TITLE V APPLICATION

# TITLE V AIR OPERATION PERMIT APPLICATION

## Harvest Energy Garden – Orlando
## Facility ID: 0951340

**Submitted For:** Harvest Power Orlando, LLC
2010 South Service Lane
Lake Buena Vista, FL 32830

**Submitted By:** Golder Associates Inc.
6026 NW 1st Place
Gainesville, FL 32607

**March 2015**

**15-26350**

Golder Associates

# APPLICATION FOR AIR PERMIT

# LONG FORM

# 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: **Harvest Power Orlando, LLC** | |
| 2. Site Name: **Harvest Energy Garden – Orlando** | |
| 3. Facility Identification Number: | |
| 4. Facility Location...<br>Street Address or Other Locator: **2010 South Service Lane**<br>City: **Lake Buena Vista** County: **Orange** Zip Code: **32830** | |
| 5. Relocatable Facility?<br>☐ Yes ☒ No | 6. Existing Title V Permitted Facility?<br>☒ Yes ☐ No |

**Application Contact**

| |
|---|
| 1. Application Contact Name: **Kelly Saikkonen, P.E., Resident Engineer** |
| 2. Application Contact Mailing Address...<br>Organization/Firm: **Harvest Power, Inc.**<br>Street Address: **221 Crescent Street, Suite 402**<br>City: **Waltham** State: **MA** Zip Code: **02453** |
| 3. Application Contact Telephone Numbers...<br>Telephone: (**717**) **439-9089** ext. Fax: ( ) |
| 4. Application Contact E-mail Address: **ksaikkonen@harvestpower.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**

☐ 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

**Application for initial Title V Air Operation permit for Harvest Energy Garden. The application will incorporate air construction permit No. 0951340-001-AC, which was extended by permit No. 0951340-002-AC.**

## APPLICATION INFORMATION

### Scope of Application

| Emissions Unit ID Number | Description of Emissions Unit | Air Permit Type | Air Permit Processing Fee |
|---|---|---|---|
| 001 & 002 | Two 1.6 MW Generators | | N/A |
| 003 | Bio-scrubber | | N/A |
| 004 | Emergency Flare | | N/A |
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### Application Processing Fee

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

**APPLICATION INFORMATION**

**Owner/Authorized Representative Statement**

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

| |
|---|
| 1. Owner/Authorized Representative Name : |
| 2. Owner/Authorized Representative Mailing Address...<br>Organization/Firm:<br>Street Address:<br>City: State: Zip Code: |
| 3. Owner/Authorized Representative Telephone Numbers...<br>Telephone: ( ) ext. Fax: ( ) |
| 4. Owner/Authorized Representative E-mail Address: |
| 5. Owner/Authorized Representative Statement:<br>*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.*<br>_____ _____<br>Signature Date |

## APPLICATION INFORMATION

### Application Responsible Official Certification

**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:
   **Jeremy Goodfellow, VP – Operations**

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: **Harvest Power Orlando, LLC**
   Street Address: **221 Crescent Street, Suite 402**
   City: **Waltham** State: **MA** Zip Code: **02453**

4. Application Responsible Official Telephone Numbers...
   Telephone: **(226) 218-1216** ext. Fax: ( )

5. Application Responsible Official E-mail Address: **jgoodfellow@harvestpower.com**

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

30 - MAR - 15
Date

## APPLICATION INFORMATION

### Professional Engineer Certification

1. Professional Engineer Name: **Philip D. Cobb**
   Registration Number: **72386**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **6026 NW 1st Place**
   City: **Gainesville** State: **FL** Zip Code: **32607**
3. Professional Engineer Telephone Numbers...
   Telephone: (**352**) **336-5600** ext. Fax: (**352**) **336-6603**
4. Professional Engineer E-mail Address: **pcobb@golder.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 ☐ , 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.*

   Digitally signed by Philip Cobb
   DN: cn=Philip Cobb, o=Golder Associates Inc., ou=Florida PE 72386, email=pcobb@golder.com, c=US
   Date: 2015.03.31 15:56:32 -04'00'

   Signature Date

   (seal)

* Attach any exception to certification statement.

**Board of Professional Engineers Certificate of Authorization #00001670.

## II. FACILITY INFORMATION

## A. GENERAL FACILITY INFORMATION

**Facility Location and Type**

| | | | |
|---|---|---|---|
| 1. Facility UTM Coordinates...<br>Zone **17** East (km) **442.10**<br>North (km) **3139.02** | | 2. Facility Latitude/Longitude...<br>Latitude (DD/MM/SS) **28 / 22 / 34**<br>Longitude (DD/MM/SS) **81 / 35 / 27** | |
| 3. Governmental Facility Code:<br>**0** | 4. Facility Status Code:<br>**A** | 5. Facility Major Group SIC Code:<br>**49** | 6. Facility SIC(s):<br>**452**<br>**4911** |
| 7. Facility Comment : | | | |

**Facility Contact**

| |
|---|
| 1. Facility Contact Name:<br>**Kelly Saikkonen, P.E., Resident Engineer** |
| 2. Facility Contact Mailing Address...<br>Organization/Firm: **Harvest Power, Inc.**<br>Street Address: **221 Crescent Street, Suite 402**<br>City: **Waltham** State: **MA** Zip Code: **02453** |
| 3. Facility Contact Telephone Numbers:<br>Telephone: (**717**) **439-9089** ext. Fax: ( ) |
| 4. Facility Contact E-mail Address: **ksaikkonen@harvestpower.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: |
| 2. Facility Primary Responsible Official Mailing Address...<br>Organization/Firm:<br>Street Address:<br>City: State: Zip Code: |
| 3. Facility Primary Responsible Official Telephone Numbers...<br>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. ☒ Title V Source | |
| 4. ☒ 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. ☒ 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. ☐ 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: **The Harvest Energy Garden – Orlando facility is collocated with the Reedy Creek Wastewater Treatment Plant.** | |

**List of Pollutants Emitted by Facility**

| 1. Pollutant Emitted | 2. Pollutant Classification | 3. Emissions Cap [Y or N]? |
|---|---|---|
| **Carbon Monoxide – CO** | **A** | **N** |
| **Volatile Organic Compounds – VOC** | **A** | **N** |
| **Nitrogen Oxides – NOx** | **A** | **N** |
| **Sulfur Dioxide – SO2** | **A** | **N** |
| **Hazardous Air Pollutants – HAPS** | **A** | **N** |
| **Particulate Matter – PM** | **A** | **N** |
| **Particulate Matter – PM10** | **A** | **N** |
| **Particulate Matter – PM2.5** | **A** | **N** |
| **Total Reduced Sulfur – TRS** | **A** | **N** |
| **Hydrogen Sulfide – H2S** | **A** | **N** |
| **Ammonia – NH3** | **A** | **N** |
| **Formaldehyde – H095** | **A** | **N** |
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## 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 |
|---|---|---|---|---|---|
| **NOx** | **N** | **001, 002, 004** | | **39** | **ESCPSD** |
| **SO2** | **N** | **001, 002, 004** | | **39** | **ESCPSD** |
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7. Facility-Wide or Multi-Unit Emissions Cap Comment:

**Emission caps are on a 12-month rolling basis.**

## 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)
   ☒ Attached, Document ID: **HP-FI-C1** ☐ 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)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ 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)
   ☒ Attached, Document ID: **HP-FI-C3** ☐ Previously Submitted, Date:_____

**Additional Requirements for Air Construction Permit Applications**

1. Area Map Showing Facility Location:
   ☐ Attached, Document ID:_____ ☐ Not Applicable (existing permitted facility)

2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL):
   ☐ Attached, Document ID:_____

3. Rule Applicability Analysis:
   ☐ Attached, Document ID:_____

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

5. Fugitive Emissions Identification:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable

7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable

8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable

9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable

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

## C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

**Additional Requirements for FESOP Applications**

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**

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☒ Attached, Document ID: **HP-FI-CV1** ☐ 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: **HP-FI-CV2**
   ☐ 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: **HP-FI-CV3**
   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)

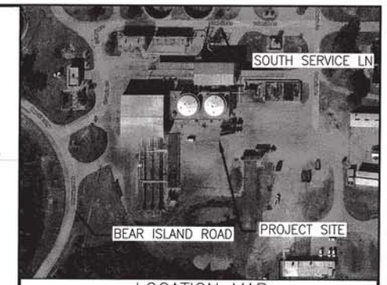
**Additional Requirements Comment**

**ATTACHMENT HP-FI-C1**

**FACILITY PLOT PLAN**

PARCEL D
SLUDGE PUMPS
SLUDGE DEWATERING
CAUSTIC TANK
STRUVITE REACTOR
SAND WASH/ STORAGE (2)
RELOCATE STORM SEWER
NEW RECEIVING BUILDING (1)
EXISTING RECEIVING BUILDING
EXISTING PUMPING STATION
MCC 2 (1)
BIO FILTER
HEAT EXCHANGERS
COOLING TOWER
TK-402
R-401 NITROGEN BIOREACTOR
TK-403 EFFLUENT EQ TANK
FOG RECEIVING
TK-103 MIX TANK
DIGESTATE SCREEN
R-201 ANAEROBIC DIGESTER
HEAT EXCHANGER
R-202 ANAEROBIC DIGESTER
R-203 POST DIGESTER
GRAVEL
CHILLER (5)
MCC 1 (3)
BIOGAS SCRUBBER
GAS BLOWERS
CONDENSATE PIT
EMERGENCY FLARE
TRANSFORMERS
CARBON
THERMAL FLUID HEATER
FERTILIZER LOADOUT
OFFICE (MODULAR) (6)
RAMP
EXISTING CONCRETE SLAB
PROPANE TANK
EDGE OF NEW PAVEMENT
CONSTRUCTION TRAFFIC / ACCESS
BEAR ISLAND ROAD
TWAS CONNECTION
N48256
E10366
BENCHMARK
FOUND NAIL IN PAVEMENT
ELEV 97.15
N48225.138
E10451.244
TEMPORARY CONSTRUCTION ACCESS
LEASED PROPERTY BOUNDARY
BENCHMARK
RAILROAD SPIKE
ELEV 96.16
N48037.811
E10483.517
PARCEL A
PARCEL B
PARCEL C
KENNEL
STORMWATER MANAGEMENT POND
N48,300
N48,200
N48,100
N48,000
N47,900
N47,800
E9,800
E9,900
E10,000
E10,100
E10,200
E10,300
E10,400
E10,500

PLAN VIEW
SCALE: 1" = 30'-0"




LOCATION MAP

NOTES:

1. FOR EROSION CONTROL DURING CONSTRUCTION, SEE GOLDER ASSOCIATES DRAWING C-1 – EXISTING CONDITIONS AND EROSION CONTROL PLAN AND C-5 – EROSION CONTROL DETAILS.
2. NEW BUILDING AREA
   NEW RECEIVING BUILDING – 825 ft²
   NEW OFFICE – 1,200 ft²
3. LEASE AREA 3.39 acres
   PARCEL A 0.19 acres
   PARCEL B 0.15 acres
   PARCEL C 1.29 acres
   PARCEL D 0.10 acres
4. CLASSIFICATION OF OCCUPANCY
   (1) I-2
   (2) S-1 SHADE STRUCTURE
   (3) S-9 ELECTRICAL VAULT
   (4) I-1
   (5) S-5 (ALL TANKS AND TOWERS ARE IN THIS CLASSIFICATION)
   (6) B-2
5. THE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. ENVIRON HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

| REV. | DESCRIPTION | DATE | APPR. BY | MADE BY |
|---|---|---|---|---|
| 0 | FOR RECORD | 26NOV13 | SGB | LTE |

REVISIONS

S. GAINES BARRY II LICENSE No 75031 STATE OF FLORIDA PROFESSIONAL ENGINEER

DRAWING SCALE MAY BE ALTERED
0 30' 60' 90'

| DRAWN | CHKD | APPR | DATE | LOGIN NAME |
|---|---|---|---|---|
| LTE | SGB | SGB | 26NOV13 | |

SCALE: 1" = 30' DWG SIZE: D LOGIN:
FILE LOCATION:

