



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

AHJRLFLG LLC  
Penobscot County  
Old Town, Maine  
A-1150-71-E-M

Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #4

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

AHJRLFLG LLC (Archaea) was issued Air Emission License A-1150-71-A-N on February 24, 2020, for the operation of emission sources associated with a renewable natural gas (RNG) processing facility. The license was subsequently amended as follows:

Amendment #	Date Issued	Brief Description
A-1150-71-B-M	8/24/2021	Extend the deadline to commence construction
A-1150-71-C-A	10/21/2022	Address several changes to the proposed project emission units and to allow the facility to begin operation prior to the natural gas pipeline being extended
A-1150-71-D-A	9/25/2023	Add Emergency Generator #9

The equipment addressed in this license amendment is located at 2828 Bennoch Road, Old Town, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Other Fuel Burning Equipment

Equipment	Max. Capacity (MMBtu/hr)	Fuel Type	Date of Manuf.
Flare #1 *	97.2	natural gas/propane off-spec gas	2022
Flare #2	192.0	natural gas/propane off-spec gas	2024

\*Flare #1 is being removed with this amendment and replaced with Flare #2.

C. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

This amendment will not increase licensed annual emissions of any pollutant. Therefore, this amendment is determined to be a minor revision and has been processed as such.

D. Facility Classification

With the limits on annual throughput and SO<sub>2</sub> emissions for Flare #2, the facility is licensed as follows:

- As a synthetic minor source of air emissions for criteria pollutants, because Archaea is subject to license restrictions that keep facility emissions below major source thresholds for SO<sub>2</sub> and CO; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

II. **BEST PRACTICAL TREATMENT (BPT)**

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

B. Flare #2

Archaea is licensed to operate Flare #1 for destruction of any product gas that is not either sold off-site or otherwise used on-site. This includes product gas that does not meet pipeline specifications.

Archaea has proposed the replacement of the existing Flare #1 with a new flare (Flare #2). The RNG plant is sized to accept an inlet stream of landfill gas of 3,200 scfm at 50% methane. However, short-term pressure fluctuations at the plant may occur multiple times per minute, potentially causing the flow rate of off-spec gas to the flare to range

between 1,600 scfm to 6,400 scfm. Flare #2 will be larger than Flare #1 to accommodate these pressure swings. The annual limit on the annual amount of gas sent to the flare (243,000 MMBtu/year) will remain unchanged.

#### 1. BACT Findings

Emissions of PM, PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, CO, and VOC from Flare #2 are dependent upon the heat content of the gas sent to the flare and hours of operation. Short-term emission limits (lb/hr) have been based on the emission factors listed in the table below, the maximum expected short-term flowrate (6,400 scfm), and the heat content of raw landfill gas (506 Btu/scf). Archaea has proposed to maintain an operational throughput limit of 243,000 MMBtu/year to limit annual emissions.

The Department finds that BACT for PM, PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, CO, and VOC emissions from Flare #2 is an annual operational limit of 243,000 MMBtu/year on a calendar year basis and the emission limits listed in the table below for all operating times. Compliance shall be demonstrated through recordkeeping of the amount of gas (scf) and the heat content of the gas (based on methane content).

Flare #2 will be used to control regulated pollutants including VOC and H<sub>2</sub>S through thermal destruction. BACT for control of VOC and H<sub>2</sub>S includes having flame present during all flare operating times. Compliance shall be demonstrated by continuous monitoring of Flare #2 for either temperature or presence of flame during all operating times. A temperature greater than 200 °F represents presence of flame.

Combustion of off-spec product gas in Flare #2 will convert any sulfur compounds, including H<sub>2</sub>S, to SO<sub>2</sub>. Archaea states that only gas which has been treated by the facility's carbon scrubbers will be sent to Flare #2. The carbon scrubbers will ensure the concentration of H<sub>2</sub>S in the exhaust gas is reduced to 25 ppm<sub>dv</sub> or less prior to combustion in any additional control device. Additional controls of SO<sub>2</sub> at this level is determined not to be economically feasible.

The Department finds that BACT for SO<sub>2</sub> emissions from Flare #2 is the use of carbon scrubbers, an H<sub>2</sub>S concentration limit for the gases being combusted of 25 ppm<sub>dv</sub> on a 12-month rolling average basis, and the emission limit listed in the table below for all operating times.

