



## Landfill Gas and Air Emissions Guidance For Municipal Solid Waste Landfill Owners and Operators

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## 1. Introduction

Municipal solid waste (MSW) landfills are regulated by both the Air Management Program (AM) and the Waste and Materials Management Program (WA) of the Wisconsin Department of Natural Resources (the department). This document provides guidance to landfill owners/operators regarding the role of each program in the landfill permit/plan approval process, explanations of applicable requirements, and communicating requests to the appropriate regulatory authority. This document is a joint guidance document from the AM and WA Programs and replaces prior guidance titled, “Wisconsin Landfill Air Emissions – A Cross-Program Regulatory Approach”, May 2007.

## 2. Regulatory approval process

Landfill gas management and air pollution emissions from MSW landfills are regulated under Wisconsin’s solid waste and air pollution control regulations, as well as federal standards. MSW landfills in Wisconsin are required to obtain an operating license from the department’s WA Program and operate in accordance with an approved plan of operation. After closure, a landfill is issued a long-term care license. The majority of active MSW landfills and certain closed landfills in Wisconsin also are subject to air pollution control permitting.

Air and WA staff provide technical assistance to determine the permits and approvals that may be needed to operate a landfill, such as:

- Feasibility report
- Plan of operation
- Air pollution control construction permit
- Air pollution control operation permit

### 2.1 WA regulatory requirements

Two major steps in the siting process for new landfills or landfill expansions include a feasibility report and plan of operation. The feasibility report under s. [289.23\(1\)](#), Wis. Stats. and ch. [NR 512](#), Wis. Adm. Code, is a prerequisite to the plan of operation and includes preliminary plans for landfill design and operation, including a landfill’s gas collection system. Other related elements within the feasibility report include a monitoring plan and an environmental analysis section, which identifies potential air emissions and impacts. The plan of operation includes design, construction, operation, monitoring, and other elements required under chs. NR 504, 506, 507, and 514, Wis. Adm. Code. Under s. [289.30\(9\)](#), Wis. Stats. and s. [NR 506.07](#), Wis. Adm. Code, the landfill must be operated in accordance with an approved plan of operation. Modifications to the plan of operation may be proposed but are required to be approved by the department prior to implementation.

Key regulatory requirements relating to landfill gas include:

- [NR 504.08\(2\)](#), Wis. Adm. Code – All landfills that accept municipal solid waste must be designed with an active gas recovery system and the system must be designed to meet the requirements of this section.

- [NR 506.135](#) and [NR 507.215](#), Wis. Adm. Code – A gas extraction system is required to be installed and operated to control additional gas generated by leachate recirculation and minimize release of uncontrolled gas. Additional gas monitoring requirements apply to landfills that recirculate leachate or accept liquid waste.
- [NR 507.22\(2\)](#), Wis. Adm. Code – The department may require the owner or operator to conduct monitoring activities to determine the effectiveness of any gas extraction or venting system.
- [NR 514.05](#), Wis. Adm. Code – The plan of operation is required to contain engineering plans, cross-sections and details depicting the design and layout of the gas control systems.
- [NR 514.06](#), Wis. Adm. Code – The plan of operation report is required to discuss the considerations and rationale behind the design, propose monitoring, describe daily operations including odor control measures, and describe phased development of gas control structures.
- [NR 514.07\(3\)\(c\)](#), Wis. Adm. Code – The components of an active gas extraction system within each phase shall be installed and made operational following attainment of waste final grades within that phase. Note: Gas extraction systems are commonly installed and operated earlier to collect gas for energy recovery, prevent or address odors, comply with air permits, or due to leachate recirculation.
- [NR 516.04\(1\)](#), Wis. Adm. Code. – A report documenting construction is required to be prepared and submitted for the construction of gas control structures.
- [289.30\(6\)](#), Wis. Stats. – The department may condition or modify approvals.

## 2.2 Air permitting applicability

MSW landfills are subject to air permitting requirements if they emit regulated air contaminants, including federal hazardous air pollutants, state hazardous air contaminants, and criteria pollutants in quantities exceeding air permit exemption thresholds. Emissions of regulated air pollutants and contaminants are generated from the decomposition of waste in the landfill, the combustion of landfill gas or other fuel, and landfill operations which may generate fugitive emissions. Information about how the different types of emissions are regulated by AM is provided below along with explanations of the types of activities that would require an air pollution control construction permit.

AM issues air pollution control permits to stationary sources of air pollution. As defined in ss. [NR 406.02](#) and [NR 407.02](#), Wis. Adm. Code, and based on federal rules, a “stationary source” or “facility” is a collection of sources emitting air contaminants which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under control of the same person, or persons under common control. This is different from the way the WA Program licenses landfills. WA issues separate operating licenses to noncontiguous landfills. One air pollution source may have multiple WA operating licenses.

Except as allowed under s. [NR 406.03\(2\)](#), Wis. Adm. Code, the MSW landfill owner/operator must be issued an air pollution control construction permit prior to commencing construction, reconstruction, replacement, relocation or modification of a stationary source of air pollution. Examples of the types of activities at an MSW landfill that would require an air pollution control construction permit include construction of a new landfill, increases in design capacity of an existing landfill, and construction or replacement of combustion units. Additional information is provided below. Typically, the application for a construction permit should be submitted between four months and eighteen months prior to the desired commence construction date to allow adequate time for the department’s review of the application and the required 30-day public comment period. Additional information about air pollution control construction permit applications may be found at the department’s [website](#).

## Emissions from decomposition of waste

MSW landfills are a source of air emissions regulated by federal New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP). Specifically, MSW landfills may be subject to one or more of the following federal air standards:

- [40 CFR part 60, subpart XXX](#): NSPS for municipal solid waste landfills that commenced construction, reconstruction, or modification after July 17, 2014
- [40 CFR part 62, subpart OOO](#): Federal plan requirements for municipal solid waste landfills that commenced construction on or before July 17, 2014 and have not been modified or reconstructed since July 17, 2014
- [40 CFR part 63, subpart AAAA](#): NESHAP for municipal solid waste landfills

The federal air standards listed above regulate emissions of nonmethane organic compounds (NMOCs) from the decomposition of waste in the landfill. The applicability of federal requirements depends on the design capacity of the landfill, the date the landfill began operation, and the amount of emissions expected from waste decomposition. The emissions expected from waste decomposition may be greater if the landfill employs leachate recirculation or liquids addition. The federal air standards regulating MSW landfills require the installation of landfill gas collection and control systems for landfills that exceed certain size and emission thresholds. Refer to the [Landfill monitoring requirements for the Air Management Program](#) section for additional information about the federal standard requirements. Any increase in the permitted design capacity of the landfill is a “modification” under the federal regulations and requires an air pollution control construction permit and operation permit revision.

