



Bismarck, ND | HEI No. 4489-0042
May 2026



NDDEQ TITLE V AIR PERMIT TO OPERATE RENEWAL APPLICATION

Bismarck Regional Landfill

Permit: AOP-28476 v1.0



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City of Bismarck
Bismarck Regional Landfill
Permit: AOP-28476 v1.0

HEI Project: R4489-0042

May, 2026
Bismarck, ND



This report was prepared by:

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LIST OF ABBREVIATIONS

Abbreviation

Term/Phrase/Name

Application	Title V Air Permit to Operate Application
BTU	British Thermal Unit
cfm	cubic feet per minute
cfr	Code of Federal Regulation
City	City of Bismarck
EPA	Environmental Protection Agency
EU	Emissions Unit
Facility	Bismarck Solid Waste Facility
GHG	Greenhouse gas
HAP	Hazardous Air Pollutants
Hp	Horsepower
ICE	Internal Compression Engines
ISW	Inert Solid Waste
KW	kilowatt
LandGEM	EPA's LandGEM Model V.3.1
LFG	Landfill Gas
MACT	Maximum Achievable Control Technology
Mg	Megagrams
MSW	Municipal Solid Waste
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
ND-CERIS	North Dakota-Combined Environmental Regulatory Information System
NDDEQ	North Dakota Department of Environmental Quality
NESHAP	National Emission Standard for Hazardous Air Pollutants
NMOC	Non-methane Organic Compounds
NSPS	New Source Performance Standards
ppm	parts per million
ppmv	parts per million by volume
scfm	standard cubic feet per minute
Site	Bismarck Solid Waste Facility

INTRODUCTION AND GENERAL INFORMATION

1.1 BACKGROUND

Houston Engineering, Inc. (HEI) has prepared this Title V Air Permit to Operate Application (Application) on behalf of the City of Bismarck (City) for the Bismarck Regional Landfill (Site) located at 2111 North 52nd Street, Bismarck, North Dakota. The City operates the Site under North Dakota Department of Environmental Quality (DEQ) Solid Waste Permit #0017. The Site has been accepting waste since approximately 1961.

The western portion of the landfill site is known as the “old fill area” and was developed prior to the enactment of the Federal Subtitle D regulations. The “old fill area” was operational from 1964 through 1986. In accordance with the common practices at that time, municipal solid waste was placed in unlined trenches to depths ranging from 25 to 75 feet. In 1986, disposal operations ceased in these unlined trenches. From 1986 to 1993, MSW was placed in clay lined trenches that were located east of the current landfill entrance. The trenches were excavated to depths ranging from 15 to 25 feet and were lined with compacted clay. These lined trenches were pre-subtitle D and did not have leachate collection systems.

In 1993, an application was submitted for development of a Subtitle D Municipal Solid Waste (MSW) landfill. That MSW landfill, herein called MSW #1, was operational from 1993 to 2023 and had a final closure project completed in 2024. In 2018 an application was submitted for development of a new Subtitle D MSW landfill on the site, herein called MSW #2. Cell 1 of the MSW #2 was complete and became operation in 2022. Since then, the MSW #2 has been expanded into cell 2 and is the current active MSW landfill for the facility.

In addition to the MSW disposal areas the facility operations include an active Inert landfill site, yardwaste composting site, wood waste management site, household hazardous waste collection site, white metals recycling collection site, an electronics collection site and a recyclable material drop off site. The finished yardwaste compost is periodically screened for use and resale. Clean wood waste material is ground up for re-use as mulch or processed through and Air Curtain Incinerator for volume reduction.

1.2 PURPOSE AND SCOPE

The purpose of this report and the associated documents is to summarize the activities and processed on the site related to the renewal of the Title V Air Permit to Operate for the facility site. This application is submitted in accordance with Section 33.1-15-14-01 of the North Dakota Administrative Code (NDAC) and guidelines outlined by the DEQ. The Title V Air Permit to Operate renewal application is completed and submitted via the ND-CERIS electronic reporting and permit system.

1.3 LEGAL DESCRIPTION AND GENERAL SITE INFORMATION

The Site is located in portions of Section 25, Township 139 North, Range 80 West and Section 30, Township 139 North, Range 79 West; Burleigh County, North Dakota (Figure: Boundary Map 2006).

The Landfill is located in eastern Bismarck, and the landfill entrance is located on 52nd Street NE, approximately 1,500 feet north of the intersection with East Divide Avenue. Vehicles are weighed prior to proceeding to the unloading area at the scale and landfill shop building located inside this entrance.

2 FACILITY PROCESS DESCRIPTION

2.1 LANDFILL DESCRIPTION

The City operates the facility under Solid Waste Permit Number 0017, pursuant to the North Dakota Century Code (NDCC), the Solid Waste Management and Land Protection Act; and Article 33.1-20 of the North Dakota Administrative Code (NDAC), Solid Waste Management Rules. The Landfill is subject to NSPS and will comply with all applicable reporting, testing, and permitting requirements presented in Article 33.1-15 of the NDAC and 40 CFR Part 60.

The Landfill receives waste from the City and surrounding areas in Burleigh and Morton Counties. The waste stream originates from residential, commercial, and industrial sources, and is generally described as municipal solid waste (MSW). The majority of the MSW is collected and delivered to the landfill by city collection trucks and private sanitation companies that serve area businesses, surrounding rural residential developments and smaller communities. MSW is also accepted at the facility from individual residents, non-residents, rural-residents, and business deliveries.

The currently planned total design capacity of the active MSW Landfill is 10,227,000 cubic yards (or approximately 7,819,095 cubic meters), excluding final cover, leachate collection drainage materials, and leachate collection system protective cover.

2.2 APPLICABLE EMISSION UNITS

The facility includes primary emission units (EU) consisting of the MSW Landfill (EU1), and stationary Internal Compression Engines (ICE) that are used to power a wood tub grinder (EU2) a compost screener (EU3) and an air curtain Incinerator (EU4B). The engines are subject to New Source Performance Standards 40 CFR 60 Subpart IIII and 40 CFR 63 (Maximum Achievable Control Technology [MACT]), Subpart ZZZZ. The air curtain incinerator (EU4A) is subject to Subpart CCCC-Standards of Performance for Commercial and Industrial Waste Incinerator Units.

The SFN61006 forms for each of the emission units have been uploaded into ND-CERIS.

2.3 INSIGNIFICANT ACTIVITIES

The potential to emit calculation results for the following activities were compared to Section 33-15-14-06.4.c of the NDAC and subsequent regulations as referenced below. The emission results calculated for each of the sources are included in the facility wide potential to emit.

Calculation summaries are uploaded in ND-CERIS and demonstrate that emissions from the following are at insignificant levels.

Stationary fossil fuel burning equipment that is installed in the buildings consists of the following:

Buildings		HVAC Type	Manufacturer	Year of Manufacture / Installation	Fuel Type	Model	Estimated BTU/KW Size
Scale House Building	Heater 1	Forced Air	Armstrong Air	Dec 2015	Natural Gas	A80US2V070A12	66,000 80%
Office/ Breakroom Building	Heater 1	Forced Air	Trane	Aug 2006	Natural Gas	XR80	60,000

Household Hazardous Waste Building	Heater 1	Forced Air	RBI Dominator Series		Natural Gas	DB600	600,000
Shop Building	Heater 1	infrared ceiling			Natural Gas		175,000
Bailer Building	Heater 1	Forced Air	Carrier		Natural Gas	9200	66,000
	Heater 2	Forced Air	Carrier		Natural Gas	9200	66,000
	Heater 3	Infrared Ceiling			Natural Gas		175,000

Stationary fossil fuel motors and the air curtain incinerator that are used on the facility consist of the following:

Emission Unit	Stationary Internal Combustion Engine	Manufacturer	Year of Manufacture	Model	Fuel Type	Size	Potential Annual Hours of use
EU2	Wood Tub Grinder	Caterpillar Motor	2015	C-27	Diesel	950 Hp	1040
EU3	Compost Screener	Perkins Motor	2023	404J-E22TA	Diesel	48 Hp	1040
EU4A	Air Curtain Incinerator (ACI)	Air Burners	2023	S223	n/a	9 Ton/Hr	1040
EU4B	ACI Engine	HATZ	2023	4H50TIC	Diesel	74 Hp	1040

Fugitive dust particulate matter emissions from operation and construction activities are also considered an insignificant emissions source at the facility. Best management practices, such as watering on an as needed basis, will be employed to limit the fugitive particulate emissions in accordance with Section 33.1-15-14-03.6 of the NDAC ("prevention and abatement of nuisance conditions caused by operation of the facility").

3 EMISSIONS ESTIMATION METHODOLOGY

The potential to emit values and insignificant combustion sources are quantified for this permit application. Emission factors and emission calculation summaries are uploaded into ND-CERIS.

3.1 INSIGNIFICANT EMISSIONS CALCULATIONS

The calculations for emissions were based on information provided in *AP42, Fifth Edition, Volume 1, Chapter 1 with updates through 2011* by the United States Environmental Protection Agency. Emissions from the diesel engines utilized information of Chapter 1.3 Fuel Oil Combustion; natural gas fired heaters are based on Chapter 1.4 Natural Gas Combustion. The heaters were conservatively assumed to be continuously operational for the entire year in the potential to emit calculations. Diesel engine emissions were estimated on assumed usage per year.

3.2 LFG GENERATION RATES

The modeled LFG generation rates for EU1 were developed using actual historical disposal rates from scale receipts from 1961 through 2025.

LFG generation rates, in cubic feet per minute (cfm), were developed using the EPA's LandGEM Model V.3.1 (LandGEM) Emissions Inventory. The inputs into LandGEM include the modeled disposal estimates and the AP 42 default parameters for sites with a 30-year precipitation average which falls below 25 inches per year. The actual annual 30-year normal precipitation in Bismarck, North Dakota is 17.85 inches (National Climatic Data Center). Based on actual site precipitation conditions, the default methane generation rate (k) per AP 42 for the Landfill is 0.02/year. The AP 42 default potential methane generation capacity (L₀) of 100 m³/Mg was utilized as this value conservatively predicts LFG emissions.

3.3 CONCENTRATIONS OF LFG EMISSIONS AND CALCULATIONS

LFG emissions from the landfill surface include GHG, HAPs, VOCs, and NMOCs which are calculated as the product of the flow times the concentration of each compound generated. The types and concentrations of constituents present in the LFG at the Landfill are derived from the 2008 Draft Version of AP 42 "Table 2.4-1. Default Concentrations for LFG Constituents for Landfills with Waste in Place On Or After 1992". Conversion of landfill gas concentration (parts per million) to weight per unit volume is required to calculate the emission rate. This is done with the following conversion:

$$(\text{Input default concentration in ppm}) \times \frac{\text{molecular weight (g)}}{\text{mol}} \times \frac{\text{mol}}{24.45 \text{ L}} = \text{Default concentration} \frac{\text{g}}{\text{meter}^3}$$

For example, considering acetone with a default concentration of 6.7 parts per million:

$$\left(\frac{6.7}{1,000,000} \right) \times \frac{58.08 \text{ g}}{\text{mol}} \times \frac{\text{mol}}{24.45 \text{ L}} \times \frac{1,000 \text{ mg}}{1 \text{ g}} \times \frac{1,000 \text{ L}}{\text{meter}^3} = 15.92 \frac{\text{mg}}{\text{meter}^3}$$

Using the calculated fugitive landfill gas flow rate (1,067 scfm, 2025) from Landgem v3.1, calculate for weight of acetone emission per year:

$$\frac{15.92 \text{ g}}{\text{meter}^3} \times \frac{1067 \text{ feet}^3}{\text{minute}} \times \frac{525,600 \text{ minute}}{\text{year}} \times \frac{\text{meter}^3}{35.315 \text{ feet}^3} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ pound}}{453.6 \text{ g}} \times \frac{1 \text{ ton}}{2,000 \text{ pound}} = 0.279 \frac{\text{tons}}{\text{year}}$$

4 REGULATORY REVIEW

4.1 NEW SOURCE PERFORMANCE STANDARDS (NSPS)

4.1.1 SUBPART WWW / XXX – LANDFILL

The Bismarck Landfill has a permitted (solid waste) capacity greater than 2.5 million cubic meters and has commenced construction, reconstruction, or modification after May 30, 1991. As a result, the landfill is subject to the NSPS for landfill gas emissions under United States Code of Federal Regulations 40 CFR 60, Subpart WWW. In addition, because the landfill has undergone modifications after July 17, 2014, 40 CFR 60, Subpart XXX also applies.

In September 2024, a Tier 2 NMOC emission rate analysis was completed for the Landfill in accordance with 40 CFR §60.754(a)(3) and 40 CFR §60.764(a)(3) to comply with 40 CFR 60, Subparts WWW and XXX.

The applicable thresholds for NMOC emissions are 50 Mg/yr (40 CFR 60, Subpart WWW) and 34 Mg/yr (40 CFR 60, Subpart XXX). The landfill will continue to perform Tier 2 testing every five years.

4.1.2 SUBPART IIII – COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

The wood tub grinder engine (EU2), the compost screener engine (EU3), and the air curtain incinerator engine are required to comply with EPA standards 40 CFR 60 Subpart IIII. Applicable criteria required by 40 CFR 60, Subpart IIII include the following:

- 40 CFR §60.4211(a)(1) - Operate and maintain the engine according to the manufacturer's emission-related written instructions
- 40 CFR §60.4211(a)(2)- Change only those emission-related settings that are permitted by the manufacturer
- 40 CFR §60.4207(b) - Diesel fuel must contain a maximum of 15 ppm sulfur content or less.

4.1.3 SUBPART CCCC – COMMERCIAL AND INDUSTRIAL SOLID WASTE INCINERATION UNITS

The air curtain incinerator (EU4A) is subject to 40 CFR 60, Subpart CCCC. For air curtain incinerators that burn only wood waste, clean lumber, or a mixture of wood waste, clean lumber, and yard waste, the subpart primarily requires compliance with the air curtain incinerator-specific provisions, including submittal of required notifications, annual opacity testing using EPA Method 9, and operation so that opacity does not exceed 10 percent, except during the first 30 minutes of startup when opacity may be up to 35 percent.

4.2 NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

The NESHAP requirements applicable to this facility's emissions units are listed below.

4.2.1 SUBPART AAAA – MUNICIPAL SOLID WASTE LANDFILL

NESHAP for MSW Landfills, 40 CFR 63, Subpart AAAA, establishes emissions standards for hazardous air pollutants for existing landfills. This subpart applies to MSW landfills that have a design capacity equal to or greater than 2.5 million Mg and have estimated uncontrolled emissions equal to or greater than 50 Mg/yr of NMOC. The Bismarck Landfill is a minor source and has estimated NMOC emissions of less than 50 Mg/yr, thus Subpart AAAA is not applicable to the Landfill at this time. Subpart AAAA applicability will be reassessed annually during the Permit period.

4.2.2 SUBPART ZZZZ – RECIPROCATING INTERNAL COMBUSTION ENGINES

The diesel-fired engines are required to comply with 40 CFR 63, Subpart ZZZZ. Applicable criteria required include the following general requirements as stated in 40 CFR §63.6605: (a) be in compliance with the emission limitations, operating limitations, and other requirements in this subpart that apply at all times; and (b) operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

4.3 COMPLIANCE PLAN AND SCHEDULE

Emission units at the Landfill will be operated to comply with applicable federal regulations, NDDEQ regulations, and landfill permit conditions as described in the DEQ solid waste permit, and the future NDDEQ Air Permit to Operate. The Landfill will conduct all required recordkeeping and reporting activities in accordance with the current and future permits.

5 REFERENCES

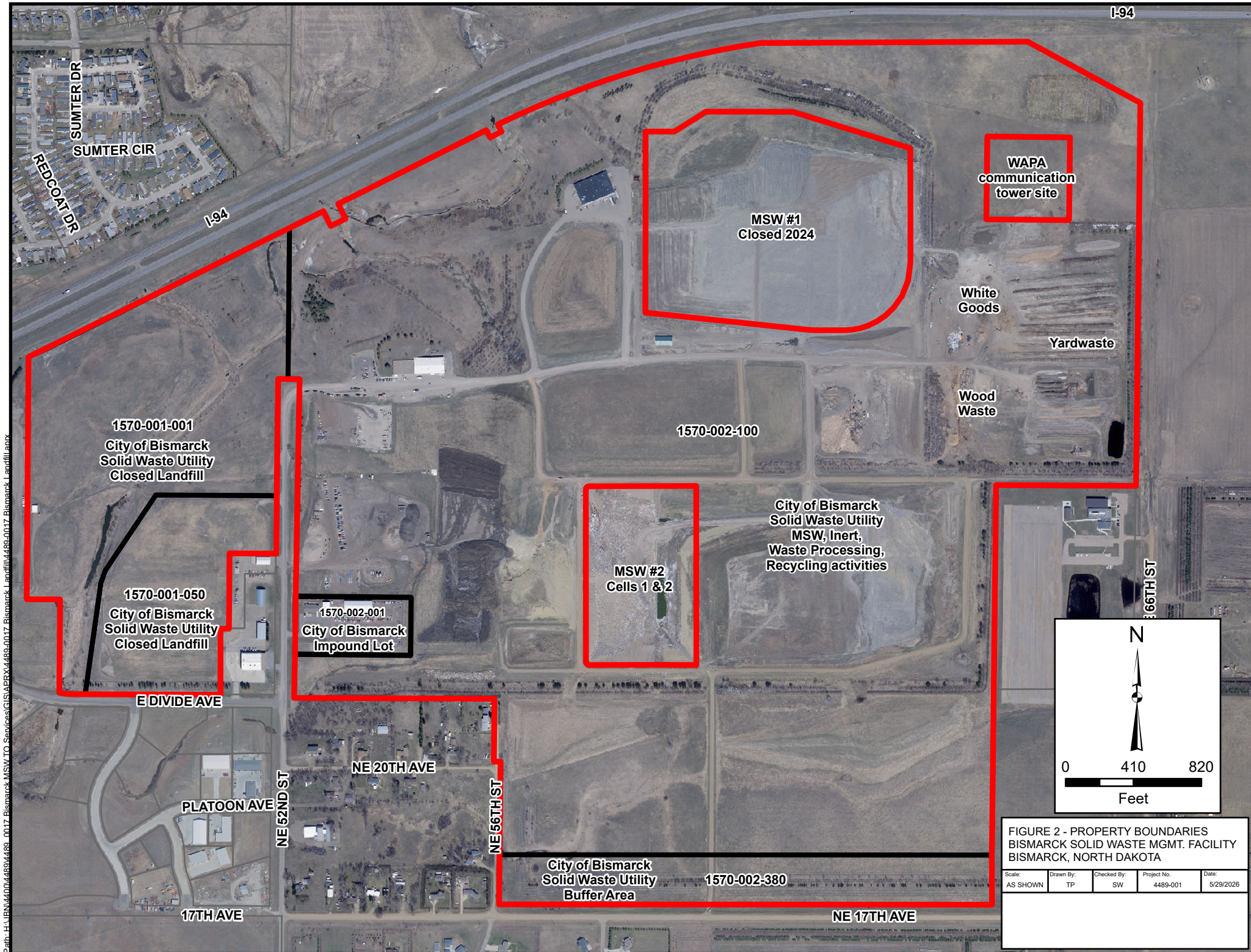
United States Environmental Protection Agency. AP 42, Fifth Edition, Volume I Chapter 2, Section 4: Municipal Solid Waste Landfills (Draft). October 2008.

United States Environmental Protection Agency. AP 42, Fifth Edition, Volume I Chapter 1, Section 4: Natural Gas Combustion. July 2008.

United States Environmental Protection Agency. AP 42, Fifth Edition, Volume I Chapter 3, Section 3: Gasoline and Diesel Industrial Engines. July 2008.



FIGURES



I-94

SUMTER CIR

REDCOAT DR

I-94

WAPA
communication
tower site

MSW #1
Closed 2024

White
Goods

Yardwaste

Wood
Waste

1570-001-001
City of Bismarck
Solid Waste Utility
Closed Landfill

1570-002-100

City of Bismarck
Solid Waste Utility
MSW, Inert,
Waste Processing,
Recycling activities

MSW #2
Cells 1 & 2

1570-001-050
City of Bismarck
Solid Waste Utility
Closed Landfill

1570-002-001
City of Bismarck
Impound Lot

E DIVIDE AVE

NE 20TH AVE

PLATOON AVE

NE 52ND ST

NE 56TH ST

City of Bismarck
Solid Waste Utility
Buffer Area

1570-002-380

17TH AVE

NE 17TH AVE

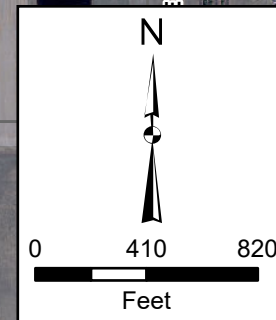


FIGURE 2 - PROPERTY BOUNDARIES
BISMARCK SOLID WASTE MGMT. FACILITY
BISMARCK, NORTH DAKOTA

Scale:	Drawn By:	Checked By:	Project No.	Date:
AS SHOWN	TP	SW	4489-001	5/29/2026

Redline Additions to Title V Permit for Bismarck Solid Waste Facility

Permittee: City of Bismarck

Permit Number: AOP-28476 V1.0.

Source Name: Bismarck Landfill

Source Type: Landfill

Below are anticipated redlines for the renewal of the Air Pollution Control Title V Permit to Operate for the Bismarck Solid Waste Facility (Bismarck Landfill). These redlines are in addition to the redlines tracked directly in the Permit document (pdf format) to update the Emission Unit 3 (EU3) compost screen engine from the Duetz model TD2011L4W to the Perkins model 404J-E22TA engine. Additions to the permit are to add the Air Curtain Incinerator (ACI) with the diesel engine (Emission Units 4A and 4B). The associated permit to construct number for the ACI is ACP-18186 V1.0.

