

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

August 29, 2016

PERMIT TO INSTALL
61-16

ISSUED TO
Ameresco Woodland Meadows Romulus, LLC

LOCATED AT
4620 Hannan Road
Canton, Michigan

IN THE COUNTY OF
Wayne

STATE REGISTRATION NUMBER
P0317

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

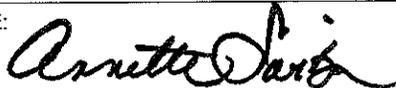
DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

July 7, 2016

DATE PERMIT TO INSTALL APPROVED:

August 29, 2016

SIGNATURE:



DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

PERMIT TO INSTALL

Table of Contents

Section	Page
Alphabetical Listing of Common Abbreviations / Acronyms	2
General Conditions	3
Special Conditions	5
Emission Unit Summary Table.....	5
Special Conditions for EUHBTUENCL.....	6
Special Conditions for EUHBTUOPEN	10
Appendices	14

Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	acfm	Actual cubic feet per minute
BACT	Best Available Control Technology	BTU	British Thermal Unit
CAA	Clean Air Act	°C	Degrees Celsius
CAM	Compliance Assurance Monitoring	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	CO ₂ e	Carbon Dioxide Equivalent
CFR	Code of Federal Regulations	dscf	Dry standard cubic foot
COM	Continuous Opacity Monitoring	dscm	Dry standard cubic meter
Department/ department	Michigan Department of Environmental Quality	°F	Degrees Fahrenheit
EU	Emission Unit	gr	Grains
FG	Flexible Group	HAP	Hazardous Air Pollutant
GACS	Gallons of Applied Coating Solids	Hg	Mercury
GC	General Condition	hr	Hour
GHGs	Greenhouse Gases	HP	Horsepower
HVLP	High Volume Low Pressure*	H ₂ S	Hydrogen Sulfide
ID	Identification	kW	Kilowatt
IRSL	Initial Risk Screening Level	lb	Pound
ITSL	Initial Threshold Screening Level	m	Meter
LAER	Lowest Achievable Emission Rate	mg	Milligram
MACT	Maximum Achievable Control Technology	mm	Millimeter
MAERS	Michigan Air Emissions Reporting System	MM	Million
MAP	Malfunction Abatement Plan	MW	Megawatts
MDEQ	Michigan Department of Environmental Quality	NMOC	Non-methane Organic Compounds
MSDS	Material Safety Data Sheet	NO _x	Oxides of Nitrogen
NA	Not Applicable	ng	Nanogram
NAAQS	National Ambient Air Quality Standards	PM	Particulate Matter
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM10	Particulate Matter equal to or less than 10 microns in diameter
NSPS	New Source Performance Standards	PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
NSR	New Source Review	pph	Pounds per hour
PS	Performance Specification	ppm	Parts per million
PSD	Prevention of Significant Deterioration	ppmv	Parts per million by volume
PTE	Permanent Total Enclosure	ppmw	Parts per million by weight
PTI	Permit to Install	psia	Pounds per square inch absolute
RACT	Reasonable Available Control Technology	psig	Pounds per square inch gauge
ROP	Renewable Operating Permit	scf	Standard cubic feet
SC	Special Condition	sec	Seconds
SCR	Selective Catalytic Reduction	SO ₂	Sulfur Dioxide
SNCR	Selective Non-Catalytic Reduction	TAC	Toxic Air Contaminant
SRN	State Registration Number	Temp	Temperature
TEQ	Toxicity Equivalence Quotient	THC	Total Hydrocarbons
USEPA/EPA	United States Environmental Protection Agency	tpy	Tons per year
VE	Visible Emissions	µg	Microgram
		µm	Micrometer or Micron
		VOC	Volatile Organic Compounds
		yr	Year

