



John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
Craig W. Butler, Director

8/27/2015

Certified Mail

Mr. Allen Bradburn  
BFI - Glenwillow Landfill  
5092 Aber Road  
Williamsburg, OH 45176

No	TOXIC REVIEW
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MODELING SUBMITTED
No	SYNTHETIC MINOR TO AVOID TITLE V
No	FEDERALLY ENFORCABLE PTIO (FEPTIO)
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE

Facility ID: 1318247721  
Permit Number: P0117903  
Permit Type: OAC Chapter 3745-31 Modification  
County: Cuyahoga

Dear Permit Holder:

Enclosed please find a final Ohio Environmental Protection Agency (EPA) Air Pollution Permit-to-Install and Operate (PTIO) which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. In this letter you will find the information on the following topics:

- **How to appeal this permit**
- **How to save money, reduce pollution and reduce energy consumption**
- **How to give us feedback on your permitting experience**
- **How to get an electronic copy of your permit**

**How to appeal this permit**

The issuance of this PTIO is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00, made payable to "Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission  
77 South High Street, 17th Floor  
Columbus, OH 43215

## **How to save money, reduce pollution and reduce energy consumption**

The Ohio EPA is encouraging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. Additionally, all or a portion of the capital expenditures related to installing air pollution control equipment under this permit may be eligible for financing and State tax exemptions through the Ohio Air Quality Development Authority (OAQDA) under Ohio Revised Code Section 3706. For more information, see the OAQDA website: [www.ohioairquality.org/clean\\_air](http://www.ohioairquality.org/clean_air)

## **How to give us feedback on your permitting experience**

Please complete a survey at [www.epa.ohio.gov/survey.aspx](http://www.epa.ohio.gov/survey.aspx) and give us feedback on your permitting experience. We value your opinion.

## **How to get an electronic copy of your permit**

This permit can be accessed electronically via the eBusiness Center: Air Services in Microsoft Word format or in Adobe PDF on the Division of Air Pollution Control (DAPC) Web page, [www.epa.ohio.gov/dapc](http://www.epa.ohio.gov/dapc) by clicking the "Search for Permits" link under the Permitting topic on the Programs tab.

If you have any questions, please contact Cleveland Division of Air Quality at (216)664-2297 or the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469.

Sincerely,



Michael E. Hopkins, P.E.  
Assistant Chief, Permitting Section, DAPC

Cc: CDAQ



**FINAL**

**Division of Air Pollution Control  
Permit-to-Install and Operate  
for  
BFI - Glenwillow Landfill**

Facility ID:	1318247721
Permit Number:	P0117903
Permit Type:	OAC Chapter 3745-31 Modification
Issued:	8/27/2015
Effective:	8/27/2015
Expiration:	8/27/2025





**Division of Air Pollution Control  
Permit-to-Install and Operate**

for  
BFI - Glenwillow Landfill

**Table of Contents**

Authorization .....	1
A. Standard Terms and Conditions .....	3
1. What does this permit-to-install and operate ("PTIO") allow me to do?.....	4
2. Who is responsible for complying with this permit? .....	4
3. What records must I keep under this permit? .....	4
4. What are my permit fees and when do I pay them?.....	4
5. When does my PTIO expire, and when do I need to submit my renewal application? .....	4
6. What happens to this permit if my project is delayed or I do not install or modify my source? .....	5
7. What reports must I submit under this permit? .....	5
8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit? .....	5
9. What are my obligations when I perform scheduled maintenance on air pollution control equipment? ...	5
10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report? .....	6
11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located? .....	6
12. What happens if one or more emissions units operated under this permit is/are shut down permanently? .....	6
13. Can I transfer this permit to a new owner or operator?.....	7
14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"? .....	7
15. What happens if a portion of this permit is determined to be invalid? .....	7
B. Facility-Wide Terms and Conditions.....	8
C. Emissions Unit Terms and Conditions .....	10
1. F002, MSW Landfill.....	11





**Final Permit-to-Install and Operate**  
BFI - Glenwillow Landfill  
**Permit Number:** P0117903  
**Facility ID:** 1318247721  
**Effective Date:** 8/27/2015

