBtu/hr * 0.00059 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.00047 TPY SOx

*NOx = [0.18 MMBtu/hr * 0.068 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.055 TPY NOx

*CO = [0.18 MMBtu/hr * 0.37 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.30 TPY CO

*PM = [0.18 MMBtu/hr * 0.0024 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.0020 TPY PM

*THC = [0.18 MMBtu/hr * 0.14 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.11 TPY THC

*CO2 = [0.18 MMBtu/hr * 117 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
94 TPY CO2

*CH4 = [0.18 MMBtu/hr * 0.0022 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.0018 TPY CH4

*N2O = [0.18 MMBtu/hr * 0.00022 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.00018 TPY N2O

CO2e (total) = (94 ton CO2/yr x 1 ton CO2e/ton CO2) + (0.0018 ton CH4/yr x 21 ton CO2e/ton CH4) + (0.00018 ton N2O/yr x 320 ton CO2e/ton N2O)
94 TPY CO2e

CO2e (non-biogenic) = CO2e (total)
94 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOGAS BACKUP FLARE

Emissions Summary

Pollutant	*Maximum (lbs./hr)*	*Annual (TPY)*
PM	0.24	0.0020
SO2	10	0.00047
NOx	6.8	0.055
CO	37	0.30
VOC[3]	14.0	0.11
CO2e (total)	11,701	94
CO2e (non-biogenic)	11.7	94

REFERENCES/NOTES

1 Based on EPA AP-42, Section 13.5, Industrial Flares, January 1995.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
COOLING TOWER

SOURCE DESCRIPTION

Cooling for equipment within the facility will be provided by an induced draft cooling tower.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Cells	4	
Water Flow (total)	25,038,000	lb/hr cooling water
Water Density	8.346	lb/gal
Water Flow (total)	50,000	gallons/minute (GPM) cooling water
Drift Losses	0.0005	%
TDS [1]	2,750	mg/L
Air Flow (total)	25,282,963	lb/hr air flow
Air Exit Temperature	94.3	°F
Air Density	0.07165	lb/ft3
Air Flow (total)	5,881,420	acfm
Air Flow (each cell)	1,470,355	acfm
Exit Diameter (each cell)	32.8	ft
Exit Velocity (each cell)	28.9	ft/s

EMISSION CALCULATIONS [1]

PM Emissions

*Drift Loss (gal/hr) = 50,000 GPM * 60 mins/hr * 0.0005 %drift*

15.00 gals/hr Drift Loss

Average Emissions

*Average = 15.0 gal/hr loss * 2,750 mg/L * 3.7854 L/gal / 453,600 mg/lb*

0.34 lb PM10/hr

Annual Emissions

*Total = 0.34 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*

1.51 TPY PM10

VOC Emissions

SCAQMD Guidance (2006)

Average Emissions

*Average = 50,000 GPM * 0.00144 MGD/GPM * 0.7 lb VOC/MGD / 24 hr/day*

2.10 lb VOC/hr

Annual Emissions

*Total = 2.10 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*

9.20 TPY VOC

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
COOLING TOWER

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*	
PM10	0.34	1.5	
PM2.5	0.34	1.5	assume equal to PM10
VOC	2.1	9.2	
HAP[2]	0.11	0.5	

Dispersion Modeling Emissions Summary, Each Cooling Tower Cell

Pollutant	*Averaging Period*	*Emissions (lb/hr)*
PM_{10}	24-Hour	0.086
PM_{10}	Annual	0.086

REFERENCES/NOTES

1 Based on facility supplied information.
2 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOMASS BOILER

SOURCE DESCRIPTION

The project includes a single fluidized bed biomass boiler with a rated capacity of 270 MMBtu/hr. The unit will burn stillage cake, biosolids, biogas and natural gas, and will supply baseload process steam to the facility. Some of the steam produced by the boiler will be used to produce 7.6 MW of power. The unit will utilize best available control technology (BACT) to minimize emissions. Specifically, the boiler will be equipped with a baghouse to control PM emissions, selective non-catalytic reduction (SNCR) to control NOx emissions, and limestone injection and a scrubber to control SO2 emissions. Good combustion practices will be used to minimize CO and VOC emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	Hrs/yr	
Total Capacity	270	MMBtu/hr	
Natural Gas Capacity	250	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Exhaust Flow	75,073	acfm	
Exit Temperature	175	°F	
Exit Diameter	7	ft	
Exit Velocity	32.5	ft/s	

EMISSION CALCULATIONS

Emission Factors[1]		lbs/MMBtu	
PM10 (filterable)		0.01	
PM10 (total)		0.05	
PM2.5 (filterable)		0.01	
PM2.5 (total)		0.05	
SO_2		0.06	30-day rolling average
SO_2		0.12	short-term average (24-hour)
SO_2		0.14	short-term average (3-hour)
NOx		0.08	30-day rolling average
NOx		0.1	short-term average (24-hour)
CO		0.1	30-day rolling average
CO		0.2	short-term average (8-hour)
VOC		0.005	
CO2 (stillage)	1	260.5	40 CFR 98, Table C-1
CO2 (nat. gas)	1	117.6	AP42, Table 1.4-2
CH4 (stillage)	21	0.0705	40 CFR 98, Table C-1
CH4 (nat. gas)	21	0.00225	AP42, Table 1.4-2
N2O (stillage)	310	0.00926	40 CFR 98, Table C-1
N2O (nat. gas)	310	0.000627	AP42, Table 1.4-2
HCl		0.0054	
Pb		0.000048	
Hg		0.00001	
NH3		0.013	

