



MSW Landfill NESHAP

- On January 16, 2003 USEPA promulgated standards for national emission hazardous air pollutants (NESHAP) for municipal solid waste (MSW) landfills.
- It can be found in the 40 CFR Part 63 Subpart AAAA and was promulgated on January 16, 2003 FR Vol. 68 p.2227

2-2

40 CFR Part 63 Subpart AAAA

The intent of the standards is to protect the public health by requiring new and existing sources to control emissions of HAP's to the level reflecting the maximum achievable control technology (MACT)

2-3

Subpart AAAA

The final rule ensures reductions of nearly 30 HAP's emitted by MSW landfills including, but are not limited to, vinyl chloride, ethyl benzene, toluene, and benzene.

Each of the HAP's emitted from MSW landfills can cause adverse health effects provided sufficient exposure.

2 - 4

Subpart AAAA

The final rule applies to all MSW landfills that are major sources or are collocated with a major source, and to some landfills that are area sources.

2 - 5

What is the Air Toxics Strategy?

Congress instructed EPA to develop a strategy for air toxics in urban areas that includes specific actions to address the large number of smaller, area sources, and that contains broader risk reduction goals encompassing all stationary sources.

The Air Toxics Strategy is EPA's *integrated* framework for addressing air toxics in those urban areas by looking at stationary, mobile, and indoor source emissions.

Air toxics can pose special threats in urban areas because of the large number of people and the variety of sources of toxic air pollutants, such as cars, trucks, large factories, gasoline stations, landfills and dry cleaners.

The Clean Air Act required EPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. As a result, EPA identified a list of 33 air toxics (see attached list) of the 188 toxic air pollutants.

2 - 6

List of the 33 Urban Air Toxics HAPs

acetaldehyde	ethylene oxide
acrolein	formaldehyde
acrylonitrile	hexachlorobenzene
arsenic compounds	hydrazine
benzene	lead compounds
beryllium compounds	manganese compounds
1, 3-butadiene	mercury compounds
cadmium compounds	methylene chloride
carbon tetrachloride +	nickel compounds
chloroform	polychlorinated biphenyls (PCBs)
chromium compounds	polycyclic organic matter (POM)
coke oven emissions +	quinoline
dioxin	1, 1, 2, 2-tetrachloroethane
ethylene dibromide +	perchloroethylene
propylene dichloride	trichloroethylene
1, 1-dichloropropene	vinyl chloride
ethylene dichloride	--

NOTE: A list of 33 urban HAPs which pose the greatest threats to public health in urban areas was listed in the 1999 Strategy. This list of HAPs considered the emissions from major, area and mobile sources. A subset of this list, 30 HAPs, represents the HAPs having the greatest emissions contribution from area sources. A cross (+) denotes the HAPs with less significant emissions contributions from area sources.

Air Toxics Strategy website

[Integrated Urban Air Toxics Strategy | Urban Air Toxics | US EPA](#)

2 - 8

Subpart AAAA (March 26, 2020)(RTR Analysis)
The final rule is applicable to both major and area sources and contains the same requirements as the Emission Guidelines and New Source Performance Standards(EG/NSPS). (State or Federal)

63.1955 (a) Comply with the requirements of 40 CFR part 60 subpart WWW, subpart XXX, a federal plan or an EPA approved and effective state or tribal plan.

All affected sources must comply with the SSM requirements subpart A of this part as specified in Table 1 and all affected sources must submit compliance reports every 6 months as specified in § 63.1981(h).

2 - 9

Residual Risk and Technology Review (RTTR)

- On March 26, 2020 the RTTR that was conducted and finalized and for the Municipal Solid Waste (MSW) Landfills source category regulated under national emission standards for hazardous air pollutants (NESHAP).
- The EPA also finalized minor changes to the MSW Landfills NSPS and Emission Guidelines (EG) and Compliance Times for MSW Landfills.

2 - 10

Residual Risk and Technology Review

- The results of the chronic baseline inhalation cancer risk assessment indicate that, based on estimates of current actual, allowable, and whole facility emissions under the NESHAP, the maximum individual risk posed by the source category is 10-in-1 million. The total estimated cancer incidence based on actual emission levels is 0.04

TABLE 2—MSW LANDFILLS INHALATION RISK ASSESSMENT RESULTS

Number of facilities ¹	Maximum individual lifetime cancer risk (in 1 million) ²		Based on actual emissions				
	Based on actual emissions ³	Based on allowable emissions ⁴	Estimated population at increased risk of cancer >10-in-1 million	Estimated population at increased risk of cancer ≥10-in-1 million	Estimated annual cancer incidence (cases per year)	Maximum chronic noncancer TOSHI ⁵	Maximum screening acute noncancer hazard quotient (HQ)
706	10 (p-dichlorobenzene, ethyl benzene, benzene)	10 (p-dichlorobenzene, ethyl benzene, benzene)	16,300	11	0.04	0.1 (neuro-logical)	HQ _{acute} ⁶ = 0.07 (chloroform)

¹ Number of facilities evaluated in the risk analysis.
² Maximum individual excess lifetime cancer risk due to HAP emissions from the source category.
³ Whole facility emissions are equal to actual emissions and have the same risk.
⁴ Maximum TOSHI. The target organ systems with the highest TOSHI for the source category are neurological, with risk driven by emissions of trichloroethylene, m-xylene, xylenes (mixed), and trichloroethylene from fugitive emissions.
⁵ Reference Exposure Level (REL).

Residual Risk and Technology Review

- Our risk analysis indicated the risks from this source category are low for both cancer and noncancer health effects, and, therefore, any additional emissions reductions would result in minimal health benefits or reductions in risk.
- Based upon results of the risk analysis and our evaluation of the technical feasibility and cost of the option(s) to reduce landfill fugitive emissions, we proposed that the current NESHAP provides an ample margin of safety to protect the public health.
- We also proposed, based on the results of our environmental screening assessment, that more stringent standards are not necessary to prevent an adverse environmental effect.

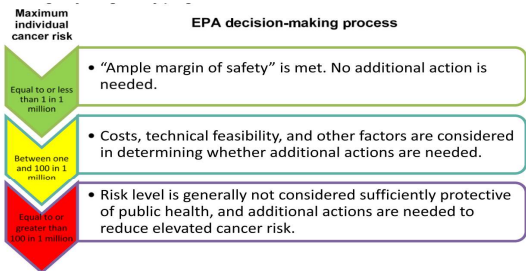
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Residual Risks

- For cancer risks > 10⁻⁴, EPA will set a residual risk standard (health based).
- For cancer risks < 10⁻⁶ EPA will not set a residual risk standard.
- For cancer risks in between 10⁻⁶ & 10⁻⁴, EPA will consider costs, technical feasibility, location of people near facility, etc. in deciding on whether to set a residual risk standard.
- For non-cancer risks, EPA will look at target organ hazard info. in deciding on whether to issue a residual risk std.

