ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60 and 63

[EPA–HQ–OAR–2002–0047; FRL–9996–22–OAR]

RIN 2060–AU18

National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills Residual Risk and Technology Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The U.S Environmental Protection Agency (EPA) is proposing amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP): Municipal Solid Waste (MSW) Landfills source category. The EPA is proposing decisions concerning the residual risk and technology review (RTR). The EPA is also proposing amendments to correct and clarify regulatory provisions related to emissions during periods of startup, shutdown, and malfunction (SSM); revise wellhead operational standards and corrective action to improve effectiveness and provide compliance flexibility; reorganize rule text to incorporate provisions from the new source performance standards (NSPS) within this subpart; and add requirements for electronic reporting of performance test results. The EPA is also proposing minor changes to the MSW Landfills NSPS and Emission Guidelines and Compliance Times for MSW Landfills. Specifically, the EPA is proposing to add provisions to the most recent MSW Landfills NSPS and Emission Guidelines (EG) that would allow affected sources to demonstrate compliance with landfill gas control, operating, monitoring, recordkeeping, and reporting requirements of the most recent NSPS and EG by following the corresponding requirements in the MSW Landfills NESHAP.

DATES:

Comments. Comments must be received on or before September 12, 2019. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best assured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before August 28, 2019.

Public hearing. If anyone contacts us requesting a public hearing on or before August 5, 2019, we will hold a hearing. Additional information about the hearing, if requested, will be published in a subsequent **Federal Register** document and posted at *https://www.epa.gov/stationary-sources-air-pollution/municipal-solid-waste-landfills-national-emission-standards.* See **SUPPLEMENTARY INFORMATION** for information on requesting and registering for a public hearing.

ADDRESSES: You may send comments, identified by Docket ID No. EPA–HQ–OAR–2002–0047, by any of the following methods:

- *Federal eRulemaking Portal: https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.
- *Email: a-and-r-docket@epa.gov.* Include Docket ID No. EPA–HQ–OAR–2002–0047 in the subject line of the message.
- *Fax:* (202) 566–9744. Attention Docket ID No. EPA–HQ–OAR–2002–0047.
- *Mail:* U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA–HQ–OAR–2002–0047, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.
- *Hand/Courier Delivery:* EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m.–4:30 p.m., Monday–Friday (except Federal holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/,* including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact Andrew Sheppard, Natural Resources Group, Sector Policies and Programs Division (E143–03), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–4161; fax number: (919) 541–0516; and email address: *Sheppard.Andrew@epa.gov.* For specific information regarding the risk modeling methodology, contact Jim Hirtz, Health and Environmental Impacts Division (C539–02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–0881; fax number: (919) 541–0840; and email address: *Hirtz.James@epa.gov.* For questions about monitoring and testing requirements, contact Muntasir Ali, Sector Policies and Programs Division (D243–05), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–0833; fax number: (919) 541–4991; and email address: *Ali.Muntasir@epa.gov.* For information about the applicability of the NESHAP to a particular entity, contact Maria Malave, Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, WJC South Building (Mail Code 2227A), 1200 Pennsylvania Avenue NW, Washington, DC 20460; telephone number: (202) 564–7027; and email address: *Malave.Maria@epa.gov.*

SUPPLEMENTARY INFORMATION:

Public hearing. Please contact Virginia Hunt at (919) 541–0832 or by email at *hunt.virginia@epa.gov* to request a public hearing, to register to speak at the public hearing, or to inquire as to whether a public hearing will be held.

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA–HQ–OAR–2002–0047. All documents in the docket are listed in *Regulations.gov.* Although listed, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *Regulations.gov* or in hard copy at the EPA Docket Center, Room 3334, WJC West Building, 1301 Constitution Avenue NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–1742.

Instructions. Direct your comments to Docket ID No. EPA–HQ–OAR–2002–0047. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/,* including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise

protected through *https://www.regulations.gov/* or email. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.*

The *https://www.regulations.gov/* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov/,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets.*

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 Code of Federal Regulations (CFR) part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404–02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention Docket ID No. EPA–HQ–OAR–2002–0047.

Preamble acronyms and abbreviations. We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

ADI Applicability Determination Index
AEGL acute exposure guideline level
AERMOD air dispersion model used by the HEM–3 model
ATSDR Agency for Toxic Substances and Disease Registry
BACT best available control technology
CAA Clean Air Act
CalEPA California EPA
CBI Confidential Business Information
CDX Central Data Exchange
CEDRT Compliance and Emissions Data Reporting Interface
CFR Code of Federal Regulations
CHIEF Clearinghouse for Inventories and Emissions Factors
CO carbon monoxide
DASEC discrete area source eddy covariance
DFW Dallas Fort Worth
EC eddy covariance
EG emission guidelines
EL expansion lag
EPA Environmental Protection Agency
ERPG Emergency Response Planning Guideline
ERT Electronic Reporting Tool
GCCS gas collection and control system
GHGRP Greenhouse Gas Reporting Program
HAP hazardous air pollutant(s)
HCl hydrochloric acid
HEM–3 Human Exposure Model, Version 1.1.0
HF hydrogen fluoride
HI hazard index
HOV higher operating value
HQ hazard quotient
IBR incorporation by reference
IRIS Integrated Risk Information System
km kilometer
LAER lowest achievable emissions rate
LFG landfill gas
LMOP Landfill Methane Outreach Program
MACT maximum achievable control technology
mg/kg-day milligrams per kilogram per day
mg/m^3 milligrams per cubic meter
Mg/yr megagrams per year
MIR maximum individual risk
MSW municipal solid waste
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NATA National Air Toxics Assessment
HEM–3 Human Exposure Model
NESHAP national emission standards for hazardous air pollutants
NMOC non-methane organic compounds
NRC National Research Council
NSPS new source performance standards
NTTAA National Technology Transfer and Advancement Act
OAQPS Office of Air Quality Planning and Standards
OECA Office of Enforcement and Compliance Assurance
OMB Office of Management and Budget
OTM Other Test Method
PAH polycyclic aromatic hydrocarbons
PB–HAP hazardous air pollutants known to be persistent and bio-accumulative in the environment
PM particulate matter
POM polycyclic organic matter
ppm parts per million
ppmv parts per million by volume
PRA Paperwork Reduction Act
RACT reasonably available control technology
RCRA Resource Conservation and Recovery Act
REL reference exposure level
RFA Regulatory Flexibility Act
RfC reference concentration
RfD reference dose
RTR residual risk and technology review
SAB Science Advisory Board
SBA Small Business Administration
SCC Source Classification Code
SOE subsurface oxidation event
SSM startup, shutdown, and malfunction
SWANA Solid Waste Association of North America
TC tracer correlation
TOSHI target organ-specific hazard index
tpy tons per year
TRIM.FaTE Total Risk Integrated Methodology.Fate, Transport, and Ecological Exposure model
UF uncertainty factor
$\mu g/m^3$ micrograms per cubic meter
UMRA Unfunded Mandates Reform Act
URE unit risk estimate
USGS U.S. Geological Survey
VCS voluntary consensus standards

Organization of this document. The information in this preamble is organized as follows:

I. General Information

A. Does this action apply to me?

Table 1 of this preamble lists the NESHAP (40 CFR part 63, subpart AAAA) and associated regulated industrial source categories that are the subject of this proposal. Table 1 is not intended to be exhaustive, but rather provides a guide for readers regarding the entities that this proposed action is likely to affect. The proposed standards, once promulgated, will be directly applicable to the affected sources. Federal, state, local, and tribal government entities could be affected by this proposed action because these entities are often the owners or operators of MSW landfills. As defined in the *Initial List of Categories of Sources Under Section 112(c)(1) of the Clean Air Act Amendments of 1990* (see 57 FR 31576, July 16, 1992) and *Documentation for Developing the Initial Source Category List, Final Report* (see EPA–450/3–91–030, July 1992), the MSW Landfills source category is any facility that is an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive commercial waste, sludges, and industrial waste. An MSW landfill may also receive other types of Resource Conservation and Recovery Act (RCRA) Subtitle D wastes (see 40 CFR 257.2) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned.

TABLE 1—NESHAP AND INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS PROPOSED ACTION

Source category	NESHAP	NAICS code [1]
Industry: Air and water resource and solid waste management	MSW Landfills	924110
Industry: Refuse systems—solid waste landfills		562212
State, local, and tribal government agencies		562212, 924110

[1] North American Industry Classification System.

B. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this action is available on the internet. Following signature by the EPA Administrator, the EPA will post a copy of this proposed action at *https://www.epa.gov/stationary-sources-air-pollution/municipal-solid-waste-landfills-national-emission-standards.* Following publication in the **Federal Register**, the EPA will post the **Federal Register** version of the proposal and key technical documents at this same website. Information on the overall RTR program is available at *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html.*

A redline version of the regulatory language that incorporates the proposed changes in this action is available in the docket for this action (Docket ID No. EPA–HQ–OAR–2002–0047).

II. Background

A. What is the statutory authority for this action?

The statutory authority for revisions to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) is provided by sections 112 and 301 of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 *et seq.*). Section 112 of the CAA establishes a two-stage regulatory process to develop standards for emissions of hazardous air pollutants (HAP) from stationary sources. Generally, the first stage involves establishing technology-based standards and the second stage involves evaluating those standards that are based on maximum achievable control technology (MACT) to determine whether additional standards are needed to address any remaining risk associated with HAP emissions. This second stage is commonly referred to as the ''residual risk review.'' In addition to the residual risk review, the CAA also requires the EPA to review standards set under CAA section 112 every 8 years to determine if there are ''developments in practices, processes, and control technologies'' that may be appropriate to incorporate into the standards. CAA section 112(d)(6). This review is commonly referred to as the ''technology review.'' When the two reviews are combined into a single rulemaking, it is commonly referred to as the ''risk and technology review.'' The discussion that follows identifies the most relevant statutory sections and briefly explains the contours of the methodology used to implement these

statutory requirements. A more comprehensive discussion appears in the document titled *CAA Section 112 Risk and Technology Reviews: Statutory Authority and Methodology,* in the docket for this rulemaking.

In the first stage of the CAA section 112 standard setting process, the EPA promulgates technology-based standards under CAA section 112(d) for categories of sources identified as emitting one or more of the HAP listed in CAA section 112(b). Sources of HAP emissions are either major sources or area sources, and CAA section 112 establishes different requirements for major source standards and area source standards. ''Major sources'' are those that emit or have the potential to emit 10 tons per year (tpy) or more of a single HAP or 25 tpy or more of any combination of HAP. All other sources are ''area sources.'' For major sources, CAA section 112(d)(2) provides that the technology-based NESHAP must reflect the maximum degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). These standards are commonly referred to as MACT standards. CAA section 112(d)(3) also establishes a minimum control level for MACT standards, known as the MACT ''floor.'' The EPA must also consider control options that are more stringent than the floor. Standards more stringent than the floor are commonly referred to as beyond-the-floor standards. In certain instances, as provided in CAA section 112(h), the EPA may set work practice standards where it is not feasible to prescribe or enforce a numerical emission standard. For area sources, CAA section 112(d)(5) gives the EPA discretion to set standards based on generally available control technologies or management practices (GACT standards) in lieu of MACT standards.

The second stage in standard-setting focuses on identifying and addressing any remaining (*i.e.,* ''residual'') risk according to CAA section 112(f). For source categories subject to MACT standards, section 112(f)(2) of the CAA requires the EPA to determine whether promulgation of additional standards is needed to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect. Section 112(d)(5) of the CAA provides that this residual risk review is not required for categories of area sources subject to GACT standards. Section 112(f)(2)(B) of the CAA further expressly preserves the EPA's use of the two-step approach for developing standards to address any residual risk and the Agency's interpretation of ''ample margin of safety'' developed in the *National Emissions Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants* (Benzene NESHAP) (54 FR 38044, September 14, 1989). The EPA notified Congress in the Risk Report that the Agency intended to use the Benzene NESHAP approach in making CAA section 112(f) residual risk determinations (EPA–453/R–99–001, p. ES–11). The EPA subsequently adopted this approach in its residual risk determinations and the United States Court of Appeals for the District of Columbia Circuit (the Court) upheld the EPA's interpretation that CAA section 112(f)(2) incorporates the approach established in the Benzene NESHAP. See *National Resources Defense Council (NRDC)* v. *EPA,* 529 F.3d 1077, 1082–1083 (D.C. Cir. 2008).

The approach incorporated into the CAA and used by the EPA to evaluate residual risk and to develop standards under CAA section 112(f)(2) is a two-step approach. In the first step, the EPA determines whether risks are acceptable. This determination ''considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual lifetime [cancer] risk (MIR) [1] of approximately 1 in 10 thousand.'' 54 FR 38045, September 14, 1989. If risks are unacceptable, the EPA must determine the emissions standards necessary to reduce risk to an acceptable level without considering costs. In the second step of the approach, the EPA considers whether the emissions standards provide an ample margin of safety to protect public health ''in consideration of all health information, including the number of persons at risk levels higher than approximately 1 in 1 million, as well as other relevant factors, including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision.'' *Id.* The EPA must promulgate emission standards necessary to provide an ample margin of safety to protect public health. After conducting the ample margin of safety analysis, we consider whether a more stringent standard is necessary to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

[1] Although defined as ''maximum individual risk,'' MIR refers only to cancer risk. MIR, one metric for assessing cancer risk, is the estimated risk if an individual were exposed to the maximum level of a pollutant for a lifetime.

CAA section 112(d)(6) separately requires the EPA to review standards promulgated under CAA section 112 and revise them ''as necessary (taking into account developments in practices, processes, and control technologies)'' no less often than every 8 years. In conducting this review, which we call the ''technology review,'' the EPA is not required to recalculate the MACT floor. *Natural Resources Defense Council (NRDC)* v. *EPA,* 529 F.3d 1077, 1084 (D.C. Cir. 2008). *Association of Battery Recyclers, Inc.* v. *EPA,* 716 F.3d 667, 673–674 (D.C. Cir. 2013). The EPA may consider cost in deciding whether to revise the standards pursuant to CAA section 112(d)(6).

The EPA is proposing amendments to the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpaft Cf) under the authority of CAA sections 111(b) and 111(d). In 1991, under authority of section 111(b)(1)(A) of the CAA, the EPA added the source category MSW Landfills to the priority list in 40 CFR 60.16 because, in the judgment of the Administrator, the source category contributes significantly to air pollution which may reasonably be anticipated to endanger public health and welfare (56 FR 24468, May 30, 1991). In that same action (56 FR 24468), the EPA proposed NSPS for new MSW landfills under section 111(b) of the CAA and proposed EG for existing MSW landfills under section 111(d) of the CAA.

B. What is this source category and how does the current NESHAP regulate its HAP emissions?

The NESHAP for the MSW Landfills source category, the National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills (herein after referred to as the ''MSW Landfills NESHAP''), was promulgated on January 16, 2003 (68 FR 2227), and is codified at 40 CFR part 63, subpart AAAA. As promulgated in 2003 and further amended on April 20, 2006 (71 FR 20462), the MSW Landfills NESHAP regulates HAP emissions from MSW landfills that are either major and area sources.

The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) applies to MSW landfills that have accepted waste since November 8, 1987, or have additional capacity for waste deposition and are major sources, are collocated with major sources, or are area source landfills with a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and have estimated uncontrolled emissions equal to or greater than 50 Mg/yr non-methane organic compounds (NMOC). The MSW

Landfills NESHAP (40 CFR part 63, subpart AAAA) also applies to MSW landfills that have accepted waste since November 8, 1987, and include a bioreactor and are major sources, are collocated with major sources, or are area source landfills with a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 that were not permanently closed as of January 16, 2003.

The majority of emissions of HAP at MSW landfills come from the continuous biodegradation of the MSW in the landfill and the formation of landfill gas emissions. Landfill gas emissions contain methane, carbon dioxide, and more than 100 different NMOC. The HAP emitted by MSW landfills include, but are not limited to, vinyl chloride, ethyl benzene, toluene, and benzene (61 FR 9906, March 12, 1996). The owner or operator of a landfill may control the gas by routing it to a non-enclosed flare, an enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use.

The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) regulates HAP emissions by requiring MSW landfills that exceed the size and emission thresholds to install and operate a landfill gas collection and control system (GCCS), as enumerated in the original NSPS for MSW landfills (40 CFR part 60, subpart WWW), the Federal Plan (40 CFR part 62, subpart GGG), or an EPA-approved state plan or tribal plan that implements the EG (40 CFR part 60, subpart Cc). The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) achieves emission reductions through a well-designed and well-operated landfill gas (LFG) collection and control system with a control device capable of reducing NMOC by 98 percent by weight. NMOC is a surrogate for LFG. The GCCS must be installed within 30 months after an MSW landfill that exceeds the design capacity threshold (2.5 million Mg and 2.5 million m^3) reaches or exceeds an NMOC level of 50 Mg/yr. The landfill must expand the system to collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade. The collection and control system may be capped or removed when the landfill is closed, the system has operated 15 years, and NMOC emissions are below 50 Mg/yr.

In addition, the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) requires timely control of bioreactors. A bioreactor is an MSW landfill or portion of the landfill where any liquid other than leachate is added to the waste mass to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the biodegradation of the waste. New bioreactors must install the GCCS in the bioreactor prior to initiating liquids addition, regardless of whether the landfill emissions rate equals or exceeds the estimated uncontrolled emissions rate; existing bioreactors must install the GCCS before initiating liquids addition and must begin operating the GCCS within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later.

Based on modeled emission estimates in the 2016 NSPS/EG datasets, and supplementary searching of the Greenhouse Gas Reporting Program (GHGRP) data, located in 40 CFR part 98, subpart HH, the EPA Landfill Methane Outreach Program (LMOP) Landfill and LFG Energy Project Database, and selected permits, as of 2014, there were between 664 and 709 MSW landfills subject to the collection and control requirements of the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). The exact list of facilities subject to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) is unknown because many landfills collect site-specific data for NMOC concentrations using the Tier 2 provisions allowed under the regulation to compute the NMOC annual emission rates. A list of facilities that were expected to be subject to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) based on modeled emissions and a default NMOC concentration of 595 parts per million by volume (ppmv) is available in the RTR dataset.[2] It is estimated that these landfills emit between 2,242 and 4,586 Mg/yr of HAP, after considering current control requirements. Most of these emissions are fugitive emissions.

C. What data collection activities were conducted to support this action?

The EPA did not gather a substantial amount of new data for this RTR proposal because data were recently gathered and compiled to support the 2016 NSPS/EG rulemaking (see 81 FR 59332 and 81 FR 59276, August 29, 2016). These regulations are codified at 40 CFR part 60, subpart XXX (NSPS) and 40 CFR part 60, subpart Cf (EG) and are hereinafter referred to as the ''MSW Landfills NSPS'' and ''MSW landfills EG.'' However, the EPA did focus additional data collection efforts in three main areas.

First, the EPA analyzed locations of the landfills, flares, and any engines, turbines or other destruction devices for the approximately 700 affected facilities by utilizing Google Maps©. Because the database for the MSW Landfills NSPS (40 CFR part 60, subpart XXX) contained only a single coordinate for each facility, every landfill was visually inspected on Google Maps© to ensure the correct location for each emission point. Additionally, some coordinates in the MSW Landfills NSPS (40 CFR part 60, subpart XXX) were for an office or headquarters away from the actual landfill location, so state records or permits were gathered to assist narrowing down the true location of these sources.

Second, the EPA visited four landfills in September 2018. These landfills were the Waste Management Dallas Fort-Worth (DFW) Landfill in Lewisville, Texas; the 121 Regional Disposal Facility and renewable natural gas production plant in Melissa, Texas; the City of Grand Prairie Landfill in Grand Prairie, Texas; and the Hunter Ferrell Landfill in Irving, Texas. The EPA discussed materials handling, materials/waste screening and separation, basic overview of waste acceptance history and general size, the use of liquids addition or leachate recirculation at the landfill, and design and operation of landfill GCCS components, including energy recovery devices and monitoring procedures to ensure a well-operated and well-controlled LFG GCCS. At the DFW Landfill, the EPA observed a quarterly surface emission monitoring event. The site visits are documented in separate reports that are available in the docket for this action: Site Visit Report—DFW Landfill, Lewisville, Texas; Site Visit Report—121 Landfill, Melissa, Texas; Site Visit Report—City of Grand Prairie Landfill, Grand Prairie, Texas; and Site Visit Report—Hunter Ferrell Landfill, Irving, Texas.

Third, emission factors were calculated for conventional landfills using data that were initially used for the 2008 Compilation of Air Pollutant Emission Factors (AP–42) draft emission factors for this source category in addition to data submitted in response of this draft.[3] Although thesse data are not ''new,'' these data came after the

[2] *MSW Landfills NESHAP RTR Draft Emissions Modeling File.* May 2018. Available at: *https://www.epa.gov/stationary-sources-air-pollution/municipal-solid-waste-landfills-national-emission-standards.*

[3] U.S. EPA. AP42, Fifth Edition, Volume I Chapter 2.4: *Municipal Solid Waste Landfills Draft Section.* October 2008. Available at: *https://www3.epa.gov/ttn/chief/ap42/ch02/index.html.*

original promulgation of the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). These emission factors were applied to estimated landfill gas flow rates to estimate the HAP emissions from landfills for the risk analysis. Further detail on the emission factor devleopment can be found in the document, *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the 2019 Risk and Technology Review Proposed Rule, located* in EPA–HQ–OAR–2002–0047.

Finally, we are coordinating with the EPA Office of Land and Emergency Management on relevant data received on the Advanced Notice of Proposed Rulemaking (ANPRM), Revisions to the Criteria for Municipal Solid Waste Landfills To Address Advances in Liquids Management (83 FR 66210; December 26, 2018). Specifically, this notice describes the NESHAP definition for bioreactor landfill units, but indicates the EPA is contemplating future revisions that could define a bioreactor landfill as including other factors such as whether liquids are added intentionally for any purpose other than cleaning, maintenance, and wetting of daily cover; the average amount of annual precipitation in an area; whether leachate is recirculated; and the magnitude of the first-order biodegradation constant (k), or unintentially (*i.e.,* from extreme weather events). Relatedly, the ANPRM distinguishes between bioreactor landfill units to which liquids are purposefully added and ''wet landfill units,'' which are MSW landfills operating at high levels of moisture content. Readers are directed to that docket (EPA–HQ–OAR–2002–0047) to review the data and information solicited and received in response to the ANPRM, which will inform the EPA in making determinations concerning what actions, if any, to take when undertaking future revisions to MSW landfill related provisions.

D. What other relevant background information and data are available?

The EPA used data and information from the 2016 NSPS/EG MSW Landfill rulemaking databases, the GHGRP (40 CFR part 98, subpart HH), and the EPA LMOP Landfill and LFG Energy Project Database to support this proposed rulemaking. We used these data to develop the modeling file for the risk review. The EPA used these same sources as well as additional information regarding the timing of GCCS installations and expansions and the types of LFG control devices installed at landfills from selected permits, state regulations, Federal regulations affecting landfills other than the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), consent decrees for MSW landfills, and Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse, and literature sources, to identify additional control technologies for the technology review. The EPA also reviewed the Applicability Determination Index (ADI),[4] consent decrees, and data available from EPA Regions related to requests for corrective action and higher operating values for wellheads. See sections IV.A, IV.B, IV.C, and IV.E of this preamble for further detail on the use of these sources of information.

III. Analytical Procedures and Decision-Making

In this section, we describe the analyses performed to support the proposed decisions for the RTR and other issues addressed in this proposal.

A. How do we consider risk in our decision-making?

As discussed in section II.A of this preamble and in the Benzene NESHAP, in evaluating and developing standards under CAA section 112(f)(2), we apply a two-step approach to determine whether or not risks are acceptable and to determine if the standards provide an ample margin of safety to protect public health. As explained in the Benzene NESHAP, ''the first step judgment on acceptability cannot be reduced to any single factor'' and, thus, ''[t]he Administrator believes that the acceptability of risk under section 112 is best judged on the basis of a broad set of health risk measures and information.'' 54 FR 38046, September 14, 1989. Similarly, with regard to the ample margin of safety determination, ''the Agency again considers all of the health risk and other health information considered in the first step. Beyond that information, additional factors relating to the appropriate level of control will also be considered, including cost and economic impacts of controls, technological feasibility, uncertainties, and any other relevant factors.'' *Id.*

The Benzene NESHAP approach provides flexibility regarding factors the EPA may consider in making determinations and how the EPA may weigh those factors for each source category. The EPA conducts a risk assessment that provides estimates of the MIR posed by the HAP emissions from each source in the source category, the hazard index (HI) for chronic exposures to HAP with the potential to cause noncancer health effects, and the hazard quotient (HQ) for acute exposures to HAP with the potential to cause noncancer health effects.[5] The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect. The scope of the EPA's risk analysis is consistent with the EPA's response to comments on our policy under the Benzene NESHAP where the EPA explained:

> [t]he policy chosen by the Administrator permits consideration of multiple measures of health risk. Not only can the MIR figure be considered, but also incidence, the presence of noncancer health effects, and the uncertainties of the risk estimates. In this way, the effect on the most exposed individuals can be reviewed as well as the impact on the general public. These factors can then be weighed in each individual case. This approach complies with the *Vinyl Chloride* mandate that the Administrator ascertain an acceptable level of risk to the public by employing his expertise to assess available data. It also complies with the Congressional intent behind the CAA, which did not exclude the use of any particular measure of public health risk from the EPA's consideration with respect to CAA section 112 regulations, and thereby implicitly permits consideration of any and all measures of health risk which the Administrator, in his judgment, believes are appropriate to determining what will 'protect the public health'.

See 54 FR 38044, 38057, September 14, 1989. Thus, the level of the MIR is only one factor to be weighed in determining acceptability of risk. The Benzene NESHAP explained that a ''MIR of approximately 1 in 10 thousand should ordinarily be the upper end of the range of acceptability. As risks increase above this benchmark, they become presumptively less acceptable under CAA section 112, and would be weighed with the other health risk measures and information in making an overall judgment on acceptability. Or, the Agency may find, in a particular case, that a risk that includes [a]MIR less than the presumptively acceptable level is unacceptable in the light of other health risk factors.'' *Id.* at 38045. Similarly, with regard to the ample margin of safety analysis, the EPA stated in the Benzene NESHAP that: ''EPA believes the relative weight of the many

[4] U.S. EPA. ADI. *https://cfpub.epa.gov/adi/.*

[5] The MIR is defined as the cancer risk associated with a lifetime of exposure at the highest concentration of HAP where people are likely to live. The HQ is the ratio of the potential HAP exposure concentration to the noncancer dose-response value; the HI is the sum of HQs for HAP that affect the same target organ or organ system.

factors that can be considered in selecting an ample margin of safety can only be determined for each specific source category. This occurs mainly because technological and economic factors (along with the health-related factors) vary from source category to source category.'' *Id.* at 38061. We also consider the uncertainties associated with the various risk analyses, as discussed earlier in this preamble, in our determinations of acceptability and ample margin of safety.

The EPA notes that it has not considered certain health information to date in making residual risk determinations. At this time, we do not attempt to quantify the HAP risk that may be associated with emissions from other facilities that do not include the source category under review, mobile source emissions, natural source emissions, persistent environmental pollution, or atmospheric transformation in the vicinity of the sources in the category.

The EPA understands the potential importance of considering an individual's total exposure to HAP in addition to considering exposure to HAP emissions from the source category and facility. We recognize that such consideration may be particularly important when assessing noncancer risk, where pollutant-specific exposure health reference levels (*e.g.,* reference concentrations (RfCs)) are based on the assumption that thresholds exist for adverse health effects. For example, the EPA recognizes that, although exposures attributable to emissions from a source category or facility alone may not indicate the potential for increased risk of adverse noncancer health effects in a population, the exposures resulting from emissions from the facility in combination with emissions from all of the other sources (*e.g.,* other facilities) to which an individual is exposed may be sufficient to result in an increased risk of adverse noncancer health effects. In May 2010, the Science Advisory Board (SAB) advised the EPA ''that RTR assessments will be most useful to decision makers and communities if results are presented in the broader context of aggregate and cumulative risks, including background concentrations and contributions from other sources in the area.'' [6]

In response to the SAB recommendations, the EPA incorporates cumulative risk analyses into its RTR risk assessments, including those reflected in this proposal. The Agency: (1) Conducts facility-wide assessments, which include source category emission points, as well as other emission points within the facilities; (2) combines exposures from multiple sources in the same category that could affect the same individuals; and (3) for some persistent and bioaccumulative pollutants, analyzes the ingestion route of exposure. In addition, the RTR risk assessments consider aggregate cancer risk from all carcinogens and aggregated noncancer HQs for all noncarcinogens affecting the same target organ or target organ system.

Although we are interested in placing source category and facility-wide HAP risk in the context of total HAP risk from all sources combined in the vicinity of each source, we are concerned about the uncertainties of doing so. Estimates of total HAP risk from emission sources other than those that we have studied in depth during this RTR review would have significantly greater associated uncertainties than the source category or facility-wide estimates. Such aggregate or cumulative assessments would compound those uncertainties, making the assessments too unreliable.