ENVIRON

HARVEST POWER
ORLANDO FACILITY
SITE PLAN

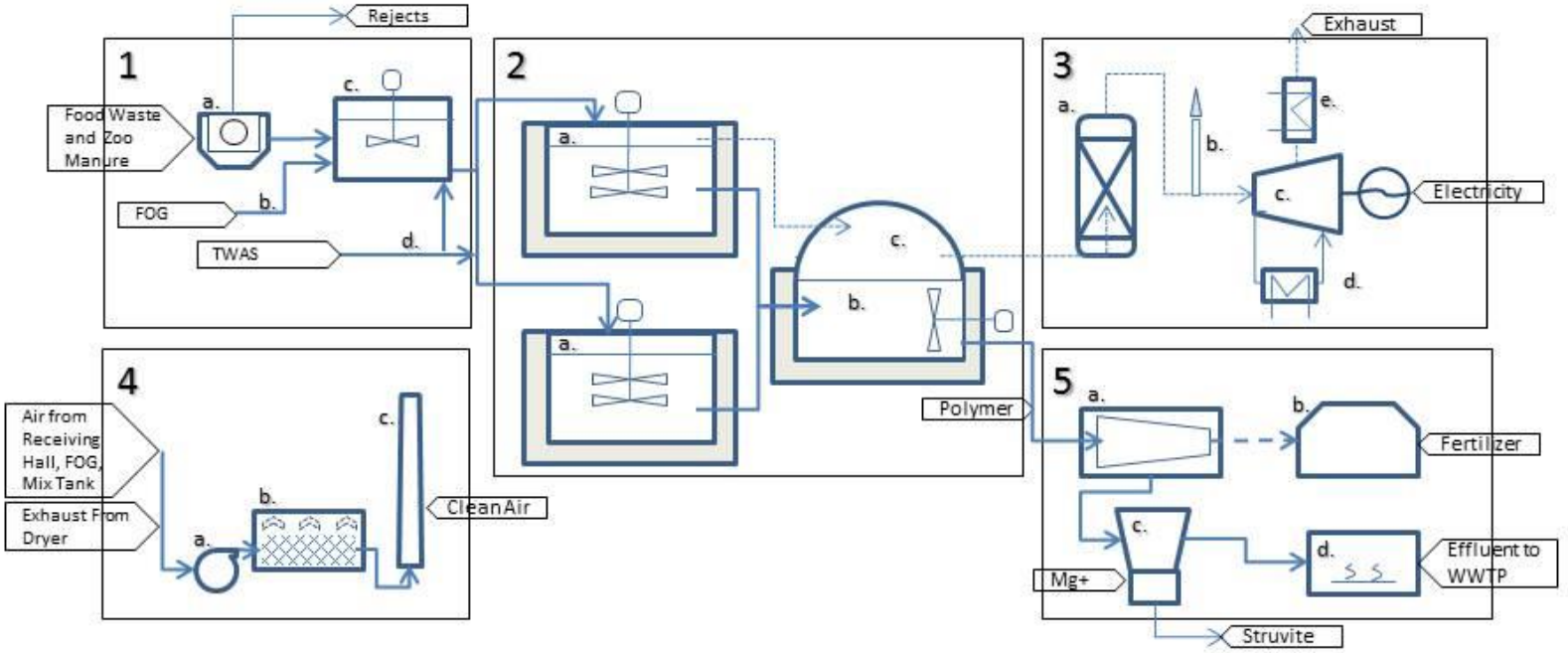
HARVEST POWER
ORLANDO, FLORIDA

| CONTRACT NO. | DRAWING NO. | REV. |
|---|---|---|
| 2029344 | SP-01 | 0 |

12/17/2013 12:18 PM TYLINE SANDERS M:\WORKING FILES\JAMES B\2029344 SP-01.DWG

**ATTACHMENT HP-FI-C2**

**PROCESS FLOW DIAGRAM**




| | | |
|---|---|---|
| 1 | FEEDSTOCK RECEIVING and PRE-TREATMENT | a. Food waste contaminant removal b. Food, Oil, Grease (FOG) receiving c. Mix tank<br>d. Thickened waste-activated sludge (TWAS) addition and metering |
| 2 | DIGESTERS | a. Continuously stirred tank reactor (CSTR) Digesters b. Post-digester c. Integrated gasholder |
| 3 | BIOGAS, POWER GENERATION and HEAT RECOVERY | a. Biogas scrubber, water knockout b. Emergency flare c. CAT Engine gen-set (2)<br>d. Water jacket heat recovery for process heat e. Thermal oil exhaust heat recovery for dryer |
| 4 | ODOR REMOVAL | a. Collection ductwork and blower b. 90+% odor removal bio-scrubber<br>c. Stack with real-time odor monitoring |
| 5 | DIGESTATE MANAGEMENT | a. Centrifuge for liquid/solids separation b. Digestate solids indirect dryer<br>c. phosphorus recovery from centrate d. Liquid effluent treatment to WWTP |

ATTACHMENT HP-FI-C2
PROCESS FLOW DIAGRAM
HARVEST POWER ORLANDO, LLC
HARVEST ENERGY GARDEN – ORLANDO
LAKE BUENA VISTA, FLORIDA

Process Flow Legend:
Solid / Liquid ——▶
Gas – – – – –▶
Steam ----------▶

Golder Associates

C:\Users\pcobb\Desktop\15-26350 Harvest Power TV Permit\Updates\HP-FI-C2.vsd

**ATTACHMENT HP-FI-C3**

**PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER**

# ATTACHMENT HP-FI-C3

# PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

Harvest Power Orlando, LLC (HP) will take reasonable precautions to prevent emissions of unconfined PM at the Harvest Energy Garden – Orlando facility. These consist of the following:

- Process tanks and equipment will be covered and sealed to the extent possible
- Receiving and handling of solids and wastes will take place inside of the receiving building, which will be vented to the bio-scrubber
- Emissions from the dryer will be vented to the bio-scrubber prior being released to the environment
- Fugitive PM emissions from truck traffic will be minimized by using paved roads

# ATTACHMENT HP-FI-CV1

# LIST OF INSIGNIFICANT ACTIVITIES

# ATTACHMENT HP-FI-CV1
# LIST OF INSIGNIFICANT EMISSIONS UNITS AND/OR ACTIVITIES

The facilities, emissions units, or pollutant-emitting activities listed in Rule 62-210.300(3)(a), F.A.C., Categorical Exemptions, are exempt from the permitting requirements of Chapters 62-210 and 62-4, F.A.C.; provided, however, that exempt emissions units shall be subject to any applicable emission limiting standards and the emissions from exempt emissions units or activities shall be considered in determining the potential emissions of the facility containing such emissions units. Emissions units and pollutant-emitting activities exempt from permitting under Rule 62-210.300(3)(a), F.A.C., shall not be exempt from the permitting requirements of Chapter 62-213, F.A.C., if they are contained within a Title V source; however, such emissions units and activities shall be considered insignificant for Title V purposes provided they also meet the criteria of Rule 62-213.430(6)(b), F.A.C. No emissions unit shall be entitled to an exemption from permitting under Rule 62.210.300(3)(a), F.A.C., if its emissions, in combination with the emissions of other units and activities at the facility, would cause the facility to emit or have the potential to emit any pollutant in such amount as to make the facility a Title V source.

The below listed emissions units and/or activities are considered insignificant pursuant to Rule 62-213.430(6), F.A.C.

1. Polymer Totes
2. Food waste in totes, containers, and 55-gallon drums
3. Water softening operations
4. Forklifts, trucks, front end loaders, scissor lifts, and other facility truck traffic
5. Cooling tower (725 gallons per minute, cross-flow design)
6. 55-gallon oil drums for generator operations
7. 1000 gallon propane tank (backup for fertilizer dryer)
8. 50-percent caustic tank (4,750 gallons)
9. Fertilizer loadout operations and fertilizer delivery trucks

# ATTACHMENT HP-FI-CV2

# IDENTIFICATION OF APPLICABLE REQUIREMENTS

# ATTACHMENT HP-FI-CV2
# IDENTIFICATION OF APPLICABLE REQUIREMENTS
# TITLE V CORE LIST

Effective: 06/15/12

(Updated by Golder Associates Inc. based on current version of FDEP and USEPA Air Rules)

[Note: The Title V Core List is meant to simplify the completion of the "List of Applicable Regulations" for DEP Form No. 62-210.900(1), Application for Air Permit - Long Form. The Title V Core List is a list of rules to which all Title V Sources are presumptively subject. The Title V Core List may be referenced in its entirety, or with specific exceptions. The Department may periodically update the Title V Core List.]

***Federal:*** ***(description)***

40 CFR 60, Subpart JJJJ:
40 CFR 61, Subpart M: NESHAP for Asbestos.
40 CFR 63, Subpart ZZZZ: NESHAP for Stationary Reciprocating Internal Combustion Engines.
40 CFR 68: Chemical Accident Prevention Provisions.
40 CFR 82: Protection of Stratospheric Ozone.
40 CFR 82, Subpart B: Servicing of Motor Vehicle Air Conditioners (MVAC).
40 CFR 82, Subpart F: Recycling and Emissions Reduction.

***State:*** ***(description)***

**CHAPTER 62-4, F.A.C.: PERMITS,** effective 12-01-11

62-4.030, F.A.C.: General Prohibition.
62-4.040, F.A.C.: Exemptions.
62-4.050, F.A.C.: Procedure to Obtain Permits; Application. 10-31-07
62-4.055, F.A.C.: Permit Processing. 8-16-98
62-4.060, F.A.C.: Consultation.
62-4.070, F.A.C.: Standards for Issuing or Denying Permits; Issuance; Denial.
62-4.080, F.A.C.: Modification of Permit Conditions.
62-4.090, F.A.C.: Renewals. 3-16-08
62-4.100, F.A.C.: Suspension and Revocation.
62-4.110, F.A.C.: Financial Responsibility.
62-4.120, F.A.C.: Transfer of Permits.
62-4.130, F.A.C.: Plant Operation - Problems.
62-4.150, F.A.C.: Review.
62-4.160, F.A.C.: Permit Conditions.
62-4.210, F.A.C.: Construction Permits.
62-4.220, F.A.C.: Operation Permit for New Sources.

**CHAPTER 62-210, F.A.C.: STATIONARY SOURCES - GENERAL REQUIREMENTS**, effective 6-29-11

62-210.300, F.A.C.: Permits Required.
62-210.300(1), F.A.C.: Air Construction Permits.
62-210.300(2), F.A.C.: Air Operation Permits.
62-210.300(3), F.A.C.: Exemptions from Permitting.
62-210.300(5), F.A.C.: Notification of Startup.
62-210.300(6), F.A.C.: Emissions Unit Reclassification.
62-210.300(7), F.A.C.: Transfer of Air Permits.
62-210.350, F.A.C.: Public Notice and Comment. 10-12-08.
62-210.350(1), F.A.C.: Public Notice of Proposed Agency Action.

62-210.350(2), F.A.C.: Additional Public Notice Requirements for Emissions Units Subject to Prevention of Significant Deterioration or Nonattainment-Area Preconstruction Review.
62-210.350(3), F.A.C.: Additional Public Notice Requirements for Sources Subject to Operation Permits for Title V Sources.
62-210.360, F.A.C.: Administrative Permit Corrections and Amendments. 3-16-08
62-210.370(3), F.A.C.: Annual Operating Report for Air Pollutant Emitting Facility. 7-3-08
62-210.650, F.A.C.: Circumvention.
62-210.700, F.A.C.: Excess Emissions.
62-210.900, F.A.C.: Forms and Instructions.
62-210.900(1), F.A.C.: Application for Air Permit – Long Form, Form and Instructions. 3-11-10
62-210.900(5), F.A.C.: Annual Operating Report for Air Pollutant Emitting Facility, Form and Instructions. 7-3-08
62-210.900(7), F.A.C.: Application for Transfer of Air Permit – Title V and Non-Title V Source. 7-3-08

**CHAPTER 62-212, F.A.C.: STATIONARY SOURCES - PRECONSTRUCTION REVIEW**, effective 12-04-11

**CHAPTER 62-213, F.A.C.: OPERATION PERMITS FOR MAJOR SOURCES OF AIR POLLUTION**, effective 6-29-11

62-213.205, F.A.C.: Annual Emissions Fee.
62-213.400, F.A.C.: Permits and Permit Revisions Required.
62-213.410, F.A.C.: Changes Without Permit Revision.
62-213.412, F.A.C.: Immediate Implementation Pending Revision Process.
62-213.415, F.A.C.: Trading of Emissions Within a Source.
62-213.420, F.A.C.: Permit Applications.
62-213.430, F.A.C.: Permit Issuance, Renewal, and Revision.
62-213.440, F.A.C.: Permit Content.
62-213.450, F.A.C.: Permit Review by EPA and Affected States
62-213.460, F.A.C.: Permit Shield.
62-213.900, F.A.C.: Forms and Instructions.
62-213.900(1), F.A.C.: Major Air Pollution Source Annual Emissions Fee Form.
62-213.900(2), F.A.C.: Statement of Compliance Form.
62-213.900(3), F.A.C.: Responsible Official Notification Form.

**CHAPTER 62-296, F.A.C.: STATIONARY SOURCES - EMISSION STANDARDS**, effective 03-11-10

62-296.320(4)(c), F.A.C.: Unconfined Emissions of Particulate Matter.
62-296.320(2), F.A.C.: Objectionable Odor Prohibited.

**CHAPTER 62-297, F.A.C.: STATIONARY SOURCES - EMISSIONS MONITORING**, effective 02-12-04

62-297.310, F.A.C.: General Compliance Test Requirements.
62-297.620, F.A.C.: Exceptions and Approval of Alternate Procedures and Requirements.