13

EPA decision-making process for addressing residual risk for carcinogens in the Agency's regulatory program



Source: OIG summary of information from the EPA. (EPA OIG image)
 Note: A maximum individual risk level of less than 100 in one million is generally considered acceptable, but the overall determination of risk acceptability and ample margin of safety are also dependent on other health measures and factors, including the chronic and acute non-cancer risks, number of people exposed at various risk levels, and uncertainties.

14

NESHAP AAAA Control Requirements

- Contains same requirements as NSPS/EG
- Requires gas collection and control system (GCCS) for same landfills as NSPS/EG:
- Design capacity ≥ 2.5 million Mg or 2.5 million m³ and estimated uncontrolled NMOC emissions ≥ 50 (34 for XXX) Mg/yr
- Requires more timely control of bioreactors

2 - 15

Part 63 Subpart AAAAA
**National Emission Standards for Hazardous Air Pollutants:
Municipal Solid Waste Landfills (11/8/87)**

- **63.1935 Applicability**
- A MSW landfill is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAPS) MSW Maximum Achievable Control Technology (MACT) if meeting the following criteria:
The landfill has accepted waste since 11/8/87 and meets any one of the following criteria:
 - The MSW landfill is a major source* as defined in 40 CFR 63.2 of Subpart A or if it is collocated with a major source
 - The MSW landfill is an area source that has a design capacity ≥ 2.5 million MG and 2.5 million m³ and has estimated uncontrolled emissions ≥ 50 MG/yr NMOC .
 - The MSW landfill uses a **bioreactor** and has a design capacity ≥ 2.5 million MG and 2.5 million m³ and is no permanently closed as of 1/16/03.

2 - 16

Part 63 Subpart AAAAA
**National Emission Standards for Hazardous Air
Pollutants: Municipal Solid Waste Landfills**

- **63 Subpart AAAAA Requirements:**
- Landfill must comply with 40 CFR 60 Subpart WWW or 40 CFR 60 Subpart Cc, whichever is applicable § 63.1955.
- Landfill must keep records and reports as specified in 40 CFR 60 Subpart WWW or Subpart Cc, whichever is applicable. Landfill must submit the **annual report described in 40 CFR 60.757(f) every 6 months** (§ 63.1980(a))
- Recordkeeping and reporting requirements for bioreactors §63.1980(b) to (h).
- **Major source* 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, unless the Administrator establishes a lesser quantity, or in the case of radionuclides, different criteria from those specified in this sentence.

2 - 17

**Purpose of the Original NSPS/EG
Regulation**

- **Limit LFG migration subsurface off site**
- **Limit LFG migration into onsite structures**
- **Limit LFG odors at or beyond the landfill boundary**
- **Limit LFG emissions into the atmosphere**

2 - 18

EG/NSPS

Subpart Cc (Cf) – Emission Guidelines (EG) and Compliance Times for Municipal Solid Waste Landfills (March 12, 1996)(August 29, 2016)

§ 60.33c (60.33f)

a) For approval, a State plan shall include control of MSW landfill emissions at each MSW landfill meeting the following three conditions:

2 - 19

EG/NSPS

(1) The landfill has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition;

(2) The landfill has a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the design capacity report; and

(3) The landfill has a non-methane organic compound emission rate of 50 (34) megagrams per year or more.

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EG/NSPS

(b) For approval, a State plan shall include the installation of a collection and control system meeting the conditions provided in

§ 60.752(b)(2)(ii) of this part at each MSW landfill meeting the conditions in paragraph (a) of this section. The State plan shall include a process for State review and approval of the site-specific design plans for the gas collection and control system(s).

2 - 21

EG/NSPS

(c) For approval, a State plan shall include provisions for the control of collected MSW landfill emissions through the use of control devices meeting the requirements of paragraph (c)(1), (2), or (3) of this section, except as provided in § 60.24.

2 - 22

EG/NSPS

§ 60.752 Standards for air emissions from municipal solid waste landfills.

(a) Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Administrator as provided in § 60.757(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values.

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Subpart GGG

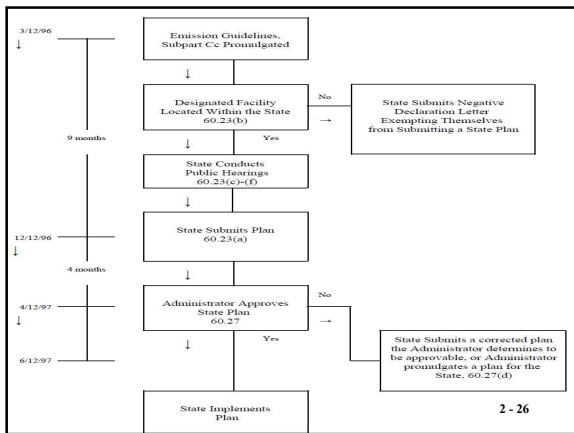
- Federal Plan Requirements for Municipal Solid Waste Landfills That Commenced Construction Prior to May 30, 1991 and Have Not Been Modified or Reconstructed Since May 30, 1991.
- A municipal solid waste landfill regulated by an EPA approved and currently effective State or Tribal plan is not subject to the requirements of this subpart. States that have an approved and effective State plan are listed in table 1 of this subpart. Notwithstanding the exclusions in table 1 of this subpart, any MSW landfill located in a State or portion of Indian country that does not have an EPA approved and currently effective State or Tribal plan is subject to the requirements of this subpart. 2 - 24

EG/NSPS

Subpart WWW—Standards of Performance for Municipal Solid Waste Landfill (March 12, 1996)

§ 60.750 Applicability, designation of affected facility, and delegation of authority.

(a) The provisions of this subpart apply to each municipal solid waste landfill that commenced construction, reconstruction or modification on or after May 30, 1991. Physical or operational changes made to an existing MSW landfill solely to comply with Subpart Cc of this part are not considered construction, reconstruction, or modification for the purposes of this section.



40 CFR Part 63, Subpart AAAA

The rule applies to area source landfills if they have a design capacity equal to or greater than 2.5 million Mg and 2.5 million m³, and they have estimated uncontrolled emissions of 50 Mg/yr NMOC or more, or are operated as a bioreactor.

2 - 27

Subpart AAAA

The rule applies to area source landfills if they have a design capacity equal to or greater than 2.5 million Mg and 2.5 million m³, and they have estimated uncontrolled emissions of 50 Mg/yr NMOC or more, or are operated as a bioreactor.