B. How do we perform the technology review?

Our technology review focuses on the identification and evaluation of developments in practices, processes, and control technologies that have occurred since the MACT standards were promulgated. Where we identify such developments, we analyze their technical feasibility, estimated costs, energy implications, and non-air environmental impacts. We also consider the emission reductions associated with applying each development. This analysis informs our decision of whether it is ''necessary'' to revise the emissions standards. In addition, we consider the appropriateness of applying controls to new sources versus retrofitting existing sources. For this exercise, we consider any of the following to be a ''development'':

- Any add-on control technology or other equipment that was not identified and considered during development of the original MACT standards;
- Any improvements in add-on control technology or other equipment (that were identified and considered during development of the original MACT standards) that could result in additional emissions reduction;
- Any work practice or operational procedure that was not identified or considered during development of the original MACT standards;
- Any process change or pollution prevention alternative that could be broadly applied to the industry and that was not identified or considered during development of the original MACT standards; and
- Any significant changes in the cost (including cost effectiveness) of applying controls (including controls the EPA considered during the development of the original MACT standards).

In addition to reviewing the practices, processes, and control technologies that were considered at the time we originally developed the NESHAP, we review a variety of data sources in our investigation of potential practices, processes, or controls to consider. See sections II.C and II.D of this preamble for information on the specific data sources that were reviewed as part of the technology review.

C. How do we estimate post-MACT risk posed by the source category?

In this section, we provide a complete description of the types of analyses that we generally perform during the risk assessment process. In some cases, we do not perform a specific analysis because it is not relevant. For example, in the absence of emissions of HAP known to be persistent and bioaccumulative in the environment (PB–HAP), we would not perform a multipathway exposure assessment. Where we do not perform an analysis, we state that we do not and provide the reason. While we present all of our risk assessment methods, we only present risk assessment results for the analyses actually conducted (see section IV.B of this preamble).

The EPA conducts a risk assessment that provides estimates of the MIR for cancer posed by the HAP emissions from each source in the source category, the HI for chronic exposures to HAP with the potential to cause noncancer health effects, and the HQ for acute exposures to HAP with the potential to cause noncancer health effects. The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect. The eight sections that follow this paragraph describe how we estimated emissions and conducted the risk assessment. The docket for this rulemaking contains the following document which provides more information on the risk assessment inputs and models: *Residual Risk Assessment for the MSW Landfills Source Category in Support of the 2019*

[6] Recommendations of the SAB Risk and Technology Review (RTR) Panel are provided in their report, which is available at: *https://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf.*

Risk and Technology Review Proposed Rule. The methods used to assess risk (as described in the eight primary steps below) are consistent with those described by the EPA in the document reviewed by a panel of the EPA's SAB in 2009;[7] and described in the SAB review report issued in 2010. They are also consistent with the key recommendations contained in that report.

1. How did we estimate actual emissions and identify the emissions release characteristics?

The initial list of facilities was based on the 2016 NSPS/EG database by selecting landfills that had an annual NMOC emission rate of 50 Mg/yr or greater in 2014. This faciliy list was then examined one-by-one using Google Earth to verify the boundaries of the landfill itself, as well as stack locations for any flare or control devices. Total flow rate of landfill gas was estimated utilizing the same method as the 2016 NSPS/EG, described below.

The EPA created a Microsoft® Access database of landfills for the 2016 NSPS and EG rules. Additional detail about the database can be found in the docketed memorandum, *Summary of Updated Landfill Dataset Used in the Cost and Emission Reduction Analysis of Landfills Regulations, 2016.* Within the database, we programmed a series of calculations in the database (hereinafter referred to as the ''model'') to estimate LFG flow rates using a first-order decay equation and the associated cost and emission reduction impacts for each landfill expected to control emissions by the NSPS and EG regulations in a particular year. The model estimated flow rates using default parameters from AP–42[8] for NMOC, methane generation potential (L_0), and the methane generation rate (k). A detailed discussion of the methodology, modeling parameters, and equations used to estimate the LFG flow rate are available in the docketed memorandum, *Revised Methodology for Estimating Cost and Emission Impacts of MSW Landfill Regulations,* 2016.

Total collected landfill gas was estimated using available information including the calculated LFG flow rate described above. Total collected landfill gas was estimated by using the maximum value of landfill gas reported as collected in GHGRP for 2014, LMOP reported collected gas where GHGRP collection in 2014 was not provided, LMOP reported flow rate to projects or 85 percent of the 2016 NSPS and EG database's total flow rate. In cases where the total collected landfill gas estimation exceeded the modeled total flow rate of landfill gas, total landfill gas flow rate was back-calculated using GHGRP's estimated gas collection efficiency (or 85 percent when not available). Fugitive landfill emissions were calculated by subtracting the total collected landfill gas estimation from the total landfill gas flow rate, whether it was modeled or back-calculated. Landfill gas flow to engines was used for instances that LMOP had reported landfill gas flow to projects. We assumed that all LMOP projects were engines with 98-percent destruction efficiency for this modeling effort. We also assumed any additional collected landfill gas estimation beyond what LMOP listed as flow to a project went to a flare with 86-percent destruction efficiency. Stack parameters were not available for the source category, therefore, default parameters were developed using RTR default values developed by the EPA based on Source Classification Code (SCC) and assigned accordingly. Once we calculated all landfill gas emissions and estimated the amount of landfill gas flow to engines and flares, we applied emission factors to estimate HAP emissions from these sources.

To estimate HAP using a factor applied to landfill gas collection or generation estimates, we determined the appropriate basis of the factor. Although the 1998 Final AP–42 is commonly used to calculate emissions in inventories, the 1998 Final AP–42 is outdated and has very few HAP emission factors. The 1998 Final AP–42 has factors for 47 different compounds, 23 of which are HAP. In 2008, the EPA drafted AP–42 emission factors for this source category. The 2008 proposed factors were based on 47 test reports containing speciated organic and reduced sulfur compound data that could be corrected for air infiltration. This draft had emission factors for 173 compounds. In response to this draft, the EPA received public comments and additional data on the proposed AP–42 emission factor updates. This included 446 new test reports, of which 242 were unique complete test reports. 116 unique landfills were represented in the new data. Overall, including the original data and additional data submissions, test reports were available for landfills in 37 different states. This complete dataset (the data used to calculate the 2008 Draft AP–42 plus the new test reports) was used to calculate HAP emission factors for use in the RTR for the MSW Landfills NESHAP.

These data were analyzed for errors and the concentrations were corrected for air infiltration, in the same fashion the 2008 data were quality controlled. These two datasets were combined with the 2008 dataset. All non-detect data were removed. Then to remove outliers, data points that were two standard deviations above or below the mean of each HAP were removed. Each HAP's data were then averaged to develop the emission factor. The docket for this rulemaking contains the following document, which provides more information on the emission factor development as well as the emission estimation calculations: *Residual Risk Modeling File Documentation for the Municipal Solid Waste Landfills Source Category.*

2. How did we estimate MACT-allowable emissions?

The available emissions data in the RTR emissions dataset include estimates of the mass of HAP emitted during a specified annual time period. These ''actual'' emission levels are often lower than the emission levels allowed under the requirements of the current MACT standards. The emissions allowed under the MACT standards are referred to as the ''MACT-allowable'' emissions. We discussed the consideration of both MACT-allowable and actual emissions in the final Coke Oven Batteries RTR (70 FR 19998–19999, April 15, 2005) and in the proposed and final Hazardous Organic NESHAP RTR (71 FR 34428, June 14, 2006, and 71 FR 76609, December 21, 2006, respectively). In those actions, we noted that assessing the risk at the MACT-allowable level is inherently reasonable since that risk reflects the maximum level facilities could emit and still comply with national emission standards. We also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP approach. (54 FR 38044, September 14, 1989.)

Because the requirements under the NESHAP are for all landfills that exceed the NMOC threshold to install a gas collection and control system, allowable emissions were equal to the calculated actual emissions, therefore, the allowable multiplier is 1. Because the landfill owner or operator is required to operate the GCCS at all times, there is

[7] U.S. EPA. *Risk and Technology Review (RTR) Risk Assessment Methodologies: For Review by the EPA's Science Advisory Board with Case Studies—MACT I Petroleum Refining Sources and Portland Cement Manufacturing,* June 2009. EPA–452/R–09–006. *https://www3.epa.gov/airtoxics/rrisk/rtrpg.html.*

[8] U.S. EPA, AP–42, Fifth Edition, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.* 1995. *http://www.epa.gov/ttnchie1/ap42/.*

no differentiation between actual and allowable emissions.

3. How do we conduct dispersion modeling, determine inhalation exposures, and estimate individual and population inhalation risk?

Both long-term and short-term inhalation exposure concentrations and health risk from the source category addressed in this proposal were estimated using the Human Exposure Model (HEM–3).[9] The HEM–3 performs three primary risk assessment activities: (1) Conducting dispersion modeling to estimate the concentrations of HAP in ambient air, (2) estimating long-term and short-term inhalation exposures to individuals residing within 50 kilometers (km) of the modeled sources, and (3) estimating individual and population-level inhalation risk using the exposure estimates and quantitative dose-response information.

a. Dispersion Modeling

The air dispersion model AERMOD, used by the HEM–3 model, is one of the EPA's preferred models for assessing air pollutant concentrations from industrial facilities.[10] To perform the dispersion modeling and to develop the preliminary risk estimates, HEM–3 draws on three data libraries. The first is a library of meteorological data, which is used for dispersion calculations. This library includes 1 year (2016) of hourly surface and upper air observations from 824 meteorological stations, selected to provide coverage of the United States and Puerto Rico. A second library of United States Census Bureau census block [11] internal point locations and populations provides the basis of human exposure calculations (U.S. Census, 2010). In addition, for each census block, the census library includes the elevation and controlling hill height, which are also used in dispersion calculations. A third library of pollutant-specific dose-response values is used to estimate health risk. These are discussed below.

b. Risk From Chronic Exposure to HAP

In developing the risk assessment for chronic exposures, we use the estimated annual average ambient air concentrations of each HAP emitted by each source in the source category. The HAP air concentrations at each nearby census block centroid located within 50 km of the facility are a surrogate for the chronic inhalation exposure concentration for all the people who reside in that census block. A distance of 50 km is consistent with both the analysis supporting the 1989 Benzene NESHAP (54 FR 38044, September 14, 1989) and the limitations of Gaussian dispersion models, including AERMOD.

For each facility, we calculate the MIR as the cancer risk associated with a continuous lifetime (24 hours per day, 7 days per week, 52 weeks per year, 70 years) exposure to the maximum concentration at the centroid of each inhabited census block. We calculate individual cancer risk by multiplying the estimated lifetime exposure to the ambient concentration of each HAP (in micrograms per cubic meter ($\mu g/m^3$)) by its unit risk estimate (URE). The URE is an upper-bound estimate of an individual's incremental risk of contracting cancer over a lifetime of exposure to a concentration of 1 microgram of the pollutant per cubic meter of air. For residual risk assessments, we generally use UREs from the EPA's Integrated Risk Information System (IRIS). For carcinogenic pollutants without IRIS values, we look to other reputable sources of cancer dose-response values, often using California EPA (CalEPA) UREs, where available. In cases where new, scientifically credible dose-response values have been developed in a manner consistent with the EPA guidelines and have undergone a peer review process similar to that used by the EPA, we may use such dose-response values in place of, or in addition to, other values, if appropriate. The pollutant-specific dose-response values used to estimate health risk are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants.*

To estimate individual lifetime cancer risks associated with exposure to HAP emissions from each facility in the source category, we sum the risks for each of the carcinogenic HAP [12] emitted by the modeled facility. We estimate cancer risk at every census block within 50 km of every facility in the source category. The MIR is the highest individual lifetime cancer risk estimated for any of those census blocks. In addition to calculating the MIR, we estimate the distribution of individual cancer risks for the source category by summing the number of individuals within 50 km of the sources whose estimated risk falls within a specified risk range. We also estimate annual cancer incidence by multiplying the estimated lifetime cancer risk at each census block by the number of people residing in that block, summing results for all of the census blocks, and then dividing this result by a 70-year lifetime.

To assess the risk of noncancer health effects from chronic exposure to HAP, we calculate either an HQ or a target organ-specific hazard index (TOSHI). We calculate an HQ when a single noncancer HAP is emitted. Where more than one noncancer HAP is emitted, we sum the HQ for each of the HAP that affects a common target organ or target organ system to obtain a TOSHI. The HQ is the estimated exposure divided by the chronic noncancer dose-response value, which is a value selected from one of several sources. The preferred chronic noncancer dose-response value is the EPA RfC, defined as ''an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.'' *(https://iaspub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&vocabName=IRIS%20Glossary).* In cases where an RfC from the EPA's IRIS is not available or where the EPA determines that using a value other than the RfC is appropriate, the chronic noncancer dose-response value can be a value from the following prioritized sources, which define their dose-response values similarly to the EPA: (1) The Agency for Toxic

[9] For more information about HEM–3, go to *https://www.epa.gov/fera/risk-assessment-and-modeling-human-exposure-model-hem.*

[10] U.S. EPA. Revision to the Guideline on Air Quality Models: *Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions* (70 FR 68218, November 9, 2005).

[11] A census block is the smallest geographic area for which census statistics are tabulated.

[12] The EPA's 2005 *Guidelines for Carcinogen Risk Assessment* classifies carcinogens as: ''carcinogenic to humans,'' ''likely to be carcinogenic to humans,'' and ''suggestive evidence of carcinogenic potential.'' These classifications also coincide with the terms ''known carcinogen, probable carcinogen, and possible carcinogen,'' respectively, which are the terms advocated in the EPA's *Guidelines for Carcinogen Risk Assessment,* published in 1986 (51 FR 33992, September 24, 1986). In August 2000, the document, *Supplemental Guidance for Conducting Health Risk Assessment of Chemical Mixtures* (EPA/630/R–00/002), was published as a supplement to the 1986 document. Copies of both documents can be obtained from *https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=20533&CFID=70315376&CFTOKEN=71597944.* Summing the risk of these individual compounds to obtain the cumulative cancer risk is an approach that was recommended by the EPA's SAB in their 2002 peer review of the EPA's National Air Toxics Assessment (NATA) titled *NATA—Evaluating the National-scale Air Toxics Assessment 1996 Data*—an SAB Advisory, available at *https://yosemite.epa.gov/sab/sabproduct.nsf/214C6E915BB04E14852570CA007A682C/$File/ecadv02001.pdf.*

Substances and Disease Registry (ATSDR) Minimum Risk Level *(https://www.atsdr.cdc.gov/mrls/index.asp);* (2) the CalEPA Chronic Reference Exposure Level (REL) *(https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0);* or (3), as noted above, a scientifically credible dose-response value that has been developed in a manner consistent with the EPA guidelines and has undergone a peer review process similar to that used by the EPA. The pollutant-specific dose-response values used to estimate health risks are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants.*

c. Risk From Acute Exposure to HAP That May Cause Health Effects Other Than Cancer

For each HAP for which appropriate acute inhalation dose-response values are available, the EPA also assesses the potential health risks due to acute exposure. For these assessments, the EPA makes conservative assumptions about emission rates, meteorology, and exposure location. In this proposed rulemaking, as part of our efforts to continually improve our methodologies to evaluate the risks that HAP emitted from categories of industrial sources pose to human health and the environment,[13] we are revising our treatment of meteorological data to use reasonable worst-case air dispersion conditions in our acute risk screening assessments instead of worst-case air dispersion conditions. This revised treatment of meteorological data and the supporting rationale are described in more detail in *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the 2019 Risk and Technology Review Proposed Rule* and in Appendix 5 of the report: *Technical Support Document for Acute Risk Screening Assessment.* We will be applying this revision in RTR rulemakings proposed on or after June 3, 2019.

To assess the potential acute risk to the maximally exposed individual, we use the peak hourly emission rate for each emission point,[14] reasonable worst-case dispersion conditions (*i.e.,* 99th percentile), and the point of highest off-site exposure. Specifically, we assume that peak emissions from the source category and reasonable worst-case air dispersion conditions co-occur and that a person is present at the point of maximum exposure.

To characterize the potential health risks associated with estimated acute inhalation exposures to a HAP, we generally use multiple acute dose-response values, including acute RELs, acute exposure guideline levels (AEGLs), and emergency response planning guidelines (ERPG) for 1-hour exposure durations, if available, to calculate acute HQs. The acute HQ is calculated by dividing the estimated acute exposure concentration by the acute dose-response value. For each HAP for which acute dose-response values are available, the EPA calculates acute HQs.

An acute REL is defined as ''the concentration level at or below which no adverse health effects are anticipated for a specified exposure duration.'' [15] Acute RELs are based on the most sensitive, relevant, adverse health effect reported in the peer-reviewed medical and toxicological literature. They are designed to protect the most sensitive individuals in the population through the inclusion of margins of safety. Because margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours.[16] They are guideline levels for ''once-in-a-lifetime, short-term exposures to airborne concentrations of acutely toxic, high-priority chemicals.'' *Id.* at 21. The AEGL–1 is specifically defined as ''the airborne concentration (expressed as ppm (parts per million) or mg/m^3 (milligrams per cubic meter)) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.'' The document also notes that ''Airborne concentrations below AEGL–1 represent exposure levels that can produce mild and progressively increasing but transient and nondisabling odor, taste, and sensory irritation or certain asymptomatic, nonsensory effects.'' *Id.* AEGL–2 are defined as ''the airborne concentration (expressed as parts per million or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.'' *Id.*

ERPGs are ''developed for emergency planning and are intended as health-based guideline concentrations for single exposures to chemicals.'' [17] *Id.* at 1. The ERPG–1 is defined as ''the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or without perceiving a clearly defined, objectionable odor.'' *Id.* at 2. Similarly, the ERPG–2 is defined as ''the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.'' *Id.* at 1.

[13] See, *e.g.,* U.S. EPA. *Screening Methodologies to Support Risk and Technology Reviews (RTR): A Case Study Analysis* (Draft Report, May 2017. *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html*).

[14] In the absence of hourly emission data, we develop estimates of maximum hourly emission rates by multiplying the average actual annual emissions rates by a factor (either a category-specific factor or a default factor of 10) to account for variability. This is documented in *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the 2019 Risk and Technology Review Proposed Rule* and in Appendix 5 of the report: *Technical Support Document for Acute Risk Screening Assessment.* Both are available in the docket for this rulemaking.

[15] CalEPA issues acute RELs as part of its Air Toxics Hot Spots Program, and the 1-hour and 8-hour values are documented in *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part I, The Determination of Acute Reference Exposure Levels for Airborne Toxicants,* which is available at *https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary.*

[16] National Academy of Sciences, 2001. *Standing Operating Procedures for Developing Acute Exposure Levels for Hazardous Chemicals,* page 2. Available at *https://www.epa.gov/sites/production/files/2015-09/documents/sop_final_standing_operating_procedures_2001.pdf.* Note that the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances ended in October 2011, but the AEGL program continues to operate at the EPA and works with the National Academies to publish final AEGLs, *(https://www.epa.gov/aegl).*

[17] ERPGS Procedures and Responsibilities. March 2014. American Industrial Hygiene Association. Available at: *https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponsePlanningGuidelines/Documents/ERPG%20Committee%20Standard%20Operating%20Procedures%20%20-%20March%202014%20Revision%20%28Updated%2010-2-2014%29.pdf.*

An acute REL for 1-hour exposure durations is typically lower than its corresponding AEGL–1 and ERPG–1. Even though their definitions are slightly different, AEGL–1s are often the same as the corresponding ERPG–1s, and AEGL–2s are often equal to ERPG–2s. The maximum HQs from our acute inhalation screening risk assessment typically result when we use the acute REL for a HAP. In cases where the maximum acute HQ exceeds 1, we also report the HQ based on the next highest acute dose-response value (usually the AEGL–1 and/or the ERPG–1).

For this source category, we used the default multiplication factor of 10. While we don't anticipate large variations in acute hourly emissions, we took a conservative approach to determine if the default multiplication factor would result in high risk. Upon modeling the emissions using the acute multiplication factor of 10, we determined that the noncancer risk was still below a HQ of 1. Due to the low risk results, further research to justify a lower multiplication factor was not necessary.

In our acute inhalation screening risk assessment, acute impacts are deemed negligible for HAP for which acute HQs are less than or equal to 1, and no further analysis is performed for these HAP. In cases where an acute HQ from the screening step is greater than 1, we assess site-specific data to ensure that the acute HQ is at an off-site location. For this source category, we did not have to perform any refined acute assessments.

4. How do we conduct the multipathway exposure and risk screening assessment?

The EPA conducts a tiered screening assessment examining the potential for significant human health risks due to exposures via routes other than inhalation (*i.e.,* ingestion). We first determine whether any sources in the source category emit any PB–HAP, as identified in the EPA's Air Toxics Risk Assessment Library (see Volume 1, Appendix D, at *https://www2.epa.gov/fera/risk-assessment-and-modeling-air-toxics-risk-assessment-reference-library.*)

For the MSW Landfills source category, we identified PB–HAP emissions of mercury, so we proceeded to the next step of the evaluation. In this step, we determine whether the facility-specific emission rates of the emitted PB–HAP are large enough to create the potential for significant human health risk through ingestion exposure under reasonable worst-case conditions. To facilitate this step, we use previously developed screening threshold emission rates for several PB–HAP that are based on a hypothetical upper-end screening exposure scenario developed for use in conjunction with the EPA's Total Risk Integrated Methodology.Fate, Transport, and Ecological Exposure (TRIM.FaTE) model. The PB–HAP with screening threshold emission rates are arsenic compounds, cadmium compounds, chlorinated dibenzodioxins and furans, mercury compounds, and polycyclic organic matter (POM). Based on the EPA estimates of toxicity and bioaccumulation potential, the pollutants above represent a conservative list for inclusion in multipathway risk assessments for RTR rules. (See Volume 1, Appendix D at *https://www.epa.gov/sites/production/files/2013-08/documents/volume_1_reflibrary.pdf.*) In this assessment, we compare the facility-specific emission rates of these PB–HAP to the screening threshold emission rates for each PB–HAP to assess the potential for significant human health risks via the ingestion pathway. We call this application of the TRIM.FaTE model the Tier 1 screening assessment. The ratio of a facility's actual emission rate to the Tier 1 screening threshold emission rate is a ''screening value.''

We derive the Tier 1 screening threshold emission rates for these PB–HAP (other than lead compounds) to correspond to a maximum excess lifetime cancer risk of 1-in-1 million (*i.e.,* for arsenic compounds, polychlorinated dibenzodioxins and furans and POM) or, for HAP that cause noncancer health effects (*i.e.,* cadmium compounds and mercury compounds), a maximum HQ of 1. If the emission rate of any one PB–HAP or combination of carcinogenic PB–HAP in the Tier 1 screening assessment exceeds the Tier 1 screening threshold emission rate for any facility (*i.e.,* the screening value is greater than 1), we conduct a second screening assessment, which we call the Tier 2 screening assessment.

In the Tier 2 screening assessment, the location of each facility that exceeds a Tier 1 screening threshold emission rate is used to refine the assumptions associated with the Tier 1 fisher and farmer exposure scenarios at that facility. A key assumption in the Tier 1 screening assessment is that a lake and/or farm is located near the facility. As part of the Tier 2 screening assessment, we use a U.S. Geological Survey (USGS) database to identify actual waterbodies within 50 km of each facility. We also examine the differences between local meteorology near the facility and the meteorology used in the Tier 1 screening assessment. We then adjust the previously-developed Tier 1 screening threshold emission rates for each PB–HAP for each facility based on an understanding of how exposure concentrations estimated for the screening scenario change with the use of local meteorology and USGS waterbody data. If the PB–HAP emission rates for a facility exceed the Tier 2 screening threshold emission rates and data are available, we may conduct a Tier 3 screening assessment. If PB–HAP emission rates do not exceed a Tier 2 screening value of 1, we consider those PB–HAP emissions to pose risks below a level of concern.

There are several analyses that can be included in a Tier 3 screening assessment, depending upon the extent of refinement warranted, including validating that the lakes are fishable, considering plume-rise to estimate emissions lost above the mixing layer, and considering hourly effects of meteorology and plume rise on chemical fate and transport. If the Tier 3 screening assessment indicates that risks above levels of concern cannot be ruled out, the EPA may further refine the screening assessment through a site-specific assessment.

For further information on the multipathway assessment approach, see the *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the Risk and Technology Review 2019 Proposed Rule,* which is available in the docket for this action.

5. How do we assess risks considering emissions control options?

In addition to assessing baseline inhalation risks and screening for potential multipathway risks, we also estimate risks considering the potential emission reductions that would be achieved by the control options under consideration. In these cases, the expected emission reductions are applied to the specific HAP and emission points in the RTR emissions dataset to develop corresponding estimates of risk and incremental risk reductions.

6. How do we conduct the environmental risk screening assessment?

a. Adverse Environmental Effect, Environmental HAP, and Ecological Benchmarks

The EPA conducts a screening assessment to examine the potential for an adverse environmental effect as required under section 112(f)(2)(A) of the CAA. Section 112(a)(7) of the CAA defines ''adverse environmental effect''

as ''any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas.''

The EPA focuses on eight HAP, which are referred to as ''environmental HAP,'' in its screening assessment: Six PB–HAP and two acid gases. The PB–HAP included in the screening assessment are arsenic compounds, cadmium compounds, dioxins/furans, POM, mercury (both inorganic mercury and methyl mercury), and lead compounds. The acid gases included in the screening assessment are hydrochloric acid (HCl) and hydrogen fluoride (HF).

HAP that persist and bioaccumulate are of particular environmental concern because they accumulate in the soil, sediment, and water. The acid gases, HCl and HF, are included due to their well-documented potential to cause direct damage to terrestrial plants. In the environmental risk screening assessment, we evaluate the following four exposure media: Terrestrial soils, surface water bodies (includes water-column and benthic sediments), fish consumed by wildlife, and air. Within these four exposure media, we evaluate nine ecological assessment endpoints, which are defined by the ecological entity and its attributes. For PB–HAP (other than lead), both community-level and population-level endpoints are included. For acid gases, the ecological assessment evaluated is terrestrial plant communities.

An ecological benchmark represents a concentration of HAP that has been linked to a particular environmental effect level. For each environmental HAP, we identified the available ecological benchmarks for each assessment endpoint. We identified, where possible, ecological benchmarks at the following effect levels: Probable effect levels, lowest-observed-adverse-effect level, and no-observed-adverse-effect level. In cases where multiple effect levels were available for a particular PB–HAP and assessment endpoint, we use all of the available effect levels to help us to determine whether ecological risks exist and, if so, whether the risks could be considered significant and widespread.

For further information on how the environmental risk screening assessment was conducted, including a discussion of the risk metrics used, how the environmental HAP were identified, and how the ecological benchmarks were selected, see Appendix 9 of the *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the Risk and Technology Review 2019 Proposed Rule,* which is available in the docket for this action.

b. Environmental Risk Screening Methodology

For the environmental risk screening assessment, the EPA first determined whether any facilities in the MSW Landfills source category emitted any of the environmental HAP. For the MSW Landfills source category, we identified emissions of mercury. Because mercury is listed as an environmental HAP and is emitted by at least one facility in the source category, we proceeded to the second step of the evaluation.

c. PB–HAP Methodology

The environmental screening assessment includes six PB–HAP, arsenic compounds, cadmium compounds, dioxins/furans, POM, mercury (both inorganic mercury and methyl mercury), and lead compounds. With the exception of lead, the environmental risk screening assessment for PB–HAP consists of three tiers. The first tier of the environmental risk screening assessment uses the same health-protective conceptual model that is used for the Tier 1 human health screening assessment. TRIM.FaTE model simulations were used to back-calculate Tier 1 screening threshold emission rates. The screening threshold emission rates represent the emission rate in tons of pollutant per year that results in media concentrations at the facility that equal the relevant ecological benchmark. To assess emissions from each facility in the category, the reported emission rate for each PB–HAP was compared to the Tier 1 screening threshold emission rate for that PB–HAP for each assessment endpoint and effect level. If emissions from a facility do not exceed the Tier 1 screening threshold emission rate, the facility ''passes'' the screening assessment and, therefore, is not evaluated further under the screening approach. If emissions from a facility exceed the Tier 1 screening threshold emission rate, we evaluate the facility further in Tier 2.

In Tier 2 of the environmental screening assessment, the screening threshold emission rates are adjusted to account for local meteorology and the actual location of lakes in the vicinity of facilities that did not pass the Tier 1 screening assessment. For soils, we evaluate the average soil concentration for all soil parcels within a 7.5-km radius for each facility and PB–HAP. For the water, sediment, and fish tissue concentrations, the highest value for each facility for each pollutant is used. If emission concentrations from a facility do not exceed the Tier 2 screening threshold emission rate, the facility ''passes'' the screening assessment and typically is not evaluated further. If emissions from a facility exceed the Tier 2 screening threshold emission rate, we evaluate the facility further in Tier 3.

