

United States  
Environmental Protection  
Agency

Office of Air Quality  
Planning and Standards  
Research Triangle Park, NC 27711

EPA-456R/98-009 ✓  
November 1998

---

Air



## Municipal Solid Waste Landfills, Volume 2:

# Summary of the Requirements for Section 111(d) State Plans for Implementing the Municipal Solid Waste Landfills Emission Guidelines



Doc # 155986

**Municipal Solid Waste Landfills, Volume 2:  
Summary of the Requirements for Section 111(d)  
State Plans for Implementing the  
Municipal Solid Waste Landfill  
Emission Guidelines**

**EPA-456/R-98-009**

Office of Air Quality Planning and Standards  
U.S. Environmental Protection Agency  
Research Triangle Park, North Carolina 27711

**U.S. Environmental Protection Agency  
Region 5, Library (PL-12J)  
77 West Jackson Boulevard, 12th Floor  
Chicago, IL 60604-3590**

November 1998

## ABSTRACT

This guidance document explains the State plan development and approval process, and explains the regulations developed under the Clean Air Act (CAA) as they apply to municipal solid waste (MSW) landfills. The CAA requires States to adopt and submit a State plan to implement the Emission Guidelines developed under the CAA. This document discusses the regulations developed under Section 111(d) of the Clean Air Act, focusing on Subpart Cc, Emission Guidelines for existing MSW landfills; and Subpart B, Adoption and Submittal of State plans for designated facilities. In addition, the document outlines and explains the required content of State plans, outlines the timeline and responsibilities for developing and submitting State plans, and answers general questions about how to prepare State plans. The appendices include reference materials States may need when developing State plans. For example, copies of relevant regulations, policy memos, procedures for estimating emissions, and a list of MSW landfill rule contacts who can assist in developing the State plan are included. This volume is one of a series of documents designed to assist States, EPA regional offices, and MSW landfill owners and operators in implementing the New Source Performance Standards (NSPS) and Emission Guidelines. Full references to all related documents are provided in the Executive Summary.

**Municipal Solid Waste Landfills, Volume 2:  
Summary of the Requirements for Section 111(d)  
State Plans for Implementing the  
Municipal Solid Waste Landfills  
Emission Guidelines  
EPA-456/R-98-009**

Available at:

- (1) U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

Air and Radiation Docket and Information Center  
Room M-1500 Waterside Mall, Ground Floor  
Phone: 202-260-7548  
Docket Number: A-88-09  
Item number: II-B-54

- (2) U.S. Environmental Protection Agency  
Regional Office Libraries (Regions I-X)  
(see Appendix C for Addresses)
- (3) U.S. Environmental Protection Agency  
EPA Technology Transfer Network Website (TTN Web)

Unified Air Toxics Website: Rule and Implementation Information for Standards of Performance for Municipal Solid Waste Landfills  
<http://www.epa.gov/ttn/uatw/landfill/landflpg.html>

or

Office of Air Policy and Guidance (OAR P&G)  
<http://www.epa.gov/ttn/oarpg>

The file is located under:  
Actions Sorted by CAA Title  
Title III I  
Policy and Guidance Memos.

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
ABSTRACT .....	iii
EXECUTIVE SUMMARY .....	1
Background .....	1
State Plan Content .....	2
Schedule .....	4
Related Documents .....	4
1.0 INTRODUCTION .....	1-1
1.1 Organization of this Document .....	1-2
1.2 Clean Air Act Requirements .....	1-3
1.3 Indian Tribes and State Plans .....	1-4
1.4 MSW Landfills Covered by State Plans .....	1-4
1.5 Requirements for State Plans .....	1-6
1.6 Relationship Between the Section 111(d) State Plan and SIP .....	1-7
2.0 SCHEDULE AND RESPONSIBILITIES .....	2-1
2.1 State Plan Schedule .....	2-1
2.2 Responsibilities .....	2-4
2.2.1 EPA Responsibilities .....	2-4
2.2.2 State Responsibilities .....	2-5
2.2.3 Landfill Owners and Operators Responsibilities .....	2-6
3.0 REQUIRED ELEMENTS OF AN ACCEPTABLE STATE PLAN .....	3-1
3.1 Criteria for an Adequate Enforceable Mechanism .....	3-2
3.2 Demonstration of Legal Authority .....	3-5
3.3 Source Inventory .....	3-6
3.4 Emission Inventory .....	3-8
3.4.1 Emission Estimation Procedures .....	3-8
3.4.2 Annual Emission Reporting .....	3-10
3.5 Emission Standards .....	3-11
3.5.1 Allowable Emission Rates and Control Requirements .....	3-11
3.6 Process for Review of Design Plans .....	3-12
3.7 Compliance Schedules .....	3-13
3.7.1 Compliance Times .....	3-13
3.7.2 Increments of Progress .....	3-15
3.8 Testing, Monitoring, Recordkeeping, and Reporting .....	3-17
3.8.1 Requirements of the Emission Guidelines .....	3-18
3.8.2 Provisions for Requirements Other Than Those in the Emission Guidelines .....	3-20
3.9 Public Hearings .....	3-20
3.10 State Progress Reports to EPA .....	3-21

## TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
3.11 State Flexibility .....	3-23
3.11.1 Submittal of State Plan .....	3-23
3.11.2 Emission Standards .....	3-23
3.11.3 Compliance Schedules .....	3-24
4.0 ANSWERS TO SOME GENERAL QUESTIONS ABOUT SECTION 111(D) STATE PLANS .....	4-1

### **Appendices**

A	Emission Guideline Fact Sheet (40 CFR 60 Subpart Cc)
B	MSW Landfills Implementation Timeline
C	State, Regional, and Other Contacts
D	Emission Estimation Procedures for State Plan Emissions Inventory
E	New Source Review
F	Title V Operating Permits White Paper Number 2
G	Clean Air Act Section 111(d)
H	40 CFR 60 Subpart B
I	40 CFR 60 Subparts Cc and WWW, Including June 16, 1998 Amendments
J	Key Elements of an Acceptable Section 111(d) State Plan
K	Memo: Emission Inventory of MSWLF State Plans

## LIST OF FIGURES

	<u>Page</u>
2-1 State Plan Approval Process and Schedule .....	2-2

## LIST OF TABLES

	<u>Page</u>
1-1 Appendices to this Document .....	1-3
1-2 Outline of the Emission Guidelines for MSW Landfills (40 CFR Part 60, Subpart Cc) .....	1-5
1-3 Regulations for Adopting and Submitting State Plans (40 CFR 60 Subpart B) .....	1-9
2-1 Suggested Schedule for Section 111(d) State Plans .....	2-3
3-1 Summary of Requirements for Section 111(d) State Plans .....	3-3
3-2 Schedule for MSW Landfill Compliance with the Emission Guidelines .....	3-14

## LIST OF ACRONYMS AND ABBREVIATIONS

AFS	Aerometric Emissions Information Retrieval System Facility Subsystem
CAA	Clean Air Act (of 1990)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FR	<u>Federal Register</u>
Mg	Megagram (2204 lb)
MSW	Municipal Solid Waste
MWC	Municipal Waste Combustor
NAAQS	National Ambient Air Quality Standards
NMOC	Non-methane organic compounds
NSPS	New Source Performance Standard
NSR	New Source Review
SIP	State Implementation Plan
TAR	Tribal Authority Rule
TTN Web	EPA Technology Transfer Network Website

## EXECUTIVE SUMMARY

This is the second of two guidance documents designed to assist States, EPA regional offices, and Municipal Solid Waste (MSW) landfill owners and operators in implementing the New Source Performance Standards (NSPS) and Emission Guidelines. The NSPS apply to new landfills, whereas the Emission Guidelines pertain to existing landfills. States must develop State plans as part of the implementation process for the Emission Guidelines for existing landfills in their State. Indian Tribes are not required to submit Tribal plans, but may submit Tribal plans to implement and enforce the Emission Guidelines in Indian country. The purpose of this document is to explain the State plan development and approval process. This volume, "Municipal Solid Waste Landfills, Volume 2: Summary of the Requirements for Section 111(d) State plans for Implementing the Municipal Solid Waste Landfill Emission Guidelines," EPA-456/R-96-005 (MSW Landfills, Volume 2), draws together the relevant information from the various Federal regulations that affect existing MSW landfills to give the State regulatory agencies the information they need to develop State plans. Background information is provided on the MSW landfills regulations that have been developed under Section 111 of the Clean Air Act (CAA). States must include specific information in their State plans and must comply with a specific schedule. The required content of State plans and the adoption and submittal schedule are outlined below and are discussed in detail in the body of this guidance document. The first guidance document, Volume 1, and related documents that will assist States in developing their plans are briefly discussed in the section of this Executive Summary entitled "Related Documents."

This document is a revision of the final draft published in October 1996, EPA-456/R-96-005. It has been revised to reflect the amendments to the NSPS and Emission Guidelines published on June 16, 1998 (63 FR 32743) and to update other information.

### **Background**

Air pollution emissions from MSW landfills are regulated by various federal regulations promulgated to implement the CAA of 1990. This document addresses the MSW

landfills regulations that have been developed under Section 111 of the CAA. Section 111 of the CAA addresses Standards of Performance for Stationary Sources.

Federal air pollution rules promulgated in the Code of Federal Regulations (CFR) that affect MSW landfills include: (1) Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills [Title 40 CFR Part 60, Subpart Cc]; (2) New Source Performance Standards for MSW Landfills [Title 40 CFR Part 60 Subpart WWW]; and (3) rules governing the Adoption and Submittal of State plans for Designated Facilities [Title 40 CFR Part 60, Subpart B]. This document focuses on the Emission Guidelines and the rules governing State plans. Appendices G and H of this document contain the full text of Section 111(d) and Subpart B, respectively. Appendix I contains the full text of Subparts Cc and WWW, including amendments published on June 16, 1998 (63 FR 32743).

The Subpart Cc Emission Guidelines apply to existing MSW landfills. States with existing MSW landfills must implement the Emission Guidelines. As part of the implementation effort, States must develop a State plan and submit it for approval to the U.S. Environmental Protection Agency (EPA). Together, Subpart B and Subpart Cc specify the State plan content and the general rules for adopting and submitting State plans.

State plan requirements for MSW landfills are similar to those for municipal waste combustor (MWC) units because they are both regulated under Section 111(d) of the CAA. However, there are differences because MWC units are regulated under Section 129 of the CAA in addition to Section 111(d). Section 129 addresses Solid Waste Combustion and does not apply to MSW landfills; therefore, State plans for MSW landfills will differ slightly from State plans for MWC units and other section 129 State plans.

### **State Plan Content**

On March 12, 1996 the EPA adopted (1) Emission Guidelines for existing MSW landfills and (2) New Source Performance Standards for new MSW landfills. On June 16, 1998, EPA published a notice to amend, correct errors, and clarify regulatory text. These amendments

did not affect the due date or the required contents of State plans for existing landfills. The CAA requires that State regulatory agencies implement the Emission Guidelines according to a State plan developed under Section 111(d) of the CAA, and that they submit the State plan to EPA within nine months of EPA's adoption of the Emission Guidelines. The CAA and the Tribal Authority Rule (TAR) allow, but do not require, Indian Tribes to develop Tribal plans in the same manner as States if the Indian Tribe meets criteria outlined in the TAR.

State plans must contain specific information and legal mechanisms necessary to implement the Emission Guidelines. The minimum requirements are listed below and are discussed in detail in Section 3 and Appendix J.

- Identification of enforceable State mechanisms selected by the State for implementing the Emission Guidelines;
- A demonstration of the State's legal authority to carry out the Section 111(d) State plan as submitted;
- An inventory of existing MSW landfills in the State affected by the Emission Guidelines. An existing landfill may be active (currently accepting waste or having additional capacity available to accept waste) or closed (no longer accepting waste nor having available capacity for future waste deposition).
- An inventory of emissions from existing MSW landfills in the State that are affected by the Emission Guidelines;
- Emission standards for existing MSW landfills that are no less stringent than those in the Emission Guidelines;<sup>1</sup>
- A State process, as stipulated in § 60.33c(b) of Subpart Cc, for State review and approval of site-specific gas collection and control system design plans;

---

<sup>1</sup>On a case-by-case basis, the State may provide for a less stringent standard or a longer compliance schedule if the State demonstrates to EPA that the criteria in § 60.24(f) of Subpart B are met, and the EPA approves the standard or schedule. See Section 3.11 for additional information.

- Compliance schedules, extending no later than 30 months after the date the annual NMOC emission rate reaches or exceeds 50 megagrams (Mg) per year;
- Testing, monitoring, recordkeeping, and reporting requirements;
- A record of public hearing(s) on the State plan; and
- Provision for annual State progress reports to EPA on implementation of the State plan.

### **Schedule**

States must adopt and submit a State plan to EPA within nine months (December 12, 1996) after promulgation of the Emission Guidelines. The State must make available to the public the State plan implementing the Emission Guidelines and provide opportunity for discussion of the State plan in a public hearing prior to submittal to EPA. EPA then has four months (April 12, 1997) to approve or disapprove the State plan. Plan approval or disapproval will be published in the Federal Register (FR). If a plan is disapproved, EPA will State the reasons for disapproval in the FR. If a State does not submit an approvable State plan, EPA will adopt and implement a Federal Plan.

### **Related Documents**

A number of related documents and resources are available that may prove useful to States, EPA regional offices, and landfill owners and operators. These documents are available as indicated below, however, these and other landfill-related documents are available on the EPA Technology Transfer Network Website (TTN web) at:  
<http://www.epa.gov/ttn/uatw/landfill/landflpg.html>.

- "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements, for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills," EPA-453/R-96-004 (MSW Landfills, Volume 1 is posted on the TTN web and explains landfills NSPS and Emission Guideline control, monitoring, recordkeeping

and reporting requirements, and assists States in determining compliance. The document is also available in the docket (see address on page iv).

- "Municipal Solid Waste Landfill New Source Performance Standards and Emission Guidelines—Issues and Answers," is posted on the TTN Web and contains a periodically updated summary of answers to questions EPA has recently been asked about the MSW Landfills NSPS and Emission Guidelines.
- "Air Emissions from Municipal Solid Waste Landfills — Background Information for Final Standards and Guidelines," EPA-453/R-94-021 contains summaries of public comments received on the landfills NSPS and Emission Guidelines, EPA's responses, and the estimated impacts of these regulations. This document may be obtained from the TTN Web, the U.S. EPA Library (MD-33), Research Triangle Park, NC 27711, telephone (919) 541-2777, or from the docket (see addresses on page iv).
- EPA's Landfill Methane Outreach Program (LMOP). To cost-effectively reduce methane emissions from landfills, the EPA encourages the development of environmentally and economically beneficial landfill gas-to-energy projects through the LMOP. The LMOP works with States, utilities, and the landfill gas-to-energy industry to facilitate the development of successful projects. One of the key ways the LMOP does this is by publishing technical information on how to develop a gas-to-energy project including current technology, cost, and financing options, and regulatory considerations. Appendix C includes information on how to contact LMOP.
- "Landfill Gas Emissions Model" Version 2.01 and User's Manual, September 1998. The computer model can be used to calculate annual emission rates as to determine applicability of the NSPS or Emission Guidelines or for State emission inventory or other purposes. The user's guide and diskettes can be obtained from the National Technical Information Services, as described in Appendix D, or accessed on the TTN Web at <http://www.epa.gov/ttn/catc/products.html#software>.

Appendix C includes information on how to contact landfill resources, including EPA regional and State contacts and EPA contacts for LMOP, the landfill model, implementation model, implementation issues, and other information. Documents posted on the TTN Web may be accessed by computer as described on page iv. The user can download an electronic copy from the TTN Web. Printed copies of the documents are available as discussed above.

## 1.0 INTRODUCTION

The purpose of this document is to assist the State air regulatory agencies in developing State plans that implement regulations controlling air pollutant emissions from municipal solid waste (MSW) landfills. The United States Environmental Protection Agency (EPA) has developed regulations to control air pollutant emissions from MSW landfills under the Clean Air Act of 1990. Emissions from new MSW landfills are addressed by standards of performance for new sources (New Source Performance Standards [NSPS]), and emissions from existing MSW landfills are addressed by standards of performance for existing sources (Emission Guidelines). EPA promulgated the NSPS (Subpart WWW) and Emission Guidelines (Subpart Cc) for MSW landfills on March 12, 1996, and published amendments on June 16, 1998. States are required to develop State plans to implement the Emission Guidelines for existing sources and submit the State plans to EPA by December 12, 1996. Indian Tribes may submit, but are not required to submit, Tribal plans to implement and enforce the emission guidelines in Indian country. This document provides State agencies and Indian Tribes information on the required content of these State plans. In some cases, local agencies, or protectorates of the of the United States may submit plans for landfills in their jurisdictions. The same guidance applies. The word "State plan" used throughout this document includes tribal plans developed by Indian Tribes and plans developed by agencies or protectorates.

Another document has been prepared to assist States, Tribes, EPA regional offices, and MSW landfill owners and operators in implementing the NSPS and Emission Guidelines. A September 1998 draft document entitled, "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills," EPA-453/R-96-004 (MSW Landfills, Volume 1) is posted on the EPA Technology Transfer Network Website (TTN Web). The September 1998 version of MSW Landfills Volume 1 replaces and updates a March 1996 draft to reflect the rule amendments published on June 16, 1998. Volume 1 provides a plain English summary of the requirements of the NSPS and Emission Guidelines. It contains example forms that may be used for reporting. It also contains tools, such as checklists, that may be used by regulatory agencies to determine landfill compliance with the rules. A question-and-answer

document, "Municipal Solid Waste Landfill New Source Performance Standards and Emission Guidelines—Questions and Answers" is also posted on the TTN Web, and contains answers to questions EPA has been asked about the MSW Landfills NSPS and Emission Guidelines. The document may be updated as additional questions are received. The TTN Web address for these documents is <http://www.epa.gov/ttn/uatw/landfill/landflpg.html>.

## **1.1 Organization of this Document**

This document brings together the information on the relevant parts of the various regulations that affect existing MSW landfills, i.e., those that were constructed, modified or reconstructed before May 30, 1991 and have not been modified or reconstructed since May 30, 1991 and that have accepted waste since November 8, 1987 or have additional capacity available for future waste deposition. These regulations were developed under Section 111(d) of the Clean Air Act. The regulations are codified in Title 40 of the Code of Federal Regulations (CFR). The CFR rules include (1) Adoption and Submittal of State plans for designated facilities, Subpart B, and (2) the Emission Guidelines for existing MSW landfills, Subpart Cc.

This document provides information on the relevant requirements of the Clean Air Act and the Emission Guidelines, and the required contents of State plans, including an overview of Clean Air Act, regulatory, and State plan requirements (Section 1); information on the timeline and responsibilities for developing and submitting State plans (Section 2); the elements of a State plan (Section 3); and answers to some general questions about preparing State plans (Section 4).

The appendices of this document (Table 1-1) include reference materials that States may find useful when developing the State plans. The appendices include copies of Section 111(d), relevant regulations, policy memos, procedures for estimating MSW landfill emissions, and contact lists.

**Table 1-1. Appendices to this Document**

Appendix	Title
A	Emission Guideline Fact Sheet (40 CFR 60 Subpart Cc)
B	MSW Landfills Implementation Timeline
C	State, Regional, and Other Contacts
D	Emission Estimation Procedures for State Plan Emissions Inventory
E	New Source Review
F	Title V Operating Permits White Paper Number 2
G	Clean Air Act Section 111(d)
H	40 CFR 60 Subpart B
I	40 CFR 60 Subparts Cc and WWW, including the June 16, 1998 Amendments
J	Key Elements of an Acceptable Section 111(d) State Plan
K	Memo: Emission Inventory for MSWLF State Plans

## **1.2 Clean Air Act Requirements**

Section 111(d) (see Appendix G) has been included in the Clean Air Act since the 1970's and requires EPA to establish procedures for submitting State plans for implementing Emission Guidelines. The landfill standard is a health-based Emission Guideline. Procedures and requirements for health-based Emission Guidelines are different from welfare-based. Because the landfills Emission Guidelines are health-based, this document focuses on the procedures and requirements for health-based Emission Guidelines. The first health-based Emission Guideline adopted was for sulfuric acid plants in 1977. Other health- and welfare-based Emission Guidelines have been adopted since that time. The State plans implement and provide for enforcing the Emission Guidelines. Detailed procedures for submitting and approving State plans were promulgated by EPA in 1975 as 40 CFR Part 60, Subpart B and amended in 1979, 1989, and 1995 (see Appendix H). The MSW landfill Emission Guidelines (Subpart Cc) were promulgated on March 12, 1996, under the authority of Section 111(d) of the Act, and were amended on June 16, 1998.

The Subpart Cc Emission Guidelines for MSW landfills differ from those adopted for MWC units because MSW landfills are regulated under Section 111(d) of the CAA, whereas MWC units are regulated under Sections 111(d) and 129 of the CAA. Section 129 does not apply to MSW landfills. Therefore, the State plan requirements for landfills are slightly different than those for MWC units or other Section 129 State plans. In particular, Subpart B requires that State plans for MSW landfills be submitted to EPA within nine months after promulgation of Emission Guidelines; whereas the Section 129 requirements that apply to MWC units have a different schedule.

### **1.3 Indian Tribes and State Plans**

Indian Tribes are not required to submit State or Tribal plans. However, Indian Tribes have the authority under the CAA to develop Tribal plans in the same manner States develop State plans. On February 12, 1998, EPA promulgated regulations that outline provisions of the CAA for which EPA is authorized to treat Indian Tribes in the same manner as States (see 63 FR 7254, Indian Tribes: Air Quality Planning and Management). If the Indian Tribe meets certain criteria, it may submit for EPA approval a Tribal plan to implement and enforce the Emission Guidelines in Indian country. If an Indian Tribe chooses to prepare a Tribal plan, the Indian Tribe would follow this guidance the same way as a State.

### **1.4 MSW Landfills Covered by State Plans**

State plans must address existing landfills that are subject to the Emission Guidelines for MSW landfills. These Emission Guidelines outlined in Table 1-2 were promulgated on March 12, 1996 (61 FR 9905), and codified in 40 CFR Part 60, Subpart Cc. Amendments to clarify the Emission Guidelines were published in the Federal Register on June 16, 1998 (63 FR 32743). The amended rule will be published in Subpart Cc when the next version of the CFR is published.

**Table 1-2. Outline of the Emission Guidelines for MSW Landfills  
(40 CFR Part 60, Subpart Cc)**

Section	Contents
60.30c	Scope
60.31c	Definitions
60.32c	Designated facilities
60.33c	Emission guidelines for municipal solid waste landfill emissions
60.34c	Test methods and procedures
60.35c	Reporting and recordkeeping guidelines
60.36c	Compliance times

The Emission Guidelines apply to existing MSW landfills, i.e., those that commenced construction, modification, or reconstruction before May 30, 1991 and that have accepted waste at any time since November 8, 1987 or have additional capacity for future waste deposition. New landfills (those that commenced construction, modification, or reconstruction on or after May 30, 1991) need not be addressed by State plans. Modification means an increase in the permitted volume design capacity by either horizontal or vertical expansion. New, modified, and reconstructed landfills are subject to the federal NSPS (40 CFR Part 60 Subpart WWW), which has similar requirements to the Emission Guidelines.

The pollutant regulated by Subpart Cc is MSW landfill emissions, which contain a mixture of VOC, other organic compounds, methane, and toxic pollutants. To determine whether control is required, non-methane organic compounds (NMOC) are measured as a surrogate for MSW landfill emissions. The NSPS and Emission Guidelines are summarized in a fact sheet included in this document (see Appendix A). The full text of the Emission Guidelines (Subpart Cc) including the direct final amendments is also provided (see Appendix I).