Draft permit additions for the ACI:

Condition

1. Emission Unit Identification

Add

ACI Emissions Units 4A and 4B



Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Air Curtain Incinerator (ACI) rated up to 9 tons/hr (NSPS CCCC)	4A ^A	4A	None
ACI Diesel-Fired Engine (NSPS IIII) (MACT ZZZZ)	4B ^{A, B}	4B	Diesel Oxidation Catalyst

^A ACI is a combined unit that includes a diesel-fired engine.

^B Certified Tier 4 Engine, per 40 CFR 60, Subpart IIII.

2. Applicable Standards, Restrictions and Miscellaneous Conditions

A. Add

3) Subpart CCCC-Standards of Performance for Commercial and Industrial Solid Waste Incineration Units (EU 4A).

C. Add

Material Restrictions: Only 100% wood waste, 100% clean lumber and/or yard waste (including compost Tree of plastic) shall be burned. Burning

preservative treated wood, rubber (tires), asphalt shingles, and other materials that generate hazardous air pollutants is prohibited (EU 4A).

Location Restriction: The unit (EUs 4A and 4B) shall not be operated offsite of the Bismarck Municipal Solid Waste Facility or within a quarter mile of any residence or occupied building without prior approval from the occupant of the residence or building.

3. Emission Unit Limits

Add

ACI Emission Limits

Emission Unit Description	EU	EP	Pollutant/Parameter	Emission Limits
ACI	4A	4A	Opacity (Start-up)	≤35% within the 1 st 30-minutes of operation
			and Opacity (all other times)	and ≤10% other than start-up
ACI Generator Engine	4B	4B	Opacity	20% ^A

^A 40% opacity is permissible for not more than one six-minute period per hour.

4. Monitoring Requirements and Conditions:

A. Requirements

Add

Emission Unit Description	EP	Pollutant/Parameter	Monitoring Requirement (Method)	Condition Number	NDAC Applicable Requirement
ACI	4A	Opacity	EPA Method 9	4.D.1	33.1-15-12-02, Subpart CCCC
			Recordkeeping		33.1-15-14-06.5.1(3)a)
ACI Generator Engine	4B	Particulate Matter (PM) NOx, & CO	Engine Certification	4.C.2	33.1-15-14-06.5a(3)(a) 33.1-15-12-02, Subpart IIII
		Opacity	Recordkeeping	4.C.1	

					33.1-15-14-06.5.1(3)a)
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D. ACI Monitoring Conditions (EU 4A):

Emissions testing shall be conducted for the pollutant(s) listed below in accordance with EPA Reference Methods listed in 40 CFR 60, Appendix A.

Test methods other than those listed below may be used upon approval by the Department.

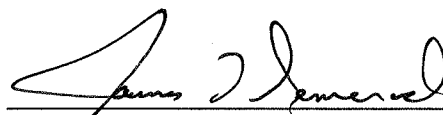
Emission Unit Description	EP	Pollutant/Parameter	Method
ACI	4A	Opacity	9

**AIR POLLUTION CONTROL
TITLE V PERMIT TO OPERATE**

Permittee: Name: City of Bismarck Address: P.O. Box 5503 Bismarck, ND 58506-5503	Permit Number: AOP-28476 v1.0 Source Name: Bismarck Landfill
Source Location: 2111 N 52 nd Street Bismarck, ND 58501 Burleigh County	Source Type: Landfill
Expiration Date: <u>December 6, 2021</u>	

Pursuant to Chapter 23.1-06 of the North Dakota Century Code (NDCC), and the Air Pollution Control Rules of the State of North Dakota, Article 33.1-15 of the North Dakota Administrative Code (NDAC), and in reliance on statements and representations heretofore made by the permittee (i.e., owner) designated above, a Title V Permit to Operate is hereby issued authorizing such permittee to operate the emissions units at the location designated above. This Title V Permit to Operate is subject to all applicable rules and orders now or hereafter in effect of the North Dakota Department of Environmental Quality (Department) and to any conditions specified on the following pages. All conditions are enforceable by EPA and citizens under the Clean Air Act unless otherwise noted.

Initial: 12/6/2021



James L. Semerad
Director
Division of Air Quality

City of Bismarck Landfill
Title V Permit to Operate
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1. **Emission Unit Identification:**

The emission units regulated by this permit are as follows:

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Municipal solid waste landfill with a total capacity of approximately $7.835 \times 10^6 \text{ m}^3$ ($\sim 10.248 \times 10^6 \text{ yd}^3$) of waste (NSPS XXX)	1	1	None ^A
Caterpillar C-27 Diesel-Fired Engine (Wood Grinder) rated at 950 bhp (NSPS IIII) (MACT ZZZZ)	2 ^B	2	Diesel Oxidation Catalyst
Duetz TD-2011 L4 W Diesel-Fired Engine (Compost Screen) rated at 91 bhp (NSPS IIII) (MACT ZZZZ)	3 ^B	3	Diesel Oxidation Catalyst
Fugitive Dust Emissions	FUG ^C	FUG	Fugitive Dust Control Condition 2.D

^A Future changes in the estimated size of the landfill or the kind of waste disposed, which could change the Nonmethane Organic Compound (NMOC) emissions, may result in required control equipment per Condition 4.B.

^B Certified Tier 4 Engine, per 40 CFR 60, Subpart IIII.

^C Insignificant or fugitive emission sources (no specific emission limit).

2. **Applicable Standards, Restrictions and Miscellaneous Conditions:**

A. **New Source Performance Standards (NSPS):** The permittee shall comply with all applicable requirements of the following NDAC 33.1-15-12-02 and 40 CFR 60 subparts in addition to complying with Subpart A - General Provisions.

- 1) Subpart XXX – Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification after July 17, 2014 (EU 1).
- 2) Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (EUs 2 and 3).

Applicable Requirement: NDAC 33.1-15-12

B. **Maximum Achievable Control Technology Standards (MACT):** The permittee shall comply with all applicable requirements of the following NDAC 33.1-15-22 and 40 CFR 63 subparts in addition to complying with Subpart A – General Provisions.

- 1) 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (EUs 2 and 3). The North Dakota Department of Environmental Quality has not adopted the area source provisions of this subpart. Please send all documentation to EPA at the address below.

U.S. EPA Region 8
1595 Wynkoop Street
Mail Code 8ENF-AT
Denver, CO 80202-1129

Applicable Requirement: 40 CFR 63, Subpart ZZZZ

- C. **Fuel Restriction:** The engines (EUs 2 and 3) are restricted to combusting only distillate oil containing no more than 0.0015 percent sulfur by weight.

Applicable Requirement: NDAC 33.1-15-14-06.5.b(1)

- D. **Fugitive Dust Control:** The permittee shall control Fugitive Dust (EU FUG) as follows:

- 1) Implement watering during land clearing, topsoil and overburden removal, and other material handling operations, unless natural moisture is sufficient to control fugitive particulate emissions.
- 2) Water stockpiles, both active and inactive, as necessary to control fugitive particulate emissions.
- 3) Vegetate closed landfill surfaces within one year of disturbance.
- 4) Water unpaved on-site haul roads as often as necessary to control fugitive particulate emissions.
- 5) Limit vehicle speeds on unpaved roads and disturbed areas on-site.
- 6) Minimize the size of the working face.
- 7) Apply cover to disposed solid waste as often as practical. The application of cover shall serve to control fugitive particulate emissions, odor production, and accumulation of litter. If the planned operations are shown to be ineffective in controlling any of the mentioned issues, remedial action shall be taken on a case-by-case basis.

Applicable Requirement: NDAC 33.1-15-14-06.5.b(1)

- E. **Like-Kind Engine Replacement:** This permit allows the permittee to replace the existing engine with a like-kind engine. Replacement is subject to the following conditions.

- 1) The Department must be notified within 10 days after change-out of the engine.
- 2) The replacement engine/turbine shall operate in the same manner, provide no increase in throughput and have equal or less emissions than the engine it is replacing.
- 3) The date of manufacture of the replacement engine must be included in the notification. The facility must comply with any applicable federal standards (e.g. NSPS, NESHAP, MACT) triggered by the replacement.

- 4) The replacement engine is subject to the same state emission limits as the existing engine in addition to any NSPS or MACT emission limit that is applicable. Testing to confirm compliance with the applicable emissions limits shall be in accordance with the applicable subparts (s).

Applicable Requirement: NDAC 33.1-15-14-06.5.b(1)

3. **Emission Unit Limits:**

Emission Unit Description	EU	EP	Pollutant/ Parameter	Emission Limit	NDAC Applicable Requirement
Municipal solid waste landfill	1	1	NMOC or NMOC & Surface Emissions of Methane (SEM)	34 Mg/yr threshold ^{A, B} or ≥34 Mg/yr & <50 Mg/yr & <500 ppm thresholds ^{B, C}	33.1-15-12-02, Subpart XXX
Caterpillar C-27 Diesel-Fired Engine	2	2	Opacity	20% ^{D, E}	33.1-15-03-02
Duetz TD 2011 L4 W Diesel-Fired Engine	3	3	Opacity	20% ^{D, E}	33.1-15-03-02

^A As determined by Tier 1, Tier 2, or Tier 3 of the subpart.

^B Exceeding the emission limit (threshold) requires additional monitoring or control as outlined in Condition 4.A, 4.B, Condition 5, and Condition 6, respectively.

^C As determined by Tier 4.

^D 40% permissible for not more than one six-minute period per hour.

^E The permittee shall comply with any applicable emission limits established by 40 CFR 63, Subpart ZZZZ.



4. **Monitoring Requirements and Conditions:**

A. **Requirements:**

Emission Unit Description	EP	Pollutant/ Parameter	Monitoring Requirement (Method)	Condition Number	NDAC Applicable Requirement
Municipal solid waste landfill	1	NMOC (as hexane)	NMOC Emissions Sampling/Calculation or NMOC Emissions Sampling/Calculation & SEM Monitoring	4.B	33.1-15-12, Subpart XXX
Caterpillar C-27 Diesel-Fired Engine	2	Particulate Matter (PM), NOx, & CO	Engine Certification	4.C.2	33.1-15-14-06.5.a(3)(a) 33.1-15-12, Subpart IIII
		Opacity	Recordkeeping	4.C.1	33.1-15-14-06.5.a(3)(a)
Duetz TD 2011 L4 W Diesel-Fired Engine	3	Particulate Matter (PM), NOx, & CO	Engine Certification	4.C.2	33.1-15-14-06.5.a(3)(a) 33.1-15-12, Subpart IIII
		Opacity	Recordkeeping	4.C.1	33.1-15-14-06.5.a(3)(a)



B. **NMOC Monitoring Conditions (EU 1):** The permittee shall calculate the annual NMOC emission rate per Equation 1 or Equation 2 provided in NDAC 33.1-15-12, Subpart XXX, §60.764(a)(1)(i) or (a)(1)(ii) depending upon the known actual year-to-year solid waste acceptance rate. As a result of the NMOC emission rate calculated per the aforementioned equations, monitoring shall be conducted as outlined below.

1) Tier 1:

- a) If the NMOC emission rate is less than 34 Mg/year, the permittee shall recalculate the NMOC annually according to §60.762(b) and submit an annual NMOC emission rate report (annual emissions inventory report) per §60.767(b), unless the provisions of §60.767(b)(1)(ii) are met.
- b) If the NMOC emission rate is equal to or greater than 34 Mg/year, the permittee shall conduct one of the following:
 - 1) Within in one year of determining an NMOC emission rate equal to or greater than 34 Mg/year, submit a gas collection and control system design per §60.767(c), operate the system within 30 months according to §60.762(b)(2)(ii) and (iii), and conduct monitoring per §60.766;

- 2] Use the Tier 2 site-specific NMOC concentration recalculation method specified in §60.764(a)(3) and Condition 4.B.2); or
 - 3] Determine the site-specific methane generation rate constant per Tier 3 methods as specified in §60.764(a)(4) and Condition 4.B.3).
- 2) Tier 2: The permittee shall determine the site-specific NMOC concentration per the method specified in §60.764(a)(3) and recalculate the NMOC mass emission rate per §60.764(a)(1)(i) or (a)(1)(ii) using the average site-specific NMOC concentration from the collected samples in lieu of the default value.
- a) If the NMOC emission rate is less than 34 Mg/year according to §60.764(a)(3), the permittee shall recalculate the NMOC mass emission rate annually per §60.762(b) and the site-specific (Tier 2) testing must be conducted every five years.
 - b) If the NMOC mass emission rate is equal to or greater than 34 Mg/year, the permittee shall conduct one of the following:
 - 1] Within in one year of determining an NMOC emission rate equal to or greater than 34 Mg/year, submit a gas collection and control system design per §60.767(c), operate the system within 30 months according to §60.762(b)(2)(i) and (iii), and conduct monitoring per §60.766;
 - 2] Determine the site-specific methane generation rate constant per Tier 3 methods specified in §60.764(a)(4) and Condition 4.B.3).; or
 - 3] Conduct Tier 4 surface methane emissions monitoring per §60.764(a)(6) and Condition 4.B.4).
- 3) Tier 3: The permittee shall determine a site-specific methane generation constant according to 40 CFR 60 Appendix A-1 Method 2E and a site-specific NMOC concentration according to §60.764(a)(3). The NMOC mass emission rate must be recalculated per §60.764(a)(1)(i) or (a)(1)(ii) using the average site-specific NMOC concentration from the collected samples and the site-specific methane generation constant in lieu of the default values.
- a) If the NMOC emission rate (Tier 3 monitoring) is less than 34 Mg/year, then the permittee must recalculate the NMOC annually, using the Tier 2 and Tier 3 site-specific values, according to §60.764(a)(1)(i) or (a)(1)(ii).
 - b) If the NMOC mass emission rate is equal to or greater than 34 Mg/year, the permittee shall conduct one of the following:
 - 1] Within in one year of determining an NMOC emission rate equal to or greater than 34 Mg/year, submit a gas collection and control system design per §60.767(c), then install, and operate the system within 30 months

according to §60.762(b)(2)(ii) and (iii), and conduct monitoring per §60.766; or

- 2] Conduct Tier 4 surface methane emissions monitoring per §60.764(a)(6) and Condition 4.B.4).
- 4) Tier 4: The NMOC emission rate shall be equal to or greater than 34 Mg/year but less than 50 Mg/year to qualify for Tier 4 monitoring. The permittee shall demonstrate that the surface methane emissions are below 500 ppm on a quarterly basis according to §60.764(a)(6). Monitoring shall be conducted per §60.764(a)(6).
 - a) For facilities that report a site-specific methane concentration greater than 500 parts per million from the landfill surface, the permittee shall submit a gas collection and control system design per §60.767(c) operate the system within 30 months according to §60.762(b)(2)(ii) and (iii).

C. Diesel-Fired Engine Monitoring Conditions (EUs 2 and 3):

- 1) For purposes of compliance monitoring, the burning of low sulfur distillate oil shall be considered credible evidence of compliance with the applicable opacity standard. However, results from 40 CFR 60, Appendix A, Method 9 - Visual Determination of the Opacity of Emissions will take precedence over the burning of distillate oil, for evidence of compliance or noncompliance with the applicable opacity standard.
- 2) Collect operational and maintenance data to demonstrate that the facility complies with the engine manufacture's emissions-related written instructions in 40 CFR §60.4211(a).

5. Recordkeeping Requirements and Conditions:

- A. The permittee shall maintain compliance monitoring records according to §60.768 and as outlined in the Monitoring Records table (below) that includes the following information.
 - 1) The date, place (as defined in the permit) and time of sampling or measurement.
 - 2) The date(s) testing was performed.
 - 3) The company, entity, or person that performed the testing.
 - 4) The testing techniques or methods used.
 - 5) The results of such testing.
 - 6) The operating conditions that existed at the time of sampling or measurement.

Applicable Requirement: NDAC 33.1-15-14-06.5.a(3)(b)[1]

Monitoring Records

Emission Unit Description	EP	Pollutant/ Parameter	Compliance Monitoring Record
Municipal solid waste landfill	1	NMOC or NMOC & SEM Monitoring	NMOC Calculations/Emissions Test Data or NMOC Calculations/Emissions Test Data & Surface Emission Monitoring of Methane Data
Caterpillar C-27 Diesel-Fired Engine	2	Particulate matter (PM), NOx & CO Opacity	Maintain Records & Maintenance Plan(s) Fuel Type Data & Operational/Maintenance Data
Duetz TD 2011 L4 W1 Diesel- Fired Engine	3	Particulate matter (PM), NOx & CO Opacity	Maintain Records & Maintenance Plan(s) Fuel Type Data & Operational/Maintenance Data

B. Recordkeeping Conditions:

- 1) The permittee shall retain readily accessible paper or electronic records per 40 CFR 60, §60.768, including the design capacity, the current amount of solid waste in-place, and the year-by-year acceptance rate. Off-site records that are retrievable within four hours may be maintained in lieu of on-site records.

Applicable Requirement: NDAC 33.1-15-12, Subpart XXX

- 2) Tier 4 Recordkeeping: Permittees demonstrating compliance per Tier 4 site-specific surface methane emissions monitoring shall maintain records per §60.768(g).

Applicable Requirement: NDAC 33.1-15-12, Subpart XXX

- 3) Recordkeeping for the engines (EUs 2 and 3) shall be in accordance with 40 CFR 60, Subpart A, §60.7, Notification and Recordkeeping and 40 CFR 60, Subpart IIII, §60.4214.

Applicable Requirement: NDAC 33.1-15-12 Subparts A and IIII

- 4) The permittee shall retain records of all required monitoring data and support information for a period of at least five years from the date of the monitoring sampling, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings/computer printouts of continuous monitoring instrumentation, and copies of all reports required by the permit.

Applicable Requirements: NDAC 33.1-15-14-06.5.a(3)(b)[2]

6. **Reporting:**

A. **NMOC Reporting Conditions (EU 1):**

- 1) The permittee shall conduct reporting according to 40 CFR §60.767 and, if applicable, shall submit an annual NMOC emission rate report (annual emissions inventory report) in a format provided or approved by the Department. This report shall be submitted by March 15 of each year, unless the provisions of §60.767(b)(1)(ii) are met, or the permittee elects to install a collection and control system that complies with §60.762(b)(2)(ii) and (iii). Insignificant units/activities listed in this permit do not need to be included in the report.

Applicable Requirement: NDAC 33.1-15-12, Subpart XXX, NDAC 33.1-15-14-06.5.a(7) and NDAC 33.1-15-23-04

- 2) Tier 1:
 - a) If the five consecutive year annual emission rate is less than 34 Mg/year, then an estimate of the NMOC emission rate over that five-year period may be submitted in lieu of an annual report. The five consecutive year report shall be revised every five-year period and the report shall include the following:
 - b) the current mass of solid waste at the facility; and
 - c) the estimate waste acceptance rate for each of the five years for which an NMOC emission rate is estimated.

Applicable Requirements: NDAC 33.1-15-12, Subpart XXX and NDAC 33.1-15-23-04

- 3) Tier 2: The permittee shall submit the NMOC concentration, and corresponding NMOC emission rate calculated per §60.764(a)(3) to the Department within 60 days after the determination of the results of the Tier 2 evaluation.
 - a) If the Tier 2 calculation demonstrates that the NMOC is less than 34 Mg/year, then the permittee shall submit a periodic estimate of the NMOC emission rate per §60.767(b)(1).
 - b) If using the site-specific NMOC concentration obtained from Tier 2 procedures result in a NMOC emissions rate equal to or greater than 34 Mg year, then the permittee shall conduct reporting according to Tier 3 (Condition 6.A.4) or Tier 4 (Condition 6.A.5) reporting requirements.

Applicable Requirements: NDAC 33.1-15-12, Subpart XXX and NDAC 33.1-15-23-04

- 4) Tier 3:
 - a) If the Tier 2 site specific NMOC concentration and Tier 3 site-specific methane generation rate is less than 34 Mg/year, then the permittee shall submit an annual

NMOC emission rate report as provided in §60.767(b)(1) unless the provisions of §60.767(b)(1)(ii) are met.

- b) If the Tier 2 site specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 34 Mg/year, then the permittee shall either:
 - 1] Conduct reporting according to Tier 4 procedures specified in §60.764(a)(6) once, and that value shall be use in all annual NMOC emission rate calculations; or
 - 2] Submit a gas collection and control system design plan according to §60.767(c), then install and operate the system within 30 months per §60.762(b)(2)(ii) and (iii).

Applicable Requirements: NDAC 33.1-15-12, Subpart XXX and NDAC 33.1-15-23-04

- 5) Tier 4: For facilities that elect to monitor site specific surface methane emissions per §60.764(a)(6), the permittee shall conduct Tier 4 reporting according to §60.767(c)(4)(iii).
 - a) For facilities that report a site-specific methane concentration greater than 500 parts per million from the landfill surface, the permittee shall submit a gas collection and control system design per §60.767(c), operate the system within 30 months according to §60.762(b)(2)(ii) and (iii), and conduct reporting per §60.767.
 - b) For facilities that demonstrate site-specific methane concentration less than 500 parts per million, the permittee shall submit an annual Tier 4 methane surface emission report (annual emissions inventory report).

Applicable Requirements: NDAC 33.1-15-14-02, Subpart XXX and NDAC 33.1-15-23-

- B. **Diesel-Fired Engine Reporting (EUs 2 and 3):** The permittee shall conduct reporting for certified stationary CI internal combustion engines per §60.4214(a)(2).

Applicable Requirement: NDAC 33.1-15-12, Subpart IIII

- C. The permittee shall submit an annual compliance certification report in accordance with NDAC 33.1-15-14-06.5.c(5) within 45 days after December 31 of each year in a format provided or approved by the Department. The report must include the reporting requirements according to §60.2210.

Applicable Requirement: NDAC 33.1-15-14-06.5.c(5)

- D. For emission units where the method of compliance monitoring is demonstrated by an EPA Test Method or a portable analyzer test, the test report shall be submitted to the Department within 60 days after completion of the test.