As in the multipathway human health risk assessment, in Tier 3 of the environmental screening assessment, we examine the suitability of the lakes around the facilities to support life and remove those that are not suitable (*e.g.,* lakes that have been filled in or are industrial ponds), adjust emissions for plume-rise, and conduct hour-by-hour time-series assessments. If these Tier 3 adjustments to the screening threshold emission rates still indicate the potential for an adverse environmental effect (*i.e.,* facility emission rate exceeds the screening threshold emission rate), we may elect to conduct a more refined assessment using more site-specific information. If, after additional refinement, the facility emission rate still exceeds the screening threshold emission rate, the facility may have the potential to cause an adverse environmental effect.

To evaluate the potential for an adverse environmental effect from lead, we compared the average modeled air concentrations (from HEM–3) of lead around each facility in the source category to the level of the secondary National Ambient Air Quality Standards (NAAQS) for lead. The secondary lead NAAQS is a reasonable means of evaluating environmental risk, because it is set to provide substantial protection against adverse welfare effects which can include ''effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.''

d. Acid Gas Environmental Risk Methodology

The environmental screening assessment for acid gases evaluates the potential phytotoxicity and reduced productivity of plants due to chronic exposure to HF and HCl. The environmental risk screening methodology for acid gases is a single-tier screening assessment that compares modeled ambient air concentrations (from AERMOD) to the ecological benchmarks for each acid gas. To identify a potential adverse

environmental effect (as defined in Section 112(a)(7) of the CAA) from emissions of HF and HCl, we evaluate the following metrics: The size of the modeled area around each facility that exceeds the ecological benchmark for each acid gas, in acres and km^2; the percentage of the modeled area around each facility that exceeds the ecological benchmark for each acid gas; and the area-weighted average screening value around each facility (calculated by dividing the area-weighted average concentration over the 50-km modeling domain by the ecological benchmark for each acid gas). For further information on the environmental screening assessment approach, see Appendix 9 of the *Residual Risk Assessment for the Municipal Solid Waste Landfills Source Category in Support of the Risk and Technology Review 2019 Proposed Rule,* which is available in the docket for this action.

7. How do we conduct facility-wide assessments?

To put the source category risks in context, we typically examine the risks from the entire ''facility,'' where the facility includes all HAP-emitting operations within a contiguous area and under common control. In other words, we examine the HAP emissions not only from the source category emission points of interest, but also emissions of HAP from all other emission sources at the facility for which we have data. For this source category, we conducted the facility-wide assessment using the same dataset that was compiled for actual emissions. The modeled emissions were based upon EPA-derived emission factors for the source category. The facility-wide file was then used to analyze risks due to the inhalation of HAP that are emitted ''facility-wide'' for the populations residing within 50 km of each facility, consistent with the methods used for the source category analysis described above. For these facility-wide risk analyses, the modeled source category risks were the same as the facility-wide risks. The *Residual Risk Assessment for the MSW Landfills Source Category in Support of the Risk and Technology Review 2019 Proposed Rule,* available through the docket for this action, provides the methodology and results of the facility-wide analyses, including all facility-wide risks.

8. How do we consider uncertainties in risk assessment?

Uncertainty and the potential for bias are inherent in all risk assessments, including those performed for this proposal. Although uncertainty exists, we believe that our approach, which used conservative tools and assumptions, ensures that our decisions are health and environmentally protective. A brief discussion of the uncertainties in the RTR emissions dataset, dispersion modeling, inhalation exposure estimates, and dose-response relationships follows below. Also included are those uncertainties specific to our acute screening assessments, multipathway screening assessments, and our environmental risk screening assessments. A more thorough discussion of these uncertainties is included in the *Residual Risk Assessment for the MSW Landfills Source Category in Support of the Risk and Technology Review 2019 Proposed Rule,* which is available in the docket for this action. If a multipathway site-specific assessment was performed for this source category, a full discussion of the uncertainties associated with that assessment can be found in Appendix 11 of that document, *Site-Specific Human Health Multipathway Residual Risk Assessment Report.*

a. Uncertainties in the RTR Emissions Dataset

Although the development of the RTR emissions dataset involved quality assurance/quality control processes, the accuracy of emissions values will vary depending on the source of the data, the degree to which data are incomplete or missing, the degree to which assumptions made to complete the datasets are accurate, errors in emission estimates, and other factors. The emission estimates considered in this analysis generally are annual totals for certain years, and they do not reflect short-term fluctuations during the course of a year or variations from year to year. The estimates of peak hourly emission rates for the acute effects screening assessment were based on an emission adjustment factor applied to the average annual hourly emission rates, which are intended to account for emission fluctuations due to normal facility operations.

b. Uncertainties in Dispersion Modeling

We recognize there is uncertainty in ambient concentration estimates associated with any model, including the EPA's recommended regulatory dispersion model, AERMOD. In using a model to estimate ambient pollutant concentrations, the user chooses certain options to apply. For RTR assessments, we select some model options that have the potential to overestimate ambient air concentrations (*e.g.,* not including plume depletion or pollutant transformation). We select other model options that have the potential to underestimate ambient impacts (*e.g.,* not including building downwash). Other options that we select have the potential to either under- or overestimate ambient levels (*e.g.,* meteorology and receptor locations). On balance, considering the directional nature of the uncertainties commonly present in ambient concentrations estimated by dispersion models, the approach we apply in the RTR assessments should yield unbiased estimates of ambient HAP concentrations. We also note that the selection of meteorology dataset location could have an impact on the risk estimates. As we continue to update and expand our library of meteorological station data used in our risk assessments, we expect to reduce this variability.

c. Uncertainties in Inhalation Exposure Assessment

Although every effort is made to identify all of the relevant facilities and emission points, as well as to develop accurate estimates of the annual emission rates for all relevant HAP, the uncertainties in our emission inventory likely dominate the uncertainties in the exposure assessment. Some uncertainties in our exposure assessment include human mobility, using the centroid of each census block, assuming lifetime exposure, and assuming only outdoor exposures. For most of these factors, there is neither an under nor overestimate when looking at the maximum individual risk or the incidence, but the shape of the distribution of risks may be affected. With respect to outdoor exposures, actual exposures may not be as high if people spend time indoors, especially for very reactive pollutants or larger particles. For all factors, we reduce uncertainty when possible. For example, with respect to census-block centroids, we analyze large blocks using aerial imagery and adjust locations of the block centroids to better represent the population in the blocks. We also add additional receptor locations where the population of a block is not well represented by a single location.

d. Uncertainties in Dose-Response Relationships

There are uncertainties inherent in the development of the dose-response values used in our risk assessments for cancer effects from chronic exposures and noncancer effects from both chronic and acute exposures. Some uncertainties are generally expressed quantitatively, and others are generally expressed in qualitative terms. We note, as a preface to this discussion, a point on dose-response uncertainty that is

stated in the EPA's *2005 Guidelines for Carcinogen Risk Assessment;* namely, that ''the primary goal of EPA actions is protection of human health; accordingly, as an Agency policy, risk assessment procedures, including default options that are used in the absence of scientific data to the contrary, should be health protective'' (the EPA's *2005 Guidelines for Carcinogen Risk Assessment,* page 1–7). This is the approach followed here as summarized in the next paragraphs.

Cancer UREs used in our risk assessments are those that have been developed to generally provide an upper bound estimate of risk.[18] That is, they represent a ''plausible upper limit to the true value of a quantity'' (although this is usually not a true statistical confidence limit). In some circumstances, the true risk could be as low as zero; however, in other circumstances the risk could be greater.[19] Chronic noncancer RfC and reference dose (RfD) values represent chronic exposure levels that are intended to be health-protective levels. To derive dose-response values that are intended to be ''without appreciable risk,'' the methodology relies upon an uncertainty factor (UF) approach,[20] which considers uncertainty, variability, and gaps in the available data. The UFs are applied to derive dose-response values that are intended to protect against appreciable risk of deleterious effects.

Many of the UFs used to account for variability and uncertainty in the development of acute dose-response values are quite similar to those developed for chronic durations. Additional adjustments are often applied to account for uncertainty in extrapolation from observations at one exposure duration (*e.g.,* 4 hours) to derive an acute dose-response value at another exposure duration (*e.g.,* 1 hour). Not all acute dose-response values are developed for the same purpose, and care must be taken when interpreting the results of an acute assessment of human health effects relative to the dose-response value or values being exceeded. Where relevant to the estimated exposures, the lack of acute dose-response values at different levels of severity should be factored into the risk characterization as potential uncertainties.

Uncertainty also exists in the selection of ecological benchmarks for the environmental risk screening assessment. We established a hierarchy of preferred benchmark sources to allow selection of benchmarks for each environmental HAP at each ecological assessment endpoint. We searched for benchmarks for three effect levels (*i.e.,* no-effects level, threshold-effect level, and probable effect level), but not all combinations of ecological assessment/environmental HAP had benchmarks for all three effect levels. Where multiple effect levels were available for a particular HAP and assessment endpoint, we used all of the available effect levels to help us determine whether risk exists and whether the risk could be considered significant and widespread.

For a group of compounds that are unspeciated (*e.g.,* glycol ethers), we conservatively use the most protective dose-response value of an individual compound in that group to estimate risk. Similarly, for an individual compound in a group (*e.g.,* ethylene glycol diethyl ether) that does not have a specified dose-response value, we also apply the most protective dose-response value from the other compounds in the group to estimate risk.

e. Uncertainties in Acute Inhalation Screening Assessments

In addition to the uncertainties highlighted above, there are several factors specific to the acute exposure assessment that the EPA conducts as part of the risk review under section 112 of the CAA. The accuracy of an acute inhalation exposure assessment depends on the simultaneous occurrence of independent factors that may vary greatly, such as hourly emissions rates, meteorology, and the presence of a person. In the acute screening assessment that we conduct under the RTR program, we assume that peak emissions from the source category and reasonable worst-case air dispersion conditions (*i.e.,* 99th percentile) co-occur. We then include the additional assumption that a person is located at this point at the same time. Together, these assumptions represent a reasonable worst-case actual exposure scenario. In most cases, it is unlikely that a person would be located at the point of maximum exposure during the time when peak emissions and reasonable worst-case air dispersion conditions occur simultaneously.

f. Uncertainties in the Multipathway and Environmental Risk Screening Assessments

For each source category, we generally rely on site-specific levels of PB–HAP or environmental HAP emissions to determine whether a refined assessment of the impacts from multipathway exposures is necessary or whether it is necessary to perform an environmental screening assessment. This determination is based on the results of a three-tiered screening assessment that relies on the outputs from models—TRIM.FaTE and AERMOD—that estimate environmental pollutant concentrations and human exposures for five PB–HAP (dioxins, POM, mercury, cadmium, and arsenic) and two acid gases (HF and HCl). For lead, we use AERMOD to determine ambient air concentrations, which are then compared to the secondary NAAQS standard for lead. Two important types of uncertainty associated with the use of these models in RTR risk assessments and inherent to any assessment that relies on environmental modeling are model uncertainty and input uncertainty.[21]

Model uncertainty concerns whether the model adequately represents the actual processes (*e.g.,* movement and accumulation) that might occur in the environment. For example, does the model adequately describe the movement of a pollutant through the soil? This type of uncertainty is difficult to quantify. However, based on feedback received from previous EPA SAB reviews and other reviews, we are confident that the models used in the screening assessments are appropriate and state-of-the-art for the multipathway and environmental screening risk assessments conducted in support of RTR.

Input uncertainty is concerned with how accurately the models have been configured and parameterized for the assessment at hand. For Tier 1 of the multipathway and environmental screening assessments, we configured the models to avoid underestimating exposure and risk. This was accomplished by selecting upper-end values from nationally representative datasets for the more influential parameters in the environmental model,

[18] IRIS glossary *(https://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=IRIS%20Glossary).*

[19] An exception to this is the URE for benzene, which is considered to cover a range of values, each end of which is considered to be equally plausible, and which is based on maximum likelihood estimates.

[20] *See* A Review of the Reference Dose and Reference Concentration Processes, U.S. EPA, December 2002 (*https://www.epa.gov/sites/production/files/2014-12/documents/rfd-final.pdf*), and Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry, U.S. EPA, 1994 (*https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=71993*).

[21] In the context of this discussion, the term ''uncertainty'' as it pertains to exposure and risk encompasses both *variability* in the range of expected inputs and screening results due to existing spatial, temporal, and other factors, as well as *uncertainty* in being able to accurately estimate the true result.

including selection and spatial configuration of the area of interest, lake location and size, meteorology, surface water, soil characteristics, and structure of the aquatic food web. We also assume an ingestion exposure scenario and values for human exposure factors that represent reasonable maximum exposures.

In Tier 2 of the multipathway and environmental screening assessments, we refine the model inputs to account for meteorological patterns in the vicinity of the facility versus using upper-end national values, and we identify the actual location of lakes near the facility rather than the default lake location that we apply in Tier 1. By refining the screening approach in Tier 2 to account for local geographical and meteorological data, we decrease the likelihood that concentrations in environmental media are overestimated, thereby increasing the usefulness of the screening assessment. In Tier 3 of the screening assessments, we refine the model inputs again to account for hour-by-hour plume rise and the height of the mixing layer. We can also use those hour-by-hour meteorological data in a TRIM.FaTE run using the screening configuration corresponding to the lake location. These refinements produce a more accurate estimate of chemical concentrations in the media of interest, thereby reducing the uncertainty with those estimates. The assumptions and the associated uncertainties regarding the selected ingestion exposure scenario are the same for all three tiers.

For the environmental screening assessment for acid gases, we employ a single-tiered approach. We use the modeled air concentrations and compare those with ecological benchmarks.

For all tiers of the multipathway and environmental screening assessments, our approach to addressing model input uncertainty is generally cautious. We choose model inputs from the upper end of the range of possible values for the influential parameters used in the models, and we assume that the exposed individual exhibits ingestion behavior that would lead to a high total exposure. This approach reduces the likelihood of not identifying high risks for adverse impacts.

Despite the uncertainties, when individual pollutants or facilities do not exceed screening threshold emission rates (*i.e.,* screen out), we are confident that the potential for adverse multipathway impacts on human health is very low. On the other hand, when individual pollutants or facilities do exceed screening threshold emission rates, it does not mean that impacts are significant, only that we cannot rule out that possibility and that a refined assessment for the site might be necessary to obtain a more accurate risk characterization for the source category.

The EPA evaluates the following HAP in the multipathway and/or environmental risk screening assessments, where applicable: Arsenic, cadmium, dioxins/furans, lead, mercury (both inorganic and methyl mercury), POM, HCl, and HF. These HAP represent pollutants that can cause adverse impacts either through direct exposure to HAP in the air or through exposure to HAP that are deposited from the air onto soils and surface waters and then through the environment into the food web. These HAP represent those HAP for which we can conduct a meaningful multipathway or environmental screening risk assessment. For other HAP not included in our screening assessments, the model has not been parameterized such that it can be used for that purpose. In some cases, depending on the HAP, we may not have appropriate multipathway models that allow us to predict the concentration of that pollutant. The EPA acknowledges that other HAP beyond these that we are evaluating may have the potential to cause adverse effects and, therefore, the EPA may evaluate other relevant HAP in the future, as modeling science and resources allow.

IV. Analytical Results and Proposed Decisions

A. What are the results of the risk assessment and analyses?

1. Inhalation Risk Assessment Results

The inhalation risk modeling performed to estimate risks based on actual, allowable, and whole facility emissions relied primarily on emissions factors derived by the EPA.

The results of the chronic baseline inhalation cancer risk assessment indicate that, based on estimates of current actual, allowable, and whole facility emissions under 40 CFR part 63, subpart AAAA, the MIR posed by the source category could be as high as 10-in-1 million. The total estimated cancer incidence based on actual emission levels is 0.04 excess cancer cases per year, or 1 case every 25 years. The total estimated cancer incidence based on allowable emission levels is 0.05 excess cancer cases per year, or 1 case every 20 years. Fugitive air emissions of benzene-based pollutants contributed approximately 50 percent to the cancer incidence. The population exposed to cancer risks greater than or equal to 1-in-1 million based upon actual emissions is 18,300 (see Table 2 of this preamble).

TABLE 2—INHALATION RISK ASSESSMENT SUMMARY FOR MUNICIPAL SOLID WASTE LANDFILLS SOURCE CATEGORY
[40 CFR part 63, subpart AAAA]

	Cancer MIR (in 1 million)		Based upon actual emissions			
	Based on actual emissions [1]	Based on allowable emissions	Cancer incidence (cases per year)	Population with risk of 1-in-1 million or more	Population with risk of 10-in-1 million or more	Max chronic noncancer HI (actuals and allowables)
Source Category ...	10 (p-dichlorobenzene, ethyl benzene, benzene).	10 (p-dichlorobenzene, ethyl benzene, benzene).	0.04	18,300	11	HI < 1

[1] Whole facility emissions are equal to actual emissions and have the same risk.

2. Acute Risk Results

Our screening analysis for worst-case acute impacts based on actual emissions indicates that no pollutants exceed an acute HQ value of 1 based upon the REL. The acute hourly multiplier utilized a default factor of 10 for all emission processes.

3. Multipathway Risk Screening Results

The multipathway risk screening assessment resulted in a maximum Tier 2 noncancer screening value of less than 1 for mercury. Mercury was the only PB–HAP emitted by the source category. Based on these results, we are confident that the noncancer risks due to multipathway exposures have an HI less than 1.

4. Environmental Risk Screening Results

The ecological risk screening assessment indicated all modeled points were below the Tier 1 screening threshold based on actual emissions of mercury emitted by the source category.

5. Facility-Wide Risk Results

An assessment of whole-facility risks was performed as described above in Table 2 of this preamble. Whole-facility modeled emissions were the same as actuals for this source category. Refer to Section B1 of the Inhalation Risk Assessment Results for a discussion of the health risks.

6. What demographic groups might benefit from this regulation?

Results of the demographic analysis indicate that, for six of the 11 demographic groups; (African American, Other and Multiracial, Hispanic, below the poverty level, and those individuals over 25 without a highschool diploma) that are living within 5 km of facilities in the source category exceed the corresponding national percentage for the same demographic groups. When examining the risk levels of those exposed to emissions from MSW landfill facilities, we find 18,200 people are exposed to a cancer risk at or above 1-in-1 million and no individuals or groups exposed to a chronic noncancer TOSHI greater than 1.[22]

The methodology and the results of the demographic analysis are presented in a technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near MSW Landfills,* available in the docket for this action.

To examine the potential for any environmental justice issues that might be associated with the source category, we performed a demographic analysis, which is an assessment of risk to individual demographic groups of the populations living within 5 km and within 50 km of the facilities. In the analysis, we evaluated the distribution of HAP-related cancer and noncancer risk from the MSW Landfills source category across different demographic groups within the populations living near facilities.[23]

The results of the demographic analysis are summarized in Table 3 of this preamble. These results, for various demographic groups, are based on the estimated risk from actual emissions levels for the population living within 50 km of the facilities.

TABLE 3—MSW LANDFILLS DEMOGRAPHIC RISK ANALYSIS RESULTS

Municipal Solid Waste landfills Source Category: Demographic Assessment Results—50 km Study Area Radius			
		Population with cancer risk greater than or equal to 1-in-1 million	Population with HI greater than 1
	Nationwide	Source Category	
Total Population	317,746,049	18,217	0
	White and minority by percent		
White	62	58	0
Minority	38	42	0
	Minority by percent		
African American	12	13	0
Native American	0.8	0.1	0
Hispanic or Latino (includes white and nonwhite)	18	20	0
Other and Multiracial	7	8	0
	Income by percent		
Below Poverty Level	14	15	0
Above Poverty Level	86	85	0
	Education by percent		
Over 25 and without a High School Diploma	14	17	0
Over 25 and with a High School Diploma	86	83	0
	Linguistically isolated by percent		
Linguistically Isolated	6	8	0

The percentages of the at-risk population in each demographic group (except for White, Native American, and Non-Hispanic) are lower than their respective nationwide percentages.

The methodology and the results of the demographic analysis are presented in a technical report, *Risk and*

[22] There may be small differences between the Environment Justice (EJ) Tool's total population within 50 km and HEM–3's total domain population, because some of the 2010 Census blocks modeled by HEM–3 (which have a non-zero population) match to American Community Survey 2014 Census block groups that have a population of zero.

[23] Demographic groups included in the analysis are: White, African American, Native American, other races and multiracial, Hispanic or Latino, children 17 years of age and under, adults 18 to 64 years of age, adults 65 years of age and over, adults without a high school diploma, people living below the poverty level, people living two times the poverty level, and linguistically isolated people.

Technology Review—Analysis of Demographic Factors for Populations Living Near Municipal Solid Waste Landfills Source Category Operations, available in the docket for this action.

B. What are our proposed decisions regarding risk acceptability, ample margin of safety, and adverse environmental effect?

1. Risk Acceptability

As noted in section III of this preamble, the EPA sets standards under CAA section 112(f)(2) using ''a two-step standard-setting approach, with an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on MIR of approximately 1-in-10 thousand'' (54 FR 38045, September 14, 1989). In this proposal, the EPA estimated risks based on actual and allowable emissions from MSW landfills, and we considered these in determining acceptability.

For the MSW Landfills source category, the risk analysis indicates that the cancer risk to the individual most exposed is below 10-in-1 million from both actual and allowable emissions. This risk is considerably less than 100-in-1 million, which is the presumptive upper limit of acceptable risk. The risk analysis also estimates a cancer incidence of 0.04 excess cancer cases per year, or 1 case every 20 years, as well as a maximum chronic noncancer TOSHI value below 1 (0.1). In addition, the risk assessment indicates no significant potential for multipathway health effects.

The results of the acute screening analysis also estimate a maximum acute noncancer HQ value of less than 1 based on the acute REL. By definition, the acute REL represents a health-protective level of exposure, with effects not anticipated below those levels, even for repeated exposures.

Considering all of the health risk information and factors discussed above, including the uncertainties discussed in section III of this preamble, we propose that the risks from the MSW Landfills source category are acceptable.

2. Ample Margin of Safety Analysis

As directed by CAA section 112(f)(2), we conducted an analysis to determine whether the current emissions standards provide an ample margin of safety to protect public health. Under the ample margin of safety analysis, we evaluated the cost and feasibility of available control technologies and other measures (including the controls, measures, and costs reviewed under the technology review) that could be applied to this source category to further reduce the risks (or potential risks) due to emissions of HAP identified in the risk assessment. In this analysis, we considered the results of the technology review, risk assessment, and other aspects of our MACT rule review to determine whether there are any cost-effective controls or other measures that would reduce emissions further.

The risks from this source category were deemed acceptable with a maximum upper-bound chronic excess cancer risk of 10-in-1 million from 1 facility and 168 facilities with an excess cancer risk greater than or equal to 1-in-1 million but less than 10-in-1 million. Our risk analysis indicated the risks from this source category are low for both cancer and noncancer health effects, and, therefore, any risk reductions to control fugitive landfill emissions would result in minimal health benefits. Fugitive landfill emissions result in 84 percent of the cancer incidence for this source category. 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 are proposing that the current MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) provides an ample margin of safety to protect the public health.

3. Adverse Environmental Effect

For the MSW Landfills source category, we did not identify emissions of any environmental HAP. Because we did not identify environmental HAP emissions, we expect no adverse environmental effects.

C. What are the results and proposed decisions based on our technology review?

To fulfill the obligations under CAA section 112(d)(6), we conducted a technology review to identify developments in practices, processes, and control technologies that may warrant revisions to the current MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). In conducting our technology review, we researched data reported to the U.S. EPA GHGRP (40 CFR part 98, subpart HH), the U.S. EPA LMOP Landfill and LFG Energy Database, state regulations, Federal regulations other than the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), permits, the RACT/BACT/LAER Clearinghouse, enforcement consent decrees, and literature sources.

Our research identified three types of developments that could lead to additional control of HAP from MSW landfills. The three potential developments are practices to reduce HAP formation within a landfill, to collect more landfill gas for control or treatment, and to achieve a greater level of HAP destruction in the collected landfill gas. After analyzing these options, we determined that changes to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) are not warranted at this time, because each option is either not technically feasible or the cost is not justified for the level of emission reduction achievable.

1. Reduce HAP Formation

To reduce HAP formation in a landfill requires a program to divert or restrict certain types of wastes from disposal in an MSW landfill. Restricting certain wastes would reduce emissions because the quantity of HAP emitted is a function of the amount of waste disposed and the composition of the waste. For example, household wastes could contain numerous components that emit HAP, *e.g.,* paints, solvents, paint thinners, used motor oil, insecticides, pesticides, and household cleaning products. Diverting these materials from MSW landfills will reduce both the volume and HAP concentration of landfill gas emitted. Many states already have programs to prohibit landfill disposal of such products and other materials, such as electronic devices, tires, plastics, batteries, and yard waste.

We have determined that mandating programs for landfill operators to ban or recycle wastes is not technically feasible. Although some successful programs exist for waste diversion, recycling, and alternative disposal, these programs are not typically operated by landfill owners or operators, but often involve rules that affect generators, haulers, and third party processors. A landfill owner or operator could require waste separation by banning certain materials from entering the landfill. However, it would not be feasible for the landfill owner or operator to enforce such bans, because policing the content of every truck passing the gate of a landfill is economically unreasonable and technically impracticable.

2. Collect More Landfill Gas

More gas could be collected by requiring the GCCS to be installed earlier, requiring the GCCS to be expanded more frequently than currently required by the NESHAP, or requiring the GCCS to remain in place longer than currently required. The current MSW Landfills NESHAP (40

CFR part 63, subpart AAAA) requires that landfills with a design capacity of 2.5 million Mg and 2.5 million m^3 and an NMOC emission rate exceeding 50 Mg/yr must install controls. The GCCS must be installed within 30 months of the initial NMOC report that exceeds the 50 Mg/yr emission threshold and then expanded every 5 years in active fill areas, or every 2 years in closed areas.

Earlier gas collection is technically feasible. Earlier gas collection could be accomplished by lowering the NMOC emission rate below 50 Mg/yr either alone or in conjunction with the design capacity to below 2.5 million Mg and 2.5 million m^3. Earlier gas collection could also be accomplished by shortening the initial 30-month lag time for installing a GCCS or reducing the amount of time required before the GCCS is expanded. Although earlier gas collection, or more frequent expansion of a GCCS expansion, could require some technical design changes (*e.g.,* horizontal gas collection system), this equipment is commercially available and in use at many landfills today. Horizontal collection trenches can be installed during the filling of the landfill so that gas collection can commence earlier than with the more typically used vertical gas wells, although sufficient waste must be placed on top of the trenches before vacuum can be applied to the trench, in order to minimize air intrustion. Passive flares have been demonstrated to operate more effectively than active flares when the quantity of gas generation is low or the quality of the gas decreases to lower methane content, or if the landfill gas is contained by impermeable liners on the bottom, sides, and top of the landfill. Our evaluation of available data from the GHGRP and LMOP indicate that 1,199 landfills have installed a GCCS in 2014, compared to between 625 and 700 landfills that are estimated to have installed controls, based on modeling under the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). These data demonstrate that earlier gas collection is technically feasible. Additionally, the 2016 MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf) both employ an NMOC emission rate of 34 Mg/yr, but it is not known how many landfills are controlling pursuant to these new 2016 regulations. Moreover, states, including California, Minnesota, Wisconsin, and Pennsylvania, use different regulatory metrics to require gas collection earlier than required by the NESHAP.

Another means of increasing the collection efficiency of GCCSs is to install cover material earlier. Studies have shown increased collection efficiencies, depending on the type of cover. However, the effectiveness of early final cover installation depends on site-specific circumstances such as the filling sequence and cell design of the landfill. We identified no state regulations, permit conditions, or other research that prescribed conditions under which regulating the timing of final cover installation is a technically and economically feasible strategy for improving gas collection.

We also considered whether a biocover provides more HAP control than a traditional clay cover. A biocover is a layer of media containing methanotrophic bacteria that digest and oxidize organic matter. Although these bacteria can be found in soil, other materials can be used as cover material or added to clay covers to enhance the environmental conditions for bacteria growth, which increases the oxidation. Most biocover research and most installations have been directed at methane emission reductions. However, a few studies have indicated that biocovers can microbially degrade volatile organic compounds as well, including some of the HAP contained in landfill gas. Although a number of landfills have reported using a biocover on at least a portion of the surface, the long-term HAP reduction performance of oxidative covers has not yet been adequately demonstrated in a full-scale industrial setting at a landfill.

Biocovers and earlier installation of final covers were not deemed technically feasible, and, therefore, the cost and reductions for these control practices were not further analyzed. Because earlier GCCS installation was technically feasible, we evaluated the cost for three options for enhanced gas collection, which are as follows:

- Reduce the NMOC emission threshold for initial installation of GCCS from 50 Mg/yr to 34 Mg/yr for all landfills that are open in 2015. For landfills that closed in 2014 or earlier, these remained at the baseline level of 50 Mg/yr NMOC.
- Retain the baseline NMOC emission threshold (50 Mg/yr NMOC) but reduce the expansion lag (EL) time from an average of 4 to 3 years for landfills that closed after 2014. The ''expansion lag time'' is the amount of time allotted for the landfill to expand the GCCS into new areas of the landfill. The rule currently allows 5 years for active areas and 2 years for areas that are closed or at final grade, but the EPA understands most landfills are choosing the 5-year option and, therefore, the average lag time of 4 years was modeled. A modeled EL of 3 years could represent a reduction from 5 years to 3 years in active areas.
- Retain the baseline NMOC emission threshold (50 Mg/yr NMOC) but reduce the EL time from an average of 4 to 2 years for landfills that closed after 2014. A modeled EL of 2 years could represent a requirement for all landfills to expand their system within two years.