## 1.5 Requirements for State Plans

States are required to develop Section 111(d) State plans to implement the MSW landfill Emission Guidelines and to submit plans to EPA for approval. The first step for meeting the State plan requirement is to identify existing MSW landfills that are subject to the Emission Guidelines that are located in the State. If there are no existing MSW landfills in the State, then the State need only submit a letter of certification to that effect, which is called a negative declaration, and no plan is submitted. States may also submit negative declarations if they have no existing MSW landfills with design capacities greater than or equal to 2.5 million megagrams (Mg) and 2.5 million cubic meters (m<sup>3</sup>). Such negative declarations must include the design capacities of the landfills. (The Emission Guidelines do not require control for landfills with design capacities less than 2.5 million Mg or 2.5 million m<sup>3</sup>.) Existing MSW landfills that are closed must be included in the MSW landfill inventory if they have accepted waste at any time since November 8, 1987, or have additional capacity for future waste deposition.

States that have existing MSW landfills and have not submitted a negative declaration are required to submit a Section 111(d) State plan. As a minimum, the State plan must include the following elements which are discussed in detail in Section 3.0.

- Identification of enforceable State mechanisms selected by the State for implementing the Emission Guidelines;
- A demonstration of the State's legal authority to carry out the Section 111(d) State plan as submitted;
- An inventory of existing MSW landfills in the State affected by the Emission Guidelines;
- An inventory of emissions from existing MSW landfills in the State;
- Emission standards for existing MSW landfills;
- A process for State review and approval of site-specific gas collection and control system design plans;
- Compliance schedules;

- Testing, monitoring, recordkeeping, and reporting requirements;
- A record of public hearing(s) on the State plan; and
- Provision for annual progress reports to EPA.

The State plans are due to EPA by December 12, 1996. Table 1-3 summarizes the regulations for adopting and submitting State plans, as codified in Subpart B of 40 CFR Part 60, and specifies the required elements of the plans.

## **1.6 Relationship Between the Section 111(d) State Plan and SIP**

The State plans for implementing the MSW landfill Emission Guidelines are different from State Implementation Plans (SIP) required by Sections 110 or 172 of the Clean Air Act. The State plan and the SIP are both programs for State implementation of federal requirements. For both, the administrative procedures, particularly the public hearing process, are the same. Both programs are designed to achieve emission reductions at sources by identifying the pollutant to be controlled, establishing the emission limits for the source, and establishing procedures to ensure that emission limits are met.

However, the States and EPA fulfill different responsibilities under the two programs. The goal of Section 111(d) State plans is to control the emissions of designated pollutants<sup>2</sup> by establishing standards of performance for existing sources. Section 111(d) Emission Guidelines (including emission standards or performance levels) are based on demonstrated technology and are established by EPA on a national level, and the States are responsible for developing and implementing a program to achieve compliance with these standards. The goal of the SIPs, on the other hand, is to attain and maintain National Ambient Air Quality Standards (NAAQS) or ambient concentrations for certain criteria pollutants (lead, SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub>, CO, and ozone) in a given area. Hence, in the SIP program, the State

---

<sup>2</sup> The MSW landfills Section 111(d) Plans apply to MSW landfill emissions, measured as NMOC.

**Table 1-3. Regulations for Adopting and Submitting State Plans  
(40 CFR 60 Subpart B)**

Section Number and Title	General Contents
60.20 Applicability	Subpart B applies when final guidelines (Subpart Cc) are promulgated.
60.21 Definitions	Defines key terms.
60.22 Publication of guideline documents, Emission Guidelines, and final compliance times	Describes contents of Emission Guidelines to be developed by EPA.
60.23 Adoption and submittal of State plans, public hearings	Schedules and procedures for States to follow in developing and submitting State plans. Requirements for public hearings on State plans.
60.24 Emission standards <sup>a</sup> and compliance schedules	State plans must include emission standards and compliance schedules. State plans may be no less stringent than the guidelines, except as provided in § 60.24(f).
60.25 Emission inventories, source surveillance, reports	Plans must include an inventory of existing MSW landfills and their emissions and provisions for monitoring compliance. States must submit progress reports to EPA.
60.26 Legal authority	Plans must demonstrate that the State has legal authority to carry out the plan as submitted.
60.27 Actions by the Administrator	Procedures for EPA review and approval or disapproval of plans. Federal Plans will be developed if States have not submitted timely and approvable plans.
60.28 Plan revisions <sup>b</sup> by the State	Procedures for revision of plans.
60.29 Plan revisions <sup>b</sup> by the Administrator	Procedures for revision of plans.

<sup>a</sup> Note that "emission standards" can include any State enforceable mechanisms including, but not limited to, State rules (see Section 3.1 in this document).

<sup>b</sup> Plan revisions refer to changes to a State Plan that is already in place.

establishes emission standards or standards based on the sources' contributions to local air quality, meteorology, and other local factors. The emission control requirements for a regulated source category under a SIP may vary from plant to plant based on local factors.

The States are responsible for implementing both Section 111(d) State plans and SIP programs, and both programs complement each other. Where the SIP requirements are adequate to meet the Section 111(d) standard, the State may elect to submit a Section 111(d) State plan that relies on the requirements in the SIP, Section 110, to meet the Section 111(d) emission standard. In addition, where the Section 111(d) requirements protect the NAAQS, the State may elect to rely on these requirements in the control strategy in the SIP.

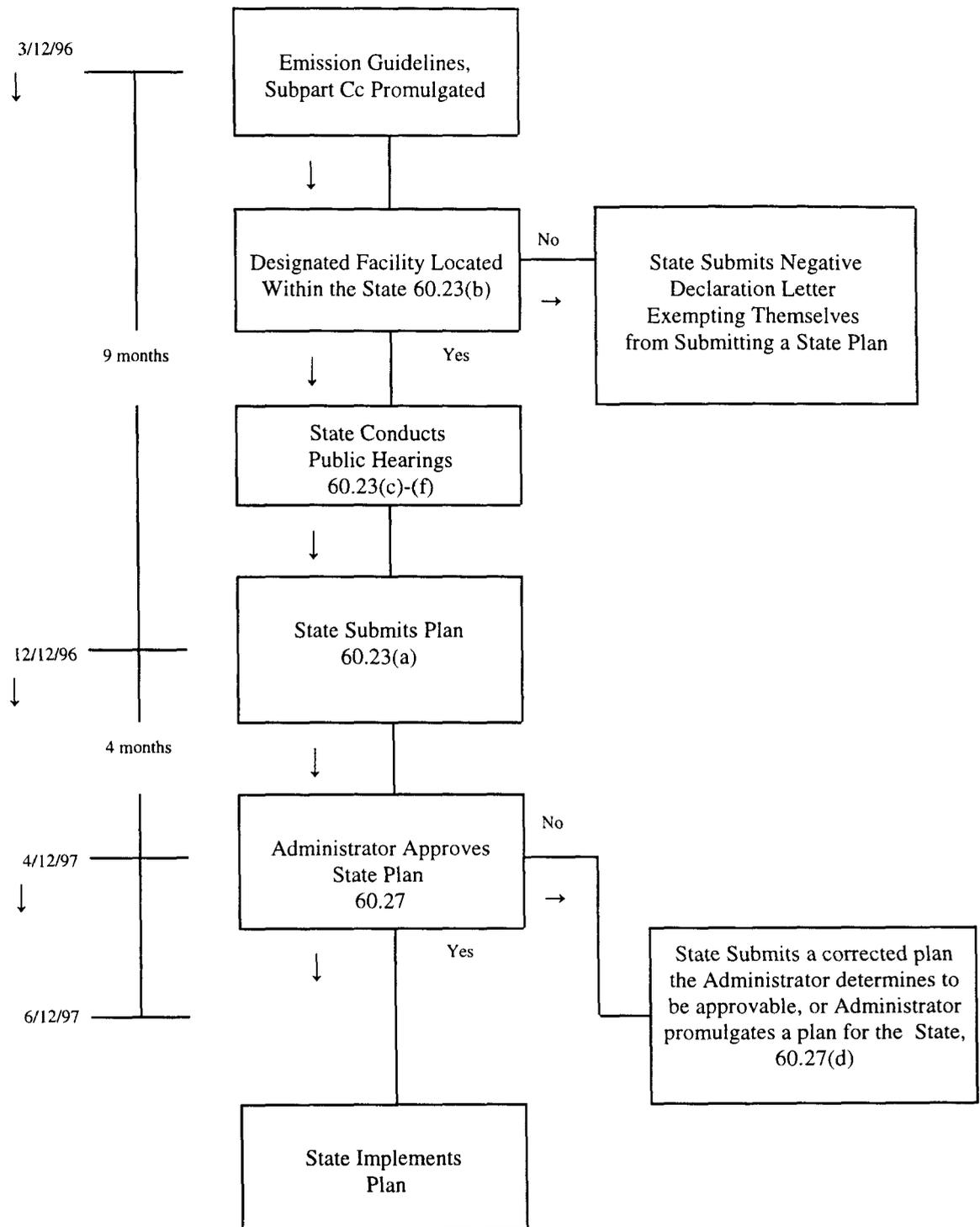
## 2.0 SCHEDULE AND RESPONSIBILITIES

To develop a State plan to implement and enforce the Emission Guidelines, the States, EPA, and landfill owners and operators have specific responsibilities in developing, reviewing, and complying with State plans, as discussed below. Appendix B also discusses the timeline for MSW landfills to comply with the Emission Guidelines.

### 2.1 State Plan Schedule

States must submit a plan to implement and enforce the Emission Guidelines within nine months after promulgation of the Emission Guidelines. According to 40 CFR § 60.23(a), States are required by EPA to adopt and submit to the Administrator a plan implementing requirements of the Emission Guidelines. Within the nine months, or before December 12, 1996, States must develop a State plan, hold public hearings, and submit the plan to the Administrator. Figure 2-1 is a flow chart showing the approval process. Table 2-1 is a suggested schedule for developing State plans. The table shows more detail on the steps States need to take to develop State plans.

After the State plan is submitted, EPA is required to approve or disapprove the State plan within four months (approximately April 12, 1997). It is possible for the Administrator to approve a portion of the plan and disapprove another portion. EPA's decision to approve or disapprove each State plan will be published in the Federal Register (FR). Final decisions will be codified in 40 CFR Part 62, "Approval and Promulgation of State plans for Designated Facilities and Pollutants." If a plan is not approved, the basis for disapproval will be discussed in the FR notice. For plans that are disapproved, the State should submit a corrected plan that addresses these concerns. If a State does not submit an approvable plan, EPA will promulgate a Federal Plan for the State. Under certain circumstances, a State may request an extension of the period to submit a plan or corrected plan (see Section 3.11.1).



**Figure 2-1. State Plan Approval Process and Schedule**

**Table 2-1. Suggested Schedule for Section 111(d) State Plans**

Action	Date
EPA promulgates Emission Guidelines	March 12, 1996
EPA posts draft Guidance Document Volume 1 on the TTN Web	March 1996
State decides what State authority to use	April 1996
State starts rulemaking or other procedure needed to ensure State authority	May 1996
State starts drafting State plan	August 1996
State posts notice of public hearings	September 1996 (30 days before hearing)
EPA issues guidance on Section 111(d) State plans	October 1996
State completes rulemaking or other procedure needed to ensure State authority	October 1996
State completes public hearing on State plan	October 1996
State submits State plan to EPA (Regional Office) unless an extension is received	December 12, 1996
State responds to any clarifications requested by EPA	During the 4 month period following December 12, 1996
EPA approves/disapproves the State plan	April 12, 1997
EPA promulgates Federal Plan if State has not submitted an approvable State plan	1999 <sup>a</sup>

<sup>a</sup>A Federal Plan is expected to be proposed in late 1998 and promulgated in 1999.

State plans may need to be modified in response to clarifying amendments to the Emission Guidelines. A direct-final notice to amend the guidelines was published in the Federal Register on June 16, 1998. Under 40 CFR § 60.23(a)(2), States have 9 months to adopt and submit to EPA plan revisions consistent with the revised Emission Guidelines. EPA would then review plan revisions and approve or disapprove them within 4 months. Because the amendments were primarily corrections and clarifications, any changes to State plans are expected to be minor.

## **2.2            Responsibilities**

EPA, the States, and owners and operators of MSW landfills are responsible for implementing the Emission Guidelines. The primary responsibilities are outlined below.

### **2.2.1            EPA Responsibilities**

**Assisting State, Local, and Tribal Programs and MSW Landfill Owners and Operators.** EPA assists State, local, and tribal agencies in developing approvable Section 111(d) State plans. EPA provides information, answers questions, and interprets federal requirements for the State and for MSW landfill owners and operators. EPA conducts outreach and compliance assistance programs. EPA identifies contact persons to answer States' questions, clarify approval criteria, and address specific implementation issues as necessary. States' questions should be directed to the appropriate EPA contact to ensure efficient and consistent responses. (See Appendix C for a list of State, regional, and other contacts.)

**Review of State Plans.** EPA is required to approve or disapprove the State plan within four months of the submittal due date (December 12, 1996). States must develop their Section 111(d) State plans according to the criteria in this document and 40 CFR Part 60, Subpart B. EPA will inform the State if the EPA has questions about the State plan before making a decision on the approval or disapproval of the State plan.

**Federal Plan.** In the event approvable State plans (or local or tribal agency plans) are not submitted, EPA will develop and implement a Federal Plan for those landfills not covered by State plans or Tribal plans. The Federal Plan is expected to be a gap-filling action. When a State or Tribal plan is submitted and approved after the Federal Plan is in effect, the Federal Plan will no longer apply to MSW landfills covered by the State or Tribal plan after the State or Tribal plan becomes effective.

**Related Programs.** EPA reviews and comments on State development of Title V operating permits. Title V permits are not a required component of State plan submittal, nor are they required for EPA approval of the State plan.

## **2.2.2 State Responsibilities**

**Developing a State Plan.** The State develops and submits a State plan that meets the criteria presented in Section 111(d), the Emissions Guidelines, and this document. This document outlines how States can meet this responsibility. In some cases, local agencies, Indian Tribes, or protectorates, rather than States, may develop plans for landfills in their jurisdictions. The same responsibilities apply.

**Establishing Compliance Schedules.** The State plan must develop emission limits and compliance schedules for all existing MSW landfills in the State. States should meet with MSW landfill owners and operators to develop compliance schedules to ensure a workable Section 111(d) State plan. All MSW landfills addressed by the State plan that have a design capacity equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup> must install emission controls within 30 months after the landfill NMOC emission rate report shows NMOC emissions reach or exceed 50 Mg/yr. States may require compliance sooner, but not later, than specified in the Emission Guidelines, except in unusual case-by-case situations (see Section 3.11).

**Submitting Progress Reports.** States must report annually to the EPA on the progress of implementing the plan, including the status of meeting increments of progress and achieving final compliance. The States must also include in an annual report (as specified in

Section 3.10) compliance status, enforcement actions, and updates on MSW landfill information and emission data.

**Related Programs.** Once EPA approves a State's Section 111(d) plan and it is effective, all applicable requirements from the plan and all the terms and conditions needed to assure compliance with the applicable requirements must be incorporated into Title V permits for those MSW landfills that are subject to Title V and the Emission Guidelines. See White Paper Number 2 in Appendix F for EPA guidance on improving the implementation of Title V operating permits programs.

Some MSW landfills are on the Superfund national priorities list. The Emission Guidelines apply to existing MSW landfills, including Superfund sites that meet these criteria. State plans should include such landfills. In addition to being subject to the requirements of the Emission Guidelines, these landfills may need to undergo remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). For consistency, the requirements of the Emission Guidelines should be considered when determining case-by-case CERCLA remedial actions at Superfund sites. This is discussed further in the preamble to the promulgated NSPS and guidelines (61 FR 9909, March 12, 1996).

### **2.2.3 Landfill Owners and Operators Responsibilities**

**Developing Compliance Schedules and Installing Controls.** MSW landfill owners and operators must work with the State to develop a compliance plan and control system schedule for the State plan that are both workable and meet requirements established by the State to implement the Emission Guidelines. The schedule for achieving compliance generally must be as stringent as the Emission Guidelines, however, on a case-by-case basis, the flexibility of the Emission Guidelines allows some variations from the schedules specified in § 60.33c of Subpart Cc and § 60.757 of Subpart WWW (see section 3.11 for additional information). Since landfill owners and operators need to comply with their State's requirements, they should consult with their State for schedules specific to their landfills. An example schedule of submittals and

compliance times is described below for landfill owners and operators whose States adopt the provisions of Subparts Cc and WWW.

Example submittals include a Design Capacity Report, an Annual Emission Rate Report, and a Collection and Control System Design Plan. The owner or operator would submit a Design Capacity Report within 90 days after the effective date of EPA's approval of the State plan. If the design capacity is greater than or equal to 2.5 million Mg and 2.5 million m<sup>3</sup>, the first Emission Rate Report would be submitted at the same time. The MSW landfill owner or operator would then submit a collection and control system design plan prepared by a professional engineer within 1 year after the date of the first Emission Rate Report that shows that the landfill's NMOC emission rate equals or exceeds 50 Mg/yr. Within 30 months after a landfill's NMOC emission rate report shows NMOC emissions to be equal to or greater than 50 Mg/yr, MSW landfill owners and operators would install and start up a gas collection and control system at a landfill. The landfill owner or operator would conduct an initial performance test on the control system to document compliance within 180 days after control system startup.

A brief discussion and flow chart timeline describing the responsibilities of landfill owners or operators is provided in Appendix B. The details regarding the owner or operator's responsibilities and the schedule for installing controls are discussed in Section 2 of MSW Landfills, Volume 1.

**Meeting Additional Emission Guideline Requirements.** Owners and operators are responsible for meeting other Emission Guidelines requirements, including an initial performance test and report to demonstrate compliance. They will also report ongoing monitoring results and keep required records to demonstrate compliance.

**Related Programs.** Owners and operators must apply for a Title V operating permit within a year of becoming subject to a Title V program. The authority for requiring Title V permits for existing MSW landfills is found in Section 502(a) of the CAA and is codified in 40 CFR Parts 70 and 71. Section 502(a) specifies that major sources and sources (including

area sources) subject to standards or regulations under Sections 111 or 112 of the CAA (such as the Emission Guidelines and NSPS) are required to obtain Title V operating permits.

MSW landfills that are subject to a Title V permitting program under parts 70 or 71 are required to submit Title V permit application within 12 months after first becoming subject to Title V. If more than one requirement causes a landfill to become subject to Title V permitting, the 12-month time frame for submitting a Title V application will be triggered by the requirement that first causes the landfill to be subject to Title V. MSW landfills may, for example, be subject to Title V permitting as a result of being a major source under one or more of three major source definitions in Title V: (1) Section 112, (2) Section 302, or (3) Part D of Title I of the CAA. MSW landfills could also be subject to Title V permitting as a result of being subject to the Emission Guidelines.

The Emission Guidelines specify that landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m<sup>3</sup> are subject to Title V permitting requirements. The guidelines also state that landfills smaller than 2.5 million Mg or 2.5 million m<sup>3</sup> are not subject to Title V unless they are a major source or are subject for some other reason (e.g., subject to another section 111 or 112 regulation). An existing MSW landfill with a design capacity equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup> which is not already subject to Title V, becomes subject to Title V permitting 90 days after the effective date of EPA's approval of the relevant State plan. (This allows time for submission of the design capacity report to determine if the landfill meets or exceeds the design capacity cutoff.) Permit applications would generally be due within 1 year after this date, but States can establish earlier schedules, prior to the 12-month deadline, for the submittal of permit applications. The establishment of those earlier deadlines is consistent with Section 503(c) of the CAA. Owners and operators should contact the respective permitting authorities to determine when permit applications are due for their MSW landfills. White Paper Number 2 (see Appendix F) provides guidance on improving implementation of Title V operating permits programs.

Construction or modification of a MSW landfill may trigger NSR. The NSR program requires the preconstruction review of major new sources and major modifications. The

review includes a control technology review and an analysis of the air quality impacts of the new or modified source. On a case-by-case basis, some sources with Pollution Control Projects (PCP) may be excluded from NSR. Landfills that apply controls to comply with the Emission Guidelines may contact their State to determine whether they qualify for the PCP exclusion. NSR and the PCP exclusion are discussed in more detail in Appendix E.

### 3.0 REQUIRED ELEMENTS OF AN ACCEPTABLE STATE PLAN

This document and Appendix J contain summaries of existing information on the required elements of a State plan. States may find this summary helpful in preparing Section 111(d) State plans, and EPA will use it in reviewing the plans. A Section 111(d) State plan for MSW landfills has ten essential elements:

1. Identification of enforceable State mechanisms selected by the State for implementing the Emission Guidelines,
2. A demonstration of the State's legal authority to carry out the Section 111(d) State plan as submitted,
3. An inventory of existing MSW landfills in the State affected by the Emission Guidelines. An existing landfill may be active (currently accepting waste or having additional capacity available for waste deposition) or closed (no longer accepting waste nor having available capacity for future waste deposition),
4. An inventory of emissions from existing MSW landfills in the State,
5. Emission standards for existing MSW landfills that are "no less stringent" than those in the Emission Guidelines<sup>3</sup>,
6. A State process, as specified in § 60.33c(b) of Subpart Cc, for State review and approval of site-specific gas collection and control system design plans.
7. Compliance schedules extending no later than 30 months after the date the annual NMOC emission rate reaches or exceeds 50 Mg/yr<sup>5</sup>,
8. Testing, monitoring, recordkeeping, and reporting requirements,
9. A record of public hearing(s) on the State plan, and
10. Provision for annual State progress reports to EPA on implementation of the State plan.

---

<sup>3</sup>On a case-by-case basis, the State may provide for a less stringent standard or a longer compliance schedule if the State demonstrates to EPA that the criteria in § 60.24(f) of Subpart B are met, and the EPA approves the standard or schedule. See Section 3.11 for additional information.

Table 3-1 summarizes these elements of the State plan for MSW landfills, provides citations from Subparts B and Cc, and identifies the sections of this chapter that discuss each element.

Some components of a Section 111(d) State plan may duplicate existing State requirements and therefore will not add additional requirements. For example, most States require public notice for rulemaking consistent with 40 CFR Part 60, Subpart B. Similarly, Section 112 and Title V of the CAA require various demonstrations of legal authority. If earlier demonstrations of legal authority by the State meet the requirements of 40 CFR Part 60, Subpart B, the State will simply need to include copies of such demonstrations in the State plan submittal. Appendix J, Key Elements of an Acceptable Section 111(d) State plan, provides a detailed list of requirements for demonstrating legal authority if this initial authority has not been previously demonstrated.

### **3.1 Criteria for an Adequate Enforceable Mechanism**

Many States that have MSW landfills covered by the guidelines are developing Section 111(d) State plans that will use State rules as the legal instrument to enforce the Emission Guidelines. However, some States may use alternative mechanisms to implement the Emission Guidelines. An essential element of a Section 111(d) State plan requires the plan to include emission standards, which 40 CFR Part 60, Subpart B § 60.20(f) defines as "a legally enforceable regulation setting forth an allowable rate of emissions into the atmosphere, or prescribing equipment specifications for control of air pollution emissions." For Section 111(d) State plans, EPA interprets the term "regulation" in Section 60.22(f) to include, in addition to a uniform State requirement or State rule, other mechanisms that are legally enforceable under State law. For example, depending on the applicable State law, enforceable mechanisms that might be used as the vehicle for implementing the MSW landfills Emission Guidelines may include a regulatory or administrative order, a compliance order, or a State operating permit. A State may select other enforceable mechanisms provided that the State demonstrates that it has the underlying authority and demonstrates that the selected mechanism is State enforceable.