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

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

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EUHBTUENCL	2,600 cubic feet per minute (CFM) enclosed flare used for the destruction of the pressure swing adsorption (PSA) process CO ₂ tail gas stream. Due to the low BTU value of the gas stream, landfill gas and N ₂ tail gas will be used as supplementary fuel.	To be determined	N/A
EUHBTUOPEN	1,440 CFM open flare used for the destruction of the N ₂ tail gas stream. The flare will use product gas (approximately 94% methane) and propane to run the pilot continuously if needed for flame stability.	To be determined	N/A
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

The following conditions apply to: EUHBTUENCL

DESCRIPTION: 2,600 CFM enclosed flare used for the destruction of the pressure swing adsorption (PSA) process CO₂ tail gas stream. Due to the low BTU value of the gas stream, landfill gas and N₂ tail gas will be used as supplementary fuel.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing/ Monitoring Method	Underlying Applicable Requirements
1. NMOC	Reduce NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen	Test Protocol*	EUHBTUENCL	SC V.2	40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.754(d), 40 CFR 60.758(b)(2)
2. SO ₂	16.8 pph	Test Protocol*	EUHBTUENCL	SC V.3	40 CFR 52.21 (c) & (d)
3. SO ₂	73.7 tpy	12-month rolling time period as determined at the end of each month	EUHBTUENCL	SC V.3, VI.5	R 336.1205(3)

*Test Protocol shall determine averaging time.

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall equip and maintain EUHBTUENCL with a temperature monitor. **(R336.1205(1)(a), R 336.1225)**
2. The temperature monitor for EUHBTUENCL shall be calibrated annually to confirm accuracy, and adjustments made as necessary to maintain accuracy. **(R336.1205(1)(a), R 336.1225)**
3. The permittee shall monitor and record the flaring duration each time EUHBTUENCL ground flare is ignited in a manner and with instrumentation acceptable to the Air Quality Division. All of the accumulated data shall be kept on file for a period of at least five years and made available to the Air Quality Division upon request. **(R 336.1225, R336.1205(3))**
4. The permittee shall operate EUHBTUENCL at all times when the collected gas is routed to the enclosed flare. **(40 CFR 60.753(f), 40 CFR 63.1955(a))**

5. The permittee shall not operate EUHBTUENCL unless a start-up, shutdown, malfunction abatement (SSM) plan as described in Rule 911(2), for the enclosed flare, has been submitted within 60 days of permit issuance, and is implemented and maintained. If at any time the SSM plan fails to address or inadequately addresses an event that meets the characteristics of a start-up, shutdown, or malfunction, the permittee shall amend the SSM plan within 45 days after such an event occurs. The permittee shall also amend the SSM plan within 45 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the SSM plan and any amendments to the SSM plan to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the SSM plan or amended SSM plan shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. **(R 336.1225, R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, 40 CFR 52.21(c) & (d), 40 CFR 63.1960, 40 CFR 63.6(e)(3))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner, a device to monitor and record the volumetric flow rate of landfill gas burned in EUHBTUENCL, on a continuous basis. **(R 336.1224, R 336.1225, R 336.1901; R 336.12803, R 336.2804, 40 CFR 52.21(c) & (d); 40 CFR Part 60 Subparts A & WWW; 40 CFR Part 63 Subparts A & AAAA)**
2. The nominal design capacity of EUHBTUENCL shall be 2,600 CFM, as specified by the equipment manufacturer. **(R 336.1205(1)(a), R 336.1225, R 336.1702, 40 CFR 52.21(c) & (d))**