**Miscellaneous:**

**CHAPTER 28-106, F.A.C.:** Decisions Determining Substantial Interests
**CHAPTER 62-110, F.A.C.:** Exception to the Uniform Rules of Procedure, effective 07-01-98
**CHAPTER 62-256, F.A.C.:** Open Burning and Frost Protection Fires, effective 10-06-08
**CHAPTER 62-257, F.A.C.:** Asbestos Notification and Fee, effective 10-12-08
**CHAPTER 62-281, F.A.C.:** Motor Vehicle Air Conditioning Refrigerant Recovery and Recycling, effective 09-10-96

Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400



**PERMITTEE**

Harvest Power, Inc.
221 Crescent Street, Suite 402
Waltham, Massachusetts 02453

*Authorized Representative:*
John M. Eustermann, Senior Vice President, General Counsel

Air Permit No. 0951340-001-AC
Expires: December 31, 2014
PSD-FL-418
Harvest Energy Garden - Orlando
Facility ID No. 0951340
Biogas-to-Energy and Fertilizer Project

**PROJECT**

This is the final air construction permit, which authorizes the installation and operation of a new biogas-to-energy and fertilizer plant – the Harvest Energy Garden - Orlando, which will be primarily classified as electrical services under Standard Industrial Classification No. 4911. The proposed new plant will be collocated with the Reedy Creek Wastewater Treatment Plant in Orange County at 2151 Bear Island Road in Lake Buena Vista, Florida. The UTM coordinates are Zone 17, 442.10 kilometers (km) East and 3139.02 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

**STATEMENT OF BASIS**

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Executed in Tallahassee, Florida
*(Electronic Signature)*

## CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this final air permit package (including the Final Determination and Final Permit with Appendices) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Mr. John M. Eustermann, Harvest Power, Inc.: jeustermann@harvestpower.com
Mr. Alex MacFarlane, Harvest Power Orlando, LLC: amacfarlane@harvestpower.com
Mr. Philip D. Cobb, P.E., Golder Associates, Inc.: pcobb@golder.com
Mr. Robert Manning, Hopping Green & Sams: rmanning@hgslaw.com
Ms. Caroline Shine, Central District: caroline.shine@dep.state.fl.us
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Ms. Lynn Scearce, DEP OPC: lynn.scearce@dep.state.fl.us

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.
*(Electronic Signature)*

## PROPOSED PROJECT

Harvest Energy Orlando, LLC proposes to construct and operate a biogas-to-energy and fertilizer plant. The facility will receive food waste, thickened wastewater activated sludge, and other organic materials. The materials will be digested and converted to biogas and fertilizer. The project will be constructed on land leased from Reedy Creek Improvement District (RCID) and collocated with the existing RCID's wastewater treatment plant. The RCID and Walt Disney World currently operate under a single Title V air permit as a single facility. The project is considered an expansion of this existing facility and is subject to PSD preconstruction review for carbon monoxide and volatile organic compounds in accordance with Rule 62-212.400, F.A.C. Construction is scheduled to commence in 2012 and be completed in 2013.

The proposed new plant will consist of five main sections: a feedstock receiving and pre-treatment process; an anaerobic digestion process; a biogas, power generation, and heat recovery process; an odor removal process; and a digestate management/fertilizer production process. Biogas produced by the digesters will be directed to a biogas scrubber to remove hydrogen sulfide and pass through a condensate trap/gravel filter to remove water before being fired in the two 1.6 MW reciprocating internal combustion engine/electrical generator sets. If the engines are unavailable or more gas is produced than the engines can accommodate, a backup flare will combust the excess biogas before it is scrubbed. Emissions of organic compounds and odor-causing pollutants from the receiving building, three holding tanks, and the digestate handling and drying system will be minimized by the installation of a bio-scrubber designed for at least 90% removal of organic compounds.

Organic waste entering the facility will undergo a pre-treatment process to remove contaminants, such as glass, metals, plastic, etc. All inorganic material will be shipped off site to a landfill. The organic waste will be turned into a slurry and then sent to two continuously stirred tank reactor digesters, which break down the organics in the slurry to convert it to primarily methane and carbon dioxide. Exhaust from the engine/generator sets will be used to heat oil for an indirectly heated dryer. The engine/generator sets will also be equipped with water jackets to heat water for use in other processes at the facility. The remaining solids will be sent through a centrifuge to remove water and then to the indirectly heated dryer to further reduce the water content to produce a final fertilizer product.

This project will consist of the following emissions units (EU).

| EU No. | Description |
|---|---|
| 001 - 002 | Two nominal 1.6 MW Caterpillar Model G3520C lean-burn internal combustion engine/generator sets |
| 003 | Bio-Scrubber |
| 004 | Emergency Flare |

## FACILITY REGULATORY CLASSIFICATION

- The project will be a major source of hazardous air pollutants (HAP).
- The project will be a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The project includes no units subject to the acid rain provisions of the Clean Air Act.
- The project is subject to PSD preconstruction review in accordance with Rule 62-212.400, F.A.C.
- The project includes units subject to applicable New Source Performance Standards (NSPS) in Title 40, Part 60 of the Code of Federal Regulations.
- The project includes units subject to applicable National Emissions Standards for Hazardous Air Pollutants (NESHAP) in Title 40, Part 63 of the Code of Federal Regulations.

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The Permitting Authority for this project is the Office of Permitting and Compliance in the Division of Air Resource Management of the Department of Environmental Protection (Department). The mailing address for the Office of Permitting and Compliance is 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Central District Office at 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767.

3. Appendices: The following Appendices are attached as a part of this permit: Appendix A (Citation Formats and Glossary of Common Terms); Appendix B (General Conditions); Appendix C (Common Conditions); Appendix D (Common Testing Requirements); and Appendix E (Final BACT Determinations); Appendix F (NSPS Subpart A); and Appendix G (NSPS Subpart JJJJ); Appendix H (NESHAP Provisions).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: No emissions unit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Source Obligation:

   (a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.

   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   (c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   [Rule 62-212.400(12), F.A.C.]

8. Title V Permit: This permit authorizes specific modifications and/or new construction on the affected emissions units as well as initial operation to determine compliance with conditions of this permit. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply

for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after completing the required work and commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to each Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

### A. Biogas Engines and Bio-Scrubber (EU 001 - 003)

This section of the permit addresses the following emissions units.

| EU No. | Emission Unit Description |
|---|---|
| 001 - 002 | Two nominal 1.6 MW Caterpillar Model G3520C lean-burn internal combustion engine/generator sets |
| 003 | Bio-Scrubber |

*{Permitting Note: In accordance with Rule 62-212.400(PSD), F.A.C., the above emission units are subject to Best Available Control Technology (BACT) determinations for carbon monoxide (CO) and volatile organic compounds (VOC). The final BACT determinations are presented in Appendix E of this permit. Other emissions standards and performance restrictions specified in this permit allow the emission units to avoid PSD preconstruction review for sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_X$).*

**EQUIPMENT**

1. The permittee is authorized to install and operate the following processes and equipment:
   a. Feedstock Receiving and Pre-Treatment Process, including: waste receiving and contaminate removal building; waste storage tanks; and blending tanks.
   b. Anaerobic Digestion Process, including: two continuously stirred tank reactor digesters; post digester; and integrated gasholder.
   c. Biogas, Power Generation and Heat Recovery Process, including: biogas scrubber and water knockout; emergency flare; two engine/generator sets; water jacket heat recovery for process heat; and thermal oil exhaust heat recovery for dryer.
   d. Odor Removal Process, including: collection ductwork and blower; bio- scrubber; and stack with real-time odor monitoring.
   e. Digestate Management/Fertilizer Production, including: centrifuge for liquid/solids separation; digestate solids indirect dryer; phosphorus recovery from centrate; and liquid effluent nitrification /de-nitrification.

   *{Permitting Note: The storage vessels are well below the vapor pressure specified in NSPS Subpart Kb and the facility will not contain volatile organic liquid storage tanks. Therefore, the tanks are considered unregulated emissions units.}* [Design and Application No. 0951340-001-AC]
2. Biogas Engine/Generator Sets: The permittee is authorized to install and operate two spark-ignited reciprocating internal combustion engine/generator sets (Caterpillar Model G3520C or equivalent) that will fire biogas with the following nominal design specifications per engine: a maximum engine rating of 2,242 brake-horsepower (bhp) at 100% load; a nominal electrical generator rating of 1.6 MW; and a heat input rate of approximately 18.2 million British thermal units (MMBtu)/hour from biogas. Each engine shall be equipped with:
   a. An air-to-fuel ratio controller and ignition timing to maintain efficient fuel combustion.
   b. An automatic fail-safe block valve, which must be designed to stop the flow of biogas in the event of an engine failure.
   c. A non-resettable elapsed time meter to indicate the elapsed engine operating time in cumulative hours.
   d. A gas flow meter to monitor the actual biogas flow rate to each engine.

   *{Permitting Note: The heat input rate is based on 100% load (2,242 bhp), a nominal biogas heating value of 581.4 Btu/standard cubic feet (scf) and an approximate biogas firing rate of 525 scf per minute (scfm) per engine.}* [Design, Application No. 0951340-001-AC, and Rule 62-212.400(BACT) for CO/VOC emissions]
3. Bio-Scrubber: The permittee shall install a bio-scrubber system to control the ventilation exhaust from the receiving building, three holding tanks, digestate handling, and drying system. The general design specifications for the bio-scrubber are:
   a. Flow rate of 41,800 cubic feet per minute (cfm);
   b. 50 parts per million (ppm) maximum water hardness;

c. 90% or more removal of VOC emissions;

d. 99% removal of $H_2S$ or < 0.1 ppm at the system discharge, whichever is greater;

e. Ammonia levels shall be < 10 ppm during average conditions and 25 ppm during peak conditions; and

f. 90% odor removal for inlet concentration levels between 5,000 and 15,000 odor unit (OU). For inlet conditions less than 5,000 OU, the outlet concentrations levels shall be less than 500 OU.

A pressure indicator and flow switch shall be installed to measure the differential pressure across the unit to control the water level. In addition, an alarm system shall be installed to warn of high/low water levels. [Design, Application No. 0951340-001-AC, and Rule 62-212.400(BACT) for VOC emissions]

**PERFORMANCE STANDARDS AND RESTRICTIONS**

4. Permitted Capacity: Each engine/generator set has a maximum engine power rating of 2,242 bhp at 100% load (approximately 18.2 MMBtu/hour) with an electrical generator rating 1.6 MW, nominal. [Design, Application No. 0951340-001-AC, and Rule 62-210.200(PTE), F.A.C.]

5. Authorized Fuel: Propane, natural gas, or biogas/landfill gas from another facility may be combusted in the engine/generator sets during the initial startup testing prior to full commissioning of the facility. Once biosolids have been added to the anaerobic digestion system, and biogas is being generated, only biogas shall be fired in the engine/generator sets. [Design, Application No. 0951340-001-AC, and Rule 62-210.200(PTE), F.A.C.]

6. Hours of Operation: Operation of the new engine/generator sets and bio-scrubber is not limited (8,760 hours per year). [Design, Application No. 0951340-001-AC, and Rule 62-210.200(PTE), F.A.C.]

7. Operating Requirements: The permittee shall set the air-to-fuel ratio for each engine based on the most recent emissions tests demonstrating compliance with the standards specified in this permit and other operating conditions identified in NSPS Subpart JJJJ. [NSPS Subpart JJJJ in 40 CFR 60 and Rules 62-212.400(BACT) for CO/VOC emissions]

8. Applicable NSPS Provisions: The biogas engines are subject to, and shall comply with, the applicable provisions in NSPS Subpart A (General Provisions) and NSPS Subpart JJJJ (Stationary Spark Ignition Internal Combustion Engines) of 40 CFR 60, which are identified in Appendix E and F of this permit. [NSPS Subparts A and JJJJ in 40 CFR 60 and Rule 62-204.800, F.A.C.]

9. Applicable NESHAP Provisions: The biogas engines are subject to, and shall comply with, the applicable provisions in NESHAP Subpart A (General Provisions) and NESHAP Subpart ZZZZ (Reciprocating Internal Combustion Engines) of 40 CFR 63, which are identified in Appendix G of this permit. Pursuant to §63.6600(c) of this subpart, any stationary reciprocating internal combustion engine that combusts landfill gas or digester gas equivalent to 10% or more of the gross heat input on an annual basis is exempt from any emission limits and operating limitations contained in the subpart. The other requirements of NESHAP Subpart ZZZZ are met by complying with the requirements of NSPS Subpart JJJJ. [NESHAP Subparts A and ZZZZ in 40 CFR 63 and Rule 62-204.800, F.A.C.]

**EMISSIONS STANDARDS**

10. CO Standard: The emissions of CO from each engine/generator set shall not exceed 24.7 lb/hour and 7.0 g/kW-hr (equivalent to 5.0 g/bhp-hour). [NSPS Subpart JJJJ in 40 CFR 60 and Rule 62-212.400(BACT), F.A.C.]