Applicable Requirement: NDAC 33.1-15-14-06.5.a(6)(e)

7. **Facility Wide Operating Conditions:**

A. **Ambient Air Quality Standards:**

- 1) Particulate and gases. The permittee shall not emit air contaminants in such a manner or amount that would violate the standards of ambient air quality listed in Table 1 of NDAC 33.1-15-02, external to buildings, to which the general public has access.
- 2) Radioactive substances. The permittee shall not release into the ambient air any radioactive substances exceeding the concentrations specified in NDAC 33.1-10.
- 3) Other air contaminants. The permittee shall not emit any other air contaminants in concentrations that would be injurious to human health or well-being or unreasonably interfere with the enjoyment of property or that would injure plant or animal life.
- 4) Disclaimer. Nothing in any other part or section of this permit may in any manner be construed as authorizing or legalizing the emission of air contaminants in such manner that would violate the standards in Paragraphs 1), 2) and 3) of this condition.

Applicable Requirements: NDAC 33.1-15-02-04 and 40 CFR 50.1(e)

- B. **Fugitive Emissions:** The release of fugitive emissions shall comply with the applicable requirements in NDAC 33.1-15-17.

Applicable Requirement: NDAC 33.1-15-17

- C. **Open Burning:** The permittee may not cause, conduct, or permit open burning of refuse, trade waste, or other combustible material, except as provided for in Section 33.1-15-04-02 and may not conduct, cause, or permit the conduct of a salvage operation by open burning. Any permissible open burning under NDAC 33.1-15-04-02 must comply with the requirements of that section.

Applicable Requirement: NDAC 33.1-15-04

- D. **Asbestos Renovation or Demolition:** Any asbestos renovation or demolition at the facility shall comply with emission standard for asbestos in NDAC 33.1-15-13.

Applicable Requirement: NDAC 33.1-15-13-02

E. **Requirements for Organic Compounds Gas Disposal:**

- 1) Any organic compounds, gases and vapors which are generated as wastes as the result of storage, refining or processing operations and which contain hydrogen sulfide shall be incinerated, flared or treated in an equally effective manner before being released into the ambient air.
- 2) Each flare must be equipped and operated with an automatic ignitor or a continuous burning pilot.

Applicable Requirement: NDAC 33.1-15-07-02

- F. **Rotating Pumps and Compressors:** All rotating pumps and compressors handling volatile organic compounds must be equipped and operated with properly maintained seals designed for their specific product service and operating conditions.

Applicable Requirement: NDAC 33.1-15-07-01.5

- G. **Shutdowns/Malfunction/Continuous Emission Monitoring System Failure:**

- 1) Maintenance Shutdowns. In the case of shutdown of air pollution control equipment for necessary scheduled maintenance, the intent to shut down such equipment shall be reported to the Department at least 24 hours prior to the planned shutdown provided that the air contaminating source will be operated while the control equipment is not in service. Such prior notice shall include the following:
 - a) Identification of the specific facility to be taken out of service as well as its location and permit number.
 - b) The expected length of time that the air pollution control equipment will be out of service.
 - c) The nature and estimated quantity of emissions of air pollutants likely to be emitted during the shutdown period.
 - d) Measures, such as the use of off-shift labor and equipment, that will be taken to minimize the length of the shutdown period.
 - e) The reasons that it would be impossible or impractical to shut down the source operation during the maintenance period.
 - f) Nothing in this subsection shall in any manner be construed as authorizing or legalizing the emission of air contaminants in excess of the rate allowed by this article or a permit issued pursuant to this article.

Applicable Requirement: NDAC 33.1-15-01-13.1

- 2) Malfunctions.
 - a) When a malfunction in any installation occurs that can be expected to last longer than 24 hours and cause the emission of air contaminants in violation of this article or other applicable rules and regulations, the person responsible for such installation shall notify the Department of such malfunction as soon as possible during normal working hours. The notification must contain a statement giving all pertinent facts, including the estimated duration of the breakdown. The Department shall be notified when the condition causing the malfunction has been corrected.

- b) Immediate notification to the Department is required for any malfunction that would threaten health or welfare or pose an imminent danger. During normal working hours the Department can be contacted at 701-328-5188. After hours the Department can be contacted through the 24-hour state radio emergency number 1-800-472-2121. If calling from out of state, the 24-hour number is 701-328-9921.
- c) Unavoidable Malfunction. The owner or operator of a source who believes any excess emissions resulted from an unavoidable malfunction shall submit a written report to the Department which includes evidence that:
 - [1] The excess emissions were caused by a sudden, unavoidable breakdown of technology that was beyond the reasonable control of the owner or operator.
 - [2] The excess emissions could not have been avoided by better operation and maintenance, did not stem from an activity or event that could have been foreseen and avoided, or planned for.
 - [3] To the extent practicable, the source maintained and operated the air pollution control equipment and process equipment in a manner consistent with good practice for minimizing emissions, including minimizing any bypass emissions.
 - [4] Any necessary repairs were made as quickly as practicable, using off-shift labor and overtime as needed and possible.
 - [5] All practicable steps were taken to minimize the potential impact of the excess emissions on ambient air quality.
 - [6] The excess emissions are not part of a recurring pattern that may have been caused by inadequate operation or maintenance, or inadequate design of the malfunctioning equipment.

The report shall be submitted within 30 days of the end of the calendar quarter in which the malfunction occurred or within 30 days of a written request by the Department, whichever is sooner.

The burden of proof is on the owner or operator of the source to provide sufficient information to demonstrate that an unavoidable equipment malfunction occurred. The Department may elect not to pursue enforcement action after considering whether excess emissions resulted from an unavoidable equipment malfunction. The Department will evaluate, on a case-by-case basis, the information submitted by the owner or operator to determine whether to pursue enforcement action.

Applicable Requirement: NDAC 33.1-15-01-13.2

- 3) Continuous Emission Monitoring System Failures. When a failure of a continuous emission monitoring system occurs, an alternative method for measuring or estimating emissions must be undertaken as soon as possible. The owner or operator of a source that

uses an alternative method shall have the burden of demonstrating that the method is accurate. Timely repair of the emission monitoring system must be made. The provisions of this subsection do not apply to sources that are subject to monitoring requirements in Chapter 33.1-15-21 (40 CFR 75, Acid Rain Program).

Applicable Requirement: NDAC 33.1-15-01-13.3

H. **Noncompliance Due to an Emergency:** The permittee may seek to establish that noncompliance with a technology-based emission limitation under this permit was due to an emergency. To do so, the permittee shall demonstrate the affirmative defense of emergency through properly signed, contemporaneous operating logs, or other relevant evidence that:

- 1) An emergency occurred, and that the permittee can identify the cause(s) of the emergency;
- 2) The permitted facility was at the time being properly operated;
- 3) During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards, or other requirements in this permit; and
- 4) The permittee submitted notice of the emergency to the Department within one working day of the time when emission limitations were exceeded longer than 24-hours due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. Those emergencies not reported within one working day, as well as those that were, will be included in the semi-annual report.

In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.

Technology-based emission limits are those established on the basis of emission reductions achievable with various control measures or process changes (e.g., a New Source Performance Standard) rather than those established to attain a health-based air quality standard.

An “emergency” means any situation arising from sudden and reasonably unforeseeable events beyond the control of this source, including acts of God, which requires immediate corrective action to restore normal operation, and that causes this source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

Applicable Requirement: NDAC 33.1-15-14-06.5.g

I. **Air Pollution from Internal Combustion Engines:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-08-01 – Internal Combustion Engine Emissions Restricted.

Applicable Requirement: NDAC 33.1-15-08-01

J. **Prohibition of Air Pollution:**

- 1) The permittee shall not permit or cause air pollution, as defined in NDAC 33.1-15-01-04.
- 2) Nothing in any other part of this permit or any other regulation relating to air pollution shall in any manner be construed as authorizing or legalizing the creation or maintenance of air pollution.

Applicable Requirement: NDAC 33.1-15-01-15

K. **Performance Tests:**

- 1) The Department may reasonably require the permittee to make or have made tests, at a reasonable time or interval, to determine the emission of air contaminants from any source, for the purpose of determining whether the permittee is in violation of any standard or to satisfy other requirements of NDCC 23.1-06. All tests shall be made, and the results calculated in accordance with test procedures approved or specified by the Department including the North Dakota Department of Environmental Quality Emission Testing Guideline. All tests shall be conducted by reputable, qualified personnel. The Department shall be given a copy of the test results in writing and signed by the person responsible for the tests.
- 2) The Department may conduct tests of emissions of air contaminants from any source. Upon request of the Department, the permittee shall provide necessary and adequate access into stacks or ducts and such other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices, as may be necessary for proper determination of the emission of air contaminants.

Applicable Requirement: NDAC 33.1-15-01-12

- 3) Except for sources subject to 40 CFR 63, the permittee shall notify the Department by submitting a Proposed Test Plan, or its equivalent, at least 30 calendar days in advance of any tests of emissions of air contaminants required by the Department. The permittee shall notify the Department at least 60 calendar days in advance of any performance testing required under 40 CFR 63, unless otherwise specified by the subpart. If the permittee is unable to conduct the performance test on the scheduled date, the permittee shall notify the Department as soon as practicable when conditions warrant and shall coordinate a new test date with the Department.

Failure to give the proper notification may prevent the Department from observing the test. If the Department is unable to observe the test because of improper notification, the test results may be rejected.

Applicable Requirements: NDAC 33.1-15-14-06.5.a(3)(a), NDAC 33.1-15-12-02 Subpart A (40 CFR 60.8), NDAC 33.1-15-13-01.2 Subpart A (40 CFR 61.13), NDAC 33.1-15-22-03 Subpart A (40 CFR 63.7)

- L. **Pesticide Use and Disposal:** Any use of a pesticide or disposal of surplus pesticides and empty pesticide containers shall comply with the requirements in NDAC 33.1-15-10.

Applicable Requirements: NDAC 33.1-15-10-01 and NDAC 33.1-15-10-02

- M. **Air Pollution Emergency Episodes:** When an air pollution emergency episode is declared by the Department, the permittee shall comply with the requirements in NDAC 33.1-15-11.

Applicable Requirements: NDAC 33.1-15-11-01 through NDAC 33.1-15-11-04

- N. **Stratospheric Ozone Protection:** The permittee shall comply with any applicable standards for recycling and emissions reduction pursuant to 40 CFR 82, Subpart F, except as provided for MVACs in Subpart B:

- 1) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to Section 82.156.
- 2) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to Section 82.158.
- 3) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to Section 82.161.
- 4) Persons owning commercial or industrial process refrigeration equipment must comply with the leak repair requirements pursuant to Section 82.156.

Applicable Requirement: 40 CFR 82

- O. **Chemical Accident Prevention:** The permittee shall comply with all applicable requirements of Chemical Accident Prevention pursuant to 40 CFR 68. The permittee shall comply with the requirements of this part no later than the latest of the following dates:

- 1) Three years after the date on which a regulated substance is first listed under this part; or
- 2) The date on which a regulated substance is first present above a threshold quantity in a process.

Applicable Requirement: 40 CFR 68

- P. **Air Pollution Control Equipment:** The permittee shall maintain and operate air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. The manufacturer's recommended Operations and Maintenance (O&M) procedures, or a site-specific O&M procedure developed from the manufacturer's recommended O&M procedures, shall be followed to assure proper operation and maintenance of the equipment. The permittee shall have the O&M procedures available onsite and provide the Department with a copy when requested.

Applicable Requirement: NDAC 33.1-15-14-06.5.b(1)

- Q. **Prevention of Significant Deterioration of Air Quality** (40 CFR 52.21 as incorporated by NDAC Chapter 33.1-15-15): If this facility is classified as a major stationary source under the Prevention of Significant Deterioration of Air Quality (PSD) rules, a Permit to Construct must be obtained from the Department for any project which meets the definition of a “major modification” under 40 CFR 52.21(b)(2).

If this facility is classified as a major stationary source under the PSD rules and the permittee elects to use the method specified in 40 CFR 52.21(b)(41)(ii)(a) through (c) for calculating the projected actual emissions of a proposed project, then the permittee shall comply with all applicable requirements of 40 CFR 52.21(r)(6).

Applicable Requirement: NDAC 33.1-15-15-01.2

8. **General Conditions:**

- A. **Annual Fee Payment:** The permittee shall pay an annual fee, for administering and monitoring compliance, which is determined by the actual annual emissions of regulated contaminants from the previous calendar year. The Department will send a notice, identifying the amount of the annual permit fee, to the permittee of each affected installation. The fee is due within 60 days following the date of such notice. Any source that qualifies as a “small business” may petition the Department to reduce or exempt any fee required under this section. Failure to pay the fee in a timely manner or submit a certification for exemption may cause this Department to initiate action to revoke the permit.

Applicable Requirements: NDAC 33.1-15-14-06.5.a(7) and NDAC 33.1-15-23-04

- B. **Permit Renewal and Expiration:** This permit shall be effective from the date of its issuance for a fixed period of five years. The permittee’s right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least six months, but no more than 18 months, prior to the date of permit expiration. The Department shall approve or disapprove the renewal application within 60 days of receipt. Unless the Department requests additional information or otherwise notifies the applicant of incompleteness, the application shall be deemed complete. For timely and complete renewal applications for which the Department has failed to issue or deny the renewal permit before the expiration date of the previous permit, all terms and conditions of the permit, including any permit shield previously granted shall remain in effect until the renewal permit has been issued or denied. The application for renewal shall include the current permit number, description of any permit revisions and off-permit changes that occurred during the permit term, and any applicable requirements that were promulgated and not incorporated into the permit during the permit term.

Applicable Requirements: NDAC 33.1-15-14-06.4 and NDAC 33.1-15-14-06.6

- C. **Transfer of Ownership or Operation:** This permit may not be transferred except by procedures allowed in Chapter 33.1-15-14 and is to be returned to the Department upon the destruction or change of ownership of the source unit(s), or upon expiration, suspension or revocation of this permit. A change in ownership or operational control of a source is treated as an administrative permit amendment if no other change in the permit is necessary and provided that a written

agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the Department.

Applicable Requirement: NDAC 33.1-15-14-06.6.d

- D. **Property Rights:** This permit does not convey any property rights of any sort, or any exclusive privilege.

Applicable Requirement: NDAC 33.1-15-14-06.5.a(6)(d)

- E. **Submissions:**

- 1) Reports, test data, monitoring data, notifications, and requests for renewal shall be submitted to the Department using a format provided or approved by the Department. Physical submittals shall be submitted to:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947

- 2) Any application form, report or compliance certification submitted shall be certified as being true, accurate, and complete by a responsible official.

Applicable Requirement: NDAC 33.1-15-14-06.4.d

- F. **Right of Entry:** Any duly authorized officer, employee or agent of the North Dakota Department of Environmental Quality may enter and inspect any property, premise or place listed on this permit or where records are kept concerning this permit at any reasonable time for the purpose of ascertaining the state of compliance with this permit and the North Dakota Air Pollution Control Rules. The Department may conduct tests and take samples of air contaminants, fuel, processing material, and other materials which affect or may affect emissions of air contaminants from any source. The Department shall have the right to access and copy any records required by the Department's rules and to inspect monitoring equipment located on the premises.

Applicable Requirements: NDAC 33.1-15-14-06.5.c(2) and NDAC 33.1-15-01-06

- G. **Compliance:** The permittee must comply with all conditions of this permit. Any noncompliance with a federally-enforceable permit condition constitutes a violation of the Federal Clean Air Act. Any noncompliance with any State enforceable condition of this permit constitutes a violation of NDCC Chapter 23.1-06 and NDAC 33.1-15. Violation of any condition of this permit is grounds for enforcement action, for permit termination, revocation and reissuance or modification, or for denial of a permit renewal application. Noncompliance may also be grounds for assessment of penalties under the NDCC 23.1-06. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Applicable Requirements: NDAC 33.1-15-14-06.5.a(6)(a) and NDAC 33.1-15-14-06.5.a(6)(b)

- H. **Duty to Provide Information:** The permittee shall furnish to the Department, within a reasonable time, any information that the Department may request in writing to determine whether cause

exists for modifying, revoking and reissuing, or terminating the permit, or to determine compliance with the permit. This includes instances where an alteration, repair, expansion, or change in method of operation of the source occurs. Upon request, the permittee shall also furnish to the Department copies of records that the permittee is required to keep by this permit, or for information claimed to be confidential, the permittee may furnish such recourse directly to the Department along with a claim of confidentiality. The permittee, upon becoming aware that any relevant facts were omitted, or incorrect information was submitted in the permit application, shall promptly submit such supplementary facts or corrected information. Items that warrant supplemental information submittal include, but are not limited to, changes in the ambient air boundary and changes in parameters associated with emission points (i.e., stack parameters). The permittee shall also provide additional information as necessary to address any requirements that become applicable to the source after the date a complete renewal application was submitted but prior to release of a draft permit.

Applicable Requirements: NDAC 33.1-15-14-06.5.a(6)(e), NDAC 33.1-15-14-06.6.b(3) and NDAC 33.1-15-14-06.4.b

I. **Reopening for Cause:** The Department will reopen and revise this permit as necessary to remedy deficiencies in the following circumstances:

- 1) Additional applicable requirements under the Federal Clean Air Act become applicable to the permittee with a remaining permit term of three or more years. Such a reopening shall be completed no later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the expiration date of this permit.
- 2) The Department or the United States Environmental Protection Agency determines that this permit contains a material mistake or inaccurate statements were made in establishing the emissions standards or other terms or conditions of this permit.
- 3) The Department or the United States Environmental Protection Agency determines that the permit must be revised or revoked to assure compliance with the applicable requirements.
- 4) Reopenings shall not be initiated before a notice of intent to reopen is provided to the permittee by the Department at least 30 days in advance of the date that this permit is to be reopened, except that the Department may provide a shorter time period in the case of an emergency. Proceedings to reopen and issue this permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. Such reopening shall be made as expeditiously as practicable.

Applicable Requirement: NDAC 33.1-15-14-06.6.f

J. **Permit Changes:** The permit may be modified, revoked, reopened, and reissued or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Applicable Requirement: NDAC 33.1-15-14-06.5.a(6)(c)

K. **Off-Permit Changes:** A permit revision is not required for changes that are not addressed or prohibited by this permit, provided the following conditions are met:

- 1) No such change may violate any term or condition of this permit.
- 2) Each change must comply with all applicable requirements.
- 3) Changes under this provision may not include changes or activities subject to any requirement under Title IV or that are modifications under any provision of Title I of the Federal Clean Air Act.
- 4) A Permit to Construct under NDAC 33.1-15-14-02 has been issued, if required.
- 5) Before the permit change is made, the permittee must provide written notice to both the Department and Air Program (8P-AR), Office of Partnerships & Regulatory Assistance, US EPA Region 8, 1595 Wynkoop Street, Denver, CO 80202-1129, except for changes that qualify as insignificant activities in Section 33.1-15-14-06. This notice shall describe each change, the date of the change, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result.
- 6) The permittee shall record all changes that result in emissions of any regulated air pollutant subject to any applicable requirement not otherwise regulated under this permit, and the emissions resulting from those changes. The record shall reside at the permittee's facility.

Applicable Requirement: NDAC 33.1-15-14-06.6.b(3)

L. **Administrative Permit Amendments:** This permit may be revised through an administrative permit amendment, if the revision to this permit accomplishes one of the following:

- 1) Corrects typographical errors.
- 2) Identifies a change in the name, address or phone number of any person identified in this permit or provides a similar minor administrative change at the source.
- 3) Requires more frequent monitoring or reporting by the permittee.
- 4) Allows for a change in ownership or operational control of the source where the Department determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittee has been submitted to the Department.
- 5) Incorporates into the Title V permit the requirements from a Permit to Construct when the review was substantially equivalent to Title V requirements for permit issuance, renewal, reopenings, revisions and permit review by the United States Environmental Protection Agency and affected state review, that would be applicable to the change if it were subject to review as a permit modification and compliance requirements substantially equivalent to Title V requirements for permit content were contained in the Permit to Construct.
- 6) Incorporates any other type of change which the Administrator of the United States Environmental Protection Agency has approved as being an administrative permit amendment as part of the Department's approved Title V operating permit program.

Applicable Requirement: NDAC 33.1-15-14-06.6.d

M. **Minor Permit Modification:** This permit may be revised by a minor permit modification, if the proposed permit modification meets the following requirements:

- 1) Does not violate any applicable requirement.
- 2) Does not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in this permit.
- 3) Does not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis.
- 4) Does not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include a federally enforceable emissions cap assumed to avoid classification as a modification under any provision of Title I of the Federal Clean Air Act; and alternative emissions limit approved pursuant to regulations promulgated under Section 112(i)(5) of the Federal Clean Air Act.
- 5) Is not a modification under NDAC 33.1-15-12, 33.1-15-13, and 33.1-15-15 or any provision of Title I of the Federal Clean Air Act.
- 6) Is not required to be processed as a significant modification.

Applicable Requirement: NDAC 33.1-15-14-06.6.e(1)

N. **Significant Modifications:**

- 1) Significant modification procedures shall be used for applications requesting permit modifications that do not qualify as minor permit modifications or as administrative amendments. Every significant change in existing monitoring permit terms or conditions and every relaxation of reporting or recordkeeping permit terms or conditions shall be considered significant. Nothing therein shall be construed to preclude the permittee from making changes consistent with this subsection that would render existing permit compliance terms and conditions irrelevant.
- 2) Significant permit modifications shall meet all Title V requirements, including those for applications, public participation, review by affected states, and review by the United States Environmental Protection Agency, as they apply to permit issuance and permit renewal. The Department shall complete review of significant permit modifications within nine months after receipt of a complete application.

Applicable Requirement: NDAC 33.1-15-14-06.6.e(3)

O. **Operational Flexibility:** The permittee is allowed to make a limited class of changes within the permitted facility that contravene the specific terms of this permit without applying for a permit revision, provided the changes do not exceed the emissions allowable under this permit, are not Title I modifications and a Permit to Construct is not required. This class of changes does not include changes that would violate applicable requirements; or changes to federally-enforceable

permit terms or conditions that are monitoring, recordkeeping, reporting, or compliance certification requirements.

The permittee is required to send a notice to both the Department and Air Program (8P-AR), Office of Partnerships & Regulatory Assistance, US EPA Region 8, 1595 Wynkoop Street, Denver, CO 80202-1129, at least seven days in advance of any change made under this provision. The notice must describe the change, when it will occur and any change in emissions, and identify any permit terms or conditions made inapplicable as a result of the change. The permittee shall attach each notice to its copy of this permit. Any permit shield provided in this permit does not apply to changes made under this provision.