The decomposition of waste in the landfill results in emissions of state-listed hazardous air contaminants that are regulated under ch. [NR 445](#), Wis. Adm. Code. When hazardous air contaminants are regulated by a federal standard, the emission limitations and control requirements in ch. NR 445 do not apply. Therefore, a landfill subject to the gas collection and control requirements of the NESHAP in 40 CFR part 63, subpart AAAA, has no additional requirements under NR 445 that apply to NMOC emissions from the decomposition of waste in the landfill. However, landfills that are not yet, or no longer subject to the NESHAP, under the authority of NR 445, may be required to install and operate a gas collection and control system sooner and/or longer than required by the federal air standards.

Emissions of hazardous air contaminants from the landfill that are not limited or controlled by the NESHAP in 40 CFR part 63 subpart AAAA, are subject to the requirements of ch. NR 445. An example of such a contaminant is hydrogen sulfide (H<sub>2</sub>S).

## Emissions from combustion

The combustion of landfill gas or other fuel may occur in units such as engines, open flares, enclosed combustion devices, or boilers. Combustion units are sources of criteria pollutant emissions and hazardous air pollutant emissions. The construction, reconstruction, replacement, relocation, or modification of a combustion unit requires an air pollution control construction permit and operation permit revision. Some activities may qualify for an exemption from construction permit requirements under s. [NR 406.04](#), Wis. Adm. Code. In general, the owner/operator should submit an application for an operation permit revision prior to commencing an activity that is exempt from construction permit requirements.

Combustion emissions may be subject to different NSPS, NESHAP, and/or NR 445 requirements than emissions from the decomposition of waste. Specifically, landfill gas-fired spark ignition (SI) reciprocating internal combustion engines (RICE) may be subject to Best Available Control Technology (BACT) for formaldehyde emissions under [NR 445](#). The department memorandum

[Presumptive BACT for Formaldehyde Emissions Generated from Landfill Gas-Fired SI RICE](#) (May 28, 2014) is available for use by any facility with landfill gas-fired SI RICE that meets the applicability requirements. Alternatively, any facility with landfill gas-fired SI RICE may elect to submit a site-specific BACT analysis or use any other compliance methods available under ch. NR 445, Wis. Adm. Code. Note that this presumptive BACT analysis is specific to formaldehyde for landfill gas-fired SI RICE and may not be used as a presumptive BACT for other sources or pollutants. There are several options available for demonstrating compliance identified in s. NR 445.08, Wis. Adm. Code.

### Emissions from other landfill operations

Other equipment, activities, or operations at a MSW landfill may generate emissions of regulated air contaminants, such as fugitive dust and malodorous emissions. Activities or operations at the landfill may include vehicle traffic, exposed soil stockpiles, tippers and tipper engines, tub grinders, and portable or temporary flares. These types of emission units should be listed in air permit applications.

## 3. Monitoring and reporting requirements for MSW landfills

WA and AM require monitoring of gas collection and treatment systems to evaluate effectiveness. The following outlines both programs' requirements, including any federal requirements in place as of the date of publication of this document.

### 3.1 Landfill monitoring requirements for the Waste and Materials Management Program

The department has authority under s. [289.30\(6\)](#), Wis. Stats. and ch. [NR 507](#), Wis. Adm. Code to require a landfill to conduct monitoring of a gas extraction system and related components. The department requires the sampling plan be included in a feasibility report in accordance with s. NR 507.16, Wis. Adm. Code and that the monitoring program and plan also be included in the plan of operation in accordance with ch. [NR 514](#), Wis. Adm. Code. In an effort to standardize the monitoring requirements for municipal solid waste landfills designed with an active gas extraction system, the department recommends landfills submit the following minimum sampling schedule for gas collection and treatment systems. Additional monitoring may be required.

*Table 3-A. Recommended minimum gas monitoring schedule*

Monitoring point type	Monitoring and reporting frequency	Parameter code <sup>5</sup>	Parameters
Gas extraction well <sup>6</sup>	Monitor monthly Report semi-annually	46382	Header pressure, inches of water
		46385	Well head pressure, inches of water
		46387	Valve setting, % open <sup>1</sup>
		46388	Gas temperature, °F
		85544	Carbon dioxide, volume %
		85547	Methane, volume %
		85550	Oxygen, volume %
		99098	Gas flow rate, SCFM
		99848	Balance gas, volume %
	Monitor and report annually	00009	% open interval, gas well screen
00031		Leachate depth, from top of liquid level to bottom in feet	
Blower / compressor <sup>4</sup>	Monitor monthly report semi-annually	46382	Header pressure, inches of water
		46388	Gas temperature, °F
		85544	Carbon dioxide, volume %
		85547	Methane, volume %
		85550	Oxygen, volume %

		99098 99848 98927	Gas flow rate, SCFM Balance gas, volume % Gas volume extracted, 1,000 cu ft. / month
	Monitor and report annually	99243	Total reduced sulfur (using EPA Method 16, ASTM D5504, or ASTM D 6228)  VOCs (using EPA Method TO-15 or TO-14A) <sup>2</sup>
Gas collection system (per leachate drainage basin)	Sample monthly  Report semi-annually (continues 3 years after recirculation)	98927	Gas volume extracted, 1,000 cu. Ft. / month
Surface emissions monitoring (SEM)	In accordance with air permit, or annually for MSW landfills without an air permit Report annually <sup>3</sup>	N/A	N/A
Gas probes	Monitor and report quarterly	85547 85550	Methane, volume % Oxygen, volume %
Site conditions	Monitor and report in conjunction with each quarterly SEM or gas probe event	00007  00021 00025 46381	Ground conditions (1=frozen, 2=wet, 3=dry) Ambient air temperature, °F Barometric pressure, mm of Hg Trend in barometric pressure

<sup>1</sup> May be optional.

<sup>2</sup> Refer to DNR guidance document, [Volatile Organic Compound Parameters for Landfill Gas Monitoring at Municipal Solid Waste Landfills \(PUB-WA 1701\)](#), August 1, 2014.

<sup>3</sup> Not reported to GEMS.

<sup>4</sup> Monitoring points may be shared with other licensed landfills at a facility; however, at a minimum each licensed landfill should include a point where landfill gas quality and flow rate parameters are monitored and reported to evaluate gas collection from each licensed landfill separately.

<sup>5</sup> Refer to DNR guidance document, [Procedures for Preparing and Submitting Landfill Environmental Monitoring Data to the Waste and Materials Management Program \(PUB-WA-1357\)](#).

<sup>6</sup> The monitoring program for a temporary vertical or horizontal gas extraction well should be the same as a permanent vertical gas extraction well. The intended use, design and monitoring for a temporary well should be included in the landfill's plan of operation.

### Electronic Data Submittal

All gas monitoring data described above is required to be submitted to the department electronically in accordance with s. NR 507.26(3)(a), Wis. Adm. Code. Electronic data submittals are uploaded into the department's Groundwater and Environmental Monitoring System (GEMS) database. Procedures for GEMS data submittal can be found on the department's [landfills webpage](#).