V. TESTING/SAMPLING

1. The permittee shall verify hydrogen sulfide or total reduced sulfur content of the landfill gas delivered to the HBTU process on a monthly basis, by gas testing at owner's expense, in accordance with Department requirements. No less than 60 days prior to the initial test, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to the first test. Thereafter, the permittee shall submit a test plan upon the request of the AQD District Supervisor. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3)), 40 CFR 52.21 (c) & (d))**
2. Within 60 days after achieving the maximum production rate, but not later than 180 days after commencement of initial startup, the permittee shall verify either the reduction of NMOC by 98 weight percent efficiency or the 20 ppmv outlet concentration level from EUHBTUENCL, as required by federal Standards of Performance for New Stationary Sources, by testing at owner's expense, in accordance with 40 CFR Part 60 Subparts A and WWW. The permittee shall notify the AQD District Supervisor in writing within 15 days of the date of commencement of initial startup in accordance with 40 CFR 60.7(a)(3). Stack testing procedures and the location of stack testing ports shall be in accordance with the applicable federal Reference Methods, 40 CFR Part 60 Appendix A. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(40 CFR 60.752(b)(2)(iii)(B), 40 CFR 60.754(d))**
3. Within 60 days of achieving the maximum production rate, but not later than 180 days after commencement of initial startup, the permittee shall verify and quantify SO₂ emission rates from EUHBTUENCL by testing at owner's expense, in accordance with Department requirements. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205(3), R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(c) & (d))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. **(R 336.1201(3))**

1. The permittee shall calibrate, maintain, and operate EUHBTUENCL according to the manufacturer's specifications, including the following:
 - a. A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of plus or minus 1 percent of the temperature being measured expressed in degrees centigrade or plus or minus 0.5 degrees centigrade, whichever is greater. **(40 CFR 60.756(b)(1), 40 CFR 63.1955(a))**
 - b. A device that records flow to or bypass of the control device. The permittee shall either:
 - i. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; **(40 CFR 60.756(b)(2)(i), 40 CFR 63.1955(a)) or**
 - ii. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line. **(40 CFR 60.756(b)(2)(ii), 40 CFR 63.1955(a))**
2. Except as provided in §60.752(b)(2)(i)(B), the permittee shall keep readily accessible continuous records of the equipment operating parameters specified to be monitored in §60.756 (above in condition VI.1.), as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. **(40 CFR 60.758(c))**
 - a. The following constitute exceedances that shall be recorded and reported under §60.757(f):
 - i. All 3-hour periods of operation during which the average combustion temperature was more than 28 °C (50° F) below the average combustion temperature during the most recent performance test at which compliance with §60.752(b)(2)(iii) was determined. **(40 CFR 60.758(c)(1)(i))**
 - (1) 3-hour block averages are calculated in the same way as they are calculated in 40 CFR part 60 subpart WWW, except that the data collected during the events listed below are not to be included in any average computed for 40 CFR Part 63, subpart AAAA. **(40 CFR 63.1975)**
 - (a) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments. **(40 CFR 63.1975(a))**
 - (b) Startups. **(40 CFR 63.1975(b))**
 - (c) Shutdowns. **(40 CFR 63.1975(c))**
 - (d) Malfunctions. **(40 CFR 63.1975(d))**
3. The following information shall be recorded:
 - a. The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test. **(40 CFR 60.758(b)(2)(i))**
 - b. The percent reduction of NMOC determined as specified in 40 CFR 60.752(b)(2)(iii)(B) achieved by the control device. **(40 CFR 60.758(b)(2)(ii))**
4. The permittee shall keep up-to-date, readily accessible records of all control system exceedances of the operational standards in §60.753 (SC III.4. and III.5.). **(40 CFR 60.758(e))**
5. The permittee shall calculate and record the SO₂ emission rates from EUHBTUENCL monthly, and for the preceding 12-month rolling time period using the equation in Appendix A.4. The calculations shall utilize monthly gas testing data collected (SC V.1), the actual monthly gas usage, and the average ratio of total sulfur to sulfur as H₂S from the most recent laboratory test. All records shall be kept on file at the facility and make them available to the Department upon request. **(R 336.1205(3)), 40 CFR 52.21 (c) & (d))**

VII. REPORTING

1. The permittee shall submit the SSM plan report for EUHBTUENCL to the AQD District office and it shall be delivered or postmarked by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(40 CFR 63.10(a)(5), 40 CFR 63.10(d)(5))**
2. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUHBTUENCL. **(R 336.1201(7)(a))**

VIII. STACK/VENT RESTRICTION(S)

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

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVHBTUENCL	72	40	R336.1225, 40 CFR 52.21 (c) & (d)