**Table 3-1. Summary of Requirements for Section 111(d) State Plans<sup>a</sup>**

<b>Required Item</b>	<b>Reference in 40 CFR Part 60, Subpart B or Cc</b>	<b>Section of this Document</b>
Identify enforceable mechanisms selected by the State to implement the guidelines	60.24(a) of Subpart B	3.1
Show that State has legal authority to carry out plan	60.26(a) of Subpart B	3.2
An inventory of MSW landfills and an emissions inventory	60.25(a) and 60.25(c) of Subpart B	3.3 and 3.4
Allowable emission rates	60.24(b)(1), 60.24(c), and 60.24(f) of Subpart B and 60.33c of Subpart Cc	3.5
Process for State review and approval of site-specific gas collection and control system design plans	60.33c(b) of Subpart Cc	3.6
Compliance schedules and legally enforceable increments of progress for MSW landfills to achieve compliance	60.24(a) and 60.24(e)(1) of Subpart B and 60.36(c) of Subpart Cc	3.7
Test methods and procedures used for determining compliance with the emissions standards	60.24(b)(2) of Subpart B and 60.34c of Subpart Cc	3.8
Provisions for monitoring a MSW landfill's compliance status, including: <ol style="list-style-type: none"> <li>1. Legally enforceable procedures for requiring the maintenance of records and periodic reporting to the State for the determination of compliance,</li> <li>2. Periodic inspections and testing, and</li> <li>3. Specific testing, monitoring, recordkeeping, and reporting requirements specified by Subpart Cc.</li> </ol>	60.25(b) of Subpart B and 60.34c and 60.35c of Subpart Cc	3.8
Certification that a public hearing was held before the State plan was adopted and list of the attendees at the hearing and their affiliation, with a summary of their presentations and handouts	60.23(f)(1) and (2) of Subpart B	3.9
State progress reports	60.25(f) of Subpart B	3.10

<sup>a</sup>See text of Section 3 and Appendix J of this document for additional discussion of the required elements of a State plan.

All applicable requirements on MSW landfills and terms and conditions needed to implement and enforce these applicable requirements must remain continually in force throughout the time the landfill is subject to the State plan even if the enforceable mechanism, e.g., permit, expires.

If the State relies on a mechanism that is not a State rule to implement the Emission Guidelines, such as a regulatory order, the State must document in the State plan how the selected mechanism meets the emission standards for the designated pollutant (MSW landfill emissions, measured as NMOC) and attach a copy of the enforceable mechanism. A State operating permit can be used as the enforceable mechanism in a State plan, as long as the requirements contained in the permit are binding on the owner or operator as a matter of State law. When EPA approves the State plan, the requirements in the permit would then become federally enforceable. If a State rule is used, only citations of the overall rule and copies of the sections pertaining to MSW landfills are required. The State does not have to submit a copy of the entire rule. The State may submit a Section 111(d) State plan that relies on the requirements in the SIP to meet the Section 111(d) emission standard for NMOC emissions, where they are found to be adequate. If the State relies on existing or revised SIP emission limits to implement the Section 111(d) MSW landfill emission standards, the State must submit the Section 111(d) State plan citing the SIP and the date when it became effective and document how the SIP assures that the requirements of Section 111(d) are met. In all cases the mechanism(s) must be in place and effective by the date the State plan is submitted.

The EPA emphasizes that the determination of whether a particular mechanism may be used to enforce the Emission Guidelines in a particular State is a question of State law; the State law must give the State the requisite authority to enforce the emission limit using the legal mechanism identified by the State. Thus, a mechanism (for example, a regulatory order) that is approvable for one State under its State law might not be approvable if selected by another State under the law in that State.

After a State incorporates a State-enforceable requirement into the State plan, and the plan has been approved by EPA and is effective, the State requirement, if it is to be codified, becomes federally enforceable.

### **3.2 Demonstration of Legal Authority**

The Section 111(d) State plan must demonstrate that the State has the legal authority under current State law to adopt and implement the emission standards and compliance schedules in the Section 111(d) State plan. The legal authority must support the legal mechanism selected by the State to implement the emission limits for MSW landfills. The legal authority must be available to the State at the time the State submits its Section 111(d) State plan to EPA [40 CFR Part 60, Subpart B, § 60.26(c)]. States must submit with the Section 111(d) State plan copies of the laws or regulations that demonstrate the State's legal authority, unless: (1) such laws or regulations were approved when previously submitted under either 40 CFR Part 60, Subpart B or other sections of the CAA, and (2) the State can demonstrate that such previously submitted laws or regulations are applicable to the pollutants<sup>4</sup> for which the plan is submitted [§ 60.26(b)].

A State may use existing demonstrations of legal authority to meet the requirements of Subpart B. The legislative structure of the State will determine which existing authorities the State can use to implement the Section 111(d) requirements. This implementation guidance provides the minimum requirements of Section 111(d) pertaining to MSW landfills, and leaves the State flexibility to implement the requirements as long as provisions are enforceable under State law.

---

<sup>4</sup>For MSW landfills, the regulated pollutant is MSW landfill emissions, measured as NMOC.

A State must include in its demonstration of existing legal authority a showing that it has the authority to:

1. Adopt emission standards and enforceable conditions (see Section 3.1) as well as compliance schedules applicable to the designated facilities and pollutant for which the Section 111(d) State plan is submitted;
2. Enforce the relevant laws, regulations, standards and compliance schedules referenced in Section 111(d);
3. Obtain information necessary to determine compliance;
4. Require recordkeeping, make inspections, and conduct tests;
5. Require the use of monitors and require emission reports of MSW landfill owners or operators; and
6. Make emission data available to the public.

Demonstrations of legal authority can take several forms. States that use a legal mechanism other than rulemaking to implement the Emission Guidelines should submit legal documentation, preferably an opinion by the State's Attorney General that the State possesses the adequate authority to implement and enforce the Section 111(d) State plan using that legal mechanism.

A State governmental agency other than the State air pollution control agency may be assigned responsibility for carrying out a portion of a Section 111(d) State plan, provided that the State demonstrates that the State governmental agency has adequate authority [§ 60.26(e) of Subpart B]. The State may authorize a local agency to implement a portion of the Section 111(d) State plan provided that the local agency demonstrates that it has adequate legal authority to implement that portion of the plan and the State is not relieved of responsibility [§ 60.26(e)].

### **3.3 Source Inventory**

A complete source inventory of existing MSW landfills in the State that are regulated by the Emission Guidelines must be submitted as part of the Section 111(d) State plan

[§ 60.25(a) of Subpart B]. An "existing" landfill is a landfill that commenced construction, modification, or reconstruction before May 30, 1991 and that has accepted waste at any time since November 8, 1987 or has additional capacity for future waste deposition. (Landfills that commenced construction, modification, or reconstruction since then are considered "new" and are subject to the NSPS instead of the Emission Guidelines.) "Municipal Solid Waste Landfill New Source Performance Standards and Emission Guidelines — Questions and Answers", posted on the TTN Web, contains additional information on applicability.

The source inventory should include existing MSW landfills with design capacities both above and below the 2.5 million Mg/yr or 2.5 million m<sup>3</sup>/yr design capacity cutoff. Landfills below this capacity are not required to apply controls under the Emission Guidelines, but they are required to submit a design capacity report and supporting information to show that they are below the cutoff.

State air agencies may be able to obtain information on these landfills from their State solid waste agency counterparts. The 1984 Hazardous and Solid Waste Amendments to RCRA required States to establish a permit program or other system of prior approval to ensure that facilities receiving household hazardous waste or small quantity generator hazardous waste are in compliance with 40 CFR Part 257. This permit program was to be established by November 8, 1987. This permit program is a resource for States to use in locating landfills that are subject to the Emission Guidelines. Another source of information may be county and municipal governments.

One special consideration for identifying all of the existing MSW landfills is that some may be closed. Identifying and locating owners or operators of closed MSW landfills may be difficult; however, only landfills that have accepted MSW since November 8, 1987 or have additional capacity for future waste deposition are subject to the Emission Guidelines. Therefore, these landfills may have RCRA permits. Once a closed MSW landfill has been identified, the State will need to identify and locate the owner, operator, or responsible party.

### **3.4            Emission Inventory**

An emission inventory based on the MSW landfills source inventory required by § 60.25(a) of Subpart B, must be included in the Section 111(d) State plan. The inventory must present estimates of the pollutant regulated by the Emission Guidelines, which is NMOC. Emission estimates should be reported in Mg/yr NMOC. The emissions inventory must be made available to the general public and presented with the applicable emission standards.

In view of the limited requirements on landfills below the 2.5 million Mg or 2.5 million m<sup>3</sup> cutoff, the EPA will allow States, in limited circumstances, to submit emission inventories as part of State plans without developing emissions data where the development of such data would be unreasonable or impractical. For example, it may be unreasonable or impractical for an MSW landfill below the size cutoff to estimate NMOC emissions if the landfill is closed and there are no records of waste in place. A memo entitled, "Emission Inventory for MSWLF State plans" is posted on the TTN Web (<http://www.epa.gov/ttn/oarpg/t3pgm.html>) and discusses this policy in detail. The memo is also included in this document as Appendix K. The allowance for exclusion of NMOC emission from certain landfills below 2.5 million Mg or 2.5 million m<sup>3</sup> does not affect the requirement for States to submit an inventory of existing MSW landfills with the State plans. The memo provides details on situations where obtaining emissions data may be unreasonable or impractical.

#### **3.4.1            Emission Estimation Procedures**

Two different methods can be used to estimate emissions from landfills. To estimate emissions for State inventories, the procedures in AP-42, "Compilation of Air Pollutant Emission Factors"<sup>5</sup> are the preferred method unless site-specific data is available. To determine

---

<sup>5</sup>AP-42 is the common name for the EPA document entitled "Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources," Fifth Edition, January 1995, available from GPO or from the CHIEF TTN Website (<http://www.epa.gov/ttn/chief>). The landfill emission factors section was updated in November 1998.

applicability of or compliance with the MSW Emission Guidelines, the owner or operator must use the tiered emission estimation procedure in § 60.754 of Subpart WWW or another method if it has been approved by the EPA Administrator as provided in § 60.752(b)(2)(i)(B).

The equations in Subpart WWW are the same as the AP-42 equations. However, the values of the variables used in the equations are different for the two methods. The variable values specified in Subpart WWW are purposefully conservative to protect human health, to encompass a wide range of landfills, and to encourage the use of site-specific data. The variable values in AP-42 would more accurately reflect current conditions at a landfill and thus yield more accurate emissions for the purposes of the emission inventory.

**AP-42 Procedures.** Emission estimation procedures for MSW landfills from AP-42, the "Compilation of Air Pollutant Emission Factors" are presented in Appendix D. These procedures, from Section 2.4, Municipal Solid Waste Landfills have been updated to reflect changes to the Section which were published in September 1997. AP-42 includes equations that estimate emissions as a function of three variables: the NMOC concentration in landfill gas ( $C_{\text{NMOC}}$ ); the methane generation rate constant ( $k$ ); and the refuse methane generation potential ( $L_0$ ). Although site-specific testing is not required for developing the emission inventory, it is preferable to use site-specific measured data for the variables when it is available because it would better reflect the conditions at a particular landfill. If site-specific data is not available, default values for these variables, which are found in AP-42, can be used. The default values for these variables are designed to provide typical, or average, estimates of landfill emissions and are appropriate for use in State emission inventories. However, it should be stressed that the AP-42 default values should NOT be used to determine applicability of or compliance with the MSW landfills Emission Guidelines.

**Subpart WWW Procedures.** Under the Emission Guidelines, the owner or operator must use the tiered emission estimation procedure in § 60.754 of Subpart WWW to determine whether the annual emission rate equals or exceeds the 50 Mg/yr NMOC cutoff and whether the landfill must be controlled. The owner or operator must use the equations and Tier 1 default values provided in the NSPS and the Emission Guidelines to determine NMOC emissions

or develop site-specific values using the Tier 2 or 3 procedures in § 60.754. If a MSW landfill equals or exceeds the 50 Mg/yr cutoff using Tier 1 procedures, they can apply controls or collect site-specific data and refine the emission estimates using Tier 2 or 3 procedures.

**Computer Model for Calculating Emissions.** A computer model is available to calculate landfill emissions. It uses equations that are the same as those in the Emission Guidelines and AP-42. The model contains default values from AP-42 that can be used to estimate emissions for inventories and permitting purposes. It also contains default values from the NSPS and Emission Guidelines that can be used to determine applicability of the Emission Guidelines. Appendix D provides information on the computer model and how to obtain it.

### **3.4.2 Annual Emission Reporting**

In addition to the initial emission inventory, States must submit annual progress reports on implementation of the Emission Guidelines. These annual progress reports, described in Section 3.10, must include updated NMOC emission rate data (per § 60.25(a), (e), and (f) of Subpart B). To avoid duplication, these updated emission estimates must be included in the annual State Implementation Plan (SIP) reports required by § 51.321. These annual reports must update the emission inventory for those sources whose emissions have changed more than 5 percent from the most recently submitted emission data (as specified in §§ 51.321 through 51.323). If emissions from an MSW landfill have not changed more than 5 percent, then the State must update the year of record of the previously reported emission data. This emission data must be reported to the Aerometric Information Retrieval System Facility Subsystem (AFS) as specified in 40 CFR Part 60, Appendix D. AFS is a repository of emission information for stationary sources that has now superseded the National Emissions Data System (NEDS) described in 40 CFR Part 60, Appendix D. A discussion of other types of information that must be included in the annual progress reports is contained in Section 3.10.

## 3.5 Emission Standards

### 3.5.1 Allowable Emission Rates and Control Requirements

The State plan must include emission standards that prescribe allowable emission rates for existing MSW landfills. Subpart B [§ 60.24(c)] specifies that emission standards should be "no less stringent than" the Subpart Cc Emission Guidelines, except as provided under § 60.24(f), discussed in Section 3.11.

The Emission Guidelines require control of emissions from existing MSW landfills (that is, MSW landfills that commenced construction, modification, or reconstruction before May 30, 1991 and have not been modified or reconstructed since May 30, 1991 and have accepted waste at any time since November 8, 1987 or have additional capacity for future waste deposition) that:

- have a design capacity greater than or equal to 2.5 million Mg and 2.5 million m<sup>3</sup>; and
- have an NMOC emission rate of 50 Mg/year or more.

The level of control required by the Emission Guidelines for these landfills includes a collection and control system. The collection system must meet certain design criteria. The control system must either:

- achieve 98 percent NMOC reduction (by weight, determined by the performance test procedures specified in the rule); or
- be an enclosed combustion device achieving an outlet NMOC concentration of less than 20 ppmv (as hexane, dry basis at 3 percent oxygen); or
- be an open flare meeting the design and operating specifications of § 60.18 of 40 CFR Part 60 Subpart A.

State plans must generally require this same level of control.

Section 60.24(b)(1) of Subpart B specifies that Section 111(d) State plans should include emission rates, or if these are impractical, State plans may contain equipment specifications. The Emission Guidelines for existing MSW landfills provide a combination of emission limits and design criteria. Emission limits (for example, 98 percent reduction) are practical for most control devices and are included in the Emission Guidelines. However, it is not practical to establish numerical limits or measure performance for landfill gas collection systems and flares, so design criteria are provided for gas collection systems and flares. Thus, a State plan that allows design criteria for gas collection systems and flares similar to the Emission Guidelines will meet the requirements of § 60.24(b)(1).

Section 60.24(b)(1) further specifies that if emission standards prescribing equipment specifications are established, the State plan must set forth to the degree possible the emission reductions achievable by implementation of such specifications. The State plan may permit compliance by the use of equipment determined by the State to be equivalent to that prescribed. The Subpart Cc Emission Guidelines contain design criteria rather than prescriptive equipment specifications. They also provide for submission of alternative collection system design plans for systems that do not meet the design criteria for active collection systems and they provide for approval of alternative collection systems and control devices. Therefore, State plans that allow alternative equipment that meet the design criteria for active and passive collection systems specified in the Emission Guidelines will fulfill the intent of § 60.24(b)(1). Section 60.24(f) allows the State in certain case-by-case situations to provide for a less stringent standard (see Section 3.11).

### **3.6 Process for Review of Design Plans**

The Emissions Guidelines [§ 60.33c(b) of Subpart Cc] require State plans to include a process for State review and approval of site-specific design plans for required gas collection and control systems. If MSW landfill emissions equal or exceed 50 Mg/yr, the landfill owner or operator must submit a site-specific design plan within 1 year. The plan must be prepared by a professional engineer and must meet the design criteria in § 60.752(b)(2)(ii) of Subpart WWW. The plan must also conform to design specifications for active collection

systems in § 60.759 of Subpart WWW or include a demonstration of the sufficiency of alternative provisions [see § 60.752(b)(2) of Subpart WWW]. Further information about the design criteria and examples of alternative designs are contained in "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills" (EPA-453/R-96-004).

The process that the State will use to review the gas collection and control system design plan must be described in the State plan. The description of the process in the State plan could include information on review responsibilities, schedules, and notification procedures such as communication of reasons for disapproval. States are encouraged to review the design plans expeditiously so that there is sufficient time after approval for the landfills to install controls prior to the compliance date.

### **3.7 Compliance Schedules**

To comply with the emission limits contained in the Section 111(d) State plan, existing MSW landfills may need to install emission controls. The State plan must contain schedules for controlling emissions from these landfills. The elements included in a compliance schedule are listed in Table 3-2.

#### **3.7.1 Compliance Times**

The compliance schedules for MSW landfills are developed by the State air pollution control agency considering input from the public and input from the MSW landfills owners and operators. The Emission Guidelines place certain restrictions on these schedules.

The Emission Guidelines [§ 60.36(c)] specify that owners or operators must accomplish specific tasks within 30 months after the Annual Emission Rate Report first shows that emissions equal or exceed 50 Mg/yr of NMOC. These tasks include planning, awarding of contracts, installing MSW landfill air emission collection and control equipment capable of meeting the Emission Guidelines, and complying with the Emission Guidelines.

**Table 3-2. Schedule for MSW Landfill Compliance with the Emission Guidelines**

State plan submittal to EPA	December 12, 1996
EPA approval of State plan	April 12, 1997
Submit Design Capacity Report. Also submit first Annual Emission Rate Report if design capacity is greater than or equal to 2.5 million Mg and 2.5 million m <sup>3</sup>	A set date in State plan. For consistency with Subparts Cc and WWW, 90 days after the effective date of the EPA's approval of the State plan.
If not in compliance by this date, need enforceable increments of progress for MSW landfills	April 12, 1998
Submit a final control plan. (The final control plan may be interpreted to be the same as the site-specific collection and control system design plan required by the Emission Guidelines.)	A set date in State plan. For consistency with Subparts Cc and WWW, the collection and control system design plan must be submitted within 1 year after the date of the landfill's submittal of the first Annual Emission Rate Report that shows that NMOC emissions first equal or exceed 50 Mg/yr of NMOC
Award contracts for gas collection and control system	A set date in State plan
Initiate construction or installation of gas collection and control system	A set date in State plan
Complete construction and installation of gas collection and control system	A set date in State plan. For consistency with Subpart Cc, installation of a collection and control system capable of achieving compliance with the Emission Guidelines must be accomplished within 30 months after a landfill's annual emission rate report first shows that emissions equal or exceed 50 Mg/yr of NMOC. <sup>a</sup>
Final compliance date for MSW landfill	A set date in State plan. For consistency with Subpart Cc, the collection and control system must be operating in compliance with the Emission Guidelines within 30 months after a landfill's annual emission rate report first shows that emissions equal or exceed 50 Mg/yr of NMOC. <sup>a</sup>
Initial performance test for MSW landfill control system	As scheduled in State plan and for consistency with the NSPS general provisions, no later than 180 days after installation of the collection and control system
Reports of periodic monitoring results	Annually after compliance date

<sup>a</sup>On a case-by-case basis, the State may provide for a longer compliance schedule only if the State demonstrates in the Section 111(d) State plan that the criteria in § 60.24(f) of Subpart B are met, and the EPA approves the compliance schedule.

States can require landfills to comply sooner than the dates specified in the Emission Guidelines. In fact, § 60.24(c) specifies that State plans must require compliance as expeditiously as practicable, but no later than the compliance times suggested in the Emission Guidelines. The EPA believes that many landfills will need the compliance time specified in the Emission Guidelines to design and install collection and control systems. A shorter compliance time may be specified if a State determines more rapid compliance is reasonable for certain landfills, or groups of landfills. States may provide for a longer compliance schedule on a case-by-case basis (see Section 3.11.3).

### **3.7.2 Increments of Progress**

Compliance schedules for MSW landfills with compliance dates that extend more than 1 year beyond the date of State plan approval must include legally enforceable increments of progress towards compliance as required by § 60.24(e) of Subpart B. Because the Emission Guidelines allow 30 months after the first Annual Emission Rate Report shows NMOC emissions equal or exceed 50 Mg/yr for compliance, State plans that are based on the Emission Guidelines will need to include increments of progress. Each increment of progress in § 60.21(h) of Subpart B must have an enforceable compliance date in the Section 111(d) State plan that may include such additional increments of progress as may be necessary for close and effective supervision of progress toward final compliance.

The minimum five increments of progress required by § 60.21(h) of Subpart B for each MSW landfill within a State are as follows:

1. Submitting a final control plan. The control plan may be interpreted to be the same as the site-specific collection and control system design plan required by the Emission Guidelines (see Section 3.6). If the State plan uses the schedule in Subparts Cc and WWW, an Annual Emission Rate Report is due 90 days after the effective date of EPA's approval of the State plan and the control plan is due within 1 year of the date of the first Annual Emission Report showing that the NMOC emission rate is 50 Mg/yr or greater. In this example, the date of the increment of progress is tied to the date of the annual emission report;

2. Awarding contracts for construction of collection and control systems or orders for purchase of components;
3. Initiating on-site construction or installation of the collection and control systems;
4. Completing on-site construction or installation of collection and control systems; and
5. Final compliance.

All five increments of progress for MSW landfills can be fixed calendar dates or floating dates (such as the example shown for increment No. 1). The floating dates can be tied to the effective date of EPA's approval of the State plan or the date the Annual Emission Rate Report shows that NMOC emissions equal or exceed 50 Mg/yr.

As previously discussed, Subpart Cc requires the fourth increment, the installation of collection and control systems capable of meeting the Emission Guidelines to be completed within 30 months after the date the first Annual NMOC Emission Rate Report shows NMOC emissions equal or exceed 50 Mg/yr. The landfill must also be in compliance (increment 5) at this time.

EPA strongly recommends that a date for the initial official performance test of the control device be included in the Section 111(d) State plan. Following installation of the collection and control system, a performance test must be completed within 180 days. In addition, the Section 111 general provisions (40 CFR 60 Subpart A) require a 30-day notice before a performance test. The report of the performance test results must be submitted within 60 days after the test is conducted. These test results are for demonstrating whether or not the MSW landfill is in compliance with the emission standards after the controls are installed. This performance test timing is consistent with other EPA air regulations for existing sources, such as the NESHAP general provisions (40 CFR 63 Subpart A). Note that the "initial" official performance test denoted above does not mean the first ever test but rather the first official test for determining compliance; that is, EPA would expect MSW landfill owners and operators to conduct preliminary tests for their own use (similar to other industry owners and operators who

typically conduct preliminary tests to tune equipment) at least two to three months before the scheduled initial official performance test. Preliminary tests enable MSW landfill owners to make any necessary "shakedown" adjustments and retest before the initial official performance test. EPA does not have to be notified of the unofficial tests nor do they have to be on site for the unofficial tests.

The Section 111(d) State plan may include one set of increments with compliance dates applicable to all MSW landfills within the State or it may vary the compliance dates from one MSW landfill to another to address specific issues relevant to individual landfills. In all cases, the enforceable increments of progress must be arranged chronologically, and the compliance dates must be set to ensure full compliance with the applicable requirements as expeditiously as practicable [§ 60.24(c) of Subpart B]. For example, a State plan that requires a MSW landfill to submit a final control plan no later than 2 years after the effective date of EPA's approval of the State plan will likely be disapproved because the increment is too close to the end of the compliance window, does not appear to ensure expeditious progress, and thus jeopardizes timely compliance. Although there may be MSW landfill-specific reasons for other schedules, EPA would expect the control plan to be submitted within 15 months of the effective date of EPA's approval of the State plan (90 days for the first Annual Emission Rate Report plus 1 year for the control plan if NMOC emissions equal or exceed 50 Mg/yr). EPA would expect contracts to be awarded within about 20 months for landfills that must comply within 33 months (90 days for the Annual Emission Rate Report plus 30 months for compliance, if NMOC emissions equal or exceed 50 Mg/yr).

### **3.8 Testing, Monitoring, Recordkeeping, and Reporting**

The Section 111(d) State plan must include requirements for the testing, monitoring, recordkeeping, and reporting provisions from the Emission Guidelines.