Typical Emissions

Typical = Boiler Capacity (270 MMBtu/hr) x Emission Factor (lb/MMBtu)

Filterable PM10 = 270 MMBtu/hr x 0.01 lb/MMBtu
2.70 lb Filterable PM10/hr

Total PM10 = 270 MMBtu/hr x 0.05 lb/MMBtu
13.5 lb Total PM10/hr

Filterable PM2.5 = 270 MMBtu/hr x 0.01 lb/MMBtu
2.70 lb Filterable PM2.5/hr

Total PM2.5 = 270 MMBtu/hr x 0.05 lb/MMBtu
13.5 lb Total PM2.5/hr

SO2 = 270 MMBtu/hr x 0.06 lbs/MMBtu
16.2 lb SO2/hr

NOx = 270 MMBtu/hr x 0.08 lbs/MMBtu
21.6 lb NOx/hr

CO = 270 MMBtu/hr x 0.1 lbs/MMBtu
27.0 lb CO/hr

VOC = 270 MMBtu/hr x 0.005 lbs/MMBtu
1.35 lb VOC/hr

CO2 = 270 MMBtu/hr x 260.5 lbs/MMBtu
70,340 lb CO2/hr

CH4 = 270 MMBtu/hr x 0.071 lbs/MMBtu
19.0 lb CH4/hr

N2O = 270 MMBtu/hr x 0.0093 lbs/MMBtu
2.50 lb N2O/hr

CO2e (total) = (70,340 lb CO2/hr x 1 lb CO2e/lb CO2) + (19.0 lb CH4/hr x 21 lb CO2e/lb CH4 + (2.50 lb N2O/hr x 310 lb CO2e/lb N2O)
71,515 lb CO2e/hr

HCl = 270 MMBtu/hr x 0.0054 lbs/MMBtu
1.46 lb HCl/hr

Pb = 270 MMBtu/hr x 0.000048 lbs/MMBtu
1.30E-02 lb Pb/hr

Hg = 270 MMBtu/hr x 0.00001 lbs/MMBtu
2.70E-03 lb Hg/hr

NH3 = 270 MMBtu/hr x 0.013 lbs/MMBtu
3.44 lb NH3/hr

Annual Emissions

Annual = *Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Filterable PM10 = *(2.70 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
11.8 TPY Filterable PM10

Total PM10 = *(13.5 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
59.1 TPY Total PM10

Filterble PM2.5 = *(2.70 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
11.8 TPY Filterable PM2.5

Total PM2.5 = *(13.5 lbs/hr) * (75,073 hrs/yr) / (2,000 lbs/ton)*
59.1 TPY Total PM2.5

SO2 = *(16.2 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
71.0 TPY SO2

NOx = *(21.6 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
95 TPY NOx

CO = *(27.0 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
118 TPY CO

VOC = *(1.35 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
5.91 TPY VOC

CO2e (total) = *(71,515 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
313,238 TPY CO2e

HCl = *(1.46 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
6.39 TPY HCl

*Pb = (0.01296 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*

5.68E-02 TPY Pb

*Hg = (0.0027 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*

1.18E-02 TPY Hg

*NH3 = (3.44 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*

15.1 TPY Hg

EMISSION SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
Filterable PM10	2.70	11.8
Total PM10	13.5	59.1
Filterable PM2.5	2.70	11.8
Total PM2.5	13.5	59.1
SO_2	16.2	71.0
NOx	21.6	95
CO	27.0	118
VOC	1.35	5.91
CO2e (total)	71,515	313,238
HCl	1.46	6.39
Pb	0.0130	0.0568
Hg	0.00270	0.0118
total HAPs	1.50	6.57
NH3	3.44	15.1

Dispersion Modeling Emissions Summary

Pollutant	*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}	24-Hour	13.5	1.70
PM_{10}	Annual	13.5	1.70
$PM_{2.5}$	24-Hour	13.5	1.70
$PM_{2.5}$	Annual	13.5	1.70
SO_2	1-Hour	37.8	4.76
SO_2	3-Hour	37.8	4.76
SO_2	24-Hour	37.8	4.76
SO_2	Annual	37.8	4.76
NO_2	1-Hour	27.0	3.40
NO_2	Annual	27.0	3.40
CO	1-Hour	54.0	6.80
CO	8-Hour	54.0	6.80

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
BIOMASS BOILER

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[2,3]

The maximum potential HAP emissions of biomass or natural gas are used for purposes of calculating potential emissions. For example, total potential HAP emissions are greater for biomass combustion than for natural gas combustion, so in the case of total HAPs the maximum potential emissions are based on biomass combustion. In contrast, maximum potential n-hexane emissions are greater for natural gas combustion, so in the case of n-hexane the maximum potential emissions are based on natural gas combustion. Because of this conservative approach, individual HAP potential emissions will not sum to equal total HAP potential emissions.