For each scenario, we estimated the incremental net annualized costs of each regulatory option in 2023 relative to a baseline of the current NESHAP requirements. The costs incorporate the annualized capital costs to install the GCCS, operation and maintenance costs for the GCCS, and costs for monthly wellhead monitoring and continuous combustor monitoring. The costs have been offset by the revenue anticipated from electricity sales for any landfills that would likely operate cost-effective energy recover projects. Table 4 of this preamble shows the incremental cost effectiveness of 14 different HAP compounds if requiring earlier gas collection as well as the incremental HAP cost effectivness of total HAP, inclusive of 47 different HAP. Of these 14 HAP, toluene, ethyl benzene, dichloromethane, hexane, and xylenes are five of the most prevalent (HAP) in LFG, while the remaining nine HAP, although less prevalent, are driving our estimates of health risks. The LFG emissions vary each year because the emissions profile follows a first-order decay equation pattern over time, as a landfill accepts additional waste. Additionally, the number of landfills controlling in any given year and the site-specific collection efficiency of the controlling landfills varies given the GCCS installation and expansion lag times. The EPA selected the year 2023 to quantify the impacts because it is 3 years after the final MSW Landfill NESHAP amendments are expected to be finalized, which is the maximum time allowable under the General Provisions of part 63.

TABLE 4—COST EFFECTIVENESS OF EARLIER GAS COLLECTION

Compound	Cost effectiveness ($100,000 per Mg HAP), year 2023		
	Reduce from 50 Mg/yr to 34 Mg/yr	Reduce EL from 4 to 2 years	Reduce EL from 4 to 3 years
Toluene	6.75	5.38	6.36
Hexane	11.48	9.15	10.82
Xylenes (Mixture of o, m, and p Isomers)	14.28	11.38	13.46
Ethyl Benzene	37.10	29.55	34.96
Methylene Chloride	37.84	30.14	35.66
1,4-Dichlorobenzene	119	94.56	112
Benzene	122	97.36	115
Trichloroethylene	160	128	151
Vinyl Chloride	215	171	202
Ethylene Dichloride	785	625	739
1,1,2-Trichloroethane	1,022	814	963
Naphthalene	1,183	943	1,115
1,3-Butadiene	1,695	1,350	1,597
Ethylene Dibromide	10,534	8,392	9,927
Total HAP [1]	2.07	1.64	1.94

[1] Total HAP includes 47 of the 48 HAP based on the *Updated MSW Landfill Emission Factors for RTR Risk Modeling* in 2018. No reductions were estimated for mercury as a result of earlier gas collection. Factors are available at: *https://www.epa.gov/stationary-sources-air-pollution/updated-msw-landfill-emission-factors-rtr-risk-modeling.*

Considering the high costs per ton of HAP reduced, we did not consider these control options to be cost effective for further reducing HAP emissions from MSW landfills. With respect to the non-air environmental impacts, the options for earlier gas collection may result in additional LFG becoming available for LFG energy production. Considering these costs, we concluded that requiring additional collection of landfill gas is not warranted pursuant to CAA section 112(d)(6).

3. Increased HAP Destruction

The NESHAP currently provides three options for controlling HAP from the collected landfill gas:

- An open flare that meets specified design and operating requirements;
- A control device that reduces NMOC by 98 weight-percent or 20 ppmv NMOC as hexane adjusted to 3-percent oxygen; or
- A treatment system that processes the collected gas for subsequent sale or use.

Another means of reducing HAP is to require increased destruction of HAP in the collected gas. Our technology review identified three potential methods: enclosed flares, thermal oxidation, and increased use of certain energy recovery technologies for beneficial use of landfill gas.

Enclosed flares. An open flare meeting the NESHAP design and operating requirements can achieve approximately 98-percent organic HAP reduction from landfill gas. Note that in this proposed action, flares must be designed and operated in accordance with 40 CFR 63.11, which is equivalent to 40 CFR 60.18 as referenced by the MSW Landfills NSPS (40 CFR part 60, subparts WWW and XXX). About 17 percent of landfills report using an enclosed flare. The achievable destruction efficiency varies between 99.5 and 99.9 percent depending on local regulations for emissions of other pollutants (oxides of nitrogen and carbon monoxide (CO)) and how the flare is operated.[24] [25] The HAP-specific destruction efficiencies were not reported.

While the technical feasibility of an enclosed flare for landfills is widely demonstrated, an enclosed flare is more expensive and, for landfill gas, is more complex to operate. As a result, the capital and operating cost of an enclosed flare is estimated at about 1.5 to 2 times greater. Open flares provide greater operational flexibility for handling large variations in flow rate and British thermal units (Btu) content, managing certain trace gas constituents, and serving as a backup for landfills with energy recovery projects. We estimate that to require landfills to replace all open flares with enclosed flares would reduce emissions by between 630 to 800 Mg/yr NMOC in 2023. There is a significant range in these estimates depending on the destruction efficiency. Also, because many landfills already employ at least one enclosed flare or energy recovery project, it is unknown how many conversions would actually occur. Table 5 shows the cost for converting to enclosed flares. The costs are estimated for the same 14 HAP, which represent the five most prevalent HAP and the nine HAP driving health risk and takes into consideration the variations in flare peformance and flare cost. The table also shows incremental HAP cost effectivness of total HAP, inclusive of 47 different HAP. With respect to the non-air environmental impacts, the options for requiring conversion to enclosed flares could negatively impact the number of LFG energy projects, because open flares tend to serve as back-up destruction devices at landfills with energy projects in place. Additionally, enclosed flares may require supplemental pilot fuels to operate. We conclude that the requirement to use enclosed flares is not cost effective.

[24] *LFG Technologies Brochure. http://lfgtech.com/wp-content/uploads/docs/low-emissions-brochure.pdf.*

[25] John Zink. *https://www.johnzinkhamworthy.com/products-applications/landfill-biogas/.*

TABLE 5—COST EFFECTIVENESS OF ENCLOSED FLARES

Compound	Cost effectiveness ($100,000 per Mg HAP), year 2023 [1]
	Conversion of open flares to enclosed flares
Toluene	$5–14
Hexane	9–23
Xylenes (Mixture of o, m, and p Isomers)	11–29
Ethyl Benzene	30–75
Methylene Chloride	30–77
1,4–Dichlorobenzene	95–240
Benzene	98–250
Trichloroethylene	130–330
Vinyl Chloride	170–440
Ethylene Dichloride	630–1,590
1,1,2–Trichloroethane	820–2,070
Naphthalene	950–2,400
1,3–Butadiene	1,360–3,440
Ethylene Dibromide	8,430–21,400
Total HAP [2]	1.65–4.17

[1] The minimum cost effectiveness range represents a cost factor increase of 1.5 compared to an open flare and an assumed HAP destruction efficiency of 99.9 percent. The maximum of the cost effectiveness range represents a cost factor increase of 2 compared to an open flare and an assumed HAP destruction efficiency of 99.5 percent.

[2] Total HAP includes 47 of the 48 HAP based on the *Updated MSW Landfill Emission Factors for RTR Risk Modeling* in 2018. No reductions were estimated for mercury as a result of earlier gas collection. Factors are available at: *https://www.epa.gov/stationary-sources-air-pollution/updated-msw-landfill-emission-factors-rtr-risk-modeling.*

Thermal oxidizers. The technical feasibility of installing thermal oxidizers appears to be limited to landfills that employ an energy project with gas purification equipment or other gas treatment equipment that involves a tail gas. Flares are better equipped than thermal oxidizers to manage the large fluctuations in flow rates that can occur at landfills where the primary control device is not associated with an energy recovery project. Our technical review concludes that thermal oxidizers have not been commercially demonstrated to be technologically feasible as an alternative for the destruction of landfill gas at all landfills.

Energy recovery devices. Some types of energy recovery projects can achieve destructions higher than the 98-percent reduction or 20 ppmv NMOC as required by the NESHAP. About 47 percent of landfills that have GCCS installed use some form of energy recovery system. Energy recovery systems that are capable of additional HAP control are gas turbines (including microturbines) to combust landfill gas to produce electricity and gas purification systems to produce renewable natural gas for pipeline injection or direct sale.

The technical feasibility of the landfill gas cleaning that is required to implement any energy recovery project must be assessed by in-depth engineering analysis of the site-specific conditions at each individual landfill. The economic feasibility depends on the available flow rate for the extracted landfill gas over the expected lifetime of the project; landfill gas quality; and physical and market access to either the electrical grid, a natural gas pipeline, end-users with a consistent energy demand, or an alternative fueling station (*i.e.,* compressed natural gas or liquid natural gas) with an adequate market to consume the landfill gas-derived vehicle fuel. Research has not identified specific objective criteria for stipulating when a specific energy recovery system is economically feasible for landfill gas. Accordingly, we conclude that requiring specific energy recovery devices for landfill gas is not technologically feasible or cost effective given that it is highly dependent on engineering analyses of site-specific conditions.

We request comment on the technologies and practices considered for this technology review as well as the basis for estimating the cost effectivness of those technologies at MSW landfills.

D. What other actions are we proposing?

In addition to the proposed decisions resulting from the RTR described above, we are proposing revisions to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) that promote consistency between MSW landfills regulations under CAA sections 111 and 112. We are also proposing changes to the wellhead temperature operating standards, and associated monitoring, corrective action, and reporting and recordkeeping requirements for temperature. We are proposing to adjust provisions for GCCS removal to provide additional flexibility for landfill owners and operators. In addition, we are proposing updates to SSM requirements and electronic reporting requirements.

1. Overall Rule Reorganization

We are proposing to streamline the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) by incorporating the landfill gas control, operational standards, monitoring, recordkeeping, and reporting rule requirements (*i.e.,* the major compliance provisions) from the NSPS program directly into the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), thus, minimizting cross referencing to another subpart. While the original MSW Landfills NESHAP references the 1996 MSW Landfills NSPS (40 CFR part 60, subpart WWW), updated requirements from the 2016 MSW Landfills NSPS (40 CFR part 60, subpart XXX) are incorporated where appropriate. These include sections for GCCS installation and removal (40 CFR 63.1957), GCCS operational standards (40 CFR 63.1958), NMOC calculation procedures (40 CFR 63.1959), compliance provisions (40 CFR 63.1960), monitoring (40 CFR 63.1961), specifications for active collection systems (40 CFR 63.1962), reporting (40

CFR 63.1981), and recordkeeping (40 CFR 63.1983). These changes modernized and streamlined the original NSPS. An MSW landfill would have up to 18 months after publication of the final rule to comply with these reorganized provisions. Before this time, landfills would comply with the provisions in the MSW Landfills NSPS (40 CFR part 60, subpart WWW), which continue to be cross referenced in the short term. Incorporating these provisions consolidates requirements between the MSW Landfills NSPS (40 CFR part 60, subparts WWW and XXX) and the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) and is expected to reduce confusion because many landfills are subject to an NSPS and the NESHAP.

To help distinguish the applicability of the two MSW Landfills NSPS, the EPA proposes to revise the title of 40 CFR part 60, subpart WWW, to identify the subpart's applicability dates. Specifically, the revised title for 40 CFR part 60, subpart WWW would read, ''Standards of Performance for Municipal Solid Waste Landfills that Commenced Construction, Reconstruction, or Modification on or after May 30, 1991, but before July 18, 2014.'' The EPA is making a similar change to 40 CFR part 60, subpart WWW at 40 CFR 60.750(a) to say that the provisions of 40 CFR part 60, subpart WWW apply to each MSW landfill that commenced construction, reconstruction, or modification on or after May 30, 1991, but before July 18, 2014.

To enhance consistency between the regulations and streamline compliance, we are also proposing minor edits to the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and the EG (40 CFR part 60, subpaft Cf) that would allow MSW landfills affected by the MSW Landfills NSPS and EG to demonstrate compliance with the ''major compliance provisions'' of the MSW Landfills NESHAP (GCCS operational standards at 40 CFR 63.1958, compliance provisions at 40 CFR 63.1960, and monitoring at 40 CFR 63.1961) in lieu of NSPS and EG.

With the incorporation of the major compliance provisions from the MSW Landfills NSPS (40 CFR part 60, subpart XXX), we are, thus, incorporating corresponding revisions from the MSW Landfills NSPS (40 CFR part 60, subpart XXX) that were finalized in 2016, including removing the requirement to monitor and take corrective action for oxygen and nitrogen monitoring at the wellhead, refining the procedures for taking corrective action (40 CFR 63.1960), and adding flexibility for when to cap, remove, or decommission the GCCS (40 CFR 63.1957(b)). Revisions for consistency with the MSW Landfills NSPS (40 CFR part 60, subpart XXX) also include other conforming changes that were finalized in 2016, such as allowing the use of portable gas composition analyzers to monitor the oxygen level at a wellhead (40 CFR 63.1961(a)), the requirement to report more precise locational data for each surface emissions exceedance (40 CFR 63.1961(f)), changes to the procedure for submitting a design plan (40 CFR 63.1981(d)), and changes to definitions (40 CFR 63.1990). These are described below and in the preamble to the final MSW Landfills NSPS (81 FR 59332, August 29, 2016).

To further enhance consistency between the MSW landfills regulations, we are adopting in the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) the same requirements for SSM that the MSW Landfills NSPS (40 CFR part 60, subpart XXX) adopted (40 CFR 63.1930(b)). Consistent with other CAA regulations, we are proposing additional revisions to the SSM provisions of the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) in order to ensure that they are consistent with the decision in *Sierra Club* v. *EPA,* 551 F. 3d 1019 (D.C. Cir. 2008), in which the Court vacated provisions that exempted sources from the requirement to comply with applicable CAA section 112 emission standards during periods of SSM. We are also adding electronic reporting (40 CFR 63.1981(l)).

We request comment on this re-organization of the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) structure to create a more uniform set of standards for all affected landfills. The EPA specifically requests comments from landfill owners and operators, as well as state regulatory agencies, on whether reorganization of the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) and amendments to NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf) clarifies compliance for sources affected by both the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) and the NSPS (40 CFR part 60, subpart XXX) or EG (40 CFR part 60, subpart Cf).

2. Operational Standards for Gas Collection Systems

To ensure proper operation of the gas collection system, the current MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) requires wellhead monitoring of the collected landfill gas and establishes standards at the wellhead for negative pressure, temperature, and concentration of either nitrogen or oxygen, as described in the MSW Landfills NSPS (40 CFR part 60, subpart WWW). If an operational limit is exceeded, then corrective action is required to return the measured parameter to the required level. Consistent with the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf), we are proposing to eliminate the operational standard and the corresponding corrective action for nitrogen and oxygen concentration, because we concluded that nitrogen and oxygen concentration by itself is not an effective indicator of proper landfill gas system operation. This conclusion is explained in the preamble to the 2016 NSPS (81 FR 59332, August 29, 2016). In addition, we propose to further amend the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) by increasing the operational standard for temperature at wellheads from 131 degrees Fahrenheit (°F) to 145 °F (40 CFR 63.1958(c)). The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) maintains the existing operational standards for negative pressure (40 CFR 63.1958(b)). The proposed changes to eliminate the nitrogen and oxygen operating standard and increase the wellhead temperature operating standard would reduce the burden on regulated entities and delegated state, local, and tribal agencies addressing inquiries related to operating standards in several ways. First, this proposed change removes the requirement to take corrective action for nitrogen and oxygen limits. Second, this change would reduce the number of requests and burden associated with submitting and reviewing the requests for higher operating values for oxygen and nitrogen. Third, the proposed increase in temperature operating limit is expected to reduce the number of requests for higher operating values. Similarly, the higher temperature standard is expected to reduce the frequency of corrective action for exceeding the temperature limit. In addition to reducing the burden associated with these wellhead operating standards, these changes are expected to promote greater flexibility and autonomy to landfill owners and operators with regards to wellhead operations. For example, landfill owners or operators may employ cover practices or GCCS best management practices that are suitable for their sites and GCCS designs, thereby allowing them to collect more LFG and reduce emissions without the risk of exceeding a wellhead operating parameter.

The purpose of the wellhead monitoring is to prevent fires and avoid conditions that inhibit anaerobic decomposition of the waste. In revising the NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf), the EPA received substantial comments that operation at a specific fixed level of nitrogen and oxygen concentration does not achieve the intended objectives and can become a barrier that prevents proactive landfill gas collection practices, such as connecting the gas collection system to the leachate collection system or installing early gas collectors (81 FR 59346 and 81 FR 59292, August 29, 2016). Although landfill owners or operators are not required to maintain specific nitrogen and oxygen operating limits, we propose to retain the requirement to monitor nitrogen and oxygen and maintain records at the wellhead because this parameter is an important factor for the landfill operator to evaluate along with other factors to determine how well the landfill is being operated to effectively capture landfill gas, promote efficient anaerobic decomposition, and prevent fires (40 CFR 63.1961(a)). The landfill owner or operator must make these records available to the Administrator (EPA Administrator or administrator of a state air pollution control agency or his or her designee) upon request (40 CFR 63.1983(i)).

Regarding temperature, the EPA did not increase the operating standard in the 2016 MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (81 FR 59276, August 29, 2016). Although several commenters supported removing the temperature parameters, other commenters were concerned with fire risks if the parameter was removed. At the time, the EPA consulted with EPA Regions about approaches taken in consent decrees and other enforcement actions involving elevated temperature values. Since the 2016 revisions to the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf), the EPA has reviewed several consent decrees in additional detail.[26] [27] [28] These consent decrees have temperature operating limits ranging between 131 °F to 185 °F. With higher temperatures come several addditional monitoring requirements. In addition, higher operating value guidance from Ohio EPA indicated that Ohio EPA generally will concur with requests for operating limits up to 150 °F, as long as additional data are made available.[29] The EPA has also reviewed data on requests for higher temperature operating values in EPA Region 5. Based on these data, 64 percent of all higher operating value (HOV) requests were at 145 °F or less and 95 percent of requests were below 150 °F.[30] Additionally, a Solid Waste Assosciation of North America (SWANA) manual of practice for LFG GCCS indicates that polyvinyl chloride piping begins to fail at 145 °F and fails at 165 °F, temperatures above 140 °F could indicate aerobic conditions, and landfill gas temperature over 135 °F indicates a possible subsurface oxidation event (SOE). Optimal range for mesophilic bacteria is 77–104 °F, and for thermophilic bacteria is 131–149 °F (see page 9–8).[31]

Based on the review of these additional data, the EPA is proposing to increase the temperature operating standard 14 °F, from 131 °F to 145 °F (40 CFR 63.1958(c)). We propose to require the landfill owner or operator to report any temperature readings that exceed 145 °F in semi-annual reports and maintain records of all temperature monitoring at the wellhead because this parameter is an important factor for the landfill operator to evaluate along with other factors to determine how well the landfill is being operated to effectively capture landfill gas, promote efficient anaerobic decomposition, and prevent fires. The landfill owner or operator must make these records available to the Administrator (EPA Administrator or administrator of a state air pollution control agency or his or her designee) upon request (40 CFR 63.1983(i)).

We request comment on the removal of oxygen and nitrogen wellhead operating standards and increased temperature operating standard.

3. Enhanced Monitoring and Reporting for Elevated Wellhead Temperature

Given previous concerns with fire risks from elevated temperatures, and the fact that parameters other than temperature can be indicators of SOE, and based on review of the aforementioned consent decrees and guidance materials, the EPA is also proposing enhanced wellhead monitoring and visual inspections for SOE (40 CFR 63.1961(a)), and in some cases more frequent reporting, for any landfill with wellhead temperature exceeding 145 °F. These requirements would apply to all wells with an exceedance, unless a higher operating value has been approved, in which case the stipulations of the approved HOV applies (40 CFR 63.1961(a)). The EPA is proposing to require weekly observations for SOE, as well as weekly monitoring of CO, oxygen, and methane. Temperature readings will also be required weekly at the wellhead and at downwell increments for every 10 vertical feet in the well (40 CFR 63.1961(a)).

The EPA is proposing to require an independent laboratory analysis of each CO measurement, using EPA Method 10 (40 CFR 63.1961(a)(5)(vi)(A)). The EPA is proposing to monitor methane with a methane meter using EPA Method 3C or EPA Method 18 or a portable gas composition analyzer provided that the analyzer is calibrated and the analyzer meets all quality assurance and quality control requirements for EPA Method 3C or EPA Method 18 (40 CFR 63.1961(a)(5)). The EPA is proposing downwell temperature measurements with either a removable thermotet or temporary or permanat thermocouples installed in the well. All of these data will be required to be submitted in the semi-annual report and maintained as records (40 CFR 63.1981(h)). Each report will also include a trend analysis of the weekly monitoring results over time, for each well. Enhanced monitoring will begin for 7 days and continue until the measured wellhead operating temperature is 145 °F or less, or the higher operating value is approved, whichever comes first.

For landfills that have any temperature reading of 170 °F or above at either the wellhead or on any of the downwell measurements, and a CO reading of 1,500 ppmv or above, a 24-hour electronic report will be required to notify the delegated agency about the well.

We request comment on the enhanced monitoring and reporting requirements for elevated temperatures.

4. Corrective Action

Under the current MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), if a landfill exceeds a wellhead operating parameter, the landfill owner or operator must initiate corrective action within 5 days of the measurement as described in the MSW Landfills NSPS (40 CFR part 60, subpart

[26] *United States* v. *Forward, Inc.,* Consent Decree, Case No. 2:11–cv–00590 EFB (E.D.Cal. May 2, 2012).

[27] *United States of America* v. *County of Maui,* Consent Decree, Case No. 1:12–cv–00571–LEK–RLP (D.Haw. December 27, 2012).

[28] Waimanalo: *United States of America* v. *Waste Management of Hawaii, Inc., and City and County of Honolulu,* Consent Decree, Case No. 1:13 cv–00095 (D.Haw. April 18, 2013).

[29] Ohio EPA. *Guidance Document for Higher Operating Value Demonstrations. http://web.epa.state.oh.us/eBusinessCenter/Agency/DAPC/HOV%20Demonstration.doc.*

[30] See docketed memorandum, *Analysis of HOV Requests for Wellhead Temperature.*

[31] SWANA/National Renewable Energy Laboratory (NREL). *Landfill Gas Operation and Maintenance Manual of Practice.* 1997. NREL/SR–430–23070.

WWW). If the exceedance cannot be corrected within 15 days, the landfill owner or operator must prepare to expand the GCCS within 120 days or obtain approval by the EPA or the delegated state agency for an alternative operating limit. Commenters on the revised NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf) that were proposed in 2015 stated that exceedances of elevated nitrogen and oxygen concentration are often not solved by expanding the gas collection system, especially in older areas of the landfill. Commenters also stated that wellhead corrective action often requires site-specific and highly technical solutions other than expanding a collection system. The commenters also stated that despite the 1998 amendments to the MSW Landfills NSPS (63 FR 32748, June 16, 1998), which clarified procedures for landfill owners or operators to submit an alternative timeline for correcting exceedances, there is inconsistency in how delegated state and local agencies are inconsistently interpreting when a landfill must expand the GCCS (see additional discussion at 81 FR 59332, August 29, 2016) or when landfills must submit requests for alternative timelines to correct exceedances. Commenters also expressed concern that many requests for alternative timelines are not approved in a timely manner. Since the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) references the regulatory language for corrective action in the MSW Landfills NSPS (40 CFR part 60, subpart WWW), these same concerns with implementation of corrective action affect landfills subject to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA).

For those reasons, we are proposing to eliminate the requirements for corrective action for nitrogen and oxygen as we have eliminated the operating standard for nitrogen and oxygen, as previously discussed. We are also proposing changes to the corrective action procedures to address positive pressure and elevated temperature to provide flexibility to owners or operators in determining the appropriate remedy, as well as the timeline for implementing the remedy (40 CFR 63.19620(a)). The proposed changes to the timeline and the process for correcting for positive pressure would make the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) requirements the same as the current requirements of the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf). Because the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) is also proposing changes to the temperature wellhead operating standard, the requirements for corrective action procedures being proposed are tied to the exceedance of the 145 °F (instead of 131 °F) standard, otherwise the proposed changes are consistent with the current requirements of the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf). Under these proposed provisions, corrective action must be initiated within 5 days of the measured exceedance (40 CFR 63.1960(a)). If the exceedance cannot be corrected within 15 days, then the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but within no later than 60 days of the measured exceedance. If corrective actions cannot be implemented within 60 days, then the owner or operator must prepare a corrective action analysis and an implementation schedule to complete the corrective actions within 120 days. The root cause analysis and the corrective action analysis for restoring flow does not have to be submitted or approved but must be kept on site as a record. If the exceedance cannot be corrected within 120 days, then within 75 days of the exceedance the owner or operator must submit the root cause analysis, corrective action analysis, and the corresponding implementation timeline to the Administrator for approval.

For the corrective action required to address positive pressure or elevated temperature, the owner or operator must keep a record of the root cause analysis conducted, including a description of the recommended corrective actions; the date for corrective actions already completed following the positive pressure reading or wellhead temperature measurement above 145 °F; and for actions not already completed within 60 days of the initial positive pressure reading or wellhead temperature measurement above 145 °F, a schedule for implementation, including proposed commencement and completion dates. For corrective actions taking longer than 60 days to correct the exceedance, the owner or operator would also include in the annual report the root cause analysis, recommended corrective actions, date corrective actions were completed, and schedule for implementing corrective actions. The owner or operator must also notify the Administrator within 75 days. For corrective actions that take longer than 120 days to correct the exceedance, the owner or operator would include, in a separate notification submitted to the Administrator for approval as soon as practicable, but no later than 75 days after the initial positive pressure reading or wellhead temperature measurement above 145 °F, the root cause analysis, recommended corrective actions, date corrective actions taken to date were completed, and proposed schedule for implementing corrective actions (40 CFR 63.1960(a)).

For any wells that have any temperature reading of 170 °F or above at either the wellhead or on any of the downwell measurements, and a CO reading of 1,500 ppmv or above, a shortened period of corrective action, not to exceed 15 days, is being proposed (40 CFR 63.1960(a)). High temperatures in combination with high levels of CO are considered a positive indication of an active underground landfill fire. As such, timely corrective action of such operating conditions is required to minimize fire risk.

We request comment on the revisions to the corrective action process.

5. Criteria for Removing GCCS

Consistent with the MSW Landfills NSPS and EG (81 FR 59357), the EPA is proposing to add flexibility to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) for determining when it is appropriate to cap, remove, or decommission a portion of the GCCS (40 CFR 63.1957(b)). The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) requires three criteria to be met to remove controls: (1) The landfill is closed, (2) the calculated NMOC emission rate at the landfill is less than 50 Mg/yr on three successive test dates, and (3) the GCCS has operated for at least 15 years. We are proposing to edit the third criteria to allow the landfill owner or operator to choose between the 15 years of GCCS operation, or demonstrate that the GCCS will be unable to operate for 15 years due to declining gas flows. The additional flexibility recognizes that site-specific conditions such as age of the waste, an arid climate, or low organic content. The provision allows the owner or operator to provide data that could be used to demonstrate a GCCS is unable to operate for 15 years such as supplemental fuel use or LFG measurements showing methane content lower than what is viable for combustion in the destruction device.

We request comment on the criteria for removing the GCCS.

6. Definition of Cover Penetration

The MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) requires owners

or operators to conduct surface monitoring of methane emissions on a quarterly basis. The intent of surface monitoring provisions is to maintain a tight cover that minimizes landfill gas emissions through the landfill surface. Methane concentration readings must be taken at specified intervals (distances) and where visual observations, such as distressed vegetation and cracks or seeps in the cover, indicate elevated concentrations of landfill gas. Since the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) was finalized, there have been concerns with inconsistent interpretation and implementation of surface monitoring requirements. The EPA proposed amendments to the MSW Landfills NSPS (40 CFR part 60, subpart WWW), which is referenced by the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), in September 8, 2006 (71 FR 53277). Those amendments were never finalized. In that 2006 notice, the EPA stated that while the regulatory language gives distressed vegetation and cracks as an example of a visual indication that gas may be escaping, this example does not limit the places that should be monitored by landfill staff or by enforcement agency inspectors. In the 2016 amendments to the NSPS (40 CFR part 60, subpart XXX) and EG, the EPA reiterated this interpretation (79 FR 41812, July 17, 2014), and to provide clarity, included the phrase ''. . . and all cover penetrations'' in the regulatory text. The MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf) provided examples of cover penetrations in the preambles to those final rules (81 FR 59343, 81 FR 59288, August 29, 2016) but the rules did not define cover penetrations.

To clarify the implementation concerns, we are proposing to add the phrase, ''. . . at all cover penetrations'' to the regulatory text of the MSW Landfills NESHAP (40 CFR 63.1958(d)), consistent with this phrase in the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and EG (40 CFR part 60, subpart Cf), and we are also proposing the following definition to be added to the rule: Cover penetration means *a wellhead, a part of a landfill gas collection or operations system, and/or any other object that completely passes through the landfill cover. The landfill cover includes that portion which covers the waste, as well as the portion which borders the waste extended to the point where it is sealed with the landfill liner or the surrounding land mass. Examples of what is not a penetration for purposes of this subpart include but are not limited to: Survey stakes, fencing including litter fences, flags, signs, utility posts, and trees so long as these items do not pass through the landfill cover.*

We request comment on the proposed definition and specific examples of what has and has not historically been interpreted to be a cover penetration by both regulatory agencies and affected sources.