Applicable Requirement: NDAC 33.1-15-14-06.6.b(2)

P. Relationship to Other Requirements: Nothing in this permit shall alter or affect the following:

- 1) The provisions of Section 303 of the Federal Clean Air Act (emergency orders), including the authority of the administrator of the United States Environmental Protection Agency under that section.
- 2) The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance.
- 3) The ability of the United States Environmental Protection Agency to obtain information from a source pursuant to Section 114 of the Federal Clean Air Act.
- 4) Nothing in this permit shall relieve the permittee of the requirement to obtain a Permit to Construct.

Applicable Requirements: NDAC 33.1-15-14-06.3 and NDAC 33.1-15-14-06.5.f(3)(a), (b) and (d)

Q. Severability Clause: The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

Applicable Requirement: NDAC 33.1-15-14-06.5.a(5)

R. Circumvention: The permittee shall not cause or permit the installation or use of any device of any means which conceals or dilutes an emission of air contaminants which would otherwise violate this permit.

Applicable Requirement: NDAC 33.1-15-01-08

9. State Enforceable Only Conditions (not Federally enforceable):

A. General Odor Restriction: The permittee shall not discharge into the ambient air any objectionable odorous air contaminant which exceeds the limits established in NDAC 33.1-15-16.

Applicable Requirement: NDAC 33.1-15-16

**Total Potential to Emit Emissions
Bismarck Municipal Solid Waste Facility
Bismarck, North Dakota**

	Thresholds			MSW Landfill EU1	Point SourcesTotal (3)	Total Potential to Emit (PTE) Emissions
Pollutant Name	PSD Major (tpy)	Title V Major (tpy)	Global Warming Potential ⁽¹⁾	tpy	tpy	tpy
NO _x	250	100		-	4.3044	4.3044
CO	250	100		-	1.3221	1.3221
PM ₁₀	250	100		-	2.1521	2.1521
SO ₂	250	100		-	2.2703	2.2703
NMOC (as Hexane)*	250	100		246.70	-	246.70
VOC	250	100		11.22	0.0203	11.24
Individual HAP (toluene)	-	10		1.945	-	1.945
Total HAPs	-	25		4.779	0.0383	4.817
CO ₂ (mass)	-	-	1	15,747	782.70	16,529.70
Methane [CH ₄]	-	-	25	5,739.90	0.0119	5,739.91
N ₂ O (mass)	-	-	298	0.0000	0.0114	0.011
CO ₂ e ⁽²⁾	-	-				160,031

PTE - Potential to Emit

tpy - tons per year

⁽¹⁾ https://www.law.cornell.edu/cfr/text/40/appendix-Table_A-1_to_subpart_A_of_part_98

⁽²⁾ CO₂ Equivalents = (Mass (ton/yr) * Global Warming Potential = CO₂ equivalent for that compound)

⁽³⁾ Total of Point Sources

**Emission Summary for Point Sources
Potential to Emit
Bismarck Municipal Solid Waste Facility
Bismarck, North Dakota**

	Point Sources								
		Forced Air Furnace	Forced Air Furnace	Bailer Building, Shop Building	Forced Air Furnace	Forced Air Furnace	Engine Emissions: EU2 Caterpillar Motor Wood Tub Grinder	Engine Emissions: EU3 Compost Screener Komtech Primus	Engine Emissions: EU4A Air Burner HATZ
	Sum of Point Sources to the right>>	Carrier	RBI Dominator	Infrared Heaters	Armstrong Air	Trane	Caterpillar	Perkins	HATZ
Pollutant Name	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
NO _x	4.304	0.057	0.258	0.150	0.028	0.026	1.412	1.108	1.266
CO	1.322	0.048	0.216	0.126	0.024	0.022	0.375	0.239	0.273
PM ₁₀	2.152	0.004	0.020	0.0114	0.0022	0.0020	1.013	0.431	0.669
SO ₂	2.270	0.00034	0.00155	0.001	0.000	0.000	1.087	0.463	0.718
NMOC (as Hexane)*	--	--	--	--	--	--	--	--	--
VOC	0.020	0.0031	0.0059	0.0083	0.0016	0.0014	--	--	--
Individual HAP	--	--	--	--	--	--	--	--	--
Total HAPs	0.038	0.00107	0.00486	0.00284	0.00054	0.00049	0.024	0.002	0.002
CO ₂ (mass)	782.699	68.019	309.176	180	34.01	30.9	71.957	41.190	47.075
Methane [CH ₄]	0.012	0.0013	0.0059	0.0035	0.0007	0.0006	--	--	--
N ₂ O (mass)	0.011	0.00125	0.00567	0.00331	0.00062	0.00057	--	--	--

PTE - Potential to Emit

tpy - tons per year

⁽¹⁾ https://www.law.cornell.edu/cfr/text/40/appendix-Table_A-1_to_subpart_A_of_part_98

Engine Emissions: EU2 Caterpillar Motor Wood Tub Grinder

MAKE
MODEL
YEAR
LOCATION
NUMBER OF UNITS

Caterpillar
C-27
2015
Wood Tub Grinder
1 Unit(s)

Fuel	Diesel Fuel	
HHV ^(a)	138,412	BTU/gal
Sulfur Content ^(b)	0.0015	%

Fuel	Diesel Fuel	
Max Power	950.0	hp
Mechanical Output	708.0	KW
Fuel Consumption	51.80	gal/hr 100% load
HHV	0.138	MMBtu/gal
Max heat input (HHV)	7.148	MMBtu/hr
Max annual heat input (HHV)	7,434.3	MMBtu/yr
Sulfur Content (assumed)	0.0015	%
Hours of operation (@100% Load)	1040.00	hr/yr

assume 4 months (16 weeks), 5
days per week (80 days), 8 hr/day =
640 hr/yr

Pollutant	Emission Factors			Emissions		
	lb / hp-hr	lb/MMBtu	Source	lb/hr	lb/yr	tpy
NO _x	0.0029	3.20	(c)	2.7157	2824.4	1.41
CO	0.0008	0.85	(c)	0.7214	750.2	0.38
PM/PM10/PM2.5	0.0021	0.10	(c)	1.9475	2025.4	1.01
TOC	0.0001	0.09	(c)	0.0764	79.4	0.04
SOX	0.0022	1.01	(c)	2.0900	2173.6	1.09
CO2	0.1457	163.05	(c)	138.3788	143913.9	71.96

PTE- Engine

	Emission Factors			Emissions		
	Category	lb/MMBtu	Source	lb/hr	lb/yr	ton / yr
Benzene	HAP	7.76E-04	(d)	0.005547	48.59	0.024
Toluene	HAP	2.81E-04	(d)	0.002009	17.60	0.000
Xylenes	HAP	1.93E-04	(d)	0.001380	12.09	0.000
Propylene		2.79E-03	(d)	0.019944	174.71	0.000
Formaldehyde	HAP	7.89E-05	(d)	0.000564	4.94	0.000
Acetaldehyde	HAP	2.52E-05	(d)	0.000180	1.58	0.000
Acrolein	HAP	7.88E-06	(d)	0.000056	0.49	0.000
PAH						
Naphthalene	HAP	1.30E-04	(e)	0.000929	8.14	0.000
Acenaphthylene		9.23E-06	(e)	0.000066	0.58	0.000
Acenaphthene		4.68E-06	(e)	0.000033	0.29	0.000
Fluorene		1.28E-05	(e)	0.000091	0.80	0.000
Phenanthrene		4.08E-05	(e)	0.000292	2.55	0.000
Anthracene		1.23E-06	(e)	0.000009	0.08	0.000
Fluoranthene		4.03E-06	(e)	0.000029	0.25	0.000
Pyrene		3.71E-06	(e)	0.000027	0.23	0.000
Benz(a)anthracene		6.22E-07	(e)	0.000004	0.04	0.000
Chrysene		1.53E-06	(e)	0.000011	0.10	0.000
Benzo(b)fluoranthene		1.11E-06	(e)	0.000008	0.07	0.000
Benzo(k)fluoranthene		2.18E-07	(e)	0.000002	0.01	0.000
Benzo(a)pyrene		2.57E-07	(e)	0.000002	0.02	0.000
Indeno(1,2,3-cd)pyrene		4.14E-07	(e)	0.000003	0.03	0.000
Dibenz(a,h)anthracene		3.46E-07	(e)	0.000002	0.02	0.000
Benzo(g,h,i)perylene		5.56E-07	(e)	0.000004	0.03	0.000
TOTAL PAH		2.12E-04	(e)	0.001515	13.28	0.000
Total HAP				0.01067	93.43	0.024

^(a) https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d_169.html

^(b) <https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings#nonroad-diesel>

^(c) AP-42 3.4 Table 3.4-1. GASEOUS EMISSION FACTORS FOR LARGE STATIONARY DIESEL AND ALL STATIONARY DUAL FUEL ENGINES

^(d) AP-42 3.4 Table 3.4-3 SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR LARGE UNCONTROLLED STATIONARY DIESEL ENGINES

^(e) AP-42 3.4 3.4-4 PAH EMISSION FACTORS FOR LARGE UNCONTROLLED STATIONARY DIESEL ENGINES

Highlighted Emission concentration is maximum HAP calculated

Source: Caterpillar C-27 Prime 725 kW 906 kVA Technical Data April 09 2013

Engine Emissions: EU3 Compost Screener Komtech Primus

MAKE
MODEL
YEAR
LOCATION
NUMBER OF UNITS

Perkins
404J-E22TA
2023
Compost
1 Unit(s)

Fuel	Diesel Fuel	
HHV ^(a)	138,412	BTU/gal
Sulfur Content ^(b)	0.0015	%

Fuel	Diesel Fuel	
Max Power	48.0	hp
Mechanical Output	36	kW
Fuel Consumption	3.50	gal/hr 100% load
HHV	0.138	MMBtu/gal
Max heat input (HHV)	0.483	MMBtu/hr
Max annual heat input (HHV)	502.3	MMBtu/yr
Sulfur Content (assumed)	0.0015	%
Hours of operation (@100% Load)	1040	hr/yr

Estimated

assume 6 months (26 weeks), 5 day/week, 8 hr/day = 1040 hr/yr

Pollutant	Emission Factors			Emissions		
	lb / hp-hr	lb/MMBtu	Source	lb/hr	lb/yr	tpy
NO _x	0.0053	4.41	(c)	0.2529	2215.2	1.11
CO	0.0011	0.95	(c)	0.0545	477.2	0.24
PM/PM10/PM2.5	0.0021	0.31	(c)	0.0984	862.0	0.43
TOC	0.0004	0.35	(c)	0.0201	175.8	0.09
SOX	0.0022	0.29	(c)	0.1056	925.1	0.46
CO ₂	0.1959	164.00	(c)	9.4042	82380.5	41.19

PTE- Engine

	Emission Factors			Emissions		
	Category	lb/MMBtu	Source	lb/hr	lb/yr	ton / yr
Benzene	HAP	9.33E-04	(d)	0.000451	3.95	0.0020
Toluene	HAP	4.09E-04	(d)	0.000198	1.73	0.0000
Xylenes	HAP	2.85E-04	(d)	0.000138	1.21	0.0000
Propylene		2.58E-03	(d)	0.001246	10.92	0.0000
Formaldehyde	HAP	1.18E-03	(d)	0.000570	4.99	0.0000
Acetaldehyde	HAP	7.67E-04	(d)	0.000370	3.25	0.0000
Acrolein	HAP	9.25E-05	(d)	0.000045	0.39	0.0000

PAH

Naphthalene	HAP	8.48E-05	(d)	0.000041	0.36	0.000
Acenaphthylene		5.06E-06	(d)	0.000002	0.02	0.000
Acenaphthene		1.42E-06	(d)	0.000001	0.01	0.000
Fluorene		2.92E-05	(d)	0.000014	0.12	0.000
Phenanthrene		2.94E-05	(d)	0.000014	0.12	0.000
Anthracene		1.87E-06	(d)	0.000001	0.01	0.000
Fluoranthene		7.61E-06	(d)	0.000004	0.03	0.000
Pyrene		4.78E-06	(d)	0.000002	0.02	0.000
Benz(a)anthracene		1.68E-06	(d)	0.000001	0.01	0.000
Chrysene		3.53E-07	(d)	0.000000	0.00	0.000
Benzo(b)fluoranthene		9.91E-08	(d)	0.000000	0.00	0.000
Benzo(k)fluoranthene		1.55E-07	(d)	0.000000	0.00	0.000
Benzo(a)pyrene		1.88E-07	(d)	0.000000	0.00	0.000
Indeno(1,2,3-cd)pyrene		3.75E-07	(d)	0.000000	0.00	0.000
Dibenz(a,h)anthracene		5.83E-07	(d)	0.000000	0.00	0.000
Benzo(g,h,i)perylene		4.89E-07	(d)	0.000000	0.00	0.000
TOTAL PAH		1.68E-04	(d)	0.000081	0.71	0.000
Total HAP				0.00181	15.87	0.002

(a) https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d_169.html

(b) <https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings#nonroad-diesel>

(c) AP-42 3.3-1 Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES

(d) AP-42 3.3-2 Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES

Highlighted Emission concentration is maximum HAP calculated

Perkins Spec Sheet Model 404D-22

(2) - Fuel density : 835 g/L; 6.96 lb/ US gallon @ 60F

Engine Emissions: EU4A Air Curtain Incinerator

MAKE
MODEL
YEAR
LOCATION
NUMBER OF UNITS

HATZ
4H50TIC
2023
ACI
1 Unit(s)

Fuel	Diesel Fuel	
HHV ^(a)	138,412	BTU/gal
Sulfur Content ^(b)	0.0015	%

Fuel	Diesel Fuel	
Max Power	74.5	hp
Mechanical Output	56	kW
Fuel Consumption	4.00	gal/hr 100% load
HHV	0.138	MMBtu/gal
Max heat input (HHV)	0.552	MMBtu/hr
Max annual heat input (HHV)	574.1	MMBtu/yr
Sulfur Content (assumed)	0.0015	%
Hours of operation (@100% Load)	1040	hr/yr

Estimated

assume 6 months (26 weeks), 5 day/week, 8 hr/day = 1040 hr/yr

Pollutant	Emission Factors			Emissions		
	lb / hp-hr	lb/MMBtu	Source	lb/hr	lb/yr	tpy
NO _x	0.0039	4.41	(c)	0.2890	2531.7	1.27
CO	0.0008	0.95	(c)	0.0623	545.4	0.27
PM/PM10/PM2.5	0.0021	0.31	(c)	0.1527	1337.9	0.67
TOC	0.0003	0.35	(c)	0.0229	200.9	0.10
SOX	0.0022	0.29	(c)	0.1639	1435.8	0.72
CO2	0.1443	164.00	(c)	10.7476	94149.1	47.07

PTE- Engine

	Emission Factors			Emissions		
	Category	lb/MMBtu	Source	lb/hr	lb/yr	ton / yr
Benzene	HAP	9.33E-04	(d)	0.000515	4.51	0.0023
Toluene	HAP	4.09E-04	(d)	0.000226	1.98	0.0000
Xylenes	HAP	2.85E-04	(d)	0.000157	1.38	0.0000
Propylene		2.58E-03	(d)	0.001424	12.48	0.0000
Formaldehyde	HAP	1.18E-03	(d)	0.000651	5.71	0.0000
Acetaldehyde	HAP	7.67E-04	(d)	0.000423	3.71	0.0000
Acrolein	HAP	9.25E-05	(d)	0.000051	0.45	0.0000
PAH						
Naphthalene	HAP	8.48E-05	(d)	0.000047	0.41	0.000
Acenaphthylene		5.06E-06	(d)	0.000003	0.02	0.000
Acenaphthene		1.42E-06	(d)	0.000001	0.01	0.000
Fluorene		2.92E-05	(d)	0.000016	0.14	0.000
Phenanthrene		2.94E-05	(d)	0.000016	0.14	0.000
Anthracene		1.87E-06	(d)	0.000001	0.01	0.000
Fluoranthene		7.61E-06	(d)	0.000004	0.04	0.000
Pyrene		4.78E-06	(d)	0.000003	0.02	0.000
Benz(a)anthracene		1.68E-06	(d)	0.000001	0.01	0.000
Chrysene		3.53E-07	(d)	0.000000	0.00	0.000
Benzo(b)fluoranthene		9.91E-08	(d)	0.000000	0.00	0.000
Benzo(k)fluoranthene		1.55E-07	(d)	0.000000	0.00	0.000
Benzo(a)pyrene		1.88E-07	(d)	0.000000	0.00	0.000
Indeno(1,2,3-cd)pyrene		3.75E-07	(d)	0.000000	0.00	0.000
Dibenz(a,h)anthracene		5.83E-07	(d)	0.000000	0.00	0.000
Benzo(g,h,i)perylene		4.89E-07	(d)	0.000000	0.00	0.000
TOTAL PAH		1.68E-04	(d)	0.000093	0.81	0.000
Total HAP				0.00207	18.14	0.002

^(a) https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d_169.html

^(b) <https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings#nonroad-diesel>

^(c) AP-42 3.3-1 Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINE

^(d) AP-42 3.3-2 Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINE

Highlighted Emission concentration is maximum HAP calculated

HATZ Spec Sheet Model 4H50TIC

⁽²⁾ - Fuel density : 835 g/L; 6.96 lb/ US gallon @ 60F

EMISSION UNIT

Forced Air Furnace

MAKE
MODEL
LOCATION
NUMBER OF UNITS
FUEL SOURCE
CAPACITY
NATURAL GAS HEAT CONTENT

Carrier
9200
Bailer Buidling
2 Unit(s)
NATURAL GAS
66,000 BTU/HR Item Specific
1,020 BTU/CF ^(a) Conversion from Footnote ^a Table 1.4-1

Pollutant	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
NOx	-	100 lb/10 ⁶ scf ^(b)	64.71 CF/HR	0.006	0.028	0.057
CO	-	84 lb/10 ⁶ scf ^(b)	64.71 CF/HR	0.005	0.024	0.048
CO2	-	120,000 -- scf ^(c)	64.71 CF/HR	7.765	34.009	68.019
Lead	-	0.0005 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.000	0.000
N2O (Uncontrolled)	-	2.2 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
PM (Total)	-	7.6 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.004
PM (Condensable)	-	5.7 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.003
PM (Filterable)	-	1.9 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
SO2	-	0.6 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.000	0.00034
TOC	-	11 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.001	0.003	0.006
Methane	-	2.3 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
VOCs	-	5.5 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.003
Total HAPs (Sum of all individual HAPs presented below)				0.000	0.001	0.001

Individual HAPs	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
2-Methylnaphthalene	91-57-6	2.40E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
3-Methylchloranthrene	56-49-5	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
7,12-Dimethylbenz(a)anthracene		1.60E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Acenaphthene	83-32-9	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Acenaphthylene	203-96-8	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Anthracene	120-12-7	2.40E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benz(a)anthracene	56-55-3	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benzene	71-43-2	2.10E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benzo(a)pyrene	50-32-8	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Chrysene	218-01-9	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Dichlorobenzene	25321-22-6	1.20E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Fluoranthene	206-44-0	3.00E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Fluorene	86-73-7	2.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Formaldehyde	50-00-0	7.50E-02 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00004
Hexane	110-54-3	1.80E+00 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.001	0.00102
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Naphthalene	91-20-3	6.10E-04 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Phenanthrene	85-01-8	1.70E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Pyrene	129-00-0	5.00E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Toluene	108-88-3	3.40E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.00000
Arsenic	7440-38-2	2.00E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Beryllium	7440-41-7	1.20E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Cadmium	7440-43-9	1.10E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Chromium	7440-47-3	1.40E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Cobalt	7440-48-4	8.40E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Manganese	7439-96-5	3.80E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Mercury	7439-97-6	2.60E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Nickel	7440-02-0	2.10E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000
Selenium	7782-49-2	2.40E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.00000

0.00107

- (a) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Footnote a.
 (b) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Small Boilers, Uncontrolled.
 (c) AP 42, Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.
 (d) AP 42, Table 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION
 (e) AP 42, Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION

Highlighted Emission concentration is maximum HAP calculated

EMISSION UNIT

MAKE
MODEL
LOCATION
NUMBER OF UNITS
FUEL SOURCE
CAPACITY
NATURAL GAS HEAT CONTENT

Forced Air Furnace

RBI Dominator Series
DB600

HHW Building
1 Unit(s)

NATURAL GAS

600,000 BTU/HR Item Specific
1,020 BTU/CF^(a) Conversion from Footnote^a Table 1.4-1

Pollutant	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
NOx	-	100 lb/10 ⁶ scf ^(b)	588.24 CF/HR	0.059	0.258	0.258
CO	-	84 lb/10 ⁶ scf ^(b)	588.24 CF/HR	0.049	0.216	0.216
CO2	-	120,000 -- scf ^(c)	588.24 CF/HR	70.588	309.176	309.176
Lead	-	0.0005 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.000	0.000	0.000
N2O (Uncontrolled)	-	2.2 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.001	0.006	0.0057
PM (Total)	-	7.6 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.004	0.020	0.0196
PM (Condensable)	-	5.7 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.003	0.015	0.0147
PM (Filterable)	-	1.9 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.001	0.005	0.0049
SO2	-	0.6 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.000	0.002	0.0015
TOC	-	11 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.006	0.028	0.0283
Methane	-	2.3 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.001	0.006	0.0059
VOCs	-	5.5 lb/10 ⁶ scf ^(c)	588.24 CF/HR	0.003	0.014	0.0142
Total HAPs (Sum of all individual HAPs presented below)				0.001	0.005	0.0049