HAP Emissions, Biomass Combustion

	lb/MMBtu	lb/hr	tpy
HCl	5.40E-03	1.46E+00	6.39E+00
Hg	1.00E-05	2.70E-03	1.18E-02
POM	1.43E-04	3.86E-02	1.69E-01
Total HAPs (biomass)	5.55E-03	1.50E+00	6.57E+00

HAP Emissions, Natural Gas Combustion

	lb/MMscf	lb/MMBtu	lb/hr	tpy
Total HAPs (natural gas)	1.89E+00	1.85E-03	4.63E-01	2.03E+00
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	4.41E-01	1.93E+00
formaldehyde	7.50E-02	7.35E-05	1.84E-02	8.05E-02
toluene	3.40E-03	3.33E-06	8.33E-04	3.65E-03
benzene	2.10E-03	2.06E-06	5.15E-04	2.25E-03
dichlorobenzene	1.20E-03	1.18E-06	2.94E-04	1.29E-03
naphthalene	6.10E-04	5.98E-07	1.50E-04	6.55E-04
POM Speciation				
total POM	8.82E-05	8.65E-08	2.16E-05	9.47E-05
2-methylnaphthalene	2.40E-05	2.35E-08	5.88E-06	2.58E-05
phenanthrene	1.70E-05	1.67E-08	4.17E-06	1.83E-05
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	3.92E-06	1.72E-05
pyrene	5.00E-06	4.90E-09	1.23E-06	5.37E-06
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	8.82E-07	3.86E-06
fluoranthene	3.00E-06	2.94E-09	7.35E-07	3.22E-06
fluorene	2.80E-06	2.75E-09	6.86E-07	3.01E-06
anthracene	2.40E-06	2.35E-09	5.88E-07	2.58E-06
acenaphthene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
acenaphthylene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
benz(a)anthracene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
chrysene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
3-methylchloranthene	1.80E-06	1.76E-09	4.41E-07	1.93E-06
benzo(a)pyrene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
benzo(g,h,i)perylene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	2.94E-07	1.29E-06
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	5.15E-04	2.25E-03
chromium	1.40E-03	1.37E-06	3.43E-04	1.50E-03
cadmium	1.10E-03	1.08E-06	2.70E-04	1.18E-03
manganese	3.80E-04	3.73E-07	9.31E-05	4.08E-04
mercury	2.60E-04	2.55E-07	6.37E-05	2.79E-04
arsenic	2.00E-04	1.96E-07	4.90E-05	2.15E-04
cobalt	8.40E-05	8.24E-08	2.06E-05	9.02E-05
selenium	2.40E-05	2.35E-08	5.88E-06	2.58E-05
beryllium	1.20E-05	1.18E-08	2.94E-06	1.29E-05

REFERENCES/NOTES

1 Emission factors based on proposed BACT emission limits.

2 HAP emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate except for HCl and Hg.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

SOURCE DESCRIPTION

The gas boiler is fired with natural gas and will be used to provide steam to the facility processes during peak demand periods. The boiler is conservatively assumed to operate at full capacity year-round. The unit will utilize best available control technology (BACT) to minimize emissions. Specifically, the boiler will be equipped with ultra-low NOx burners to control NOx emissions. Good combustion practices will be used to minimize CO and VOC emissions. Natural gas is inherently low in sulfur and produces little PM emissions.

OPERATING PARAMETERS

Boiler

Operating Schedule	8,760	hrs/yr	
Fuels		Natural Gas	
Capacity	95	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Capacity	93,137	scf/hr	
Sulfur Content	0.02	gr/scf	from FDEP
F-Factor	10,610	scf/MMBtu	from 40 CFR 60 Method 19
Exhaust Flow	29,590	acfm	
Exit Temperature	350	°F	
Exit Diameter	4	ft	
Exit Velocity	39.24	ft/s	

EMISSION CALCULATIONS

Criteria Pollutant and GHG Emission Factors for Natural Gas

Pollutant		lb/MMBtu	Emission Factor Source
PM10		0.004	BACT
PM2.5		0.004	BACT
SO2		0.0056	BACT
NOx		0.035	BACT
CO		0.037	BACT
VOC		0.0014	BACT
CO2	1	117.6	AP42, Table 1.4-2
CH4	21	0.00225	AP42, Table 1.4-2
N2O	310	0.000627	AP42, Table 1.4-2

Typical Emissions

Typical = Boiler Capacity (95 MMBtu/hr) x Emission Factor (lb/MMBtu)

PM10 = *95 MMBtu/hr * 0.004 lbs/MMBtu*
0.380 lbs PM/hr

PM2.5 = *95 MMBtu/hr * 0.004 lbs/MMBtu*
0.380 lbs PM/hr

SO2 = *95 MMBtu/hr * 0.0055964 lbs/MMBtu*
0.532 lbs SO2/hr

NOx = *95 MMBtu/hr * 0.035 lbs/MMBtu*
3.33 lbs NOx/hr

CO = *95 MMBtu/hr * 0.037 lbs/MMBtu*
3.52 lbs CO/hr

VOC = *95 MMBtu/hr * 0.0014 lbs/MMBtu*
0.133 lbs VOC/hr

CO2 = *95 MMBtu/hr x 117.6 lbs/MMBtu*
11,176 lb CO2/hr

CH4 = *95 MMBtu/hr x 0.00225 lbs/MMBtu*
0.214 lb CH4/hr

N2O = *95 MMBtu/hr x 0.000627 lbs/MMBtu*
0.0596 lb N2O/hr

CO2e (total) = *(11,176 lb CO2/hr x 1 lb CO2e/lb CO2) + (0.214 lb CH4/hr x 21 lb CO2e/lb CH4) + (0.0596 lb N2O/hr x 310 lb CO2e/lb N2O)*
11,199 lb CO2e/hr