7. Electronic Reporting

The EPA proposes to require owners or operators of new or modified landfills to submit electronic copies of certain required performance test reports, NMOC emission rate reports, and semi-annual reports and bioreactor 40-percent moisture reports through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI) (40 CFR 63.1981(l)). Owners or operators are allowed to maintain electronic copies of the records in lieu of hardcopies to satisfy Federal recordkeeping requirements. The requirement to submit performance test data electronically to the EPA applies to those performance tests conducted using test methods that are supported by the Electronic Reporting Tool (ERT). The proposed rule requires that performance test results collected using test methods that are supported by the EPA's ERT as listed on the ERT website: (*https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert*) at the time of the test be submitted in the format generated through the use of the ERT and that other performance test results be submitted in portable document format (PDF) using the attachment module of the ERT. When the EPA adds new methods to the ERT, a notice will be sent out through the Clearinghouse for Inventories and Emissions Factors (CHIEF) Listserv (*https://www.epa.gov/airemissions-inventories/emissionsinventory-listservs*) and a notice of availability will be added to the ERT website. You are encouraged to check the ERT website regularly for up-to-date information on methods supported by the ERT.

The EPA is requiring owners and operators of MSW landfill facilities to submit electronic copies of certain required performance test reports, periodic reports, annual reports through the EPA's CDX using the CEDRI.

Additionally, the EPA has identified two broad circumstances in which electronic reporting extensions may be provided. In both circumstances, the decision to accept the claim of needing additional time to report is within the discretion of the Administrator, and reporting should occur as soon as possible. The EPA is providing these potential extensions to protect owners and operators from noncompliance in cases where they cannot successfully submit a report by the reporting deadline for reasons outside of their control. In 40 CFR 63.1981(n), the EPA addresses the situation where an extension may be warranted due to outages of the EPA's CDX or CEDRI that precludes an owner or operator from accessing the system and submitting required reports. In 40 CFR 63.1981(o), the EPA addresses the situation where an extension may be warranted due to a force majeure event, which is defined as an event that will be or has been caused by circumstances beyond the control of the affected facility, its contractors, or any entity controlled by the affected facility that prevents an owner or operator from complying with the requirement to submit a report electronically as required by this rule. Examples of such events are acts of nature, acts of war or terrorism, or equipment failure or safety hazards beyond the control of the facility.

The electronic submittal of the reports addressed in this rulemaking will increase the usefulness of the data contained in those reports, is in keeping with current trends in data availability and transparency, will further assist in the protection of public health and the environment, will improve compliance by facilitating the ability of regulated facilities to demonstrate compliance with requirements and by facilitating the ability of delegated state, local, tribal, and territorial air agencies and the EPA to assess and determine compliance, and will ultimately reduce burden on regulated facilities, delegated air agencies, and the EPA. Electronic reporting also eliminates paper-based, manual processes, thereby saving time and resources, simplifying data entry, eliminating redundancies, minimizing data reporting errors, and providing data quickly and accurately to the affected facilities, air agencies, the EPA, and the public.

8. Changes to the SSM Provisions

In its 2008 decision in *Sierra Club* v. *EPA,* 551 F.3d 1019 (D.C. Cir. 2008), the Court vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of SSM. Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), holding that under section 302(k) of the CAA, emissions standards or limitations must be continuous in nature and that the SSM exemption violates the CAA's

requirement that some CAA section 112 standards apply continuously.

We are proposing to eliminate the SSM exemption, which is contained at 40 CFR 63.1960 of subpart AAAA. Consistent with *Sierra Club* v. *EPA,* we are proposing standards in this rule that apply at all times. We are also proposing several revisions to Table 1 to Subpart AAAA of Part 63—Applicability of NESHAP General Provisions to Subpart AAAA, as explained in more detail below. For example, we are proposing to eliminate the incorporation of the General Provisions' requirement to develop an SSM plan. We also are proposing to eliminate and revise certain recordkeeping and reporting requirements related to the SSM exemption.

The EPA has attempted to ensure that the provisions we are proposing to eliminate are inappropriate, unnecessary, or redundant in the absence of the SSM exemption. We are specifically seeking comment on whether we have successfully done so.

In proposing the standards in this rule, the EPA has taken into account startup and shutdown periods and, for the reasons explained below, has proposed alternate standards for those periods.

a. Periods of SSM

Consistent with *Sierra Club* v. *EPA* (551 F.3d 1019 (D.C. Cir. 2008)), the EPA is proposing that standards in CFR part 63, subpart AAAA, apply at all times. The 40 CFR part 63 General Provisions, which define SSM, were written for typical industrial or manufacturing sources and associated processes. Many of these sources and processes may, at times, be shut down entirely for clean-out, maintenance, or repairs, and then restarted. Applying the standards at all times, including periods of startup and shutdown, is intended to minimize excess emissions when the source or process ceases operation or commences operation, or malfunctions. Landfill emissions, however, are produced by a continuous biological process that cannot be stopped or restarted. For landfills, the primary SSM concern is with operation of the landfill GCCS and associated monitoring equipment, not with the startup, shutdown, or malfunction of the entire source. Thus, SSM provisions in the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) focus on the gas collection system, gas control system, and gas treatment system, which is part of the emission control system.

b. Periods of Malfunction

Periods of startup, normal operations, and shutdown are all predictable and routine aspects of a source's operations. Malfunctions, in contrast, are neither predictable nor routine. Instead they are, by definition, sudden, a malfunction is an infrequent and not reasonably preventable failures of emissions control, process or monitoring equipment (40 CFR 63.2). The EPA interprets CAA section 112 as not requiring emissions that occur during periods of malfunction to be factored into development of CAA section 112 standards and this reading has been upheld as reasonable by the Court in *U.S. Sugar Corp.* v. *EPA,* 830 F.3d 579, 606–610 (D.C. Cir. 2016). Under CAA section 112, emissions standards for new sources must be no less stringent than the level ''achieved'' by the best controlled similar source and for existing sources generally must be no less stringent than the average emission limitation ''achieved'' by the best performing 12 percent of sources in the category. There is nothing in CAA section 112 that directs the Agency to consider malfunctions in determining the level ''achieved'' by the best performing sources when setting emission standards. As the Court has recognized, the phrase ''average emissions limitation achieved by the best performing 12 percent of'' sources '' 'says nothing about how the performance of the best units is to be calculated.' '' *Nat'l Ass'n of Clean Water Agencies* v. *EPA,* 734 F.3d 1115, 1141 (D.C. Cir. 2013) (quoting *Sierra Club* v. *EPA,* 167 F.3d at 661). While the EPA accounts for variability in setting emissions standards, nothing in CAA section 112 requires the Agency to consider malfunctions as part of that analysis. The EPA is not required to treat a malfunction in the same manner as the type of variation in performance that occurs during routine operations of a source. A malfunction is a failure of the source to perform in a ''normal or usual manner'' and no statutory language compels the EPA to consider such events in setting CAA section 112 standards.

As the Court recognized in *U.S. Sugar Corporation,* accounting for malfunctions in setting numerical or work practice emission standards would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. The Court stated, ''As for work-practice standards, the EPA would have to conceive of a standard that could apply equally to the wide range of possible boiler malfunctions, ranging from an explosion to minor mechanical defects. Any possible standard is likely to be hopelessly generic to govern such a wide array of circumstances.'' 830 F.3d at 608. As such, the performance of units that are malfunctioning is not ''reasonably'' foreseeable. See, *e.g., Sierra Club* v. *EPA,* 167 F.3d 658, 662 (D.C. Cir. 1999) (internal citation omitted) (''The EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. We generally defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to 'invest the resources to conduct the perfect study.' ''). See also, *Weyerhaeuser* v. *Costle,* 590 F.2d 1011, 1058 (D.C. Cir. 1978) (internal citation omitted) (''In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation.''). In addition, emissions during a malfunction event can be significantly higher than emissions at any other time of source operation. For example, if an air pollution control device with 99-percent removal goes off-line as a result of a malfunction (as might happen if, for example, the bags in a baghouse catch fire) and the emission unit is a steady state type unit that would take days to shut down, the source would go from 99-percent control to zero control until the control device was repaired. The source's emissions during the malfunction would be 100 times higher than during normal operations. As such, the emissions over a 4-day malfunction period would exceed the annual emissions of the source during normal operations. As this example illustrates, accounting for malfunctions could lead to standards that are not reflective of (and significantly less stringent than) levels that are achieved by a well-performing non-malfunctioning source. It is reasonable to interpret CAA section 112 to avoid such a result. The EPA's approach to malfunctions is consistent with CAA section 112 and is a reasonable interpretation of the statute.

Although no statutory language compels the EPA to set standards for

malfunctions, the EPA has the discretion to do so where feasible. For example, in the Petroleum Refinery Sector RTR, the EPA established a work practice standard for unique types of malfunctions that result in releases from pressure relief devices or emergency flaring events because the EPA had information to determine that such work practices reflected the level of control that applies to the best performers (80 FR 75178, 75211–75214, December 1, 2015). The EPA can consider whether circumstances warrant setting standards for a particular type of malfunction and, if so, whether the EPA has sufficient information to identify the relevant best performing sources and establish a standard for such malfunctions.

In the event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, the EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. The EPA would also consider whether the source's failure to comply with the CAA section 112(d) standard was, in fact, sudden, infrequent, not reasonably preventable and was not instead caused in part by poor maintenance or careless operation. See 40 CFR 63.2 (definition of malfunction).

c. Proposed Work Practice for SSM Events

Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], by reference to 40 CFR part 60, subpart WWW, the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) exempts periods of SSM that do not exceed 5 days for the collection system or 1 hour for the treatment or control device. See 40 CFR 60.755(e). However, this exclusion is inconsistent with the *Sierra Club* 2008 decision, which ruled that emission standards apply at all times. Accordingly, we are proposing that the provisions of 40 CFR part 63, subpart AAAA, apply at all times after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. We also propose an additional work practice requirement that would apply whenever the collection and control system is not operating. The work practice requirement is proposed at 40 CFR 63.1958(e). To prevent free venting of landfill gas to the atmosphere when the collection or control system is not operating for any reason, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of gas to the atmosphere must be closed within 1 hour. The additional work practice standard also requires all repairs to the GCCS proceed expeditiously so that the amount of downtime is minimized. This standard reflects the fact that many or most repairs to restore the GCCS to operation can be completed in 1 or 2 days, but some may require longer periods of time to complete. Regardless of the quantity of work necessary to repair the system, the source should proceed promptly to address GCCS downtime.

The standard requires that the GCCS be in operation at all times. The additional work practice standard to shut down the gas mover equipment and all valves contributing to venting of gas to the atmosphere and to make all repairs to the GCCS exeditiously is an additional requirement that applies while the control system is not operating. Compliance with the work practice requirement does not constitute compliance with the applicable MSW Landfills NESHAP standards in 40 CFR part 63, subpart AAAA. The operating standards of 40 CFR 63.1958, which require operation of the gas collection system vented to a control system that complies with the applicable requirements of 40 CFR 63.1957, apply at all times after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Compliance with the work practice requirement is necessary, but not in all cases sufficient, to demonstrate compliance with the general duty in 40 CFR 63.1955(c) to minimize emissions at all times. The EPA will determine whether a landfill owner/opertor has complied with the general duty to minimize emissions at all times based on compliance with the work practice requirements, actions taken to minimize the duration of the period of SSM when the GCCS is not operating under normal conditions, and other relevant case-specific factors.

If the EPA determines in a particular case that an enforcement action against a source for violation of an emission standard is warranted, the source can raise any and all defenses in that enforcement action and the Federal district court will determine what, if any, relief is appropriate. The same is true for citizen enforcement actions. Similarly, the presiding officer in an administrative proceeding can consider any defense raised and determine whether administrative penalties are appropriate.

In summary, the EPA interpretation of the CAA and, in particular, CAA section 112 is reasonable and encourages practices that will avoid malfunctions. Administrative and judicial procedures for addressing exceedances of the standards fully recognize that violations may occur despite good faith efforts to comply and can accommodate those situations. *U.S. Sugar Corp.* v. *EPA,* 830 F.3d 579, 606–610 (2016).

d. Revisions to the 40 CFR Part 63 General Provisions

We are proposing revisions to Table 1 to Subpart AAAA of Part 63 to specify the sections of the General Provisions that apply and those that do not apply to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). We also are proposing that certain elements of the 40 CFR part 63 General Provisions (subpart A) that are inconsistent with the *Sierra Club* 2008 decision pertaining to SSM do not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. We propose that the provisions that the emission standards apply at all times, including the SSM work practice requirements and the elimination of the SSM plan and associated recordkeeping and reporting, would become effective 18 months AFTER DATE OF PUBLICATION of the rule revision. The lag time is necessary to allow sufficient time for landfill owners and operators to plan and implement procedures for complying with the revised SSM provisions. For periods of SSM, the SSM plan and associated requriements will continue to apply until such time as these proposed rule changes take effect. The paragraphs below in this section explain the proposed changes to Table 1 of 40 CFR part 63, subpart AAAA.

40 CFR 63.1956(e) General duty. We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.6(e)(1)(i) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Section 63.6(e)(1)(i) describes the general duty to minimize emissions. Some of the language in that section is no longer necessary or appropriate in light of the elimination of the SSM exemption. We are proposing instead to add general duty regulatory text at 40 CFR 63.1955(c) that reflects the general duty to minimize emissions while eliminating the reference to periods covered by an SSM exemption. The current language in 40 CFR 63.6(e)(1)(i) characterizes what the general duty

entails during periods of SSM. With the elimination of the SSM exemption, there is no need to differentiate between normal operations, startup and shutdown, and malfunction events in describing the general duty. Therefore, the language the EPA is proposing for 40 CFR 63.1955(c) does not include that language from 40 CFR 63.6(e)(1).

We are also proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.6(e)(1)(ii) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Section 63.6(e)(1)(ii) imposes requirements that are not necessary with the elimination of the SSM exemption or are redundant with the general duty requirement being added at 40 CFR 63.1956(e).

SSM plan. We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that paragraphs 40 CFR 63.6(e)(3)(i) through (ix) do not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Generally, these paragraphs require development of an SSM plan and specify SSM recordkeeping and reporting requirements related to the SSM plan. The EPA is proposing to remove the SSM exemptions. Therefore, affected units will be subject to an emission standard during such events. The applicability of a standard during such events will ensure that sources have ample incentive to plan for and achieve compliance and, thus, the SSM plan requirements are no longer necessary.

Compliance with Standards. We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.6(f)(1) and (h)(1) do not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. The current language of 40 CFR 63.6(f)(1) exempts sources from non-opacity standards during periods of SSM, and 40 CFR 63.6(h)(1) exempts sources from opacity standards. As discussed above, the Court in *Sierra Club* v. *EPA,* vacated the exemptions contained in this provision and held that the CAA requires that some CAA section 112 standard apply continuously. Consistent with *Sierra Club* v. *EPA,* the EPA is proposing to revise standards in this rule to apply at all times.

40 CFR 63.1959 Performance testing. We are proposing to add a performance testing requirement at 40 CFR 63.1959(f). The performance testing requirements of 40 CFR 63.7 of the General Provisions do not apply for this subpart after [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. The performance testing requirements that we are proposing to add differ from the General Provisions performance testing provisions in several respects. The proposed regulatory text does not allow performance testing during startup or shutdown. As in 40 CFR 63.7(e)(1), performance tests conducted under this subpart should not be conducted during malfunctions because conditions during malfunctions are often not representative of normal operating conditions. The EPA is proposing to add language that requires the owner or operator to record the process information that is necessary to document operating conditions during the test and include in such record an explanation to support that such conditions represent normal operation. We are proposing that, upon request, the owner or operator make available to the Administrator such records ''as may be necessary to determine the condition of the performance test.''

40 CFR 63.1983 Recordkeeping. We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) entry for 40 CFR 63.10(b)(2) that 40 CFR 63.10(b)(2)(i) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Section 63.10(b)(2)(i) describes the recordkeeping requirements during startup and shutdown. We are instead proposing to add recordkeeping requirements for startup and shutdown to 40 CFR 63.1983. Because 40 CFR 63.1958(e) specifies a different standard for periods when the collection and control system is not operating under normal conditions (which would include periods of startup, shutdown, and maintenance or repair), it will be important to know when such startup and shutdown periods begin and end in order to determine compliance with the appropriate standard. Thus, the EPA is proposing to add language to 40 CFR 63.1983(c)(6) requiring that a landfill owner or operator must report the date, time, and duration of each startup and shutdown period.

We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.10(b)(2)(ii) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Section 63.10(b)(2)(ii) describes the recordkeeping requirements during a malfunction. The EPA is proposing to add such requirements to 40 CFR 63.1983(c)(6). The regulatory text we are proposing differs from the General Provisions it is replacing in that the General Provisions requires the creation and retention of a record of the occurrence and duration of each malfunction of process, air pollution control, and monitoring equipment. The EPA is proposing that this requirement apply to any failure to meet an applicable standard and is requiring that the source record the date, time, and duration of the failure rather than the ''occurrence.'' The EPA is also proposing to add to 40 CFR 63.1983(c)(7), a requirement that sources keep records that include a list of the affected equipment and actions taken to minimize emissions. The EPA is proposing to require that sources keep records of this information to ensure that there is adequate information to allow the EPA to determine how the source met the general duty to minimize emissions when the source has failed to meet an applicable standard.

After [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], we will no longer require owners or operators to determine whether actions taken to correct a malfunction are consistent with an SSM plan, because plans would no longer be required. The proposed amendments, therefore, eliminate the cross reference to 40 CFR 63.10(d)(5)(i) that contains the description of the previously required SSM report format and submittal schedule from this section. These specifications are no longer necessary because the events will be reported in otherwise required reports with similar format and submittal requirements.

We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.10(b)(2)(iv) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. When applicable, the provision requires sources to record actions taken during SSM events when actions were inconsistent with their SSM plan. The requirement is no longer appropriate because SSM plans will no longer be required. The requirement previously applicable under 40 CFR 63.10(b)(2)(iv)(B) to record actions to minimize emissions and record corrective actions is now applicable by reference to 40 CFR 63.1983.

We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.10(b)(2)(v) does not apply after [DATE 18 MONTHS AFTER DATE OF

PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. When applicable, the provision requires sources to record actions taken during SSM events to show that actions taken were consistent with their SSM plan. The requirement is no longer appropriate because SSM plans will no longer be required.

We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) entry for 40 CFR 63.10(c) to specify that 40 CFR 63.10(c)(15) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. When applicable, the provision allows an owner or operator to use the affected source's SSM plan or records kept to satisfy the recordkeeping requirements of the SSM plan, specified in 40 CFR 63.6(e), to also satisfy the requirements of 40 CFR 63.10(c)(10) through (12). The EPA is proposing to eliminate this requirement because SSM plans would no longer be required, and, therefore, 40 CFR 63.10(c)(15) no longer serves any useful purpose for affected units.

40 CFR 63.1981 Reporting. We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) that 40 CFR 63.10(d)(5)(i) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. Section 63.10(d)(5)(i) describes the reporting requirements for startups, shutdowns, and malfunctions. To replace the General Provisions reporting requirement, the EPA is proposing to add reporting requirements to 40 CFR 63.1981. The replacement language differs from the General Provisions requirement in that it eliminates periodic SSM reports as a stand-alone report. We are proposing language that requires sources that fail to meet an applicable standard at any time to report the information concerning such events in the annual report already required under this rule. We are proposing that the report must contain the number, date, time, duration, and the cause of such events (including unknown cause, if applicable), and a list of the affected equipment. The EPA is proposing this requirement to ensure that there is adequate information to determine compliance, to allow the EPA to determine the severity of the failure to meet an applicable standard, and to provide data that may document how the source met the general duty to minimize emissions during a failure to meet an applicable standard.

We will no longer require owners or operators to determine whether actions taken to correct a malfunction are consistent with an SSM plan, because plans would no longer be required after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. The proposed amendments, therefore, eliminate this reporting requirement, which is contained in 40 CFR 63.6(e)(3). This reporting is no longer necessary because malfunction events will be reported in otherwise required reports with similar format and submittal requirements.

We are proposing to specify in the General Provisions table (Table 1 to Subpart AAAA of Part 63) entry for 40 CFR 63.10(d)(5) to specify that 40 CFR 63.10(d)(5)(ii) does not apply after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. 40 CFR 63.10(d)(5)(ii) describes an immediate report for startups, shutdowns, and malfunctions when a source fails to meet an applicable standard but does not follow the SSM plan. We will no longer require owners and operators to report when actions taken during a startup, shutdown, or malfunction were not consistent with an SSM plan, because plans would no longer be required.

We request comments on the proposed approach for updating the SSM provisions in the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) to be consistent with the Court decision in *Sierra Club* v. *EPA,* 551 F.3d 1019. In addition, we specifically request comment on the following topics:

- Periods of time when GCCS downtime is unavoidable, mandatory, necessary for safety, and/or necessary to minimize emissions.
- Practices or techniques that can be delpoyed to avoid or reduce GCCS downtime to a minimum during periods of repairs. These may include predictive and preventative maintentance, redundancy, and correction measures.
- The work practice requiring sources to effectuate repairs to the GCCS in a manner that the shutdown timeframe is kept to a minimum.

9. Other Clarifications and Changes To Conform With the MSW Landfills NSPS

Changes to the MSW Landfills NSPS (40 CFR part 60, subpart XXX) in 2016 were designed to refine requirements and to simplify and streamline implementation of the rule. With incorporation of compliance provisions from the MSW Landfills NSPS (40 CFR part 60, subpart XXX) into the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA), we are likewise including the following provisions:

Portable gas analyzers. We are allowing the use of portable gas composition analyzers to monitor the oxygen level at a wellhead (40 CFR 63.1961(a)). This change allows owners or operators to employ proven, reliable devices that are commonly used in practice to measure wellhead parameters.

More precise location data. We are proposing to require owners and operators to report more precise locational data for each surface emissions exceedance (40 CFR 63.1961(f)). This change will provide a more robust and long-term record of GCCS performance. In addition, more precise locational data will help ensure that the owner or operator can easily locate and correct breaches in the landfill cover, while helping the EPA and states enforce the rule.

Update and approval of design plan. We are proposing to refine the criteria for updating a design plan, consistent with the MSW Landfills NSPS (40 CFR part 60, subpart XXX). Landfill owners or operators must submit an updated design plan for approval based on the following criteria: (1) Within 90 days of expanding operations to an area not covered by the previously approved design plan; and (2) before installing or expanding the gas collection system in a way that is not consistent to the previous design plan (40 CFR 63.1981(e)). These changes help ensure that the as-built GCCS is consistent with the design plan.

Uses of treated landfill gas. Consistent with the MSW Landfills NSPS (40 CFR part 60, subpart XXX), we are proposing to clarify that the use of treated landfill gas is not limited to use as a fuel for a stationary combustion device, but also includes other uses such as the production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process (40 CFR 63.1959(b)). This revision allows other beneficial uses of landfill gas that are being implemented.

Control system and collection and control system. We propose to standardize the terms ''control system'' and ''collection and control system'' throughout the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) in order to use consistent terminology throughout the regulatory text.

Exemption. We propose to exempt owners/operators of boilers and process heaters with design capacities of 44 megawatts or greater from the requirement to conduct an initial performance test because large boilers

and process heaters consistently achieve the required level of control (67 FR 36478, May 23, 2002).

Temperature monitoring. We propose to remove the term ''combustion'' from the requirement to monitor temperature of enclosed combustors. For some enclosed combustors, it is not possible to monitor temperature inside the combustion chamber to determine combustion temperature. The proposed amendment clarifies that the ''combustion'' temperature does not have to be monitored. Temperature could be monitored at another location, as long as the monitored temperature relates to proper operation of the enclosed combustor (71 FR 53276, September 8, 2006).

Definitions. We refined multiple definitions in the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and are pulling those definitions forward into the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) to ensure consistency in terms across these Federal landfills regulations (40 CFR 63.1990). Revised definitions include Treated Landfill Gas, Treatment System and Treatment System Monitoring, Modification, Household waste, and Segregated Yard Waste.

We request comments on these changes to the regulatory text of MSW Landfills NSPS (40 CFR part 60, subpart XXX).

E. What compliance dates are we proposing?

The EPA is proposing that facilities may have up to 18 months after the effective date of the final rule to begin complying with the final rule. Before this date, facilities have the option to comply with the rule as it was finalized in 2003. This allowance is being made considering that the rule text has been significantly re-organized, introduces new electronic reporting requirements, and makes other adjustments to certain operating standards and associated recordkeeping, reporting, and monitoring requirements. Although these requirements are very simlar to the requirements finalized in the MSW Landfills NSPS (40 CFR part 60, subpart XXX), the EPA recognizes that not all MSW landfills have become subject to the MSW Landfills NSPS (40 CFR part 60, subpart XXX). The EPA requests comment on this timeframe.

The EPA recognizes that many owners and operators have already submitted reports under different subparts. For example, most MSW landfills have already submitted an initial NMOC emission rate report. If an MSW landfill owner or operator has previously submitted an initial NMOC emission rate report under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or 40 CFR part 62, subpart GGG (the MSW Landfills Federal Plan) or an EPA approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc, or 40 CFR part 60, subpart Cf, then that submission constitutes compliance with the initial NMOC emission rate report in the MSW Landfills NESHAP and you do not need to re-submit the report. However, in the first semi-annual report required in this rule, you must include a statement certifying prior submission of the report and the date of that submittal.

V. Summary of Cost, Environmental, and Economic Impacts

A. What are the affected sources?

We anticipate that approximately 738 active or closed MSW landfills in the United States and territories will be affected by these proposed amendments in the year 2023. This number is based on all landfills that accepted waste after November 8, 1987, that have a design capacity of at least 2.5 million Mg and 2.5 million m^3. In addition, this number relects the subset of landfills meeting these two criteria with modeled emission estimates of 50 Mg/yr NMOC or greater that have installed controls on or before 2023. While the EPA recognizes some uncertainty regarding which landfills have actually exceeded the emission threshold, given the allowance of sites to estimate emissions using Tiers 1, 2, or 3, and the site-specific nature of NMOC concentrations, the number of landfills that are co-located major sources and, therefore, also subject to control requirements under this rule is also unknown. Therefore, 738 is the best estimate of the affected sources.

B. What are the air quality impacts?

The proposed amendments are expected to have a minimal impact on air quality. While these amendments do not require stricter control requirements or work practice standards on landfills to comply with the proposed amendments, some landfills may find that the adjustments made to the oxygen and nitrogen and temperature wellhead operating standards provide enough operational flexibility to install, expand, and operate additional voluntary GCCS, which could reduce emissions. The other proposed revisions that affect testing, monitoring, recordkeeping, and reporting will ensure that the GCCS equipment continues to perform as expected and provide reliable data from each facility to be reported for compliance.

C. What are the cost impacts?

The EPA has estimated $0 compliance costs for all new and existing sources affected by this proposal, beyond what is already required under the existing MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) and what is already included in this NESHAP's Information Collection Request (ICR). Furthermore, landfills that commenced construction, modification, or reconstruction after July 17, 2014, must comply with the similar, yet, more stringent requirements of the MSW Landfills NSPS (40 CFR part 60, subpart XXX). The proposed changes to the operational standards for wellhead temperature and oxygen and nitrogen are likely to reduce the number of requests for HOVs, which in turn could decrease compliance costs. Many of the proposed changes in these amendments allow the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA) to better align with the requirements of the MSW Landfills NSPS (40 CFR part 60, subpart XXX), and simplify compliance, which in turn could reduce costs. Potential cost savings of these changes are unquantified. Addtionally, the proposed removal of the requirement to develop an SSM plan does not result in a cost savings for existing facilities versus the 2003 NESHAP. However, there would be a cost savings for new or modified facilities. The latest ICR renewal for the 2003 NESHAP (ICR Number 1938.07, OMB Control Number 2060–0505) quantifies costs for 13 new or modified landfills per year to preapre an SSM plan. The labor cost for these 13 landfills is approximately $52,850 per year. In addition, approximately 5 percent of controlling landfills, or 39 landfills per year, is expected to prepare a notification for a deviation from the SSM plan at a labor cost of $7,500 per year. Thus, landfill respondents under the 2003 NESHAP incur costs of approximately $60,350 per year for SSM plans and deviations. In addition, the ICR estimates that the EPA or delegated state agencies must review SSM plans at a labor cost of $5,700 and deviations of SSM reports at a labor cost of $3,100. Thus, the agency burden associated with SSM is approximately $8,800 annually. This proposal does not require an SSM plan, thus, there are cost savings related to the provisions applying at all times: Approximately $60,350 for landfill respondents and approximately $8,800 for agency respondents. We request comment on these potential cost savings due to no longer needing to prepare an SSM plan. See the docketed memorandum, *Cost Impacts of National Emission Standards*

for Hazardous Air Pollutants: Municipal Solid Waste (MSW) Landfills Risk and Technology Review, for additional discussion about the cost impacts.