### 3.2 Landfill monitoring requirements for the Air Management Program

As mentioned in the [Air Permitting Applicability](#) section, MSW landfills may be subject to one or more federal air standards. The applicability of federal requirements depends on the design capacity of the landfill, the date of construction/reconstruction/modification, and the amount of emissions expected from the decomposition of waste. The federal air standards regulating MSW landfills require the installation of landfill gas collection and control systems for landfills that exceed certain size and emission thresholds. Federal standards include New Source Performance Standards (NSPS), Federal Plans to implement Emission Guidelines (EG) and National Emission

Standards for Hazardous Air Pollutants (NESHAP). The applicability criteria for each federal air standard are summarized in Table 3-B. The monitoring required by each federal air standard is summarized in Tables 3-C through 3-E.

*Table 3-B. Applicability criteria for collection and control requirements under federal air standards*

Location of standard	Type of standard	Design capacity <sup>2</sup>	Date of construction/reconstruction/modification	Amount of NMOC emissions <sup>3</sup>
40 CFR Part 60, Subpart XXX See <a href="#">Table 3-D</a>	NSPS	> 2.5 million Mg (megagrams) and 2.5 million m <sup>3</sup>	After July 17, 2014	34 Mg/year
40 CFR Part 62, Subpart OOO / Part 60, Subpart Cf <sup>1</sup> See <a href="#">Table 3-E</a>	Federal Plan Requirements implementing Emission Guidelines	> 2.5 million Mg and 2.5 million m <sup>3</sup>	On or before July 17, 2014, AND Has accepted waste since November 8, 1987, OR Has additional capacity for waste deposition	34 Mg/year, OR 50 Mg/year if closed
40 CFR Part 63, Subpart AAAA See <a href="#">Table 3-C</a>	NESHAP	> 2.5 million Mg and 2.5 million m <sup>3</sup> , OR A major source of HAPs <sup>4</sup> , OR Collocated with a major source of HAPs	Has accepted waste since November 8, 1987, OR Has additional capacity for waste deposition	50 Mg/year

<sup>1</sup> On May 21, 2021, the federal plan requirements in 40 CFR part 62, subpart OOO, replaced the NSPS in 40 CFR part 60, subpart WWW, and the federal plan requirements in 40 CFR part 62, subpart GGG, which implemented the emission guidelines in 40 CFR part 60, subpart Cc.

<sup>2</sup> *Design capacity* means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the department, plus any in-place waste not accounted for in the most recent permit.

<sup>3</sup> The federal air standards allow sources to choose from four tiers of NMOC calculation procedures. The Tier 1 procedure specifies an equation and default inputs. The Tier 2 procedure allows sources to determine a site-specific NMOC concentration for input into the equation from Tier 1. The Tier 3 procedure allows sources to determine a site-specific methane generation rate constant for input into the equation from Tier 1. The Tier 4 procedure allows sources to demonstrate the surface methane emissions are below 500 ppm.

<sup>4</sup> A major source of HAPs means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants

Table 3-C Summary of NESHAP AAAA requirements

Applicable requirements from federal air standards: <a href="#">NESHAP Subpart AAAA – National emissions standards for hazardous air pollutants: municipal solid waste landfills</a>				
<p><b>Design capacity:</b> &gt; 2.5 million Mg and 2.5 million m<sup>3</sup>, OR A major source of HAPs, OR Collocated with a major source of HAPs</p> <p><b>Date of construction/ reconstruction/ modification:</b> Has accepted waste since November 8, 1987, OR Has additional capacity for waste deposition</p> <p><b>Amount of NMOC emissions:</b> 50 Mg/year</p> <p><b>Gas well installation<sup>1</sup>:</b> For purposes of compliance with § 63.1958(a), each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:                      (1) Five (5) years or more if active; or                      (2) Two (2) years or more if closed or at final grade.                      [40 CFR 63.1960(b)]  <sup>1</sup> WA rules may differ</p>				
Monitoring requirements: <a href="#">40 CFR 63.1961</a>				
Monitoring location	Monitoring type	Operational standard	Monitoring frequency	Monitoring devices procedures/method
Gas well	Temperature	Less than 62.8 °C (145°F) or at an approved higher operating value under 40 CFR 63.1958(c).	Monthly	40 CFR part 60, appendix A-1, Method 2, section 10.3
	Enhanced Monitoring	Triggered when landfill gas temperature greater than 62.8 °C (145°F) <sup>1</sup>	Weekly	63.1961(a)(5)
	Pressure	Negative, except under the conditions specified in 40 CFR 63.1958(b)(1)-(3).	Monthly	§63.1960(a)(3)
	Oxygen/nitrogen	No standard specified	Monthly	Nitrogen <sup>2</sup> : Method 3C Oxygen <sup>2</sup> : Method 3A or 3C of appendix A-2, or ASTM D6522-11 Portable Gas Composition Analyzer: Method 3A of appendix A-2 to 40 CFR part 60 or ASTM D6522-11
Landfill surface	Methane concentration	Operate collection system with < 500 ppm above background methane concentration at the surface of the landfill	Monitor surface emissions on a quarterly basis.	Procedures: §63.1960(c) Instrument Specifications and Procedures: §63.1960(d)
	Cover integrity	Implement program to monitor cover integrity and implement cover repairs.	Monthly	



<b>Control system</b>	<b>Enclosed combustor</b>			
	Temperature	No standard specified	Continuously	§63.1961(b)(1)
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§63.1961(b)(2)
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§63.1961(b)(2)
	<b>Non-enclosed flare</b>			
	Heat sensing device	No standard specified	Continuous	§63.1961(c)(1)
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§63.1961(c)(2)
		No standard specified	Secure bypass line valve in the closed position; Monthly visual inspection	§63.1961(c)(2)
	<b>Treatment system</b>			
	Site-specific Monitoring plan	No standard specified	Operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in §63.1983(b)(5)(ii)	§63.1961(g)
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§63.1961(g)
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§63.1961(g)

	Device other than non-enclosed flare/enclosed combustor/treatment system	Must provide information as required by § 63.1981(d)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The department may specify additional monitoring procedures when necessary to demonstrate continuous compliance.
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<sup>1</sup>Unless a higher operating temperature value has been approved by the department or the Administrator under this subpart or under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or 40 CFR part 62, subpart OOO.