## Authorization

Facility ID: 1318247721  
Application Number(s): A0051996  
Permit Number: P0117903  
Permit Description: PTIO Chapter 31 modification for emissions unit F002 which is a municipal solid waste landfill controlled with a candlestick flare. Facility is replacing the 2400 cfm flare with a 1900 cfm candlestick flare. Facility performed the three emission tests to demonstrate that the NMOC emissions are less than 50 Mg/year; consequently, the landfill is no longer subject to OAC rule 3745-76 and MACT Subpart AAAA, and will no longer be subject to Title V permitting.  
Permit Type: OAC Chapter 3745-31 Modification  
Permit Fee: \$0.00  
Issue Date: 8/27/2015  
Effective Date: 8/27/2015  
Expiration Date: 8/27/2025  
Permit Evaluation Report (PER) Annual Date: Jan 1 - Dec 31, Due Feb 15

This document constitutes issuance to:

BFI - Glenwillow Landfill  
30300 Pettibone Road  
Glenwillow, OH 44139

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

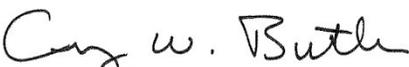
Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Cleveland Division of Air Quality  
2nd Floor  
75 Erieview Plaza  
Cleveland, OH 44114  
(216)664-2297

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

  
Craig W. Butler  
Director



**Final Permit-to-Install and Operate**  
BFI - Glenwillow Landfill  
**Permit Number:** P0117903  
**Facility ID:** 1318247721  
**Effective Date:** 8/27/2015

## Authorization (continued)

**Permit Number:** P0117903  
**Permit Description:** PTIO Chapter 31 modification for emissions unit F002 which is a municipal solid waste landfill controlled with a candlestick flare. Facility is replacing the 2400 cfm flare with a 1900 cfm candlestick flare. Facility performed the three emission tests to demonstrate that the NMOC emissions are less than 50 Mg/year; consequently, the landfill is no longer subject to OAC rule 3745-76 and MACT Subpart AAAA, and will no longer be subject to Title V permitting.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

<b>Emissions Unit ID:</b>	<b>F002</b>
Company Equipment ID:	MSW Landfill
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable



**Final Permit-to-Install and Operate**  
BFI - Glenwillow Landfill  
**Permit Number:** P0117903  
**Facility ID:** 1318247721  
**Effective Date:** 8/27/2015

## **A. Standard Terms and Conditions**

**1. What does this permit-to-install and operate ("PTIO") allow me to do?**

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

**2. Who is responsible for complying with this permit?**

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

**3. What records must I keep under this permit?**

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

**4. What are my permit fees and when do I pay them?**

There are two fees associated with permitted air contaminant sources in Ohio:

- PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

- Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. For facilities that are permitted as synthetic minor sources, the fee schedule is adjusted annually for inflation. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

**5. When does my PTIO expire, and when do I need to submit my renewal application?**

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is

very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

**6. What happens to this permit if my project is delayed or I do not install or modify my source?**

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

**7. What reports must I submit under this permit?**

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

**8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?**

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions of this permit will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

**9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?**

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.

**10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?**

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the [DO/LAA] in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

**11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?**

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

**12. What happens if one or more emissions units operated under this permit is/are shut down permanently?**

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emission unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

**13. Can I transfer this permit to a new owner or operator?**

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.

**14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?**

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

**15. What happens if a portion of this permit is determined to be invalid?**

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.



**Final Permit-to-Install and Operate**  
BFI - Glenwillow Landfill  
**Permit Number:** P0117903  
**Facility ID:** 1318247721  
**Effective Date:** 8/27/2015

## **B. Facility-Wide Terms and Conditions**



**Final Permit-to-Install and Operate**

BFI - Glenwillow Landfill

**Permit Number:** P0117903

**Facility ID:** 1318247721

**Effective Date:** 8/27/2015

1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
  - a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
    - (1) None.
  - b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
    - (1) None.



**Final Permit-to-Install and Operate**  
BFI - Glenwillow Landfill  
**Permit Number:** P0117903  
**Facility ID:** 1318247721  
**Effective Date:** 8/27/2015

## **C. Emissions Unit Terms and Conditions**

**1. F002, MSW Landfill**

**Operations, Property and/or Equipment Description:**

MSW Landfill with gas collection and control system (candlestick flare).

- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
  - (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
    - a. None.
  - (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
    - a. b)(1)c., b)(2)f.
- b) Applicable Emissions Limitations and/or Control Requirements
  - (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3) June 30, 2008  PTI 13-2256 issued on 12/18/1991	Nitrogen oxide (NOx) emissions shall not exceed 1.42 tons/month averaged over a 12-month rolling period.  Carbon monoxide (CO) emissions shall not exceed 7.7 tons/month averaged over a 12-month rolling period.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
b.	OAC rule 3745-31-05(A)(3) June 30, 2008	<p>PM<sub>10</sub> emissions shall not exceed 0.4 ton/month averaged over a 12-month rolling period.</p> <p>Volatile organic compound (VOC) emissions shall not exceed 0.05 ton/month averaged over a 12-month rolling period.</p> <p>Sulfur dioxide (SO<sub>2</sub>) emissions shall not exceed 0.81 ton/month averaged over a 12-month rolling period.</p> <p>Hydrochloric acid (HCl) emissions shall not exceed 0.55 ton/month averaged over a 12-month rolling period.</p> <p>See b)(2)e. below.</p>
c.	OAC rule 3745-31-05(A)(3)(a)(ii) June 30, 2008	<p>The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PM<sub>10</sub>, VOC, SO<sub>2</sub>, and HCl emissions from this emissions unit since the potential to emit is less than 10 tons per year.</p> <p>See b)(2)f. below.</p>
d.	OAC rule 3745-76-03	Exempt. See b)(2)a.
e.	OAC rule 3745-76-15(A)(1)	See b)(2)b. below
f.	OAC rule 3745-17-07(A)	The visible emission limitation specified by this rule is less stringent than the visible emission limitation established pursuant to OAC rule 3745-76-15(A).

(2) Additional Terms and Conditions

- a. This PTIO is for a closed municipal solid waste landfill with an open flare. The landfill stopped receiving waste in 1996 and has a potential Non Methane Organic Compound (NMOC) emission rate of less than 50 Mg (55 tons) per year. Therefore, the facility is not subject to the landfill gas collection and control system requirements outlined in OAC rule Chapter 3745-76-03 and 40 CFR Part 60, Subpart Cc.

- b. No visible emissions from the flare, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
  - c. The permittee shall properly operate, and maintain a device to continuously monitor the pilot flame of the open flare when the emissions unit is in operation. The monitoring device and any recorder shall be calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.
  - d. Pursuant to the authority in ORC section 3704.03(L), any representative of the Director may, upon presentation of proper identification, enter at any reasonable time upon any portion of the property where this landfill is located, including any improvements thereon, to make inspections; take samples; conduct tests; examine records or reports pertaining to any emissions of air contaminants; and inspect monitoring equipment, emissions control equipment, and/or methods of operation and gas sampling. No operator or agent of this landfill shall act in any manner to refuse, hinder, or thwart this legal right of entry.
  - e. This Best Available Technology (BAT) emission limit applies until U.S. EPA approves Ohio Administrative Code (OAC) paragraph 3745-31-05(A)(3)(a)(ii) (the less than 10 tons per year BAT exemption) into the Ohio State Implementation Plan (SIP).
  - f. These requirements apply once U.S. EPA approves OAC paragraph 3745-31-05(A)(3)(a)(ii) (the less than 10 tons per year BAT exemption) as part of the Ohio SIP.
- c) Operational Restrictions
- (1) A pilot flame shall be maintained at all times in the flare's pilot light burner. The presence of the pilot flame shall be monitored using a thermocouple or other equivalent device to detect the presence of a flame.
  - (2) All collected gas shall be vented to a flare designed and operated as follows:
    - a. The flare shall be designed for and operated with no visible emissions, as determined by Method 22 of Appendix A of 40 CFR Part 60, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
    - b. The flare shall be operated with a flame present at all times when gases are vented to it. 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. The net heating value of the gas being combusted and the actual exit velocity shall be calculated as required in the Testing Section of this permit.
    - c. The net heating value ( $H_T$ ) of the gas being combusted and actual exit velocity of the flare shall be calculated as required in the Testing Section of this permit.
  - (3) Flares shall be steam-assisted, air-assisted, or non-assisted, and shall comply with the following requirements for the heat content in c)(3)a. and the maximum tip velocity in

c)(3)b., or shall comply with the alternative requirements in c)(3)c. for non-assisted flares:

- a. Steam-assisted or air-assisted flares shall have a net heating value of 300 Btu/scf (11.2 MJ/scm) or greater, for the gas being combusted.

Non-assisted flares shall have a net heating value of 200 Btu/scf (7.45 MJ/scm) for the gas being combusted.