Annual Emissions

Annual = *Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

PM10 = *(0.380 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
1.664 TPY Total PM10

PM2.5 = *(0.380 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
1.664 TPY Filterable PM2.5

SO2 = *(0.532 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
2.33 TPY SO2

NOx = *(3.33 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
14.6 TPY NOx

CO = *(3.52 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
15.4 TPY CO

VOC = *(0.133 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
0.583 TPY VOC

CO2e (total) = *(11,199 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
49,054 TPY CO2e

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	0.380	1.664
PM2.5	0.380	1.664
SO2	0.532	2.33
NOx	3.33	14.6
CO	3.52	15.4
VOC	0.133	0.583
CO2e (total)	11,199	49,054
total HAP	0.176	0.770

Dispersion Modeling Emissions Summary

Pollutant		*Averaging Period*	*Emissions (lb/hr)*	*Emissions (g/s)*
PM_{10}		24-Hour	0.380	0.0479
$PM_{2.5}$		24-Hour	0.380	0.0479
SO_2		1-Hour	0.532	0.0670
SO_2		3-Hour	0.532	0.0670
SO_2		24-Hour	0.532	0.0670
SO_2		Annual	0.532	0.0670
NO_2		1-Hour	3.325	0.419
NO_2		Annual	3.33	0.419
CO		1-Hour	3.52	0.443
CO		8-Hour	3.52	0.443

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
GAS BOILER (PEAKING STEAM DEMAND)

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/MMscf	lb/MMBtu	lb/hr	tpy
HAP	1.89E+00	1.85E-03	1.76E-01	7.70E-01
Organic HAP Speciation				
n-hexane	1.80E+00	1.76E-03	1.68E-01	7.34E-01
formaldehyde	7.50E-02	7.35E-05	6.99E-03	3.06E-02
toluene	3.40E-03	3.33E-06	3.17E-04	1.39E-03
benzene	2.10E-03	2.06E-06	1.96E-04	8.57E-04
dichlorobenzene	1.20E-03	1.18E-06	1.12E-04	4.90E-04
naphthalene	6.10E-04	5.98E-07	5.68E-05	2.49E-04
POM Speciation				
total POM	8.82E-05	8.65E-08	8.21E-06	3.60E-05
2-methylnaphthalene	2.40E-05	2.35E-08	2.24E-06	9.79E-06
phenanthrene	1.70E-05	1.67E-08	1.58E-06	6.94E-06
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	1.49E-06	6.53E-06
pyrene	5.00E-06	4.90E-09	4.66E-07	2.04E-06
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	3.35E-07	1.47E-06
fluoranthene	3.00E-06	2.94E-09	2.79E-07	1.22E-06
fluorene	2.80E-06	2.75E-09	2.61E-07	1.14E-06
anthracene	2.40E-06	2.35E-09	2.24E-07	9.79E-07
acenaphthene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
acenaphthylene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
benz(a)anthracene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
chrysene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
3-methylchloranthene	1.80E-06	1.76E-09	1.68E-07	7.34E-07
benzo(a)pyrene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
benzo(g,h,i)perylene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	1.12E-07	4.90E-07
Inorganic HAP Speciation				
nickel	2.10E-03	2.06E-06	1.96E-04	8.57E-04
chromium	1.40E-03	1.37E-06	1.30E-04	5.71E-04
cadmium	1.10E-03	1.08E-06	1.02E-04	4.49E-04
manganese	3.80E-04	3.73E-07	3.54E-05	1.55E-04
mercury	2.60E-04	2.55E-07	2.42E-05	1.06E-04
arsenic	2.00E-04	1.96E-07	1.86E-05	8.16E-05
cobalt	8.40E-05	8.24E-08	7.82E-06	3.43E-05
selenium	2.40E-05	2.35E-08	2.24E-06	9.79E-06
beryllium	1.20E-05	1.18E-08	1.12E-06	4.90E-06

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
ANNUAL NON-BIOGENIC GREENHOUSE GAS EMISSIONS - BOILERS

SOURCE DESCRIPTION

Highlands Ethanol proposes to limit annual natural gas consumption in the two boilers. The limit is being proposed to ensure that the facility will be a synthetic minor source of non-biogenic GHG emissions. The limit is being proposed as a bubble limit over both boilers, which will allow the facility flexibility in determining the best use of natural gas over a 12-month period. This limit does not have an impact on the potential emissions of criteria pollutants or HAPs because the maximum potential emissions of those pollutants occurs under a scenario where the biomass boiler operates at full capacity exclusively on stillage and biogas while the peaking boiler operates at full capacity on natural gas. Likewise, potential total GHG emissions (biogenic plus non-biogenic) are greatest under that scenario. However, non-biogenic GHG emissions - the GHG emissions compared to the PSD permitting threshold - are greatest when natural gas consumption is maximized. Therefore, this calculation sheet focuses exclusively on potential non-biogenic GHG emissions.