11. VOC Standard: The emissions of VOC from each engine/generator set shall not exceed 4.9 lb/hr and 1.4 g/kW-hr (equivalent to 1.0 g/bhp-hour). When calculating emissions of VOC, emissions of formaldehyde should not be included. [NSPS Subpart JJJJ in 40 CFR 60 and Rule 62-212.400(BACT), F.A.C.]

12. $NO_X$ Standard: The emissions of $NO_X$ from each engine/generator set shall not exceed 9.9 lb/hr and 2.8 g/kW-hr (equivalent to 2.0 g/bhp-hour). [NSPS Subpart JJJJ in 40 CFR 60.]

13. NOx Emission Cap: The emissions of $NO_X$ from the combustion sources in this project (EU-001, 002, and 004, combined) shall not exceed 39 tons per consecutive 12 months. Compliance with this $NO_X$ emissions cap shall be demonstrated on a 12-month rolling basis using the following equation.

    $[(0.8 \text{ tons NOx/MMm}^3)(\text{Flare}_{\text{Biogas}})] + [(\text{EF}_{\text{engine}})(\text{lb}/454)(\text{ton}/2000 \text{ lb})(\text{Engine1}_{\text{kW-hours}} + \text{Engine2}_{\text{kW-hours}})] \leq 39.0 \text{ TPY, NOx}$

    Where:

    $\text{Flare}_{\text{Biogas}}$ = Rolling 12-month total of Biogas burned in flare (EU-004), million $m^3$ ($MMm^3$)

    $\text{EF}_{\text{engine}}$ = NOx emission rate from most recent annual stack test, g/kW-hour

    $\text{Engine}_{\text{kW-hours}}$ = Rolling 12-month total of operating kW-hours for each engine (EU-001 and EU-002)

    If necessary, the permittee shall adjust engine operation to comply with the NOx emissions cap. [Rule 62-212.400(12), F.A.C. to avoid PSD preconstruction review for NOx]

14. $SO_2$ Emission Cap: The emissions of $SO_2$ from the combustion sources in this project (EU-001, 002, and 004, combined) shall not exceed 39 tons per consecutive 12 months. Compliance with this $SO_2$ emissions cap shall be demonstrated on a 12-month rolling basis using the following information: the $H_2S$ level in the scrubbed and unscrubbed biogas fired, the amount of biogas fired in each combustion source, and the assumption that all sulfur is converted to $SO_2$. [Rule 62-212.400(12), F.A.C. to avoid PSD preconstruction review for $SO_2$]

15. Objectionable Odor Prohibited: No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. An "objectionable odor" is defined as any odor present in the outdoor atmosphere, which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance." [Rule 62-296.320(2), F.A.C.]

**TESTING REQUIREMENTS**

16. Initial Compliance Tests: Each engine/generator set shall be tested to demonstrate initial compliance with the emissions standards for CO, $NO_X$, and VOC pursuant to the NSPS Subpart JJJJ provisions in 40 CFR 60. The initial compliance test must be conducted within 60 days after achieving permitted capacity, but no later than 180 days after the start of facility commissioning when biosolids have been added to the anaerobic digestion system and biogas is being generated. [NSPS Subpart JJJJ in 40 CFR 60 and Rules 62-204.800, 62-297.310(7), and 62-212.400(BACT), F.A.C. (for CO/VOC emissions).]

17. Periodic Compliance Tests: Every 8,760 engine hours or at least once every three years, whichever comes first, each engine/generator set shall be tested to demonstrate compliance with the emissions standards for CO, NOx and VOC pursuant to the NSPS Subpart JJJJ provisions in 40 CFR 60. [NSPS Subpart JJJJ in 40 CFR 60; and Rules 62-204.800, 62-297.310(7), and 62-212.400(BACT), F.A.C. (for CO/VOC emissions)]

18. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any scheduled stack tests. During each required compliance stack test, the permittee shall operate the tested engine/generator set at permitted capacity (2,018 bhp or greater). Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. *{Permitting Note: Although the NSPS provides for a 30-day test notification, a 15-day notice is sufficient in Florida.}* [Rule 62-297.310(7)(a)9, F.A.C.]

19. Test Methods: Required tests shall be performed in accordance with the following reference methods.

| Method | Description of Method and Comments |
|---|---|
| 1-4 | Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content |
| 7E | Determination of NOx Emissions from Stationary Sources |
| 10 | Determination of CO Emissions from Stationary Sources (based on continuous sampling train) |
| 18 | Measurement of Gaseous Organic Compound Emissions by Gas Chromatography |
| 25A | Method for Determining Gaseous Organic Concentrations (Flame Ionization) |

| Method | Description of Method and Comments |
|---|---|
| 320 | Measurement of Vapor Phase Organic and Inorganic Emissions by Extractive Fourier Transform Infrared (FTIR) Spectroscopy |

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

**MONITORING REQUIREMENTS**

20. Biogas Sampling/Analysis: At least semiannually, the permittee shall obtain the following representative samples of scrubbed and unscrubbed biogas: during each required compliance stack test; and during the next semiannual period, but no earlier than 5 months since the previous sample was taken. The representative samples shall be taken in each calendar semiannual period (January – June and July – December) approximately six months apart. Each gas sample shall be collected under normal operating conditions with the appropriate canister (e.g., SUMMA®, Bottle-Vac Sampler, or equivalent). Each sample shall have an analysis conducted to determine the $H_2S$ concentration. Based on the sampling results and Rule 62-297.310(7)(b)(Special Compliance Tests), F.A.C., the Compliance Authority may request additional gas sampling and analyses. [Rules 62-210.200(PTE) and 62-212.400(12), F.A.C. to avoid PSD review for $SO_2$ emissions]

21. Bio-Scrubber Design: Within 60 days of beginning construction on the biogas system, the permittee shall submit the final design specifications for the bio-scrubber including the designed VOC control efficiency. [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C. for VOC emissions]

22. Monthly Records: Within ten calendar days following each month, the permittee shall observe and record the total monthly number of hours of operation of each engine, the average electrical power produced (kW) of each engine, and the calculated monthly and 12 month rolling total emissions of $NO_X$ and $SO_2$ to demonstrate compliance with the emissions caps. [Rules 62-4.070(3), F.A.C.]

**RECORDS AND REPORTS**

23. Test Reports: The required test report shall be filed with the Department, as soon as practical, but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. In addition to the information identified in Rule 62-297.310(8)(c), F.A.C., the test report shall also indicate the engine power (kW and bhp) during the test and the biogas heating value. To show compliance with NSPS 40 CFR 60, Subpart JJJJ emission limits, compliance test results for the generators sets shall be report in both g/kW-hr and g/bhp-hr. The conversion from g/kW-hr to g/bhp-hr shall be based on the appropriate electrical efficiency at the engine load at which the compliance tests were conducted. [Rule 62-297.310(8), F.A.C.]

## B. Utility Flare (EU 004)

This section of the permit addresses the following emissions unit.

| EU No. | Emission Unit Description |
|---|---|
| 004 | An open utility, candlestick-type backup flare rated at 1,200 scfm of biogas (manufactured by Perennial Energy, Inc., Model No. FLR-301, or equivalent). The open flare stack will be 8 inches in diameter and 24 feet in height with a total volumetric flow rate of 3,454 acfm. At the design biogas flow rate with a biogas methane content 40% to 60%, the destruction efficiency is 98% overall destruction of total hydrocarbons. |

### EQUIPMENT

1. Backup Flare: The permittee is authorized to install a digester gas (biogas) backup flare with the following specifications:
   a. Open "candlestick-type" flare;
   b. Maximum biogas flow rate of 1,200 scfm; and
   c. Estimated maximum heat input rate of 41.9 MMBtu/hour.

   *{Permitting Note: The heat input rate is based on a nominal methane heating value of 1,020 Btu/scf and a methane content of 57% in the biogas.}*

   [Design and Application No. 0951340-001-AC]

2. Applicable NSPS Provisions: The utility flare is subject to, and shall comply with, the applicable provisions for flares in NSPS Subpart A (General Provisions) of 40 CFR 60, which are identified in Appendix E of this permit. [NSPS Subpart A in 40 CFR 60]

### PERFORMANCE RESTRICTIONS

3. Authorized Fuel: Propane, natural gas, or biogas/landfill gas from another facility may be combusted in the flare during the initial startup testing prior to full commissioning of the facility. After the start of the facility commissioning when biosolids have been added to the anaerobic digestion system, and biogas is being generated, only biogas shall be fired in the flare. [Application No. 0951340-001-AC, and Rule 62-210.200(PTE), F.A.C.]

4. Restricted Operation: The flare shall not fire more than 2.96 $MMm^3$ of biogas during any consecutive 12-months. *{Permitting Note: This is equivalent to approximately 19% of the maximum design biogas generation rate of 15.6 $MMm^3$.}* [Rules 62-210.200(PTE) and 62-212.400(12), F.A.C. to avoid PSD review for $SO_2$ emissions]

### EMISSIONS STANDARDS

5. Visible Emissions: Flares shall be designed for, and operated with, no visible emissions as determined by the methods specified in 40 CFR 60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. [Rule 62-296.800, F.A.C.; and 40 CFR 60.18(c)]

6. NOx Emission Cap: The emissions of $NO_X$ from the combustion sources in this project (EU-001, 002, and 004, combined) shall not exceed 39 tons per consecutive 12 months. Compliance with this $NO_X$ emissions cap shall be demonstrated on a 12-month rolling basis using the following equation.

   $[(0.8 \text{ tons NOx/MMm}^3)(\text{Flare}_{\text{Biogas}})] + [(\text{EF}_{\text{engine}})(\text{lb}/454)(\text{ton}/2000 \text{ lb})(\text{Engine1}_{\text{kW-hours}} + \text{Engine2}_{\text{kW-hours}})] \leq 39.0 \text{ TPY, NOx}$

   Where:

   $\text{Flare}_{\text{Biogas}}$ = Rolling 12-month total of Biogas burned in flare (EU-004), million $m^3$ ($MMm^3$)

   $\text{EF}_{\text{engine}}$ = NOx emission rate from most recent annual stack test, g/kW-hour

   $\text{Engine}_{\text{kW-hours}}$ = Rolling 12-month total of operating kW-hours for each engine (EU-001 and EU-002)

If necessary, the permittee shall adjust engine operation to comply with the NOx emissions cap. [Rule 62-212.400(12), F.A.C. to avoid PSD preconstruction review for NOx]

7. $SO_2$ Emission Cap: The emissions of $SO_2$ from the combustion sources in this project (EU-001, 002, and 004, combined) shall not exceed 39 tons per consecutive 12 months. Compliance with this $SO_2$ emissions cap shall be demonstrated on a 12-month rolling basis using the following information: the $H_2S$ level in the scrubbed and unscrubbed biogas fired, the amount of biogas fired in each combustion source, and the assumption that all sulfur is converted to $SO_2$. [Rule 62-212.400(12), F.A.C. to avoid PSD preconstruction review for $SO_2$]

**TESTING REQUIREMENTS**

8. Initial Compliance Tests: The emission unit shall be tested to demonstrate initial compliance for visible emissions. The initial compliance test must be conducted within 60 days after achieving permitted capacity, but no later than 180 days after the start of facility commissioning when biosolids have been added to the anaerobic digestion system and biogas is being generated. [Rules 62-4.070(3) and 62-297.310(7), F.A.C.]

9. Annual Compliance Tests: During each federal fiscal year (October 1st to September 30th), the emissions unit shall be tested to demonstrate compliance with the emissions standards for visible emissions. [Rule 62-297.310(7), F.A.C.]

10. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. *{Permitting Note: Although the NSPS provides for a 30-day test notification, a 15-day notice is sufficient in Florida.}*
[Rule 62-297.310(7), F.A.C.]

11. Test Methods: Required tests shall be performed in accordance with the following reference methods.

| Method | Description of Method and Comments |
|---|---|
| 22 | Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares |

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C. and Appendix A of 40 CFR 60]

**MONITORING REQUIREMENTS**

12. Work Practice: Good combustion practices will be utilized at all times to ensure emissions from the flare system are minimized. Owners or operators of flares used to comply with the provisions of this subpart shall be trained to monitor these control devices to ensure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators of flares shall monitor these control devices. [40 CFR 60.18(d) and Rule 62-296.800, F.A.C.]

13. Monitoring: The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame. [40 CFR 60.18(f) and Rule 62-296.800, F.A.C.]

**RECORDS AND REPORTS**

14. Monthly Records: Within ten calendar days following each month, the permittee shall observe and record in a written log the duration and cause of each flare event, the hours of operation, and the amount of biogas fired for the month and the previous 12 months of operation. [Rules 62-4.070(3), F.A.C.]

15. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix D (Common Testing Requirements) of this permit.
[Rule 62-297.310, F.A.C.]