2 - 28

40 CFR Part 63, Subpart AAAA

- **The final rule adds startup, shutdown, and malfunction (SSM) requirements, adds operating condition deviations for out of-bounds monitoring parameters, requires timely control of bioreactor landfills, and changes the reporting frequency for compliance monitoring report to every 6 months.**

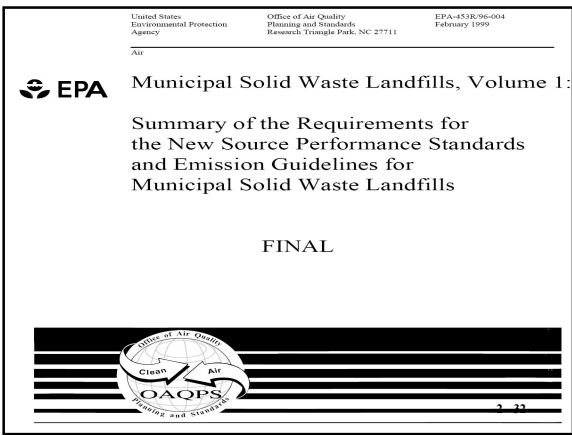
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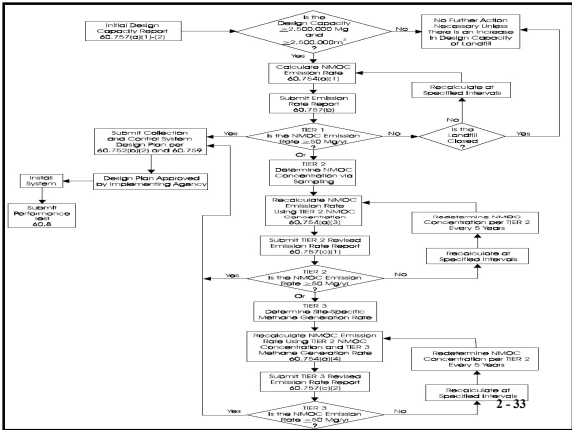
The final rule requires operation of the control device(s) within the operating parameter boundaries as described in 40 CFR 60.758(c)(1) and to continuously monitor control device operating parameters

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Compliance with the operating conditions is demonstrated when monitoring data show that the gas control devices are operated within the established operating parameter range. Compliance also occurs when the data quality is sufficient to constitute a valid hour of data in a 3-hour block period.

2 - 31





2 - 33

More Information

[www.epa.gov/non-
Municipal Solid Waste Landfills | Landfills | US EPA
reduce.htm](http://www.epa.gov/non-
Municipal Solid Waste Landfills | Landfills | US EPA
reduce.htm)

2 - 34

NSPS/EG Requirements

- **GCCS must be designed for the maximum expected flow over the intended use period**
- **The flow used for the design must be equal to or greater than flows estimated by EPA Model w/ AP-42 defaults for Lo and k. Site specific k from Method 2E may be substituted. [§ 60.755(a)(1)]**

2 - 35

60.752 Standards for air emissions from municipal solid waste landfills.
(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in § 60.754. The NMOC emission rate shall be recalculated annually, except as provided in § 60.757(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements²⁶

(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall:
(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year:
(A) The collection and control system as described in the plan shall meet the design requirements of paragraph (b)(2)(ii) of this section.
(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 60.753 through 60.758 proposed by the owner or operator.

2 - 37

(D) The Administrator shall review the information submitted under paragraphs (b)(2)(i) (A),(B) and (C) of this section and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems.

2 - 38

§ 60.754 Test methods and procedures.
(a)(1) The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in paragraph (a)(1)(i) of this section or the equation provided in paragraph (a)(1)(ii) of this section. Both equations may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i), for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii), for part of the life of the landfill.

2 - 39

(continued)

- The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for Lo, and 4,000 parts per million by volume as hexane for the CNMOC. For landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorological site, the k value to be used is 0.02 per year.

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$$M_{NMOC} = \sum_{i=1}^n 2 k L_o M_i (e^{-kt_i}) (C_{NMOC}) (3.6 \times 10^{-9})$$

where,

M_{NMOC}=Total NMOC emission rate from the landfill, megagrams per year

k=methane generation rate constant, year⁻¹

Lo=methane generation potential, cubic meters per megagram solid waste

M_i = mass of solid waste in the ith section, megagrams

t_i=age of the ith section, years

C_{NMOC}=concentration of NMOC, parts per million by volume as hexane

t = age of landfill, years

C_{NMOC}=concentration of NMOC, parts per million by volume as hexane

c=time since closure, years; for active landfill c=0 and e = k c
3.6×10⁻⁹ =conversion factor

2 - 41

Gas collection systems are not 100 percent efficient in collecting landfill gas, so emissions of CH₄ and NMOCs at a landfill with a gas recovery system still occur.

To estimate controlled emissions of CH₄, NMOCs, and other constituents in landfill gas, the collection efficiency of the system must first be estimated.

Reported collection efficiencies typically range from 60 to 85 percent, with an assumed average of 75 percent. If site-specific collection efficiencies are available, they should be used instead of the 75 percent average.

2 - 42

$$\text{Controlled Landfill Emissions} = P \left(1 - \frac{\text{Percent Collection Efficiency}}{100} \right) + P \left(\frac{\text{Percent Collection Efficiency}}{100} \right) * \left(1 - \frac{\text{Percent Control Efficiency}}{100} \right)$$

2 - 43

Example of Landfill NMOC Collection and Control

VOC emissions from Landfill A are estimated to be 3,197 cubic meters per year. Average collection efficiency of the landfill gas recovery system is not known at Landfill A, so a 75-percent collection efficiency rate is assumed. The collected landfill gas is controlled by a flare, which has a control efficiency for NMOCs of 83.16 percent.

Controlled NMOC Emissions = $3,197 \text{ m}^3 * [1 - 0.75] + 3,197 \text{ m}^3 * [0.75] * [1 - 0.8316]$

= $799.25 \text{ m}^3 + 3,197 \text{ m}^3 * 0.1263$
 = $799.25 \text{ m}^3 + 403.78 \text{ m}^3$
 = $1,203 \text{ m}^3$

2 - 44

Part 60 Subpart Cc- Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (11/8/87 to 5/29/91) FR 3/12/96

- **Designated facilities-** each existing MSW landfill for which construction, reconstruction, or modification was commenced before 5/30/91
- **For approval, a State plan shall** include control of MSW landfill emissions at each MSW landfill meeting the following 3 conditions:
 - existing landfills that have accepted waste since 11/8/87 or has additional design capacity to accept waste
 - landfill with design capacity ≥ 2.5 million megagrams by mass or ≥ 2.5 million cubic meters by volume
 - landfill has a NMOC emission rate of ≥ 50 megagrams/yr

2 - 45

Part 60 Subpart Cf- Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (FR 8/29/2016)

■ **60.31f Designated facilities.**

(a) The designated facility to which these Emission Guidelines apply is each existing MSW landfill for which construction, reconstruction, or modification was commenced on or before July 17, 2014.