IX. OTHER REQUIREMENTS

1. The permittee shall comply with all applicable provisions of the federal Standards of Performance for Municipal Solid Waste Landfills as specified in 40 CFR Part 60 Subpart A and WWW, as they apply to EUHBTUENCL. **(40 CFR Part 60 Subpart A and WWW)**
2. The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills as specified in 40 CFR Part 63 Subparts A and AAAA, as they apply to EUHBTUENCL. **(40 CFR Part 63 Subpart A and AAAA)**

The following conditions apply to: EUHBTUOPEN

DESCRIPTION: 1,440 CFM open flare used for the destruction of the N2 tail gas stream. The flare will use product gas (approximately 94% methane) and propane to run the pilot continuously if needed for flame stability.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

I. EMISSION LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Visible Emissions	0% Opacity	Test Protocol*	EUHBTUOPEN	SC V.2, VI.2	R336.1301, 40 CFR 60.18(c)(1)
*Test Protocol shall determine averaging time period.					

II. MATERIAL LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Net heating value of landfill gas	≥ 200 Btu/scf for non-assisted flares	Test Protocol*	EUHBTUOPEN	SC V.1	40 CFR 60.18(c)(3)
*Test Protocol shall determine averaging time period.					

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall operate EUHBTUOPEN in accordance with 40 CFR 60.18. **(40 CFR 60.752(b)(2)(iii)(A), 40 CFR 63.1955(a))**
2. The permittee shall operate EUHBTUOPEN at all times when the collected gas is routed to it. **(40 CFR 60.753(f), 40 CFR 63.1955(a))**
3. EUHBTUOPEN 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. **(40 CFR 60.18(c)(1))**
4. EUHBTUOPEN shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR 60.18(f). **(40 CFR 60.18(c)(2))**
5. EUHBTUOPEN shall be used only with the net heating value of the gas being combusted of 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted of 7.45 MJ/scm (200 Btu/scf) or greater if the flare is non-assisted. The net heating value of the gas being combusted shall be determined by the methods specified in 40 CFR 60.18(f) and Appendix A. **(40 CFR 60.18(c)(3))**