**ATTACHMENT HP-FI-CV3**

**COMPLIANCE REPORT**

## ATTACHMENT HP-FI-CV3
## COMPLIANCE REPORT

Harvest Power Orlando, LLC certifies that the facility located in Lake Buena Vista, Orange County, Florida, as of the date of this application, is in compliance with each applicable requirement addressed in this Title V air operation permit application.

I, the undersigned, am the responsible official as designated in Chapter 62-213, F.A.C., of the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete.

Compliance statements for this facility will be submitted on an annual basis to FDEP, on or before March 1 of each year.

Signature, Responsible Official

30-MAR-15

Date

# SECTION 1

# TWO 1.6 MW GENERATORS

## 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.

**EMISSIONS UNIT INFORMATION**
**Section [1]**
**Two 1.6 MW Generators**

## 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.)

   ☒ 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)

   ☐ 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:
   **Two 1.6 MW Generators fueled by biogas**

3. Emissions Unit Identification Number: **001 & 002**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: |
|---|---|---|---|
| **A** | | | **49** |

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

   ☐ Acid Rain Unit

   ☐ CAIR Unit

9. Package Unit:
   Manufacturer: **Caterpillar** Model Number: **G3520C**

10. Generator Nameplate Rating: **3.2** MW

11. Emissions Unit Comment:

    **Each generator has a nameplate capacity of 1.6 MW, for a total nameplate capacity of 3.2 MW.**

**EMISSIONS UNIT INFORMATION**
**Section [1]**
**Two 1.6 MW Generators**

**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: |

**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: | |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: **36.46** million Btu/hr | |
| 4. Maximum Incineration Rate: pounds/hr<br>tons/day | |
| 5. Requested Maximum Operating Schedule:<br>**24** hours/day<br>**52** weeks/year | **7** days/week<br>**8,760** hours/year |
| 6. Operating Capacity/Schedule Comment:<br>**Each engine has a maximum heat input rate of 18.23 MMBtu/hr and a maximum engine rating of 2,242 brake horsepower (bhp). Each generator has a nominal rating of 1.6 megawatts (MW).** | |

## 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: **CHP1 and CHP2** | 2. Emission Point Type Code: **2** | |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: **18.25** feet | 7. Exit Diameter: **1.33** feet |
| 8. Exit Temperature: **915**°F | 9. Actual Volumetric Flow Rate: **12,309** acfm | 10. Water Vapor: % |
| 11. Maximum Dry Standard Flow Rate: dscfm | 12. Nonstack Emission Point Height: feet | |
| 13. Emission Point UTM Coordinates... Zone: East (km): North (km): | 14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |
| 15. Emission Point Comment: **Stack parameters (exit temperature, actual volumetric flow rate, etc) are based on design information for each engine.** | | |

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment **1** of **1**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br>**Internal Combustion Engines; Electric Generation; Process Gas; Reciprocating** | | |
| 2. Source Classification Code (SCC):<br>**2-01-007-02** | 3. SCC Units:<br>**Million Standard Cubic Feet** | |
| 4. Maximum Hourly Rate:<br>**0.063** | 5. Maximum Annual Rate:<br>**549.30** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit:<br>**581.4** |
| 10. Segment Comment:<br>**Heat content based on 1,020 Btu/scf x 57-percent methane. Maximum hourly rate based on combined heat input rate of 36.46 MMBtu/hr for two engines.** | | |

**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 |
|---|---|---|---|
| **CO** | | | **EL** |
| **NOx** | | | **EL** |
| **VOC** | | | **EL** |
| **Formaldehyde – H095** | | | **NS** |
| **HAPS** | | | **NS** |
| **SO2** | | | **EL** |
| **PM** | | | **NS** |
| **PM10** | | | **NS** |
| **PM2.5** | | | **NS** |
| **H2S** | | | **NS** |
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## 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: **SO2** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **2.08** lb/hour **9.12** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **200 ppmvd $H_2S$** Reference: **Maximum estimated $H_2S$ concentration in biogas** | 7. Emissions Method Code: **5** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |
| 10. Calculation of Emissions: **Hourly: $200/10^6$ x 60 min/hr x 2116.8/1545.6 x 1/528°R x 522.5 scf/min x 34 lb $H_2S$/lbmol x (32 lb S/34 lb $H_2S$) x (64 lb $SO_2$/32 lb S) x 2 engines = 2.08 lb/hr** **Annual: 2.08 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 9.12 TPY** | |
| 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 **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **39 TPY** | 4. Equivalent Allowable Emissions: lb/hour **39** tons/year |
| 5. Method of Compliance: **Biogas sampling/analysis of scrubbed and unscrubbed biogas fired and amount of biogas fired** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 0951340-001-AC/PSD-FL-418. Limit represents combined emissions from EUs 001, 002, and 004.** | |

**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): | |

## 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: |
| 3. Potential Emissions: **49.43** lb/hour **216.49** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **5.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ** | 7. Emissions Method Code: **0** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |

10. Calculation of Emissions:

**Hourly: 5.0 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 49.43 lb/hr**

**Annual: 49.43 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 216.49 TPY**

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 **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **5.0 g/bhp-hr** | 4. Equivalent Allowable Emissions: **49.43** lb/hour **216.49** tons/year |
| 5. Method of Compliance: **EPA Method 10** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **NSPS 40 CFR 60 Subpart JJJJ and Permit No. 0951340-001-AC/PSD-FL-418** | |

**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): | |

## 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: **NOx** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **19.77** lb/hour **39** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **2.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ** | 7. Emissions Method Code: **0** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |
| 10. Calculation of Emissions: **Hourly: 2.0 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 19.77 lb/hr** **Annual: Permit Limit = 39 TPY (EU 001, 002, and 004 combined)** | |
| 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 **2**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **2.0 g/bhp-hr** | 4. Equivalent Allowable Emissions: **19.77** lb/hour **86.60** tons/year |
| 5. Method of Compliance: **EPA Method 7E** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **NSPS 40 CFR 60 Subpart JJJJ and Permit No. 0951340-001-AC/PSD-FL-418** | |

**Allowable Emissions** Allowable Emissions **2** of **2**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **39 TPY** | 4. Equivalent Allowable Emissions: lb/hour **39** tons/year |
| 5. Method of Compliance: **Calculation outlined in Permit No. 0951340-001-AC/PSD-FL-418 Section A, Condition 13** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 0951340-001-AC/PSD-FL-418. Limit represents combined emissions from EUs 001, 002, and 004.** | |

**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): | |

## 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: |
| 3. Potential Emissions: **9.89** lb/hour **43.30** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **1.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ** | 7. Emissions Method Code: **0** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |

10. Calculation of Emissions:

**Hourly: 1.0 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 9.89 lb/hr**

**Annual: 9.89 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 43.30 TPY**

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 **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **1.0 g/bhp-hr** | 4. Equivalent Allowable Emissions: **9.89** lb/hour **43.30** tons/year |
| 5. Method of Compliance: **EPA Method 18 and 25A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **NSPS 40 CFR 60 Subpart JJJJ and Permit No. 0951340-001-AC/PSD-FL-418** | |

**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.**

**Visible Emissions Limitation:** Visible Emissions Limitation **1** of **1**

| | |
|---|---|
| 1. Visible Emissions Subtype: **VE20** | 2. Basis for Allowable Opacity: ☒ Rule ☐ Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour | |
| 4. Method of Compliance: **EPA Method 9** | |
| 5. Visible Emissions Comment: **General visible emissions limitation based on Rule 62-296.320(4)(b)1., F.A.C. There is no testing requirement imposed by the rule.** | |

**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.**

**Continuous Monitoring System:** Continuous Monitor **1** of **2**

| | |
|---|---|
| 1. Parameter Code: **Hours** | 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: **Non-resettable elapsed time meter indicating elapsed engine operating time in cumulative hours. Permit No. 0951340-001-AC** | |

**Continuous Monitoring System:** Continuous Monitor **2** of **2**

| | |
|---|---|
| 1. Parameter Code: **FLOW** | 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: **Gas flow meter to monitor actual biogas flow rate to each engine. Permit No. 0951340-001-AC.** | |

## 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)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ 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: **HP-EU1-I2** ☐ 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)
   ☒ Attached, Document ID: **HP-EU1-I3** ☐ 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 _____
   ☐ 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 _____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☒ Previously Submitted, Date: **March 2014**
   Test Date(s)/Pollutant(s) Tested: **February 12-13, 2014 – NOx, CO, VOC**
   _____
   ☐ To be Submitted, Date (if known): _____
   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: _____ ☒ 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)):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)<br>☐ Attached, Document ID: _____ ☐ Not Applicable |

**Additional Requirements for Title V Air Operation Permit Applications**

| |
|---|
| 1. Identification of Applicable Requirements:<br>☒ Attached, Document ID: **HP-FI-CV2** |
| 2. Compliance Assurance Monitoring:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 3. Alternative Methods of Operation:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 4. Alternative Modes of Operation (Emissions Trading):<br>☐ Attached, Document ID: _____ ☒ Not Applicable |

**Additional Requirements Comment**

| |
|---|
| |

**ATTACHMENT HP-EU1-I2**

**FUEL ANALYSIS OR SPECIFICATION**

# ATTACHMENT HP-EU1-I2
# FUEL ANALYSIS

| Fuel | Density (lb/gal) | Moisture (%) | Weight % Sulfur | Weight % Nitrogen | Weight % Ash | Heat Capacity |
|---|---|---|---|---|---|---|
| Biogas | -- | -- | 0.024 [a] | -- | -- | 570 – 627 Btu/scf [b] |

[a] Based on 200 ppmvd $H_2S$ content.

[b] Based on 57-percent methane content in biogas.

**ATTACHMENT HP-EU1-I3**

**DETAILED DESCRIPTION OF CONTROL EQUIPMENT**

# G3520C

## GAS ENGINE TECHNICAL DATA

CATERPILLAR®

| | | | |
|---|---|---|---|
| ENGINE SPEED (rpm): | 1200 | FUEL: | Low Energy |
| COMPRESSION RATIO: | 11.3 | FUEL SYSTEM: | CAT LOW PRESSURE |
| AFTERCOOLER - STAGE 2 INLET (°F): | 130 | | WITH AIR FUEL RATIO CONTROL |
| AFTERCOOLER - STAGE 1 INLET (°F): | 217 | FUEL PRESSURE RANGE(psig): | 1.5-5.0 |
| JACKET WATER OUTLET (°F): | 230 | FUEL METHANE NUMBER: | 140 |
| ASPIRATION: | TA | FUEL LHV (Btu/scf): | 500 |
| COOLING SYSTEM: | JW+1AC, OC+2AC | ALTITUDE CAPABILITY AT 77°F INLET AIR TEMP. (ft): | 2887 |
| IGNITION SYSTEM: | ADEM3 | APPLICATION: | Genset |
| EXHAUST MANIFOLD: | DRY | POWER FACTOR: | 0.8 |
| COMBUSTION: | Low Emission | VOLTAGE(V): | 480-4160 |
| NOx EMISSION LEVEL (g/bhp-hr NOx): | 1.0 | | |

| RATING | | NOTES | LOAD | 100% | 75% | 50% |
|---|---|---|---|---|---|---|
| GENSET POWER | (WITHOUT FAN) | (1)(2) | ekW | 1600 | 1200 | 800 |
| GENSET POWER | (WITHOUT FAN) | (1)(2) | KVA | 2000 | 1500 | 1000 |
| ENGINE POWER | (WITHOUT FAN) | (2) | bhp | 2242 | 1683 | 1128 |
| GENERATOR EFFICIENCY | | (1) | % | 95.7 | 95.6 | 95.1 |
| GENSET EFFECIENCY | (ISO 3046/1) | (3) | % | 39.2 | 37.5 | 36.6 |
| GENSET EFFECIENCY | (NOMINAL) | (3) | % | 38.3 | 36.6 | 35.7 |
| ENGINE EFFICIENCY | (NOMINAL) | (3) | % | 40.0 | 38.3 | 37.6 |
| THERMAL EFFICIENCY | (NOMINAL) | (4) | % | 39.9 | 39.9 | 41.6 |
| TOTAL EFFICIENCY | (NOMINAL) | (5) | % | 78.2 | 76.5 | 77.3 |

| ENGINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| GENSET FUEL CONSUMPTION | (ISO 3046/1) | (6) | Btu/ekW-hr | 8697 | 9100 | 9320 |
| GENSET FUEL CONSUMPTION | (NOMINAL) | (6) | Btu/ekW-hr | 8910 | 9322 | 9547 |
| ENGINE FUEL CONSUMPTION | NOMINAL | (6) | Btu/bhp-hr | 6358 | 6646 | 6771 |
| AIR FLOW (77°F, 14.7 psia) | (WET) | (7) | scfm | 4248 | 3222 | 2242 |
| AIR FLOW | (WET) | (7) | lb/hr | 18836 | 14288 | 9940 |
| COMPRESSOR OUT PRESSURE | | | in Hg(abs) | 104.1 | 77.8 | 53.5 |
| COMPRESSOR OUT TEMPERATURE | | | °F | 369 | 295 | 212 |
| AFTERCOOLER AIR OUT TEMPERATURE | | | °F | 140 | 137 | 136 |
| INLET MAN. PRESSURE | | (8) | in Hg(abs) | 89.7 | 68.3 | 48.4 |
| INLET MAN. TEMPERATURE | (MEASURED IN PLENUM) | (9) | °F | 140 | 137 | 136 |
| TIMING | | (10) | °BTDC | 28 | 28 | 28 |
| EXHAUST TEMPERATURE - ENGINE OUTLET | | (11) | °F | 915 | 958 | 982 |
| EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) | (WET) | (12) | ft3/min | 12309 | 9663 | 6823 |
| EXHAUST GAS MASS FLOW | (WET) | (12) | lb/hr | 20951 | 15948 | 11073 |
| MAX INLET RESTRICTION | | (13) | in H2O | 10.04 | 10.04 | 10.04 |
| MAX EXHAUST RESTRICTION | | (13) | in H2O | 20.07 | 20.07 | 20.07 |

| EMISSIONS DATA - ENGINE OUT | | | | | |
|---|---|---|---|---|---|
| NOx (as NO2) | (14)(15) | g/bhp-hr | 1.00 | 1.00 | 1.00 |
| CO | (14)(16) | g/bhp-hr | 4.78 | 4.88 | 4.97 |
| THC (mol. wt. of 15.84) | (14)(16) | g/bhp-hr | 5.36 | 6.07 | 7.34 |
| NMHC (mol. wt. of 15.84) | (14)(16) | g/bhp-hr | 0.80 | 0.91 | 1.10 |
| NMNEHC (VOCs) (mol. wt. of 15.84) | (14)(16)(17) | g/bhp-hr | 0.54 | 0.61 | 0.73 |
| HCHO (Formaldehyde) | (14)(16) | g/bhp-hr | 0.44 | 0.44 | 0.49 |
| CO2 | (14)(16) | g/bhp-hr | 736 | 765 | 806 |
| EXHAUST OXYGEN | (14)(18) | % DRY | 8.4 | 8.1 | 8.0 |
| LAMBDA | (14)(18) | | 1.64 | 1.58 | 1.61 |

| ENERGY BALANCE DATA | | | | | |
|---|---|---|---|---|---|
| LHV INPUT | (19) | Btu/min | 237589 | 186442 | 127298 |
| HEAT REJECTION TO JACKET WATER (JW) | (20)(27) | Btu/min | 29397 | 25887 | 21531 |
| HEAT REJECTION TO ATMOSPHERE | (21) | Btu/min | 7210 | 6013 | 4823 |
| HEAT REJECTION TO LUBE OIL (OC) | (22)(28) | Btu/min | 7791 | 6995 | 6197 |
| HEAT REJECTION TO EXHAUST (LHV TO 77°F) | (23) | Btu/min | 75835 | 63569 | 41405 |
| HEAT REJECTION TO EXHAUST (LHV TO 350°F) | (23) | Btu/min | 53213 | 43777 | 31605 |
| HEAT REJECTION TO A/C - STAGE 1 (1AC) | (24)(27) | Btu/min | 12077 | 4700 | -241 |
| HEAT REJECTION TO A/C - STAGE 2 (2AC) | (25)(28) | Btu/min | 8222 | 5917 | 3767 |
| PUMP POWER | (26) | Btu/min | 1977 | 1977 | 1977 |

## CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.60 in Hg barometric pressure, 500 ft. altitude.) No overload permitted at rating shown. Consult altitude curves for applications above maximum rated altitude and/or temperature.

Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3.

For notes information consult page three.

## FUEL USAGE GUIDE

| CAT METHANE NUMBER | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|
| SET POINT TIMING | - | 24 | 26 | 28 | 30 |
| DERATION FACTOR | 0 | 1 | 1 | 1 | 1 |

## ALTITUDE DERATION FACTORS AT RATED SPEED

| INLET AIR TEMP °F | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 1 | 0.98 | 0.94 | 0.91 | 0.87 | 0.84 | 0.81 | 0.78 | 0.74 | 0.72 | 0.69 | 0.66 | 0.63 |
| 120 | 1 | 1 | 0.96 | 0.92 | 0.89 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.67 | 0.64 |
| 110 | 1 | 1 | 0.98 | 0.94 | 0.90 | 0.87 | 0.84 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 | 0.66 |
| 100 | 1 | 1 | 0.99 | 0.96 | 0.92 | 0.88 | 0.85 | 0.82 | 0.79 | 0.75 | 0.72 | 0.70 | 0.67 |
| 90 | 1 | 1 | 1 | 0.97 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 |
| 80 | 1 | 1 | 1 | 0.99 | 0.95 | 0.92 | 0.88 | 0.85 | 0.81 | 0.78 | 0.75 | 0.72 | 0.69 |
| 70 | 1 | 1 | 1 | 1 | 0.97 | 0.93 | 0.90 | 0.86 | 0.83 | 0.80 | 0.77 | 0.73 | 0.70 |
| 60 | 1 | 1 | 1 | 1 | 0.99 | 0.95 | 0.92 | 0.88 | 0.85 | 0.81 | 0.78 | 0.75 | 0.72 |
| 50 | 1 | 1 | 1 | 1 | 1 | 0.97 | 0.93 | 0.90 | 0.86 | 0.83 | 0.80 | 0.76 | 0.73 |

ALTITUDE (FEET ABOVE SEA LEVEL)

## AFTERCOOLER HEAT REJECTION FACTORS (ACHRF)

| INLET AIR TEMP °F | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 1.33 | 1.38 | 1.43 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 | 1.47 |
| 120 | 1.26 | 1.31 | 1.36 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 |
| 110 | 1.20 | 1.24 | 1.29 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| 100 | 1.13 | 1.18 | 1.22 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 |
| 90 | 1.06 | 1.11 | 1.16 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |
| 80 | 1 | 1.04 | 1.09 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| 70 | 1 | 1 | 1.02 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 60 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 50 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

ALTITUDE (FEET ABOVE SEA LEVEL)

## FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

## ALTITUDE DERATION FACTORS:

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

## ACTUAL ENGINE RATING:

To determine the actual rating of the engine at site conditions, one must consider separately, limitations due to fuel characteristics and air system limitations. The Fuel Usage Guide deration establishes fuel limitations. The Altitude/Temperature deration factors and RPC (reference the Caterpillar Methane Program) establish air system limitations. RPC comes into play when the Altitude/Temperature deration is less than 1.0 (100%). Under this condition, add the two factors together. When the site conditions do not require an Altitude/Temperature derate (factor is 1.0), it is assumed the turbocharger has sufficient capability to overcome the low fuel relative power, and RPC is ignored. To determine the actual power available, take the lowest rating between 1) and 2).

1) Fuel Usage Guide Deration
2) 1-((1-Altitude/Temperature Deration) + (1-RPC))

## AFTERCOOLER HEAT REJECTION FACTORS(ACHRF):

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft. altitude. To maintain a constant air inlet manifold temperature, as the inlet air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor (ACHRF) to adjust for inlet air temp and altitude conditions. See Notes 27 and 28 below for application of this factor in calculating the heat exchanger sizing criteria. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

## NOTES:

1. Generator efficiencies, power factor, and voltage are based on standard generator. [Genset Power (ekW) is calculated as: Engine Power (bkW) x Generator Efficiency], [Genset Power (kVA) is calculated as: Engine Power (bkW) x Generator Efficiency / Power Factor]
2. Rating is with two engine driven water pumps. Tolerance is (+)3, (-)0% of full load.
3. ISO 3046/1 Genset efficiency tolerance is (+)0, (-)5% of full load % efficiency value. Nominal genset and engine efficiency tolerance is ± 2.5% of full load % efficiency value.
4. Thermal Efficiency is calculated as: (Heat rejection to jacket water + Heat Rejection to A/C Stage 1 + Heat rejection to exhaust to 350ºF) / LHV Input
5. Total efficiency is calculated as: Genset Efficiency + Thermal Efficiency. Tolerance is ±10% of full load data.
6. ISO 3046/1 Genset fuel consumption tolerance is (+)5, (-)0% of full load data. Nominal genset and engine fuel consumption tolerance is ± 2.5% of full load data.
7. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.
8. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.
9. Inlet manifold temperature is a nominal value with a tolerance of ± 9°F.
10. Timing indicated is for use with the minimum fuel methane number specified. Consult the appropriate fuel usage guide for timing at other methane numbers.
11. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
12. Exhaust flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 6 %.
13. Inlet and Exhaust Restrictions are maximum allowed values at the corresponding loads. Increasing restrictions beyond what is specified will result in a significant engine derate.
14. Emissions data is at engine exhaust flange prior to any after treatment.
15. NOx tolerances are ± 18% of specified value.
16. CO, CO2, THC, NMHC, NMNEHC, and HCHO values are "Not to Exceed" levels. THC, NMHC, and NMNEHC do not include aldehydes.
17. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
18. Exhaust Oxygen tolerance is ± 0.5; Lambda tolerance is ± 0.05. Lambda and Exhaust Oxygen level are the result of adjusting the engine to operate at the specified NOx level.
19. LHV rate tolerance is ± 2.5%.
20. Heat rejection to jacket water value displayed includes heat to jacket water alone. Value is based on treated water. Tolerance is ± 10% of full load data.
21. Heat rejection to atmosphere based on treated water. Tolerance is ± 50% of full load data.
22. Lube oil heat rate based on treated water. Tolerance is ± 20% of full load data.
23. Exhaust heat rate based on treated water. Tolerance is ± 10% of full load data.
24. Heat rejection to A/C - Stage 1 based on treated water. Tolerance is ±5% of full load data.
25. Heat rejection to A/C - Stage 2 based on treated water. Tolerance is ±5% of full load data.
26. Pump power includes engine driven jacket water and aftercooler water pumps. Engine brake power includes effects of pump power.
27. Total Jacket Water Circuit heat rejection is calculated as: (JW x 1.1) + (1AC x 1.05) + [0.9 x (1AC + 2AC) x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.
28. Total Second Stage Aftercooler Circuit heat rejection is calculated as: (OC x 1.2) + (2AC x 1.05) + [(1AC + 2AC) x 0.1 x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.

## FREE FIELD MECHANICAL & EXHAUST NOISE

### MECHANICAL: Sound Power (1/3 Octave Frequencies)

| Gen Power Without Fan | Percent Load | Engine Power | Overall | 100 Hz | 125 Hz | 160 Hz | 200 Hz | 250 Hz | 315 Hz | 400 Hz | 500 Hz | 630 Hz | 800 Hz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ekW | % | bhp | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 1600 | 100 | 2242 | 116.6 | 77.2 | 87.0 | 87.7 | 90.3 | 96.5 | 98.1 | 98.9 | 101.2 | 93.8 | 102.6 |
| 1200 | 75 | 1683 | 115.5 | 76.3 | 84.2 | 84.9 | 88.9 | 93.3 | 97.2 | 94.3 | 99.0 | 92.5 | 100.8 |
| 800 | 50 | 1128 | 113.7 | 73.8 | 81.0 | 80.4 | 87.2 | 90.5 | 93.2 | 92.4 | 98.1 | 90.5 | 99.6 |

### MECHANICAL: Sound Power (1/3 Octave Frequencies)

| Gen Power Without Fan | Percent Load | Engine Power | 1 kHz | 1.25 kHz | 1.6 kHz | 2 kHz | 2.5 kHz | 3.15 kHz | 4 kHz | 5 kHz | 6.3 kHz | 8 kHz | 10 kHz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ekW | % | bhp | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 1600 | 100 | 2242 | 107.9 | 105.6 | 108.6 | 105.5 | 103.2 | 102.6 | 101.3 | 101.0 | 101.1 | 106.1 | 109.8 |
| 1200 | 75 | 1683 | 107.9 | 103.4 | 105.7 | 104.3 | 101.2 | 101.1 | 100.1 | 100.1 | 100.7 | 110.6 | 99.2 |
| 800 | 50 | 1128 | 108.2 | 101.3 | 104.2 | 105.6 | 99.7 | 100.1 | 98.8 | 98.9 | 102.7 | 98.0 | 95.2 |

### EXHAUST: Sound Power (1/3 Octave Frequencies)

| Gen Power Without Fan | Percent Load | Engine Power | Overall | 100 Hz | 125 Hz | 160 Hz | 200 Hz | 250 Hz | 315 Hz | 400 Hz | 500 Hz | 630 Hz | 800 Hz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ekW | % | bhp | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 1600 | 100 | 2242 | 117.6 | 107.2 | 98.1 | 98.0 | 88.1 | 106.8 | 97.7 | 106.0 | 100.2 | 94.2 | 102.5 |
| 1200 | 75 | 1683 | 117.1 | 106.8 | 96.7 | 96.0 | 92.9 | 110.8 | 99.0 | 105.5 | 97.8 | 95.8 | 102.1 |
| 800 | 50 | 1128 | 114.8 | 106.3 | 95.0 | 93.9 | 89.4 | 108.0 | 96.1 | 101.8 | 94.2 | 94.8 | 98.8 |

### EXHAUST: Sound Power (1/3 Octave Frequencies)

| Gen Power Without Fan | Percent Load | Engine Power | 1 kHz | 1.25 kHz | 1.6 kHz | 2 kHz | 2.5 kHz | 3.15 kHz | 4 kHz | 5 kHz | 6.3 kHz | 8 kHz | 10 kHz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ekW | % | bhp | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 1600 | 100 | 2242 | 100.4 | 102.1 | 101.7 | 101.9 | 104.9 | 106.9 | 107.2 | 107.4 | 105.8 | 104.7 | 107.9 |
| 1200 | 75 | 1683 | 97.9 | 100.9 | 101.6 | 98.9 | 103.0 | 105.2 | 105.9 | 106.6 | 105.3 | 101.0 | 105.8 |
| 800 | 50 | 1128 | 94.7 | 97.6 | 98.5 | 95.1 | 101.0 | 103.9 | 103.9 | 103.9 | 101.3 | 101.5 | 100.8 |

**SOUND PARAMETER DEFINITION:**

Sound Power Level Data - DM8702-01

Sound power is defined as the total sound energy emanating from a source irrespective of direction or distance. Sound power level data is presented under two index headings:
Sound power level -- Mechanical
Sound power level -- Exhaust

Mechanical: Sound power level data is calculated in accordance with ISO 6798. The data is recorded with the exhaust sound source isolated.