2 - 46

Part 60 Subpart Cc (Cf)-Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (11/8/87 to 5/29/91)

- **For approval, a State plan shall include** the requirement for existing landfills to install a collection and control system meeting the requirements:
 - An open flare designed and operated in accordance with the parameters established in §60.18.
 - A control system designed and operated to reduce NMOC by 98% by weight.
 - An enclosed combustor designed and operated to reduce the outlet NMOC concentration to 20 ppm as hexane by volume, on a dry basis at 3% O₂ or less.

2 - 47

Applicability of Part 60 Subpart Cc; Part 60 Subpart WWW;

■ Part 60 Subpart Cc-Emission Guidelines is for existing MSW landfill for which construction, reconstruction, or modification was commenced before 5/30/91, but incorporates all of the requirements of Subpart WWW.

■ NSPS Subpart WWW is applicability to all landfills constructed, reconstructed, or modified on or after 5/30/91

2 - 48

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- Landfills with a design capacity < **2.5 million megagrams by mass** or < **2.5 million cubic meters by volume** shall submit an initial design capacity report to the Director.
- If the design capacity **equals or exceeds 2.5 million megagrams** or **2.5 million cubic meters** the owner shall calculate an annual NMOC emission rate for the landfill.
- If the calculate NMOC is calculated to < **50 (34) megagrams/yr** the owner will recalculate the NMOC annually and submit an annual emission report. 2 - 49

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills 60.757(b)(1)(ii)**

- NMOC emission rate reports are submitted to the State Agency annually, with the following exception:
- If the estimated NMOC emission rate is **less than 50 (34) MG/yr in each of the next 5 consecutive years**, based on the estimated waste acceptance rate, the owner may elect to submit the report **every 5 years**, and if all the data and calculations upon which the estimate is based is provided in the report.
- If the actual waste acceptance rate is exceeded in any year reported in the 5-year estimate, a revised 5-year report shall be submitted beginning with year in which the actual acceptance rate exceeded the estimated rate. 2 - 50

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

The owner has the option to recalculate the NMOC emissions in 3 Tiers to document the annual emissions to be < 50 (34) MG :

- Tier 1: NMOC emissions calculations (2) use default values set in 60.754(a)(1)
- Tier 2: Determine the site-specific NMOC emission rate (at least every 5 yrs.)
 - install at least 2 sample probes per hectare of landfill surface that has been in waste for 2 years, up to a maximum of 50 probes;
 - analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C;
 - composite samples from different probes to one cylinder are allowed if equal sample volumes are taken from each probe; and
 - the average site-specific NMOC concentration is used instead of the default value in Tier 1, in one of the 2 calculations contained in 60.754(a)(1)
- Tier 3: The site-specific CH₄ generation rate constant is determined using Method 2E (rather than the default value), along with the site-specific NMOC concentration measured in Tier 2. CH₄ generation rate constant perf. only 50nce.

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The owner shall submit a collection and control system design plan (prepared by a professional engineer) within 1 year of the first report in which the NMOC emission rate exceeds 50 (34) MG/yr; except where NMOC emissions are re-calculated to be less than this amount using Tier 2 or Tier 3.
- The owner shall install a collection and control system within 30 months after the 1st annual report in which NMOC emissions exceed 50 MG/yr.
- Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of (§60.755(b)):
 - 5 years or more if active; or 2 years or more if closed or at final grade
 - Collected gases shall be routed to a control device meeting one of the following requirements:
 - An open flare designed and operated in accordance with the parameters established in §60.18.
 - A control system designed and operated to reduce NMOC by 98% by weight.
 - An enclosed combustor designed and operated to reduce the outlet NMOC concentration to 20 ppm as hexane by volume, on a dry basis at 3% O₂ or less.

2 - 52

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills (60.753) (60.763)**

Operational standards for collection and control systems

- The gas collection system must be operated under negative pressure at each wellhead, except under the following conditions:
 - a fire or increased well temperature (maintain records and report)
 - use of a geomembrane or synthetic cover
 - a decommissioned well, w/ declined flows (capped not removed)
- Operate each interior wellhead with a landfill gas temperature less than 55° C (131 F°) and with either oxygen less than 5% or nitrogen less than 20% (For XXX O₂ does not have limits nor need to be reported, but should be recorded,
- A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.
- Operate the collection system so methane concentration is < 500 ppm above background at the surface of the landfill.

2 - 53

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The following procedures shall be used for compliance w/ the surface methane operational standards:
 - The owner shall monitor the surface CH₄ concentrations along the entire perimeter of the collection area and along a pattern that transverses the landfill at 30 meter intervals on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitoring device meeting the requirements of § 60.755(d).
 - The background concentration shall be determined by moving the probe upwind and downwind outside the boundary of the landfill at a distance of 30 meters from the perimeter wells.
 - Surface CH₄ monitoring shall be performed in accordance w/ Section 4.3.1 of Method 21, except the probe inlet shall be placed 5 to 10 cm from the ground; and monitoring shall be conducted during normal meteorological conditions.

2 - 54

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

- For the purposes of identifying the **infiltration of excess air**, the wellhead shall be monitored monthly for temperature and nitrogen or oxygen to demonstrate compliance with § 60.753(c).
 - Actions shall be initiated to correct the exceedance within 5 days of the measured exceedance.
 - If any exceedance cannot be achieved within 15 days of the 1st measurement, the gas collection system shall be expanded within 120 days of the initial exceedance.
 - An **alternative timeline** for correcting the exceedance may be submitted to the Director for approval.

2 - 55

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

- The **gauge pressure** shall be measured monthly in the gas collection header at each individual well. If positive pressure exists the following procedures shall be followed:
 - Actions shall be initiated to correct the exceedance within 5 days, except for the 3 conditions allowed in § 60.753(b) (fire, geomembrane, decommissioned well).
 - If negative pressure cannot be achieved without excess air infiltration within 15 days of the 1st measurement, the gas collection system shall be expanded within 120 days of the initial measurement of + pressure.
 - An **alternative timeline** for correcting the exceedance may be submitted to the Director for approval.