### **3.8.1 Requirements of the Emission Guidelines**

The testing and monitoring provisions are specified in the MSW landfills Emission Guidelines (§ 60.34c of Subpart Cc). They apply to landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m<sup>3</sup>, and include, in particular:

- calculation of the MSW landfill NMOC emission rate using the procedures in § 60.754 of Subpart WWW to determine whether the annual emission rate equals or exceeds the emission rate cutoff of 50 Mg/yr;
- the operational standards in § 60.753 of Subpart WWW;
- the compliance provisions in § 60.755 of Subpart WWW; and
- the monitoring provisions in § 60.756 of Subpart WWW.

For landfills that emit 50 Mg/yr or more of NMOC, a performance test is required to demonstrate that the control device achieves the specified emission limits. The operational standards, compliance, and monitoring provisions require periodic monitoring of surface methane concentration, wellhead temperature, and nitrogen or oxygen level. Details on the compliance and monitoring requirements are contained in Subparts Cc and WWW (Appendix I). The document, "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills" (EPA-453/R-96-004) further explains these requirements.

The recordkeeping and reporting provisions are specified in the MSW landfills Emission Guidelines (§ 60.25c of Subpart Cc). For approval, the State plan must include:

- the reporting provisions in § 60.757 of Subpart WWW; and
- the recordkeeping provisions in § 60.758 of Subpart WWW.

The MSW landfill owner or operator must maintain records of the design capacity, performance test, and monitoring data for five years. Certain records on collection and control system design

and the initial performance test must be kept for the life of the control equipment. The MSW landfill owner or operator must submit an initial design capacity report. If the design capacity is greater than or equal to 2.5 million Mg and 2.5 million m<sup>3</sup>, the landfill owner or operator must submit Annual NMOC Emission Rate Reports.<sup>6</sup> Both the design capacity report and the first Annual Emission Rate Report are due within 90 days of the effective date of EPA's approval of the State plan. If NMOC emissions are 50 Mg/yr or more, a collection and control system design plan must be submitted. An initial test report and annual report of testing and monitoring results are required after the collection and control system is installed. Closure reports are required when the landfill closes. These recordkeeping and reporting requirements are described in more detail in the "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills" (EPA-453/R-96-004). The regulatory text of these requirements are contained in Subpart Cc and Subpart WWW (Appendix I).

A State plan that incorporates the testing, monitoring, reporting, and recordkeeping requirements specified in Subpart Cc will be consistent with the State plan requirements in Subpart B. Under § 60.25(b) of Subpart B, State plan requirements for monitoring compliance must include the following:

- legally enforceable requirements for owners and operators to keep records of the nature and amount of emissions and any other information that may be necessary to enable the State to judge compliance. This information must be reported periodically to the State (Subpart Cc requires such records and reports);
- legally enforceable requirements that provide for periodic inspection and testing (Subpart Cc requires periodic inspection and monitoring); and
- provisions for making reports of emission data, correlated with the emission standards that apply, available to the general public. This would include the Annual Emission Rate Reports, in Mg/yr, that must be submitted for uncontrolled landfills. The reported annual emission rate

---

<sup>6</sup>If estimated NMOC emissions are less than 50 Mg/yr for each of the next 5 consecutive years, the owner or operator may elect to submit a 5-year emission rate report instead of Annual Emission Rate Reports per § 60.757(b) of Subpart WWW.

would be compared to the 50 Mg/yr threshold to determine whether controls must be installed.<sup>7</sup>

### **3.8.2 Provisions for Requirements Other Than Those in the Emission Guidelines**

Requirements in State plans for compliance demonstration, monitoring, recordkeeping, and reporting must be at least as stringent as the Emission Guidelines. In developing the Emission Guidelines, EPA sought to develop a system that would provide all the information necessary to determine compliance, yet would not be burdensome to landfills or generate unnecessary paperwork. However, a State can choose to require more frequent reports or additional information. Test methods and procedures for determining compliance that are different than those specified in 40 CFR Part 60, Appendix A may be specified in the plan as allowed in § 60.24(b) of Subpart B. These alternatives must be shown to be "equivalent methods," or acceptable "alternative methods" as defined in § 60.2 of Subpart A.

### **3.9 Public Hearings**

Public participation, under the provisions of the CAA, is an important right and responsibility of citizens in the State process of developing, adopting, and implementing Section 111(d) State plans. As with State Implementation Plans (SIPs) for criteria pollutants, EPA regulations in 40 CFR Part 60, Subpart B, make it clear that citizen input on Section 111(d) State plans is encouraged in order to help define appropriate emission standards and compliance schedules. Under Subpart B, some minimum public participation requirements are as follows:

1. Reasonable notice of opportunity for one or more public hearing(s) at least 30 days before the hearing.

---

<sup>7</sup>For landfills that require control, the emission standards are expressed in terms of design criteria and operational requirements for the gas collection system and a percent reduction for the control device, instead of emission rate limits. Therefore, the Subpart B requirement to "correlate" the annual emission inventory information (in Mg/yr, discussed in Section 3.4) with the landfill emission standards is not relevant for controlled landfills. The performance testing, monitoring, and recordkeeping procedures in the Emission Guidelines are appropriate for determining compliance with the percent reduction limit and collection system requirements.

2. One or more public hearing(s) on the Section 111(d) State plan (or revision) conducted at location(s) within the State, if requested.
3. Date, time, and place of hearing(s) prominently advertised in each region affected.
4. Availability of draft Section 111(d) State plan for public inspection in at least one location in each region to which it will apply.
5. Notice of hearing provided to:
  - a. EPA Regional Administrator
  - b. Local affected agencies
  - c. Other States affected
6. Certification that the public hearing, if held, was conducted in accordance with Subpart B and State procedures.
7. Hearing records must be retained for a minimum of two years. These records must include the list of commenters, their affiliation, summary of each presentation and/or comments submitted, and the State's responses to those comments.

### **3.10 State Progress Reports to EPA**

States are required under § 60.25(e) and (f) to submit to EPA annual reports on the progress of plan enforcement. These reports must be incorporated into the reports required by 40 CFR § 51.321. Inclusion in this § 51.321 report is intended to avoid duplicative reporting. The first progress report is due 1 year after plan approval or promulgation of a plan by EPA. Section 60.25(f) applies to all regulated sources; however, MSW landfills and emissions from MSW landfills are different from typical sources and emissions. The following list has been modified to reflect how the progress report items specifically apply to MSW landfills.

1. Enforcement actions. The State must report enforcement actions initiated against a MSW landfill during the reporting period. For example, the State must report any enforcement actions taken in response to a compliance schedule or emission limit violation.
2. Increments of progress. The State must report achievement of increments of progress made by landfills such as submittal of a final control plan

(design plan) or initiation of on-site construction of the collection and control system.

3. Identification of MSW landfills that have closed and ceased to operate a collection and control system. Landfills that have ceased to accept MSW will continue to emit NMOC. Emission Guidelines require the control system to be operated even after the landfill has closed. Control systems may be removed after: a closure report has been submitted, the collection and control system has been operated a minimum of 15 years, and NMOC emissions are less than 50 Mg/yr. The State progress report should identify closed MSW landfills that have met these criteria and have ceased to operate their control systems.
4. Emission inventory for MSW landfills that were not in operation or were not identified at the time of plan development. Except for MSW landfills that were not identified in the State plan and were later determined to be affected by the Emission Guidelines, most existing MSW landfills would have been in operation at the time of plan development.
5. Updated information or emission data. The State must report updated landfill information such as any increases in design capacity and newly identified existing MSW landfills that were not included in the State plan. In addition, emissions data must be reported for existing MSW landfills, if the annual emission rate from the landfill has changed by more than 5 percent from the previous year, as discussed in Section 3.4.2. Emissions must also be reported if the annual emission rate report submitted by a MSW landfill shows that emissions have increased to 50 Mg/yr or more, such that the landfill now requires control.
6. Test reports and concurrent data. Subpart B requires that the initial performance test and concurrent process data be submitted with an annual report. However, since MSW landfill emissions are not generated by a manufacturing process, concurrent process data are not applicable; therefore, control device operating conditions should be reported with the performance test.

States may want to include additional information on periodic inspection and testing activities, emission and parameter exceedances, QA/QC, outreach activities, Title V or other permit condition compliance status, and compliance assistance activities. Some States and EPA regional offices have developed more specific or tailored reporting and recordkeeping procedures via Memoranda of Agreements, Program Specific Guidance for Section 105 Grants, and the Timely and Appropriateness Guidance. For example, some EPA offices prefer that the

States retain the performance test reports until EPA requests review as part of a compliance determination or other action. The State and EPA will continue to have discretion on the format of the annual reports. States should work with their EPA regional office to determine appropriate reporting procedures for MSW landfill State plans.

### **3.11 State Flexibility**

States may request an extension to the submittal date of their State plans or prescribe less stringent emission standards or longer compliance schedules than the Emission Guidelines. These case-by-case situations are described below.

#### **3.11.1 Submittal of State Plan**

**Extension of Submittal of State Plan.** Section 60.27(a) allows the EPA Administrator to extend the period of submission of plans or revised plans if the Administrator determines this to be necessary. If a State requests an extension, the State must demonstrate why such an extension is necessary.

#### **3.11.2 Emission Standards**

States may prescribe more stringent emission standards than the Emission Guidelines. States may prescribe less stringent emission standards only in unique situations. These case-by-case less stringent standards must be justified in the State plan and are subject to EPA approval. The provisions for allowing less stringent emission standards are provided in § 60.24(f) of Subpart B. This paragraph States that on a case-by-case basis for particular designated facilities, or classes of facilities, States may provide for the application of less stringent emission standards if certain criteria are met. These criteria are: (1) unreasonable cost of control resulting from age, location, or design, (2) physical impossibility of installing necessary control equipment, or (3) other factors specific to the MSW landfills that make application of a less stringent standard significantly more reasonable. The State is responsible for demonstrating the reason for any less stringent emission standards in its State plan.

The MSW landfill Emission Guidelines are a health-based Section 111(d) emission standard rather than a welfare-based standard as have been some previous Section 111(d) standards. As a health-based standard, greater consideration should be given to the health impacts of a less stringent emission standard during the development and evaluation of State standards for MSW landfills. Any less stringent emission standards should be carefully reviewed to assure that public health will not be adversely affected by MSW landfill emissions.

Public comments on the landfill NSPS and Emission Guidelines contain examples of situations where a State might want to consider a less stringent standard. These public comments are summarized in the background information document, "Air Emissions from Municipal Solid Waste Landfills — Background Information for Final Standards and Guidelines," (EPA-453/R-94-021). For example, an existing MSW landfill might already have installed a 95 percent efficient combustion control device prior to proposal of the Emission Guidelines. Engineering analysis might show that the existing control device cannot be upgraded to achieve 98 percent. The State might judge the costs of replacing the control device to be unreasonable in light of the 3 percent additional reduction that would be achieved. Another example that might warrant special consideration would be a landfill that closed on or after November 8, 1987, but before the May 1991 proposal date and that has no means of obtaining funding for installation of a control system. A third situation would be a landfill that accepts very little MSW and, because of the site-specific waste mixture and landfill design characteristics, experiences unreasonable costs relative to typical landfills. It should be stressed that the State must demonstrate that one or more of the criteria in § 60.24(f) are met and gain EPA approval in order to apply a less stringent standard.

### **3.11.3 Compliance Schedules**

States have the option of allowing longer compliance times for particular MSW landfills or classes of MSW landfills on a case-by-case basis if certain criteria listed in § 60.24(f) are met. These criteria are the same as the criteria for a less stringent standard. These criteria allow States discretion in regulating individual MSW landfills. In the plan, the State must demonstrate that one of these criteria apply when a less stringent compliance schedule is

specified for a MSW landfill or class of MSW landfills. EPA approval is required for less stringent control system schedules. As mentioned in Section 3.11.2, the MSW landfill Emission Guidelines are a health-based standard rather than a welfare-based standard. As a health-based standard, greater consideration should be given to the health impacts of any less stringent compliance schedule during the development and evaluation of State plans for MSW landfills.

#### 4.0                    **ANSWERS TO SOME GENERAL QUESTIONS ABOUT SECTION 111(D) STATE PLANS**

This section contains answers to some frequently asked questions about development and submittal of Section 111(d) State plans. Additional questions and answers are contained in the document "Municipal Solid Waste Landfill New Source Performance Standards and Emission Guidelines—Questions and Answers," available on the TTN Web.

**Question No. 1:** If a State uses a SIP regulation as a basis for the enforceable mechanism in a State plan, does the State need to demonstrate legal authority?

**Answer:** A State can select from a range of legal mechanisms as described in this summary document provided that the State can show it has adequate legal authority. A demonstration of legal authority is required in all cases except for State rules. If a SIP rule is used, citations, rather than copies of actual State legal authority are adequate. The State must show that the SIP requirements are adequate to meet the NMOC control requirements in the Emission Guidelines. [See § 60.26(b) of Subpart B].

**Question No. 2:** Do emission limits in the State plan need to be the same as the emission limits in the Subpart Cc Emission Guidelines?

**Answer:** The emission limits in the State plan must generally be "no less stringent than" the Emission Guidelines, and EPA recommends that the limits be presented in the same regulatory format as the Emission Guidelines (for example, a percent reduction or concentration limits for the control device and design criteria for the gas collection system). If a regulatory format other than that used in the Emission Guidelines is used in a State plan, then the State must show how the format correlates to the format in the Emission Guidelines and demonstrate that it is no less stringent than the Emission Guidelines. In limited case-by-case situations, a State plan may request approval of less stringent emission limits. As described in Section 3.11.2, the State plan would need to demonstrate that the criteria in § 60.24(f) of Subpart B are met and EPA approval would be required.

**Question No. 3:** Does the State plan need to address each MSW landfill located in the State in the inventory?

**Answer:** Only existing MSW landfills that are subject to the Emission Guidelines must be addressed by the State plan and included in the inventory.

**Question No. 4:** Can a State plan identify only air pollution control equipment to be installed or must it include emission limits?

**Answer:** A State plan must include emission standards that are no less stringent than the Emission Guidelines, and they must apply them to each MSW landfill that meets the applicability criteria in the Emission Guidelines (see Section 3.5). The Emission Guidelines include percent reduction and outlet concentration standards for control devices. They also include design criteria for gas collection systems and flares, because it was not feasible to establish a numerical limit for these controls. Prescriptive equipment specifications are not required, and alone are unacceptable.

**Question No. 5:** Do reporting requirements in State plans apply to MSW landfill operators or just State agencies?

**Answer:** There are requirements that apply to MSW landfill operators and requirements that apply to State agencies. The State has responsibilities to develop the State plan and to report implementation progress to EPA. The MSW landfill owner or operator must show expeditious progress on achieving compliance by the dates set and then show continuing compliance with the standard by a performance test and periodic monitoring, recordkeeping, and reporting. Additional information on testing, monitoring, recordkeeping, and reporting requirements that apply to MSW landfill owners or operators are contained in MSW Landfills, Volume 1, (EPA-453/R-96-004), and in Subparts Cc and WWW (see Appendix I).

**Question No. 6:** Are fixed calendar dates required in increments of progress?

**Answer:** Either calendar dates or floating dates can be used for these increments of progress. There are five mandatory increments of compliance. These are: 1) submittal of a final control plan (collection and control system design plan); 2) awarding of contracts; 3) initiation of on-site construction of collection and control systems; 4) completion of on-site installation of collection and control systems; and 5) final compliance.

The State may submit a schedule that uses either all calendar dates or a mix of calendar and floating dates, or a State could submit a schedule with dates that all float. The dates may float from the effective date of EPA's approval of the State plan or the date the Annual Emission Rate Report shows that NMOC emissions equal or exceed 50 Mg/yr.

For the fourth and fifth increments of progress, completion of installation of collection and control systems and final compliance, respectively, if a floating date is used, that date must be no later than 30 months after the Annual Emission Rate Report first shows that the landfill has reached or exceeded an annual NMOC emission rate of 50 Mg/yr .

**Question No. 7:** Are public hearings required prior to submittal of a State plan?

**Answer:** Adequate opportunity for public hearings is required. The requirements described in Section 3.9 of this document apply and require the opportunity for public hearings on State plans prior to submittal. If after adequate notice, no one requests a hearing, the hearing is not required.

**Question No. 8:** Can the States incorporate the MSW landfill progress reports into their 40 CFR Part 51, § 51.321 annual report for SIPs?

**Answer:** Yes, EPA encourages States/EPA coordination to work with the EPA to minimize any potential duplication of reporting requirements and to tailor the reports to ensure the most productive compliance and enforcement activities.

**Appendix A**

**NSPS and Emission Guideline Fact Sheet (40 CFR 60 Subpart Cc)**

**NSPS and Emission Guideline Fact Sheet (40 CFR 60 Subpart Cc)**  
**Final Air Regulations for Municipal Solid Waste Landfills**

On March 1, 1996, the Environmental Protection Agency (EPA), under authority of the Clean Air Act, issued a final regulation controlling emissions of a variety of air pollutants from new and existing large municipal solid waste landfills. This regulation was published in the Federal Register on March 12, 1996. Landfills subject to EPA's regulation accept and handle everyday household waste; they do not handle regulated hazardous waste. Currently, 60 percent of municipal solid waste generated in the United States is landfilled; 16 percent is incinerated; and 24 percent is recycled.

EPA worked in partnership with major stakeholders, including private industry, the National Association of Counties, the National League of Cities, and the Solid Waste Association of North America to develop the final rule.

**What are the Health and Environmental Benefits?**

As the waste in a landfill decomposes, it breaks down to form landfill gases, such as methane, smog-causing volatile organic compounds (VOCs), and air toxics, pollutants known or suspected of causing cancer and other serious health effects. Landfills are the largest anthropogenic source of methane emissions in the United States. Methane is a potent greenhouse gas that contributes to global warming.

EPA's final air rules for municipal solid waste landfills will achieve significant reductions in emissions of VOCs and air toxics, such as benzene, carbon tetrachloride, and chloroform. EPA's regulation will reduce emissions of VOCs, air toxics, and malodorous compounds from existing and new landfills by over 90,000 tons annually (a 53 percent reduction from current levels). This rulemaking will also result in significant reductions in emissions of methane, a major constituent of landfill gas and a potent greenhouse gas. By reducing methane emissions, EPA's regulation will also increase safety in and near landfills.

## **How Does Today's Action Relate to the U.S. Climate Change Action Plan?**

Landfills are the largest anthropogenic source of methane emissions in the United States, constituting about 40 percent of these sources. Methane reductions of over 50 percent in the year 2000, anticipated under this rulemaking, as well as reductions achieved by EPA's Landfill Methane Outreach Program, are important components of the U.S. "Climate Change Action Plan" to reduce emissions of greenhouse gases to 1990 levels by the year 2000. The rule alone will reduce greenhouse gas emissions by 37.1 million metric tons of carbon equivalent (6.2 million tons of methane). When the outreach program is included as well, total reductions will be 38.6 mmtce (6.8 million tons of methane).

This rulemaking and the EPA Landfill Methane Outreach Program (LMOP) go hand-in-hand to provide substantial reductions in greenhouse gas emissions. The new regulations will cause many landfills across the country to assess their landfill gas emissions and the potential for cost-effective recovery of energy from this gas. The LMOP will provide these landfills with guidance on how to comply with the regulations, including how to evaluate energy recovery options. Working together, these two cornerstone actions of the Climate Change Action Plan will encourage many landfills to capture and use their landfill gas.

## **What are the Main Components of EPA's Final Rule?**

EPA's final rule takes the form of new source performance standards for new landfills and emission guidelines for existing landfills. States will adopt and enforce the emission guidelines for existing landfills. The regulation will require large landfills that emit landfill gas in excess of 50 megagrams (Mg) per year to control emissions. In general, controlling emissions involves drilling collection wells into the landfill and routing the gas to a suitable energy recovery system or combustion device. Specifically, the regulations will require the following:

- New and existing landfills designed to hold 2.5 million Mg and 2.5 million m<sup>3</sup> of waste or more will be required to install gas collection systems or prove that the

landfill emits less than 50 Mg per year of non-methane organic compounds, including smog-causing VOCs and air toxics.

- EPA's final rule provides the owner or operator of a landfill with a tier system for determining if controls will be required. If the owner or operator initially calculates the emissions to be above the 50 Mg per year threshold by using default parameters provided in the regulation, the tier system provides the opportunity to conduct sampling and determine site specific values to demonstrate that emissions are below the emission threshold and that controls are not required.
- If emissions controls are required, the rule provides flexibility to industry by allowing landfill owners or operators to design their own gas collection and control system to fit their unique circumstances. A control device may be a flare or a device which utilizes the energy content of the gas, such as an internal combustion engine, a turbine, or a boiler.
- EPA's final rule contains an operational standard that requires a landfill's surface methane concentration to be monitored on a quarterly basis. If the surface concentration of methane is greater than 500 parts per million after three consecutive measurements, the regulation requires system expansion to comply with the rule.

The final rule will achieve substantial emission reductions without placing an undue financial burden on municipalities, and will place no burden on small municipalities (since small landfills are exempted from the regulation). Waste disposal costs will increase only about 20 to 40 cents per household. EPA anticipates that many landfills will use energy recovery systems, further reducing costs per household.

### **Who Will be Affected by EPA'S Final Rule?**

Approximately 7000 landfills exist in the United States. However, over 90 percent of these landfills have design capacities less than the 2.5 million Mg exemption in the regulation. Thus, less than 10 percent are subject to the annual emission rate reports and/or control requirements. Of this 10 percent, about 6 percent will have emissions less than 50 Mg/yr, so will not be required to apply controls. The remaining 4 percent of the existing landfills nationwide will have emissions over 50 Mg/yr and will be subject to the control requirements of the Emission Guidelines.

**For Further Information...**

Anyone with a computer and a modem can download the final rule from the Clean Air Act Amendments bulletin board (look under "Recently Signed Rules") on EPA's electronic Technology Transfer Network (TTN) by calling (919) 541-5742. For further information about how to access the board, call (919) 541-5384. For technical questions about the rule, contact Martha Smith of EPA's Office of Air Quality Planning and Standards at (919) 541-2421. For information on the EPA Landfill Methane Outreach Program (LMOP), call the LMOP Hotline at (202) 233-9042.