<sup>2</sup> Alternative methods exist under 63.1981(d)(2)

Table 3-D. Summary of NSPS requirements

<b>Applicable requirements from federal air standards</b>				
<u><a href="#">NSPS Subpart XXX - Standards of performance for municipal solid waste landfills that commenced construction, reconstruction, or modification after July 17, 2014</a></u>				
<p><b>Design capacity:</b> &gt; 2.5 million Mg and 2.5 million m<sup>3</sup></p> <p><b>Date of construction/ reconstruction/ modification:</b> After July 17, 2014</p> <p><b>Amount of NMOC emissions that trigger collection and control requirements:</b> 34 Mg/year (except as allowed under 40 CFR 60.764(a)).</p> <p><b>Gas well installation<sup>1</sup>:</b> For purposes of compliance with § 60.763(a), each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:</p> <p>(1) Five (5) years or more if active; or</p> <p>(2) Two (2) years or more if closed or at final grade.</p> <p>[40 CFR 60.765(b)]</p> <p><sup>1</sup> WA rules may differ</p>				
<b>Monitoring requirements: <a href="#">40 CFR 60.766</a></b>				
<b>Monitoring location</b>	<b>Monitoring type</b>	<b>Operational standard</b>	<b>Monitoring frequency</b>	<b>Monitoring devices procedures/method</b>
<b>Gas well</b>	Temperature	Less than 55 °C (131 °F) or at an approved higher operating value under 40 CFR 60.763(c).	Monthly	40 CFR part 60, appendix A-1, Method 2, section 10.3
	Pressure	Negative, except under the conditions specified in 40 CFR 60.763(b)(1)-(3).	Monthly	§ 60.765(a)(3)
	Oxygen/nitrogen	No standard specified	Monthly	Nitrogen <sup>1</sup> : Method 3C Oxygen <sup>1</sup> : Method 3A, 3C, or ASTM D6522-11 Portable Gas Composition Analyzer: Method 3A of appendix A-2 to 40 CFR part 60 or ASTM D6522-11

<b>Landfill surface</b>	Methane concentration	Operate collection system with < 500 ppm above background methane concentration at the surface of the landfill	Quarterly	SEM Procedures: §60.765(c) section 8.3.1 of Method 21 of appendix A Instrument Specifications and Procedures: §60.765(d)
	Cover integrity	Implement program to monitor cover integrity and implement cover repairs.	Monthly	
<b>Control system</b>	<b>Enclosed combustor</b>			
	Temperature	No standard specified	Continuously	60.766(b)(1)
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§60.766(b)(2)
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§60.766(b)(2)
	<b>Non-enclosed flare</b>			
	Heat sensing device	No standard specified	Continuous	§60.766(c)(1)
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§60.766(c)(2)
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§60.766(c)(2)
	<b>Treatment system</b>			
	Site-specific monitoring plan	No standard specified	Operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in §60.768(b)(5)(ii)	

	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§60.766(g)
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§60.766(g)
	Device other than non-enclosed flare/enclosed combustor/treatment system	Must provide information as required in § 60.766(e) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The department may specify additional monitoring procedures when necessary to demonstrate continuous compliance.		

<sup>1</sup> Alternative methods exist under 60.767(c)(2)

Table 3-E. Summary of federal plan requirements

Applicable requirements from federal air standards				
<a href="#">Subpart 000 - Federal plan requirements for municipal solid waste landfills that commenced construction on or before July 17, 2014 and have not been modified or reconstructed since July 17, 2014</a>				
<b>Design capacity:</b> > 2.5 million Mg and 2.5 million m <sup>3</sup>				
<b>Date of construction/ reconstruction/ modification:</b> On or before July 17, 2014 and has accepted waste since November 8, 1987, OR has additional capacity for waste deposition				
<b>Amount of NMOC emissions that trigger collection and control requirements:</b> 34 Mg/year or Tier 4 SEM shows a surface emission concentration of 500 parts per million methane or greater. (except as allowed under 40 CFR 62.16712)				
<b>Gas well installation<sup>1</sup>:</b> For purposes of compliance with §62.16716(a), each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of: (1) Five (5) years or more if active; or (2) Two (2) years or more if closed or at final grade. [40 CFR 62.16720(b)]				
<sup>1</sup> WA rules may differ				
Monitoring requirements: <a href="#">40 CFR 62.16722<sup>t</sup></a>				
Monitoring location	Monitoring type	Operational standard	Monitoring frequency	Monitoring devices procedures/method
Gas well	Temperature	Less than 55 °C (131 °F) or at an approved higher operating value under 40 CFR 62.16716(c).	Monthly	62.16722(a)(3) 40 CFR part 60, appendix A-1, Method 2, section 10.3
	Pressure	Negative, except under the conditions specified in 40 CFR 62.16716(b)(1)-(3).	Monthly	§ 62.16720(a)(3)
	Oxygen/nitrogen	No standard specified	Monthly	Nitrogen <sup>1</sup> : Method 3C Oxygen <sup>1</sup> : Method 3A, 3C, or ASTM D6522-11

<b>Landfill surface</b>	Methane concentration	Operate collection system with < 500 ppm above background methane concentration at the surface of the landfill.	Quarterly	Procedures: §62.16720(c) Instrument Specifications and Procedures: §62.16720(d)	
	Cover integrity	Implement program to monitor cover integrity and implement cover repairs.	Monthly		
<b>Control system</b>	<b>Enclosed combustor</b>				
	Temperature	No standard specified	Continuously	§62.16722(b)(1)	
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§62.16722(b)(2)	
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§62.16722(b)(2)	
	<b>Non-enclosed flare</b>				
	Heat sensing device	No standard specified	Continuous	§62.16722(c)(1))	
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§62.16722(c)(2)	
		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§62.16722(c)(2)	
	<b>Treatment System</b>				
	Site-specific monitoring plan	No Standard specified	Operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan	§62.16726(b)(5)(ii)	
	Flow meter	No standard specified	Record flow to the control device and bypass (if applicable) every 15 minutes.	§62.16722(g)	

		No standard specified	Secure bypass line valve in the closed position. Monthly visual inspection	§62.16722(g)
	Device other than non-enclosed flare/enclosed Combustor/treatment system	Must provide information as required in §62.16722(e) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The department may specify additional monitoring procedures when necessary to demonstrate continuous compliance.		

<sup>†</sup> Follow the monitoring provisions in § 62.16722 or the monitoring provisions in 40 CFR § 63.1961 in NESHAP subpart AAAAA, or both as alternative means of compliance, for an MSW landfill with a gas collection and control system used to comply with the provisions of subpart 000. Once the owner or operator begins to comply with the provisions of § 63.1961, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of § 62.16722.

### Instructions for deviations from air permit requirements

Section [NR 439.03\(4\)](#), Wis. Adm. Code, contains various requirements for an owner or operator of a source to report to the department, by the next business day, any deviation from permit requirements and certain malfunctions or other unscheduled events at the source that were not reported in advance to the department. Form 4530-182, available on the [Air Permit and Compliance Forms webpage](#), assists sources in submitting all required information. In addition, the [Next Business Day Reporting guidance memo](#) is available on the [Air Program Publications & Guidance page](#). The response to comments (which clarifies many questions for facilities) is included after the guidance memo as an appendix.