The limits apply at all times. Compliance with the H<sub>2</sub>S ppm<sub>dv</sub> limit shall be demonstrated by sampling the concentration of the H<sub>2</sub>S in the tail gas exiting the control equipment (i.e., the carbon scrubber outlet) at least once per calendar week using a handheld monitor or equivalent. Weekly measurements shall be used to develop a monthly average. The handheld monitor or equivalent shall be operated, calibrated, and maintained in accordance with the manufacturer's specifications.

At least annually, Archaea shall test the gas exiting the carbon scrubbers three times during a single day using ASTM Test Method D5504, or other methods as approved by the Department, to analyze for H<sub>2</sub>S and total sulfur. Concurrent with the annual test, measurements of H<sub>2</sub>S shall be taken with the handheld monitor or equivalent. If the results of the handheld (or equivalent) sampling do not correspond within 5 ppm of the annual test results, Archaea shall re-assess/replace/recalibrate the handheld monitor, or equivalent, as appropriate to obtain valid sampling results.

Archaea shall update the written site-specific monitoring plan, as necessary, and submit it to the Department for approval within 60 days of the issuance of this air emission license amendment.

Archaea shall keep records of any maintenance activities performed (planned or unplanned) on Flare #2 and the carbon scrubbers.

## 2. Emission Limits

The BACT emission limits for Flare #2 were based on the following:

PM/PM <sub>10</sub> /PM <sub>2.5</sub>	– 17 lb/MMscf of methane based on AP-42 Table 2.4-5 dated 11/98
SO <sub>2</sub>	– 1.60 lb/hr based on an H <sub>2</sub> S concentration of 25 ppm <sub>dv</sub>
NO <sub>x</sub>	– 0.068 lb/MMBtu based on AP-42 Table 13.5-1 dated 2/18
CO	– 0.31 lb/MMBtu based on AP-42 Table 13.5-2 dated 2/18
VOC	– 340.47 ppm <sub>dv</sub> based on manufacturer specs
Visible Emissions	– 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Flare #2 are the following:

Unit	Pollutant	lb/MMBtu
Flare #2	PM	0.02

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	PM <sub>2.5</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Flare #2	3.23	3.23	3.23	1.60*	13.06	59.52	0.63

\*12-month rolling average basis.

Visible emissions from Flare #2 shall not exceed 10% opacity on a six-minute block average basis. Compliance shall be demonstrated by testing in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 upon request by the Department.

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit

for Flare #2 has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

C. Annual Emissions

This license amendment will not change the facility's licensed annual emissions.

### III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM <sub>10</sub>	25
PM <sub>2.5</sub>	15
SO <sub>2</sub>	50
NO <sub>x</sub>	50
CO	250

The total annual licensed emissions for the facility are above at least one of the emission levels contained in the table above; however, after taking into consideration the following factors:

- similarity with other licensed sources based on size, emissions, and local topography;
- location, including proximity to other sources, complex terrain and Class I areas; and
- background air quality data available in or representative of the local area,

the Department has determined that an ambient air quality impact analysis is not required for the facility and that Ambient Air Quality Standards (AAQS) will not be exceeded.

This determination is based on information provided by the applicant regarding the expected construction and operation of the proposed emission units. If the Department determines that any parameter (e.g., stack size, configuration, flow rate, emission rates, nearby structures, etc.) deviates from what was included in the application, the Department may require Archaea to submit additional information and may require an ambient air quality impact analysis at that time.

## ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-1150-71-E-M subject to the conditions found in Air Emission License A-1150-71-A-N, in amendments A-1150-71-B-M, A-1150-71-C-A, and A-1150-71-D-A, and the following conditions.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

### SPECIFIC CONDITIONS

**The following shall replace Specific Condition (17) of Air Emission License A-1150-71-C-A:**

**(17) Gas Processing, TO #1, and Flare #2**

- A. Archaea shall combust all tail gas produced by the RNG process in TO #1.  
[06-096 C.M.R. ch. 115, BACT]
- B. TO #1 shall maintain a minimum temperature of 1,300 °F during all operating times.  
[06-096 C.M.R. ch. 115, BACT]
- C. Archaea shall continuously monitor the temperature inside TO #1 during all operating times. [06-096 C.M.R. ch. 115, BACT]
- D. Operation of Flare #2 shall be limited to 243,000 MMBtu/year on a calendar year basis.  
[06-096 C.M.R. ch. 115, BACT]
- E. Flare #2 shall be continuously monitored for either temperature or presence of flame during all operating times. If using temperature, presence of flame is assumed at temperatures above 200 °F. [06-096 C.M.R. ch. 115, BACT]