6. Steam-assisted and non-assisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than 18.3 m/sec (60 ft/sec), except as provided in 40 CFR 60.18(c)(4)(ii) and (iii). **(40 CFR 60.18(c)(4)(i))**
 - a. Steam-assisted and non-assisted flares 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) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf). **(40 CFR 60.18(c)(4)(ii))**
 - b. Steam-assisted and non-assisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4) less than the velocity, V_{max} , as determined by the method specified in 40 CFR 60.18(f)(5), and less than 122 m/sec (400 ft/sec) are allowed. **(40 CFR 60.18(c)(4)(iii))**
7. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in 40 CFR 60.18(f)(6). **(40 CFR 60.18(c)(5))**
8. Flares used to comply with provisions of 40 CFR Part 60 Subpart A shall be operated at all times when landfill gas may be vented to them. **(40 CFR 60.18(e))**
9. The permittee shall operate the control system such that all collected gases are vented to a control system designed and operated in accordance with 40 CFR 60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one hour. **(40 CFR 60.753(e), 40 CFR 63.1955(a))**
10. The permittee shall not operate EUHBTUOPEN unless a SSM plan as described in Rule 911(2), for the open flare, has been submitted within 60 days of permit issuance, and is implemented and maintained. If at any time the SSM plan fails to address or inadequately addresses an event that meets the characteristics of a start-up, shutdown, or malfunction, the permittee shall amend the SSM plan within 45 days after such an event occurs. The permittee shall also amend the SSM plan within 45 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the SSM plan and any amendments to the SSM plan to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the SSM plan or amended SSM plan shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. **(R 336.1225, R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, 40 CFR 52.21(c) & (d), 40 CFR 63.1960, 40 CFR 63.6(e)(3))**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The nominal design capacity of EUHBTUOPEN shall be 1,440 CFM, as specified by the equipment manufacturer. **(R 336.1205(1)(a), R 336.1225, R 336.1702, 40 CFR 52.21(c) & (d))**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. For the performance test required in 40 CFR 60.752(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in 40 CFR 60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR 60.18(f)(4). **(40 CFR 60.752(b)(2)(iii)(A), 40 CFR 60.754(e))**
2. Method 22 of appendix A to 40 CFR Part 60 shall be used to determine the compliance of EUHBTUOPEN with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22. **(40 CFR 60.18(f)(1), 40 CFR 60.752(b)(2)(iii)(A))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall install, calibrate, maintain, and operate, according to the manufacturer's specifications, a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame. **(40 CFR §60.756(c)(1), 40 CFR §63.1955(a))**
2. Except as provided in §60.752(b)(2)(i)(B), the permittee shall keep up-to-date, readily accessible records for the life of the open flare of the data listed below in SC VI.3, as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the open flare vendor specifications shall be maintained until removal. **(40 CFR §60.758(b), 40 CFR §63.1955(a))**
3. The permittee shall maintain records regarding the flare type (i.e., steam-assisted, air-assisted, or non-assisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in §60.18; continuous records of the open flare pilot flame or open flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent. **(40 CFR §60.758(b)(4), 40 CFR §63.1955(a))**
4. The following records for the flare shall be maintained onsite:
 - a. Records indicating presence of flare pilot flame. **(40 CFR §60.18(f)(2))**
 - b. The net heating value of the gas being combusted in the flare shall be calculated and recorded using the equation provided in Appendix A.1. **(40 CFR §60.18(f)(3))**
 - c. The actual exit velocity of the flare shall be calculated and recorded by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Federal Reference Test Methods 2, 2A, 2C, or 2D as appropriate, by the unobstructed (free) cross sectional area of the flare tip. **(40 CFR §60.18(f)(4))**
 - d. The maximum permitted velocity, V_{max} , for flares complying with 40 CFR §60.18(c)(4)(iii) shall be calculated and recorded using the equation provided in Appendix A.2. **(40 CFR §60.18(f)(5))**
 - e. The maximum permitted velocity, V_{max} , for air-assisted flares shall be calculated and recorded using the equation provided in Appendix A.3. **(40 CFR §60.18(f)(6))**
5. The permittee shall monitor and record on a monthly basis the average Btu content of the landfill gas burned in EUHBTUOPEN. As an alternative, the permittee may use the monitored Btu value of the landfill gas burned in the Gas to Energy Plant. All records shall be kept on file for a period of at least five years and make them available to the Department upon request. **(R 336.1205(3), 40 CFR 52.21 (c) & (d))**
6. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling heat input calculations for EUHBTUOPEN. The permittee shall keep all records on file at the facility for a period of at least five years and make them available to the Department upon request. **(R 336.1205(3), 40 CFR 52.21 (c) & (d))**
7. The permittee shall calculate and record the SO₂ emission rates from EUHBTUOPEN monthly, and for the preceding 12-month rolling time period using the equation in Appendix A.4. The calculations shall utilize monthly gas testing data collected (SC V.1), the actual monthly gas usage, and the average ratio of total sulfur to sulfur as H₂S from the most recent laboratory test. All records shall be kept on file at the facility and make them available to the Department upon request. **(R 336.1205(3), 40 CFR 52.21 (c) & (d))**

VII. REPORTING

1. The permittee shall submit the startup, shutdown, and malfunction (SSM) report to the appropriate AQD district office and it shall be delivered or postmarked by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(40 CFR 63.10(a)(5), 40 CFR 63.10(d)(5))**
2. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUHBTUOPEN. **(R 336.1201(7)(a))**

VIII. STACK/VENT RESTRICTIONS

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

Stack & Vent ID	Maximum Exhaust Diameter (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVHBTUOPEN	12 ^a	35 ^b	R 336.1225, 40 CFR 52.21(c) & (d)
^a Calculated effective diameter is 4.56 inches. ^b Calculated effective height above ground is 37.1 feet.			