Exhaust: Sound power level data is calculated in accordance with ISO 6798 Annex A.

Measurements made in accordance with ISO 6798 for engine and exhaust sound level only. No cooling system noise is included unless specifically indicated. Sound level data is indicative of noise levels recorded on one engine sample in a survey grade 3 environment.

How an engine is packaged, installed and the site acoustical environment will affect the site specific sound levels. For site specific sound level guarantees, sound data collection needs to be done on-site or under similar conditions.

# SECTION 2

# BIO-SCRUBBERS

## 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.

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## 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.)

   ☒ 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)

   ☒ 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:
   **Bio-scrubber**

3. Emissions Unit Identification Number: **003**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: **49** |
|---|---|---|---|

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

   ☐ Acid Rain Unit

   ☐ CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    **This emissions unit includes the receiving hall with all processing areas, solids dewatering and drying processes, and the bio-scrubber that controls odors from the facility. The bio-scrubber controls emissions from the receiving hall, three receiving tanks, the digestate handling building, and the dryer.**

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

**Emissions Unit Control Equipment/Method:** Control **1** of **1**

| |
|---|
| 1. Control Equipment/Method Description:<br><br>**Gas Scrubber (General, Not Classified) – Bio-Scrubber** |
| 2. Control Device or Method Code: **013** |

**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: **301,900 TPY biosolids** | |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: million Btu/hr | |
| 4. Maximum Incineration Rate: pounds/hr<br>tons/day | |
| 5. Requested Maximum Operating Schedule: | |
| **24** hours/day | **7** days/week |
| **52** weeks/year | **8,760** hours/year |
| 6. Operating Capacity/Schedule Comment: | |
| **Maximum throughput rate corresponds to 20 million gallons per day (MGD) of wastewater.** | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## 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: **Bio-Filter** | 2. Emission Point Type Code: **1** | |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: **65** feet | 7. Exit Diameter: **1.67** feet |
| 8. Exit Temperature: **110**°F | 9. Actual Volumetric Flow Rate: **6,800** acfm | 10. Water Vapor: % |
| 11. Maximum Dry Standard Flow Rate: dscfm | 12. Nonstack Emission Point Height: feet | |
| 13. Emission Point UTM Coordinates... Zone: East (km): North (km): | 14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |
| 15. Emission Point Comment: | | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment _____ of _____

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br>**Waste Disposal; Site Remediation; Biological Treatment; Anaerobic Biodegredation: Digester** | | |
| 2. Source Classification Code (SCC):<br>**5-04-107-21** | 3. SCC Units:<br>**Tons Biosolids** | |
| 4. Maximum Hourly Rate: | 5. Maximum Annual Rate:<br>**235,580** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit: |
| 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: | | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## 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 |
|---|---|---|---|
| **VOC** | **013** | | **NS** |
| **TRS** | **013** | | **NS** |
| **H2S** | **013** | | **NS** |
| **HAPS** | **013** | | **NS** |
| **Ammonia – NH3** | **013** | | **NS** |
| | | | |
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## 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: | 2. Total Percent Efficiency of Control: | |
| 3. Potential Emissions: lb/hour tons/year | | 4. Synthetically Limited? ☐ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | | |
| 6. Emission Factor: Reference: | | 7. Emissions Method Code: |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: | |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years | |
| 10. Calculation of Emissions: | | |
| 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 _____ 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): | |

**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): | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## 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: ☒ Rule ☐ Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour | |
| 4. Method of Compliance: **EPA Method 9** | |
| 5. Visible Emissions Comment: **General visible emissions limitation based on Rule 62-296.320(4)(b)1, F.A.C. There is no testing requirement imposed by the rule.** | |

**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: | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## H. CONTINUOUS MONITOR INFORMATION

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

**Continuous Monitoring System:** Continuous Monitor **1** of **1**

| | |
|---|---|
| 1. Parameter Code: **Pressure** | 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: **Pressure indicator to measure the differential pressure across the unit to control the water level.** | |

**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: | |

**EMISSIONS UNIT INFORMATION**
**Section [2]**
**Bio-scrubber**

## 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)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ 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: _____ ☐ 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)
   ☒ Attached, Document ID: **HP-EU2-I3** ☐ 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 _____
   ☐ 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 _____
   ☒ 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: _____
   _____
   ☐ To be Submitted, Date (if known): _____
   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: _____ ☒ 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)):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)<br>☐ Attached, Document ID: _____ ☐ Not Applicable |

**Additional Requirements for Title V Air Operation Permit Applications**

| |
|---|
| 1. Identification of Applicable Requirements:<br>☒ Attached, Document ID: **HP-FI-CV2** |
| 2. Compliance Assurance Monitoring:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 3. Alternative Methods of Operation:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 4. Alternative Modes of Operation (Emissions Trading):<br>☐ Attached, Document ID: _____ ☒ Not Applicable |

**Additional Requirements Comment**

| |
|---|
| |

**ATTACHMENT HP-EU2-I3**

**DETAILED DESCRIPTION OF CONTROL EQUIPMENT**

# 3. Process

## 3.1. Process Description

The BIOREM® Biofilter System is designed for removing H2S, low levels of ammonia and other odorous gases from air streams. The biofilter system consists of cross-flow ammonia scrubber filled which also humidifies the air and an FRP rectangular biofilter that utilizes BIOREM® high performance media, Biosorbens® which results in a cost effective and efficient process. The following tables below display air quality, process design parameters and system dimensions for the Harvest Power Orlando project. For system components specifics please refer to Sections 4 and 5 (Mechanical and Electrical Packages) of this submittal.

**Table 1: Process Air Quality**

| Process Parameter | Value | | Units |
|---|---|---|---|
| Flow rate (from fertilizer load out area) | 1100 | | CFM |
| Flow rate (from remaining areas) | 4800 | | CFM |
| Flow rate (into scrubber and biofilter) | 4800 | | CFM |
| Flow rate (into carbon) | 5900 | | CFM |
| Inlet air temperature | 50 - 100 | | °F |
| Average inlet relative humidity | >50 | | % |
| **Type of Contaminant** | **From fertilizer load out area** | **From remaining areas** | **System outlet concentration** |
| Assumed $H_2S$ concentration | <1 ppm | 10 ppm | N/A |
| Assumed ammonia concentration | N/A | <5 ppm | N/A |
| Given odor concentration | 1,000 OU | 4,000 - 22,000 OU | <400 OU |

Note 1: This value is considered after carbon unit.

**Table 2: Ammonia Scrubber Design Parameters**

| Design Parameter | Value | Units |
|---|---|---|
| Number of Scrubber Systems | 1 | Cross-flow scrubber |
| Scrubber Dimensions (L x W x H) | 128 x 48 x 54 | in x in x in |
| Total Media (Q-PAC) Volume | 60 | $ft^3$ |
| Active Media (Q-PAC) Volume | 40 | $ft^3$ |
| Media (Q-PAC) Depth | 4 | ft |
| Media Design Pressure Drop | 0.5 | "WC |
| Front Recirculation Flow Rate | 9 | gpm |
| Top Recirculation Flow Rate | 36 | gpm |
| Estimated Water Consumption[1] | 325 | gpd |
| Leachate pH (to Drain) | 5 - 8 | pH |

Note 1: Water consumption is the estimated make-up water supplied to the sump due to evaporation and continual blow down.

**Table 3: Biofilter Design (each vessel)**

| Design Parameter | Operating with one biofilter | Operating with both biofilters | Units |
|---|---|---|---|
| Biofilter EBRT | 17.5 | 35 | seconds |
| Media (BIOSORBENS) Volume | 1400 | | $ft^3$ |
| Media (BIOSORBENS) Height | 5 | | ft |
| Expected Pressure Drop | 0.8 | 3.0 | "WC |
| Water Consumption[1] | 105 | | gpd |
| Leachate pH (to Drain) | 5 - 8 | | pH |

Note 1: Water consumption is amount of water used intermittently for irrigating the biofilter bed.

**Table 4: Carbon Design (each vessel)**

| Design Parameter | Value | Units |
|---|---|---|
| Carbon EBRT | 4.8 | seconds |
| Media (Carbon) Volume | 472 | $ft^3$ |
| Media (Carbon) Height | 3 | ft |
| Expected Pressure Drop | 5.4 | "WC |

**Table 5: Odour Control System Description/Dimensions**

| Design Parameter | Value | Units |
|---|---|---|
| Odor Control System (Biofilter) Model | Modular Biofilters | 2 |
| System Dimensions (L x W)[1] | 120 x 24 | ft x ft |
| Design Pressure Drop for 1100 CFM Fan[2] | 8 | "WC |
| Design Pressure Drop for 4800 CFM Fan[2] | 12 | "WC |
| Drain Piping Size | 2 | inches |
| Water Supply Connection Size | 1 | inches |
| Electrical Requirements | 460/3/60 | VAC/Ph/Hz |
| 1100 CFM Fan | 5 | HP |
| 4800 CFM Fan | 15 | HP |
| Recirculation Pump | 3 | HP |

Note 1: Refer to P&ID and General Arrangement drawings.

Note 2: Design Pressure Drop includes 2" WC through the ducting and a 1.5 safety factor for the scrubber and biofilter expected pressure drops.

## 3.2. Performance Guarantee

BIOREM

## PERFORMANCE GUARANTEE

This Performance Guarantee is made on February 11 2013 and pertains to Sales Order ("Contract") number 19247-027 dated January 07, 2013 with Layne Construction ("Customer").

Biorem guarantees that when loaded under average and peak conditions as listed, the complete odor control system shall provide a discharge odor concentration <400 OU. (Odor concentrations to be determined using ASTM-E679 with a 20 liter/minute odor panel presentation rate).