### *Definition of the terms: deviation, exceedance, non-compliance, and violation*

To achieve consistency with landfill air permits, the term deviation, exceedance, non-compliance and violation will be used in the following contexts:

- A **deviation** occurs any time an owner or operator fails to meet any requirement or obligation established in the permit including but not limited to any emission limit, or operating limit, work practice requirement, monitoring or recordkeeping requirement.
- An **exceedance** occurs when an emission limit, monitoring parameter or other quantifiable term is exceeded. Exceedances are considered deviations. Examples may include an elevated temperature, positive pressure gas collection and/or elevated methane concentrations during surface emissions monitoring.
- **Non-compliance** and **violation** are terms used to identify non-conformance with the conditions and requirements of permits and regulations, including all deviations and exceedances unless otherwise stated. For example, some deviations will not be alleged as violations if prescribed corrective action is taken within a time frame specified in a permit or regulation. However, the department may allege a violation if an exceedance when not corrected within the timeline, even if correction attempts were made in the appropriate timeline.

Whether a deviation or an exceedance may be alleged as a violation will be determined by the department on a case-by-case basis, taking into account the magnitude, type and frequency of the deviation or exceedance.

## Electronic data submittal

See [Air reporting](#) in section 7.1 for information about reporting air compliance reports in electronic form.

### **3.3 Supplemental and/or temporary odor and gas control system (STOCS)**

Supplemental and/or Temporary Odor and Gas Control System (STOCS) components are supplemental or temporary points where landfill gas is extracted. One category of STOCS include systems or components whose primary intended purpose is not gas collection but are used for supplemental control of fugitive gas and odors. Examples of STOCS in this category include leachate collection cleanouts, leachate recirculation lines, and other landfill structures such as manholes. The other category of STOCS include temporary supplemental/sacrificial portions of the gas collection system. An example of STOCS in this category include horizontal gas collectors.

The U.S. Environmental Protection Agency (EPA) has guidance on the type of monitoring required under the federal air standards for STOCS in the Applicability Determination Index (ADI) under Control Numbers 0600063 and 0600096<sup>1</sup> (see links in [For more information](#)). STOCS components that extract gas from active areas where waste has been in place for five years or more, or closed areas that have been at final grade for two years or more, are considered part of the landfill gas collection and control system and are subject to all applicable requirements under the federal air standards. Such STOCS components are subject to the same monitoring requirements, temperature standards, and pressure standards as vertical gas extraction wells.

Each interior well, meaning any well or similar collection component located within the perimeter of the landfill waste such as a vertical or horizontal gas extraction well and each STOCS component, must be monitored for pressure, temperature, oxygen/nitrogen content, and any additional parameters required by the WA program, upon installation. A perimeter well located outside the landfilled waste is not an interior well (40 CFR §§ 60.761, 62.16730, and 63.1990). Examples of a perimeter well include a perimeter gas collection system or a perimeter gas monitoring probe. The WA program may require monitoring of perimeter gas collection systems and perimeter gas monitoring probes. Perimeter gas monitoring probes are subject to the monitoring requirements in s. NR 507.11, Wis. Adm. Code. See the [Landfill Monitoring Requirements for Waste and Materials Management Program](#) section above.

### **3.4 Surface emission monitoring**

Surface emissions monitoring is used in determining if a landfill gas control system is adequately preventing methane and other landfill gases from escaping through the landfill cover. Surface emissions monitoring is required at MSW landfills in accordance with federal regulations. Surface emissions monitoring is required to be conducted on a quarterly and/or annual basis in accordance with the landfill's air pollution control permit. For landfills that are not subject to the surface emissions monitoring requirements of the federal air standards, the department's WA Program may require the surface emissions monitoring as a condition of approval in accordance with the authority under s. NR 507.22(2), Wis. Adm. Code. Routine surface emissions monitoring will typically be required on an annual basis at MSW landfills with a design capacity of greater than or equal to 500,000 cubic yard and designed with an active gas recovery system.

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<sup>1</sup> U.S. EPA's applicability determination for STOCS references the requirements of 40 CFR part 60, subpart WWW. The information in the applicability determination continues to apply to MSW landfills subject to 40 CFR part 60, subpart XXX or to 40 CFR part 62, subpart OOO.

Procedures used to determine compliance with surface methane operational standard as provided in 40 CFR 63.1958(d) are listed under 40 CFR 63.1960(c)(3). A summary of the requirements is listed below:

- An owner or operator must use a portable analyzer that meets the instrument specifications found in section 6 of the EPA Method 21 of appendix A-7 of 40 CFR part 60, except that methane replaces all references to VOC. The portable analyzer must be calibrated using methane gas diluted to a nominal concentration of 500 ppm in the air immediately before commencing a surface monitoring survey.
- Surface emissions monitoring should be scheduled when atmospheric conditions are adequate to obtain accurate measurements and should include monitoring in a serpentine pattern, as well as monitoring of all penetrations, areas of distressed vegetation, cracks or seeps.
- Any reading of 500 ppm or more above background at any location must be recorded as a monitored exceedance and follow up actions are required:
  - At the location of the exceedance, the owner or operator must initiate corrective action. These actions can be to repair cracks or areas of differential settlement, placement of less permeable cover materials, repair of ripped geomembrane, repair of seals around vertical penetrations, or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance. The owner or operator has 10 days to take one of the possible actions and re-monitor the location of the detected exceedance.
  - If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, a new well or other collection device must be installed within 120 days of the initial exceedance.
  - Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring, must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 ppm above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the 10-day corrective action re-monitoring cycle starts again.
  - The owner or operator may submit for approval an alternative remedy and corresponding implementation timeline.

### **3.5 Liquids addition and leachate recirculation**

Sections NR 506.135, 507.215, 514.07(7), and 514.10, Wis. Adm. Code contain the WA Program requirements for leachate recirculation and liquids addition at MSW landfills. Leachate recirculation may be performed at an MSW landfill in accordance with an approved leachate recirculation plan. Liquids addition is the practice of adding liquid waste or leachate or gas condensate from another landfill into the landfill for accelerated decomposition of the waste mass. Liquids addition may be performed under an approved research, development and demonstration (RDD) plan. The addition of liquids under an RDD plan also must comply with the requirements and plan for leachate recirculation. Leachate recirculation and liquids addition increase the rate of gas generation and the landfill gas systems must be designed and operated to manage the additional gas generated.

Leachate and gas condensate may only be recirculated, and liquids may only be introduced, in areas of the landfill that have active gas extraction systems installed. The gas system is required to be operated to control any additional gas generated by recirculation or liquids addition and to



minimize the release of uncontrolled gas. Additional monitoring and reporting requirements apply to landfills approved to recirculate leachate and/or for liquids addition.