OPERATING PARAMETERS

Boilers

Fuel		Natural Gas	
Natural Gas HHV	1,020	Btu/scf	from AP42
Proposed Natural Gas Limit	1,085	million scf/yr	
Proposed Natural Gas Limit	1,106,700	MMBtu/yr	
Total Heat Input Capacity	3,197,400	MMBtu/yr, both boilers (including biomass fuel)	

EMISSION CALCULATIONS

GHG Emission Factors for Natural Gas

Pollutant	GWP	lb/MMBtu	Emission Factor Source
CO2	1	117.6	AP42, Table 1.4-2; GWP from 40 CFR 98
CH4	21	0.00225	AP42, Table 1.4-2; GWP from 40 CFR 98
N2O	310	0.000627	AP42, Table 1.4-2; GWP from 40 CFR 98

GHG Emission Factors for Stillage

CH4	21	0.0705
N2O	310	0.00926

Annual Emissions

Annual Potential Emissions = Proposed Annual Gas Consumption Limit (1,106,700 MMBtu/yr) x Emission Factor (lb/MMBtu) / 2000 lb/ton
+ Stillage Combustion Emissions of CH4 and N2O for balance of heat input

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA

ANNUAL NON-BIOGENIC GREENHOUSE GAS EMISSIONS - BOILERS

CO2 = 1,106,700 MMBtu/yr x 117.6 lbs/MMBtu / 2000 lb/ton

65,100 tpy CO2

CH4 (natural gas) = 1,106,700 MMBtu/yr x 0.00225 lbs/MMBtu / 2000 lb/ton

1.25 tpy CH4

N2O (natural gas) = 1,106,700 MMBtu/yr x 0.000627 lbs/MMBtu / 2000 lb/ton

0.35 tpy N2O

CH4 (stillage) = (3,197,400 MMBtu/yr - 1,106,700 MMBtu/yr) x 0.0705 lbs/MMBtu / 2000 lb/ton

73.7 tpy CH4

N2O (stillage) = (3,197,400 MMBtu/yr - 1,106,700 MMBtu/yr) x 0.00926 lbs/MMBtu / 2000 lb/ton

9.68 tpy N2O

CO2e (total) = (65,100 ton CO2/yr x 1 ton CO2e/ton CO2) + (75.00 ton CH4/yr x 21 ton CO2e/ton CH4) + (10.03 ton N2O/yr x 310 ton CO2e/ton N2O)

69,783 tpy CO2e

CO2e (non-biogenic) = (65,100 ton CO2/yr x 1 ton CO2e/ton CO2) + (75.00 ton CH4/yr x 21 ton CO2e/ton CH4) + (10.03 ton N2O/yr x 310 ton CO2e/ton N2O)

69,783 tpy CO2e

TOTAL GHG POLLUTANT EMISSIONS SUMMARY

Pollutant	***Annual (TPY)***
CO2e (total)	69,783
CO2e (non-biogenic)	69,783

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FIRE PUMP

SOURCE DESCRIPTION

The diesel pump will be used in the event of a fire. The pump will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 100 hours per year.

OPERATING PARAMETERS

Operating Schedule	100	hrs/yr
Capacity	850	hp
	6.16	MMBtu/hr
Primary Fuel	#2 Diesel (ULSD)	
Sulfur Content	15	ppm (ULSD)

EMISSION CALCULATIONS

Pollutant	g/kW-hr [1]	GWP	Pollutant	lb/MMBtu [2]
PM10	0.2		Acetaldehyde	0.0000252
SOx	0.00738		Acrolein	0.00000788
NOx	5.76		Benzene	0.000776
CO	3.5		Formaldehyde	0.0000789
VOC	0.64		Propylene	0.00279
CO2*	165	1	Toluene	0.000281
CH4*	0.0066	21	Xylene	0.000193
N2O*	0.00132	310		

*Emission factors for GHGs are lb/MMBtu. For CO2, EFs are from AP-42 Section 3.4. For CH4 and N2O, EFs from Part 98 Table C-2.

Average Emissions - Criteria Pollutants

*Average = Capacity (kW) * Emission Factor (g/kW-hr) * (1 lb/453.5924 g)*

*PM = 634 kW * 0.2 g/kW-hr * (1 lb/453.5924 g)*

0.279 lb PM10/hr

*SO2 = 634 kW * 0.0074 g/kW-hr * (1 lb/453.5924 g)*

0.0103 lb SO2/hr

*NOx = 634 kW * 5.76 g/kW-hr * (1 lb/453.5924 g)*

8.05 lb NOx/hr

*CO = 634 kW * 3.5 g/kW-hr * (1 lb/453.5924 g)*

4.89 lb CO/hr

*VOC = 634 kW * 0.64 g/kW-hr * (1 lb/453.5924 g)*

0.894 lb VOC/hr

CO2 = *6.16 MMBtu/hr * 165 lb/MMBtu*

1,017 lb CO2/hr

CH4 = *6.16 MMBtu/hr * 0.0066 lb/MMBtu*

0.0407 lb CH4/hr

N2O = *6.16 MMBtu/hr * 0.00132 lb/MMBtu*

0.00814 lb N2O/hr

CO2e = *(1,017 lb CO2/hr x lb CO2e/lb) + (0.0407 lb CH4/hr x lb CO2e/lb CH4) + (0.00814 lb N2O/hr x 1 lb CO2e/lb N2O)*

1,020 lb CO2e/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (6.16 MMBtu/hr) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 6.16 MMBtu/hr * 0.0000252 lb/MMBtu*

0.00016 lb Acetaldehyde/hr

*Acrolein = 6.16 MMBtu/hr * 0.0000079 lb/MMBtu*

0.000049 lb Acrolein/hr

*Benzene = 6.16MMBtu/hr * 0.000776 lb/MMBtu*

0.0048 lb Benzene/hr

*Formaldehyde = 6.16 MMBtu/hr * 0.0000789 lb/MMBtu*

0.00049 lb Formaldehyde/hr

*Propylene = 6.16 MMBtu/hr * 0.002790 lb/MMBtu*

0.017 lb Propylene/hr

*Toluene = 6.16 MMBtu/hr * 0.000281 lb/MMBTu*

0.0017 lb Toluene/hr

*Xylene = 6.16 MMBtu/hr * 0.000193 lb/MMBtu*

0.0012 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.28 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.0140 TPY PM10