**BIOREM Technologies Inc.** 7496 Wellington Road 34, RR #3, Guelph, Ontario, Canada N1H 6H9
Telephone: (519) 767-9100 • Toll Free: 1-800-353-2087• Fax: (519) 767 -1824

**BIOREM *Environmental Inc.*** 100 Rawson Road, Suite 230, Victor, New York, 14564
Telephone: (585) 924-2220• Toll Free: 1 -877-299-2108• Fax: (585) 924 -8280

Email: info@biorem.biz • www.biorem.biz

# SECTION 3

# EMERGENCY FLARE

## 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.

**EMISSIONS UNIT INFORMATION**
**Section [3]**
**Emergency Flare**

## 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.)

   ☒ 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)

   ☒ 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:
   **Emergency (Utility) Flare**

3. Emissions Unit Identification Number: **004**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: **49** |
|---|---|---|---|

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

   ☐ Acid Rain Unit

   ☐ CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

    **Emergency backup flare typically operates when the generators are not operating and biogas must be removed from the biogas storage and treatment train.**

**EMISSIONS UNIT INFORMATION**
**Section [3]**
**Emergency Flare**

**Emissions Unit Control Equipment/Method:** Control **1** of **1**

| |
|---|
| 1. Control Equipment/Method Description:<br>**Flaring** |
| 2. Control Device or Method Code: **023** |

**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: **2.96 million cubic meters biogas** | |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: **36** million Btu/hr | |
| 4. Maximum Incineration Rate: pounds/hr<br>tons/day | |
| 5. Requested Maximum Operating Schedule:<br>**24** hours/day<br>**52** weeks/year | **7** days/week<br>**8,760** hours/year |
| 6. Operating Capacity/Schedule Comment:<br>**Maximum process or throughput rate is equivalent to approximately 19% of the maximum design biogas generation rate of 15.6 million cubic meters.** | |

## 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: **Emergency Flare** | 2. Emission Point Type Code: **1** | |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: **24** feet | 7. Exit Diameter: **0.67** feet |
| 8. Exit Temperature: **900-1200**°F | 9. Actual Volumetric Flow Rate: **3,454** acfm | 10. Water Vapor: % |
| 11. Maximum Dry Standard Flow Rate: dscfm | 12. Nonstack Emission Point Height: feet | |
| 13. Emission Point UTM Coordinates... Zone: East (km): North (km): | 14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |
| 15. Emission Point Comment: **Stack parameters (exit temperature, actual volumetric flow rate, etc) are based on design information** | | |

**EMISSIONS UNIT INFORMATION**
**Section [3]**
**Emergency Flare**

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment **1** of **1**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br>**Waste Disposal; Solid Waste Disposal – Industrial; Liquid Waste; Sludge Digester Gas Flare** | | |
| 2. Source Classification Code (SCC):<br>**5-03-007-89** | 3. SCC Units:<br>**Million Cubic Feet** | |
| 4. Maximum Hourly Rate:<br>**0.063** | 5. Maximum Annual Rate:<br>**104.53** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit: |
| 10. Segment Comment:<br>**Maximum annual rate equivalent to approximately 19% of the maximum design biogas generation rate of 15.6 million cubic meters.** | | |

**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: | | |

**EMISSIONS UNIT INFORMATION**
**Section [3]**
**Emergency Flare**

## 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 |
|---|---|---|---|
| **GHGs** | | | **NS** |
| **CO2e** | | | **NS** |
| **CO** | | | **NS** |
| **VOC** | **023** | | **NS** |
| **NOx** | | | **EL** |
| **SO2** | | | **EL** |
| **H2S** | **023** | | **NS** |
| **PM** | | | **NS** |
| **PM10** | | | **NS** |
| **PM2.5** | | | **NS** |
| | | | |
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## 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: **NOx** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **2.85** lb/hour **12.48** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.8 tons NOx/million cubic meters biogas** Reference: **Permit No. 0951340-001-AC/PSD-FL-418** | 7. Emissions Method Code: **0** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |
| 10. Calculation of Emissions: **Hourly: 0.8 tons/MMm$^3$ x 15.6 MMm$^3$/yr x 2,000 lb/ton x 1 yr/8,760 hr = 2.85 lb/hr** **Annual: 0.8 tons/MMm$^3$ x 15.6 MMm$^3$/yr = 12.48 TPY** | |
| 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 **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **39 TPY** | 4. Equivalent Allowable Emissions: lb/hour **39** tons/year |
| 5. Method of Compliance: **Calculation outlined in Permit No. 0951340-001-AC/PSD-FL-418 Section B, Condition 6** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 0951340-001-AC/PSD-FL-418. Limit represents combined emissions from EUs 001, 002, and 004.** | |

**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): | |

## 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: **SO2** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **0.11** lb/hour **0.095** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **200 ppmvd $H_2S$** Reference: **Maximum estimated $H_2S$ concentration in biogas** | 7. Emissions Method Code: **5** |
| 8.a. Baseline Actual Emissions (if required): tons/year | 8.b. Baseline 24-month Period: From: To: |
| 9.a. Projected Actual Emissions (if required): tons/year | 9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years |

10. Calculation of Emissions:

**Hourly:**
**$200/10^6$ x 60 min/hr x 2116.8/1545.6 x 1/528°R x 3454 scf/min x 34 lb $H_2S$/lbmol x (32 lb S/34 lb $H_2S$) x (64 lb $SO_2$/32 lb S) = 0.11 lb/hr**

**Annual: 0.11 lb/hr x 8,760 hr/yr x 19% x 1 ton/2,000 lb = 0.095 TPY**

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.**

**A Allowable Emissions** Allowable Emissions **1** of **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **39 TPY** | 4. Equivalent Allowable Emissions: lb/hour **39** tons/year |
| 5. Method of Compliance: **Biogas sampling/analysis of scrubbed and unscrubbed biogas fired and amount of biogas fired** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 0951340-001-AC/PSD-FL-418. Limit represents combined emissions from EUs 001, 002, and 004.** | |

**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.**

**Visible Emissions Limitation:** Visible Emissions Limitation **1** of **1**

| | |
|---|---|
| 1. Visible Emissions Subtype: **VE05** | 2. Basis for Allowable Opacity: ☒ Rule ☐ Other |
| 3. Allowable Opacity: Normal Conditions: **5** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: **5** min/hour | |
| 4. Method of Compliance: **EPA Method 22** | |
| 5. Visible Emissions Comment: **Rule 62-296.800, F.A.C. and 40 CFR 60.18(c). Periods of excess emissions not to exceed a total 5 minutes during any 2 consecutive hours.** | |

**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.**

**Continuous Monitoring System:** Continuous Monitor **1** of **1**

| | |
|---|---|
| 1. Parameter Code: **FLAME** | 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: **The presence of a flame is monitored using a thermocouple or an equivalent device used to detect the presence of a flame.** | |

**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: | |

**EMISSIONS UNIT INFORMATION**
**Section [3]**
**Emergency Flare**

## 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)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ 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: **HP-EU1-I2** ☐ 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)
   ☒ Attached, Document ID: **HP-EU3-I3** ☐ 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 _____
   ☐ 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 _____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☒ Previously Submitted, Date: **April 2014**
   Test Date(s)/Pollutant(s) Tested: **March 26, 2014 – VE**
   _____
   ☐ To be Submitted, Date (if known): _____
   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: _____ ☒ 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)):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):<br>☐ Attached, Document ID: _____ ☐ Not Applicable |
| 3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)<br>☐ Attached, Document ID: _____ ☐ Not Applicable |

**Additional Requirements for Title V Air Operation Permit Applications**

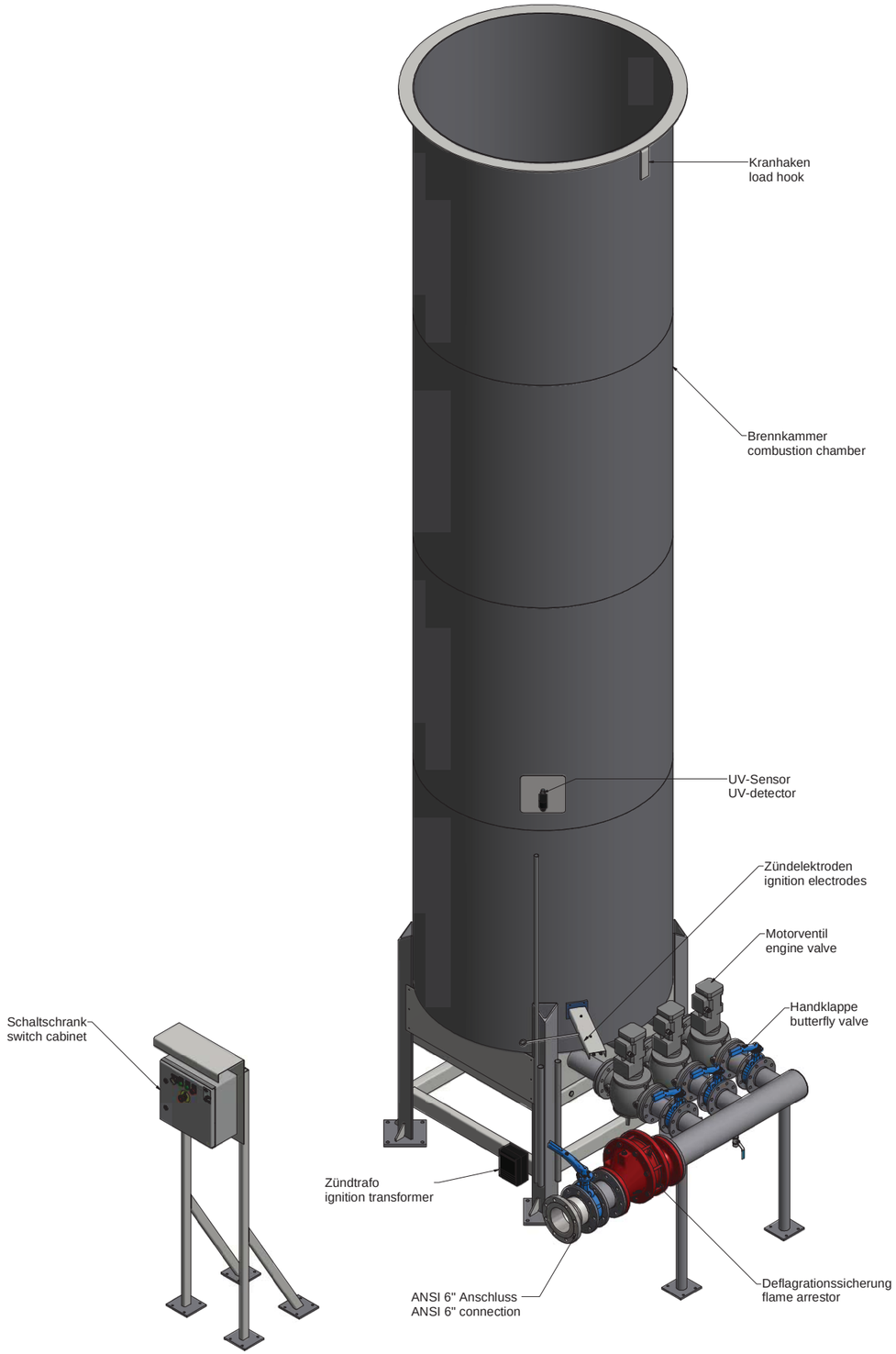
| |
|---|
| 1. Identification of Applicable Requirements:<br>☒ Attached, Document ID: **HP-FI-CV2** |
| 2. Compliance Assurance Monitoring:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 3. Alternative Methods of Operation:<br>☐ Attached, Document ID: _____ ☒ Not Applicable |
| 4. Alternative Modes of Operation (Emissions Trading):<br>☐ Attached, Document ID: _____ ☒ Not Applicable |

**Additional Requirements Comment**

| |
|---|
| |

**ATTACHMENT HP-EU3-I3**

**DETAILED DESCRIPTION OF CONTROL EQUIPMENT**




# Flare specification FAII1500hp

Automatic working gas flare - for combustion of biogas and other burning gases according to TA air 5.4.8.1a2;

Standard configuration for ambient temperature > -10°C; antifreeze configuration optional.

- **gas pressure:** min. 60mbar - max. 120mbar
- **flow:** max. 1500Nm³/h
- **power:** max. 9750kW
- **total height:** 7046mm
- **connection:** DN150 or ANSI 6" 150LBS

**MAIN PARTS:**

**Frame, substructure, combustion chamber:**
- combustion chamber in stainless steel 1.4571
- frame/substructure in stainless steel 1.4301
- bracing, anchoring in stainless steel

**Armatures:**
- manual butterfly valve with DVGW-certificate;
- 3 pieces automatic valves with motor drive DN100 to regulate gasflow individually
- flame-arrestor with ATEX-certificate

**Ignition and flame control:**
- 3 burner heads, individually regulated
- ignition device
- flame Control with UV-sensor

**Switch Board:**
- with Siemens S7 200, plug & play!
- IP 54
- installation place is changeable

**Local supply:**
- building of the foundation according our given forces and drawings
- supply of 4-20mA signal
- power supply (110V/60Hz or 230V/50Hz)
- gas supply line and connection
- lightning protection according local laws
- assembly of delivered parts

**technische Änderungen vorbehalten /**
**technical changes reserved**

| Index | Änderung / Revision | Name / Name | Datum / Date |
|---|---|---|---|
| E | | | |
| D | | | |
| C | | | |
| B | | | |
| A | | | |

Allgemeintoleranz ISO 2768 - m / General tolerance ISO 2768 - m

Form und Lagetoleranzen DIN ISO 1101 / Geometrical tolerance DIN ISO 1101

Oberflächenangaben DIN ISO 1302 / Surface specification DIN ISO 1302



| | gezeichnet / designed | geprüft / Checked | Freigabe / released |
|---|---|---|---|
| Datum / Date | 22.05.2012 | | |
| Name / Name | NP | | |

Oberfläche / Surface: —
Objektgr. / Type: —
Firma / Company: Bilgen EnviroTec GmbH
Masse / Mass: — kg
Maßstab / Scale: 1:10

Projekt / Project: Harvester Power
Projekt Nr. / Project No.: 500-47-02
Ersetzt durch / replaced by: —
Ersatz für / replacement for: —
Maße / Dimensions: mm

Bezeichnung 1,2 / Title 1,2: Gas flare FAII1500 Biogasfackel
Ident-Nr. / Identity Number: FAII1500hp_Fackel_Komplett_Übersicht
Revision / Revision: ---

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Golder Associates

**Engineering Earth's Development, Preserving Earth's Integrity**