**Appendix B**

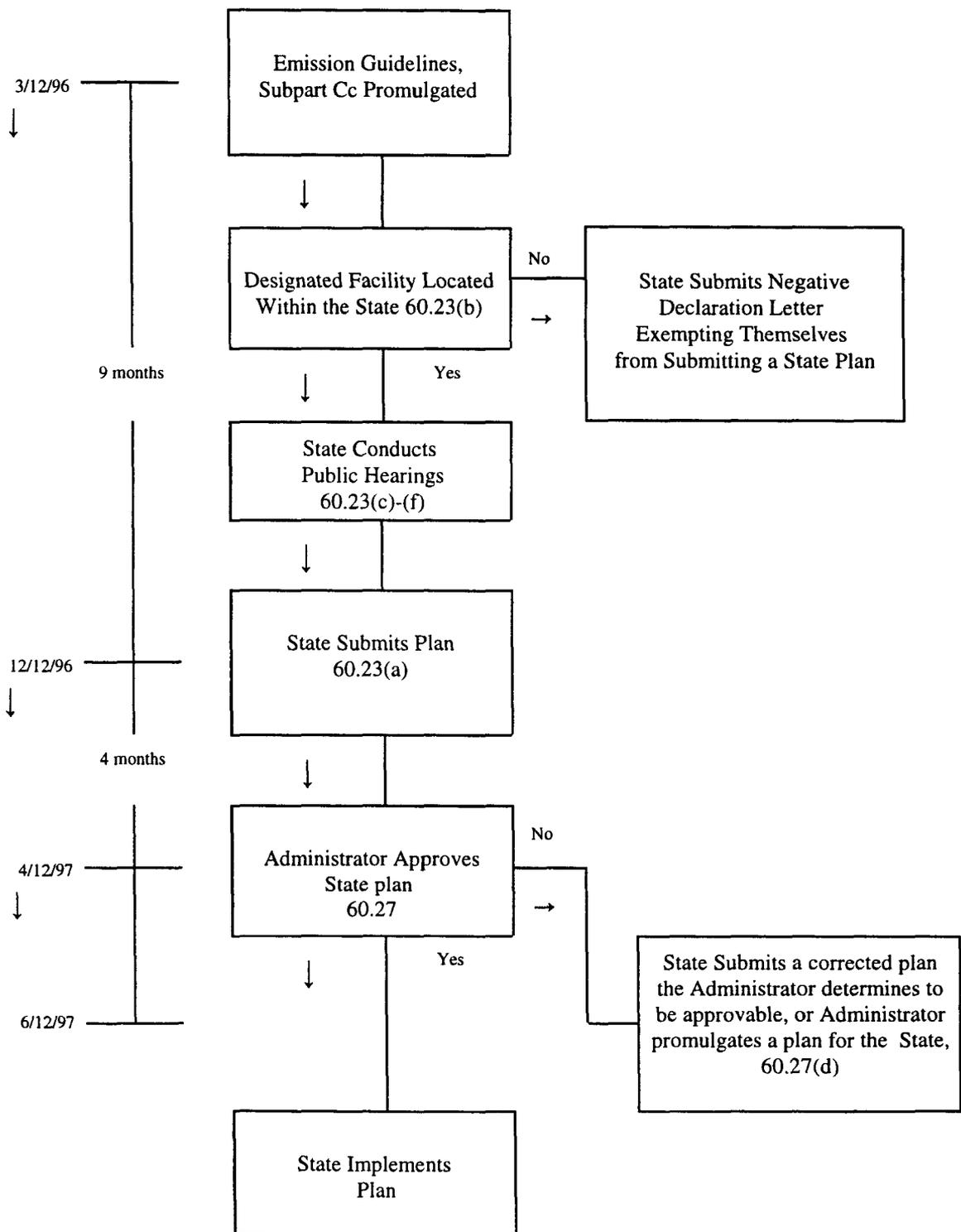
**MSW Landfills Implementation Timeline**

## MSW Landfills Implementation Timeline

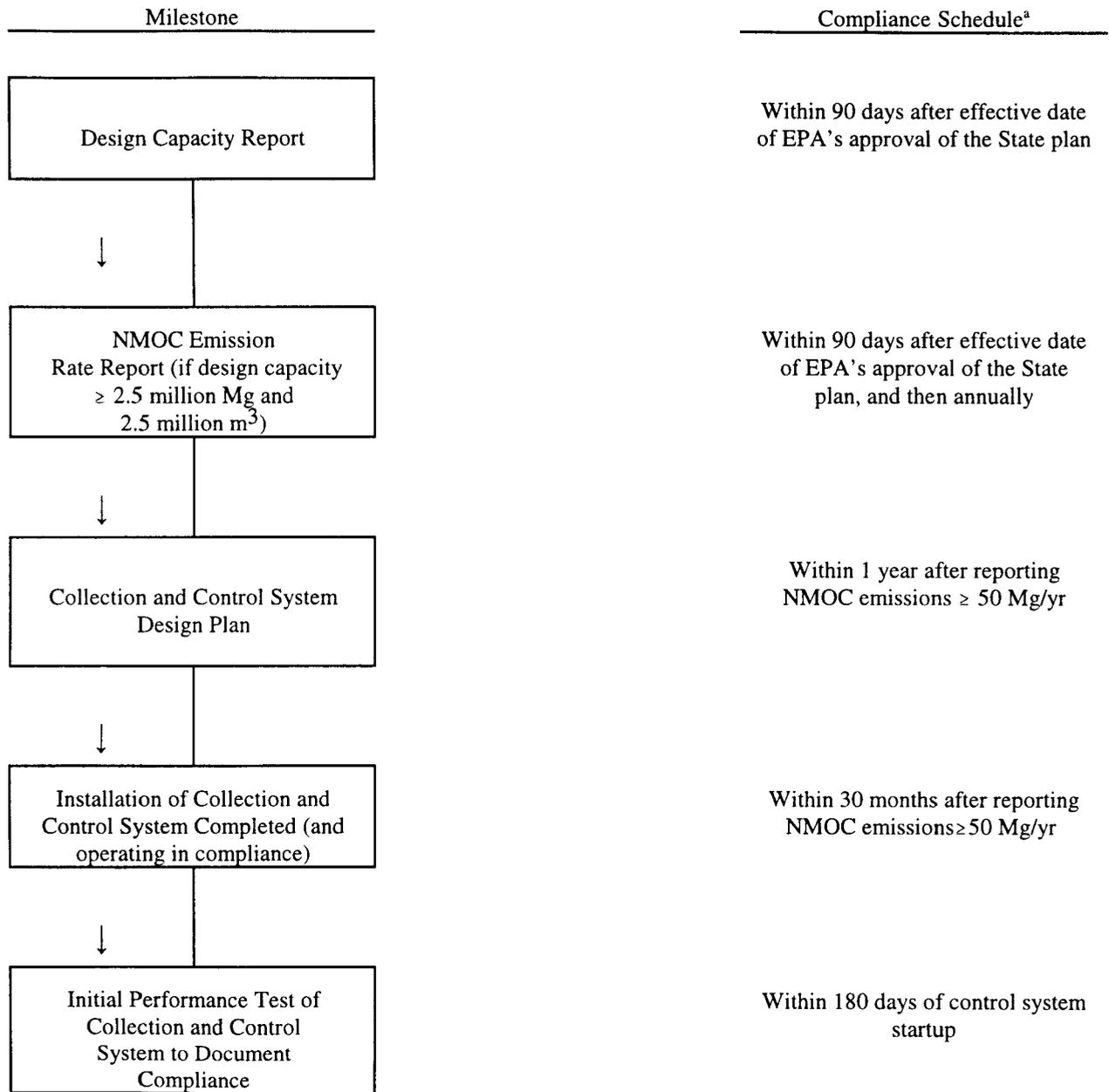
State plans must be submitted by December 12, 1996, unless the State receives an extension. EPA has four months (that is, until April 12, 1997) to approve or disapprove the plan. Figure B-1 presents a timeline for submission and approval of Section 111(d) State plans to implement the MSW landfill Emission Guidelines. If the state does not submit an approvable plan, the EPA will promulgate a Federal Plan for the state.

The timeline for MSW landfill compliance as presented in Figure B-2 applies to existing MSW landfills with design capacities equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup>. (The compliance timeline for the NSPS is similar to the timeline for the Emission Guidelines, except that it starts as of March 12, 1996 [the date of promulgation of the NSPS] instead of the effective date of EPA's approval of the State plan.) The states must establish a compliance schedule that is no less stringent than the schedule in the Emission Guidelines (Subpart Cc), except in unusual case-by-case situations (see Section 3.11). As shown in Figure B-2, the first reports are due 90 days after the effective date of EPA's approval of the State plan.

If a MSW landfill emits 50 Mg/yr or more of NMOC as of the effective date of EPA's approval of the State plan, a site-specific collection and control system design plan must be submitted within 1 year after the first Annual Emission Rate Report is due, if the source is following the Emission Guidelines schedule. This Emission Rate Report is due within 90 days of the effective date of EPA's approval of the State plan, so the design plan is due within 1 year plus 90 days of the effective date of EPA's approval of the State plan. Installation of the collection and control system must be completed and the system must be in compliance within 30 months after the Emission Rate Report shows NMOC emissions are  $\geq$  50 Mg/yr (e.g., within 30 months and 90 days of the effective date of EPA's approval of the State plan).



**Figure B-1. State Plan Approval Process and Schedule**



<sup>a</sup> The time frames specified in this example are based on the dates in section 60.757 of Subpart WWW.

**Figure B-2. General Milestones for the Compliance Schedule for An Existing MSW Landfill**

The compliance schedule is different for MSW landfills that have design capacities that are  $\geq 2.5$  million Mg and 2.5 million  $m^3$  and emit less than the 50 Mg/yr emission rate cutoff on the effective date. Because landfill emissions increase over time as additional waste is deposited, a landfill may emit less than 50 Mg/yr when the State plan takes effect, but emissions may increase to greater than 50 Mg/yr in future years. The Emission Guidelines require such landfills to submit Annual Emission Rate Reports. The collection and control system design plan must be submitted within 1 year after the date of the first Annual Emission Rate Report shows that emissions equal or exceed 50 Mg/yr of NMOC. Collection and control systems must be installed within 30 months after the Emission Rate Report shows emissions of NMOC equal or exceed 50 Mg/yr. MSW Landfills, Volume 1 (EPA-453/R-96-004) presents additional information on landfill compliance requirements.

## **Appendix C**

### **Contacts**

- C1 EPA Regional MSW Landfill Rule Contacts**
- C2 State MSW Landfill Rule Contacts**
- C3 Other Contacts**

**Appendix C1**

**EPA Regional MSW Landfill Rule Contacts**

### EPA Regional MSW Landfill Rule Contacts

Regional Contact	Phone #	Fax #
Jeanne Cosgrove U.S. EPA/CAQ Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) John F. Kennedy Federal Bldg. Boston, MA 02203-001	617/565-9451	617/565-4940
Christine DeRosa U.S. EPA/25th floor Region II (New Jersey, New York, Puerto Rico, Virgin Islands) 290 Broadway New York, NY 10007-1866	212/637-4022	212/637-3901
James B. Topsale U.S. EPA/3ATT22 Region III (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia) 1650 Arch Street Philadelphia, PA 19103-2029	215/814-2190	215/814-2114
Scott Davis U.S. EPA/APTMD Region IV (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee) 61 Forsyth Street, SW Atlanta, GA 30303	404/562-9127	404/562-9095
Charles Hatten U.S. EPA Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin) 77 W. Jackson Blvd. Chicago, IL 60604	312/886-6031	312/886-0617
Mick Cote U.S. EPA Region VI (Arkansas, Louisiana, New Mexico, Oklahoma, Texas) 1445 Ross Av., Suite 1200 Dallas, TX 75202-2733	214/665-7219	214/665-7263

**EPA Regional MSW Landfill Rule Contacts**

Regional Contact	Phone #	Fax #
Ward Burns U.S. EPA/RME Region VII (Iowa, Kansas, Missouri, Nebraska) 726 Minnesota Av./ARTDAPCO Kansas City, KS 66101-2728	913/551-7960	913/551-7065
Lee Hanley U.S. EPA Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming) 999 18th Street, Suite 500 Denver, CO 80202-2466	303/312-6555	303/312-6409
Patricia Bowlin U.S. EPA/RM HAW/17211 Region IX (American Samoa, Arizona, California, Guam, Hawaii, Nevada) 75 Hawthorne Street/Air-4 San Francisco, CA 94105	415/744-1188	415/744-1076
Catherine Woo U.S. EPA Region X (Alaska, Idaho, Oregon, Washington) 1200 Sixth Av. Seattle, WA 98101	206/553-1814	206/553-0404

**Appendix C2**

**State MSW Landfill Rule Contacts**

### State Contacts

Contact	State	Phone #	Fax #
<b>REGION I</b>			
Scott Koschwitz	CT	860/424-3427	860/424-4063
Nancy Seidman	MA	617/292-5593	617/556-1046
John Chandler	ME	207/287-2437	207/287-7641
Don Anderson	ME	207/287-2437	207/287-7641
Andy Bodnarik	NH	603/271-1370	603/271-1381
Barbara Morin	RI	401/277-2808	401/277-2017
Harold Garabedian	VT	802/241-3840	802/241-2590
<b>REGION II</b>			
John Elston	NJ	609/292-6710	
Tom Lynch	NY	518/457-2051	
Tom Christoffell	NY	518/457-7688	
Eduardo Del Rio	PR	787/767-8025	
<b>REGION III</b>			
Ron Amirikian	DE	302/323-4542	302/323-4561
Ruben Deza	MD	410/631-3240	410-631-3202
Carl York	MD	410/631-3234	410-631-3202
Jayne Graham	PA Allegheny Co.	412/578-8129	412-578-8058
John Slade	PA	717/783-9476	717/772-2303
Kris Ramamurthy	PA	717/787-9256	717/772-2303
Karen Sabasteanski	VA	804/698-4426	804-698-4510
Lucy Pontiveros	WV	304/558-1220	304-558-1222
<b>REGION IV</b>			
Jerold Griffies	AL	334/271-7861	334/271-7950
Larry Brown	AL	334/271-7861	334/271-7950
Venkata Panchakarla	FL	904/488-0114	904/922-6979
Kent Pierce	GA	404/363-7103	404/363-7100
Millie Ellis	KY	502/573-3382	502/573-3787
Mark Wyatt	MS	601/961-5367	601/961-5742
Tom Allen	NC	919/733-1489	919/715-7175
Renee Shealy	SC	803/734-4750	803/734-4556

### State Contacts

Contact	State	Phone #	Fax #
Malcolm Butler	TN	615/532-0600	615/532-0614
Gene Bradley	TN	615/532-0593	615/532-0614
<b>REGION V</b>			
Dick Forbes	IL	217/785-1889	
Pat Daniel	IN	317/233-0429	
Jerry Trautman	MI	517/373-7059	517-335-3122
Margaret McCourtney	MN	612/297-7894	612-297-8701
Tammy Hilkens	OH	614/644-3596	
Steve Dunn	WI	608/267-0566	608-267-0560
<b>REGION VI</b>			
Mark McCorkle	AR	501/682-0736	
Annette Sharp	LA	504/765-0914	
Karen Blackmore	LA	504/765-0130	
David Duran	NM	505/827-2950	
Angel Martinez	NM (Albuquerque)	505/768-1961	
Joyce Sheedy or Cheryl Bradley	OK	405/290-8247	405/962-2200
Gus Eghneim	TX	512/239-1965	
<b>REGION VII</b>			
Catharine Fitsimmons	IA	515/281-8034	515/281-8895
Chuck Layman	KS	913/296-1579	913/296-1545
Paul Myers	MO	573/751-4817	573/751-2706
Susan Fields	NE	402/471-0019	402/471-2909
<b>REGION VIII</b>			
Kirsten King	CO	303/692-3212	303/782-0278
Dave Klemp	MT	406/444-0286	406/444-5275
Tom Bachman	ND	701/328-5188	701/328-5200
Jackie Flowers	SD	605/773-5708	605/773-4068
Carol Neilson	UT	801/536-4000	801/536-4099
Bernie Dailey	WY	307/777-7345	307/777-5616

**State Contacts**

<b>Contact</b>	<b>State</b>	<b>Phone #</b>	<b>Fax #</b>
<b>REGION IX</b>			
Renaldo Crooks	CA	916/327-5618	916/327-5621
<b>REGION X</b>			
Bill Walker	AK	907/465-5124	
Sue Richards	ID	208/334-5898	
Kathleen Craig	OR	503/229-6833	
Judy Geier	WA	360/407-6850	

**Appendix C3**

**Other MSW Landfill Contacts**

### Other MSW Landfill Contacts

Contact	Phone #	Fax #
<b>For information concerning analyses performed in developing the landfills rule, contact:</b>		
Michele Laur U.S. Environmental Protection Agency Waste and Chemical Processes Group Emission Standards Division (MD-13) Research Triangle Park, NC 27711	919/541-5256	919/541-3470
<b>For implementation issues, contact:</b>		
Mary Ann Warner U.S. Environmental Protection Agency Program Review Group Information Transfer and Program Integration Division (MD-12) Research Triangle Park, NC 27711	919/541-1192	919/541-2664
<b>For information on the Landfill Model, contact:</b>		
Susan Thorneloe U.S. Environmental Protection Agency Air Pollution Prevention and Control Division (MD-63) Research Triangle Park, NC 27711 thorneloe.susan@epamail.epa.gov		919/541-2382
<b>For enforcement and compliance assurance contact:</b>		
Zofia S. Kosim, P.E. (2242A) U.S. Environmental Protection Agency Air Enforcement Division/ Office of Regulatory Enforcement Office of Enforcement and Compliance Assurance 401 M Street, S.W. Washington, DC 20460	202/564-8733	202/564-0015

**Other MSW Landfill Contacts (Continued)**

Contact	Phone #	Fax #
<b>To order documents/receive general information on the Landfill Methane Outreach Program, contact:</b>		
LMOP Hotline Home page: <a href="http://www.epa.gov/lmop">http://www.epa.gov/lmop</a>	1-888/STAR YES	703/934-3895
<b>For more specific requests on landfill gas-to-energy, contact:</b>		
Ed Coe U.S. Environmental Protection Agency 501 Third Street, N.W. Mail Code 6202J Washington, DC 20001	202/564-8994	202/565-2077
<b>For information on monitoring and sampling methods contact:</b>		
Foston Curtis U.S. Environmental Protection Agency Source Characterization Group Emissions, Monitoring, and Analysis Division (MD-19) Research Triangle Park, NC 27711	919/541-1063	919/541-1039

**Appendix D**

**Emission Estimation Procedures for State Plan  
Emissions Inventory**

## **Emission Estimation Procedures for State Plan Emissions Inventory**

The pollutants emitted from municipal solid waste (MSW) landfills include methane, carbon dioxide and non-methane organic compounds. The attached chapter from the EPA document "Compilation of Air Pollution Emission Factors (AP-42)"<sup>1</sup> contains emission estimation procedures and default values that can be used to calculate methane, carbon dioxide, and NMOC emissions for MSW landfill emissions inventories and other purposes. Emissions are calculated using equations (which are based on a first order decomposition model), as a function of three variables: the NMOC concentration in landfill gas ( $C_{\text{NMOC}}$ ), the methane generation rate constant ( $k$ ); and the refuse methane generation potential ( $L_0$ ). The default values for these variables presented in AP-42 are designed to provide typical, or average, estimates of MSW landfill emissions and are appropriate for use in state emission inventories. An individual MSW landfill may emit more or less than calculated based on site-specific factors. The AP-42 document also provides calculations for the use and adjustment of site-specific data, if it is available (that is, to adjust measured NMOC concentration data for air infiltration). If site-specific measured values are available, it is preferable to use these rather than the default values.

It should be stressed that the AP-42 default values should NOT be used to determine applicability of or compliance with the MSW landfills Emission Guidelines. Under the Emission Guidelines and the NSPS, the owner or operator must use the tiered emission estimation procedure in § 60.754 of Subpart WWW or another method if it has been approved by the EPA Administrator as provided in § 60.752(b)(2)(i)(B) to determine whether the annual emission rate equals or exceeds the 50 Mg/yr cutoff and whether the MSW landfill must be controlled. The owner or operator must use the equations and Tier 1 default values provided in the NSPS and the Emission Guidelines to determine NMOC emissions or develop site-specific values using the Tier 2 or 3 procedures in § 60.754. The equations in Subpart WWW are the same as the AP-42 equations. However, the Tier 1 default values for methane generation potential ( $L_0$ ) and methane generation rate constant ( $k$ ) provided in the NSPS and the Emission Guidelines are purposefully conservative to protect human health, to encompass a wide range of MSW landfills, and to encourage the use of site-specific data.

For more information about the AP-42 emission factors and documentation of the assumptions and calculations, see Chapter 2 in AP-42. The current version of AP-42 is included in this appendix (November 1998). Because AP-42 is updated periodically, the AP-42 section in this appendix should not be used for subsequent emission inventories unless verified to be current. For current information in AP-42, check the TTN Web at <http://www.epa.gov/ttn/chief>.

A computer model is also available to calculate MSW landfill emissions. The "Landfill Gas Emissions Model", utilizes a first-order decomposition model that is consistent with AP-42 and the NSPS and Emission Guidelines equations to estimate emissions of methane, carbon dioxide, NMOC and other pollutants. The model combines user-entered landfill operating characteristics with defaults derived from either the MSW landfills NSPS and Emission Guidelines or AP-42 to provide yearly estimates of gaseous emissions. These estimates may be displayed as text or in graphical depictions. The model also allows the user to replace internal defaults with landfill specific parameters to refine the calculations for a specific site.

The model is consistent with the equations specified in the MSW landfill NSPS and Emission Guidelines. MSW landfills using the model to calculate annual emission rates for purposes of NSPS or Emission Guidelines applicability determination must use the NSPS default values rather than the AP-42 default values. Those using the model for a state emissions inventory or for NSR or PSD permitting purposes should use site-specific measured values, and if these are not available, the AP-42 defaults.

A package with a diskette containing the model as well as the user's guide is available under the title: "Landfill Gas Emissions Model, Users Manual," Version 2.01 and may be purchased from:

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
Telephone: (703) 487-4650

or:

accessed on the EPA TTN Web at <http://www.epa.gov/ttn/catc/products.html# software>.

Additionally, information or questions regarding the models and their operation may be obtained from Susan A. Thorneloe, the EPA Project Officer overseeing its development. She may be contacted at:

Air and Energy Engineering Research Laboratory  
U.S. Environmental Protection Agency  
Research Triangle Park, NC 27711  
Fax: (919) 541-2382  
thorneloe.susan@epamail.epa.gov

## REFERENCES

1. U.S. EPA. Compilation of Air Pollutant Emission Factors, 5th ed. (AP-42), Volume I: Stationary Point and Area Sources, Section 2.4: Municipal Solid Waste Landfills," Research Triangle Park, North Carolina: U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, November, 1998.

## 2.4 MUNICIPAL SOLID WASTE LANDFILLS

### 2.4.1 General<sup>1-4</sup>

A municipal solid waste (MSW) landfill unit is a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile. An MSW landfill unit may also receive other types of wastes, such as commercial solid waste, nonhazardous sludge, and industrial solid waste. The municipal solid waste types potentially accepted by MSW landfills include (most landfills accept only a few of the following categories):

- MSW,
- Household hazardous waste,
- Municipal sludge,
- Municipal waste combustion ash,
- Infectious waste,
- Waste tires,
- Industrial non-hazardous waste,
- Conditionally exempt small quantity generator (CESQG) hazardous waste,
- Construction and demolition waste,
- Agricultural wastes,
- Oil and gas wastes, and
- Mining wastes.

In the United States, approximately 57 percent of solid waste is landfilled, 16 percent is incinerated, and 27 percent is recycled or composted. There were an estimated 2,500 active MSW landfills in the United States in 1995. These landfills were estimated to receive 189 million megagrams (Mg) (208 million tons) of waste annually, with 55 to 60 percent reported as household waste, and 35 to 45 percent reported as commercial waste.

### 2.4.2 Process Description<sup>2,5</sup>

There are three major designs for municipal landfills. These are the area, trench, and ramp methods. All of these methods utilize a three step process, which includes spreading the waste, compacting the waste, and covering the waste with soil. The trench and ramp methods are not commonly used, and are not the preferred methods when liners and leachate collection systems are utilized or required by law. The area fill method involves placing waste on the ground surface or landfill liner, spreading it in layers, and compacting with heavy equipment. A daily soil cover is spread over the compacted waste. The trench method entails excavating trenches designed to receive a day's worth of waste. The soil from the excavation is often used for cover material and wind breaks. The ramp method is typically employed on sloping land, where waste is spread and compacted similar to the area method, however, the cover material obtained is generally from the front of the working face of the filling operation.

Modern landfill design often incorporates liners constructed of soil (i.e., recompacted clay), or synthetics (i.e., high density polyethylene), or both to provide an impermeable barrier to leachate (i.e., water that has passed through the landfill) and gas migration from the landfill.

### 2.4.3 Control Technology<sup>1,2,6</sup>

The Resource Conservation and Recovery Act (RCRA) Subtitle D regulations promulgated on October 9, 1991 require that the concentration of methane generated by MSW landfills not exceed 25 percent of the lower explosive limit (LEL) in on-site structures, such as scale houses, or the LEL at the facility property boundary.

The New Source Performance Standards (NSPS) and Emission Guidelines for air emissions from MSW landfills for certain new and existing landfills were published in the Federal Register on March 1, 1996. The regulation requires that Best Demonstrated Technology (BDT) be used to reduce MSW landfill emissions from affected new and existing MSW landfills emitting greater than or equal to 50 Mg/yr (55 tons/yr) of non-methane organic compounds (NMOCs). The MSW landfills that are affected by the NSPS/Emission Guidelines are each new MSW landfill, and each existing MSW landfill that has accepted waste since November 8, 1987, or that has capacity available for future use. The NSPS/Emission Guidelines [require control systems for] **affect** landfills with a design capacity of 2.5 million Mg (2.75 million tons) [and 2.5 million cubic meters (3.27 million cubic yards) that emit greater than or equal to 50 Mg/yr NMOCs]\* ~~or more~~. Control systems require: (1) a well-designed and well-operated gas collection system, and (2) a control device capable of reducing NMOCs in the collected gas by 98 weight-percent.