D. What are the economic impacts?

The economic impact analysis is designed to inform decision makers about the potential economic consequences of a regulatory action. Because there are no costs associated with the current proposal, no economic impacts are anticipated.

E. What are the benefits?

As stated above in section V.B of this preamble, we were unable to quantify the specific emissions reductions associated with adjustments made to the oxygen and nitrogen wellhead operating standards, although this proposed change has the potential to reduce emissions. Any reduction in HAP emissions would be expected to provide health benefits in the form of improved air quality and less exposure to potentially harmful chemicals.

VI. Request for Comments

We solicit comments on this proposed action. In addition to general comments on this proposed action, we are also interested in additional data that may improve risk assessments and other analyses. We are specifically interested in receiving any improvements to the data used in the site-specific emissions profiles used for risk modeling. Such data should include supporting documentation in sufficient detail to allow characterization of the quality and representativeness of the data or information. Section VII of this preamble provides more information on submitting data.

We are also specifically interested in comments related to the changes we are proposing that are descibed in section IV.D of this preamble. The respective topics in section IV.D close with details on the specific information the EPA seeks in comments. From section IV.D of this preamble, we are requesting comments on overall rule reorganization; wellhead temperature operating standards, and associated monitoring, corrective action, and reporting and recordkeeping requirements for temperature; and revisions to the GCCS removal criteria to provide additional flexibility for landfill owners and operators. In addition, the EPA is soliciting comments on potential methane emissions measurement methodologies and concerns identified by stakeholders regarding areas with declinging gas flow, as described in this section of the preamble. Comments on areas with declining gas flow will help the EPA determine the extent of the potential issue and, if necessary, identify potential remedies. The EPA will evaluate all comments and any new information and, if warranted, will initiate a subsequent rulemaking to address any issues raised from this solicitiation of comment.

A. Methane Emissions Measurement Methodologies

Current modeling approaches for estimating landfill emissions, which rely on the decomposition rate of different waste streams buried in a landfill, are prone to uncertainties due to inaccuracies in input data and often unverifiable assumptions. New methane emissions measurement methodologies are emerging that are anticipated to provide landfill methane emission rates (mass per unit time) over time, thereby reducing significantly the uncertainty associated with current modeling and emission measurements approaches. Two promising examples of new methane measurement methodologies being used by research groups to quantify landfill methane emissions are mobile tracer correlation (TC) [32] [33] [34] [35] [36] [37] [38] [39] and discrete area source eddy covariance (DASEC).[40]

1. Mobile Tracer Correlation

This methodology provides a ''snap-shot in time'' assessment of whole facility methane emissions using on-site release of atmospheric tracer gases. It provides a total mass emission rate of methane (or other gas) per unit of time. An instrumented vehicle driving 1 km to 4 km downwind of the landfill simultaneously measures the emitted landfill methane plume along with the superimposed tracer gas release. The landfill methane emission rate is determined through a simple ratio to the known tracer gas release rate. The technique has been demonstrated using a variety of tracer gases and instruments by a number of groups to investigate emissions from landfills and other sources. The mobile TC approach is under development as a Best Available Technique measurement reference document under the European Intergovernmental Panel on Climate

[32] *Methodologies for measuring fugitive methane emissions from landfills—A review;* Jacob, M; Kjeldsen, P.; Scheutz, C.,Waste Management (2019), *https://doi.org/10.1016/j.wasman.2018.12.047.*

[33] *Guidelines for landfill gas emission monitoring using the tracer gas dispersion method;* Scheutz, C.; Kjeldsen, P., Waste Management 85 (2019): 351–360.

[34] *Validation and error assessment of the mobile tracer gas dispersion method for measurement of fugitive emissions from other area sources;* Fredenslund, A.M.; Rees-White, T.C.; Beaven, R.P.; Delre, A.; Finlayson, A.; Helmore, J.; Allen G.; Scheutz, C., Waste Management, 2019, 83, pp. 68–78.R.; Swan, N.D.; Chanton, J.P. Atmos. Environ. 2015, 102 (0), 323–330. *https://doi.org/10.1016/j.wasman.2018.10.036.*

[35] *Development of a mobile tracer correlation method for assessment of air emissions from landfills and other area sources;* Foster-Wittig, T.A.; Thoma, E.D.; Green, R.B.; Hater, G.R.; Swan, N.D.; Chanton, J.P. Atmos. Environ. 2015, 102 (0), 323–330.

[36] *Quantification of methane emissions from 15 Danish landfills using the mobile tracer dispersion method;* Mønster, J.; Samuelsson, J.; Kjeldsen, P.; Scheutz, C. Waste Manage. 2015, 35 (0), 177–186.

[37] *Methane Emissions Measured at Two California Landfills by OTM–10 and an Acetylene Tracer Method;* Green, R.B., Hater, G.R., Thoma, E.D., DeWees, J., Rella, C.W., Crosson, E.R., Goldsmith, C.D., Swan, N., Proceedings of the Global Waste Management Symposium, San Antonio, TX, October 3–6, 2010.

[38] *Development of Mobile Measurement Method Series OTM 33;* Thoma, E.D.; Brantley, H.L.; Squier, B.; DeWees, J.; Segall, R.; Merrill, R.; Proceedings of the Air and Waste Management Conference and Exhibition, Raleigh, NC, June 22–25, 2015.

[39] *Impact of Changes in Barometric Pressure on Landfill Methane Emission;* Xu, L., Lin, X., Amen, J., Welding, K. and McDermitt, D. Global Biogeochemical Cycles 2014, 28(7), pp. 679–695.

[40] *Using Eddy Covariance to Quantify Methane Emissions from a Dynamic Heterogeneous Area;* Li, J.; Green, R.B.; Magnusson, D.A.; Amen, J.; Thoma, E.D.; Foster-Wittig, T.A.; McDermitt, D.K.; Xu, L.; Burba, G., 2015, June. In Proceedings of the Air and Waste Management Conference and Exhibition (pp. 22–25).

Chang (IPCC), Industrial Emissions Directive.

2. Eddy Covariance (EC)

This micrometeorological method estimates the source emission rate from the vertical wind speed and gas concentration above the emitting surface. This technique measures the emissions flux in mass of methane (or other gas) per unit area. The technique is well-established for measurement of emission fluxes from spatially-extended homogenous sources, such as very large, flat fields. The DASEC is an application of EC to finite, heterogeneous area sources. This application of EC has been recently demonstrated on landfills, although method development questions on the effects of topography and variable observational footprint remain. The DASEC provides the potential for long term (near continuous) measurements of discrete sections of a landfill using solar-powered onsite instrumentation. Development of this type of long term measurement capability is critical to better understand and track changes in landfill emissions over time that may be caused by both site management and atmospheric factors.

In sum, as noted above, these techniques are still being investigated and additional work will be needed before the EPA can deem them ready for use in this application. Once additional research is completed, we believe that DASEC used in combination with mobile TC will provide a characterization of methane landfill emissions with significantly reduced uncertainty over current models or measurement techniques. However, the EPA requests comments on these and other potential alternative approaches to emission monitoring at MSW landfills.

B. Areas With Declining Gas Flow

In the proposed revisions to the MSW Landfills NSPS (79 FR 41817, July 17, 2014), the EPA recognized that there are situations in which the quantity of gas production has greatly declined in separate closed areas of some landfills, and the methane content has fallen such that the area is producing insufficient gas to properly operate a GCCS and control device. Thus, the EPA finalized a provision in the MSW Landfills NSPS (81 FR 59343, August 29, 2016) that allows the use of actual flow data when estimating NMOC emissions for the purposes of excluding low- or non-productive areas of the landfill from control. To use this provision, the non-productive area must be physically separated and closed. The EPA requests comments on how these provisions could potentially be improved in the future to better address areas with declining gas flows.

VII. Submitting Data Corrections

The site-specific emissions profiles used in the source category risk and demographic analyses and instructions are available for download on the RTR website at *https://www3.epa.gov/airtoxics/rrisk/rtrpg.html.* The data files include detailed information for each HAP emissions release point for the facilities in the source category.

If you believe that the data are not representative or are inaccurate, please identify the data in question, provide your reason for concern, and provide any ''improved'' data that you have, if available. When you submit data, we request that you provide documentation of the basis for the revised values to support your suggested changes. To submit comments on the data downloaded from the RTR website, complete the following steps:

1. Within this downloaded file, enter suggested revisions to the data fields appropriate for that information.

2. Fill in the commenter information fields for each suggested revision (*i.e.,* commenter name, commenter organization, commenter email address, commenter phone number, and revision comments).

3. Gather documentation for any suggested emissions revisions (*e.g.,* performance test reports, material balance calculations).

4. Send the entire downloaded file with suggested revisions in Microsoft® Access format and all accompanying documentation to Docket ID No. EPA–HQ–OAR–2002–0047 (through the method described in the **ADDRESSES** section of this preamble).

5. If you are providing comments on a single facility or multiple facilities, you need only submit one file for all facilities. The file should contain all suggested changes for all sources at that facility (or facilities). We request that all data revision comments be submitted in the form of updated Microsoft® Excel files that are generated by the Microsoft® Access file. These files are provided on the RTR website at *https://www3.epa.gov/airtoxics/rrisk/rtrpg.html.*

VIII. Incorporation by Reference (IBR)

We are proposing to incorporate by reference ASTM D6522–11—Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers (proposed to be IBR approved for 40 CFR 63.1961(a)(2)(ii) and 40 CFR 63.1961(a)(2)(iii)(B)), which is an alternative for determining oxygen for wellhead standards. For this test method, a gas sample is continuously extracted from a duct and conveyed to a portable analyzer for determination of nitrogen oxides, carbon monoxide, and oxygen gas concentrations using electrochemical cells. Analyzer design specifications, performance specifications, and test procedures are provided to ensure reliable data. This method is an alternative to EPA methods and is consistent with the methods already allowed under the MSW Landfills NSPS (40 CFR part 60, subpart XXX) and MSW Landfills EG (40 CFR part 60, subpart Cf). The ASTM standards are available from American Society for Testing and Materials, 100 Barr Harbor Drive, Post Office Box C700, West Conshohocken, PA 19428–2959. See *http://www.astm.org.*

IX. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was, therefore, not submitted to OMB for review.

B. Executive Order 13771: Reducing Regulations and Controlling Regulatory Costs

This action is expected to be an Executive Order 13771 deregulatory action. Details on the estimated cost savings of this proposed rule can be found in the EPA's analysis of the potential costs and benefits associated with this action.

C. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control number 2060–0505. The only burden created by the proposed rule is limited to affected sources becoming familiar with the changes in the proposed rule. The burden for respondents to review rule requirements each year is already accounted for in the previously approved information collection activities contained in the existing regulations (40 CFR part 63, subpart

AAAA), which were assigned OMB control number 2060–0505. Additionally, changes to 40 CFR part 60, subpart WWW, subpart XXX and subpart Cf only add clarifying language for affected sources and provide alternatives for any deviations from the respective standards. These changes would not increase any burden for affected sources.

D. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden, or otherwise has a positive economic effect on the small entities subject to the rule. This action is projected to affect 738 MSW landfills, and approximately 60 of these facilities are owned by a small entity. The small entities subject to the requirements of this proposed rule may include private small business and small governmental jurisdictions that own or operate landfills, but the cost for complying with the proposed amendments is expected to be $0. We have, therefore, concluded that this action will have no net regulatory burden for all directly regulated small entities.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. While state, local, or tribal governments own and operate landfills subject to these proposed amendments, the impacts resulting from this regulatory action are far below the applicable threshold.

F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action has tribal implications. However, it will neither impose substantial direct compliance costs on federally recognized tribal governments, nor preempt tribal law. The database used to estimate impacts of these proposed amendments identified one tribe, the Salt River Pima-Maricopa Indian Community, that owns three landfills potentially subject to the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA). Two of these landfills are already controlling emissions—the Salt River Landfill and the Tri Cities Landfill. Although the permits for these landfills indicate they are subject to this subpart, these proposed changes are not estimated to increase the costs. The other landfill, North Center Street Landfill, is not estimated to install controls under the MSW Landfills NESHAP (40 CFR part 63, subpart AAAA).

The EPA will consult with tribal officials under the EPA Policy on Consultation and Coordination with Indian Tribes in the process of developing this regulation to permit them to have meaningful and timely input into its development. A summary of that consultation will be provided in the docket for this action once completed.

H. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in sections III.A and C and sections IV.B and C of this preamble.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

J. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR Part 51

This action involves technical standards. For the proposed MSW Landfills NESHAP, the EPA has decided to use EPA Methods 2, 2E, 3, 3A, 3C, 10, 18, 21, 25, 25A, and 25C of 40 CFR part 60, appendix A. The EPA searched for voluntary consensus standards (VCS) using the Enhanced National Standards Service Network (NSSN) Database managed by the American National Standards Institute (ANSI). The EPA also contacted VCS organizations and accessed and searched their databases. Searches were conducted for EPA Methods 2, 2E, 3, 3A, 3C, 10, 18, 21, 25, 25A, and 25C of 40 CFR part 60, appendix A. No applicable VCS were identified for EPA Methods 2E, 21, and 25C. However, the EPA identified three VCS as acceptable alternatives to EPA test methods for the purposes of this rule.

The VCS ASTM D6522–11, ''Standard Test Method for the Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers'' is an acceptable alternative to EPA Method 3A when used at the wellhead before combustion.

The EPA's search identified 15 additional VCS that are potentially applicable for this rule in lieu of EPA reference methods. After reviewing the available standards, the EPA determined that 15 candidate VCS (ASTM D3154–00 (2014), ASTM D3464–96 (2014), ASTM D3796–09 (2016), ISO 10780: 1994 (2016), ASME B133.9–1994 (2001), ANSI/ASME PTC 19–10–1981 Part 10, ISO 10396:(2007), ISO 12039:2001 (2012), ASTM D5835–95 (2013), CAN/CSA Z223.2–M86 (Rl999), CAN/CSA Z223.21–M1978, ASTM D3162–12, ASTM D6060–17, ISO 14965:2000 (2012), EN 12619 (2013)) identified for measuring emissions of pollutants or their surrogates subject to emission standards in the rule would not be practical due to lack of equivalency, documentation, validation data, and other important technical and policy considerations.

The EPA's review, including review of comments for these 15 methods, is documented in the memorandum, *Voluntary Consensus Standard Results for National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills Residual Risk and Technology Review,* in the docket for this rulemaking (EPA–HQ–OAR–2002–0047).

In this rule, the EPA is proposing regulatory text for 40 CFR part 63, subpart AAAA that includes IBR in accordance with requirements of 1 CFR 51.5. Specifically, the EPA is incorporating by reference ASTM D6522–11. The ASTM standards are available from American Society for Testing and Materials, 100 Barr Harbor Drive, Post Office Box C700, West Conshohocken, PA 19428–2959. See *http://www.astm.org.*

K. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (58 FR 7629, February 16, 1994).

Our analysis of the demographics of the population with estimated risks greater than 1-in-1 million indicates potential disparities in risks between demographic groups, including the African American, Hispanic or Latino, Over 25 Without a High School Diploma, and Below the Poverty Level groups. In addition, the population living within 50 km of the MSW landfills has a higher percentage of minority, lower income, and lower education people when compared to the nationwide percentages of those groups. However, acknowledging these potential disparities, the risks for the source category were determined to be acceptable, and emissions reductions from the proposed revisions will benefit these groups the most.

The documentation for this decision is contained in section IV.B and C of this preamble, and the technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Municipal Solid Waste Landfill Source Category Operations,* which is available in the docket for this action.

List of Subjects

40 CFR Part 60

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Incorporation by reference, Reporting and recordkeeping requirements.

Dated: June 27, 2019.

Andrew R. Wheeler,

Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend 40 CFR parts 60 and 63 as follows:

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

■ 1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 2. Subpart Cf is amended by revising the title of the subpart to read as follows:

Subpart Cf—Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills

■ 3. Section 60.34f is amended by revising the introductory paragraph to read as follows:

§ 60.34f Operational standards for collection and control systems.

For approval, a state plan must include provisions for the operational standards in this section (as well as the provisions in § 60.36f and § 60.37f), or the operational standards in § 63.1958 of this chapter (as well as the provisions in § 63.1960 and § 63.1961) for an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.33f(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1958 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section. Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.33f(b) and (c) must:

* * * * *

■ 4. Section 60.36f is amended by revising the introductory paragraph and paragraph (a)(3)(ii) to read as follows:

§ 60.36f Compliance provisions.

For approval, a state plan must include the compliance provisions in this section (as well as the provisions in § 60.34f and § 60.37f), or the compliance provisions in § 63.1960 of this chapter (as well as the provisions in § 63.1958 and § 63.1961) for an MSW landfill with a gas collection and control system used to comply with the provisions of §§ 60.33f(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1960 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section.

(a) * * *

(3) * * *

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure or elevated temperature measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure. The owner or operator must submit the items listed in § 60.38f(h)(7) as part of the next annual report. The owner or operator must keep records according to § 60.39f(e)(4).

* * * * *

■ 5. Section 60.37f is amended by revising the introductory paragraph to read as follows:

§ 60.37f Monitoring of operations.

For approval, a state plan must include the monitoring provisions in this section, (as well as the provisions in § 60.34f and § 60.36f) except as provided in § 60.38f(d)(2), or the monitoring provisions in § 63.1961 of this chapter (as well as the provisions in § 63.1958 and § 63.1960) for an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.33f(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1961 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section.

* * * * *

■ 6. Section 60.38f is amended by revising introductory paragraph (h) and paragraph (h)(7) and adding paragraph (n) to read as follows:

§ 60.38f Reporting guidelines.

* * * * *

(h) *Annual report.* The owner or operator of a landfill seeking to comply with § 60.33f(e)(2) using an active collection system designed in accordance with § 60.33f(b) must submit to the Administrator, following the procedures specified in paragraph (j)(2) of this section, an annual report of the recorded information in paragraphs (h)(1) through (7) of this section. The initial annual report must be submitted within 180 days of installation and startup of the collection and control system. The initial annual report must include the initial performance test report required under § 60.8, as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. In the initial annual report, the process unit(s) tested, the pollutant(s) tested and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX.

The initial performance test report must be submitted, following the procedure specified in paragraph (j)(1) of this section, no later than the date that the initial annual report is submitted. For enclosed combustion devices and flares, reportable exceedances are defined under § 60.39f(c)(1). If complying with the operational provisions of §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at §§ 60.34f, 60.36f, and 60.37f, the owner or operator must follow the semi-annual reporting requirements in § 63.1981(h) in lieu of paragraph (1) of this section.

* * * * *

(7) For any corrective action analysis for which corrective actions are required in § 60.36f(a)(3) or § 60.36f(a)(5) and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or elevated temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

* * * * *

(n) Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at in §§ 60.34f, 60.36f, and 60.37f, must submit the 24-hour high temperature report according to § 63.1981(k) of this chapter.

■ 7. Section 60.39f is amended by revising introductory text of paragraph (e) and adding paragraph (e)(6) to read as follows:

§ 60.39f Recordkeeping guidelines.

* * * * *

(e) Except as provided in § 60.38f(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the items in paragraphs (e)(1) through (5) of this section. Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at in §§ 60.34f, 60.36f, and 60.37f, must keep the records in paragraph (e)(6) of this section and must keep records according to § 63.1983(e)(1) through (5) of this chapter in lieu of paragraphs (e)(1) through (5) of this section.

* * * * *

(6) Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at in §§ 60.34f, 60.36f, and 60.37f, must keep records of the date upon which you the owner or operator started complying with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter.

* * * * *

Subpart WWW—Standards of Performance for Municipal Solid Waste Landfills

■ 8. Subpart WWW is amended by revising the heading of the subpart to read as follows:

Subpart WWW—Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification on or After May 30, 1991, But Before July 18, 2014

■ 9. Section 60.750 is amended by revising paragraph (a) to read as follows:

§ 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, but before July 18, 2014.

* * * * *

Subpart XXX—Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014

■ 10. Section 60.762 is amended by revising paragraph (b)(2)(iv) to read as follows:

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

* * * * *

(b) * * *

(2) * * *

(iv) *Operation.* Operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§ 60.763, 60.765, and 60.766; or the provisions of §§ 63.1958, 63.1960, and 63.1961 of this chapter. Once the owner or operator begins to comply with the provisions of §§ 63.1958, 63.1960, and 63.1961 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of §§ 60.763, 60.765, and 60.766.

* * * * *

■ 11. Section 60.765 is amended by revising paragraph (a)(5)(ii) to read as follows:

§ 60.765 Compliance provisions.

(a) * * *

(5) * * *

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure or elevated temperature measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure. The owner or operator must submit the items listed in § 60.767(g)(7) as part of the next annual report. The owner or operator must keep records according to § 60.768(e)(4).

* * * * *

■ 12. Section 60.767 is amended by revising introductory paragraph (g) and paragraph (g)(7) and adding paragraph (m) to read as follows:

§ 60.767 Reporting requirements.

* * * * *

(g) *Annual report.* The owner or operator of a landfill seeking to comply with § 60.762(b)(2) using an active collection system designed in accordance with § 60.762(b)(2)(ii) must submit to the Administrator, following the procedure specified in paragraph (i)(2) of this section, annual reports of the recorded information in paragraphs (g)(1) through (7) of this section. The initial annual report must be submitted within 180 days of installation and startup of the collection and control system, and must include the initial performance test report required under § 60.8, as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. In the initial annual report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. For enclosed combustion devices and flares, reportable exceedances are defined under § 60.768(c). If complying with the operational provisions of §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at § 60.762(b)(2)(iv), the owner or operator must follow the semi-annual reporting requirements in § 63.1981(h) of this chapter in lieu of paragraph (1) of this section.

* * * * *

(7) For any corrective action analysis for which corrective actions are required in § 60.765(a)(3) or § 60.765(a)(5) and that take more than 60 days to correct the exceedance, the root cause analysis

conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or elevated temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

* * * * *

(m) Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961, as allowed at § 60.762(b)(2)(iv), must submit the 24-hour high temperature report according to § 63.1981(k) of this chapter.

■ 13. Section 60.768 is amended by revising introductory paragraph (e) and adding paragraph (e)(6) to read as follows:

§ 60.768 Recordkeeping requirements.

* * * * *

(e) Except as provided in § 60.767(c)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the items in paragraphs (e)(1) through (5) of this section. Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961, as allowed at § 60.762(b)(2)(iv)), must keep the records in paragraph (e)(6) of this section and must keep records according to §§ 63.1983(e)(1) through (5) of this chapter in lieu of paragraphs (e)(1) through (5) of this section.

* * * * *

(6) Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at § 60.762(b)(2)(iv)), must keep records of the date upon which youthe owner or operator started complying with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter.

* * * * *

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

■ 14. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 15. Section 63.14 is amended by redesignating paragraphs (h)(94) through (h)(111) as paragraphs (h)(95) through (h)(112) and adding new paragraph (h)(94) to read as follows:

§ 63.14 Incorporations by reference.

* * * * *

(h) * * *

(94) ASTM D6522–11 Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers (Approved December 1, 2011), IBR approved for § 63.1961(a).

* * * * *

■ 16. Subpart AAAA is revised to read as follows:

Subpart AAAA—National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

Sec.

What This Subpart Covers

§ 63.1930 What is the purpose of this subpart?

This subpart establishes national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills.

(a) Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], all landfills described in § 63.1935 must meet the requirements of 40 CFR part 60, subpart WWW, or an approved state or federal plan that implements 40 CFR part 60, subpart Cc, and requires timely control of bioreactors and additional reporting requirements. Landfills must also meet the startup, shutdown, and malfunction (SSM) requirements of the general provisions as specified in Table 1 to Subpart AAAA of Part 63 and must demonstrate compliance with the operating conditions by parameter monitoring results that are within the specified ranges. Specifically, landfills must meet the following requirements of this subpart that apply before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**] as set out in: §§ 63.1955(a) and (b), 63.1965(a) and (c), 63.1975, 63.1981(a) and (b), and 63.1982, and the definitions of ''Controlled landfill'' and ''Deviation'' in § 63.1990.

(b) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], all landfills described in § 63.1935 must meet the requirements of this subpart. A landfill may chose to meet the requirements of this subpart rather than the requirements identified in § 63.1930(a) at any time before [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. The requirements of this subpart apply at all times including during periods of SSM, and the SSM requirements of the general provisions of this part do not apply.

§ 63.1935 Am I subject to this subpart?

You are subject to this subpart if you meet the criteria in paragraph (a) or (b) of this section.

(a) You are subject to this subpart if you own or operate an MSW landfill that has accepted waste since November 8, 1987, or has additional capacity for waste deposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section:

(1) Your MSW landfill is a major source as defined in § 63.2 of subpart A.

(2) Your MSW landfill is collocated with a major source as defined in § 63.2 of subpart A.

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to § 63.1959.

(b) You are subject to this subpart if you own or operate an MSW landfill that has accepted waste since November 8, 1987, or has additional capacity for waste deposition, that includes a bioreactor, as defined in § 63.1990, and that meets any one of the criteria in paragraphs (b)(1) through (3) of this section:

(1) Your MSW landfill is a major source as defined in § 63.2 of subpart A.

(2) Your MSW landfill is collocated with a major source as defined in § 63.2 of subpart A.

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 and that is not permanently closed as of January 16, 2003.

§ 63.1940 What is the affected source of this subpart?

(a) An affected source of this subpart is an MSW landfill, as defined in § 63.1990, that meets the criteria in § 63.1935(a) or (b). The affected source includes the entire disposal facility in a contiguous geographic space where household waste is placed in or on land, including any portion of the MSW landfill operated as a bioreactor.

(b) A new affected source of this subpart is an affected source that commenced construction or reconstruction after November 7, 2000. An affected source is reconstructed if it meets the definition of reconstruction in § 63.2 of subpart A.

(c) An affected source of this subpart is existing if it is not new.

§ 63.1945 When do I have to comply with this subpart?

(a) If your landfill is a new affected source, you must comply with this subpart by January 16, 2003, or at the time you begin operating, whichever is later.

(b) If your landfill is an existing affected source, you must comply with this subpart by January 16, 2004.

§ 63.1947 When do I have to comply with this subpart if I own or operate a bioreactor?

You must comply with this subpart by the dates specified in § 63.1945(a) or (b). If you own or operate a bioreactor located at a landfill that is not permanently closed as of January 16, 2003, and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must install and operate a collection and control system that meets the criteria in § 63.1959(b)(2) according to the schedule specified in paragraph (a), (b), or (c) of this section.

(a) If your bioreactor is at a new affected source, then you must meet the requirements in paragraphs (a)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40 percent moisture content instead of 180 days after liquids addition, use the procedures in §§ 63.1980(g) and (h) to determine when the bioreactor moisture content reaches 40 percent.

(b) If your bioreactor is at an existing affected source, then you must install and begin operating the gas collection and control system for the bioreactor by January 17, 2006, or by the date your bioreactor is required to install a gas collection and control system under 40 CFR part 60, subpart WWW; the Federal plan; or an EPA approved and effective State plan or tribal plan that applies to your landfill, whichever is earlier.

(c) If your bioreactor is at an existing affected source and you do not initiate liquids addition to your bioreactor until later than January 17, 2006, then you must meet the requirements in paragraphs (c)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40 percent moisture content instead of 180 days after liquids addition, use the procedures in §§ 63.1980(e) and (f) to determine when the bioreactor moisture content reaches 40 percent.

§ 63.1950 When am I no longer required to comply with this subpart?

(a) You are no longer required to comply with the requirements of this subpart when your landfill meets the collection and control system removal criteria in § 63.1957(b).

§ 63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

If you own or operate a landfill that includes a bioreactor, you are no longer required to comply with the requirements of this subpart for the bioreactor provided you meet the conditions of either paragraph (a) or (b) of this section.

(a) Your affected source meets the control system removal criteria in § 63.1950 or the bioreactor meets the criteria for a nonproductive area of the landfill in § 63.1962(a)(3)(ii).

(b) The bioreactor portion of the landfill is a closed landfill as defined in § 63.1990, you have permanently ceased adding liquids to the bioreactor, and you have not added liquids to the bioreactor for at least 1 year. A closure report for the bioreactor must be submitted to the Administrator as provided in § 63.1981(g).

Standards

§ 63.1955 What requirements must I meet?

(a) Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], if alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions have already been approved under 40 CFR part 60, subpart WWW or the federal plan, or an EPA approved and effective state or tribal plan, these alternatives can be used to comply with this subpart, except that all affected sources must comply with the SSM requirements in subpart A of this part as specified in Table 1 of this subpart and all affected sources must submit compliance reports every 6 months as specified in § 63.1981(h), including information on all deviations that occurred during the 6-month reporting period. Deviations for continuous emission monitors or numerical continuous parameter monitors must be determined using a 3-hour monitoring block average. Beginning no later than [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the collection and control system design plan may include for approval collection and control systems that include any alternatives to the operational standards, test methods,

procedures, compliance measures, monitoring, recordkeeping or reporting provisions, as provided in § 63.1981(d)(2).

(b) If you own or operate a bioreactor that is located at an MSW landfill that is not permanently closed and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must meet the requirements of this subpart, including requirements in paragraphs (b)(1) and (2) of this section.