40 CFR part 60, subpart XXX; 40 CFR part 62, subpart OOO and 40 CFR part 63, subpart AAAA contain AM requirements for leachate recirculation and liquids addition at MSW landfills. NSPS XXX and Federal Plan OOO both require the owner or operator of a designated facility that has employed leachate recirculation or added liquids based on an approved RDD plan within the last 10 years to submit an annual report to AM and U.S. EPA that includes details of the leachate recirculation and/or liquids addition.

NESHAP AAAA has additional requirements for leachate recirculation and/or liquids addition. In NESHAP AAAA, a landfill is considered to be a bioreactor when any liquid other than leachate (leachate includes landfill gas condensate) is added in a controlled fashion into an MSW landfill to reach a minimum average moisture content of at least 40 percent by weight. If an MSW landfill is planned to be a bioreactor, NESHAP AAAA requires the owner or operator to install a gas collection and control system for the bioreactor before initiating liquids addition; and to begin operating the gas collection and control system within 180 days after the later of initiating liquids addition or achieving a moisture content of 40 percent by weight. In addition, if liquids other than leachate are added in a controlled fashion to the waste mass and the permittee does not comply with the bioreactor requirements in NESHAP AAAA, the permittee must keep records to show that the percent moisture by weight expected in the waste mass to which liquid is added is less than 40 percent.

#### **4. Other regulated activities**

In addition to landfill gas collection, there are several other activities related to the operation of MSW landfills that are regulated by both the AM and WA Programs. These include asbestos disposal, fugitive dust control, and odor control.

##### **4.1 Asbestos**

Asbestos disposal in a municipal solid waste landfill is regulated by ch. [NR 447](#), Wis. Adm. Code, which is administered by the AM Program, and ch. [NR 506](#), Wis. Adm. Code, administered by the WA Program. Section NR 447.17, Wis. Adm. Code, contains requirements for active disposal sites, such as, requirements for daily cover, warning signs and fencing, recordkeeping, and notification. Section NR 506.10, Wis. Adm. Code provides additional requirements related to the types of landfills that may accept asbestos containing materials and specific disposal procedures. Municipal solid waste landfills in compliance with s. NR 506.05(1), Wis. Adm. Code for daily cover may also satisfy AM requirements for daily cover; however, it is the landfill owner or operator's responsibility to review and ensure they are operating in compliance with all of the applicable regulations.

##### **4.2 Fugitive dust control**

Fugitive dust at a municipal solid waste landfill is regulated by ch. [NR 415](#), Wis. Adm. Code, administered by AM, and chs. [NR 506](#) and [514](#), Wis. Adm. Code, administered by WA. Section NR 415.04, Wis. Adm. Code, contains AM requirements for preventing particulate matter (fugitive dust) from becoming airborne. Section NR 506.07(1)(n), Wis. Adm. Code, requires landfills to control fugitive dust in accordance with s. NR 415.04 from all areas of the landfill.

The plan of operation is required to include plans for controlling dust during operation of the landfill, as specified in s. NR 514.06(8), Wis. Adm. Code. The department also may require a specific dust control plan as a condition of feasibility during the siting process for a new landfill or an expansion of an existing landfill.

The general permit conditions in Part II of all air pollution control permits requires sources to take precautions to prevent particulate matter from becoming airborne. Such precautions include, but are not limited to:

- Application of asphalt, oil, water, suitable chemicals, or plastic coverings on dirt roads, material stockpiles, and other surfaces which can create airborne dust, provided such application does not create a hydrocarbon, odor, or water pollution problem.
- Covering or securing of materials likely to become airborne while being moved on public roads, railroads, or navigable waters.
- The paving or maintenance of roadway areas so as not to create air pollution.

The source-specific requirements in Part I of an air pollution control permit may require a source to develop and implement a fugitive dust control plan. Elements of a source's fugitive dust control plan may be included as conditions of the air pollution control permit. For consistency, the fugitive dust control plan developed to comply with the air pollution control permit should be the same as the plan submitted with the landfill's plan of operation to comply with WA requirements. Sources are required to keep records of the precautions taken to prevent particulate matter from becoming airborne, especially additional precautions taken in response to a fugitive dust complaint.

In addition to taking precautions to prevent fugitive particulate matter emissions, sources shall quantify the amount of fugitive particulate matter that is emitted. If the quantity emitted is above air emissions inventory reporting thresholds for the facility, sources must report fugitive particulate matter emissions to the emissions inventory.

### 4.3 Odor control

Landfill facilities and operations have the potential to cause off site odors. Landfill odors can be caused by uncovered waste, certain waste types, leachate, or by landfill gas that is produced by decomposition of waste. Both active and closed landfills have potential for odors.

#### Odor control plans

AM regulates malodorous emissions under ch. [NR 429](#), Wis. Adm. Code. Many air permits require the preparation and implementation of an odor control plan that specifies the precautions a source will take to prevent malodorous emissions from occurring. Elements of the odor control plan may be included as conditions of the air pollution control permit.

Similar to dust control, s. NR 514.06(8), Wis. Adm. Code requires the landfill's plan of operation include plans for controlling odor during operation of the landfill. The department also may require a specific odor control plan as a condition of feasibility during the siting process for a new landfill or an expansion of an existing landfill. The odor control procedures should include methods for tracking and responding to complaints from the public. Odors at landfills may occur from different sources (e.g., landfill gas, waste, or leachate) and methods to address odors will vary based on the source. Methods for odor control at a landfill may include:

- Assessing management options for problematic waste (e.g., scheduling, mitigation measures).
- Application and maintenance of cover soils/materials.
- Installation of gas extraction wells (permanent or temporary).
- Intermediate and final cover sequencing.
- Evaluation of leachate management or recirculation practices.
- Use of odor control products and technologies.

## Odor complaints

It is the responsibility of the landfill owner and operator to control or abate malodorous emissions and to ensure the landfill is in compliance with all applicable regulatory requirements. A landfill may receive odor complaints directly from the public and it is advised that landfills have a process for reporting and responding to odor complaints.

When the department receives an odor complaint, the department will notify the landfill and/or conduct an inspection to evaluate the odor complaint. The AM and WA Programs may work together to follow-up on odor complaints with the landfill and to evaluate odors at the landfill. Each landfill is unique and will be treated on a case-by-case basis depending on the circumstances of the complaint. When odors occur, the following may be evaluated:

- The frequency (how often, have others complained), intensity and duration of the odor.
- The nature of the odor (garbage, landfill gas, etc.)
- Applicable air pollutant limits or other standards.
- Applicable requirements in the landfill's approved plan of operation.
- The landfill's Odor Control Plan which includes the implementation of adequate preventative measures to control malodorous emissions.
- Odor monitoring and/or surface emission monitoring conducted by the landfill.
- Actions taken to respond to odors.
- Recent landfill activity, including types and locations of waste placement and construction events which may cause temporary shutdowns of the landfill gas extraction system.