Landfill gas (LFG) collection systems are either active or passive systems. Active collection systems provide a pressure gradient in order to extract LFG by use of mechanical blowers or compressors. Passive systems allow the natural pressure gradient created by the increase in pressure created by LFG generation within the landfill to mobilize the gas for collection.

LFG control and treatment options include (1) combustion of the LFG, and (2) purification of the LFG. Combustion techniques include techniques that do not recover energy (i.e., flares and thermal incinerators), and techniques that recover energy (i.e., gas turbines and internal combustion engines) and generate electricity from the combustion of the LFG. Boilers can also be employed to recover energy from LFG in the form of steam. Flares involve an open combustion process that requires oxygen for combustion, and can be open or enclosed. Thermal incinerators heat an organic chemical to a high enough temperature in the presence of sufficient oxygen to oxidize the chemical to carbon dioxide (CO<sub>2</sub>) and water. Purification techniques can also be used to process raw landfill gas to pipeline quality natural gas by using adsorption, absorption, and membranes.

\*[This clarification will be reflected in the next revision of AP-42.]

### 2.4.4 Emissions<sup>2,7</sup>

Methane (CH<sub>4</sub>) and CO<sub>2</sub> are the primary constituents of landfill gas, and are produced by microorganisms within the landfill under anaerobic conditions. Transformations of CH<sub>4</sub> and CO<sub>2</sub>

are mediated by microbial populations that are adapted to the cycling of materials in anaerobic environments. Landfill gas generation, including rate and composition, proceeds through four phases. The first phase is aerobic [i.e., with oxygen (O<sub>2</sub>) available] and the primary gas produced is CO<sub>2</sub>. The second phase is characterized by O<sub>2</sub> depletion, resulting in an anaerobic environment, where large amounts of CO<sub>2</sub> and some hydrogen (H<sub>2</sub>) are produced. In the third phase, CH<sub>4</sub> production begins, with an accompanying reduction in the amount of CO<sub>2</sub> produced. Nitrogen (N<sub>2</sub>) content is initially high in landfill gas in the first phase, and declines sharply as the landfill proceeds through the second and third phases. In the fourth phase, gas production of CH<sub>4</sub>, CO<sub>2</sub>, and N<sub>2</sub> becomes fairly steady. The total time and phase duration of gas generation varies with landfill conditions (i.e., waste composition, design management, and anaerobic state).

Typically, LFG also contains a small amount of non-methane organic compounds (NMOC). This NMOC fraction often contains various organic hazardous air pollutants (HAP), greenhouse gases (GHG), and compounds associated with stratospheric ozone depletion. The NMOC fraction also contains volatile organic compounds (VOC). The weight fraction of VOC can be determined by subtracting the weight fractions of individual compounds that are non-photochemically reactive (i.e., negligibly-reactive organic compounds as defined in 40 CFR 51.100).

Other emissions associated with MSW landfills include combustion products from LFG control and utilization equipment (i.e., flares, engines, turbines, and boilers). These include carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), hydrogen chloride (HCl), particulate matter (PM) and other combustion products (including HAPs). PM emissions can also be generated in the form of fugitive dust created by mobile sources (i.e., garbage trucks) traveling along paved and unpaved surfaces. The reader should consult AP-42 Volume I Sections 13.2.1 and 13.2.2 for information on estimating fugitive dust emissions from paved and unpaved roads.

The rate of emissions from a landfill is governed by gas production and transport mechanisms. Production mechanisms involve the production of the emission constituent in its vapor phase through vaporization, biological decomposition, or chemical reaction. Transport mechanisms involve the transportation of a volatile constituent in its vapor phase to the surface of the landfill, through the air boundary layer above the landfill, and into the atmosphere. The three major transport mechanisms that enable transport of a volatile constituent in its vapor phase are diffusion, convection, and displacement.

**2.4.4.1 Uncontrolled Emissions** — To estimate uncontrolled emissions of the various compounds present in landfill gas, total landfill gas emissions must first be estimated. Uncontrolled CH<sub>4</sub> emissions may be estimated for individual landfills by using a theoretical first-order kinetic model of methane production developed by the EPA.<sup>8</sup> This model is known as the Landfill Air Emissions Estimation model, and can be accessed from the Office of Air Quality Planning and Standards Technology Transfer Network Website (OAQPS TTN Web) in the Clearinghouse for Inventories and Emission Factors (CHIEF) technical area (URL <http://www.epa.gov/ttn/chief>). The Landfill Air Emissions Estimation model equation is as follows:

$$Q_{\text{CH}_4} = L_o R (e^{-kc} - e^{-kt}) \quad (1)$$

where:

$Q_{\text{CH}_4}$	=	Methane generation rate at time t, m <sup>3</sup> /yr;
$L_o$	=	Methane generation potential, m <sup>3</sup> CH <sub>4</sub> /Mg refuse;
R	=	Average annual refuse acceptance rate during active life, Mg/yr;
e	=	Base log, unitless;
k	=	Methane generation rate constant, yr <sup>-1</sup> ;
c	=	Time since landfill closure, yrs (c = 0 for active landfills); and
t	=	Time since the initial refuse placement, yrs.

It should be noted that the model above was designed to estimate LFG generation and not LFG emissions to the atmosphere. Other fates may exist for the gas generated in a landfill, including capture and subsequent microbial degradation within the landfill's surface layer. Currently, there are no data that adequately address this fate. It is generally accepted that the bulk of the gas generated will be emitted through cracks or other openings in the landfill surface.

Site-specific landfill information is generally available for variables R, c, and t. When refuse acceptance rate information is scant or unknown, R can be determined by dividing the refuse in place by the age of the landfill. If a facility has documentation that a certain segment (cell) of a landfill received *only* nondegradable refuse, then the waste from this segment of the landfill can be excluded from the calculation of R. Nondegradable refuse includes concrete, brick, stone, glass, plaster, wallboard, piping, plastics, and metal objects. The average annual acceptance rate should only be estimated by this method when there is inadequate information available on the actual average acceptance rate. The time variable, t, includes the total number of years that the refuse has been in place (including the number of years that the landfill has accepted waste and, if applicable, has been closed).

Values for variables  $L_o$  and k must be estimated. Estimation of the potential CH<sub>4</sub> generation capacity of refuse ( $L_o$ ) is generally treated as a function of the moisture and organic content of the refuse. Estimation of the CH<sub>4</sub> generation constant (k) is a function of a variety of factors, including moisture, pH, temperature, and other environmental factors, and landfill operating conditions. Specific CH<sub>4</sub> generation constants can be computed by the use of EPA Method 2E (40 CFR Part 60 Appendix A).

The Landfill Air Emission Estimation model includes both regulatory default values and recommended AP-42 default values for  $L_o$  and k. The regulatory defaults were developed for compliance purposes (NSPS/Emission Guideline). As a result, the model contains conservative  $L_o$  and k default values in order to protect human health, to encompass a wide range of landfills, and to encourage the use of site-specific data. Therefore, different  $L_o$  and k values may be appropriate in estimating landfill emissions for particular landfills and for use in an emissions inventory.

Recommended AP-42 defaults include a k value of 0.04/yr for areas receiving 25 inches or more of rain per year. A default k of 0.02/yr should be used in drier areas (<25 inches/yr). An  $L_0$  value of 100 m<sup>3</sup>/Mg (3,530 ft<sup>3</sup>/ton) refuse is appropriate for most landfills. Although the recommended default k and  $L_0$  are based upon the best fit to 21 different landfills, the predicted methane emissions ranged from 38 to 492% of actual, and had a relative standard deviation of 0.85. It should be emphasized that in order to comply with the NSPS/Emission Guideline, the regulatory defaults for k and  $L_0$  must be applied as specified in the final rule.

When gas generation reaches steady state conditions, LFG consists of approximately 40 percent by volume CO<sub>2</sub>, 55 percent CH<sub>4</sub>, 5 percent N<sub>2</sub> (and other gases), and trace amounts of NMOCs. Therefore, the estimate derived for CH<sub>4</sub> generation using the Landfill Air Emissions Estimation model can also be used to represent CO<sub>2</sub> generation. Addition of the CH<sub>4</sub> and CO<sub>2</sub> emissions will yield an estimate of total landfill gas emissions. If site-specific information is available to suggest that the CH<sub>4</sub> content of landfill gas is not 55 percent, then the site-specific information should be used, and the CO<sub>2</sub> emission estimate should be adjusted accordingly.

Most of the NMOC emissions result from the volatilization of organic compounds contained in the landfilled waste. Small amounts may be created by biological processes and chemical reactions within the landfill. The current version of the Landfill Air Emissions Estimation model contains a proposed regulatory default value for total NMOC of 4,000 ppmv, expressed as hexane. However, available data show that there is a range of over 4,400 ppmv for total NMOC values from landfills. The proposed regulatory default value for NMOC concentration was developed for regulatory compliance purposes and to provide the most cost-effective default values on a national basis. For emissions inventory purposes, site-specific information should be taken into account when determining the total NMOC concentration. In the absence of site-specific information, a value of 2,420 ppmv as hexane is suggested for landfills known to have co-disposal of MSW and non-residential waste. If the landfill is known to contain only MSW or have very little organic commercial/industrial wastes, then a total NMOC value of 595 ppmv as hexane should be used. In addition, as with the landfill model defaults, the regulatory default value for NMOC content must be used in order to comply with the NSPS/Emission Guideline.

If a site-specific total pollutant concentration is available (i.e., as measured by EPA Reference Method 25C), it must be corrected for air infiltration which can occur by two different mechanisms: LFG sample dilution, and air intrusion into the landfill. These corrections require site-specific data for the LFG CH<sub>4</sub>, CO<sub>2</sub>, nitrogen (N<sub>2</sub>), and oxygen (O<sub>2</sub>) content. If the ratio of N<sub>2</sub> to O<sub>2</sub> is less than or equal to 4.0 (as found in ambient air), then the total pollutant

concentration is adjusted for sample dilution by assuming that CO<sub>2</sub> and CH<sub>4</sub> are the primary (100 percent) constituents of landfill gas, and the following equation is used:

$$C_P \text{ (ppmv) (corrected for air infiltration)} = \frac{C_P \text{ (ppmv)} (1 \times 10^6)}{C_{CO_2} \text{ (ppmv)} + C_{CH_4} \text{ (ppmv)}} \quad (2)$$

where:

- C<sub>P</sub> = Concentration of pollutant P in landfill gas (i.e., NMOC as hexane), ppmv;
- C<sub>CO<sub>2</sub></sub> = CO<sub>2</sub> concentration in landfill gas, ppmv;
- C<sub>CH<sub>4</sub></sub> = CH<sub>4</sub> Concentration in landfill gas, ppmv; and
- 1 x 10<sup>6</sup> = Constant used to correct concentration of P to units of ppmv.

If the ratio of N<sub>2</sub> to O<sub>2</sub> concentrations (i.e., C<sub>N<sub>2</sub></sub>, C<sub>O<sub>2</sub></sub>) is greater than 4.0, then the total pollutant concentration should be adjusted for air intrusion into the landfill by using equation 2 and adding the concentration of N<sub>2</sub> (i.e., C<sub>N<sub>2</sub></sub>) to the denominator. Values for C<sub>CO<sub>2</sub></sub>, C<sub>CH<sub>4</sub></sub>, C<sub>N<sub>2</sub></sub>, C<sub>O<sub>2</sub></sub>, can usually be found in the source test report for the particular landfill along with the total pollutant concentration data.

To estimate emissions of NMOC or other landfill gas constituents, the following equation should be used:

$$Q_P = 1.82 Q_{CH_4} * \frac{C_P}{(1 \times 10^6)} \quad (3)$$

where:

- Q<sub>P</sub> = Emission rate of pollutant P (i.e. NMOC), m<sup>3</sup>/yr;
- Q<sub>CH<sub>4</sub></sub> = CH<sub>4</sub> generation rate, m<sup>3</sup>/yr (from the Landfill Air Emissions Estimation model);
- C<sub>P</sub> = Concentration of P in landfill gas, ppmv; and
- 1.82 = Multiplication factor (assumes that approximately 55 percent of landfill gas is CH<sub>4</sub> and 45 percent is CO<sub>2</sub>, N<sub>2</sub>, and other constituents).

Uncontrolled mass emissions per year of total NMOC (as hexane), CO<sub>2</sub>, CH<sub>4</sub>, and speciated organic and inorganic compounds can be estimated by the following equation:

$$UM_P = Q_P * \left[ \frac{MW_P * 1 \text{ atm}}{(8.205 \times 10^{-5} \text{ m}^3\text{-atm/gmol-}^\circ\text{K})(1000\text{g/kg})(273 + T^\circ\text{K})} \right] \quad (4)$$

where:

- UM<sub>P</sub> = Uncontrolled mass emissions of pollutant P (i.e., NMOC), kg/yr;
- MW<sub>P</sub> = Molecular weight of P, g/gmol (i.e., 86.18 for NMOC as hexane);
- Q<sub>P</sub> = NMOC emission rate of P, m<sup>3</sup>/yr; and
- T = Temperature of landfill gas, °C.

This equation assumes that the operating pressure of the system is approximately 1 atmosphere. If the temperature of the landfill gas is not known, a temperature of 25°C (77°F) is recommended.

Uncontrolled default concentrations of speciated organics along with some inorganic compounds are presented in Table 2.4-1. These default concentrations have already been corrected for air infiltration and can be used as input parameters to equation 3 or the Landfill Air Emission Estimation model for estimating speciated emissions from landfills when site-specific data are not available. An analysis of the data, based on the co-disposal history (with non-residential wastes) of the individual landfills from which the concentration data were derived, indicates that for benzene, NMOC, and toluene, there is a difference in the uncontrolled concentrations. Table 2.4-2 presents the corrected concentrations for benzene, NMOC, and toluene to use based on the site's co-disposal history.

It is important to note that the compounds listed in Tables 2.4-1 and 2.4-2 are not the only compounds likely to be present in LFG. The listed compounds are those that were identified through a review of the available literature. The reader should be aware that additional compounds are likely present, such as those associated with consumer or industrial products. Given this information, extreme caution should be exercised in the use of the default VOC weight fractions and concentrations given at the bottom of Table 2.4-2. These default VOC values are heavily influenced by the ethane content of the LFG. Available data have shown that there is a range of over 1,500 ppmv in LFG ethane content among landfills.

**2.4.4.2 Controlled Emissions** — Emissions from landfills are typically controlled by installing a gas collection system, and combusting the collected gas through the use of internal combustion engines, flares, or turbines. Gas collection systems are not 100 percent efficient in collecting landfill gas, so emissions of CH<sub>4</sub> and NMOC at a landfill with a gas recovery system still occur. To estimate controlled emissions of CH<sub>4</sub>, NMOC, and other constituents in landfill gas, the collection efficiency of the system must first be estimated. Reported collection efficiencies typically range from 60 to 85 percent, with an average of 75 percent most commonly assumed. Higher collection efficiencies may be achieved at some sites (i.e., those engineered to control gas emissions). If site-specific collection efficiencies are available (i.e., through a comprehensive surface sampling program), then they should be used instead of the 75 percent average.

Controlled emission estimates also need to take into account the control efficiency of the control device. Control efficiencies based on test data for the combustion of CH<sub>4</sub>, NMOC, and some speciated organics with differing control devices are presented in Table 2.4-3. Emissions from the control devices need to be added to the uncollected emissions to estimate total controlled emissions.

Controlled CH<sub>4</sub>, NMOC, and speciated emissions can be calculated with equation 5. It is assumed that the landfill gas collection and control system operates 100 percent of the time. Minor durations of system downtime associated with routine maintenance and repair (i.e., 5 to 7 percent) will not appreciably effect emission estimates. The first term in equation 5 accounts for emissions from uncollected landfill gas, while the second term accounts for emissions of the pollutant that were collected but not combusted in the control or utilization device:

$$CM_P = \left[ UM_P * \left( 1 - \frac{\eta_{col}}{100} \right) \right] + \left[ UM_P * \frac{\eta_{col}}{100} * \left( 1 - \frac{\eta_{cnt}}{100} \right) \right] \quad (5)$$

where:

- $CM_P$  = Controlled mass emissions of pollutant P, kg/yr;  
 $UM_P$  = Uncontrolled mass emissions of P, kg/yr (from equation 4 or the Landfill Air Emissions Estimation Model);  
 $\eta_{col}$  = Collection efficiency of the landfill gas collection system, percent; and  
 $\eta_{cnt}$  = Control efficiency of the landfill gas control or utilization device, percent.

Emission factors for the secondary compounds, CO and NO<sub>x</sub>, exiting the control device are presented in Tables 2.4-4 and 2.4-5. These emission factors should be used when equipment vendor guarantees are not available.

Controlled emissions of CO<sub>2</sub> and sulfur dioxide (SO<sub>2</sub>) are best estimated using site-specific landfill gas constituent concentrations and mass balance methods.<sup>68</sup> If site-specific data are not available, the data in tables 2.4-1 through 2.4-3 can be used with the mass balance methods that follow.

Controlled CO<sub>2</sub> emissions include emissions from the CO<sub>2</sub> component of landfill gas (equivalent to uncontrolled emissions) and additional CO<sub>2</sub> formed during the combustion of landfill gas. The bulk of the CO<sub>2</sub> formed during landfill gas combustion comes from the combustion of the CH<sub>4</sub> fraction. Small quantities will be formed during the combustion of the NMOC fraction, however, this typically amounts to less than 1 percent of total CO<sub>2</sub> emissions by weight. Also, the formation of CO through incomplete combustion of landfill gas will result in small quantities of CO<sub>2</sub> not being formed. This contribution to the overall mass balance picture is also very small and does not have a significant impact on overall CO<sub>2</sub> emissions.<sup>68</sup>

The following equation which assumes a 100 percent combustion efficiency for CH<sub>4</sub> can be used to estimate CO<sub>2</sub> emissions from controlled landfills:

$$CM_{CO_2} = UM_{CO_2} + \left[ UM_{CH_4} * \frac{\eta_{col}}{100} * 2.75 \right] \quad (6)$$

where:

- $CM_{CO_2}$  = Controlled mass emissions of CO<sub>2</sub>, kg/yr;  
 $UM_{CO_2}$  = Uncontrolled mass emissions of CO<sub>2</sub>, kg/yr (from equation 4 or the Landfill Air Emission Estimation Model);  
 $UM_{CH_4}$  = Uncontrolled mass emissions of CH<sub>4</sub>, kg/yr (from equation 4 on the Landfill Air Emission Estimation Model);  
 $\eta_{col}$  = Efficiency of the landfill gas collection system, percent; and  
 2.75 = Ratio of the molecular weight of CO<sub>2</sub> to the molecular weight of CH<sub>4</sub>.

To prepare estimates of SO<sub>2</sub> emissions, data on the concentration of reduced sulfur compounds within the landfill gas are needed. The best way to prepare this estimate is with site-

specific information on the total reduced sulfur content of the landfill gas. Often these data are expressed in ppmv as sulfur (S). Equations 3 and 4 should be used first to determine the uncontrolled mass emission rate of reduced sulfur compounds as sulfur. Then, the following equation can be used to estimate SO<sub>2</sub> emissions:

$$CM_{SO_2} = UM_S * \frac{\eta_{col}}{100} * 2.0 \quad (7)$$

where:

- CM<sub>SO<sub>2</sub></sub> = Controlled mass emissions of SO<sub>2</sub>, kg/yr;
- UM<sub>S</sub> = Uncontrolled mass emissions of reduced sulfur compounds as sulfur, kg/yr (from equations 3 and 4);
- η<sub>col</sub> = Efficiency of the landfill gas collection system, percent; and
- 2.0 = Ratio of the molecular weight of SO<sub>2</sub> to the molecular weight of S.

The next best method to estimate SO<sub>2</sub> concentrations, if site-specific data for total reduced sulfur compounds as sulfur are not available, is to use site-specific data for speciated reduced sulfur compound concentrations. These data can be converted to ppmv as S with equation 8. After the total reduced sulfur as S has been obtained from equation 8, then equations 3, 4, and 7 can be used to derive SO<sub>2</sub> emissions.

$$C_S = \sum_{i=1}^n C_P * S_P \quad (8)$$

where:

- C<sub>S</sub> = Concentration of total reduced sulfur compounds, ppmv as S (for use in equation 3);
- C<sub>P</sub> = Concentration of each reduced sulfur compound, ppmv;
- S<sub>P</sub> = Number of moles of S produced from the combustion of each reduced sulfur compound (i.e., 1 for sulfides, 2 for disulfides); and
- n = Number of reduced sulfur compounds available for summation.

If no site-specific data are available, a value of 46.9 ppmv can be assumed for C<sub>S</sub> (for use in equation 3). This value was obtained by using the default concentrations presented in Table 2.4-1 for reduced sulfur compounds and equation 8.

Hydrochloric acid [Hydrogen Chloride (HCl)] emissions are formed when chlorinated compounds in LFG are combusted in control equipment. The best methods to estimate emissions are mass balance methods that are analogous to those presented above for estimating SO<sub>2</sub> emissions. Hence, the best source of data to estimate HCl emissions is site-specific LFG data on total chloride [expressed in ppmv as the chloride ion (Cl<sup>-</sup>)]. If these data are not available, then total chloride can be estimated from data on individual chlorinated species using equation 9 below. However, emission estimates may be underestimated, since not every chlorinated

compound in the LFG will be represented in the laboratory report (i.e., only those that the analytical method specifies).

$$C_{Cl} = \sum_{i=1}^n C_p * Cl_p \quad (9)$$

where:

- $C_{Cl}$  = Concentration of total chloride, ppmv as  $Cl^-$  (for use in equation 3);
- $C_p$  = Concentration of each chlorinated compound, ppmv;
- $Cl_p$  = Number of moles of  $Cl^-$  produced from the combustion of each chlorinated compound (i.e., 3 for 1,1,1-trichloroethane); and
- $n$  = Number of chlorinated compounds available for summation.

After the total chloride concentration ( $C_{Cl}$ ) has been estimated, equations 3 and 4 should be used to determine the total uncontrolled mass emission rate of chlorinated compounds as chloride ion ( $UM_{Cl}$ ). This value is then used in equation 10 below to derive HCl emission estimates:

$$CM_{HCl} = UM_{Cl} * \frac{\eta_{col}}{100} * 1.03 * \left( \frac{\eta_{cnt}}{100} \right) \quad (10)$$

where:

- $CM_{HCl}$  = Controlled mass emissions of HCl, kg/yr;
- $UM_{Cl}$  = Uncontrolled mass emissions of chlorinated compounds as chloride, kg/yr (from equations 3 and 4);
- $\eta_{col}$  = Efficiency of the landfill gas collection system, percent;
- 1.03 = Ratio of the molecular weight of HCl to the molecular weight of  $Cl^-$ ; and
- $\eta_{cnt}$  = Control efficiency of the landfill gas control or utilization device, percent.

In estimating HCl emissions, it is assumed that all of the chloride ion from the combustion of chlorinated LFG constituents is converted to HCl. If an estimate of the control efficiency,  $\eta_{cnt}$ , is not available, then the high end of the control efficiency range for the equipment listed in Table 9 should be used. This assumption is recommended to assume that HCl emissions are not underestimated.

If site-specific data on total chloride or speciated chlorinated compounds are not available, then a default value of 42.0 ppmv can be used for  $C_{Cl}$ . This value was derived from the default LFG constituent concentrations presented in Table 2.4-1. As mentioned above, use of this default may produce underestimates of HCl emissions since it is based only on those compounds for which analyses have been performed. The constituents listed in Table 2.4-1 are likely not all of the chlorinated compounds present in LFG.