IX. OTHER REQUIREMENTS

1. The duration of start-up, shutdown, or malfunction for the open flare shall not exceed 1 hour. **(40 CFR 60.755(e), 40 CFR 63.1955(a))**
2. Compliance with 40 CFR Part 63, Subpart AAAA is determined in the same way it is determined for 40 CFR Part 60, Subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data collected above in SC VI.1 and VI.5 are used to demonstrate compliance with the operating conditions for the open flare. The permittee shall have developed and implemented a written SSM plan for EUHBTUOPEN, according to SC III.10. A copy of the SSM plan shall be maintained on site. **(40 CFR 63.1960, 40 CFR 63.6(e)(3))**
3. The permittee shall comply with all applicable provisions of 40 CFR Part 60 Subpart A and WWW "Standard of Performance for Municipal Solid Waste Landfills as they apply to EUHBTUOPEN. **(40 CFR Part 60 Subpart A and WWW)**
4. The permittee shall comply with all applicable provisions of 40 CFR Part 63 Subpart A and AAAA "National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills as they apply to EUHBTUOPEN. **(40 CFR Part 63 Subpart A and AAAA)**

Footnotes:

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

APPENDIX A

1. Net Heating Value of the gas being combusted in the flare:

The net heating value of the gas being combusted in the flare shall be calculated and recorded using the equation provided in 40 CFR 60.18(f)(3). **(40 CFR 60.18(f)(3))**

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

WHERE:

H_T = Net heating value of the sample, MJ/scm;

where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C;

$$K = \frac{\text{Constant}}{1.740 \times 10^{-7}} \left(\frac{1}{\text{ppm}} \right) \left(\frac{\text{g mole}}{\text{scm}} \right) \left(\frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for $\left(\frac{\text{g mole}}{\text{scm}} \right)$ is 20°C;

C_i = Concentration of sample component i in ppm on a dry basis, as measured by Reference Method 3C (40 CFR 60.754(e)); and

H_i = Net heat of combustion of sample component i , kcal/g mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76, 88 (incorporated by reference as specified in 60.17(30)) or D4809–95 (incorporated by reference as specified in 60.17(56)) if published values are not available or cannot be calculated.

2. Calculation for Vmax steam-assisted and non-assisted flares:

The maximum permitted velocity, V_{max} , for flares complying with 40 CFR 60.18(c)(4)(iii) shall be calculated and recorded using the equation provided in 40 CFR 60.18(f)(5). **(40 CFR 60.18(f)(5))**

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

V_{max} = Maximum permitted velocity, M/sec

28.8=Constant

31.7=Constant

HT= The net heating value as determined above.

3. Calculation for Vmax for air-assisted flares:

The maximum permitted velocity, V_{max} , for air-assisted flares shall be calculated and recorded using the equation provided in 40 CFR 60.18(f)(6). **(40 CFR 60.18(f)(6))**

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

V_{max} = Maximum permitted velocity, m/sec 8.706=Constant 0.7084=Constant HT=The net heating value as determined above.

4. Calculation for Monthly SO₂ Emissions:

The following calculation for SO₂ emissions shall utilize monthly H₂S concentration measurements from testing data collected, the actual monthly gas usage, and the average ratio of total sulfur to sulfur as H₂S from the most recent laboratory test. The permittee shall use a default ratio of total sulfur to sulfur as H₂S equal to 1.2, if there are no test results.

SO₂ Emissions (tons per month)

$$\begin{aligned} &= \frac{\text{Monthly H}_2\text{S Concentration (ppmv)}}{1,000,000} \times \frac{1.1733 \text{ mols Sulfur}}{\text{ft}^3} \times \frac{34.065 \text{ grams}}{\text{mol Sulfur}} \times \frac{\text{pound}}{453.59 \text{ grams}} \times \frac{\text{ton}}{2,000 \text{ pounds}} \\ &\times \frac{1.88 \text{ SO}_2}{\text{H}_2\text{S}} \times \frac{1.2 \text{ TRS}}{\text{H}_2\text{S}} \times \text{Actual Monthly Landfill Gas Usage (ft}^3\text{/month)} \end{aligned}$$