Individual HAPs	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
2-Methylnaphthalene	91-57-6	2.40E-05 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
3-Methylchloranthrene	56-49-5	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
7,12-Dimethylbenz(a)anthracene		1.60E-05 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Acenaphthene	83-32-9	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Acenaphthylene	203-96-8	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Anthracene	120-12-7	2.40E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Benz(a)anthracene	56-55-3	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Benzene	71-43-2	2.10E-03 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000005
Benzo(a)pyrene	50-32-8	1.20E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Chrysene	218-01-9	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Dichlorobenzene	25321-22-6	1.20E-03 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000003
Fluoranthene	206-44-0	3.00E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Fluorene	86-73-7	2.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Formaldehyde	50-00-0	7.50E-02 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000193
Hexane	110-54-3	1.80E+00 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.001	0.005	0.004638
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Naphthalene	91-20-3	6.10E-04 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000002
Phenanthrene	85-01-8	1.70E-05 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Pyrene	129-00-0	5.00E-06 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000000
Toluene	108-88-3	3.40E-03 lb/10 ⁶ scf ^(d)	588.24 CF/HR	0.000	0.000	0.000009
Arsenic	7440-38-2	2.00E-04 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000001
Beryllium	7440-41-7	1.20E-05 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000000
Cadmium	7440-43-9	1.10E-03 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000003
Chromium	7440-47-3	1.40E-03 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000004
Cobalt	7440-48-4	8.40E-05 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000000
Manganese	7439-96-5	3.80E-04 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000001
Mercury	7439-97-6	2.60E-04 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000001
Nickel	7440-02-0	2.10E-03 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000005
Selenium	7782-49-2	2.40E-05 lb/10 ⁶ scf ^(e)	588.24 CF/HR	0.000	0.000	0.000000

0.004864

Parameters from the following sources:

- (a) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Footnote a.
 (b) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Small Boilers, Uncontrolled.
 (c) AP 42, Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.
 (d) AP 42, Table 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION
 (e) AP 42, Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION

Highlighted Emission concentration is maximum HAP calculated

EMISSION UNIT

MAKE
MODEL
LOCATION
NUMBER OF UNITS
FUEL SOURCE
CAPACITY
NATURAL GAS HEAT CONTENT

Infrared Heaters

Unknown
Unknown ⁽¹⁾
Bailer Building, Shop Building
2 Units
NATURAL GAS
175,000 BTU/HR
1,020 BTU/CF ^(a)

Pollutant	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
NOx	-	100 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.017	0.075	0.150
CO	-	84 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.014	0.063	0.126
CO2	-	120,000 -- scf ^(b)	171.57 CF/HR	20.588	90.177	180.354
Lead	-	0.0005 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.000
N2O (Uncontrolled)	-	2.2 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.002	0.003
PM (Total)	-	7.6 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.001	0.006	0.011
PM (Condensable)	-	5.7 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.001	0.004	0.009
PM (Filterable)	-	1.9 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.001	0.003
SO2	-	0.6 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.001
TOC	-	11 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.002	0.008	0.017
Methane	-	2.3 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.002	0.003
VOCs	-	5.5 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.001	0.004	0.008
Total HAPs (Sum of all individual HAPs presented below)				0.000	0.001	0.003

Individual HAPs	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
2-Methylnaphthalene	91-57-6	2.40E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
3-Methylchloranthrene	56-49-5	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
7,12-Dimethylbenz(a)anthracene		1.60E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Acenaphthene	83-32-9	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Acenaphthylene	203-96-8	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Anthracene	120-12-7	2.40E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benz(a)anthracene	56-55-3	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benzene	71-43-2	2.10E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benzo(a)pyrene	50-32-8	1.20E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Chrysene	218-01-9	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Dichlorobenzene	25321-22-6	1.20E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Fluoranthene	206-44-0	3.00E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Fluorene	86-73-7	2.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Formaldehyde	50-00-0	7.50E-02 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00011
Hexane	110-54-3	1.80E+00 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.001	0.00271
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Naphthalene	91-20-3	6.10E-04 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Phenanthrene	85-01-8	1.70E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Pyrene	129-00-0	5.00E-06 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Toluene	108-88-3	3.40E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00001
Arsenic	7440-38-2	2.00E-04 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Beryllium	7440-41-7	1.20E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Cadmium	7440-43-9	1.10E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Chromium	7440-47-3	1.40E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Cobalt	7440-48-4	8.40E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Manganese	7439-96-5	3.80E-04 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Mercury	7439-97-6	2.60E-04 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Nickel	7440-02-0	2.10E-03 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000
Selenium	7782-49-2	2.40E-05 lb/10 ⁶ scf ^(b)	171.57 CF/HR	0.000	0.000	0.00000

0.00284

- (a) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Footnote a.
- (b) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Small Boilers, Uncontrolled.
- (c) AP 42, Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.
- (d) AP 42, Table 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION
- (e) AP 42, Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION
- Highlighted** Emission concentration is maximum HAP calculated
- (1) - Assumed: Enerco F102662XL - Model #; ERXL175-N 175,000 BTU/HR

EMISSION UNIT

MAKE
MODEL
LOCATION
NUMBER OF UNITS
FUEL SOURCE
CAPACITY
NATURAL GAS HEAT CONTENT

Forced Air Furnace

Armstrong Air
A80US2V070A12
Scale House

1 Unit(s)

NATURAL GAS

66,000 BTU/HR Item Specific

1,020 BTU/CF^(a) Conversion from Footnote^a Table 1.4-1

Pollutant	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
NOx	-	100 lb/10 ⁶ scf ^(b)	64.71 CF/HR	0.006	0.028	0.028
CO	-	84 lb/10 ⁶ scf ^(b)	64.71 CF/HR	0.005	0.024	0.024
CO2	-	120,000 -- scf ^(c)	64.71 CF/HR	7.765	34.009	34.009
Lead	-	0.0005 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.000	0.000
N2O (Uncontrolled)	-	2.2 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
PM (Total)	-	7.6 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.002
PM (Condensable)	-	5.7 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.002
PM (Filterable)	-	1.9 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
SO2	-	0.6 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.000	0.000
TOC	-	11 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.001	0.003	0.003
Methane	-	2.3 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.001	0.001
VOCs	-	5.5 lb/10 ⁶ scf ^(c)	64.71 CF/HR	0.000	0.002	0.002
Total HAPs (Sum of all individual HAPs presented below)				0.000	0.001	0.001

Individual HAPs	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
2-Methylnaphthalene	91-57-6	2.40E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
3-Methylchloranthrene	56-49-5	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
7,12-Dimethylbenz(a)anthracene		1.60E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Acenaphthene	83-32-9	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Acenaphthylene	203-96-8	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Anthracene	120-12-7	2.40E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benz(a)anthracene	56-55-3	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benzene	71-43-2	2.10E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benzo(a)pyrene	50-32-8	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Chrysene	218-01-9	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Dichlorobenzene	25321-22-6	1.20E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Fluoranthene	206-44-0	3.00E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Fluorene	86-73-7	2.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Formaldehyde	50-00-0	7.50E-02 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Hexane	110-54-3	1.80E+00 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.001	0.0005
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Naphthalene	91-20-3	6.10E-04 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Phenanthrene	85-01-8	1.70E-05 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Pyrene	129-00-0	5.00E-06 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Toluene	108-88-3	3.40E-03 lb/10 ⁶ scf ^(d)	64.71 CF/HR	0.000	0.000	0.0000
Arsenic	7440-38-2	2.00E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Beryllium	7440-41-7	1.20E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Cadmium	7440-43-9	1.10E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Chromium	7440-47-3	1.40E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Cobalt	7440-48-4	8.40E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Manganese	7439-96-5	3.80E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Mercury	7439-97-6	2.60E-04 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Nickel	7440-02-0	2.10E-03 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000
Selenium	7782-49-2	2.40E-05 lb/10 ⁶ scf ^(e)	64.71 CF/HR	0.000	0.000	0.0000

0.0005

(a) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Footnote a.

(b) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Small Boilers, Uncontrolled.

(c) AP 42, Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.

(d) AP 42, Table 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION

(e) AP 42, Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION

Highlighted Emission concentration is maximum HAP calculated

EMISSION UNIT

MAKE
MODEL
LOCATION
NUMBER OF UNITS
FUEL SOURCE
CAPACITY
NATURAL GAS HEAT CONTENT

Forced Air Furnace

Trane
XR80
Office / Breakroom
1 Unit(s)
NATURAL GAS
60,000 BTU/HR Item Specific
1,020 BTU/CF^(a) Conversion from Footnote^a Table 1.4-1

Pollutant	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
NOx	-	100 lb/10 ⁶ scf ^(b)	58.82 CF/HR	0.006	0.026	0.026
CO	-	84 lb/10 ⁶ scf ^(b)	58.82 CF/HR	0.005	0.022	0.022
CO2	-	120,000 -- scf ^(c)	58.82 CF/HR	7.059	30.918	30.918
Lead	-	0.0005 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.000	0.000
N2O (Uncontrolled)	-	2.2 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.001	0.001
PM (Total)	-	7.6 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.002	0.002
PM (Condensable)	-	5.7 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.001	0.001
PM (Filterable)	-	1.9 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.000	0.000
SO2	-	0.6 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.000	0.000
TOC	-	11 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.001	0.003	0.003
Methane	-	2.3 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.001	0.001
VOCs	-	5.5 lb/10 ⁶ scf ^(c)	58.82 CF/HR	0.000	0.001	0.001
Total HAPs (Sum of all individual HAPs presented below)				0.000	0.000	0.000

Individual HAPs	CASNo.	Emission Factor	Potential Throughput	PTE Emissions		
				lb/hr	tpy	(tpy) x (X units)
2-Methylnaphthalene	91-57-6	2.40E-05 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
3-Methylnaphthalene	56-49-5	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
7,12-Dimethylbenz(a)anthracene		1.60E-05 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Acenaphthene	83-32-9	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Acenaphthylene	203-96-8	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Anthracene	120-12-7	2.40E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benz(a)anthracene	56-55-3	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benzene	71-43-2	2.10E-03 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benzo(a)pyrene	50-32-8	1.20E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Chrysene	218-01-9	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Dichlorobenzene	25321-22-6	1.20E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Fluoranthene	206-44-0	3.00E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Fluorene	86-73-7	2.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Formaldehyde	50-00-0	7.50E-02 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00002	0.00002
Hexane	110-54-3	1.80E+00 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00011	0.00046	0.00046
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Naphthalene	91-20-3	6.10E-04 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Phenanthrene	85-01-8	1.70E-05 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Pyrene	129-00-0	5.00E-06 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Toluene	108-88-3	3.40E-03 lb/10 ⁶ scf ^(d)	58.82 CF/HR	0.00000	0.00000	0.00000
Arsenic	7440-38-2	2.00E-04 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Beryllium	7440-41-7	1.20E-05 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Cadmium	7440-43-9	1.10E-03 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Chromium	7440-47-3	1.40E-03 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Cobalt	7440-48-4	8.40E-05 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Manganese	7439-96-5	3.80E-04 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Mercury	7439-97-6	2.60E-04 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Nickel	7440-02-0	2.10E-03 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000
Selenium	7782-49-2	2.40E-05 lb/10 ⁶ scf ^(e)	58.82 CF/HR	0.00000	0.00000	0.00000

0.00049

- (a) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Footnote a.
 (b) AP 42, Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION. Small Boilers, Uncontrolled.
 (c) AP 42, Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.
 (d) AP 42, Table 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION
 (e) AP 42, Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION

Highlighted Emission concentration is maximum HAP calculated

Air emissions from internal combustion engines

For each engine, complete one engine tab and include all information in the blue boxes.

Engine designation	Wood Chip Grinder	Date of manufacture	TBD	
Make	CAT	Date installed	TBD	at the site
Model	C27	Displacement	2.25	liters/cylinder
Electrical output	708 kW	Diesel engine tier	Tier 4	if known

Does this engine operate to do any of the following? Select yes or no for each. Go to the 'FAQs' tab for more information.

No	Supply power to electric grid in emergency situations (emergency demand response)
No	Supply power to electric grid in non-emergency situations (peak shaving)
No	Other financial arrangement

Does a federal rule apply to this engine?

No	Need help? Use EPA's Regulation Navigation tools for assistance. Go to the 'Federal standards' tab for more information.
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Calculate the potential and actual air emissions from this engine

Engine and fuel type	Reciprocating - diesel
Engine use	Routine
Rated mechanical output	950 Horsepower(HP) or Brake Power (HP-hr)
Quantity of fuel actually burned per 12 months	7591 gallons per year (gal/yr)
Brake specific fuel consumption	7000 (Btu/HP-hr)
Heat value of fuel	138000 (Btu/gal)
Sulfur content of the fuel	0.0015 %

Internal combustion engine potential and actual emissions

Pollutant	a	b	c	d	e	Emission Rate	Potential Emissions	Actual Emissions
	GWP ¹	Engine Rated Output (MMBtu/hr)	Actual Annual Throughput (MMBtu/yr)	Potential Annual Hours ³ (hr/yr)	Emission Factor (lbs/MMBtu)	lb/hr	(b * d * e) / 2000 (ton/yr)	(c * e) / 2000 (tons/yr)
Criteria Air Pollutants		6.65	1047.558	8760	by pollutant	by pollutant	see engine emission factors tab	
PM					0.1000	0.6650	2.91	0.05
PM10					0.0573	0.3810	1.67	0.03
PM2.5					0.0556	0.3697	1.62	0.03
CPM					0.0077	0.0512	0.22	0.00
SOx					1.0100	6.7165	29.42	0.53
NOx					3.2000	21.2800	93.21	1.68
TOC					0.0900	0.5985	2.62	0.05
CO					0.8500	5.6525	24.76	0.45
Lead					n/a		0.00	0.00
Greenhouse Gas Emissions							Source: 40 CFR 98, Subp. C, Table C-1 and C-2	
CO ₂ ²	1				163.0540	1084.3092	4749.27	85.40
CH ₄ ²	25				0.0066	0.0440	0.1926	0.0035
N ₂ O ²	298				0.0013	0.0088	0.0385	0.0007
GHG total (CO ₂ e) ²						1084.3620	4765.57	85.70
Hazardous Air Pollutants							see engine emission factors tab	
1,1,2,2-tetrachloroethane							0.0000	0.0000
1,1,2-trichloroethane							0.0000	0.0000
1,3-butadiene							0.0000	0.0000
1,3-dichloropropene							0.0000	0.0000
Acetaldehyde					0.0000	0.0002	0.0007	0.0000
Acrolein					0.0000	0.0001	0.0002	0.0000
Benzene					0.0008	0.0052	0.0226	0.0004
Biphenyl							0.0000	0.0000
Carbon tetrachloride							0.0000	0.0000
Chlorobenzene							0.0000	0.0000
Chloroform							0.0000	0.0000
Ethylbenzene							0.0000	0.0000
Ethylene dibromide							0.0000	0.0000
Formaldehyde					0.0001	0.0005	0.0023	0.0000
Hexane							0.0000	0.0000
Methanol							0.0000	0.0000
Methylene chloride							0.0000	0.0000
Naphthalene					0.0001	0.0009	0.0038	0.0001
PAH					0.0002	0.0014	0.0062	0.0001
Phenol							0.0000	0.0000
Styrene							0.0000	0.0000
Tetrachloroethane							0.0000	0.0000
Toluene					0.0003	0.0019	0.0082	0.0001
Vinyl chloride							0.0000	0.0000
Xylene					0.0002	0.0013	0.0056	0.0001
HAP total						0.0113	0.0496	0.0009

¹ Global Warming Potential from 40 CFR Part 98, Subpart A, Table A-1² CO₂e = carbon dioxide equivalents³ Routine = 24 hr/day * 365 day/yr or 8760 hr/yr; Emergency = 500 hr/yr for purposes of calculating potential air emission to identify whether or not a permit is required.

Air emissions from internal combustion engines

For each engine, complete one engine tab and include all information in the blue boxes.

Engine designation	Compost Screen	Date of manufacture	TBD	located on nameplate
Make	Perkins Tier 4F	Date installed	TBD	at the site
Model	404J-E22TA	Displacement	0.5667	liters/cylinder
Electrical output	36 kW	Diesel engine tier	Tier 4	if known

Does this engine operate to do any of the following? Select yes or no for each. Go to the 'FAQs' tab for more information.

No	Supply power to electric grid in emergency situations (emergency demand response)
No	Supply power to electric grid in non-emergency situations (peak shaving)
No	Other financial arrangement

Does a federal rule apply to this engine?

No	Need help? Use EPA's Regulation Navigation tools for assistance. Go to the 'Federal standards' tab for more information.
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Calculate the potential and actual air emissions from this engine

Engine and fuel type	Reciprocating - diesel
Engine use	Routine
Rated mechanical output	48 Horsepower(HP) or Brake Power (HP-hr)
Quantity of fuel actually burned per 12 months	100.6 gallons per year (gal/yr)
Brake specific fuel consumption	7000 (Btu/HP-hr)
Heat value of fuel	138000 (Btu/gal)
Sulfur content of the fuel	0.00150 %

Internal combustion engine potential and actual emissions

Pollutant	a	b	c	d	e	Potential Emissions	Actual Emissions
	GWP ¹	Engine Rated Output (MMBtu/hr)	Actual Annual Throughput (MMBtu/yr)	Potential Annual Hours ³ (hr/yr)	Emission Factor (lbs/MMBtu) by pollutant	(ton/yr) (b * d * e) / 2000	(tons/yr) (c * e) / 2000
Criteria Air Pollutants		0.336	13.8828	8760			
						see engine emission factors tab	
PM					0.3100	0.46	0.00
PM10					0.3100	0.46	0.00
PM2.5					0.3100	0.46	0.00
CPM						0.00	0.00
SOx					0.2900	0.43	0.00
NOx					4.4100	6.49	0.03
TOC					0.3600	0.53	0.00
CO					0.9500	1.40	0.01
Lead					n/a	0.00	0.00
Greenhouse Gas Emissions						Source: 40 CFR 98, Subp. C, Table C-1 and C-2	
CO ₂ ²	1				163.0540	239.96	1.13
CH ₄ ²	25				0.0066	0.0097	0.0000
N ₂ O ²	298				0.0013	0.0019	0.0000
GHG total (CO ₂ e) ²						240.79	1.14
Hazardous Air Pollutants						see engine emission factors tab	
1,1,2,2-tetrachloroethane						0.0000	0.0000
1,1,2-trichloroethane						0.0000	0.0000
1,3-butadiene					0.0000	0.0001	0.0000
1,3-dichloropropene						0.0000	0.0000
Acetaldehyde					0.0008	0.0011	0.0000
Acrolein					0.0001	0.0001	0.0000
Benzene					0.0009	0.0014	0.0000
Biphenyl						0.0000	0.0000
Carbon tetrachloride						0.0000	0.0000
Chlorobenzene						0.0000	0.0000
Chloroform						0.0000	0.0000
Ethylbenzene						0.0000	0.0000
Ethylene dibromide						0.0000	0.0000
Formaldehyde					0.0012	0.0017	0.0000
Hexane						0.0000	0.0000
Methanol						0.0000	0.0000
Methylene chloride						0.0000	0.0000
Naphthalene					0.0001	0.0001	0.0000
PAH					0.0002	0.0002	0.0000
Phenol						0.0000	0.0000
Styrene						0.0000	0.0000
Tetrachloroethane						0.0000	0.0000
Toluene					0.0004	0.0006	0.0000
Vinyl chloride						0.0000	0.0000
Xylene					0.0003	0.0004	0.0000
HAP total						0.0058	0.0000

¹ Global Warming Potential from 40 CFR Part 98, Subpart A, Table A-1² CO₂e = carbon dioxide equivalents³ Routine = 24 hr/day * 365 day/yr or 8760 hr/yr; Emergency = 500 hr/yr for purposes of calculating potential air emission to identify whether or not a permit is required.

Air emissions from internal combustion engines

For each engine, complete one engine tab and include all information in the blue boxes.

Engine designation	Air Burner	Date of manufacture		located on nameplate
Make	HATZ	Date installed		at the site
Model	4H50TIC (Tier 4 Final)	Displacement	0.488	liters/cylinder
Electrical output	55.5 kW	Diesel engine tier	Tier 4	if known

Does this engine operate to do any of the following? Select yes or no for each. Go to the 'FAQs' tab for more information.

No	Supply power to electric grid in emergency situations (emergency demand response)
No	Supply power to electric grid in non-emergency situations (peak shaving)
No	Other financial arrangement

Does a federal rule apply to this engine?