*SO2 = 0.01 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.000516 TPY SO2

*NOx = 8.05 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.402 TPY NOx

*CO = 4.89 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.245 TPY CO

*VOC = 0.89 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.0447 TPY VOC

CO2e = *1,020 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

51.0 TPY CO2e

*Acetaldehyde = 0.00016 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.0000078 TPY Acetaldehyde

*Acrolein = 0.00005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.0000024 TPY Acrolein

*Benzene = 0.005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

0.00024 TPY Benzene

*Formaldehyde = 0.0005 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000024 TPY Formaldehyde

*Propylene = 0.0012 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000059 TPY Propylene

*Toluene = 0.017 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00086 TPY Toluene

*Xylene = 0.0017 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000087 TPY Xylene

Emissions Summary

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
PM10	0.279	0.0140
PM2.5	0.279	0.0140
SOx	0.0103	0.000516
NOx	8.05	0.402
CO	4.89	0.245
Total VOC	0.894	0.0447
CO2e	1,020	51.0
HAPs	0.0244	0.0012
Acetaldehyde	0.00016	0.0000078
Acrolein	0.000049	0.0000024
Benzene	0.0048	0.00024
Formaldehyde	0.00049	0.000024
Propylene	0.0012	0.000059
Toluene	0.017	0.00086
Xylene	0.0017	0.000087

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII

2 Emission factor based on AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
EMERGENCY GENERATORS

SOURCE DESCRIPTION

Three emergency generators will be used in the event of power supply disruptions. The engines will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 100 hours per year. Emissions listed here are per each engine.

OPERATING PARAMETERS, EACH ENGINE

Operating Schedule	100	hrs/yr	
Capacity	2,012	hp	1500 ekW
	14.59	MMBtu/hr	104.2 gal/hr
Primary Fuel	#2 Diesel (ULSD)		
Sulfur Content	15	ppm (ULSD)	

EMISSION CALCULATIONS, EACH ENGINE

Pollutant	g/kW-hr [1]	GWP	Pollutant	lb/MMBtu [2]
PM10	0.2		Acetaldehyde	0.0000252
SOx	0.00738		Acrolein	0.00000788
NOx	5.76		Benzene	0.000776
CO	3.5		Formaldehyde	0.0000789
VOC	0.64		Propylene	0.00279
CO2*	165	1	Toluene	0.000281
CH4*	0.0066	21	Xylene	0.000193
N2O*	0.00132	310		

*Emission factors for GHGs are lb/MMBtu. For CO2, EFs are from AP-42 Section 3.4. For CH4 and N2O, EFs from Part 98 Table C-2.

Average Emissions - Criteria Pollutants and GHGs

*Average = Capacity (kW) * Emission Factor (g/kW-hr) * (1 lb/453.5924 g)*

*PM = 1,500 kW * 0.2 g/kW-hr * (1 lb/453.5924 g)*
0.661 lb PM10/hr

*SO2 = 1,500 kW * 0.0074 g/kW-hr * (1 lb/453.5924 g)*
0.0244 lb SO2/hr

*NOx = 1,500 kW * 5.76 g/kW-hr * (1 lb/453.5924 g)*
19.0 lb NOx/hr

*CO = 1,500 kW * 3.5 g/kW-hr * (1 lb/453.5924 g)*
11.6 lb CO/hr

*VOC = 1,500 kW * 0.64 g/kW-hr * (1 lb/453.5924 g)*
2.12 lb VOC/hr

CO2 = *14.59 MMBtu/hr * 165 lb/MMBtu*
2,407 lb CO2/hr

CH4 = *14.59 MMBtu/hr * 0.0066 lb/MMBtu*
0.0963 lb CH4/hr

N2O = *14.59 MMBtu/hr * 0.00132 lb/MMBtu*
0.0193 lb N2O/hr

CO2e = *(2,407 lb CO2/hr x lb CO2e/lb) + (0.0963 lb CH4/hr x lb CO2e/lb CH4) + (0.01925 lb N2O/hr x 1 lb CO2e/lb N2O)*
2,415 lb CO2e/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (14.59 MMBtu/hr) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 14.59 MMBtu/hr * 0.0000252 lb/MMBtu*
0.00037 lb Acetaldehyde/hr

*Acrolein = 14.59 MMBtu/hr * 0.0000079 lb/MMBtu*
0.00011 lb Acrolein/hr

*Benzene = 14.59MMBtu/hr * 0.000776 lb/MMBtu*
0.011 lb Benzene/hr

*Formaldehyde = 14.59 MMBtu/hr * 0.0000789 lb/MMBtu*
0.0012 lb Formaldehyde/hr

*Propylene = 14.59 MMBtu/hr * 0.002790 lb/MMBtu*
0.041 lb Propylene/hr

*Toluene = 14.59 MMBtu/hr * 0.000281 lb/MMBTu*
0.0041 lb Toluene/hr

*Xylene = 14.59 MMBtu/hr * 0.000193 lb/MMBtu*
0.0028 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 100 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.66 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0331 TPY PM10