(1) You must comply with this subpart starting on the date you are required to install the gas collection and control system.

(2) You must extend the collection and control system into each new cell or area of the bioreactor prior to initiating liquids addition in that area.

(c) At all times, beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

§ 63.1957 Requirements for gas collection and control system installation and removal.

(a) *Operation.* Operate the collection and control device in accordance with the provisions of §§ 63.1958, 63.1960, and 63.1961.

(b) *Removal criteria.* The collection and control system may be capped, removed, or decommissioned if the following criteria are met:

(1) The landfill is a closed landfill (as defined in § 63.1990). A closure report must be submitted to the Administrator as provided in § 63.1981(f);

(2) The gas collection and control system has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flow; and

(3) Following the procedures specified in § 63.1959(c), the calculated NMOC emission rate at the landfill is less than 50 megagrams per year on three successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart.

§ 63.1958 Operational standards for collection and control systems.

Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 63.1957 must:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade;

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

(1) A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the semi-annual reports as provided in § 63.1981(h);

(2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan;

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in § 63.1981(d)(2);

(c) Operate each interior wellhead in the collection system as specified in § 60.753(c), except:

(1) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], operate each interior wellhead in the collection system with a landfill gas temperature less than 62.8 degrees Celsius (145 degrees Fahrenheit).

(2) The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (*i.e.,* neither causing fires nor killing methanogens is acceptable).

(d)(1) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(2) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**] the owner or operator must:

(A) Conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in § 63.1960(d).

(B) Conduct surface testing at all cover penetrations. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required.

(C) Determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(e) Operate the system as specified in § 60.753(e), except:

(1) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], operate the system in accordance to § 63.1955(c) such that all collected gases are vented to a control system designed and operated in compliance with § 63.1959(b)(2)(iii). In the event the collection or control system is not operating:

(i) The gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating; and

(ii) Efforts to repair the collection or control system must be initiated and completedin a manner such that downtime is kept to a minimum, and

the collection and control system must be returned to operation.

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action must be taken as specified in § 63.1960(a)(3) and (5) or § 63.1960(c). If corrective actions are taken as specified in § 63.1960, the monitored exceedance is not a deviation of the operational requirements in this section.

§ 63.1959 NMOC calculation procedures.

(a) Calculate the NMOC emission rate using the procedures specified in § 60.754(a), except:

(1) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**] the landfill owner or operator must calculate the NMOC emission rate using either Equation 1 provided in paragraph (a)(1)(i) of this section or Equation 2 provided in paragraph (a)(1)(ii) of this section. Both Equation 1 and Equation 2 may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i) of this section, 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) of this section, for part of the life of the landfill. The values to be used in both Equation 1 and Equation 2 are 0.05 per year for k, 170 cubic meters per megagram for L_O, and 4,000 parts per million by volume as hexane for the C_{NMOC}. For landfills located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.

(i)(A) Equation 1 must be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2\,k\,L_o M_i \left(e^{-kt_i}\right)(C_{NMOC})\,(3.6x1010^{-9}) \quad \text{(Eq. 1)}$$

Where:

M_{NMOC} = Total NMOC emission rate from the landfill, megagrams per year.
k = Methane generation rate constant, year^{-1}.
L_o = 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 i^{th} section, years.
C_{NMOC} = Concentration of NMOC, parts per million by volume as hexane.
3.6×10^{-9} = Conversion factor.

(B) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for M_i if documentation of the nature and amount of such wastes is maintained.

(ii)(A) Equation 2 must be used if the actual year-to-year solid waste acceptance rate is unknown.

$$M_{NMOC} = 2L_oR\,(e^{-kc} - e^{-kt})\,C_{NMOC}(3.6 \times 10^{-9}) \quad \text{(Eq. 2)}$$

Where:

M_{NMOC} = Mass emission rate of NMOC, megagrams per year.
L_o = Methane generation potential, cubic meters per megagram solid waste.
R = Average annual acceptance rate, megagrams per year.
k = Methane generation rate constant, year^{-1}.
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 $e^{-kc} = 1$.
3.6×10^{-9} = Conversion factor.

(B) The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value of R, if documentation of the nature and amount of such wastes is maintained.

(2) *Tier 1.* The owner or operator must compare the calculated NMOC mass emission rate to the standard of 50 megagrams per year.

(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 50 megagrams per year, then the landfill owner or operator must submit an NMOC emission rate report according to § 63.1981(c) and must recalculate the NMOC mass emission rate annually as required under paragraph (b) of this section.

(ii) If the calculated NMOC emission rate as calculated in paragraph (a)(1) of this section is equal to or greater than 50 megagrams per year, then the landfill owner must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 63.1981(d) and install and operate a gas collection and control system within 30 months of the first annual report in which the NMOC emission rate equals or exceeds 50 megagrams per year, according to paragraphs (b)(2)(ii) and (iii) of this section;

(B) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in paragraph (a)(3) of this section; or

(C) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in paragraph (a)(4) of this section.

(3) *Tier 2.* The landfill owner or operator must determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator must install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator must collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of appendix A–7 to part 60. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples are taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from Method 25 or 25C of

appendix A–7 to part 60 by 6 to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe.

(i) Within 60 days after the date of completing each performance test (as defined in § 63.7), the owner or operator must submit the results according to § 63.1981(i).

(ii) The landfill owner or operator must recalculate the NMOC mass emission rate using Equation 1 or Equation 2 provided in paragraph (a)(1)(i) or (ii) of this section and use the average site-specific NMOC concentration from the collected samples instead of the default value provided in paragraph (a)(1) of this section.

(iii) If the resulting NMOC mass emission rate is less than 50 megagrams per year, then the owner or operator must submit a periodic estimate of NMOC emissions in an NMOC emission rate report according to § 63.1981(c) and must recalculate the NMOC mass emission rate annually as required under paragraph (b) of this section. The site-specific NMOC concentration must be retested every 5 years using the methods specified in this section.

(iv) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 50 megagrams per year, the landfill owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 63.1981(d) and install and operate a gas collection and control system within 30 months according to paragraphs (b)(2)(ii) and (iii) of this section; or

(B) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in paragraph (a)(4) of this section.

(4) *Tier 3.* The site-specific methane generation rate constant must be determined using the procedures provided in Method 2E of appendix A–1 to part 60. The landfill owner or operator must estimate the NMOC mass emission rate using Equation 1 or Equation 2 in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using a site-specific methane generation rate constant, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator must compare the resulting NMOC mass emission rate to the standard of 50 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 50 megagrams per year, the owner or operator must:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 63.1981(e) and install and operate a gas collection and control system within 30 months of the first annual report in which the NMOC emission rate equals or exceeds 50 megagrams per year, according to paragraphs (b)(2)(ii) and (iii) of this section.

(B) [Reserved]

(ii) If the NMOC mass emission rate is less than 50 megagrams per year, then the owner or operator must recalculate the NMOC mass emission rate annually using Equation 1 or Equation 2 in paragraph (a)(1) of this section and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in § 63.1981(c). The calculation of the methane generation rate constant is performed only once, and the value obtained from this test must be used in all subsequent annual NMOC emission rate calculations.

(5) The owner or operator may use other methods to determine the NMOC concentration or a site-specific methane generation rate constant as an alternative to the methods required in paragraphs (a)(3) and (a)(4) of this section if the method has been approved by the Administrator.

(b) Each owner or operator of an affected source having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in paragraph (a) of this section. The NMOC emission rate must be recalculated annually, except as provided in § 63.1981(c)(1)(ii)(A).

(1) If the calculated NMOC emission rate is less than 50 megagrams per year, the owner or operator must:

(i) Submit an annual NMOC emission rate emission report to the Administrator, except as provided for in § 63.1981(c)(1)(ii); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in paragraph (a)(1) of this section until such time as the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, or the landfill is closed.

(A) If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (b) of this section, is equal to or greater than 50 megagrams per year, the owner or operator must either: Comply with paragraph (b)(2) of this section or calculate NMOC emissions using the next higher tier in paragraph (a) of this section.

(B) If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided for in § 63.1981(f).

(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator must either:

(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in § 63.1981(d) or calculate NMOC emissions using the next higher tier in paragraph (a) of this section. The collection and control system must meet the requirements in paragraphs (b)(2)(ii) and (iii) of this section.

(ii) Collection system. Install and start up a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(B) or (C) and (b)(2)(iii) of this section within 30 months after:

(A) The first annual report in which the NMOC emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 megagrams.

(B) An active collection system must:

(*1*) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment;

(*2*) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade;

(*3*) Collect gas at a sufficient extraction rate; and

(*4*) Be designed to minimize off-site migration of subsurface gas.

(C) A passive collection system must:

(*1*) Comply with the provisions specified in paragraphs (b)(2)(ii)(B)(1), (2), and (3) of this section; and

(*2*) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under § 258.40.

(iii) Control system. Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii)(A), (B), or (C) of this section.

(A) A non-enclosed flare designed and operated in accordance with the parameters established in § 63.11(b) except as noted in paragraph (f) of this section; or

(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in paragraph (e) of this section. The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(*1*) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.

(*2*) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §§ 63.1961(b) through (e);

(C) A treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas must be controlled according to either paragraph (b)(2)(iii)(A) or (B) of this section.

(D) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.

(c) After the installation and startup of a collection and control system in compliance with this subpart, the owner or operator must calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in § 63.1957(b)(3), using Equation 3:

$$MNMOC = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC} \quad \text{(Eq. 3)}$$

Where:

M_{NMOC} = Mass emission rate of NMOC, megagrams per year.

Q_{LFG} = Flow rate of landfill gas, cubic meters per minute.

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

1.89×10^{-3} = Conversion factor.

(1) The flow rate of landfill gas, Q_{LFG}, must be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 10 of Method 2E of appendix A–1 of part 60.

(2) The average NMOC concentration, C_{NMOC}, must be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25 or Method 25C of appendix A–7 to part 60. The sample location on the common header pipe must be before any condensate removal or other gas refining units. The landfill owner or operator must divide the NMOC concentration from Method 25 or Method 25C of appendix A–7 to part 60 by 6 to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(i) Within 60 days after the date of completing each performance test (as defined in § 63.7), the owner or operator must submit the results of the performance test, including any associated fuel analyses, according to § 63.1981(i).

(ii) [Reserved]

(d) For the performance test required in § 63.1959(b)(2)(iii)(B), Method 25 or 25C (Method 25C of appendix A–7 to part 60 may be used at the inlet only) of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 parts per million by volume outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by § 63.1981(d)(2). Method 3, 3A, or 3C of appendix A–7 to part 60 must be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. Method 18 may be used in conjunction with Method 25A on a limited basis (compound specific, *e.g.,* methane) or Method 3C may be used to determine methane. The methane as carbon should be subtracted from the Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landowner or operator must divide the NMOC concentration as carbon by 6 to convert from the C_{NMOC} as carbon to C_{NMOC} as hexane. Equation 4 must be used to calculate efficiency:

$$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out})/(NMOC_{in}) \quad \text{(Eq. 4)}$$

Where:

$NMOC_{in}$ = Mass of NMOC entering control device.

$NMOC_{out}$ = Mass of NMOC exiting control device.

(e) For the performance test required in § 63.1959(b)(2)(iii)(A), the net heating

value of the combusted landfill gas as determined in § 63.11(b)(6)(ii) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under § 63.11(b)(7).

(1) Within 60 days after the date of completing each performance test (as defined in § 63.7), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, required by § 63.1959(c) or (e) according to § 63.1981(i).

(2) [Reserved]

(f) The performance tests required in §§ 63.1959(b)(2)(iii)(A) and (B), must be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. Representative conditions exclude periods of startup and shutdown unless specified by the Administrator. The owner or operator may not conduct performance tests during periods of malfunction. The owner or operator must record the process information that is necessary to document operating conditions during the test and include in such record an explanation to support that such conditions represent normal operation. Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

§ 63.1960 Compliance provisions.

(a) Except as provided in § 63.1981(d)(2), the specified methods in paragraphs (a)(1) through (6) of this section must be used to determine whether the gas collection system is in compliance with § 63.1959(b)(2)(ii).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with § 63.1959(b)(2)(ii)(C)(1), either Equation 5 or Equation 6 must be used. The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator. The methane generation rate constant (k) and methane generation potential (L_o) kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42) or other site specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in § 63.1959(a)(4), the value of k determined from the test must be used. A value of no more than 15 years must 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 of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

$$Qm = 2L_oR\left(e^{-kc} - e^{-kt}\right) \quad \text{(Eq. 5)}$$

Where:

Qm = Maximum expected gas generation flow rate, cubic meters per year.

L_o = Methane generation potential, cubic meters per megagram solid waste.

R = Average annual acceptance rate, megagrams per year.

k = Methane generation rate constant, $year^{-1}$.

t = Age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years.

c = Time since closure, years (for an active landfill c = 0 and $e^{-kc} = 1$).

2 = Constant

(ii) For sites with known year-to-year solid waste acceptance rate:

$$Q_M = \sum_{i=1}^{n} 2kL_oM_i\left(e^{-kt_i}\right) \quad \text{(Eq. 6)}$$

Where:

Qm = Maximum expected gas generation flow rate, cubic meters per year.

k = Methane generation rate constant, $year^{-1}$.

L_o = Methane generation potential, cubic meters per megagram solid waste.

M_i = Mass of solid waste in the i^{th} section, megagrams.

t_i = Age of the i^{th} section, years.

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 5 or Equation 6 in paragraphs (a)(1)(i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using Equation 5 or Equation 6 in paragraphs (a)(1)(i) or (ii) of this section or other methods must be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with § 63.1959(b)(2)(ii)(B)(*2*), the owner or operator must design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with § 63.1959(b)(2)(ii)(B)(*3*), the owner or operator must measure gauge pressure in the gas collection header applied to each individual well monthly. Any attempted corrective measure must not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval. If a positive pressure exists, follow the procedures as specified in § 60.755(a)(3), except:

(i) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], if a positive pressure exists, action must be initiated to correct the exceedance within 5 days, except for the three conditions allowed under § 63.1958(b).

(A) If negative pressure cannot be achieved without excess air infiltration within 15 days of the first measurement of positive pressure, the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after positive pressure was first measured. The owner or operator must

keep records according to § 63.1983(e)(3).

(B) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the positive pressure measurement. The owner or operator must submit the items listed in § 63.1981(h)(7) as part of the next semi-annual report. The owner or operator must keep records according to § 63.1983(e)(5).

(C) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to § 63.1981(j). The owner or operator must keep records according to § 63.1983(e)(5).

(ii) [Reserved]

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph § 63.1958(c), for the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator must follow the procedures as specified in § 60.755(a)(5), except:

(i) Once an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1), the owner or operator must monitor each well monthly for temperature for the purpose of identifying whether excess air infiltration exists. If a well exceeds the operating parameter for temperature as provided in § 63.1958(c)(1), action must be initiated to correct the exceedance within 5 days. Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(A) If a landfill gas temperature less than or equal to 62.8 degrees Celsius (145 degrees Fahrenheit) cannot be achieved within 15 days of the first measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit), the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) was first measured. The owner or operator must keep records according to § 63.1983(e)(3).

(B) If corrective actions cannot be fully implemented within 60 days following the temperature measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit). The owner or operator must submit the items listed in § 63.1981(h)(7) as part of the next semi-annual report. The owner or operator must keep records according to § 63.1983(e)(4).

(C) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to § 63.1981(h)(7) and § 63.1981(j). The owner or operator must keep records according to § 63.1983(e)(5).

(D) If a landfill gas temperature measured at either the wellhead or at any point in the well is greater than or equal to 76.7 degrees Celsius (170 degrees Fahrenheit) and the carbon monoxide concentration measured, according to the procedures in § 63.1961(a)(5)(vi) is greater than or equal to 1,500 ppmv the corrective action(s) must be completed within 15 days.

(5) An owner or operator seeking to demonstrate compliance with § 63.1959(b)(2)(ii)(B)(*4*) through the use of a collection system not conforming to the specifications provided in § 63.1962 must provide information satisfactory to the Administrator as specified in § 63.1981(c)(3) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with § 63.1958(a), each owner or operator of a controlled landfill must place each well or design component as specified in the approved design plan as provided in § 63.1981(b). 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) 5 years or more if active; or

(2) 2 years or more if closed or at final grade.

(c) The following procedures must be used for compliance with the surface methane operational standard as provided in § 63.1958(d).

(1) After installation and startup of the gas collection system, the owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A–7 of part 60, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location must be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 63.1958(d).

(i) The location of each monitored exceedance must be marked and the location and concentration recorded.

(A) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the location must be recorded using an instrument with an accuracy of at least 4 meters.

(B) (i) [Reserved]

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 days of detecting the exceedance.

(iii) 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, the action specified in paragraph (c)(4)(v) of this section must be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of this section has been taken.

(iv) 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 specified in paragraph (c)(4)(ii) or (iii) of this section must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million 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 actions specified in paragraph (c)(4)(iii) or (v) of this section must be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device must be installed within 120 days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

(5) The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer must meet the instrument specifications provided in section 6 of Method 21 of appendix A of part 60, except that ''methane'' replaces all references to ''VOC''.

(2) The calibration gas must be methane, diluted to a nominal concentration of 500 parts per million in air.

(3) To meet the performance evaluation requirements in section 8.1 of Method 21 of appendix A of part 60, the instrument evaluation procedures of section 8.1 of Method 21 of appendix A of part 60 must be used.

(4) The calibration procedures provided in sections 8 and 10 of Method 21 of appendix A of part 60 must be followed immediately before commencing a surface monitoring survey.

(e)(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standards in introductory paragraph § 63.1958(c), the provisions of this subpart apply at all times, except during periods of startup, shutdown, or malfunction, provided that the duration of startup, shutdown, or malfunction does not exceed 5 days for collection systems and does not exceed 1 hour for treatment or control devices. You must comply with the provisions in Table 1 to subpart AAAA that apply before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**].

(2) Once an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in § 63.1958(c)(1), the provisions of this subpart apply at all times, including periods of startup, shutdown, or malfunction. During periods of startup, shutdown, and malfunction, you must comply with the work practice requirement specified in § 63.1958(e) in lieu of the compliance provisions in § 63.1960.

§ 63.1961 Monitoring of operations.

Except as provided in § 63.1981(d)(2):

(a) Each owner or operator seeking to comply with § 63.1959(b)(2)(ii)(B) for an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in § 63.1960(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:

(i) The nitrogen level must be determined using Method 3C of Appendix A–2 to part 60 of this chapter, unless an alternative test method is established as allowed by § 63.1981(d)(2).

(ii) Unless an alternative test method is established as allowed by § 63.1981(d)(2), the oxygen level must be determined by an oxygen meter using Method 3A or 3C of Appendix A–2 to part 60 of this chapter or ASTM D6522–11 (incorporated by reference, see § 63.14). Determine the oxygen level by an oxygen meter using Method 3A or 3C of Appendix A–2 to part 60 of this chapter or ASTM D6522–11 (if sample location is prior to combustion) except that:

(A) The span must be set between 10 and 12 percent oxygen;

(B) A data recorder is not required;

(C) Only two calibration gases are required, a zero and span;

(D) A calibration error check is not required; and

(E) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(iii) A portable gas composition analyzer may be used to monitor the oxygen levels provided:

(A) The analyzer is calibrated; and

(B) The analyzer meets all quality assurance and quality control requirements for Method 3A of Appendix A–2 to part 60 of this chapter or ASTM D6522–11 (incorporated by reference, see § 63.14).

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph § 63.1958(c), the owner or operator must follow the procedures as specified in § 60.756(a)(2) and (3) of this chapter. Monitor temperature of the landfill gas on a monthly basis as provided in § 63.1960(a)(4). The temperature measuring device must be calibrated annually using the procedure in Section 10.3 of Method 2 of Appendix A–1 to part 60 of this chapter.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1), monitor temperature of the landfill gas on a monthly basis as provided in § 63.1960(a)(4). The temperature measuring device must be calibrated annually using the procedure in Section 10.3 of Method 2 of Appendix A–1 to part 60 of this chapter. Keep records specified in § 63.19.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1), unless a higher operating temperature value has been approved by the Administrator, you must initiate enhanced monitoring at all wells with a measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) and less than 76.7 degrees Celsius (170 degrees Fahrenheit), as follows:

(i) Visual observations for subsurface oxidation events (smoke, smoldering ash, damage to well) within the radius of influence of the well;

(ii) Monitor oxygen concentration as provided in paragraph (a)(2) of this section;

(iii) Monitor temperature of the landfill gas at the wellhead as provided in paragraph (a)(4) of this section;

(iv) Monitor temperature of the landfill gas every 10 vertical feet of the well. This temperature can be monitored either with a removable thermometer, or using temporary or permanent thermocouples installed in the well;

(v) Monitor the methane concentration with a methane meter using Method 3C of appendix A–6 to part 60, Method 18 of appendix A–6 to part 60, or a portable gas composition

analyzer to monitor the methane levels provided that the analyzer is calibrated and the analyzer meets all quality assurance and quality control requirements for Method 3C or Method 18;

(vi) Monitor carbon monoxide concentrations, as follows:

(A) Collect the sample from the wellhead sampling port in a passivated canister or multi-layer foil gas sampling bag (such as the Cali-5-Bond Bag) and analyzing that sample by an independent offsite laboratory that uses Method 10 of appendix A–4 to part 60, or an equivalent method with a detection limit of at least 100 ppmv of carbon monoxide in high concentrations of methane; and

(B) Collect and analyze the sample from the wellhead using Method 10 of Appendix A–4 to part 60 to measure carbon monoxide concentrations.

(vii) The enhanced monitoring in paragraph (a)(4) of this section must be conducted on a weekly basis, beginning seven days after the first measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit); and

(viii) The enhanced monitoring in paragraph (a)(4) of this section can be stopped once a higher operating value is approved, at which time the monitoring provisions issued with the higher operating value should be followed, or once the measurement of landfill gas temperature at the wellhead is less than or equal to 62.8 degrees Celsius (145 degrees Fahrenheit).

(b) Each owner or operator seeking to comply with § 63.1959(b)(2)(iii) using an enclosed combustor must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with § 63.1959(b)(2)(iii) using a non-enclosed flare must install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) 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; and

(2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with § 63.1959(b)(2)(iii) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system must provide information satisfactory to the Administrator as provided in § 63.1981(d)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator must review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that does not meet the specifications in § 63.1962 or seeking to monitor alternative parameters to those required by § 63.1958 through § 63.1961 must provide information satisfactory to the Administrator as provided in §§ 63.1981(d)(2) and (3) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in § 63.1958(d) must monitor surface concentrations of methane according to the procedures in § 63.1960(c) and the instrument specifications in § 63.1960(d). If you are complying with the 500 parts per million surface methane operational standard in § 63.1958(d)(2), for location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters and the coordinates must be in decimal degrees with at least five decimal places. In the semi-annual report in 63.1981(i), you must report the location of each exceedance of the 500 parts per million methane concentration as provided in § 63.1958(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with § 63.1959(b)(2)(iii)(C) using a landfill gas treatment system must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], each owner or operator must maintain and 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). The owner or operator must:

(1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(h) The monitoring requirements of paragraphs (a), (b), (c), (d), and (g) of this section apply at all times the affected source is operating, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and

required monitoring system quality assurance or quality control activities. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You are required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph §§ 63.1958(c)(1), 63.1958(d)(2), and 63.1958(e)(1), the standards apply at all times.

§ 63.1962 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with § 63.1959(b)(2)(i) must site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in §§ 63.1981(d)(2) and (3):

(1) 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 expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section must address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section must control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 63.1983(d). The documentation must provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area and must be provided to the Administrator upon request.

(ii) 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 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material must be documented and provided to the Administrator upon request. A separate NMOC emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the NMOC emissions estimate for the entire landfill.

(A) The NMOC emissions from each section proposed for exclusion must be computed using Equation 7:

$$Q_i = 2\ k\ L_o M_i (e^{-kt_i})\ (C_{NMOC})\ (3.6 \times 10^{-9})\ \text{(Eq. 7)}$$

Where:

Q_i = NMOC emission rate from the i^{th} section, megagrams per year.

k = Methane generation rate constant, $year^{-1}$.

L_o = Methane generation potential, cubic meters per megagram solid waste.

M_i = Mass of the degradable solid waste in the i^{th} section, megagram.

t_i = Age of the solid waste in the i^{th} section, years.

C_{NMOC} = Concentration of nonmethane organic compounds, parts per million by volume.

3.6×10^{-9} = Conversion factor.

(B) If the owner/operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (*e.g.,* separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area must be computed using either Equation 3 in § 63.1959(c) or Equation 7 in paragraph (a)(3)(ii)(A) of this section.

(iii) The values for k and C_{NMOC} determined in field testing must be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, L_o and C_{NMOC} provided in § 63.1959(a)(1) or the alternative values from § 63.1959(a)(5) must be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.

(b) Each owner or operator seeking to comply with § 63.1959(b)(2)(ii) must construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components must be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: Convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system must extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors must be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations must be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells must be placed so as not to endanger underlying liners and must address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors must be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices must be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly must include a positive closing throttle valve, any

necessary seals and couplings, access couplings and at least one sampling port. The collection devices must be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with § 63.1959(b)(2)(iii) must convey the landfill gas to a control system in compliance with § 63.1959(b)(2)(iii) through the collection header pipe(s). The gas mover equipment must be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section must be used.

(2) For new collection systems, the maximum flow rate must be in accordance with § 63.1960(a)(1).

General and Continuing Compliance Requirements

§ 63.1964 How is compliance determined?

Compliance is determined using performance testing, collection system monitoring, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data collected under §§ 63.1961(b)(1), (c)(1), and (d) are used to demonstrate compliance with the operating standards for control systems. If a deviation occurs, you have failed to meet the control device operating standards described in this subpart and have deviated from the requirements of this subpart.

(a) Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], you must develop a written SSM plan according to the provisions in § 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of this subpart.

(b) After [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the SSM provisions of § 63.6(e) no longer apply to this subpart and the SSM plan developed under paragraph (a) of this section no longer applies. Compliance with the emissions standards and the operating standards of § 63.1958 of this subpart is required at all times.

§ 63.1965 What is a deviation?

A deviation is defined in § 63.1990. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the items in paragraphs (a) through (c) of this section.

(a) A deviation occurs when the control device operating parameter boundaries described in § 63.1983(c)(1) are exceeded.

(b) A deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour.

(c) Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], a deviation occurs when a SSM plan is not developed or maintained on site and when an affected source fails to meet any emission limitation, (including any operating limit), or work practice requirement in this subpart during startup, shutdown, or malfunction, regardless of whether or not such failure is permitted by this subpart.

§ 63.1975 How do I calculate the 3-hour block average used to demonstrate compliance?

Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], averages are calculated in the same way as they are calculated in 40 CFR part 60, subpart WWW (§ 60.758(b)(2)(i) for average combustion temperature and § 60.758(c) for 3-hour average combustion temperature for enclosed combustors), except that the data collected during the events listed in paragraphs (a) through (d) of this section are not to be included in any average computed under this subpart. Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], averages are calculated according to §§ 63.1983(b)(2)(i) and 63.1983(c)(1)(i) and the data collected during the events listed in paragraphs (a) through (d) of this section are included in any average computed under this subpart.

(a) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments.

(b) Startups.

(c) Shutdowns.

(d) Malfunctions.

Notifications, Records, and Reports

§ 63.1981 What reports must I submit?

You must submit the reports specified in this section and the reports specified in Table 1 to this subpart. If you have previously submitted a design capacity report, amended design capacity report, initial NMOC emission rate report, initial or revised collection and control system design plan, closure report, equipment removal report, or initial performance test under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or the federal plan (40 CFR part 62, subpart GGG) or EPA approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf, then that submission constitutes compliance with the design capacity report in paragraph (a) of this section, the amended design capacity report in paragraph (b) of this section, the initial NMOC emission rate report in paragraph (c) of this section, the initial collection and control system design plan in paragraph (d) of this section, the revised design plan in paragraph (e) of this section, the closure report in paragraph (f) of this section, the equipment removal report in paragraph (g) of this section, and the initial performance test report in paragraph (i) of this section. You do not need to re-submit the report(s). However, you must include a statement certifying prior submission of the respective report(s) and the date of submittal in the first semi-annual report required in this section.

(a) *Initial design capacity report.* The initial design capacity report must contain the information specified in § 60.757(a)(2), except beginning no later than [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**] the report must contain:

(i) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill.

(ii) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity must be calculated using good engineering practices. The calculations must be provided, along with the relevant parameters as part of the report. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume

to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually. Any density conversions must be documented and submitted with the design capacity report. The state, tribal, local agency or Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(b) *Amended design capacity report.* An amended design capacity report must be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in § 63.1983(f).

(c) *NMOC emission rate report.* Each owner or operator subject to the requirements of this subpart must submit a copy of the latest NMOC emission rate report that was submitted according to § 60.757(b) or submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraph (c)(1)(ii)(A) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate. If you have submitted an annual report under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or the federal plan (40 CFR part 62, subpart GGG) or an EPA approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf, then that submission constitutes compliance with the annual NMOC emission rate report in this paragraph. You do not need to re-submit the annual report for the current year. Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the report must meet the the following requirements:

(1) The NMOC emission rate report must contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in § 63.1959(a) or (b), as applicable.