No	Need help? Use EPA's Regulation Navigation tools for assistance. Go to the 'Federal standards' tab for more information.
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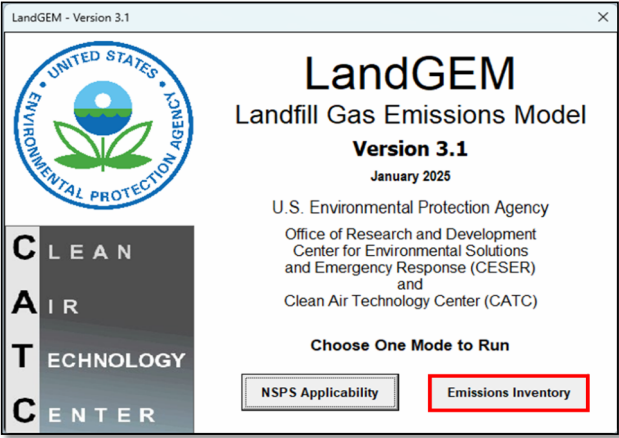
Calculate the potential and actual air emissions from this engine

Engine and fuel type	Reciprocating - diesel	
Engine use	Routine	
Rated mechanical output	74.5	Horsepower(HP) or Brake Power (HP-hr)
Quantity of fuel actually burned per 12 months	705.9	gallons per year (gal/yr)
Brake specific fuel consumption	7000	(Btu/HP-hr)
Heat value of fuel	138000	(Btu/gal)
Sulfur content of the fuel	0.00150	%

Internal combustion engine potential and actual emissions

Pollutant	a	b	c	d	e	Potential Emissions	Actual Emissions
	GWP ¹	Engine Rated Output (MMBtu/hr)	Actual Annual Throughput (MMBtu/yr)	Potential Annual Hours ³ (hr/yr)	Emission Factor (lbs/MMBtu) by pollutant	(ton/yr) (b * d * e) / 2000	(tons/yr) (c * e) / 2000
Criteria Air Pollutants		0.5215	97.4142	8760			
						see engine emission factors tab	
PM					0.3100	0.71	0.02
PM10					0.3100	0.71	0.02
PM2.5					0.3100	0.71	0.02
CPM						0.00	0.00
SOx					0.2900	0.66	0.01
NOx					4.4100	10.07	0.21
TOC					0.3600	0.82	0.02
CO					0.9500	2.17	0.05
Lead					n/a	0.00	0.00
Greenhouse Gas Emissions						Source: 40 CFR 98, Subp. C, Table C-1 and C-2	
CO ₂ ²	1				163.0540	372.44	7.94
CH ₄ ²	25				0.0066	0.0151	0.0003
N ₂ O ²	298				0.0013	0.0030	0.0001
GHG total (CO ₂ e) ²						373.72	7.97
Hazardous Air Pollutants						see engine emission factors tab	
1,1,2,2-tetrachloroethane						0.0000	0.0000
1,1,2-trichloroethane						0.0000	0.0000
1,3-butadiene					0.0000	0.0001	0.0000
1,3-dichloropropene						0.0000	0.0000
Acetaldehyde					0.0008	0.0018	0.0000
Acrolein					0.0001	0.0002	0.0000
Benzene					0.0009	0.0021	0.0000
Biphenyl						0.0000	0.0000
Carbon tetrachloride						0.0000	0.0000
Chlorobenzene						0.0000	0.0000
Chloroform						0.0000	0.0000
Ethylbenzene						0.0000	0.0000
Ethylene dibromide						0.0000	0.0000
Formaldehyde					0.0012	0.0027	0.0001
Hexane						0.0000	0.0000
Methanol						0.0000	0.0000
Methylene chloride						0.0000	0.0000
Naphthalene					0.0001	0.0002	0.0000
PAH					0.0002	0.0004	0.0000
Phenol						0.0000	0.0000
Styrene						0.0000	0.0000
Tetrachloroethane						0.0000	0.0000
Toluene					0.0004	0.0009	0.0000
Vinyl chloride						0.0000	0.0000
Xylene					0.0003	0.0007	0.0000
HAP total						0.0090	0.0002

¹ Global Warming Potential from 40 CFR Part 98, Subpart A, Table A-1² CO₂e = carbon dioxide equivalents³ Routine = 24 hr/day * 365 day/yr or 8760 hr/yr; Emergency = 500 hr/yr for purposes of calculating potential air emission to identify whether or not a permit is required.



Emissions Inventory Summary Report

Landfill Name or Identifier: Bismarck Municipal Solid Waste Facility

Date: Wednesday, May 20, 2026

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation

$$G_{CH4} = \sum_{x=S}^{T-1} W_x \times MCF \times DOC \times DOC_f \times F \times \frac{16}{12} \times (e^{-k(T-x-1)} - e^{-k(T-x)})$$

Where,
GCH4 = Modeled methane generation rate in reporting year T (metric tons CH4).
x = Year in which waste was disposed
Wx = Quantity of waste disposed in the landfill in year x from measurement data, tipping fee receipts, or other company records (metric tons, as received (wet weight)). Use bulk waste tonnage
DOC = Degradable organic carbon (Mg C/Mg waste)
16/12 = stoichiometric ratio of CH4/C molecular weights

T = Reporting year for which emissions are calculated.
S = Start year of calculation
MCF = Methane correction factor (fraction). Use the default value of 1
DOCf = Fraction of DOC dissimilated (fraction). Use the default value of 0.5.
F = Fraction by volume of CH4 in landfill gas; use the default of 0.5.
k = Rate constant from Table HH-1 to this subpart (yr-1).

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <https://www.epa.gov/land-research/landfill-gas-emissions-model-landgem>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS		
Landfill Open Year	1961	
Landfill Closure Year (with 80-year limit)	2025	
Actual Closure Year (without limit)		
Have Model Calculate Closure Year?	No	
Waste Design Capacity	4,022,044	Metric tons
MODEL PARAMETERS		
Methane Generation Rate, k	0.020	year ⁻¹
Degradable Organic Carbon, DOC	0.170	Mg C/Mg waste
Potential Methane Generation Capacity, L ₀	80	m ³ /Mg
NMOC Concentration	184	ppmv as hexane
Methane Content	0.50	Fraction by volume in landfill gas (0.5 = 50%)
Fraction of DOC dissimilated, DOC _f	0.50	Fraction by mass (0.5 = 50%)
Methane Correction Factor, MCF	1.0	fractional percentage (1.0 = 100%)
GASES / POLLUTANTS SELECTED		

Gas / Pollutant #1:
Gas / Pollutant #2:
Gas / Pollutant #3:
Gas / Pollutant #4:

Total landfill gas
Methane
Carbon dioxide
NMOC

WASTE ACCEPTANCE RATES

Year	Waste Accepted	(short tons/year)	Waste-In-Place	(short tons)
	(Mg/year)		(Mg)	
1961	41,716	45,984	0	0
1962	47,393	52,241	41,716	37,845
1963	47,393	52,241	89,109	80,839
1964	47,393	52,241	136,502	123,834
1965	47,393	52,241	183,895	166,828
1966	47,393	52,241	231,288	209,823
1967	47,393	52,241	278,681	252,818
1968	47,393	52,241	326,074	295,812
1969	47,393	52,241	373,467	338,807
1970	47,393	52,241	420,860	381,802
1971	47,393	52,241	468,253	424,796
1972	47,393	52,241	515,646	467,791
1973	47,393	52,241	563,039	510,786
1974	47,393	52,241	610,432	553,780
1975	47,170	51,995	657,825	596,775
1976	47,170	51,995	704,995	639,567
1977	47,170	51,995	752,165	682,360
1978	47,170	51,995	799,335	725,152
1979	47,170	51,995	846,505	767,944
1980	47,170	51,995	893,675	810,737
1981	47,170	51,995	940,845	853,529
1982	35,754	39,412	988,015	896,321
1983	43,919	48,412	1,023,769	928,757
1984	43,919	48,412	1,067,688	968,600
1985	26,616	29,339	1,111,607	1,008,443
1986	6,708	7,394	1,138,223	1,032,589
1987	18,242	20,108	1,144,931	1,038,675
1988	11,045	12,175	1,163,173	1,055,224
1989	43,354	47,789	1,174,218	1,065,244
1990	53,147	58,584	1,217,572	1,104,574
1991	53,147	58,584	1,270,719	1,152,789
1992	53,147	58,584	1,323,866	1,201,003
1993	9,328	10,282	1,377,013	1,249,218
1994	44,041	48,546	1,386,341	1,257,680
1995	45,472	50,124	1,430,382	1,297,634
1996	44,939	49,536	1,475,854	1,338,886
1997	47,364	52,209	1,520,793	1,379,654
1998	48,865	53,864	1,568,157	1,422,623
1999	48,811	53,804	1,617,022	1,466,953
2000	49,625	54,702	1,665,833	1,511,234
2001	52,406	57,767	1,715,458	1,556,253
2002	56,665	62,462	1,767,864	1,603,796
2003	57,957	63,886	1,824,529	1,655,202
2004	61,123	67,376	1,882,486	1,707,780
2005	63,280	69,754	1,943,609	1,763,231
2006	66,216	72,990	2,006,889	1,820,638
2007	69,236	76,319	2,073,105	1,880,709
2008	66,243	73,020	2,142,341	1,943,519
2009	70,348	77,545	2,208,584	2,003,614
2010	76,432	84,251	2,278,932	2,067,434
2011	81,188	89,494	2,355,364	2,136,772
2012	80,676	88,929	2,436,552	2,210,425
2013	86,346	95,179	2,517,228	2,283,614
2014	90,169	99,393	2,603,574	2,361,947
2015	92,740	102,227	2,693,743	2,443,748
2016	91,680	101,059	2,786,483	2,527,881
2017	99,250	109,403	2,878,163	2,611,052
2018	93,425	102,982	2,977,413	2,701,091
2019	98,516	108,594	3,070,838	2,785,846
2020	92,138	101,564	3,169,354	2,875,219
2021	90,954	100,259	3,261,492	2,958,806
2022	93,096	102,620	3,352,446	3,041,319
2023	104,878	115,607	3,445,542	3,125,775
2024	98,355	108,417	3,550,420	3,220,920
2025	98,435	108,505	3,648,775	3,310,147
2026	0	0	3,747,210	3,399,447
2027	0	0	3,747,210	3,399,447
2028	0	0	3,747,210	3,399,447
2029	0	0	3,747,210	3,399,447
2030	0	0	3,747,210	3,399,447
2031	0	0	3,747,210	3,399,447
2032	0	0	3,747,210	3,399,447
2033	0	0	3,747,210	3,399,447
2034	0	0	3,747,210	3,399,447
2035	0	0	3,747,210	3,399,447
2036	0	0	3,747,210	3,399,447
2037	0	0	3,747,210	3,399,447
2038	0	0	3,747,210	3,399,447
2039	0	0	3,747,210	3,399,447
2040	0	0	3,747,210	3,399,447

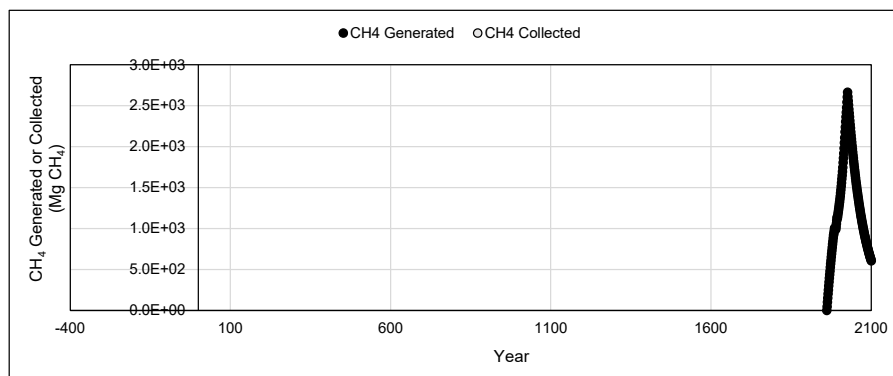
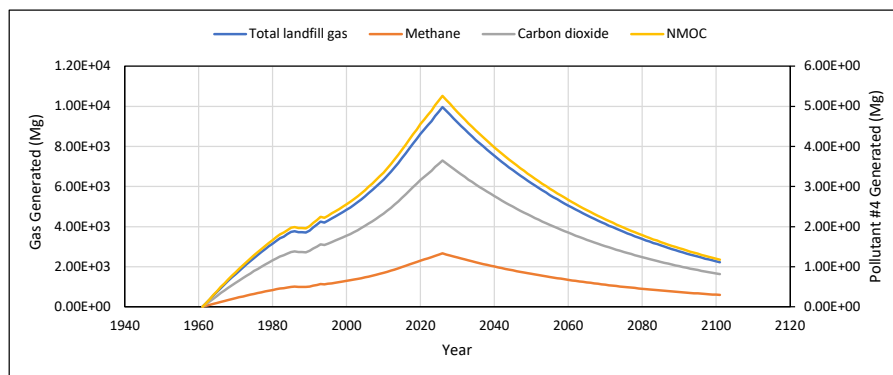
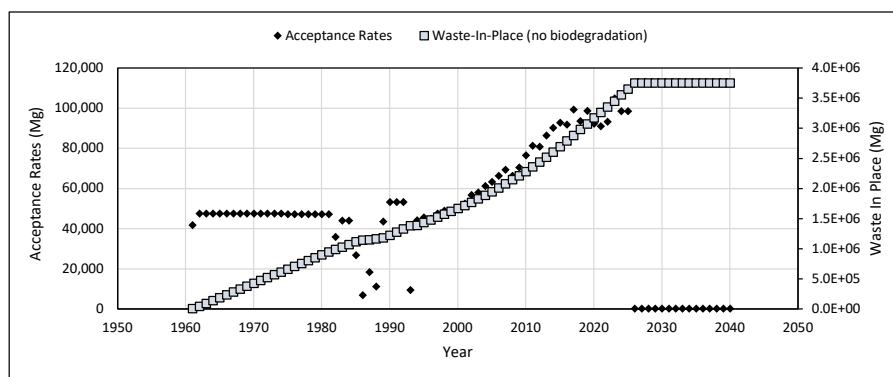
Pollutant Parameters*User-specified***Gas / Pollutant Default Parameters:**

	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Gases	Total landfill gas	1.00E+06	30.03		
	Methane	5.00E+05	16.04		
	Carbon dioxide	5.00E+05	44.01		
	NMOC	184	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2- Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co- disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	105	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorodifluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Pollutant Parameters (Continued)*User-specified*

<i>Gas / Pollutant Default Parameters:</i>				<i>User-specified</i>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		
	<enter new compound here>				
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Graphs of Waste Acceptance, Gas Generation, and Gas Collection



Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(short tons/year)	(Mg/year)	(m ³ /year)	(short tons/year)
1961	0	0	0	0	0	0
1962	1.760E+02	1.409E+05	1.940E+02	4.700E+01	7.045E+04	5.181E+01
1963	3.707E+02	2.968E+05	4.086E+02	9.900E+01	1.484E+05	1.091E+02
1964	5.617E+02	4.497E+05	6.191E+02	1.500E+02	2.248E+05	1.653E+02
1965	7.489E+02	5.996E+05	8.255E+02	2.000E+02	2.998E+05	2.205E+02
1966	9.361E+02	7.495E+05	1.032E+03	2.500E+02	3.747E+05	2.756E+02
1967	1.116E+03	8.934E+05	1.230E+03	2.980E+02	4.467E+05	3.285E+02
1968	1.292E+03	1.034E+06	1.424E+03	3.450E+02	5.171E+05	3.803E+02
1969	1.468E+03	1.175E+06	1.618E+03	3.920E+02	5.876E+05	4.321E+02
1970	1.636E+03	1.310E+06	1.804E+03	4.370E+02	6.550E+05	4.817E+02
1971	1.801E+03	1.442E+06	1.985E+03	4.810E+02	7.210E+05	5.302E+02
1972	1.966E+03	1.574E+06	2.167E+03	5.250E+02	7.869E+05	5.787E+02
1973	2.127E+03	1.703E+06	2.344E+03	5.680E+02	8.514E+05	6.261E+02
1974	2.284E+03	1.829E+06	2.518E+03	6.100E+02	9.143E+05	6.724E+02
1975	2.438E+03	1.952E+06	2.687E+03	6.510E+02	9.758E+05	7.176E+02
1976	2.587E+03	2.072E+06	2.852E+03	6.910E+02	1.036E+06	7.617E+02
1977	2.733E+03	2.188E+06	3.013E+03	7.300E+02	1.094E+06	8.047E+02
1978	2.879E+03	2.305E+06	3.174E+03	7.690E+02	1.153E+06	8.477E+02
1979	3.018E+03	2.416E+06	3.327E+03	8.060E+02	1.208E+06	8.885E+02
1980	3.157E+03	2.527E+06	3.479E+03	8.430E+02	1.264E+06	9.292E+02
1981	3.295E+03	2.638E+06	3.632E+03	8.800E+02	1.319E+06	9.700E+02
1982	3.426E+03	2.743E+06	3.777E+03	9.150E+02	1.372E+06	1.009E+03
1983	3.508E+03	2.809E+06	3.867E+03	9.370E+02	1.404E+06	1.033E+03
1984	3.625E+03	2.902E+06	3.995E+03	9.680E+02	1.451E+06	1.067E+03
1985	3.737E+03	2.992E+06	4.119E+03	9.980E+02	1.496E+06	1.100E+03
1986	3.774E+03	3.022E+06	4.160E+03	1.008E+03	1.511E+06	1.111E+03
1987	3.729E+03	2.986E+06	4.111E+03	9.960E+02	1.493E+06	1.098E+03
1988	3.729E+03	2.986E+06	4.111E+03	9.960E+02	1.493E+06	1.098E+03
1989	3.703E+03	2.965E+06	4.082E+03	9.890E+02	1.482E+06	1.090E+03
1990	3.812E+03	3.052E+06	4.202E+03	1.018E+03	1.526E+06	1.122E+03
1991	3.962E+03	3.172E+06	4.367E+03	1.058E+03	1.586E+06	1.166E+03
1992	4.104E+03	3.286E+06	4.524E+03	1.096E+03	1.643E+06	1.208E+03
1993	4.246E+03	3.400E+06	4.681E+03	1.134E+03	1.700E+06	1.250E+03
1994	4.201E+03	3.364E+06	4.631E+03	1.122E+03	1.682E+06	1.237E+03
1995	4.302E+03	3.445E+06	4.742E+03	1.149E+03	1.722E+06	1.267E+03
1996	4.411E+03	3.531E+06	4.862E+03	1.178E+03	1.766E+06	1.299E+03
1997	4.512E+03	3.612E+06	4.974E+03	1.205E+03	1.806E+06	1.328E+03
1998	4.621E+03	3.699E+06	5.093E+03	1.234E+03	1.850E+06	1.360E+03
1999	4.733E+03	3.789E+06	5.217E+03	1.264E+03	1.895E+06	1.393E+03
2000	4.845E+03	3.879E+06	5.341E+03	1.294E+03	1.940E+06	1.426E+03
2001	4.958E+03	3.969E+06	5.465E+03	1.324E+03	1.985E+06	1.459E+03
2002	5.081E+03	4.068E+06	5.601E+03	1.357E+03	2.034E+06	1.496E+03
2003	5.220E+03	4.179E+06	5.754E+03	1.394E+03	2.089E+06	1.537E+03
2004	5.358E+03	4.290E+06	5.906E+03	1.431E+03	2.145E+06	1.577E+03
2005	5.508E+03	4.410E+06	6.071E+03	1.471E+03	2.205E+06	1.621E+03
2006	5.665E+03	4.536E+06	6.245E+03	1.513E+03	2.268E+06	1.668E+03
2007	5.830E+03	4.668E+06	6.428E+03	1.557E+03	2.334E+06	1.716E+03
2008	6.006E+03	4.809E+06	6.620E+03	1.604E+03	2.404E+06	1.768E+03
2009	6.167E+03	4.937E+06	6.798E+03	1.647E+03	2.469E+06	1.815E+03
2010	6.339E+03	5.075E+06	6.988E+03	1.693E+03	2.538E+06	1.866E+03
2011	6.534E+03	5.231E+06	7.202E+03	1.745E+03	2.616E+06	1.924E+03
2012	6.747E+03	5.402E+06	7.438E+03	1.802E+03	2.701E+06	1.986E+03
2013	6.953E+03	5.567E+06	7.665E+03	1.857E+03	2.783E+06	2.047E+03
2014	7.178E+03	5.747E+06	7.912E+03	1.917E+03	2.873E+06	2.113E+03
2015	7.414E+03	5.936E+06	8.172E+03	1.980E+03	2.968E+06	2.183E+03
2016	7.657E+03	6.131E+06	8.441E+03	2.045E+03	3.065E+06	2.254E+03
2017	7.899E+03	6.316E+06	8.697E+03	2.107E+03	3.158E+06	2.323E+03
2018	8.152E+03	6.526E+06	8.985E+03	2.177E+03	3.263E+06	2.400E+03
2019	8.384E+03	6.712E+06	9.241E+03	2.239E+03	3.356E+06	2.468E+03
2020	8.631E+03	6.910E+06	9.514E+03	2.305E+03	3.455E+06	2.541E+03
2021	8.848E+03	7.084E+06	9.753E+03	2.363E+03	3.542E+06	2.605E+03
2022	9.054E+03	7.249E+06	9.980E+03	2.418E+03	3.624E+06	2.665E+03
2023	9.267E+03	7.420E+06	1.022E+04	2.475E+03	3.710E+06	2.728E+03
2024	9.522E+03	7.623E+06	1.050E+04	2.543E+03	3.812E+06	2.803E+03
2025	9.747E+03	7.803E+06	1.074E+04	2.603E+03	3.902E+06	2.869E+03
2026	9.968E+03	7.980E+06	1.099E+04	2.662E+03	3.990E+06	2.934E+03
2027	9.769E+03	7.821E+06	1.077E+04	2.609E+03	3.911E+06	2.876E+03
2028	9.578E+03	7.668E+06	1.056E+04	2.558E+03	3.834E+06	2.820E+03
2029	9.387E+03	7.516E+06	1.035E+04	2.507E+03	3.758E+06	2.763E+03
2030	9.200E+03	7.366E+06	1.014E+04	2.457E+03	3.683E+06	2.708E+03
2031	9.020E+03	7.222E+06	9.943E+03	2.409E+03	3.611E+06	2.655E+03
2032	8.841E+03	7.078E+06	9.745E+03	2.361E+03	3.539E+06	2.603E+03
2033	8.665E+03	6.937E+06	9.551E+03	2.314E+03	3.468E+06	2.551E+03
2034	8.496E+03	6.802E+06	9.365E+03	2.269E+03	3.401E+06	2.501E+03
2035	8.328E+03	6.667E+06	9.179E+03	2.224E+03	3.334E+06	2.452E+03
2036	8.163E+03	6.535E+06	8.998E+03	2.180E+03	3.268E+06	2.403E+03
2037	7.998E+03	6.403E+06	8.816E+03	2.136E+03	3.202E+06	2.355E+03
2038	7.841E+03	6.277E+06	8.643E+03	2.094E+03	3.139E+06	2.308E+03
2039	7.687E+03	6.155E+06	8.474E+03	2.053E+03	3.077E+06	2.263E+03

2040	7.534E+03	6.032E+06	8.304E+03	2.012E+03	3.016E+06	2.218E+03
2041	7.384E+03	5.912E+06	8.139E+03	1.972E+03	2.956E+06	2.174E+03
2042	7.238E+03	5.795E+06	7.978E+03	1.933E+03	2.897E+06	2.131E+03
2043	7.096E+03	5.681E+06	7.821E+03	1.895E+03	2.840E+06	2.089E+03
2044	6.953E+03	5.567E+06	7.665E+03	1.857E+03	2.783E+06	2.047E+03
2045	6.819E+03	5.459E+06	7.516E+03	1.821E+03	2.730E+06	2.007E+03