2 - 56

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

- Any reading of 500 ppm CH4 or more above background shall be recorded as an exceedance. The exceedance is not a violation if the following procedures are followed:
 - The location of each monitored exceedance shall be marked and the location recorded.
 - Cover maintenance or adjustments to the vacuum of the adjacent wells is made to increase the gas collection in the vicinity of the exceedance.
 - The location is re-monitored w/i 10 days of detecting the exceedance and it is corrected;
 - Or if, w/i 10 days, the location is monitored with a 2nd exceedance, additional corrective action is taken; and the location is re-monitored w/i 10 days of the 2nd exceedance.
 - Any location showing an exceedance, where the CH4 conc. is re-monitored to be < 500 ppm over background, shall be monitored w/i 1 mo. of the initial exceedance.
 - Any location showing an exceedance of 500 ppm above background 3 times in a quarterly period, shall have a new well installed w/i 120 days of the initial exceedance.
 - An **alternative remedy** to the exceedance such as upgrading the blower, header pipes, or control device may be submitted to the Director for approval.

2 - 57

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The calculation for the maximum expected gas generation flow rate from the landfill to determine the design of the collection and control system is provided in § 60.755(d).
- A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number or years until closure.
- The collection and control system shall be designed to control and extract gas from all portions of the landfill sufficient to meet all of the operational and performance standards of the NSPS.
- The owner shall monitor for the cover integrity and implement cover repairs as necessary on a monthly basis. 2 - 58

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

Each owner demonstrating compliance through the use of an **enclosed combustor** shall install, calibrate, operate, and maintain, according to mfg's specifications, the following equipment:

A temperature monitoring device equipped with a continuous recorder, except a temperature monitoring device is not required for boilers or process heaters > 44 MW.

A device that records flow to or bypass of the control device using either of the following methods:

- Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; or
- Secure the bypass line valve in the closed position with a car-seal or lock-and-key, w/ a visual inspection at least 2 - 59
once/month.

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- Each owner demonstrating compliance w/ and **open flare** shall install, calibrate, operate, and maintain, according to mfg's specifications, the following equipment:
 - a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself, to indicate the continuous presence of a flame.
 - A device that records the flow to or bypass of the flare, using either of the following methods:
 - Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the flare at least every 15 minutes; or
 - Secure the bypass line valve in the closed position with a car-seal or lock-and-key, w/ a visual inspection at least 2 - 60
once/month.

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- Requirements for surface CH₄ monitoring devices:
The portable analyzer shall meet the instrument specifications in Section 3 of Method 21, except CH₄ will replace VOC.

- The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction provided the duration of start-up, shutdown, or malfunction:
 - does not exceed 5 days for the collection systems and
 - does not exceed 1 hour for the control devices. ^{2 - 61}

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The owner shall submit an **equipment removal report** 30 days prior to removal or cessation of operations of the control equipment which shall include:
 - A copy of the closure report;
 - A copy of the initial performance test report demonstrating that the collection and control equipment has been in place for a minimum of 15-years; and
 - Dated copies of 3 successive NMOC emission rate reports, calculated no less than 90 days or more than 180 days apart, demonstrating that the landfill is producing < 50 MG NMOC/yr.

2 - 62

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- Any **closed landfill** that has no monitored exceedances of the 500 ppm CH₄ over background limitation in 3 consecutive quarterly monitoring periods may skip to annual monitoring, but shall return to quarterly if an exceedance is detected.

- The owner shall submit a **closure report** within **30 days** of waste acceptance cessation. No additional wastes may be accepted following the report without filing a notice of modification. ^{2 - 63}

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

- **Annual (Biannual) Report** The owner using an active collection system for compliance shall submit biannual reports to the Director containing the following information:
 - Value and length of time for any exceedance of any parameters monitored under § 60.756(a) thru (d), i.e., pressure, temp., O₂/N₂ measurements at wellhead; continuous temp. records for enclosed combustor or flow measurement requirements for flare, etc.
 - Description and duration of all periods when the gas stream was diverted from the control device through a bypass line or there was an indication of a bypass.
 - Description and duration of all periods when the control device was not in operation for a period exceeding 1 hour and length of time it was not in operation.
 - All periods when the collection system was not operating in excess of 5 days.
 - The location of each exceedance of the 500 ppm CH₄ concentration over background and the concentration recorded at each such location the following month.
 - The date of installation and location of each well or collection system expansion added to comply with § 60.755.

2 - 64

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The following exceedances shall be reported in the annual (or semiannual) report:
 - For enclosed combustors, except for boilers or process heater with a design heat input capacity \geq 44 MW (150 MMBtu/hr):
 - All 3-hr. periods of operation during which the avg. combustion temp. was more than 28° C below the avg. combustion temp. maintained during the most recent compliance test.
 - For all boilers and process heaters, any change in the location at which the landfill gas vent stream is introduced into the flame zone from that maintained during the performance or compliance demonstration.

2 - 65

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- The **initial performance test report** for the collection and control system shall include the following information:
 - A diagram of the collection system showing all locations including: all wells, horizontal collectors, surface collectors, or other gas extraction devices;
 - This diagram shall include the locations excluded from the collection area (non-organic/non-productive) and any proposed areas for future collection system expansion;
 - The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other extraction devices and the gas mover equipment sizing was based;
 - Documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded;
 - The sum of the gas generation flow rates and calculations of these flow rates for all areas for which collection wells have been excluded based on non-productivity;
 - Provisions for increasing gas mover equipment capacity with increased gas generation, if the present gas moving equipment is inadequate to move the maximum flow rate expected over the life of the landfill;
 - The provisions for control of off-site migration of landfill gases.

2 - 66

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements

- Each landfill owner subject to §60.752(b) shall keep, for at least 5 years, up-to-date readily accessible records, of the design capacity report, the current amount of solid waste in place, and the year-by-year acceptance rate.
- Each landfill owner shall keep up-to-date, readily accessible records, and for the life of the control equipment, the data measured during the initial performance test or compliance determination. Records of subsequent test or monitoring shall be maintained for a minimum of 5 years.
- Records of control device vendor specifications shall be maintained until its removal.

2 - 67

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements (cont.)

- For a facility required to install a **collection and control system**:
 - The maximum expected gas generation flow rate calculated as required per §60.755(a)(1); and
 - The density of wells, horizontal collectors, surface collectors, or other gas collection devices using procedures specified in §60.759(a)(1).
- Where using an **enclosed combustor**, other than a boiler or process heater with a design heat input capacity \geq 44 MW:
 - The average combustion temperature measured at least every 15 minutes and averaged over the same time period as the performance test; and
 - The % reduction of NMOC or outlet NMOC concentration, ²⁻⁶⁸ measured as required per §60.752(b)(2)(iii)(B) for the control device.

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements (cont.)

- Where using an **open flare** to demonstrate compliance:
 - The flare type (steam-assisted, air-assisted, or nonassisted); and
 - All visible emission readings;
 - The heat content determination;
 - The flow rate or bypass flow rate measurements;
 - The exit velocity determinations made during the performance test as specified in §60.8;
 - Continuous records of the flare pilot flame or flare flame monitoring equipment; and
 - Records of all periods of operations during which the pilot flame to the flare flame is absent.