(i) The initial NMOC emission rate report must be submitted no later than 90 days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

(ii) Subsequent NMOC emission rate reports must be submitted annually thereafter, except as provided for in paragraph (c)(1)(ii)(A) of this section.

(A) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 50 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate must include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based must be provided to the Administrator. This estimate must be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate must be submitted to the Administrator. The revised estimate must cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(B) The report must be submitted following the procedure specified in paragraph (l)(2) of this section.

(2) The NMOC emission rate report must include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

(3) Each owner or operator subject to the requirements of this subpart is exempted from the requirements to submit an NMOC emission rate report, after installing a collection and control system that complies with § 63.1959(b)(2), during such time as the collection and control system is in operation and in compliance with §§ 63.1958 and 63.1960.

(d) *Collection and control system design plan.* Each owner or operator subject to the provisions of § 63.1959(b)(2) must submit a collection and control system design plan to the Administrator for approval according to § 60.757(c) and the schedule in § 60.757(c)(1) and (2). Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], each owner or operator subject to the provisions of § 63.1959(b)(2) must submit a collection and control system design plan to the Administrator according to paragraphs (d)(1) through (6) of this section. The collection and control system design plan must be prepared and approved by a professional engineer.

(1) The collection and control system as described in the design plan must meet the design requirements in § 63.1959(b)(2).

(2) The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 63.1957 through 63.1983 proposed by the owner or operator.

(3) The collection and control system design plan must either conform with specifications for active collection systems in § 63.1962 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to § 63.1962.

(4) Each owner or operator of an MSW landfill affected by this subpart must submit a collection and control system design plan to the Administrator for approval within 1 year of becoming subject to this subpart.

(5) The landfill owner or operator must notify the Administrator that the design plan is completed and submit a copy of the plan's signature page. The Administrator has 90 days to decide whether the design plan should be submitted for review. If the Administrator chooses to review the plan, the approval process continues as described in paragraph (d)(6) of this section. In the event that the design plan is required to be modified to obtain approval, the owner or operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

(6) Upon receipt of an initial or revised design plan, the Administrator must review the information submitted under paragraphs (d)(1) through (3) 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.

(e) *Revised design plan.* Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the owner or operator who has already been required to submit a design plan under paragraph (d) of this section must

submit a revised design plan to the Administrator for approval as follows:

(1) At least 90 days before expanding operations to an area not covered by the previously approved design plan.

(2) Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (d) of this section.

(f) *Closure report.* Each owner or operator of a controlled landfill must submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under § 63.9(b).

(g) *Equipment removal report.* Each owner or operator of a controlled landfill must submit an equipment removal report as provided in § 60.757(e). Each owner or operator of a controlled landfill must submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the equipment removal report must contain all of the following items:

(i) A copy of the closure report submitted in accordance with paragraph (f) of this section;

(ii) A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, or information that demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in § 63.1957(b) have been met.

(h) *Semi-annual report.* The owner or operator of a landfill seeking to comply with § 63.1959(b)(2) using an active collection system designed in accordance with § 63.1959(b)(2)(ii) must submit to the Administrator semi-annual reports. Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], you must submit the report, following the procedure specified in paragraph (l) of this section. The initial report must be submitted within 180 days of installation and startup of the collection and control system and must include the initial performance test report required under § 63.7, as applicable. In the initial report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. For enclosed combustion devices and flares, reportable exceedances are defined under § 63.1983(c). The semi-annual reports must contain the information in paragraphs (h)(1) through (8) of this section.

(1) Number of times that applicable parameters monitored under §§ 63.1958(b) through (e) were exceeded. For each instance, report the date, time, and duration of each failure.

(i) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph § 63.1958(c), provide a statement of the wellhead operational standard for temperature and oxygen you are complying with for the period covered by the report. Indicate the number of times each of those parameters monitored under § 63.1961(a)(3) were exceeded. For each instance, report the date, time, and duration of each failure.

(ii) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1), provide a statement of the wellhead operational standard for temperature and oxygen you are complying with for the period covered by the report. Indicate the number of times each of those parameters monitored under § 63.1961(a)(4) were exceeded. For each instance, report the date, time, and duration of each failure.

(iii) Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], number of times the parameters for the site-specific treatment system in § 63.1961(g) were exceeded.

(2) Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under § 63.1961.

(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

(4) All periods when the collection system was not operating.

(5) The location of each exceedance of the 500 parts per million methane concentration as provided in § 63.1958(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], for location, you record the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(6) The date of installation and the location of each well or collection system expansion added pursuant to § 63.1960(a)(3) through (4), (b), and (c)(4).

(7) For any corrective action analysis for which corrective actions are required in § 63.1960(a)(3)(i), or § 63.1960(a)(5) and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(8) Each owner or operator required to conduct enhanced monitoring in § 63.1961(a)(5) must include the results of all monitoring activities conducted during the period.

(i) For each monitoring point, report the date, time, and well identifier along with the value and units of measure for oxygen, temperature (wellhead and

downwell), methane and carbon monoxide.

(ii) Include a summary trend analysis for each well subject to the enhanced monitoring requirements to chart the weekly readings over time for oxygen, temperature (wellhead and downwell), methane, and carbon monoxide.

(iii) Include the date, time, staff person name, and description of findings for each visual observation for subsurface oxidation event.

(i) *Initial performance test report.* Each owner or operator seeking to comply with § 63.1959(b)(2)(iii) must include the following information with the initial performance test report required under § 63.7:

(1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

(2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

(3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

(4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

(5) The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and

(6) The provisions for the control of off-site migration.

(j) *Corrective action and the corresponding timeline.* The owner or operator must submit information regarding corrective actions according to paragraphs (j)(1) and (2) of this section.

(1) For corrective action that is required according to § 63.1960(a)(3) or § 63.1960(a)(4) and is not completed within 60 days after the initial exceedance, you must submit a notification to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(2) For corrective action that is required according to § 63.1960(a)(3) or § 63.1960(a)(4) and is expected to take longer than 120 days after the initial exceedance to complete, you must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 62.8 degrees Celsius (145 degrees Fahrenheit) or above. The Administrator must approve the plan for corrective action and the corresponding timeline.

(k) *24-hour high temperature report.* Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1) and a landfill gas temperature measured at either the wellhead or at any point in the well is greater than or equal to 76.7 degrees Celsius (170 degrees Fahrenheit) and the carbon monoxide concentration measured is greater than or equal to 1,500 ppmv, then you must report the date, time, well identifier, temperature and carbon monoxide reading via email to the Administrator within 24 hours of the measurement.

(l) *Electronic reporting.* Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the owner or operator must submit reports electronically according to paragraphs (l)(1) and (2) of this section.

(1) Within 60 days after the date of completing each performance test required by this subpart, you must submit the results of the performance test following the procedures specified in paragraphs (l)(1)(i) through (iii) of this section.

(i) Data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (*https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert*) at the time of the test. Submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through the EPA's Central Data Exchange (CDX) (*https://cdx.epa.gov/*). The data must be submitted in a file format generated through the use of the EPA's ERT. Alternatively, you may submit an electronic file consistent with the extensible markup language (XML) schema listed on the EPA's ERT website.

(ii) Data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test. The results of the performance test must be included as an attachment in the ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the ERT generated package or alternative file to the EPA via CEDRI.

(iii) Confidential business information (CBI). If you claim some of the information submitted under paragraph (a) of this section is CBI, you must submit a complete file, including information claimed to be CBI, to the EPA. The file must be generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404–02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described in paragraph (l)(1)(i) of this section.

(2) Each owner or operator required to submit reports following the procedure specified in this paragraph must submit reports to the EPA via the CEDRI. The CEDRI interface can be accessed through the EPA's CDX. The owner or operator must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the XML schema listed on the CEDRI website (*https://www.epa.gov/electronic-reporting-air-emissions/compliance-and-emissions-data-reporting-interface-cedri*). If the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the owner or operator must submit the report to the Administrator at the appropriate address listed in § 63.13. Once the form has been available in CEDRI for 90 days, the owner or operator must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted.

(m) *Claims of EPA system outage.* Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], if you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of EPA system outage for failure to comply timely with the reporting requirement. To assert a claim of EPA system outage, you must meet the following requirements:

(1) You must have been or will be precluded from accessing CEDRI and submitting a required report within the time prescribed due to an outage of either the EPA's CEDRI or CDX systems.

(2) The outage must have occurred within the period of time beginning 5 business days prior to the date that the submission is due.

(3) The outage may be planned or unplanned.

(4) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(5) You must provide to the Administrator a written description identifying:

(i) The date(s) and time(s) when CDX or CEDRI was accessed and the system was unavailable;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to EPA system outage;

(iii) Measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(6) The decision to accept the claim of EPA system outage and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(7) In any circumstance, the report must be submitted electronically as soon as possible after the outage is resolved.

(n) *Claims of force majeure.* Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], if you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of force majeure for failure to comply timely with the reporting requirement. To assert a claim of force majeure, you must meet the following requirements:

(1) You may submit a claim if a force majeure event is about to occur, occurs, or has occurred or there are lingering effects from such an event within the period of time beginning 5 business days prior to the date the submission is due. For the purposes of this section, a force majeure event is defined as an event that will be or has been caused by circumstances beyond the control of the affected facility, its contractors, or any entity controlled by the affected facility that prevents you from complying with the requirement to submit a report electronically within the time period prescribed. Examples of such events are acts of nature (*e.g.,* hurricanes, earthquakes, or floods), acts of war or terrorism, or equipment failure or safety hazard beyond the control of the affected facility (*e.g.,* large scale power outage).

(2) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(3) You must provide to the Administrator:

(i) A written description of the force majeure event;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to the force majeure event;

(iii) Measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(4) The decision to accept the claim of force majeure and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(5) In any circumstance, the reporting must occur as soon as possible after the force majeure event occurs.

§ 63.1982 What records and reports must I submit and keep for bioreactors or liquids addition other than leachate?

Submit reports as specified in this section and § 63.1981. Keep records as specified in this section and § 63.1983.

(a) For bioreactors at new affected sources you must submit the initial semi-annual compliance report and performance test results described in § 63.1981(h) within 180 days after the date you are required to begin operating the gas collection and control system by § 63.1947(a)(2).

(b) If you must submit a semi-annual compliance report for a bioreactor as well as a semi-annual compliance report for a conventional portion of the same landfill, you may delay submittal of a subsequent semi-annual compliance report for the bioreactor according to paragraphs (b)(1) through (3) of this section so that the reports may be submitted on the same schedule.

(1) After submittal of your initial semi-annual compliance report and performance test results for the bioreactor, you may delay submittal of the subsequent semi-annual compliance report for the bioreactor until the date the initial or subsequent semi-annual compliance report is due for the conventional portion of your landfill.

(2) You may delay submittal of your subsequent semi-annual compliance report by no more than 12 months after the due date for submitting the initial semi-annual compliance report and performance test results described in § 63.1981(h) for the bioreactor. The report must cover the time period since the previous semi-annual report for the bioreactor, which would be a period of at least 6 months and no more than 12 months.

(3) After the delayed semi-annual report, all subsequent semi-annual reports for the bioreactor must be submitted every 6 months on the same date the semi-annual report for the conventional portion of the landfill is due.

(c) If you add any liquids other than leachate in a controlled fashion to the waste mass and do not comply with the bioreactor requirements in §§ 63.1947 and 63.1955(b) and paragraphs (a) and (b) of this section, you must keep a record of calculations showing that the percent moisture by weight expected in the waste mass to which liquid is added is less than 40 percent. The calculation must consider the waste mass, moisture content of the incoming waste, mass of water added to the waste including leachate recirculation and other liquids addition and precipitation, and the mass of water removed through leachate or other water losses. Moisture level sampling or mass balances calculations can be used. You must document the calculations and the basis of any assumptions. Keep the record of the calculations until you cease liquids addition.

(d) If you calculate moisture content to establish the date your bioreactor is required to begin operating the collection and control system under § 63.1947(a)(2) or (c)(2), keep a record of the calculations including the information specified in paragraph (e) of this section for 5 years. Within 90 days after the bioreactor achieves 40 percent moisture content, report the results of the calculation, the date the bioreactor achieved 40 percent moisture content by weight, and the date you plan to begin collection and control system operation to the Administrator. Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the reports should be submitted following the procedure specified in § 63.1981(l)(2).

§ 63.1983 What records must I keep?

You must keep records as specified in this subpart. You must also keep records as specified in the general provisions of 40 CFR part 63 as shown in Table 1 to this subpart.

(a) Except as provided in § 63.1981(d)(2), each owner or operator

of an MSW landfill subject to the provisions of §§ 60.762(b)(2)(ii) and (iii) must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered § 60.762(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in § 63.1981(d)(2), each owner or operator of a controlled landfill must keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (5) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of 5 years. Records of the control device vendor specifications must be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 63.1959(b)(2)(ii):

(i) The maximum expected gas generation flow rate as calculated in § 63.1960(a)(1).

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §§ 63.1962(a)(1) and (2).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 63.1959(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in § 63.1959(b)(2)(iii)(B) achieved by the control device.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 63.1959(b)(2)(iii)(B)(1) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 63.1959(b)(2)(iii)(A) through use of a non-enclosed flare, the flare type (*i.e.,* steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in § 63.11; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 63.1959(b)(2)(iii)(C) through use of a landfill gas treatment system:

(i) *Bypass records.* Records of the flow of landfill gas to, and bypass of, the treatment system.

(ii) *Site-specific treatment monitoring plan.* Beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the owner or operator must prepare a site-specific treament monitoring plan to include:

(A) Monitoring records of parameters that are identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, records should include records of filtration, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas.

(B) Monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for each intended end use of the treated landfill gas.

(C) Documentation of the monitoring methods and ranges, along with justification for their use.

(D) List of responsible staff (by job title) for data collection.

(E) Processes and methods used to collect the necessary data.

(F) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

(c) Except as provided in § 63.1981(d)(2), each owner or operator of a controlled landfill subject to the provisions of this subpart must keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in § 63.1961 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that must be recorded and reported under § 63.1981(h):

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal units per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with § 63.1959(b)(2)(iii) was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.

(2) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under §§ 63.1961(b)(2)(ii), 63.1961(c)(2)(ii), and 63.1961(g)(2).

(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with § 63.1959(b)(2)(iii) must keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, tribal, or federal regulatory requirements.

(4) Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare must keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under § 63.1961(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(5) Each owner or operator of a landfill seeking to comply with § 63.1959(b)(2) using an active collection system designed in accordance with § 63.1959(b)(2)(ii) must keep records of periods when the collection system or control device is not operating.

(6) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in § 63.1958(e)(1), the date, time, and

duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown.

(7) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in § 63.1958(e)(1), in the event that an affected unit fails to meet an applicable standard, record the information below in this paragraph:

(i) For each failure record the date, time and duration of each failure and the cause of such events (including unknown cause, if applicable).

(ii) For each failure to meet an applicable standard; record and retain a list of the affected sources or equipment.

(iii) Record actions taken to minimize emissions in accordance with the general duty of § 63.1955(c) and any corrective actions taken to return the affected unit to its normal or usual manner of operation.

(d) Except as provided in § 63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

(1) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 63.1960(b).

(2) Each owner or operator subject to the provisions of this subpart must keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in § 63.1962(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in § 63.1962(a)(3)(ii).

(e) Except as provided in § 63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the following:

(1) All collection and control system exceedances of the operational standards in § 63.1958, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(2) Each owner or operator subject to the control provisions of this subpart must keep records of each wellhead temperature monitoring value of greater than 55 degrees Celsius (131 degrees Fahrenheit), each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent, except:

(i) When an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the compliance provisions for wellhead temperature in § 63.1958(c)(1), but no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], the records of each wellhead temperature monitoring value of 62.8 degrees Celsius (145 degrees Fahrenheit) or above instead of values greater than 55 degrees Celsius (131 degrees Fahrenheit).

(i) Each owner or operator required to conduct the enhanced monitoring provisions in § 63.1961(a)(4), must also keep records of all enhanced monitoring activities.

(ii) Each owner or operator required to submit the *24-hour high temperature report in* § 63.1981(k), must also keep a record of the email transmission.

(3) For any root cause analysis for which corrective actions are required in § 63.1960(a)(3)(i)(A) or § 63.1960(a)(4)(i)(A), keep a record of the root cause analysis conducted, including a description of the recommended corrective action(s) taken, and the date(s) the corrective action(s) were completed.

(4) For any root cause analysis for which corrective actions are required in § 63.1960(a)(3)(i)(b) or § 63.1960(a)(4)(i)(B), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(5) For any root cause analysis for which corrective actions are required in § 63.1960(a)(3)(iii) or § 63.1960(a)(4)(i)(C), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the Administrator.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of ''design capacity'', must keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(g) Except as provided in § 63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in § 63.1961(a)(1) through (5).

(h) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in § 63.1958(c)(1), you must keep the following records.

(1) Records of the landfill gas temperature on a monthly basis as monitored in § 63.1960(a)(4).

(2) Records of enhanced monitoring data at each well with a measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) and less than 76.7 degrees Celsius (170 degrees Fahrenheit) as gathered in § 63.1961(a)(5).

(i) Any records required to be maintained by this subpart that are submitted electronically via the EPA's CEDRI may be maintained in electronic format. This ability to maintain electronic copies does not affect the requirement for facilities to make records, data, and reports available upon request to a delegated air agency or the EPA as part of an on-site compliance evaluation.

Other Requirements and Information

§ 63.1985 Who enforces this subpart?

(a) This subpart can be implemented and enforced by the EPA, or a delegated authority such as the applicable state, local, or tribal agency. If the EPA Administrator has delegated authority to a state, local, or tribal agency, then that agency as well as the EPA has the authority to implement and enforce this subpart. Contact the applicable EPA Regional Office to find out if this subpart is delegated to a State, local, or tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a state, local, or tribal agency under 40 CFR part 63, subpart E, the authorities contained in paragraph (c) of this section are retained by the EPA Administrator and are not transferred to the State, local, or tribal agency.

(c) The authorities that will not be delegated to state, local, or tribal agencies are as follows. Approval of alternatives to the standards in §§ 63.1955 through 63.1962. Where these standards reference another subpart, the cited provisions will be delegated according to the delegation provisions of the referenced subpart.

§ 63.1990 What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, 40 CFR part 60, subparts A, Cc, Cf, WWW, and XXX; 40 CFR part 62, subpart GGG, and 40 CFR part 63 subpart A, and this section that follows:

Active collection system means a gas collection system that uses gas mover equipment.

Active landfill means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.

Bioreactor means an MSW landfill or portion of an MSW landfill where any liquid other than leachate (leachate includes landfill gas condensate) is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic (without oxygen) biodegradation of the waste.

Closed area means a separately lined area of an MSW landfill in which solid waste is no longer being placed. If additional solid waste is placed in that area of the landfill, that landfill area is no longer closed. The area must be separately lined to ensure that the landfill gas does not migrate between open and closed areas.

Closed landfill means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under § 63.9(b). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.

Closure means that point in time when a landfill becomes a closed landfill.

Commercial solid waste means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

Controlled landfill means any landfill at which collection and control systems are required under this subpart as a result of the nonmethane organic compounds emission rate. The landfill is considered controlled at the time a collection and control system design plan is submitted in compliance with § 60.752(b)(2)(i) if submitted before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**] or in compliance with § 63.1959(b)(2)(i) if submitted after [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**].

Corrective action analysis means a description of all reasonable interim and long-term measures, if any, that are available, and an explanation of why the selected corrective action(s) is/are the best alternative(s), including, but not limited to, considerations of cost effectiveness, technical feasibility, safety, and secondary impacts.

Cover penetration means a wellhead, a part of a landfill gas collection or operations system, and/or any other object that completely passes through the landfill cover. The landfill cover includes that portion which covers the waste, as well as the portion which borders the waste extended to the point where it is sealed with the landfill liner or the surrounding land mass. Examples of what is not a penetration for purposes of this subpart include but are not limited to: Survey stakes, fencing including litter fences, flags, signs, utility posts, and trees so long as these items do not pass through the landfill cover.

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 state, local, or tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually.

*Deviation before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]*,means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart, including, but not limited to, any emissions limitation (including any operating limit) or work practice requirement;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Fails to meet any emission limitation, (including any operating limit), or work practice requirement in this subpart during startup, shutdown, or malfunction, regardless of whether or not such failure is permitted by this subpart.

*Deviation beginning no later than [DATE 18 MONTHS AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]*, means any instance in which an affected source subject to this subpart or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart including but not limited to any emission limit, or operating limit, or work practice requirement; or

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit.

Disposal facility means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

Emissions limitation means any emission limit, opacity limit, operating limit, or visible emissions limit.

Enclosed combustor means an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.

EPA approved State plan means a State plan that EPA has approved based on the requirements in 40 CFR part 60, subpart B to implement and enforce 40 CFR part 60, subparts Cc or Cf. An approved state plan becomes effective on the date specified in the notice published in the **Federal Register** announcing EPA's approval.

EPA approved Tribal plan means a plan submitted by a tribal authority pursuant to 40 CFR parts 9, 35, 49, 50, and 81 to implement and enforce 40 CFR part 60, subpart Cc or subpart Cf.

Federal plan means the EPA plan to implement 40 CFR part 60, subparts Cc or Cf for existing MSW landfills located in States and Indian country where state plans or tribal plans are not currently in effect. On the effective date of an EPA approved state or tribal plan, the federal plan no longer applies. The federal plan implementing 40 CFR part 60, subpart Cc is found at 40 CFR part 62, subpart GGG.

Flare means an open combustor without enclosure or shroud.

Gas mover equipment means the equipment (*i.e.,* fan, blower, compressor) used to transport landfill gas through the header system.

Household waste means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). Household waste does not include fully segregated yard waste. Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities. Household waste does not include construction, renovation, or demolition wastes, even if originating from a household.

Industrial solid waste means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act, parts 264 and 265 of this chapter. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

Interior well means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside the landfilled waste is not an interior well.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under § 257.2 of this title.

Lateral expansion means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

Leachate recirculation means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

Modification means an increase in the permitted volume design capacity of the landfill by either lateral or vertical expansion based on its permitted design capacity after November 7, 2000. Modification does not occur until the owner or operator commences construction on the lateral or vertical expansion.

Municipal solid waste landfill or *MSW landfill* means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA Subtitle D wastes (§ 257.2 of this title) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.

Municipal solid waste landfill emissions or *MSW landfill emissions* means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.

NMOC means nonmethane organic compounds, as measured according to the provisions of § 63.1959.

Nondegradable waste means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.

Passive collection system means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

Root cause analysis means an assessment conducted through a process of investigation to determine the primary cause, and any other contributing causes, of an exceedance of a standard operating parameter at a wellhead.

Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities.

Sludge means the term sludge as defined in § 258.2.

Solid waste means the term solid waste as defined in § 258.2.

Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this subpart.

Sufficient extraction rate means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

Treated landfill gas means landfill gas processed in a treatment system as defined in this subpart.

Treatment system means a system that filters, de-waters, and compresses landfill gas for sale or beneficial use.

Untreated landfill gas means any landfill gas that is not treated landfill gas.

Work practice requirement means any design, equipment, work practice, or operational standard, or combination thereof, that is promulgated pursuant to section 112(h) of the Clean Air Act.

As specified in this subpart, you must meet each requirement in the following table that applies to you.

TABLE 1 TO SUBPART AAAA OF PART 63—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART AAAA

Part 63 citation	Description	Applicable to subpart AAAA before [date 18 months + 1 day after date of publication of final rule in the **Federal Register**]	Applicable to subpart AAAA after [date 18 months after date of publication of final rule in the **Federal Register**]	Explanation
§ 63.1(a)	Applicability: general applicability of NESHAP in this part.	Yes	Yes.	
§ 63.1(b)	Applicability determination for stationary sources.	Yes	Yes.	
§ 63.1(c)	Applicability after a standard has been set.	No [a]	Yes.	
§ 63.1(e)	Applicability of permit program before relevant standard is set.	Yes	Yes.	
§ 63.2	Definitions	Yes	Yes.	
§ 63.3	Units and abbreviations	No [a]	Yes.	
§ 63.4	Prohibited activities and circumvention.	Yes	Yes.	
§ 63.5(a)	Construction/reconstruction	No [a]	Yes.	
§ 63.5(b)	Requirements for existing, newly constructed, and reconstructed sources.	Yes	Yes.	
§ 63.5(d)	Application for approval of construction or reconstruction.	No [a]	Yes.	
§ 63.5(e)–(f)	Approval of construction and reconstruction.	No [a]	Yes.	
§ 63.6(a)	Compliance with standards and maintenance requirements -applicability.	No [a]	Yes.	
§ 63.6(b)–(c)	Compliance dates for new, reconstructed, and existing sources.	No [a]	Yes.	
§ 63.6(e)(1)(i)–(ii)	Operation and maintenance requirements.	Yes	No	See § 63.1955(c) for general duty requirements.
63.6(e)(3)(i)–(ix)	Startup, shutdown, and malfunction plan.	Yes	No.	
63.6(f)(1)	Exemption of nonopacity emission standards during SSM.	Yes	No.	
§ 63.6(f)(2)–(3)	Compliance with nonopacity emission standards.	Yes	Yes.	
§ 63.6(g)	Use of an alternative nonopacity standard.	No [a]	Yes.	
§ 63.6(h)	Compliance with opacity and visible emission standards.	No [a]	No	Subpart AAAA does not prescribe opacity or visible emission standards.
§ 63.7	Performance testing	No [a]	Yes.	
§ 63.8	Monitoring requirements	No [a]	Yes.	
§ 63.9(a)–(d)	Notifications	No [a]	Yes.	
§ 63.9(e)	Notification of compliance test	No [a]	Yes.	
§ 63.9(f)	Notification of visible emissions/opacity test.	No [a]	No	Subpart AAAA does not prescribe opacity or visible emission standards.
§ 63.9(g)	Notification when using CMS	No [a]	Yes.	
§ 63.9(h)	Notification of compliance status	No [a]	Yes.	
§ 63.9(i)	Adjustment of submittal deadlines.	No [a]	Yes.	
§ 63.9(j)	Change in information already provided.	No [a]	Yes.	
§ 63.10(a)	Recordkeeping and reporting—general.	No [a]	.	
§ 63.10(b)(1)	General recordkeeping	No [a]	Yes.	
§ 63.10(b)(2)(i)	Startup and shutdown records	Yes	No	See § 63.1983(c)(6) for recordkeeping for periods of startup and shutdown.
§ 63.10(b)(2)(ii)	Recordkeeping of failures to meet a standard.	Yes	No	See § 63.1983(c)(6)–(7) for recordkeeping for any exceedance of a standard.
§ 63.10(b)(2)(iii)	Recordkeeping of maintenance on air pollution control equipment.	Yes	Yes.	

TABLE 1 TO SUBPART AAAA OF PART 63—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART AAAA—Continued

Part 63 citation	Description	Applicable to subpart AAAA before [date 18 months + 1 day after date of publication of final rule in the **Federal Register**]	Applicable to subpart AAAA after [date 18 months after date of publication of final rule in the **Federal Register**]	Explanation
§ 63.10(b)(2)(iv)–(v)	Actions taken to minimize emissions during SSM.	Yes	No	See § 63.1983(c)(7) for recordkeeping of corrective actions to restore compliance.
§ 63.10(b)(vi)	Recordkeeping for CMS malfunctions.	No [a]	Yes.	
§ 63.10(b)(vii)–(xiv)	Other Recordkeeping of compliance measurements.	No [a]	Yes.	
§ 63.10(c)	Additional recordkeeping for sources with CMS.	No [a]		See § 63.1983 for required CMS recordkeeping.
§ 63.10(d)(1)	General reporting	No [a]	Yes.	
§ 63.10(d)(2)	Reporting of performance test results.	No [a]	Yes.	
§ 63.10(d)(3)	Reporting of visible emission observations.	No [a]	Yes.	
§ 63.10(d)(4)	Progress reports for compliance date extensions.	No [a]	Yes.	
§ 63.10(d)(5)	SSM reporting	Yes	No	All exceedances must be reported in the semi-annual report required by § 63.1981(h).
§ 63.10(e)	Additional reporting for CMS systems.	No [a]	Yes.	
§ 63.10(f)	Recordkeeping/reporting waiver	No [a]	Yes.	
§ 63.11	Control device requirements/flares.	No [a]	Yes	§ 60.18 is required before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**]. However, § 60.18 and 63.11 are equivalent.
§ 63.12(a)	State authority	Yes	Yes.	
§ 63.12(b)–(c)	State delegations	No [a]	Yes.	
§ 63.13	Addresses	No [a]	Yes.	
§ 63.14	Incorporation by reference	No [a]	Yes.	
§ 63.15	Availability of information and confidentiality.	Yes	Yes.	

[a] Before [DATE 18 MONTHS + 1 DAY AFTER DATE OF PUBLICATION OF FINAL RULE IN THE **FEDERAL REGISTER**], this subpart requires affected facilities to follow 40 CFR part 60, subpart WWW, which incorporates the General Provisions of 40 CFR part 60.

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