*SO2 = 0.02 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00122 TPY SO2

*NOx = 19.05 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.952 TPY NOx

*CO = 11.57 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.579 TPY CO

*VOC = 2.12 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.106 TPY VOC

CO2e = *2,415 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
121 TPY CO2e

*Acetaldehyde = 0.00037 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000018 TPY Acetaldehyde

*Acrolein = 0.00011 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0000057 TPY Acrolein

*Benzene = 0.011 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00057 TPY Benzene

*Formaldehyde = 0.0012 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.000058 TPY Formaldehyde

*Propylene = 0.0028 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00014 TPY Propylene

*Toluene = 0.041 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.0020 TPY Toluene

*Xylene = 0.0041 lbs/hr * 100 hrs/yr / 2,000 lbs/ton*
0.00020 TPY Xylene

Emissions Summary - Each Engine

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
PM10	0.661	0.0331
PM2.5	0.661	0.0331
SOx	0.0244	0.00122
NOx	19.0	0.952
CO	11.6	0.579
Total VOC	2.12	0.106
CO2e	2,415	121
HAPs	0.0577	0.0029
Acetaldehyde	0.00037	0.000018
Acrolein	0.00011	0.0000057
Benzene	0.011	0.00057
Formaldehyde	0.0012	0.000058
Propylene	0.0028	0.00014
Toluene	0.041	0.0020
Xylene	0.0041	0.00020

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII

2 Emission factor based on AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
STILLAGE LOADOUT (FUGITIVE VOC)

SOURCE DESCRIPTION

Stillage is removed from the beer stripper distillation column, centrifuged to remove some of the water fraction, and conveyed to the biomass boiler. The stillage will not be dried. Stillage will be generated at a rate of 11 dry tons per hour and will consist primarily of lignin fibers and secondarily of unhydrolyzed cellulose fibers with a moisture content between 50 and 60 percent. Emissions will occur from the conveyor and the centrifuges used for dewatering. Based on the consistency and moisture content of the material, PM emissions are expected to be negligible. VOC emissions will occur from the evaporation of organics dissolved in the water fraction and escaping the conveyor as fugitive emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Ethanol Production	39,420,000	gal/yr

EMISSION CALCULATIONS [1]

VOC Emission Factor	0.0004262	lb/gal

VOC Emissions

*Average Emissions = VOC Emission Factor (0.00043 lb/gal) * Ethanol Production (39,420,000 gal/yr) / Operating Hours (8,760 hrs/yr)*

Average VOC Emission Rate	1.918	lbs/hr

*Annual Emissions = Average VOC Emission Rate (1.92 lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Annual VOC Emission Rate	8.40	tons/yr

Emissions Speciation [2]

Pollutant	CAS No.	Percent	HAP
Acetic Acid	64-19-7	66.5%	No
Hydroxymethylfurfural	67-47-0	16.9%	No
Ethanol	64-17-5	12.4%	No
Furfural	98-01-1	4.2%	No

Speciated Emissions

Pollutant	Average (lb/hr)	Annual (tpy)
Acetic Acid	1.275	5.586
Hydroxymethylfurfural	0.324	1.420
Ethanol	0.238	1.042
Furfural	0.081	0.353

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
STILLAGE LOADOUT (FUGITIVE VOC)

Emissions Summary

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
Total VOC	1.9	8.4
Acetic Acid	1.3	5.6
Hydroxymethylfurfural	0.3	1.4
Ethanol	0.2	1.0
Furfural	0.1	0.4

REFERENCES/NOTES

1 Emission factor based on the procedure used for the permitting of the Pacific Ethanol Facility located in Madera, California. Three emission calculation procedures were identified and the one that resulted in the greatest VOC emission rate was selected. The emission factor was then doubled for an additional margin of safety. See Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004. AMEC in turn tripled the resulting emissions factor to provide for an additional margin of safety.

2 ASPEN modeling of the water fraction of the stillage cake shows constituents that are consistent in properties with those identified in the Pacific Ethanol analysis. The speciation shown is based on the ASPEN modeling and shows only those components that EPA's WATER9 model shows to be volatile.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FUGITIVE VOC EQUIPMENT LEAKS

SOURCE DESCRIPTION

Equipment components in VOC service are subject to 40 CFR Part 60 Subpart VV; therefore components are monitored monthly. Control effectiveness is allowed for components subject to an LDAR program.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

EMISSION CALCULATIONS [1]

*Average (Lbs/hr) = Component Count x Emission Factor (lb/hr/source) * (1 - Control Effectiveness/100)*