2 - 69

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

Recordkeeping requirements (cont.)

- Where using a **boiler or process heater of any size** for compliance:
 - A description of the location at which the collected gas vent stream is/was introduced into the boiler/process heater during the performance test; and documentation that it is not moved without a new compliance demonstration.
- Each owner of a controlled landfill, subject to the provisions of this subpart, shall keep for 5 years, up-to-date and readily accessible:
 - Continuous records of equipment operating parameters specified to be monitored as required by §60.756; and
 - Periods of operation during which the parameter boundaries established during the most recent performance test were exceeded.

2 - 70

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements (cont.)

Where using a **boiler or process heater** with a design heat input capacity \geq 44 MW for compliance:

- all periods of operation of the boiler/process heater, e.g., to include records of steam use, fuel use, or monitoring date required per a State permit.

Where using an **open flare** to demonstrate compliance:

- continuous records of the flame or flare pilot flame monitoring required per §60.756(c); and
- all periods of operation during which the flame or flare pilot flame is absent.

2 - 71

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements (cont.)

- Each owner of a **controlled landfill**, subject to the provisions of this subpart, shall keep for the lifetime of the collection system:
 - An update, readily accessible plot map showing each existing and planned collector system and the identification of each to include:
 - The installation date and location of all newly installed collectors; and
 - Documentation of the nature, date of deposition, amount, and location of asbestos-containing, nondegradable, and non-productive wastes excluded from the collection areas

2 - 72

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

Recordkeeping requirements (cont.)

- Each owner of a controlled landfill, subject to the provisions of this subpart, shall keep up-to-date and readily accessible continuous records of:
 - The flow to the control device and the indication of any/every bypass flow to the control device; and
 - The monthly inspection of the car-seals or lock-and-key configurations used to seal bypass lines.
- Land owners who convert design capacity from volume to mass or mass to volume, to demonstrate that the landfill capacity is less than 2.5 million MG or 2.5 million cubic meters, shall keep readily accessible records of the annual recalculation of site-specific density, design capacity and the supporting documentation of the conversion from mass to volume or volume to mass. 2 - 73

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal
Solid Waste Landfills**

- Each owner of a **controlled landfill**, subject to the provisions of this subpart, shall keep for 5 years, up-to-date and readily accessible records for:
 - All collection and control system exceedances of the operational standards required per §60.753;
 - The readings in the subsequent month, whether or not the 2nd reading is an exceedance; and

2 - 74

Part 60 Subpart WWW (XXX)
**Standards of Performance for Municipal Solid
Waste Landfills**

- Any **nonproductive area of the landfill may be excluded** from control provided that the total of all excluded areas can be shown to contribute less than 1% of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Director upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the formula in this paragraph, where Q_i = NMOC emission rate from the section, in MG/yr.
- All gas collection devices shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous resistant material of suitable dimensions to withstand environmental and operational stresses of a landfill. 2 - 75

NSPS XXX Rule Applicability

- NSPS XXX applies to MSW LFs that commenced construction, reconstruction, or modification after July 17, which is an increase in the permitted volume design capacity by either lateral or vertical expansion based on its permitted design capacity as of July 17, 2014.

2 - 76

40 CFR 60 Subpart XXX (cont.) § 60.765 Compliance procedures

- Monitoring of operations
- Reporting requirements
- Recordkeeping requirements
- Specifications for active CS

2 - 77

40 CFR 60 Subpart XXX (cont.)

- Calculated NMOC Emission Rate. Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in §60.767(c); calculate NMOC emissions using the next higher tier in §60.764; or conduct a surface emission monitoring demonstration using the procedures specified in §60.764(a)(6). The collection and control system must meet the requirements in paragraphs (b)(2)(ii) and (iii) of this section.
- The collection devices within the interior must be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues must be addressed in the design: Depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system
- Current WWW plan applies and continue to follow WWW until agency approval and also while upgrading GCCS and other monitoring requirements to meet XXX. Any new XXX requirements, must state that these are prospective (ability to isolate, treatment plan, going forward, the GCCS design plan must be revised within 90 days of expanding operations to an area not covered by the previously approved design plan and/or before installing/expanding the GCCS in a manner inconsistent with the previous design plan.

Reference Documents:

- Part 60 **Subpart Cf- Emission Guidelines** and Compliance Times for Municipal Solid Waste Landfills
- Part 60 **Subpart XXX Standards of Performance for Municipal Solid Waste Landfills**
- Part 60 Subpart A, **§60.18-** Standards of Performance for New Stationary Sources, General Provisions, General control device and work practice requirements for a **flare**
- Part 63 Subpart A, **§63.11-** National Emission Standards for Hazardous Air Pollutants, General Provisions, General control device and work practice requirements for a flare

2 - 79

40 CFR Part 62 Subpart OOO (May 21, 2021)

- Promulgation of a Federal plan to implement the Emission Guidelines (EG) and Compliance Times for Municipal Solid Waste (MSW) Landfills (2016 MSW Landfills EG) for existing MSW landfills located in states and Indian country where state plans or tribal plans are not in effect.
- This MSW Landfills Federal Plan includes the same elements as required for a state plan: Identification of legal authority and mechanisms for implementation; inventory of designated facilities; emissions inventory; emission limits; compliance schedules; a process for the EPA or state review of design plans for site-specific gas collection and control systems (GCCS); testing, monitoring, reporting and record keeping requirements; and public hearing requirements.
- Additionally, this action summarizes implementation and delegation of authority of the MSW Landfills Federal Plan.

2 - 80

40 CFR Part 62 Subpart OOO

- Newly effective Federal Plan Subpart OOO contains provisions for existing "legacy controlled landfills" that already have a GCCS in place (i.e., they are not expected to redo certain specified previously completed compliance obligations), as well as increments of progress for previously uncontrolled existing landfills to meet the requirements (i.e., they are not expected to comply on day one).
- Uncontrolled landfills now subject to Federal Plan Subpart OOO must submit a design capacity report (and an NMOC emissions rate report if the capacity equals or exceeds 2.5 million Mg and 2.5 million cubic meters) by September 20, 2021.
- Future requirements will depend on the NMOC emissions rate; once greater than 34 Mg/year (50 Mg/year for closed landfills), and if surface methane emissions exceed 500 ppm for those choosing to utilize the new Tier 4 option, the landfill will be required to install a GCCS according to specified increments of progress.
- The first increment is due one year after the NMOC emissions rate report in which NMOC emissions equaled or exceeded 34/50 Mg/year, and the last increment (i.e., achieving final compliance) is due 30 months after that report.