- b. Steam-assisted and/or non-assisted flares shall be designed for and operated with an exit velocity of less than 18.3 m/sec (60 ft/sec), with the following exceptions:

- i. steam-assisted and non-assisted flares, having a net heating value of 1,000 Btu/scf (37.3 MJ/scm) for the gas being combusted, can be designed for and operated with an exit velocity equal to or greater than 18.3 m/sec (60 ft/sec), but less than 122 m/sec (400 ft/sec); and

steam-assisted and non-assisted flares can be designed for and operated with an exit velocity of less than the velocity calculated below for  $V_{max}$ , and less than 122 m/sec (400 ft/sec):

$$\text{Log}_{10} (V_{max}) = (H_T + 28.8) / 31.7$$

where:

$V_{max}$  = maximum permitted velocity, m/sec;

28.8 = constant;

31.7 = constant; and

$H_T$  = the net heating value as determined in the Testing Section of this permit.

- ii. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity  $V_{max}$ , calculated as follows:

$$V_{max} = 8.706 + 0.7084 (H_T)$$

where:

$V_{max}$  = maximum permitted velocity, m/sec;

8.706 = constant;

0.7084 = constant; and

$H_T$  = the net heating value as determined in the Testing Section of this permit.

- c. Non-assisted flares that have a diameter of 3 inches or greater and a hydrogen content of 8.0 percent (by volume), or greater, shall be designed for and operated with an exit velocity of less than 37.2 m/sec (122 ft/sec) and less than the velocity,  $V_{max}$ , as determined by the following equation:

$$V_{max} = (X_{H_2} - K_1) K_2$$

where:

$V_{max}$  = maximum permitted velocity, m/sec;

$K_1$  = constant, 6.0 volume-percent hydrogen;

$K_2$  = constant, 3.9 (m/sec)/volume-percent hydrogen; and

$X_{H_2}$  = the volume-percent of hydrogen, on a wet basis, as calculated by using the ASTM Method D1946-90.

d) **Monitoring and/or Recordkeeping Requirements**

- (1) The permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design and the requirements contained in this permit. The net heating value of a gas, the actual exit velocity for the flare, and the maximum permitted velocity for an air-assisted flare shall be determined as required by 40 CFR 60.18, 40 CFR 63.11, and/or OAC rule 3745-76-15, as applicable.
- (2) The permittee shall record the following information each day for the flare and process operations:
  - a. all periods during which there was no pilot flame; and
  - b. the operating times for the flare, monitoring equipment, and the associated emissions unit.

e) **Reporting Requirements**

- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the Cleveland Division of Air Quality (Cleveland DAQ).
- (2) The permittee shall submit an annual Permit Evaluation Report (PER) to the Cleveland DAQ by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.
- (3) The permittee shall identify in the annual permit evaluation report all periods of time during which the pilot flame was not functioning properly or the flare was not maintained as required in this permit. The reports shall include the date, time, and duration of each such period.

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

1.42 tons/month NO<sub>x</sub> averaged over a 12-month rolling period

Applicable Compliance Method:

The manufacturer guarantees the NO<sub>x</sub> emission rate of 0.068 pound of NO<sub>x</sub> per million Btu (lb/mmBtu). The average Btu content of landfill gas is 500 Btu per cubic foot (500 Btu/cf). The potential to emit for NO<sub>x</sub> emissions from the flare shall be determined by the following calculations:

$$(1,900 \text{ cf/min}) \times (500 \text{ Btu/cf}) \times (1 \text{ mmBtu}/1,000,000 \text{ Btu}) \times (0.068 \text{ lb/mmBtu}) \times (60 \text{ min/hr}) = 3.88 \text{ lbs NO}_x/\text{hr}$$

$$(3.88 \text{ lbs NO}_x/\text{hr}) \times (8,760 \text{ hrs/yr}) \times (1 \text{ ton}/2,000 \text{ lbs}) = 16.99 \text{ TPY NO}_x$$

$$16.99 \text{ ton/year NO}_x \times \text{year}/12 \text{ months} = 1.42 \text{ ton/month NO}_x \text{ average}$$

b. Emission Limitation:

7.7 tons/month CO averaged over a 12-month rolling period

Applicable Compliance Method:

The manufacture guarantees the CO emission rate of 0.37 lb/mmBtu. Continuous operation of the flare will result in a potential to emit of 21.1 lbs/hr and 92.4 TPY of CO. The potential to emit for CO emissions from the flare shall be determined by the following calculations:

$$(1,900 \text{ cf/min}) \times (500 \text{ Btu/cf}) \times (1 \text{ mmBtu}/1,000,000 \text{ Btu}) \times (0.37 \text{ lb/mmBtu}) \times (60 \text{ min/hr}) = 21.1 \text{ lbs CO/hr}$$

$$(21.1 \text{ lbs CO/hr}) \times (8,760 \text{ hrs/yr}) \times (1 \text{ ton}/2,000 \text{ lbs}) = 92.4 \text{ TPY CO}$$

$$(92.4 \text{ ton/year CO}) \times (\text{year}/12 \text{ months}) = 7.7 \text{ ton/month CO average}$$

c. Emission Limitation:

0.4 ton/month PM<sub>10</sub> averaged over a 12-month rolling, period

Applicable Compliance Method:

The active LFG collection/control system for the facility is designed with features to remove particulate matter (PM<sub>10</sub>) from the inlet LFG stream prior to entering the flares for destruction. As the extracted LFG is drawn to the flare, it enters a

knockout pot. The knockout pot is equipped with a demisting pad that prevents entrained water (condensate) from entering the flare, and minimizes the quantity of PM<sub>10</sub> entering the flare. The potential to emit for PM<sub>10</sub> was determined using the AP-42, Table 2.4-5 emission factor of 17 pounds of PM<sub>10</sub> per million cubic feet, as well as the LFG flow rate to the flare. The potential to emit for PM<sub>10</sub> was determined as follows:

$$(1900 \text{ cfm}) \times (60 \text{ min/hr}) / (1,000,000) = 0.114 \text{ mmscf/hr}$$

$$(0.114 \text{ mmscf/hr}) \times (50\% \text{ CH}_4 \text{ concentration}) \times (17 \text{ lbs/mmscf}) \\ = 0.97 \text{ lbs PM}_{10}/\text{hr}$$

$$(0.97 \text{ lbs PM}_{10}/\text{hr}) \times (8760 \text{ hrs/yr}) \times (1 \text{ ton}/2,000 \text{ lbs}) = 4.25 \text{ TPY PM}_{10}$$

$$(4.25 \text{ ton/year PM}_{10}) \times (\text{year}/12 \text{ months}) = 0.4 \text{ ton/month PM}_{10} \text{ average}$$

d. Emission Limitation:

0.05 ton/month VOC averaged over a 12-month rolling period

Applicable Compliance Method:

Landfill gas is made up of methane and other organics. Emission factors for NMOCs were assumed to be total VOCs. The proposed flare is designed to meet all of the requirements of the New Source Performance Standards for Municipal Solid Waste Landfills (NSPS). Typical landfill gas has an NMOC inlet concentration of 252 ppm as hexane. The flare manufacture guarantees 98% destruction. Estimated VOC emissions shall be determined by the following calculation:

$$(252 \times 10^{-6} \text{ lb} \cdot \text{mol S} / 1 \text{ lb} \cdot \text{mol LFG}) \times (1 \text{ lb} \cdot \text{mol LFG} / 386 \text{ scf}) \times \\ (86.18 \text{ lbs VOC} / \text{mol}) \times (1,000,000 \text{ scf}/1 \text{ mmscf}) = 56.26 \text{ lbs VOC/mmscf}$$

$$(1,900 \text{ cfm}) \times (60 \text{ min/hr}) / (1,000,000) = 0.114 \text{ mmscf/hr}$$

$$(0.114 \text{ mmscf/hr}) \times (56.26 \text{ lbs VOC/mmscf}) = 6.41 \text{ lbs/hr of VOC uncontrolled}$$

$$(6.41 \text{ lbs VOC/hr}) \times (1 - 0.98) = 0.13 \text{ lb VOC/hr controlled}$$

$$(0.13 \text{ lb VOC/hr}) \times (8,760 \text{ hrs/yr}) \times (1 \text{ ton}/2,000 \text{ lbs}) = 0.57 \text{ TPY VOC}$$

$$(0.57 \text{ ton/year VOC}) \times (\text{year}/12 \text{ months}) = 0.05 \text{ ton/month VOC average}$$

e. Emission Limitation:

0.81 ton/month SO<sub>2</sub> averaged over a 12-month rolling period

Applicable Compliance Method:

The emission rate of sulfur dioxide (SO<sub>2</sub>) from the flares is based on the concentration of sulfur-containing compounds found in the LFG, and the

collection efficiency 75% (CE) of the LFG collection and control system. From AP-42, Section 2.4, page 2.4-8, the concentration of sulfur (CS) can be assumed to be 46.9 ppmv or  $46.9 \times 10^{-6} \text{ lb}^* \text{ mol S} / 1 \text{ lb}^* \text{ mol LFG}$ . BFI Glenwillow requested an adjustment factor of 117.25 ( $46.9 \times 2.5$ ) for the sulfur oxides emissions in order to be more in line with the other criteria pollutants. The following calculations from AP-42 are used to determine the potential to emit for SO<sub>2</sub> emissions from the flare:

$$(117.25 \times 10^{-6} \text{ lb}^* \text{ mol S} / 1 \text{ lb}^* \text{ mol LFG}) * (1 \text{ lb}^* \text{ mol LFG} / 386 \text{ scf}) * (64 \text{ lbsSOx} / \text{mol}) \times (1,000,000 \text{ scf} / 1 \text{ mmscf}) = 19.44 \text{ lbsSOx/mmscf}$$

$$(1,900 \text{ cfm}) \times (60 \text{ min/hr}) / (1,000,000) = 0.114 \text{ mmscf/hr}$$

$$(0.114 \text{ mmscf/hr}) \times (19.44 \text{ lbsSOx/mmscf}) = 2.22 \text{ lbsSOx/hr}$$

$$(2.22 \text{ lbs/hrSOx}) \times (8760 \text{ hrs/yr}) \times (1 \text{ ton} / 2,000 \text{ lbs}) = 9.72 \text{ tons SOx/yr}$$

$$(9.72 \text{ tons SO}_2\text{/year}) \times (\text{year} / 12 \text{ months}) = 0.81 \text{ ton/month SO}_2 \text{ average}$$

f. Emission Limitation:

0.55 ton/month HCl averaged over a 12-month rolling period

Applicable Compliance Method:

The HAP emissions were determined by using AP-42 Tables 2.4-1, 2.4-2, and 2.4-3. The maximum potential HCl emission rate was determined to be 1.5 pound per hour. The annual and ton per month emissions are determined as follows:

$$(1.5 \text{ lbHCl/hr}) \times (8760 \text{ hrs/yr}) \times (\text{ton} / 2000 \text{ lbs}) = 6.6 \text{ TPY HCl}$$

$$(6.6 \text{ ton/year HCl}) \times (\text{year} / 12 \text{ months}) = 0.55 \text{ ton/month HCl average}$$

g. Emission Limitation:

No visible emissions from the flare, except for a periods not to exceed a total of 5 minutes during any 2 consecutive hours.

Applicable Compliance Method:

If required, compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 22.

h. The net heating value of the gas being combusted at the flare shall be calculated as follows:

$$H_T = k \sum_{i=1}^n C_i H_i$$

where:

$H_T$  = net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 degrees Celsius and 760 mm Hg, but the standard temperature of 20 degrees Celsius is used for determining the volume corresponding to one mole;

$k$  = constant,  $1.740 \times 10^{-7}$  (1/ppm) (g mole/scm) (MJ/kcal), where the standard temperature for g mole/scm is 20 degrees Celsius;

$C_i$  = concentration of sample component in ppm on a wet basis, as measured for organics by Reference Method 18, of 40 CFR Part 60, and measured for hydrogen and carbon monoxide by ASTM D1946-90;

$H_i$  = net heat of combustion of sample component "i", kcal/g mole at 25 degrees Celsius and 760 mm Hg. The heat of combustion may be determined using ASTM D4809-95 if published values are not available or cannot be calculated;

$i$  = subscript denoting a specific component in the sample; and

$n$  = total number of components within the sample.

The conversion factor of 26.84 Btu scm/MJ scf can be used to convert the net heating value of the gas ( $H_T$ ) from MJ/scm to Btu/scf.

- i. The actual exit velocity of the flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure) of the flare header or headers that feed the flare, as determined by Reference Methods 2, 2A, 2C, or 2D (found in 40 CFR 60, Appendix A), as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

The conversion factor of 3.281 ft/m can be used to convert the velocity from m/sec to ft/sec.

g) Miscellaneous Requirements

- (1) None.