The reader is referred to Sections 11.2-1 (Unpaved Roads, SCC 50100401), and 11-2.4 (Heavy Construction Operations) of Volume I, and Section II-7 (Construction Equipment) of Volume II, of the AP-42 document for determination of associated fugitive dust and exhaust emissions from these emission sources at MSW landfills.

#### 2.4.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Supplement D (8/98) is a major revision of the text and recommended emission factors contained in the section. The most significant revisions to this section since publication in the Fifth Edition are summarized below.

- The equations to calculate the CH<sub>4</sub>, CO<sub>2</sub> and other constituents were simplified.
- The default L<sub>0</sub> and k were revised based upon an expanded base of gas generation data.
- The default ratio of CO<sub>2</sub> to CH<sub>4</sub> was revised based upon averages observed in available source test reports.
- The default concentrations of LFG constituents were revised based upon additional data.
- Additional control efficiencies were included and existing efficiencies were revised based upon additional emission test data.
- Revised and expanded the recommended emission factors for secondary compounds emitted from typical control devices.

Supplement E (11/98) includes correction in equation 10 and a very minor change in the molecular weights for 1,1,1-Trichloroethane (methyl chloroform), 1,1-Dichloroethane, 1,2-Dichloropropane and Trichloroethylene (trichloroethene) presented in Table 2.4-1 to agree with values presented in Perry's Handbook.

Table 2.4-1. DEFAULT CONCENTRATIONS FOR LFG CONSTITUENTS<sup>a</sup>

(SCC 50100402, 50300603)

Compound	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
1,1,1-Trichloroethane (methyl chloroform) <sup>a</sup>	133.41	0.48	B
1,1,2,2-Tetrachloroethane <sup>a</sup>	167.85	1.11	C
1,1-Dichloroethane (ethylidene dichloride) <sup>a</sup>	98.97	2.35	B
1,1-Dichloroethene (vinylidene chloride) <sup>a</sup>	96.94	0.20	B
1,2-Dichloroethane (ethylene dichloride) <sup>a</sup>	98.96	0.41	B
1,2-Dichloropropane (propylene dichloride) <sup>a</sup>	112.99	0.18	D
2-Propanol (isopropyl alcohol)	60.11	50.1	E
Acetone	58.08	7.01	B
Acrylonitrile <sup>a</sup>	53.06	6.33	D
Bromodichloromethane	163.83	3.13	C
Butane	58.12	5.03	C
Carbon disulfide <sup>a</sup>	76.13	0.58	C
Carbon monoxide <sup>b</sup>	28.01	141	E
Carbon tetrachloride <sup>a</sup>	153.84	0.004	B
Carbonyl sulfide <sup>a</sup>	60.07	0.49	D
Chlorobenzene <sup>a</sup>	112.56	0.25	C
Chlorodifluoromethane	86.47	1.30	C
Chloroethane (ethyl chloride) <sup>a</sup>	64.52	1.25	B
Chloroform <sup>a</sup>	119.39	0.03	B
Chloromethane	50.49	1.21	B
Dichlorobenzene <sup>c</sup>	147	0.21	E
Dichlorodifluoromethane	120.91	15.7	A
Dichlorofluoromethane	102.92	2.62	D
Dichloromethane (methylene chloride) <sup>a</sup>	84.94	14.3	A
Dimethyl sulfide (methyl sulfide)	62.13	7.82	C
Ethane	30.07	889	C
Ethanol	46.08	27.2	E
Ethyl mercaptan (ethanethiol)	62.13	2.28	D
Ethylbenzene <sup>a</sup>	106.16	4.61	B
Ethylene dibromide	187.88	0.001	E
Fluorotrichloromethane	137.38	0.76	B
Hexane <sup>a</sup>	86.18	6.57	B
Hydrogen sulfide	34.08	35.5	B
Mercury (total) <sup>a,d</sup>	200.61	2.92x10 <sup>-4</sup>	E

Table 2.4-1. (Concluded)

Compound	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
Methyl ethyl ketone <sup>a</sup>	72.11	7.09	A
Methyl isobutyl ketone <sup>a</sup>	100.16	1.87	B
Methyl mercaptan	48.11	2.49	C
Pentane	72.15	3.29	C
Perchloroethylene (tetrachloroethylene) <sup>a</sup>	165.83	3.73	B
Propane	44.09	11.1	B
t-1,2-dichloroethene	96.94	2.84	B
Trichloroethylene (trichloroethene) <sup>a</sup>	131.40	2.82	B
Vinyl chloride <sup>a</sup>	62.50	7.34	B
Xylenes <sup>a</sup>	106.16	12.1	B

NOTE: This is not an all-inclusive list of potential LFG constituents, only those for which test data were available at multiple sites. References 10-67. Source Classification Codes in parentheses.

<sup>a</sup> Hazardous Air Pollutants listed in Title III of the 1990 Clean Air Act Amendments.

<sup>b</sup> Carbon monoxide is not a typical constituent of LFG, but does exist in instances involving landfill (underground) combustion. Therefore, this default value should be used with caution. Of 18 sites where CO was measured, only 2 showed detectable levels of CO.

<sup>c</sup> Source tests did not indicate whether this compound was the para- or ortho- isomer. The para isomer is a Title III-listed HAP.

<sup>d</sup> No data were available to speciate total Hg into the elemental and organic forms.

Table 2.4-2. DEFAULT CONCENTRATIONS OF BENZENE, NMOC, AND TOLUENE BASED ON WASTE DISPOSAL HISTORY<sup>a</sup>

(SCC 50100402, 50300603)

Pollutant	Molecular Weight	Default Concentration (ppmv)	Emission Factor Rating
Benzene <sup>b</sup>	78.11		
Co-disposal		11.1	D
No or Unknown co-disposal		1.91	B
NMOC (as hexane) <sup>c</sup>	86.18		
Co-disposal		2420	D
No or Unknown co-disposal		595	B
Toluene <sup>b</sup>	92.13		
Co-disposal		165	D
No or Unknown co-disposal		39.3	A

<sup>a</sup> References 10-54. Source Classification Codes in parentheses.

<sup>b</sup> Hazardous Air Pollutants listed in Title III of the 1990 Clean Air Act Amendments.

<sup>c</sup> For NSPS/Emission Guideline compliance purposes, the default concentration for NMOC as specified in the final rule must be used. For purposes not associated with NSPS/Emission Guideline compliance, the default VOC content at co-disposal sites = 85 percent by weight (2,060 ppmv as hexane); at No or Unknown sites = 39 percent by weight 235 ppmv as hexane).

Table 2.4-3. CONTROL EFFICIENCIES FOR LFG CONSTITUENTS<sup>a</sup>

Control Device	Constituent <sup>b</sup>	Control Efficiency (%)		
		Typical	Range	Rating
Boiler/Steam Turbine (50100423)	NMOC	98.0	96-99+	D
	Halogenated Species	99.6	87-99+	D
	Non-Halogenated Species	99.8	67-99+	D
Flare <sup>c</sup> (50100410) (50300601)	NMOC	99.2	90-99+	B
	Halogenated Species	98.0	91-99+	C
	Non-Halogenated Species	99.7	38-99+	C
Gas Turbine (50100420)	NMOC	94.4	90-99+	E
	Halogenated Species	99.7	98-99+	E
	Non-Halogenated Species	98.2	97-99+	E
IC Engine (50100421)	NMOC	97.2	94-99+	E
	Halogenated Species	93.0	90-99+	E
	Non-Halogenated Species	86.1	25-99+	E

<sup>a</sup> References 10-67. Source Classification Codes in parentheses.

<sup>b</sup> Halogenated species are those containing atoms of chlorine, bromine, fluorine, or iodine. For any equipment, the control efficiency for mercury should be assumed to be 0. See section 2.4.4.2 for methods to estimate emissions of SO<sub>2</sub>, CO<sub>2</sub>, and HCl.

<sup>c</sup> Where information on equipment was given in the reference, test data were taken from enclosed flares. Control efficiencies are assumed to be equally representative of open flares.

Table 2.4-4. (Metric Units) EMISSION FACTORS FOR SECONDARY COMPOUNDS EXITING CONTROL DEVICES<sup>a</sup>

Control Device	Pollutant <sup>b</sup>	kg/10 <sup>6</sup> dscm Methane	Emission Factor Rating
Flare <sup>c</sup> (50100410) (50300601)	Nitrogen dioxide	650	C
	Carbon monoxide	12,000	C
	Particulate matter	270	D
IC Engine (50100421)	Nitrogen dioxide	4,000	D
	Carbon monoxide	7,500	C
	Particulate matter	770	E
Boiler/Steam Turbine <sup>d</sup> (50100423)	Nitrogen dioxide	530	D
	Carbon monoxide	90	E
	Particulate matter	130	D
Gas Turbine (50100420)	Nitrogen dioxide	1,400	D
	Carbon monoxide	3,600	E
	Particulate matter	350	E

<sup>a</sup> Source Classification Codes in parentheses. Divide kg/10<sup>6</sup> dscm by 16,700 to obtain kg/hr/dscmm.

<sup>b</sup> No data on PM size distributions were available, however for other gas-fired combustion sources, most of the particulate matter is less than 2.5 microns in diameter. Hence, this emission factor can be used to provide estimates of PM-10 or PM-2.5 emissions. See section 2.4.4.2 for methods to estimate CO<sub>2</sub>, SO<sub>2</sub>, and HCl.

<sup>c</sup> Where information on equipment was given in the reference, test data were taken from enclosed flares. Control efficiencies are assumed to be equally representative of open flares.

<sup>d</sup> All source tests were conducted on boilers, however emission factors should also be representative of steam turbines. Emission factors are representative of boilers equipped with low-NO<sub>x</sub> burners and flue gas recirculation. No data were available for uncontrolled NO<sub>x</sub> emissions.

Table 2.4-5. (English Units) EMISSION RATES FOR SECONDARY COMPOUNDS EXITING CONTROL DEVICES<sup>a</sup>

Control Device	Pollutant <sup>b</sup>	lb/10 <sup>6</sup> dscf Methane	Emission Factor Rating
Flare <sup>c</sup> (50100410) (50300601)	Nitrogen dioxide	40	C
	Carbon monoxide	750	C
	Particulate matter	17	D
IC Engine (50100421)	Nitrogen dioxide	250	D
	Carbon monoxide	470	C
	Particulate matter	48	E
Boiler/Steam Turbine <sup>d</sup> (50100423)	Nitrogen dioxide	33	E
	Carbon monoxide	5.7	E
	Particulate matter	8.2	E
Gas Turbine (50100420)	Nitrogen dioxide	87	D
	Carbon monoxide	230	D
	Particulate matter	22	E

<sup>a</sup> Source Classification Codes in parentheses. Divide lb/10<sup>6</sup> dscf by 16,700 to obtain lb/hr/dscfm.

<sup>b</sup> Based on data for other combustion sources, most of the particulate matter will be less than 2.5 microns in diameter. Hence, this emission rate can be used to provide estimates of PM-10 or PM-2.5 emissions. See section 2.4.4.2 for methods to estimate CO<sub>2</sub>, SO<sub>2</sub>, and HCl.

<sup>c</sup> Where information on equipment was given in the reference, test data were taken from enclosed flares. Control efficiencies are assumed to be equally representative of open flares.

<sup>d</sup> All source tests were conducted on boilers, however emission factors should also be representative of steam turbines. Emission factors are representative of boilers equipped with low-NO<sub>x</sub> burners and flue gas recirculation. No data were available for uncontrolled NO<sub>x</sub> emissions.

#### References for Section 2.4

1. "Criteria for Municipal Solid Waste Landfills," 40 CFR Part 258, Volume 56, No. 196, October 9, 1991.
2. *Air Emissions from Municipal Solid Waste Landfills - Background Information for Proposed Standards and Guidelines*, Office of Air Quality Planning and Standards, EPA-450/3-90-011a, Chapters 3 and 4, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1991.
3. *Characterization of Municipal Solid Waste in the United States: 1992 Update*, Office of Solid Waste, EPA-530-R-92-019, U. S. Environmental Protection Agency, Washington, DC, NTIS No. PB92-207-166, July 1992.
4. Eastern Research Group, Inc., *List of Municipal Solid Waste Landfills*, Prepared for the U. S. Environmental Protection Agency, Office of Solid Waste, Municipal and Industrial Solid Waste Division, Washington, DC, September 1992.
5. *Suggested Control Measures for Landfill Gas Emissions*, State of California Air Resources Board, Stationary Source Division, Sacramento, CA, August 1990.

6. "Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills; Proposed Rule, Guideline, and Notice of Public Hearing," 40 CFR Parts 51, 52, and 60, Vol. 56, No. 104, May 30, 1991.
7. S.W. Zison, Landfill Gas Production Curves: Myth Versus Reality, Pacific Energy, City of Commerce, CA, [Unpublished]
8. R.L. Peer, et al., Memorandum *Methodology Used to Revise the Model Inputs in the Municipal Solid Waste Landfills Input Data Bases (Revised)*, to the Municipal Solid Waste Landfills Docket No. A-88-09, April 28, 1993.
9. A.R. Chowdhury, *Emissions from a Landfill Gas-Fired Turbine/Generator Set, Source Test Report C-84-33*, Los Angeles County Sanitation District, South Coast Air Quality Management District, June 28, 1984.
10. Engineering-Science, Inc., *Report of Stack Testing at County Sanitation District Los Angeles Puente Hills Landfill*, Los Angeles County Sanitation District, August 15, 1984.
11. J.R. Manker, *Vinyl Chloride (and Other Organic Compounds) Content of Landfill Gas Vented to an Inoperative Flare, Source Test Report 84-496*, David Price Company, South Coast Air Quality Management District, November 30, 1984.
12. S. Mainoff, *Landfill Gas Composition, Source Test Report 85-102*, Bradley Pit Landfill, South Coast Air Quality Management District, May 22, 1985.
13. J. Littman, *Vinyl Chloride and Other Selected Compounds Present in A Landfill Gas Collection System Prior to and after Flaring, Source Test Report 85-369*, Los Angeles County Sanitation District, South Coast Air Quality Management District, October 9, 1985.
14. W.A. Nakagawa, *Emissions from a Landfill Exhausting Through a Flare System, Source Test Report 85-461*, Operating Industries, South Coast Air Quality Management District, October 14, 1985.
15. S. Marinoff, *Emissions from a Landfill Gas Collection System, Source Test Report 85-511*. Sheldon Street Landfill, South Coast Air Quality Management District, December 9, 1985.
16. W.A. Nakagawa, *Vinyl Chloride and Other Selected Compounds Present in a Landfill Gas Collection System Prior to and after Flaring, Source Test Report 85-592*, Mission Canyon Landfill, Los Angeles County Sanitation District, South Coast Air Quality Management District, January 16, 1986.
17. California Air Resources Board, *Evaluation Test on a Landfill Gas-Fired Flare at the BKK Landfill Facility*, West Covina, CA, ARB-SS-87-09, July 1986.
18. S. Marinoff, *Gaseous Composition from a Landfill Gas Collection System and Flare, Source Test Report 86-0342*, Syufy Enterprises, South Coast Air Quality Management District, August 21, 1986.
19. *Analytical Laboratory Report for Source Test*, Azusa Land Reclamation, June 30, 1983, South Coast Air Quality Management District.

20. J.R. Manker, *Source Test Report C-84-202*, Bradley Pit Landfill, South Coast Air Quality Management District, May 25, 1984.
21. S. Marinoff, *Source Test Report 84-315*, Puente Hills Landfill, South Coast Air Quality Management District, February 6, 1985.
22. P.P. Chavez, *Source Test Report 84-596*, Bradley Pit Landfill, South Coast Air Quality Management District, March 11, 1985.
23. S. Marinoff, *Source Test Report 84-373*, Los Angeles By-Products, South Coast Air Quality Management District, March 27, 1985.
24. J. Littman, *Source Test Report 85-403*, Palos Verdes Landfill, South Coast Air Quality Management District, September 25, 1985.
25. S. Marinoff, *Source Test Report 86-0234*, Pacific Lighting Energy Systems, South Coast Air Quality Management District, July 16, 1986.
26. South Coast Air Quality Management District, *Evaluation Test on a Landfill Gas-Fired Flare at the Los Angeles County Sanitation District's Puente Hills Landfill Facility*, [ARB/SS-87-06], Sacramento, CA, July 1986.
27. D.L. Campbell, et al., *Analysis of Factors Affecting Methane Gas Recovery from Six Landfills*, Air and Energy Engineering Research Laboratory, EPA-600/2-91-055, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1991.
28. Browning-Ferris Industries, *Source Test Report*, Lyon Development Landfill, August 21, 1990.
29. X.V. Via, *Source Test Report*, Browning-Ferris Industries, Azusa Landfill.
30. M. Nourot, *Gaseous Composition from a Landfill Gas Collection System and Flare Outlet*. Laidlaw Gas Recovery Systems, to J.R. Farmer, OAQPS:ESD, December 8, 1987.
31. D.A. Stringham and W.H. Wolfe, *Waste Management of North America, Inc.*, to J.R. Farmer, OAQPS:ESD, January 29, 1988, Response to Section 114 questionnaire.
32. V. Espinosa, *Source Test Report 87-0318*, Los Angeles County Sanitation District Calabasas Landfill, South Coast Air Quality Management District, December 16, 1987.
33. C.S. Bhatt, *Source Test Report 87-0329*, Los Angeles County Sanitation District, Scholl Canyon Landfill, South Coast Air Quality Management District, December 4, 1987.
34. V. Espinosa, *Source Test Report 87-0391*, Puente Hills Landfill, South Coast Air Quality Management District, February 5, 1988.
35. V. Espinosa, *Source Test Report 87-0376*, Palos Verdes Landfill, South Coast Air Quality Management District, February 9, 1987.
36. Bay Area Air Quality Management District, *Landfill Gas Characterization*, Oakland, CA, 1988.

37. Steiner Environmental, Inc., *Emission Testing at BFI's Arbor Hills Landfill, Northville, Michigan*, September 22 through 25, 1992, Bakersfield, CA, December 1992.
38. PEI Associates, Inc., *Emission Test Report - Performance Evaluation Landfill-Gas Enclosed Flare, Browning Ferris Industries*, Chicopee, MA, 1990.
39. Kleinfelder Inc., *Source Test Report Boiler and Flare Systems*, Prepared for Laidlaw Gas Recovery Systems, Coyote Canyon Landfill, Diamond Bar, CA, 1991.
40. Bay Area Air Quality Management District, *McGill Flare Destruction Efficiency Test Report for Landfill Gas at the Durham Road Landfill*, Oakland, CA, 1988.
41. San Diego Air Pollution Control District, *Solid Waste Assessment for Otay Valley/Annex Landfill*. San Diego, CA, December 1988.
42. PEI Associates, Inc., *Emission Test Report - Performance Evaluation Landfill Gas Enclosed Flare*, Rockingham, VT, September 1990.
43. Browning-Ferris Industries, *Gas Flare Emissions Source Test for Sunshine Canyon Landfill*. Sylmar, CA, 1991.
44. Scott Environmental Technology, *Methane and Nonmethane Organic Destruction Efficiency Tests of an Enclosed Landfill Gas Flare*, April 1992.
45. BCM Engineers, Planners, Scientists and Laboratory Services, *Air Pollution Emission Evaluation Report for Ground Flare at Browning Ferris Industries Greentree Landfill, Kersey, Pennsylvania*. Pittsburgh, PA, May 1992.
46. EnvironMETeo Services Inc., *Stack Emissions Test Report for Ameron Kapaa Quarry*, Waipahu, HI, January 1994.
47. Waukesha Pearce Industries, Inc., *Report of Emission Levels and Fuel Economies for Eight Waukesha 12V-AT25GL Units Located at the Johnston, Rhode Island Central Landfill*, Houston TX, July 19, 1991.
48. Mostardi-Platt Associates, Inc., *Gaseous Emission Study Performed for Waste Management of North America, Inc., CID Environmental Complex Gas Recovery Facility, August 8, 1989*. Chicago, IL, August 1989.
49. Mostardi-Platt Associates, Inc., *Gaseous Emission Study Performed for Waste Management of North America, Inc., at the CID Environmental Complex Gas Recovery Facility, July 12-14, 1989*. Chicago, IL, July 1989.
50. Browning-Ferris Gas Services, Inc., *Final Report for Emissions Compliance Testing of One Waukesha Engine Generator*, Chicopee, MA, February 1994.
51. Browning-Ferris Gas Services, Inc., *Final Report for Emissions Compliance Testing of Three Waukesha Engine Generators*, Richmond, VA, February 1994.

52. South Coast Environmental Company (SCEC), *Emission Factors for Landfill Gas Flares at the Arizona Street Landfill*, Prepared for the San Diego Air Pollution Control District, San Diego, CA, November 1992.
53. Carnot, *Emission Tests on the Puente Hills Energy from Landfill Gas (PERG) Facility - Unit 400, September 1993*, Prepared for County Sanitation Districts of Los Angeles County, Tustin, CA, November 1993.
54. Pape & Steiner Environmental Services, *Compliance Testing for Spadra Landfill Gas-to-Energy Plant, July 25 and 26, 1990*, Bakersfield, CA, November 1990.
55. AB2588 Source Test Report for Oxnard Landfill, July 23-27, 1990, by Petro Chem Environmental Services, Inc., for Pacific Energy Systems, Commerce, CA, October 1990.
56. AB2588 Source Test Report for Oxnard Landfill, October 16, 1990, by Petro Chem Environmental Services, Inc., for Pacific Energy Systems, Commerce, CA, November 1990.
57. Engineering Source Test Report for Oxnard Landfill, December 20, 1990, by Petro Chem Environmental Services, Inc., for Pacific Energy Systems, Commerce, CA, January 1991.
58. AB2588 Emissions Inventory Report for the Salinas Crazy Horse Canyon Landfill, Pacific Energy, Commerce, CA, October 1990.
59. Newby Island Plant 2 Site IC Engine's Emission Test, February 7-8, 1990, Laidlaw Gas Recovery Systems, Newark, CA, February 1990.
60. Landfill Methane Recovery Part II: Gas Characterization, Final Report, Gas Research Institute, December 1982.
61. Letter from J.D. Thornton, Minnesota Pollution Control Agency, to R. Myers, U.S. EPA, February 1, 1996.
62. Letter and attached documents from M. Sauers, GSF Energy, to S. Thorneloe, U.S. EPA, May 29, 1996.
63. Landfill Gas Particulate and Metals Concentration and Flow Rate, Mountaingate Landfill Gas Recovery Plant, Horizon Air Measurement Services, prepared for GSF Energy, Inc., May 1992.
64. Landfill Gas Engine Exhaust Emissions Test Report in Support of Modification to Existing IC Engine Permit at Bakersfield Landfill Unit #1, Pacific Energy Services, December 4, 1990.
65. Addendum to Source Test Report for Superior Engine #1 at Otay Landfill, Pacific Energy Services, April 2, 1991.
66. Source Test Report 88-0075 of Emissions from an Internal Combustion Engine Fueled by Landfill Gas, Penrose Landfill, Pacific Energy Lighting Systems, South Coast Air Quality Management District, February 24, 1988.
67. Source Test Report 88-0096 of Emissions from an Internal Combustion Engine Fueled by Landfill Gas, Toyon Canyon Landfill, Pacific Energy Lighting Systems, March 8, 1988.