2 - 81

40 CFR Part 62 Subpart OOO

- Beginning in 2014, the EPA reviewed the NSPS and EG based on changes in the landfill industry since the rules were first promulgated in 1996, including changes to the size and number of existing landfills, industry practices, and gas control methods and technologies.
- In August 2016, the EPA made several revisions to further reduce emissions of landfill gas (LFG) and its components and promulgated revised subparts for the MSW Landfills NSPS at 40 CFR part 60, subpart XXX, and the EG for existing MSW landfills at 40 CFR part 60, subpart Cf (81 FR 59276 and 59332, August 29, 2016).

2 - 82

40 CFR Part 62 Subpart OOO

- The CAA regulations implementing the EG require states with existing MSW landfills subject to the EG to submit state plans to the EPA in order to implement and enforce the EG.
State plans implementing the 2016 MSW Landfills EG were due on May 30, 2017.
- For states that did not submit an approvable plan by that deadline, CAA section 111 and 40 CFR 60.27(c) and (d) require the EPA to develop, implement, and enforce a Federal plan for existing MSW landfills located in any state (i.e., state, territory, or protectorate) or Indian country that does not have an approved state plan 2 that implements the 2016 MSW Landfills EG

2 - 83

40 CFR Part 62 Subpart OOO

- Section 111(d) of the CAA, as amended, 42 U.S.C. 7411(d), requires states to develop and implement state plans for MSW landfills to implement and enforce the promulgated EG.
- Accordingly, 40 CFR part 60, subpart Cf requires states to submit state plans that include specified elements.
- Because this Federal plan takes the place of state plans or state plans that are not fully approved and effective, it includes the same essential elements: (1) Identification of legal authority and mechanisms for implementation; (2) inventory of designated facilities; (3) inventory of emissions; (4) emission limits; (5) compliance schedules; (6) process for the EPA or state review of site-specific design plans for GCCS; (7) testing, monitoring, reporting, and recordkeeping requirements; and (8) public hearing requirements.

2 - 84

40 CFR Part 62 Subpart OOO

- This MSW Landfills Federal Plan includes the five increments of progress required by 40 CFR 60.24(e)(1) and provides flexibility to establish the increment dates (40 CFR 62.16712).
- The MSW Landfills Federal Plan contains a generic compliance schedule (Table 1 to 40 CFR part 62, subpart OOO) that applies to designated MSW landfills unless the EPA approves an alternative schedule according to the criteria in 40 CFR 60.27(e)(2)

2 - 85

40 CFR Part 62 Subpart OOO

- The NSPS at 40 CFR part 60, subpart WWW, identified and defined the term “controlled landfill” as one that had triggered the nonmethane organic compounds (NMOC) threshold of 50 Mg per year or more and submitted its collection and control system design plan.
- The provisions of 40 CFR part 60, subpart WWW, require the design plan to be submitted within 1 year of the first NMOC annual emission rate report that is equal to or greater than 50 Mg per year NMOC.
- The EG at 40 CFR part 60, subpart Cc, and the Federal plan at 40 CFR part 62, subpart GGG, do not define the term “controlled landfill” directly but note that the definition of terms used but not defined in those subparts has the meaning given them in the CAA and in 40 CFR part 60, subparts A, B, and WWW.

2 - 86

40 CFR Part 62 Subpart OOO

- These rules provide the same timing allowance of 1 year after the NMOC report showing emissions of 50 Mg NMOC per year or more to submit the collection and control system design plan.
- These landfills have already met requirements under existing 40 CFR part 60 or part 62 regulations, and the EPA emphasizes that there is no need to duplicate those efforts when complying with the Federal plan being finalized in this action.
- The EPA has added a definition of the term “legacy controlled landfill” to 40 CFR 62.16730 to clarify requirements and compliance times for these landfills.

2 - 87

40 CFR Part 62 Subpart OOO

- Legacy controlled landfills have previously satisfied the requirement to submit their initial design capacity report, initial or annual NMOC emission rate reports, and collection and control system design plan.
- These reports were previously submitted under 40 CFR part 60, subpart WWW; 40 CFR part 62, subpart GGG; or a state plan implementing 40 CFR part 60, subpart Cc. The EPA has clarified that it is not requiring these sources to resubmit any of these reports under 40 CFR 62.16711(h).
- Additionally, because annual NMOC reports have been previously submitted under 40 CFR part 60, subpart WWW; 40 CFR part 62, subpart GGG; or a state plan implementing 40 CFR part 60, subpart Cc, some of the legacy controlled landfills have already passed the 30-month period after the first NMOC report that showed emissions of 50 Mg NMOC per year or more.
- Other legacy controlled landfills may not reach the end of the 30-month period until after this Federal plan becomes effective. 2 - 88

40 CFR Part 62 Subpart OOO

TABLE 1 TO SUBPART OOO OF PART 62—GENERIC COMPLIANCE SCHEDULE AND INCREMENTS OF PROGRESS

Increment	Date if using tiers 1, 2, or 3	Date if using tier 4	Date if a legacy controlled landfill
Increment 1—Submit cover page of final control plan.	1 year after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 34 megagrams per year. ¹ .	1 year after the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill.	1 year after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 50 megagrams per year submitted under a previous regulation. ²
Increment 2—Award Contracts.	20 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 34 megagrams per year. ¹ .	20 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 34 megagrams per year.	20 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 50 megagrams per year submitted under a previous regulation. ²
Increment 3—Begin on-site construction.	24 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 34 megagrams per year. ¹ .	24 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 34 megagrams per year.	24 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 50 megagrams per year submitted under a previous regulation. ²
Increment 4—Complete on-site construction.	30 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 34 megagrams per year. ¹ .	30 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 34 megagrams per year.	30 months after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 50 megagrams submitted under a previous regulation. ²

2 - 89

40 CFR Part 62 Subpart OOO

TABLE 1 TO SUBPART OOO OF PART 62—GENERIC COMPLIANCE SCHEDULE AND INCREMENTS OF PROGRESS—Continued

Increment	Date if using tiers 1, 2, or 3	Date if using tier 4	Date if a legacy controlled landfill
Increment 5—Final compliance.	30 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 34 megagrams per year. ¹ .	30 months after the most recent NMOC emission rate report showing NMOC emissions ≥ 34 megagrams per year.	30 months after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥ 50 megagrams submitted under a previous regulation. ²

¹50 megagrams per year NMOC for the closed landfill subcategory.
²Previous regulation refers to 40 CFR part 60, subpart WWW; 40 CFR part 62, subpart GGG; or a state plan implementing 40 CFR part 60, subpart Cc. Increments of progress that have already been completed under previous regulations do not have to be completed again under this subpart.