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(short tons/year)	(Mg/year)	(m ³ /year)	(short tons/year)
2046	6.680E+03	5.348E+06	7.363E+03	1.784E+03	2.674E+06	1.967E+03
2047	6.549E+03	5.243E+06	7.219E+03	1.749E+03	2.622E+06	1.928E+03
2048	6.422E+03	5.141E+06	7.079E+03	1.715E+03	2.571E+06	1.890E+03
2049	6.294E+03	5.039E+06	6.938E+03	1.681E+03	2.520E+06	1.853E+03
2050	6.167E+03	4.937E+06	6.798E+03	1.647E+03	2.469E+06	1.815E+03
2051	6.047E+03	4.842E+06	6.666E+03	1.615E+03	2.421E+06	1.780E+03
2052	5.927E+03	4.746E+06	6.534E+03	1.583E+03	2.373E+06	1.745E+03
2053	5.808E+03	4.650E+06	6.402E+03	1.551E+03	2.325E+06	1.710E+03
2054	5.695E+03	4.560E+06	6.278E+03	1.521E+03	2.280E+06	1.677E+03
2055	5.583E+03	4.470E+06	6.154E+03	1.491E+03	2.235E+06	1.644E+03
2056	5.471E+03	4.380E+06	6.030E+03	1.461E+03	2.190E+06	1.610E+03
2057	5.362E+03	4.293E+06	5.910E+03	1.432E+03	2.146E+06	1.578E+03
2058	5.257E+03	4.209E+06	5.795E+03	1.404E+03	2.104E+06	1.548E+03
2059	5.152E+03	4.125E+06	5.679E+03	1.376E+03	2.063E+06	1.517E+03
2060	5.051E+03	4.044E+06	5.568E+03	1.349E+03	2.022E+06	1.487E+03
2061	4.950E+03	3.963E+06	5.456E+03	1.322E+03	1.982E+06	1.457E+03
2062	4.853E+03	3.885E+06	5.349E+03	1.296E+03	1.943E+06	1.429E+03
2063	4.755E+03	3.807E+06	5.242E+03	1.270E+03	1.904E+06	1.400E+03
2064	4.662E+03	3.732E+06	5.139E+03	1.245E+03	1.866E+06	1.372E+03
2065	4.568E+03	3.657E+06	5.035E+03	1.220E+03	1.829E+06	1.345E+03
2066	4.478E+03	3.585E+06	4.936E+03	1.196E+03	1.793E+06	1.318E+03
2067	4.388E+03	3.513E+06	4.837E+03	1.172E+03	1.757E+06	1.292E+03
2068	4.302E+03	3.445E+06	4.742E+03	1.149E+03	1.722E+06	1.267E+03
2069	4.220E+03	3.379E+06	4.652E+03	1.127E+03	1.689E+06	1.242E+03
2070	4.134E+03	3.310E+06	4.557E+03	1.104E+03	1.655E+06	1.217E+03
2071	4.051E+03	3.244E+06	4.466E+03	1.082E+03	1.622E+06	1.193E+03
2072	3.973E+03	3.181E+06	4.379E+03	1.061E+03	1.590E+06	1.170E+03
2073	3.894E+03	3.118E+06	4.293E+03	1.040E+03	1.559E+06	1.146E+03
2074	3.816E+03	3.055E+06	4.206E+03	1.019E+03	1.527E+06	1.123E+03
2075	3.741E+03	2.995E+06	4.123E+03	9.990E+02	1.497E+06	1.101E+03
2076	3.666E+03	2.935E+06	4.041E+03	9.790E+02	1.467E+06	1.079E+03
2077	3.595E+03	2.878E+06	3.962E+03	9.600E+02	1.439E+06	1.058E+03
2078	3.523E+03	2.821E+06	3.884E+03	9.410E+02	1.410E+06	1.037E+03
2079	3.452E+03	2.764E+06	3.805E+03	9.220E+02	1.382E+06	1.016E+03
2080	3.385E+03	2.710E+06	3.731E+03	9.040E+02	1.355E+06	9.965E+02
2081	3.318E+03	2.656E+06	3.657E+03	8.860E+02	1.328E+06	9.766E+02
2082	3.254E+03	2.605E+06	3.587E+03	8.690E+02	1.303E+06	9.579E+02
2083	3.186E+03	2.551E+06	3.512E+03	8.510E+02	1.276E+06	9.381E+02
2084	3.127E+03	2.503E+06	3.446E+03	8.350E+02	1.252E+06	9.204E+02
2085	3.063E+03	2.452E+06	3.376E+03	8.180E+02	1.226E+06	9.017E+02
2086	3.003E+03	2.404E+06	3.310E+03	8.020E+02	1.202E+06	8.840E+02
2087	2.943E+03	2.356E+06	3.244E+03	7.860E+02	1.178E+06	8.664E+02
2088	2.883E+03	2.308E+06	3.178E+03	7.700E+02	1.154E+06	8.488E+02
2089	2.827E+03	2.263E+06	3.116E+03	7.550E+02	1.132E+06	8.322E+02
2090	2.771E+03	2.218E+06	3.054E+03	7.400E+02	1.109E+06	8.157E+02
2091	2.718E+03	2.176E+06	2.997E+03	7.260E+02	1.088E+06	8.003E+02
2092	2.662E+03	2.131E+06	2.935E+03	7.110E+02	1.066E+06	7.837E+02
2093	2.610E+03	2.089E+06	2.877E+03	6.970E+02	1.045E+06	7.683E+02
2094	2.557E+03	2.048E+06	2.819E+03	6.830E+02	1.024E+06	7.529E+02
2095	2.509E+03	2.009E+06	2.765E+03	6.700E+02	1.004E+06	7.385E+02
2096	2.456E+03	1.967E+06	2.708E+03	6.560E+02	9.833E+05	7.231E+02
2097	2.408E+03	1.928E+06	2.654E+03	6.430E+02	9.638E+05	7.088E+02
2098	2.363E+03	1.892E+06	2.604E+03	6.310E+02	9.458E+05	6.956E+02
2099	2.314E+03	1.853E+06	2.551E+03	6.180E+02	9.263E+05	6.812E+02
2100	2.269E+03	1.817E+06	2.501E+03	6.060E+02	9.083E+05	6.680E+02
2101	2.224E+03	1.781E+06	2.452E+03	5.940E+02	8.904E+05	6.548E+02
Total	6.8E+05	5.5E+08	7.6E+05	1.8E+05	2.7E+08	2.0E+05

Results (Continued)

Year	Carbon Dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(short tons/year)	(Mg/year)	(m ³ /year)	(short tons/year)
1961	0	0	0	0	0	0
1962	1.290E+02	7.045E+04	1.421E+02	9.293E-02	2.593E+01	1.024E-01
1963	2.716E+02	1.484E+05	2.994E+02	1.957E-01	5.461E+01	2.158E-01
1964	4.116E+02	2.248E+05	4.537E+02	2.966E-01	8.274E+01	3.269E-01
1965	5.488E+02	2.998E+05	6.049E+02	3.954E-01	1.103E+02	4.359E-01
1966	6.859E+02	3.747E+05	7.561E+02	4.943E-01	1.379E+02	5.449E-01
1967	8.176E+02	4.467E+05	9.013E+02	5.892E-01	1.644E+02	6.495E-01
1968	9.466E+02	5.171E+05	1.043E+03	6.821E-01	1.903E+02	7.519E-01
1969	1.076E+03	5.876E+05	1.186E+03	7.751E-01	2.162E+02	8.543E-01
1970	1.199E+03	6.550E+05	1.322E+03	8.640E-01	2.410E+02	9.524E-01
1971	1.320E+03	7.210E+05	1.455E+03	9.510E-01	2.653E+02	1.048E+00
1972	1.440E+03	7.869E+05	1.588E+03	1.038E+00	2.896E+02	1.144E+00
1973	1.558E+03	8.514E+05	1.718E+03	1.123E+00	3.133E+02	1.238E+00
1974	1.674E+03	9.143E+05	1.845E+03	1.206E+00	3.365E+02	1.329E+00
1975	1.786E+03	9.758E+05	1.969E+03	1.287E+00	3.591E+02	1.419E+00
1976	1.896E+03	1.036E+06	2.090E+03	1.366E+00	3.812E+02	1.506E+00
1977	2.003E+03	1.094E+06	2.208E+03	1.443E+00	4.027E+02	1.591E+00
1978	2.110E+03	1.153E+06	2.326E+03	1.520E+00	4.242E+02	1.676E+00
1979	2.211E+03	1.208E+06	2.438E+03	1.594E+00	4.446E+02	1.757E+00
1980	2.313E+03	1.264E+06	2.550E+03	1.667E+00	4.650E+02	1.837E+00
1981	2.415E+03	1.319E+06	2.662E+03	1.740E+00	4.854E+02	1.918E+00
1982	2.511E+03	1.372E+06	2.767E+03	1.809E+00	5.047E+02	1.994E+00
1983	2.571E+03	1.404E+06	2.834E+03	1.853E+00	5.169E+02	2.042E+00
1984	2.656E+03	1.451E+06	2.928E+03	1.914E+00	5.340E+02	2.110E+00
1985	2.738E+03	1.496E+06	3.018E+03	1.973E+00	5.505E+02	2.175E+00
1986	2.766E+03	1.511E+06	3.049E+03	1.993E+00	5.560E+02	2.197E+00
1987	2.733E+03	1.493E+06	3.012E+03	1.969E+00	5.494E+02	2.171E+00
1988	2.733E+03	1.493E+06	3.012E+03	1.969E+00	5.494E+02	2.171E+00
1989	2.714E+03	1.482E+06	2.991E+03	1.955E+00	5.455E+02	2.155E+00
1990	2.793E+03	1.526E+06	3.079E+03	2.013E+00	5.615E+02	2.219E+00
1991	2.903E+03	1.586E+06	3.200E+03	2.092E+00	5.836E+02	2.306E+00
1992	3.007E+03	1.643E+06	3.315E+03	2.167E+00	6.046E+02	2.389E+00
1993	3.111E+03	1.700E+06	3.430E+03	2.242E+00	6.255E+02	2.472E+00
1994	3.079E+03	1.682E+06	3.393E+03	2.218E+00	6.189E+02	2.445E+00
1995	3.153E+03	1.722E+06	3.475E+03	2.272E+00	6.338E+02	2.504E+00
1996	3.232E+03	1.766E+06	3.563E+03	2.329E+00	6.498E+02	2.567E+00
1997	3.306E+03	1.806E+06	3.644E+03	2.383E+00	6.647E+02	2.626E+00
1998	3.386E+03	1.850E+06	3.732E+03	2.440E+00	6.807E+02	2.689E+00
1999	3.468E+03	1.895E+06	3.823E+03	2.499E+00	6.972E+02	2.755E+00
2000	3.550E+03	1.940E+06	3.914E+03	2.558E+00	7.138E+02	2.820E+00
2001	3.633E+03	1.985E+06	4.004E+03	2.618E+00	7.303E+02	2.886E+00
2002	3.723E+03	2.034E+06	4.104E+03	2.683E+00	7.485E+02	2.958E+00
2003	3.825E+03	2.089E+06	4.216E+03	2.756E+00	7.689E+02	3.038E+00
2004	3.926E+03	2.145E+06	4.328E+03	2.829E+00	7.893E+02	3.119E+00
2005	4.036E+03	2.205E+06	4.449E+03	2.908E+00	8.114E+02	3.206E+00
2006	4.151E+03	2.268E+06	4.576E+03	2.991E+00	8.346E+02	3.298E+00
2007	4.272E+03	2.334E+06	4.709E+03	3.078E+00	8.588E+02	3.393E+00
2008	4.401E+03	2.404E+06	4.851E+03	3.171E+00	8.848E+02	3.496E+00
2009	4.519E+03	2.469E+06	4.981E+03	3.256E+00	9.085E+02	3.590E+00
2010	4.645E+03	2.538E+06	5.120E+03	3.347E+00	9.339E+02	3.690E+00
2011	4.788E+03	2.616E+06	5.278E+03	3.450E+00	9.625E+02	3.803E+00
2012	4.944E+03	2.701E+06	5.450E+03	3.563E+00	9.940E+02	3.927E+00
2013	5.095E+03	2.783E+06	5.616E+03	3.672E+00	1.024E+03	4.047E+00
2014	5.260E+03	2.873E+06	5.798E+03	3.790E+00	1.057E+03	4.178E+00
2015	5.433E+03	2.968E+06	5.988E+03	3.915E+00	1.092E+03	4.315E+00
2016	5.611E+03	3.065E+06	6.185E+03	4.043E+00	1.128E+03	4.457E+00
2017	5.781E+03	3.158E+06	6.373E+03	4.166E+00	1.162E+03	4.592E+00
2018	5.973E+03	3.263E+06	6.584E+03	4.304E+00	1.201E+03	4.745E+00
2019	6.143E+03	3.356E+06	6.772E+03	4.427E+00	1.235E+03	4.880E+00
2020	6.324E+03	3.455E+06	6.971E+03	4.557E+00	1.271E+03	5.024E+00
2021	6.484E+03	3.542E+06	7.147E+03	4.672E+00	1.303E+03	5.150E+00
2022	6.634E+03	3.624E+06	7.313E+03	4.781E+00	1.334E+03	5.270E+00
2023	6.791E+03	3.710E+06	7.486E+03	4.894E+00	1.365E+03	5.394E+00
2024	6.977E+03	3.812E+06	7.691E+03	5.028E+00	1.403E+03	5.542E+00
2025	7.142E+03	3.902E+06	7.873E+03	5.147E+00	1.436E+03	5.673E+00
2026	7.304E+03	3.990E+06	8.051E+03	5.263E+00	1.468E+03	5.802E+00
2027	7.158E+03	3.911E+06	7.891E+03	5.159E+00	1.439E+03	5.686E+00
2028	7.019E+03	3.834E+06	7.737E+03	5.058E+00	1.411E+03	5.575E+00
2029	6.879E+03	3.758E+06	7.582E+03	4.957E+00	1.383E+03	5.464E+00
2030	6.741E+03	3.683E+06	7.431E+03	4.858E+00	1.355E+03	5.355E+00
2031	6.610E+03	3.611E+06	7.286E+03	4.763E+00	1.329E+03	5.250E+00
2032	6.478E+03	3.539E+06	7.141E+03	4.668E+00	1.302E+03	5.146E+00
2033	6.349E+03	3.468E+06	6.999E+03	4.575E+00	1.276E+03	5.043E+00
2034	6.226E+03	3.401E+06	6.862E+03	4.486E+00	1.252E+03	4.945E+00
2035	6.102E+03	3.334E+06	6.726E+03	4.397E+00	1.227E+03	4.847E+00
2036	5.981E+03	3.268E+06	6.593E+03	4.310E+00	1.202E+03	4.751E+00
2037	5.861E+03	3.202E+06	6.460E+03	4.223E+00	1.178E+03	4.655E+00
2038	5.745E+03	3.139E+06	6.333E+03	4.140E+00	1.155E+03	4.564E+00
2039	5.633E+03	3.077E+06	6.209E+03	4.059E+00	1.132E+03	4.474E+00
2040	5.520E+03	3.016E+06	6.085E+03	3.978E+00	1.110E+03	4.385E+00

2041	5.411E+03	2.956E+06	5.964E+03	3.899E+00	1.088E+03	4.298E+00
2042	5.304E+03	2.897E+06	5.846E+03	3.822E+00	1.066E+03	4.213E+00
2043	5.199E+03	2.840E+06	5.731E+03	3.747E+00	1.045E+03	4.130E+00
2044	5.095E+03	2.783E+06	5.616E+03	3.672E+00	1.024E+03	4.047E+00
2045	4.996E+03	2.730E+06	5.508E+03	3.600E+00	1.004E+03	3.969E+00
2046	4.895E+03	2.674E+06	5.396E+03	3.527E+00	9.841E+02	3.888E+00

Year	Carbon Dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(short tons/year)	(Mg/year)	(m ³ /year)	(short tons/year)
2047	4.799E+03	2.622E+06	5.290E+03	3.458E+00	9.648E+02	3.812E+00
2048	4.706E+03	2.571E+06	5.187E+03	3.391E+00	9.460E+02	3.738E+00
2049	4.612E+03	2.520E+06	5.084E+03	3.324E+00	9.272E+02	3.664E+00
2050	4.519E+03	2.469E+06	4.981E+03	3.256E+00	9.085E+02	3.590E+00
2051	4.431E+03	2.421E+06	4.884E+03	3.193E+00	8.908E+02	3.520E+00
2052	4.343E+03	2.373E+06	4.788E+03	3.130E+00	8.732E+02	3.450E+00
2053	4.256E+03	2.325E+06	4.691E+03	3.067E+00	8.555E+02	3.380E+00
2054	4.173E+03	2.280E+06	4.600E+03	3.007E+00	8.390E+02	3.315E+00
2055	4.091E+03	2.235E+06	4.509E+03	2.948E+00	8.224E+02	3.250E+00
2056	4.009E+03	2.190E+06	4.419E+03	2.889E+00	8.059E+02	3.184E+00
2057	3.929E+03	2.146E+06	4.331E+03	2.831E+00	7.899E+02	3.121E+00
2058	3.852E+03	2.104E+06	4.246E+03	2.776E+00	7.744E+02	3.060E+00
2059	3.775E+03	2.063E+06	4.162E+03	2.721E+00	7.590E+02	2.999E+00
2060	3.701E+03	2.022E+06	4.080E+03	2.667E+00	7.441E+02	2.940E+00
2061	3.627E+03	1.982E+06	3.998E+03	2.614E+00	7.292E+02	2.881E+00
2062	3.556E+03	1.943E+06	3.920E+03	2.562E+00	7.149E+02	2.825E+00
2063	3.485E+03	1.904E+06	3.841E+03	2.511E+00	7.005E+02	2.768E+00
2064	3.416E+03	1.866E+06	3.765E+03	2.462E+00	6.867E+02	2.713E+00
2065	3.347E+03	1.829E+06	3.690E+03	2.412E+00	6.730E+02	2.659E+00
2066	3.282E+03	1.793E+06	3.617E+03	2.365E+00	6.597E+02	2.607E+00
2067	3.216E+03	1.757E+06	3.545E+03	2.317E+00	6.465E+02	2.554E+00
2068	3.153E+03	1.722E+06	3.475E+03	2.272E+00	6.338E+02	2.504E+00
2069	3.092E+03	1.689E+06	3.409E+03	2.228E+00	6.217E+02	2.456E+00
2070	3.029E+03	1.655E+06	3.339E+03	2.183E+00	6.090E+02	2.406E+00
2071	2.969E+03	1.622E+06	3.272E+03	2.139E+00	5.968E+02	2.358E+00
2072	2.911E+03	1.590E+06	3.209E+03	2.098E+00	5.852E+02	2.312E+00
2073	2.854E+03	1.559E+06	3.145E+03	2.056E+00	5.737E+02	2.267E+00
2074	2.796E+03	1.527E+06	3.082E+03	2.015E+00	5.621E+02	2.221E+00
2075	2.741E+03	1.497E+06	3.021E+03	1.975E+00	5.510E+02	2.177E+00
2076	2.686E+03	1.467E+06	2.961E+03	1.936E+00	5.400E+02	2.134E+00
2077	2.634E+03	1.439E+06	2.903E+03	1.898E+00	5.295E+02	2.092E+00
2078	2.582E+03	1.410E+06	2.846E+03	1.861E+00	5.191E+02	2.051E+00
2079	2.530E+03	1.382E+06	2.789E+03	1.823E+00	5.086E+02	2.009E+00
2080	2.480E+03	1.355E+06	2.734E+03	1.787E+00	4.986E+02	1.970E+00
2081	2.431E+03	1.328E+06	2.680E+03	1.752E+00	4.887E+02	1.931E+00
2082	2.384E+03	1.303E+06	2.628E+03	1.718E+00	4.793E+02	1.894E+00
2083	2.335E+03	1.276E+06	2.574E+03	1.683E+00	4.694E+02	1.855E+00
2084	2.291E+03	1.252E+06	2.525E+03	1.651E+00	4.606E+02	1.820E+00
2085	2.244E+03	1.226E+06	2.474E+03	1.617E+00	4.512E+02	1.783E+00
2086	2.201E+03	1.202E+06	2.426E+03	1.586E+00	4.424E+02	1.748E+00
2087	2.157E+03	1.178E+06	2.377E+03	1.554E+00	4.336E+02	1.713E+00
2088	2.113E+03	1.154E+06	2.329E+03	1.522E+00	4.247E+02	1.678E+00
2089	2.072E+03	1.132E+06	2.283E+03	1.493E+00	4.165E+02	1.645E+00
2090	2.030E+03	1.109E+06	2.238E+03	1.463E+00	4.082E+02	1.613E+00
2091	1.992E+03	1.088E+06	2.196E+03	1.435E+00	4.005E+02	1.582E+00
2092	1.951E+03	1.066E+06	2.150E+03	1.406E+00	3.922E+02	1.550E+00
2093	1.912E+03	1.045E+06	2.108E+03	1.378E+00	3.845E+02	1.519E+00
2094	1.874E+03	1.024E+06	2.066E+03	1.350E+00	3.767E+02	1.489E+00
2095	1.838E+03	1.004E+06	2.026E+03	1.325E+00	3.696E+02	1.460E+00
2096	1.800E+03	9.833E+05	1.984E+03	1.297E+00	3.619E+02	1.430E+00
2097	1.764E+03	9.638E+05	1.945E+03	1.271E+00	3.547E+02	1.401E+00
2098	1.731E+03	9.458E+05	1.908E+03	1.248E+00	3.481E+02	1.375E+00
2099	1.696E+03	9.263E+05	1.869E+03	1.222E+00	3.409E+02	1.347E+00
2100	1.663E+03	9.083E+05	1.833E+03	1.198E+00	3.343E+02	1.321E+00
2101	1.630E+03	8.904E+05	1.797E+03	1.174E+00	3.277E+02	1.295E+00
Total	5.02E+05	2.74E+08	5.53E+05	3.62E+02	1.01E+05	3.99E+02



Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, engine, etc.)	Emission Unit Number:	Emission Point Number:
Make	Model	Installation or manufacture date
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process:		
Brief description of alternative operating scenario (see Section M1 & M2 to elaborate):	Alternative Emission Point:	