## 4.4 Landfill fires and elevated temperature landfills

Elevated temperature within the waste mass at a MSW landfill could result in undesirable chemical reactions. Examples of undesirable conditions are landfill fires or subsurface oxidation events and elevated temperature landfills.

### Landfill fires and subsurface oxidation events

Landfill fires may happen at or near the surface of the waste mass or deeper within the waste.

Landfill fires that occur at or near the surface can typically be put out using traditional methods such as spraying with water or covering with soil. For landfill fires further below the surface, sometimes referred to as subsurface oxidation events, a typical response measure is to shut down gas extraction well(s) near the area to restrict oxygen from entering the waste mass, as oxygen is a required element of combustion.

Landfill owners or operators should notify both WA and AM Programs of a landfill fire or subsurface oxidation event.

### Elevated temperature landfills (ETLF)

Elevated temperature landfills (ETLF) are uncommon in Wisconsin but have occurred in MSW landfills which have accepted industrial wastes, like aluminum production waste, incinerator ash, bottom ash, tires and lime kiln dust, among others. ETLF are landfills where landfill gas and/or waste temperatures are persistently well above 145 degrees Fahrenheit over an area of the landfill where there is an absence of oxygen and the primary gas ratio ( $\text{CH}_4/\text{CO}_2$ ) is diminishing or very low (<1.0). The elevated temperatures change the character of the chemical reactions taking place in the landfill such as the decomposition process of the organic matter. Other changes that may take place in elevated temperature conditions are: the ratio of methane to carbon dioxide decreasing; leachate becoming stronger with higher biological oxygen demand (BOD), lower pH, higher carboxylic acids and salts; concentrations of certain acids increasing; carbon dioxide and carbon monoxide

generation increasing; hydrogen generation increasing; landfill odors changing to a significantly pungent character; gas generation and gas pressure increasing; leachate generation increasing; landfill settlement rates increasing (but is a lagging indicator); along with other changes.

Removing gas from ETLFs is important because the gas contains volatile organics that provide fuel for the reactions. ETLFs should increase gas collection from the entire thickness of waste and remove liquids reaching the gas well to prevent the well from being watered out. Addressing an ETLF requires a long-term strategy.

Landfill owners or operators are required to notify both WA and AM Programs of elevated temperature landfill conditions.

## **5. Gas system design, phasing, and construction**

All landfills that accept municipal solid waste are required to be designed with an active gas extraction system, which utilizes vertical gas extraction wells unless otherwise approved by the department. Section NR 504.08(2), Wis. Adm. Code includes minimum design and construction criteria for landfill gas extraction systems. Collected landfill gas must be controlled. Section NR 504.08(2)(n), Wis. Adm. Code says that a flare shall be designed to meet the requirements of ch. NR 445, Wis. Adm. Code. The federal air standards include design and operating requirements for control systems.

Landfills are required to be designed so that final grades in each phase, or cell, are reached as soon as possible, and the open area used for filling is minimized. Once final grades are reached in a phase, landfills are required by solid waste rules to have a gas extraction system installed and operating. Landfills will often plan for and install gas extraction wells sooner to control odors, allow for leachate recirculation or liquids addition, or to comply with an air permit. Air permits require installation of gas extraction wells in areas where waste has been in place for five years if active or two years if closed or at final grade.

Landfills are designed to be constructed and filled in phases and therefore the installation of gas extraction system is also done in phases. The phasing of the landfill gas system is required to be addressed in the plan of operation for the landfill.

A landfill's construction quality assurance personnel are required to observe, document and certify the construction of a landfill gas system in accordance with s. NR 516.04, Wis. Adm. Code. After each construction event, construction quality assurance personnel prepare a report documenting the construction of any landfill gas control structures, including gas extraction wells and piping. The report is submitted to the WA Program for review and approval. The construction documentation is required to contain a narrative, plan sheets, detail drawings, lab reports, photos and other information necessary to document the construction. Section NR 516.06(2)(d), Wis. Adm. Code requires a table showing gas extraction well construction information including: location, surface elevation, depth of the borehole, top of casing elevation, elevation and length of the solid and perforated piping, elevation and length of the gravel backfill, bentonite seal and other backfill materials.

## **6. Ongoing requirements post-closure**

Once final capping is completed at a landfill, the landfill will continue to be monitored and regulated by the corresponding NSPS/NESHAP/Federal Plan included in the air pollution control permit until the below criteria are met.

Regulation/ last amendment date	EG 000 February 14, 2022	NSPS XXX February 14, 2022	NESHAP AAAA February 14, 2022
Closed landfill*	Must be closed (as defined in § 62.16730).	Must be a closed landfill (as defined in § 60.761).	Must be a closed landfill (as defined in § 63.1990).
Gas collection and control system (GCCS)	GCCS has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flow.		
NMOC emission rate**	Less than 34 megagrams per year on three successive test dates.		Less than 50 Mg/yr on three successive test dates.
Closed landfill subcategory***	The calculated NMOC emission rate at the landfill is less than 50 megagrams per year on three successive test dates.	N/A	N/A

\* The closure report must be submitted to U.S. EPA and AM.

\*\* The test dates must be no less than 90 days apart, and no more than 180 days apart.

\*\*\* Means a closed landfill that has submitted a closure report on or before September 27, 2017

Once a landfill is no longer subject to emission standards in the NESHAP, any remaining hazardous air contaminant emissions will be subject to ch. NR 445. The hazardous air contaminants emitted at the facility must be in compliance with the requirements in s. NR 445.07, Wis. Adm. Code using any of the compliance methods in s. NR 445.08, Wis. Adm. Code, in order to remove the landfill gas control requirements from the air pollution control permit.

A landfill gas collection system is still required under solid waste rules and the landfill’s plan of operation after a facility no longer requires an air permit. WA program approval is required prior to removal of a gas collection system at a landfill.

## 7. Communication

MSW landfill owners/operators may need to communicate with the WA and AM Programs and with the United States Environmental Protection Agency (U.S. EPA). As part of meeting regulatory requirements, MSW landfill owners/operators must submit records and reports and may request alternatives to and/or extensions of certain requirements. It may not always be clear which regulatory authority is the appropriate entity to receive submittals and requests. Additional information about communicating with different programs within the department is provided in Section 7.1. Additional information about communicating with the department and with U.S. EPA is provided in Section 7.2. Additional information about the types of required records and reports is provided in Section 3: [Monitoring and Reporting Requirements](#).

### 7.1 Communicating with Air and Waste

Requirements for landfill gas collection systems exist in both the landfill’s plan of operation and the air pollution control permit. The AM and WA Programs work together to implement these requirements. Below is information about what MSW landfill owner/operators can expect when communicating with either program about increases in design capacity, alternatives to requirements for gas collection systems, report submittal, and compliance inspections.