*Annual (TPY) = Average (lbs VOC/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Component Type	Service	Component Count	Emission Factors (kg/hr/source) [1]	Weighted Average VOC Content [2]	Subpart VV Control Effectiveness [3]	Emissions		
						Avg (lbs/hr)	Max (lbs/hr)	Tons/Yr
Valves	Gas/Vapor	50	0.00597	100%	87%	8.56E-02	1.03E-01	3.75E-01
Valves	Light Liquid	400	0.00403	96%	84%	5.46E-01	6.55E-01	2.39E+00
Valves	Heavy Liquid	200	0.00023	5%	0%	5.07E-03	6.08E-03	2.22E-02
Sealless Valves	Light Liquid	400	4.90E-07	96%	84%	6.64E-05	7.96E-05	2.91E-04
Sealless Valves	Heavy Liquid	200	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Light Liquid	0	0.0199	96%	69%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Heavy Liquid	0	0.00862	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals, Dual Mech.	Light Liquid	100	7.50E-06	96%	69%	4.92E-04	5.90E-04	2.16E-03
Pump Seals, Dual Mech.	Heavy Liquid	20	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Agitator Seals	Light Liquid	20	0.0199	96%	69%	2.61E-01	3.13E-01	1.14E+00
Agitator Seals	Heavy Liquid	20	0.00862	5%	0%	1.90E-02	2.28E-02	8.32E-02
Compressor Seals	Gas/Vapor	0	0.228	100%	0%	0.00E+00	0.00E+00	0.00E+00
Pressure Relief Valves	Gas/Vapor	0	0.104	100%	0%	0.00E+00	0.00E+00	0.00E+00
Connectors	All	2500	0.00183	30%	0%	3.03E+00	3.63E+00	1.33E+01
Open-Ended Lines	All	120	0.0017	30%	0%	1.35E-01	1.62E-01	5.91E-01
Sampling Connections	All	40	0.015	30%	0%	3.97E-01	4.76E-01	1.74E+00
					TOTAL	**4.5**	**5.4**	**19.6**

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
FUGITIVE VOC EQUIPMENT LEAKS

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
VOC	4.5	19.6
HAP [4]	0.22	0.98

REFERENCES/NOTES:

1 Table 2-1, SOCMI Average Emission Factors; or Table 2-11, Default-Zero Values: SOCMI Process Units; or Table 5-1, Summary of Equipment Modifications; Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

2 For components in liquid service, approximately 75% are associated with liquids containing less than 5% VOC, 20% are associated with liquids containing less than 95% VOC, and 5% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 30%. For components in light liquid service, approximately 80% are associated with liquids containing less than 95% VOC, and 20% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 96%.

3 Table 5-2, Control Effectiveness for an LDAR Program at a SOCMI Process Unit, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

4 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
VEHICLE FUGITIVES (PAVED ROADS)

SOURCE DESCRIPTION

Approximately 60 trucks per day will be used to deliver feedstock to the feedstock hopper, and an additional 127 vehicles per day will drive on the plant roads. All roads will be paved with asphalt.

OPERATING PARAMETERS

Operating Schedule 8,760 hr/yr

Vehicle Traffic	Vehicles/Day	Miles/Vehicle	VMT/Day	VMT/Year
Feedstock Delivery	60	0.17	10.23	3,733
Employee Vehicles	60	0.73	43.78	15,979
Product Tankers	21	0.66	13.93	5,084
Denaturant Tankers	1	0.66	0.66	242
Fuel Delivery Trucks	2	1.24	2.47	903
Chemical Delivery Trucks	9	1.10	9.87	3,604
Ash Disposal Trucks	2	1.24	2.47	903
Process Waste Trucks	20	1.10	21.94	8,009
Vendors/Deliveries	5	1.10	5.49	2,002
Miscellaneous	7	1.10	7.68	2,803
TOTAL			**118.53**	**43,264**

EMISSION CALCULATIONS [1]

$$E = k\,(sL)^{0.91} * (W)^{1.02}$$

$$E_{est} = E\,(lbs/VMT) * [1-(P/4N)]$$

where:

E = particulate emission factor (lb/VMT)

	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	particle-size-multiplier (Table 13.2.1-1)
sL =	0.6	0.6	0.6	road surface silt loading (g/m2, Table 13.2.1-3)
W =	15	15	15	avg weight of the vehicles traveling the road (tons)
P =	120	120	120	Days rainfall > 0.01" (Figure 13.2.1-2)
N =	365	365	365	days in averaging period

Emission Factor

$E = 0.011 * (0.6)^{0.91} * (15)^{1.02}$

0.11 lbs PM/VMT

$E = 0.0022 * (0.6)^{0.91} * (15)^{1.02}$

0.022 lbs PM10/VMT

$E = 0.00054 * (0.6)^{0.91} * (15)^{1.02}$

0.003 lbs PM2.5/VMT

HIGHLANDS ETHANOL, LLC
HIGHLANDS COUNTY, FLORIDA
VEHICLE FUGITIVES (PAVED ROADS)

Adjusted for Rainfall

E_{est} = *0.11 lbs/VMT * {1-[120/(4*365)]}*

0.11 lbs PM/VMT

E_{est} = *0.02 lbs/VMT * {1-[120/(4*365)]}*

0.020 lbs PM10/VMT

E_{est} = *0.00 lbs/VMT * {1-[120/(4*365)]}*

0.003 lbs PM2.5/VMT

Emission Calculations

*Average PM (Lbs/Hr) = 0.11 lbs PM/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.5 lb/hr PM

*Annual PM (TPY) = Avg (lbs/hr) * 9 hrs/yr / 2,000 lbs/ton*

2.3 tpy PM

*Average PM10 (Lbs/Hr) = 0.020 lbs PM10/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.10 lb/hr PM10

*Annual PM10 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.43 tpy PM10

*Average PM2.5 (Lbs/Hr) = 0.0026 lbs PM10/VMT * 43,264 VMT/yr / 8,760 hrs/yr*

0.013 lb/hr PM2.5

*Annual PM2.5 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.057 tpy PM2.5

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
PM	0.5	2.3
PM10	0.1	0.4
PM2.5	0.01	0.06

REFERENCES/NOTES:

1 EPA, AP-42, Section 13.2.1, Paved Roads, January 2011.