EPA Regulation Navigation Tools

Regulation Navigation (Reg Nav) tools help owners and operators of facilities in certain industries determine the requirements of specific air quality regulations. Reg Nav tools are online and interactive, and use the information entered to assess potential regulatory requirements. Reg Nav tools do not store or save information, so you must print or save any output that you want to use or reference. Note that the Reg Nav requirements may not be complete. Refer any questions to your local authority.

Air Pollutant Category	Regulation	Reg Nav Tool
National Emissions Standards for Hazardous Air Pollutants under 40 CFR part 63	Subpart LLL	Portland Cement Manufacturing Industry
	Subpart AAAA	Municipal Solid Waste Landfills
	Subpart ZZZZ	Recirculating Internal Combustion Engines (RICE)
	Subpart JJJJJ	Brick and Structural Clay Products Manufacturing
	Subpart HHHHHH	Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources: Determining exemption eligibility
New Source Performance Standards	Subpart JJJJJJ	Area Source Industrial, Commercial, and Institutional Boilers
	Subpart WWW	Municipal Solid Waste Landfills
	Subpart XXX	Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2004
	Subpart III & Subpart JJJJ (one tool)	Stationary Compression Ignition Internal Combustion Engines and Spark Ignition Internal Combustion Engines

2 - 91

EPA Regulation Navigation Tools | Stationary Sources of Air Pollution | US EPA

Municipal Solid Waste Landfills Monitoring Checklist

Subpart III, Greenhouse Gas Reporting Program

What Must Be Monitored for Each MSW Landfill?

Each MSW landfill must monitor these parameters...

- Annual quantity of waste landfilled (W, in Equation III-1)
- For each type of material landfilled, specific waste quantity or fraction, and its associated parameters used to calculate methane generation in Equation III-1, including DOC, L, MCF, F, and DOC₂.

Each MSW landfill using a gas collection system must also monitor these parameters...

- Flow rate of landfill gas before any treatment equipment (continuously)
- Moisture content** of landfill gas (continuously, if available, or monthly*)
- CH₄ concentration of collected landfill gas (continuously, if available, or monthly*)
- Annual operating hours where active gas flow was sent to each destruction device)
- Temperature** of landfill gas (continuously, if available, or monthly*)
- Annual operating hours of the gas collection system associated with each measurement location
- Pressure** of landfill gas (continuously, if available, or monthly*)
- Surface area, average depth of waste, and associated estimated collection efficiency of areas with the different and type specific and gas collection system operation listed in Table III-3

*If only one measurement is made each calendar month, there must be at least fourteen days in between measurements.
 **If the gas flow meter is not equipped with automatic correction for temperature, pressure, or moisture content.

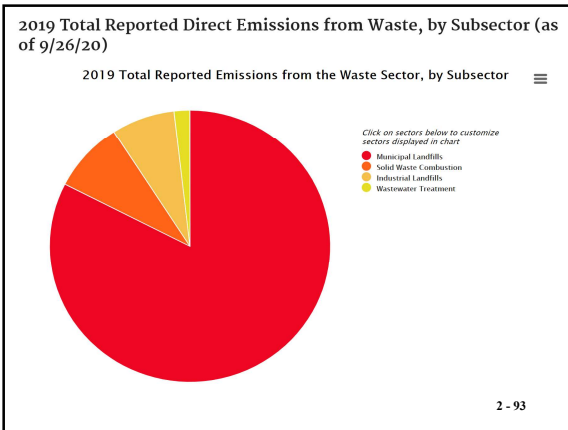
See also the information sheet for Municipal Solid Waste Landfills (EPA-430-F-09-009R) at: <https://www.epa.gov/ghgsreporting/subpart-iii-information-sheet>.

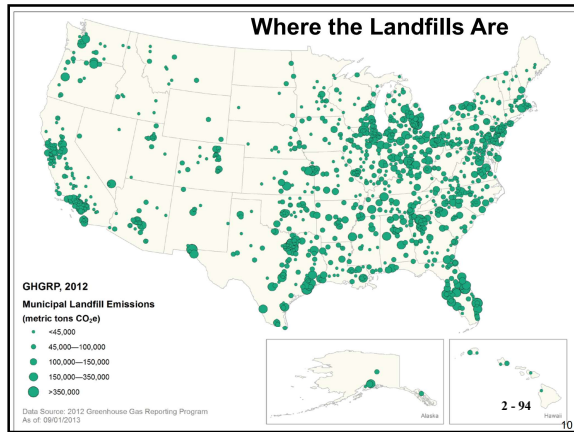
This document is provided solely for informational purposes. It does not provide legal advice, have legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits in regard to any person. This information is intended to assist reporting facilities/owners in understanding key provisions of the Greenhouse Gas Reporting Program.

2 - 92

Municipal Solid Waste Landfills Monitoring Checklist
Greenhouse Gas Reporting Program
Page 1 of 1

40 CFR, subpart III
February 2018





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GHGRP Data

2019 highlights
State Fact Sheet

Data Sets

- Power Plants
- Petroleum & Natural Gas Systems
- Refineries
- Chemicals
- Waste
- Metals
- Minerals
- Pulp & Paper
- Miscellaneous Combustion
- Underground Coal Mines
- Electronics Manufacturing
- Electrical Equipment
- Suppliers Highlights
- Capture, Storage, and Underground Injection of CO₂
- Fluorinated Greenhouse Gases

GHG Reporting Program Data Sets

The Greenhouse Gas Reporting Program (GHGRP) collects Greenhouse Gas (GHG) data from large emitting facilities, suppliers of fossil fuels and industrial gases that result in GHG emissions when used, and facilities that inject carbon dioxide underground. [Learn more about the GHGRP.](#)

 **Data Highlights Website:** A high-level summary of yearly GHG data reported to EPA. These pages summarize GHGRP data nationally and by industry sector using maps, charts, and tables.

 **Facility Level Information on Greenhouse Gases Tool (FLIGHT):** An interactive website with mapping features to identify GHGRP facilities by location, name, industry type, and other criteria. FLIGHT can also generate and download customized graphics (pie charts, trend lines, etc.) and facility lists.

 **2018 Data Summary Spreadsheets (19 MB):** Compressed file contains a multi-year data summary spreadsheet containing the most important, high-level information for facilities, as well as yearly spreadsheets containing slightly more detailed information than the multi-year summary, including reported emissions by greenhouse gas and process.

 **EPA Data Explorer:** Provides all publicly available data collected by the GHGRP in a searchable, downloadable format for facilities. This includes GHG data and much of the underlying data facilities use to determine GHG values and other reported data elements in [22 industry types](#).

 **Key Facts and Figures:** A high-level summary of reported GHGRP data that allows you to view and download key figures.

 **Industrial Profiles:** Detailed analyses of various industries that report under the

2 - 95

GHG Reporting Program Data Sets | Greenhouse Gas Reporting Program (GHGRP) | US EPA