F. Hydrogen Sulfide and Sulfur Dioxide Control [06-096 C.M.R. ch. 115, BACT]

1. Archaea shall operate carbon scrubbers to limit the concentration of H<sub>2</sub>S in the tail gas combusted in TO #1 and Flare #2 to 25 ppmdv or less on a 12-month rolling average basis. This limit applies at all times.
2. Compliance with the H<sub>2</sub>S ppmdv limit shall be demonstrated by sampling the concentration of the H<sub>2</sub>S in the tail gas exiting the control equipment (i.e., the carbon scrubber outlet) at least once per calendar week using a handheld monitor or equivalent. Weekly measurements shall be used to develop a monthly average.
3. The handheld monitor or equivalent shall be operated, calibrated, and maintained in accordance with the manufacturer's specifications.
4. At least annually, Archaea shall test the gas exiting the carbon scrubbers three times during a single day using ASTM Test Method D5504, or other methods as approved by the Department, to analyze for H<sub>2</sub>S and total sulfur.
5. Concurrent with the annual test, measurements of H<sub>2</sub>S shall be taken with the handheld monitor or equivalent. If the results of the handheld (or equivalent) sampling do not correspond within 5 ppm of the annual test results, Archaea shall re-assess/replace/recalibrate the handheld monitor, or equivalent, as appropriate to obtain valid sampling results.
6. For the weekly and annual H<sub>2</sub>S sampling required by this license, Archaea shall update the written site-specific monitoring plan, as necessary, and submit it to the Department for approval within 60 days of the issuance of this air emission license amendment.

G. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
TO #1	PM	0.008	06-096 C.M.R. ch. 115, BACT
Flare #2	PM	0.02	06-096 C.M.R. ch. 115, BACT

H. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Emission Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	PM <sub>2.5</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
TO #1	0.09	0.09	0.09	0.41	1.70	2.40	0.70
Flare #2	3.23	3.23	3.23	1.60*	13.06	59.52	0.63

\*12-month rolling average basis.

- I. Visible emissions from TO #1 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]
- J. Visible emissions from Flare #2 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]
- K. Archaea shall keep records for the following periodic monitoring for the RNG gas processing system:
  - 1. H<sub>2</sub>S concentration (ppmdv) exiting the carbon scrubbers on a monthly average and 12- month rolling average basis;
  - 2. Records of H<sub>2</sub>S and total sulfur concentrations from annual testing;
  - 3. Amount of tail gas (scf) combusted in TO #1 on a monthly and calendar year basis;
  - 4. Amount of process gas (scf) combusted in Flare #2 on a monthly and calendar year basis;
  - 5. Records of all operating times for TO #1 and Flare #2;
  - 6. Temperature inside TO #1 during all operating times;
  - 7. Heat content (based on methane content) of the tail gas combusted in TO #1 and the process gas combusted in Flare #2 on a monthly and annual average basis;
  - 8. Date, time, duration, and reason for any period of time when both carbon scrubbers are out of service; and
  - 9. Records of any maintenance activities performed (planned or unplanned) on the carbon scrubbers, TO #1, and Flare #2.

[06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 137]



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**Departmental  
Findings of Fact and Order  
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**The following are new conditions:**

**(25) Replacement of Flare #1 with Flare #2**

Archaea is license to install and operate Flare #2. Flare #1 shall cease operation and be permanently disabled or removed from the site within 60 days of the initial startup of Flare #2. Archaea shall notify the Department in writing of the date of initial startup of Flare #2 and date of shutdown of Flare #1. [06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 30<sup>th</sup> DAY OF SEPTEMBER, 2024.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for  
MELANIE LOYZIM, COMMISSIONER

**The term of this license amendment shall be ten (10) years from the issuance of Air Emission License A-1150-71-A-N (issued 2/24/2020).**

[Note: If a renewal application, determined as complete by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 M.R.S. § 10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the license renewal application.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 8/19/2024

Date of application acceptance: 8/22/2024

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.