- New landfills and increases in design capacity
  - The design capacity of the landfill impacts the requirements that apply to the landfill. A MSW landfill can have only one permitted design capacity at any given time. New and existing landfills which propose to add additional design capacity are required to go through the landfill siting process to seek WA approval prior to construction and

operation. The landfill must also apply for and be issued an air pollution control construction permit obtain AM approval prior to construction and operation. WA's landfill siting process is a lengthy process that may require several years to complete. The department recommends beginning pre-application discussions with AM during the feasibility report stage of the landfill siting process and recommends submittal of an air pollution control permit application at the time of submittal of a landfill plan of operation or earlier. Additional information about the regulatory approval process is provided in Section 2.

- Requests for alternatives

- Requests for alternatives may need to be submitted to either the WA or the AM Program or to both programs as outlined below. However, if only one program receives a request, it will be shared and discussed with the other program.
- Typical requests received include alternative operating scenarios for temperature, pressure and oxygen, abandonment, decommissioning, alternative timelines and other requests.
- Requests related to alternative operating scenarios for temperature, pressure and oxygen, alternative timelines and any other request related to air permit requirements are required to be submitted to AM. The department responds to the landfill request and either concurs (with a timeline and conditions if applicable) with the request or denies the request (with conditions, if applicable).
- Requests related to abandonment or decommissioning of gas collection wells are required to be submitted to WA for review in the form of a plan of operation modification request.
- Prior to approving or denying a request, the AM or WA engineer responding to the request may ask for documentation that the landfill owner/operator completed the following evaluation steps, as applicable:
  - Reviewed monitoring parameters, including temperature, well head pressure, header pressure, flow, valve setting, and the concentrations of methane, carbon dioxide, oxygen, and balance gas for the previous 24 months or more.
    - For instance, reduced header pressure can be indicative of a sagging or otherwise blocked header (the header should be repaired instead of decommissioning a LFG well or assigning an alternative operating parameter at the LFG well).
  - Reviewed liquid levels for the wells for the past eight quarters or more.
    - A liquid level in the well above the screen perforations can prevent landfill gas from entering the well. If liquid levels are covering more than 25 percent of the LFG well casing perforations, the landfill should consider installing a permanent or temporary leachate pump in the LFG well to see if LFG collection returns in this area.
  - Inspected the well head for air intrusion, including sampling ports, leaky pneumatic leachate pump, well head boot seals, caps, hoses, etc.
  - Verified that air intrusion is not occurring from air being pulled through the landfill cap or well casing down into the well. This would involve visual observation of the landfill cap and well casing condition (including bentonite seal) and verification that the valve setting is not too great.
  - Reviewed surface methane monitoring results from the area to ensure that methane emissions are not greater than 500 ppm at or near the well(s) of interest.
  - Verified the age and type of waste in the area of the well(s).

- Photographic or written records of the material that was removed during well drilling may indicate a substantial amount of construction/demolition material in the area. Boring samples can be taken if records do not exist.
  - Reviewed the performance of surrounding gas collection wells, along with boring log(s) or other documentation (including photographs, disposal/filling records, etc.) of the well for which an alternative operating scenario is being proposed and the surrounding wells for evidence of non-degradable wastes in the area of influence; and verified of the age of waste in the area of influence for the proposed well(s).
  - Provided evidence that there are no subsurface fires at or near the well(s) of interest.
    - Appropriate evidence may consist of, but not be limited to, carbon monoxide concentration, temperature, lack of odor or smoldering, etc.
  - Documented corrective actions that the facility has already taken (for example, replaced well, pumped well, other repairs or replacements, etc.)
- Report submittals
  - Reports that must be submitted to AM are specified in the air pollution control permit. AM encourages permittees to submit reports electronically. The [Air compliance submittal electronic reporting](#) website contains guidebooks and instructions on submitting documents electronically.
  - Reports that must be submitted to the WA Program are specified in the plan of operation, its approval, or in a modification to the plan of operation approval.
- Inspections
  - Both the AM and WA Programs conduct compliance and/or construction inspections. Joint air-waste inspections may occur.
  - Inspections may or may not be announced ahead of time to the facility.
  - The landfill should expect to provide records for viewing, discussions with operators, and allow for an inspection of the landfill (e.g. gas collection system, active landfill areas, monitoring equipment, control equipment, etc.)

### Air reporting

AM accepts submittal via electronic submittal using the switchboard and mail. The [Air compliance submittal electronic reporting](#) website contains guidebooks and instructions on submitting air reporting documents electronically. Specifically, the website contains information on:

- compliance certification
- monitoring reports
- compliance emission testing (Stack Testing)
- reports, plans and notifications
- next day reporting (including deviation reporting)
- helpful hints and FAQ
- e-Signature

AM encourages the use of electronic submittal. If a facility chooses to mail submittals, the submittals should be addressed to the assigned air compliance engineer.

The DNR Switchboard is used by sources for annual air emissions reporting, and air report submittals including compliance certifications, monitoring reports, deviation notifications,

compliance emission testing, and other required reports. The DNR Switchboard can also be used to view uploaded facility documents including active and inactive permits, historical emission summaries, and inspection reports.

The [Compliance and emissions data reporting interface \(CEDRI\)](#) is U.S. EPA's tool for sources to electronically submit performance test reports, notification reports and other periodic reports to U.S. EPA. CEDRI is located on [EPA's Central Data Exchange \(CDX\)](#). The CDX Web is the application used by U.S. EPA to manage environmental data transmitted to U.S. EPA. CEDRI also contains job aides, recent announcements, frequent questions and other helpful information.

## 7.2 Communicating with DNR and U.S. EPA

Air pollution control permits include requirements from federal air standards that are implemented by U.S. EPA. Examples of federal air standards include New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP). Once a federal standard is included in an air pollution control permit, the permittee should direct all questions and requests related to that standard to AM. AM personnel will advise permittees if there are specific questions and requests that should be directed to U.S. EPA. Federal air standards require reports be submitted to U.S. EPA via CEDRI. As specified in the air pollution control permit, reports required under federal air standards shall be submitted to both U.S. EPA and AM.

## 8. For more information

For more information on landfill gas air emissions, view the resources below:

- [Procedures for Preparing and Submitting Landfill Environmental Monitoring Data to the Waste and Materials Management Program \(PUB-WA-1357\)](#)
- [Volatile Organic Compound Parameters for Landfill Gas Monitoring at Municipal Solid Waste Landfills guidance document \(PUB-WA 1701\)](#)
- [Presumptive BACT for Formaldehyde Emissions Generated from Landfill Gas-Fired SI RICE memo \(AM-19-0021\)](#)
- [Applicability Determination Index \(ADI\) | Clean Air Act \(CAA\) Compliance Monitoring | Compliance | US EPA](#)

**DISCLAIMER** – This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

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