Are you agreeing to a limit on the operating schedule for this unit? ☐ Yes ☐ No				
Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown

Are you agreeing to a limit on the production for this unit? ☐ Yes ☐ No (If No, show normal operating schedule.)				
Material	Process Time Frame			Specify Units (tons, Btu, Gal., etc)
	Hour	Week	Year	

[illegible]

SECTION D2 – IDENTIFICATION OF AIR CONTAMINANTS

Has emission unit testing been done at the facility? ☐ Yes ☐ No			
Emission Unit ID	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency	Regulation requiring frequency (NSPS, MACT, Permit Requirement-list permit number)

Add additional pages if necessary

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications					
Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION H – ALTERNATIVE STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION I – AIR CONTAMINANTS EMITTED

Known or Suspected - Use emission rates after control equipment.			
Pollutant (use CAS for HAPs)	Amount		Basis of Estimate (AP-42, testing, engineering estimate, etc)
	Pounds/Hr	Tons/Yr	

SECTION J1 – AIR POLLUTION CONTROL EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator ☐ Wet Scrubber ☐ Spray Dryer ☐ None ☐ Other – Specify: _____				
Name of Manufacturer		Model Number		Date to Be Installed
Application: ☐ Boiler ☐ Kiln ☐ Engine ☐ Other – Specify: _____				
Pollutants Removed				
Design Efficiency (%)				

Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

SECTION J2 – GAS CONDITIONS

Gas Conditions	Inlet		Outlet	
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H ₂ O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify pollutant and unit of concentration)	Pollutant	Unit of Concentration	Inlet	Outlet
Pressure drop through gas cleaning device (in. H ₂ O)				

EMISSION UNIT FOR TITLE V PERMIT TO OPERATE
NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 61006 (3-2019)

SECTION A – EQUIPMENT INFORMATION

Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, engine, etc.)	Emission Unit Number:	Emission Point Number:
Make	Model	Installation or manufacture date
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process:		
Brief description of alternative operating scenario (see Section M1 & M2 to elaborate):	Alternative Emission Point:	

SECTION B –OPERATING SCHEDULE

Are you agreeing to a limit on the operating schedule for this unit? ☐ Yes ☐ No				
Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown

SECTION C – PRODUCTION RATES (THROUGHPUT LIMITS)

Are you agreeing to a limit on the production for this unit? ☐ Yes ☐ No (If No, show normal operating schedule.)				
Material	Process Time Frame			Specify Units (tons, Btu, Gal., etc)
	Hour	Week	Year	

SECTION D1 – APPLICABLE REQUIREMENTS

[illegible]

SECTION D2 – IDENTIFICATION OF AIR CONTAMINANTS

Has emission unit testing been done at the facility? ☐ Yes ☐ No			
Emission Unit ID	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency	Regulation requiring frequency (NSPS, MACT, Permit Requirement-list permit number)

Add additional pages if necessary

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications					
Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION H – ALTERNATIVE STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION I – AIR CONTAMINANTS EMITTED

Known or Suspected - Use emission rates after control equipment.			
Pollutant (use CAS for HAPs)	Amount		Basis of Estimate (AP-42, testing, engineering estimate, etc)
	Pounds/Hr	Tons/Yr	

SECTION J1 – AIR POLLUTION CONTROL EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator ☐ Wet Scrubber ☐ Spray Dryer ☐ None ☐ Other – Specify: _____				
Name of Manufacturer		Model Number		Date to Be Installed
Application: ☐ Boiler ☐ Kiln ☐ Engine ☐ Other – Specify: _____				
Pollutants Removed				
Design Efficiency (%)				

Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

SECTION J2 – GAS CONDITIONS

Gas Conditions	Inlet		Outlet	
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H ₂ O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify pollutant and unit of concentration)	Pollutant	Unit of Concentration	Inlet	Outlet
Pressure drop through gas cleaning device (in. H ₂ O)				



Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, engine, etc.)	Emission Unit Number:	Emission Point Number:
Make	Model	Installation or manufacture date
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process:		
Brief description of alternative operating scenario (see Section M1 & M2 to elaborate):	Alternative Emission Point:	

Are you agreeing to a limit on the operating schedule for this unit? ☐ Yes ☐ No				
Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown

Are you agreeing to a limit on the production for this unit? ☐ Yes ☐ No (If No, show normal operating schedule.)				
Material	Process Time Frame			Specify Units (tons, Btu, Gal., etc)
	Hour	Week	Year	

[illegible]

SECTION D2 – IDENTIFICATION OF AIR CONTAMINANTS

Has emission unit testing been done at the facility? ☐ Yes ☐ No			
Emission Unit ID	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency	Regulation requiring frequency (NSPS, MACT, Permit Requirement-list permit number)

Add additional pages if necessary

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications					
Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION H – ALTERNATIVE STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION I – AIR CONTAMINANTS EMITTED

Known or Suspected - Use emission rates after control equipment.			
Pollutant (use CAS for HAPs)	Amount		Basis of Estimate (AP-42, testing, engineering estimate, etc)
	Pounds/Hr	Tons/Yr	

SECTION J1 – AIR POLLUTION CONTROL EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator ☐ Wet Scrubber ☐ Spray Dryer ☐ None ☐ Other – Specify: _____				
Name of Manufacturer		Model Number		Date to Be Installed
Application: ☐ Boiler ☐ Kiln ☐ Engine ☐ Other – Specify: _____				
Pollutants Removed				
Design Efficiency (%)				

Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

SECTION J2 – GAS CONDITIONS

Gas Conditions	Inlet		Outlet	
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H ₂ O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify pollutant and unit of concentration)	Pollutant	Unit of Concentration	Inlet	Outlet
Pressure drop through gas cleaning device (in. H ₂ O)				



Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, engine, etc.)	Emission Unit Number:	Emission Point Number:
Make	Model	Installation or manufacture date
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process:		
Brief description of alternative operating scenario (see Section M1 & M2 to elaborate):	Alternative Emission Point:	

Are you agreeing to a limit on the operating schedule for this unit? ☐ Yes ☐ No				
Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown

Are you agreeing to a limit on the production for this unit? ☐ Yes ☐ No (If No, show normal operating schedule.)				
Material	Process Time Frame			Specify Units (tons, Btu, Gal., etc)
	Hour	Week	Year	

[illegible]

SECTION D2 – IDENTIFICATION OF AIR CONTAMINANTS

Has emission unit testing been done at the facility? ☐ Yes ☐ No			
Emission Unit ID	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency	Regulation requiring frequency (NSPS, MACT, Permit Requirement-list permit number)

Add additional pages if necessary

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications					
Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION H – ALTERNATIVE STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION I – AIR CONTAMINANTS EMITTED

Known or Suspected - Use emission rates after control equipment.			
Pollutant (use CAS for HAPs)	Amount		Basis of Estimate (AP-42, testing, engineering estimate, etc)
	Pounds/Hr	Tons/Yr	

SECTION J1 – AIR POLLUTION CONTROL EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator ☐ Wet Scrubber ☐ Spray Dryer ☐ None ☐ Other – Specify: _____				
Name of Manufacturer		Model Number		Date to Be Installed
Application: ☐ Boiler ☐ Kiln ☐ Engine ☐ Other – Specify: _____				
Pollutants Removed				
Design Efficiency (%)				

Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

SECTION J2 – GAS CONDITIONS

Gas Conditions	Inlet		Outlet	
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H ₂ O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify pollutant and unit of concentration)	Pollutant	Unit of Concentration	Inlet	Outlet
Pressure drop through gas cleaning device (in. H ₂ O)				



Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, engine, etc.)	Emission Unit Number:	Emission Point Number:
Make	Model	Installation or manufacture date
Capacity (manufacturer's or designer's guaranteed maximum)	Operating Capacity (specific units)	
Brief description of operation of unit or process:		
Brief description of alternative operating scenario (see Section M1 & M2 to elaborate):	Alternative Emission Point:	

Are you agreeing to a limit on the operating schedule for this unit? ☐ Yes ☐ No				
Hours Per Day	Days Per Week	Weeks Per Year	Peak Production Season (if any)	Dates of Annual Shutdown

Are you agreeing to a limit on the production for this unit? ☐ Yes ☐ No (If No, show normal operating schedule.)				
Material	Process Time Frame			Specify Units (tons, Btu, Gal., etc)
	Hour	Week	Year	

[illegible]

SECTION D2 – IDENTIFICATION OF AIR CONTAMINANTS

Has emission unit testing been done at the facility? ☐ Yes ☐ No			
Emission Unit ID	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency	Regulation requiring frequency (NSPS, MACT, Permit Requirement-list permit number)

Add additional pages if necessary

SECTION E – PRODUCTS OF UNIT OR PROCESS

Include all, even those not usable because they do not meet specifications					
Material	Hourly Process Weight (Pounds Per Hour)			Average Annual (Specify Units)	Intermittent Operation Only (Average Hours Per Week)
	Average	Maximum	Minimum		

SECTION F – FUELS USED

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

SECTION G – STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION H – ALTERNATIVE STACK PARAMETERS

List each pollutant separately.					
Pollutant (use CAS for HAPs)	Stack Height (ft)	Stack Diameter (ft at top)	Gas Volume (ACFM)	Exit Temp (°F)	Gas Velocity (fps)
Stack Base UTM Coordinate X:			Stack Base UTM Coordinate Y:		

SECTION I – AIR CONTAMINANTS EMITTED

Known or Suspected - Use emission rates after control equipment.			
Pollutant (use CAS for HAPs)	Amount		Basis of Estimate (AP-42, testing, engineering estimate, etc)
	Pounds/Hr	Tons/Yr	

SECTION J1 – AIR POLLUTION CONTROL EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator ☐ Wet Scrubber ☐ Spray Dryer ☐ None ☐ Other – Specify: _____				
Name of Manufacturer		Model Number		Date to Be Installed
Application: ☐ Boiler ☐ Kiln ☐ Engine ☐ Other – Specify: _____				
Pollutants Removed				
Design Efficiency (%)				

Operating Efficiency (%)				
Describe method used to determine operating efficiency:				

SECTION J2 – GAS CONDITIONS

Gas Conditions	Inlet		Outlet	
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H ₂ O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify pollutant and unit of concentration)	Pollutant	Unit of Concentration	Inlet	Outlet
Pressure drop through gas cleaning device (in. H ₂ O)				

Air Title V Operating Permit (AOP) - Renewal

version 2.8

(Submission #: HQH-995A-R7D63, version 1)

Digitally signed by:
CERIS-ND
Date: 2026.06.01 10:22:04 -05:00
Reason: Submission Data
Location: State of North Dakota

Details

Submission ID HQH-995A-R7D63

Form Input

Form Instructions

In accordance with 33.1-15-14-04.c. of the North Dakota Air Pollution Control Rules, a Title V permit renewal application must be submitted to the Department at least six months, but no more than eighteen months, prior to the expiration date. Permit renewal applications are incomplete unless all information requested in SFN 52824 is supplied. The current Title V permit will be the baseline reference for a renewal. The requirements (40 CFR 70.5(c) & NDAC 33.1-15-14-06.4.c) to include a citation and description of all applicable requirements and a description of or reference to any applicable test method for determining compliance with each applicable requirement may be met by accomplishing either or both of the following: 1) provide an annotated (red-lined) copy of the current permit indicating all changes needed to reflect the current facility configuration, applicable requirements and test methods; 2) provide a narrative that conveys all changes needed to the current permit to reflect the current facility configuration, all applicable requirements and test methods.

FOR ACID RAIN UNITS ONLY ♦ Submit with the Title V permit renewal application all Acid Rain renewal applications (the Acid Rain Permit Application, the Phase II NOx Compliance Plan, and if applicable, the Phase II NOx Averaging Plan).

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Section A - Permit Information

Permit Number

AOP-28476

Permit Version

1

Issue Date

12/06/2021

Expiration Date

12/06/2026

Permittee

Company Name

City of Bismarck

Address

PO Box 5503

Bismarck, ND 58506-5503

United States

Responsible Official**Prefix**

Mr.

First Name

Steve

Last Name

Salwei

Title

Public Works Director for Service Operations

Phone Type**Number****Extension**

Business

7013551700

Email

ssalwei@bismarcknd.gov

Address

601 S 26th St

Bismarck, ND 58506-5503

United States

Contact Person for Air Pollution Matters**Prefix**

Mr.

First Name

Toby

Last Name

Sheldon

Title

Bismarck Landfill Supervisor

Phone Type**Number****Extension**

Business

7013551700

Email

tsheldon@bismarcknd.gov

Address

2111 N 52nd St

Bismarck, ND 58501

United States

Section B (Part 1) - Facility Information**Facility Name**

City of Bismarck - Bismarck Landfill

Have you added, removed, or made any modifications to equipment since your last operating permit issuance?

No

Is this source subject to Title IV Acid Rain regulations?

No

Is this a portable source?

No

Facility Location

2111 North 52nd Street

P.O. Box 5503, Bismarck, ND 58506

Bismarck, ND 58501

United States

County

Burleigh

Click the link below to use Google Maps to find the lat/long for a given address

[Google Maps](#)

Facility Location:

46.832619000000001,-100.70682500000000

2111 North 52nd Street, Bismarck, ND

Section B (Part 2) - Additional Location Information

Legal Description of Facility Site

Qtr Qtr	Qtr	Section	Township	Range
SE	NE	25	139N	80W
NE	SE	25	139N	80W
NONE PROVIDED	SE	30	139N	79W
NONE PROVIDED	NE	30	139N	79W
NONE PROVIDED	SW	30	139N	79W
NONE PROVIDED	NW	30	139N	79W

Land area at facility site (indicate whether measurement is in acres or sq. ft.)

651

MSL elevation at facility

1785

Section C - Nature of Business

General Nature of Business

Describe Nature of Business	NAICS Code	SIC Code
Municipal Solid Waste Landfill Facility	562212-Solid Waste Landfill	4953-Refuse Systems

Actual Start of Construction Date

05/01/1961

Actual End of Construction Date

NONE PROVIDED

Facility Startup Date

05/01/1961

Section D - Process Equipment Information (1 of 5)

Emission Unit - EU1

Emission Unit ID

EU1

Emission Unit Description

Municipal Solid Waste Landfill

Emission Point ID

1

Emission Point Description

Municipal Solid Waste Landfill

Emission Process Description

NONE PROVIDED

Emission Unit Status

Existing, no change

Applicable PTCs

PTC Number
NONE PROVIDED

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Emission Unit form

Download the emission unit form linked here, complete it, and upload it to this application using the attachment control below.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

[EMISSION UNIT FOR TITLE V PERMIT TO OPERATE \(SFN61006\)](#)

Attach Emission Unit Form

[SFN61006 EU1.pdf - 05/20/2026 04:20 PM](#)

[LandGEM-v3.1 Bismarck MSW Landfill through 2025.pdf - 05/20/2026 04:21 PM](#)

Comment

NONE PROVIDED

Section D - Process Equipment Information (2 of 5)**Emission Unit - EU2****Emission Unit ID**

EU2

Emission Unit Description

Caterpillar C-27 Diesel Engine (Wood Grinder) rated at 950 bhp

Emission Point ID

2

Emission Point Description

NONE PROVIDED

Emission Process Description

NONE PROVIDED

Emission Unit Status

Existing, no change

Applicable PTCs

PTC Number
NONE PROVIDED

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Emission Unit form

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[EMISSION UNIT FOR TITLE V PERMIT TO OPERATE \(SFN61006\)](#)

Attach Emission Unit Form

SFN61006 EU2.pdf - 05/20/2026 05:03 PM

EU2 - Wood Grinder Combustion Engine Emission Summary.pdf - 05/20/2026 05:04 PM

Comment

NONE PROVIDED

Section D - Process Equipment Information (3 of 5)**Emission Unit - EU3****Emission Unit ID**

EU3

Emission Unit Description

Compost Screen with Diesel Engine

Emission Point ID

3

Emission Point Description

NONE PROVIDED

Emission Process Description

NONE PROVIDED

Emission Unit Status

Existing, modification

Applicable PTCs

PTC Number
NONE PROVIDED

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Emission Unit form

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[EMISSION UNIT FOR TITLE V PERMIT TO OPERATE \(SFN61006\)](#)

Attach Emission Unit Form

SFN61006 EU3.pdf - 05/20/2026 05:11 PM
EU3 - Compost Screen Combustion Engine Emission Summary.pdf - 05/20/2026 05:12 PM
Comment
In 2025 the Compost screen equipment was replaced with a new trommel screen with a new Tier 4 Engine

Section D - Process Equipment Information (4 of 5)

Emission Unit - EU4A

Emission Unit ID
EU4A

Emission Unit Description
Air Curtain Incinerator (ACI)

Emission Point ID
4A

Emission Point Description
Air Curtain Box

Emission Process Description
NONE PROVIDED

Emission Unit Status
Existing, modification

Applicable PTCs

PTC Number
ACP-18186 V1.0

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Emission Unit form

Download the emission unit form linked here, complete it, and upload it to this application using the attachment control below.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

[EMISSION UNIT FOR TITLE V PERMIT TO OPERATE \(SFN61006\)](#)

Attach Emission Unit Form

SFN61006 EU4A.pdf - 05/20/2026 05:14 PM
Comment
NONE PROVIDED

Section D - Process Equipment Information (5 of 5)

Emission Unit - EU4B

Emission Unit ID

EU4B

Emission Unit Description

Diesel-Fired Engine for Air Curtain Incinerator (ACI)

Emission Point ID

4B

Emission Point Description

NONE PROVIDED

Emission Process Description

NONE PROVIDED

Emission Unit Status

Existing, modification

Applicable PTCs

PTC Number
ACP-18186 V1.0

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Emission Unit form

Download the emission unit form linked here, complete it, and upload it to this application using the attachment control below.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

[EMISSION UNIT FOR TITLE V PERMIT TO OPERATE \(SFN61006\)](#)

Attach Emission Unit Form

[SFN61006 EU4B.pdf - 05/20/2026 05:20 PM](#)

[EU4B - ACI Combustion Engine Emission Summary.pdf - 05/20/2026 05:21 PM](#)

Comment

NONE PROVIDED

Section F - Facility-Wide Applicable Regulations and Potential to Emit (PTE)

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-14-06. Title V Permit to Operate.

Regulation

33.1-15-01. General Provisions.

33.1-15-05-03.1. Other waste incinerators.

33.1-15-08. Control of Air Pollution from Vehicles and Other Internal Combustion Engines.

Potential to Emit (PTE)

Pollutant	Tons Per Year Without Fugitives	Tons Per Year With Fugitives
NOx	4.3044	NONE PROVIDED
CO	1.3221	NONE PROVIDED
VOCs	11.24	NONE PROVIDED
SO2	2.27	NONE PROVIDED
PM	NONE PROVIDED	NONE PROVIDED
PM10	2.15	NONE PROVIDED
PM2.5	NONE PROVIDED	NONE PROVIDED
Total HAPs	4.817	NONE PROVIDED
See Attached	NONE PROVIDED	NONE PROVIDED

Emission Calculations Document Upload

Using the attachment control below, upload emission calculations documents.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attach Emission Calculations Documents

Potential to Emit Calculations for Bismarck Solid Waste Facility.pdf - 05/29/2026 02:47 PM

Comment

NONE PROVIDED

Section G - Compliance Schedule

Will your facility be in compliance with all applicable requirements effective at the time of permit issuance?

Yes

Will your facility be in compliance with all applicable requirements effective after the time of permit issuance?

Yes

Section H - Flexible Permits

Are you requesting a flexible permit?

No

Section I - Compliance Assurance Monitoring (CAM)

To determine if your facility is subject to CAM, review the information provided at the following link.

[Compliance Assurance Monitoring \(CAM\) Guidance](#)

Is the facility identified in this application in compliance with applicable monitoring and compliance certification requirements?

Yes, the facility IS in compliance with applicable monitoring and compliance certification requirements.

Section K - Redline Permit Upload

Use the attachment control below to upload a redline version of your existing permit document, showing any changes.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attach redline version of permit here

AOP-28476v1.0 (2) Redlines for Renewal and Addition of EU4A&B.pdf - 05/29/2026 02:58 PM

Comment

NONE PROVIDED

Section L - General Document Upload

File Upload

Use the attachment control below to upload any other information necessary for application review, such as plot plans, process diagrams, maps, etc.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attachments

Bismarck Landfill Title V Air Permit Renewal 5-29-26 Signed.pdf - 05/29/2026 03:01 PM

Comment

NONE PROVIDED

Additional Forms

NONE PROVIDED

Agreements and Signature(s)

Certification Statement

I certify under penalty of law that the enclosed documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I also certify that the source(s) identified in this application is/are in compliance with all applicable requirements except those requirements for which a compliance schedule has been submitted in the Compliance Schedule Form or Compliance Schedule Section of the application. I understand that failure to comply with any term of a compliance schedule is considered to be a violation of regulation NDAC 33.1-15-14-06.1.e. The source will continue to comply with the current applicable requirements with which it is in compliance. The source will meet, on a timely basis, any applicable requirement, which becomes effective during the permit term. The source is properly implementing any required risk management plan in accordance with section 112(r) of the federal clean air act, if appropriate.

I certify, as the Responsible Official, that I have read and understood the above requirements and conditions applicable to my source/facility and that the information and attachments provided in this application are true, accurate, and complete to the best of my knowledge." Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand a permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Note: This certification must be signed by a "responsible official" as defined in NDAC 33.1-15-14-06.1.

Submission Agreements

- ☒ I am the owner of the account used to perform the electronic submission and signature.
- ☒ I have the authority to submit the data on behalf of the facility I am representing.
- ☒ I agree that providing the account credentials to sign the submission document constitutes an electronic signature equivalent to my written signature.
- ☒ I have reviewed the electronic form being submitted in its entirety, and agree to the validity and accuracy of the information contained within it to the best of my knowledge.

Signed By Steve Salwei on 06/01/2026 at 10:19 AM

J/i8TgqCEj6m8jOwW6AsrfyzQZOUiYWo+M4h3wJs/YeNp8MxE06gU9BcO3e55ljzSCkN0O4t3NlcBEsIK/KMg==