68. Letter and attached documents from C. Nesbitt, Los Angeles County Sanitation Districts, to K. Brust, E.H. Pechan and Associates, Inc., December 6, 1996.
69. Determination of Landfill Gas Composition and Pollutant Emission Rates at Fresh Kills Landfill, revised Final Report, Radian Corporation, prepared for U.S. EPA, November 10, 1995.
70. Advanced Technology Systems, Inc., *Report on Determination of Enclosed Landfill Gas Flare Performance*, Prepared for Y & S Maintenance, Inc., February 1995.
71. Chester Environmental, *Report on Ground Flare Emissions Test Results*, Prepared for Seneca Landfill, Inc., October 1993.
72. Smith Environmental Technologies Corporation, *Compliance Emission Determination of the Enclosed Landfill Gas Flare and Leachate Treatment Process Vents*, Prepared for Clinton County Solid Waste Authority, April 1996.
73. AirRecon®, Division of RECON Environmental Corp., *Compliance Stack Test Report for the Landfill Gas FLare Inlet & Outlet at Bethlehem Landfill*, Prepared for LFG Specialties Inc., December 3, 1996.
74. ROJAC Environmental Services, Inc., *Compliance Test Report, Hartford Landfill Flare Emissions Test Program*, November 19, 1993.
75. Normandeau Associates, Inc., *Emissions Testing of a Landfill Gas Flare at Contra Costa Landfill, Antioch, California, March 22, 1994 and April 22, 1994*, May 17, 1994.
76. Roe, S.M., et. al., *Methodologies for Quantifying Pollution Prevention Benefits from Landfill Gas Control and Utilization*, Prepared for U.S. EPA, Office of Air and Radiation, Air and Energy Engineering Laboratory, EPA-600/R-95-089, July 1995.

**Appendix E**  
**New Source Review**

## NEW SOURCE REVIEW

This appendix briefly discusses New Source Review (NSR) and is divided into the following sections:

- Introduction
- Overview of the NSR Program
- The Pollution Control Project Exclusion
- PSD Significance Level for NMOC
- References
- Memo: Pollution Control Projects and New Source Review Applicability
- Memo: Classification of Emissions from Landfills for NSR Applicability Purposes
- Memo: Emissions from Landfills

[NOTE: The memos included in this appendix are replicas of the originals. New electronic copies were generated for posting the memos on the EPA TTN.]

### Introduction

A landfill, like any other stationary source, may need to undergo new source review (NSR) preceding either its initial construction or its expansion (modification) of an existing site. Both the amount of air pollution that a landfill releases and the location of a landfill will help determine which type of NSR requirements will apply. This section describes the applicability of landfills to the various NSR requirements and explains how a landfill which takes steps to reduce the release of certain gases may qualify for an NSR exclusion as a pollution control project. It is important to note that a landfill should be evaluated for its applicability to NSR independently from its applicability to the relevant NSPS and Emission Guidelines.

Compliance with the MSW Landfills Emission Guidelines will require the collection and reduction of NMOC emissions from larger existing MSW landfills. The reduction of NMOC emissions generally will be accomplished through the destruction of NMOC using a combustion device. This device may or may not include some type of energy recovery. Concurrent with the control of NMOC, these combustion devices generate emissions of other pollutants, such as nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and carbon monoxide (CO). (Typically, emissions of SO<sub>2</sub> are minimal from controlled MSW landfills and would rarely trigger any action.) These concurrent emission increases may trigger NSR regulatory requirements under Parts C or D of Title I of the Act.

### **Overview of the NSR Program**

The NSR program requires a preconstruction review for any major new source or major modification. The type of preconstruction review required generally depends upon the attainment status of the area in which a source will construct or modify. In an area designated as attainment or unclassifiable for a particular criteria pollutant, the requirements under part C of title I of the Act, (prevention of significant deterioration (PSD) of air quality) will apply if the source is major for any regulated pollutant. In a nonattainment area, the requirements under part D of title I of the Act (nonattainment NSR) will apply if the source is major specifically for the nonattainment pollutant.

Regardless of the area designation, a source that does not emit major amounts of any pollutant must undergo review in accordance with a State's minor source permit program. If, however, an existing minor source expands in such a way that the expansion in itself would be considered major, then the expansion is regarded as a major source and will be required to undergo either PSD or nonattainment NSR according to the applicable area designation. Tables E-1 and E-2 will be helpful in understanding how the various NSR requirements apply to specific pollutants. It is not EPA's intent that this appendix provide a complete description of the applicable NSR programs. Instead, the reader should refer to the documents listed in the References section to gain a better understanding of these NSR programs and when one might apply to the source of interest.

A MSW landfill located in an attainment area is considered to be a major PSD source if it has the potential to emit 250 tpy or more of any regulated pollutant (e.g., VOC, NO<sub>x</sub> or CO). If an existing major MSW landfill is modified, a PSD review is required if the potential emission increase from the modification is greater than the significance level established for that pollutant (for example, 40 tpy of NO<sub>x</sub> in an attainment area). Once considered major, other pollutant emissions are also subject to review if the regulatory significance level for that pollutant will be exceeded. (See Table E-1.)

If PSD is triggered, the facility must complete a review for each pollutant for which emissions increase by more than its significance level. The review includes a control technology review and an analysis of the air quality impacts of the new or modified source. The required control level for sources in attainment areas is best available control technology (BACT). Refer to reference 1 for a discussion of this term. As part of the air quality analysis, the facility must also demonstrate that the proposed activity will not cause or contribute to a violation of any national ambient air quality standard (NAAQS) or PSD increment (in attainment areas), or adversely impact an air quality related value (AQRV) in a Class I area. To demonstrate that these values are not exceeded, the facility may have to conduct some emission modelling.

In a nonattainment area, major source status occurs when a MSW landfill would release at least 100 tpy of the pollutant for which the area is designated nonattainment. Table E-2 summarizes the emissions thresholds for relevant pollutants when determining whether an expansion to an existing landfill will be subject to nonattainment NSR. Any increase in emissions of a nonattainment pollutant for which the new source is major, or any significant increase of the nonattainment pollutant from an existing major source of the nonattainment pollutant must control to the lowest achievable emission rate (LAER) and must be offset by emission decreases from some other source.

Non-major (minor) landfills can also trigger either PSD or nonattainment NSR. That is, when an existing landfill would expand to such extent that the amount of any new pollutant released would equal or exceed the applicable major source threshold, then the expansion itself would be treated as a major source. (See Tables E-1 and E-2.) For example, in an attainment area, a modification to a minor source would need to increase potential emissions of any pollutant by at least 250 tpy before PSD is triggered. Tables E-1 and E-2 summarize the NO<sub>x</sub>,

CO, VOC, and NMOC increases that constitute a major modification in attainment and nonattainment areas. The tables present NO<sub>x</sub> and CO because these are the pollutants most likely to increase significantly when combustion devices are installed to reduce NMOC emissions from landfills. (However, it should be noted that emissions of VOC, NMOC, SO<sub>2</sub>, and particulate matter must also be assessed in determining whether a landfill or a modification to a landfill is major.) Refer to references 1 and 2 for a more complete discussion of how to determine whether NSR is triggered. Reference 2, an EPA memorandum on classification of landfill emissions for NSR purposes, is included in this appendix.

There is an exclusion under NSR that may be available to an existing landfill that would otherwise trigger NSR. This exclusion applies to existing sources undergoing a physical or operational change for the primary purpose of reducing one or more air pollutants subject to regulation under the Act (i.e., a pollution control project), even though some increase of another air pollutant may occur. A pollution control project (PCP) must be, on balance, "environmentally beneficial" to be eligible for the exclusion. While the source would still be required to go through a minor NSR process, an eligible source would not be required to conduct a BACT or LAER (control device) evaluation.

The following section discusses this potential exclusion from NSR; the exclusion is available only to eligible existing landfills installing gas collection and control systems. Several resources are available for assisting in emission estimation and the determination of the potential emission increases,<sup>2,3,4,5</sup> and are listed in the references section.

### **The Pollution Control Project (PCP) Exclusion**

The following information is taken largely from EPA's July 1, 1994 guidance memorandum (attached) entitled, "Pollution Control Projects and New Source Review (NSR) Applicability."<sup>6</sup> Nothing in this section is intended to override any statement made in that memorandum; the memorandum remains the definitive guidance for this exclusion.

For several years, EPA has had a policy of excluding certain types of PCPs from the NSR requirements on a case-by-case basis. The exclusion allows states to exempt a PCP from major NSR if, as stated above, the PCP is, on balance, "environmentally beneficial." The guidance

**Table E-1. Attainment Area (PSD) Major Modification Levels for NO<sub>x</sub>, CO, VOC, and Landfill NMOC Emissions**

Pollutant <sup>a</sup>	Modifications to an Existing Minor Source are Considered Major if Emission Increases Equal or Exceed (in tpy)	Modifications to an Existing Major Source are Considered Major if Emission Increases Exceed (in tpy)
NO <sub>x</sub>	250	40
CO	250	100
VOC	250	40
NMOC	250	50

<sup>a</sup>This table presents only NO<sub>x</sub>, CO, VOC, and NMOC. The NSR prevention of significant deteriorations (PSD) rules also contain levels for SO<sub>2</sub> and PM/PM10.

**Table E-2. Nonattainment Area Major Modification Levels for NO<sub>x</sub>, CO, and VOC Emissions**

Pollutant <sup>a</sup> and Nonattainment Area Status	Modifications to an Existing Minor Source are Considered Major if Emission Increases Equal or Exceed: (in tpy)	Modifications to an Existing Major Source are Considered Major if Emission Increases Exceed: (in tpy) <sup>b</sup>
NO <sub>x</sub> and VOC		
- Marginal	100	40
- Moderate	100	40
- Serious	50	25 <sup>c</sup>
- Severe	25	25 <sup>c</sup>
- Extreme	10	0
CO		
- Moderate	100	100
- Serious	50	50

<sup>a</sup>This table presents only NO<sub>x</sub>, VOC, and CO. The NSR rules also contain levels for SO<sub>2</sub> and PM/PM10. The NSR rules in nonattainment areas apply only to criteria pollutants, so do not include levels for landfill gas NMOC.

<sup>b</sup>The source must be a major source of the particular criteria pollutant which increases significantly.

<sup>c</sup>Applies to contemporaneous net emission increases over a 5-year period.

memorandum states that "unless information regarding a specific case indicates otherwise," projects such as the addition of combustion devices to comply with this rule, "can be assumed, by their nature, to be environmentally beneficial." It should be noted that this exemption is still a case-by-case determination; the deciding authority for such an exemption is the state. Nevertheless, even though a landfill may avoid NSR because it qualifies for the PCP exclusion, any resulting emission increase could change the source's status for future applicability to NSR when additional changes are proposed.

The guidance provides additional safeguards for facilities that pass the "environmentally beneficial" test. No PCP can "cause or contribute" to a violation of a NAAQS, or a PSD increment, or adversely impact an AQRV in a class I area. (See reference 1 for a discussion of these values.)

In addition to ensuring that the project will not cause any violations of a NAAQS, PSD increment, or AQRV, the applicant must demonstrate that the increase in collateral emissions is minimized. Minimization does not mean that the permitting agency should require a full "BACT-type" review for--or prescribe add-on controls for--collateral emission increases. It is also not intended to impact the selection of the control device used to meet the NSPS or Emission Guidelines. Rather, it is intended to ensure that whatever device is selected to comply with the NSPS or Emission Guidelines is operated in such a manner as to minimize any collateral emission increase.

A landfill owner or operator wishing to apply for the PCP exclusion must obtain a determination from the applicable state that the project qualifies for this exemption. This includes a requirement for a public review of the proposed exemption (minor NSR, state applicability determination, or similar process). As part of this approval, the state may, in some cases, require some modelling to be conducted to demonstrate that none of the values discussed in the previous paragraph are violated. Any project excluded from major NSR under this exemption must still comply with all other applicable requirements under the Act (including minor source permitting requirements) and under the state Implementation Plan (SIP). In the case of nonattainment areas, the state or the source must provide offsetting emission reductions for any significant increase in a nonattainment pollutant from the PCP. Under the PCP guidance,

a one-to-one offset ratio is considered sufficient for a PCP; however, states have discretion to require offset ratios greater than one-to-one.

### **PSD Significance Level for NMOC**

The MSW Landfills NSPS and Emission Guidelines established "MSW landfill emissions" as a new classification of pollutants subject to regulation under the Act. Concurrent with promulgating the NSPS and Emission Guidelines, EPA established a PSD significance level of 50 tpy, measured as NMOC. Therefore, PSD review requirements now apply to existing MSW landfill major sources in attainment areas that undergo a modification resulting in increases in landfill gas emissions greater than the 50 tpy NMOC significance level. This level roughly corresponds to a VOC emission rate of 40 tpy, the PSD significance level for VOC.

Modified landfills below the 2.5 million Mg or 2.5 million m<sup>3</sup> design capacity exemption, which are not required by the Emission Guidelines to install controls, may exceed the PSD significance level for NMOC. In this case, the state will need to determine if controls should be installed for purposes of PSD compliance. In addition, NSR will be required if a modification of an existing landfill, which is a major source of VOC and is located in an ozone nonattainment area, increases VOC emissions by more than the levels shown in Table E-2.

### **References**

1. Office of Air Quality Planning and Standards. New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting. Draft. U.S. Environmental Protection Agency. Research Triangle Park, North Carolina. October 1990 Draft.
2. Memorandum. Seitz, John S., EPA Office of Air Quality Planning and Standards to EPA Regions I through X Air Division Directors. Classification of Emissions from Landfills for NSR Applicability Purposes. October 21, 1994.
3. Air and Energy Engineering Research Laboratory. Methodology for Quantifying Pollution Prevention Benefits from Landfill Gas Control and Utilization. U.S. Environmental Protection Agency. Research Triangle Park, North Carolina. EPA-600/R-95-089. July 1995.

4. Air and Energy Engineering Research Laboratory. Landfill Gas Energy Utilization Experience: Discussion of Technical and Non-Technical Issues, Solutions, and Trends. U.S. Environmental Protection Agency. Research Triangle Park, North Carolina. EPA-600/R-95-035. March 1995.
5. Office of Air Quality Planning and Standards. Compilation of Air Pollutant Emission Factors. U.S. Environmental Protection Agency. Research Triangle Park, North Carolina. AP-42. January 1995 (fifth edition). Section 2.4.
6. Memorandum. Seitz, John S., EPA Office of Air Quality Planning and Standards, to EPA Regions I through X Air Division Directors. Pollution Control Projects and New Source Review (NSR) Applicability. July 1, 1994.

July 1, 1994

MEMORANDUM

SUBJECT: Pollution Control Projects and New Source  
Review (NSR) Applicability

FROM: John S. Seitz, Director  
Office of Air Quality Planning and Standards (MD-10)

TO: Director, Air, Pesticides and Toxics  
Management Division, Regions I and IV  
Director, Air and Waste Management Division,  
Region II  
Director, Air, Radiation and Toxics Division,  
Region III  
Director, Air and Radiation Division,  
Region V  
Director, Air, Pesticides and Toxics Division,  
Region VI  
Director, Air and Toxics Division,  
Regions VII, VIII, IX and X

This memorandum and attachment address issues involving the Environmental Protection Agency's (EPA's) NSR rules and guidance concerning the exclusion from major NSR of pollution control projects at existing sources. The attachment provides a full discussion of the issues and this policy, including illustrative examples.

For several years, EPA has had a policy of excluding certain pollution control projects from the NSR requirements of parts C and D of title I of the Clean Air Act (Act) on a case-by-case basis. In 1992, EPA adopted an explicit pollution control project exclusion for electric utility generating units [see 57 FR 32314 (the "WEPCO rule" or the "WEPCO rulemaking")]. At the time, EPA indicated that it would, in a subsequent rulemaking, consider adopting a formal pollution control project exclusion for other source categories [see 57 FR 32332]. In the interim, EPA stated that individual pollution control projects involving source categories other than utilities could continue to be excluded from NSR by permitting authorities on a case-by-case basis [see 57 FR at 32320]. At this time, EPA expects to complete a rulemaking on a pollution control project exclusion for other source categories in early 1996. This memorandum and attachment provide interim guidance for permitting authorities on the approvability of these projects pending EPA's final action on a formal regulatory exclusion. The attachment to this memorandum

outlines in greater detail the type of projects that may qualify for a conditional exclusion from NSR as a pollution control project, the safeguards that are to be met, and the procedural steps that permitting authorities should follow in issuing an exclusion. Projects that do not meet these safeguards and procedural steps do not qualify for an exclusion from NSR under this policy. Pollution control projects potentially eligible for an exclusion (provided all applicable safeguards are met) include the installation of conventional or innovative emissions control equipment and projects undertaken to accommodate switching to an inherently less-polluting fuel, such as natural gas. Under this guidance, States may also exclude as pollution control projects some material and process changes (e.g., the switch to a less polluting coating, solvent, or refrigerant) and some other types of pollution prevention projects undertaken to reduce emissions of air pollutants subject to regulation under the Act.

The replacement of an existing emissions unit with a newer or different one (albeit more efficient and less polluting) or the reconstruction of an existing emissions unit does not qualify as a pollution control project. Furthermore, this guidance only applies to physical or operational changes whose primary function is the reduction of air pollutants subject to regulation under the Act at existing major sources. This policy does not apply to air pollution controls and emissions associated with a proposed new source. Similarly, the fabrication, manufacture or production of pollution control/prevention equipment and inherently less-polluting fuels or raw materials are not pollution control projects under this policy (e.g., a physical or operational change for the purpose of producing reformulated gasoline at a refinery is not a pollution control project).

It is EPA's experience that many bona fide pollution control projects are not subject to major NSR requirements for the simple reason that they result in a reduction in annual emissions at the source. In this way, these pollution control projects are outside major NSR coverage in accordance with the general rules for determining applicability of NSR to modifications at existing sources. However, some pollution control projects could result in significant potential or actual increases of some pollutants. These latter projects comprise the subcategory of pollution control projects that can benefit from this guidance.

A pollution control project must be, on balance, "environmentally beneficial" to be eligible for an exclusion. Further, an environmentally-beneficial pollution control project may be excluded from otherwise applicable major NSR requirements only under conditions that ensure that the project will not cause or contribute to a violation of a national ambient air quality standard (NAAQS), prevention of significant deterioration (PSD) increment, or adversely affect visibility or other air quality related value (AQRV). In order to assure that air quality concerns with these projects are adequately addressed, there are

two substantive and two procedural safeguards which are to be followed by permitting authorities reviewing projects proposed for exclusion.

First, the permitting authority must determine that the proposed pollution control project, after consideration of the reduction in the targeted pollutant and any collateral effects, will be environmentally beneficial. Second, nothing in this guidance authorizes any pollution control project which would cause or contribute to a violation of a NAAQS, or PSD increment, or adversely impact an AQRV in a class I area. Consequently, in addition to this "environmentally-beneficial" standard, the permitting authority must ensure that adverse collateral environmental impacts from the project are identified, minimized, and, where appropriate, mitigated. For example, the source or the State must secure offsetting reductions in the case of a project which will result in a significant increase in a nonattainment pollutant. Where a significant collateral increase in actual emissions is expected to result from a pollution control project, the permitting authority must also assess whether the increase could adversely affect any national ambient air quality standard, PSD increment, or class I AQRV.

In addition to these substantive safeguards, EPA is specifying two procedural safeguards which are to be followed. First, since the exclusion under this interim guidance is only available on a case-by-case basis, sources seeking exclusion from major NSR requirements prior to the forthcoming EPA rulemaking on a pollution control project exclusion must, before beginning construction, obtain a determination by the permitting authority that a proposed project qualifies for an exclusion from major NSR requirements as a pollution control project. Second, in considering this request, the permitting authority must afford the public an opportunity to review and comment on the source's application for this exclusion. It is also important to note that any project excluded from major new source review as a pollution control project must still comply with all otherwise applicable requirements under the Act and the State implementation plan (SIP), including minor source permitting.

This guidance document does not supersede existing Federal or State regulations or approved SIP's. The policies set out in this memorandum and attachment are intended as guidance to be applied only prospectively (including those projects currently under evaluation for an exclusion) during the interim period until EPA takes action to revise its NSR rules, and do not represent final Agency action. This policy statement is not ripe for judicial review. Moreover, it is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. Agency officials may decide to follow the guidance provided in this memorandum, or to act at variance with the guidance, based on an analysis of specific circumstances. The EPA also may change this guidance at any time

without public notice. The EPA presently intends to address the matters discussed in this document in a forthcoming NSR rulemaking regarding proposed changes to the program resulting from the NSR Reform process and will take comment on these matters as part of that rulemaking.

As noted above, a detailed discussion of the types of projects potentially eligible for an exclusion from major NSR as a pollution control project, as well as the safeguards such projects must meet to qualify for the exclusion, is contained in the attachment to this memorandum. The Regional Offices should send this memorandum with the attachment to States within their jurisdiction. Questions concerning specific issues and cases should be directed to the appropriate EPA Regional Office. Regional Office staff may contact David Solomon, Chief, New Source Review Section, at (919) 541-5375, if they have any questions.

Attachment

cc: Air Branch Chief, Regions I-X  
NSR Reform Subcommittee Members

## Attachment

### GUIDANCE ON EXCLUDING POLLUTION CONTROL PROJECTS FROM MAJOR NEW SOURCE REVIEW (NSR)

#### I. Purpose

The Environmental Protection Agency (EPA) presently expects to complete a rulemaking on an exclusion from major NSR for pollution control projects by early 1996. In the interim, certain types of projects (involving source categories other than utilities) may qualify on a case-by-case basis for an exclusion from major NSR as pollution control projects. Prior to EPA's final action on a regulatory exclusion, this attachment provides interim guidance for permitting authorities on the types of projects that may qualify on a case-by-case basis from major NSR as pollution control projects, including the substantive and procedural safeguards which apply.

#### II. Background

The NSR provisions of part C [prevention of significant deterioration (PSD)] and part D (nonattainment requirements) of title I of the Clean Air Act (Act) apply to both the construction of major new sources and the modification of existing major sources.<sup>1</sup> The modification provisions of the NSR programs in parts C and D are based on the broad definition of modification in section 111(a)(4) of the Act. That section contemplates a two-step test for determining whether activities at an existing major facility constitute a modification subject to new source requirements. In the first step, the reviewing authority determines whether a physical or operational change will occur. In the second step, the question is whether the physical or operational change will result in any increase in emissions of any regulated pollutant.

The definition of physical or operational change in section 111(a)(4) could, standing alone, encompass the most mundane activities at an industrial facility (even the repair or replacement of a single leaky pipe, or a insignificant change in the way that pipe is utilized). However, EPA has recognized that Congress did not intend to make every activity at a source subject to new source requirements under parts C and D. As a result, EPA has by regulation limited the reach of the modification provisions of parts C and D to only major modifications. Under NSR, a "major modification" is generally a physical change or change in the method of operation of a major stationary source which would result in a significant net

---

<sup>1</sup>The EPA's NSR regulations for nonattainment areas are set forth at 40 CFR 51.165, 52.24 and part 51, Appendix S. The PSD program is set forth in 40 CFR 52.21 and 51.166.

emissions increase in the emissions of any regulated pollutant [see, e.g., 40 CFR 52.21(b)(2)(i)]. A "net emissions increase" is defined as the increase in "actual emissions" from the particular physical or operational change together with any other contemporaneous increases or decreases in actual emissions [see, e.g., 40 CFR 52.21(b)(3)(i)]. In order to trigger major new source review, the net emissions increase must exceed specified "significance" levels [see, e.g., 40 CFR 52.21(b)(2)(i) and 40 CFR 52.21(b)(23)]. The EPA has also adopted common-sense exclusions from the "physical or operational change" component of the definition of "major modification." For example, EPA's regulations contain exclusions for routine maintenance, repair, and replacement; for certain increases in the hours of operation or in the production rate; and for certain types of fuel switches [see, e.g., 40 CFR 52.21(b)(2)(iii)].

In the 1992 "WEPCO" rulemaking [57 FR 32314], EPA amended its PSD and nonattainment NSR regulations as they pertain to utilities by adding certain pollution control projects to the list of activities excluded from the definition of physical or operational changes. In taking that action, EPA stated it was largely formalizing an existing policy under which it had been excluding individual pollution control projects where it was found that the project "would be environmentally beneficial, taking into account ambient air quality" [57 FR at 32320; see also *id.*, n. 15].<sup>2</sup>

The EPA has provided exclusions for pollution control projects in the form of "no action assurances" prior to November 15, 1990 and nonapplicability determinations based on Act changes as of November 15, 1990 (1990 Amendments). Generally, these exclusions addressed clean coal technology projects and fuel switches at electric utilities.

Because the WEPCO rulemaking was directed at the utility industry which faced "massive industry-wide undertakings of pollution control projects" to comply with the acid rain provisions of the Act [57 FR 32314], EPA limited the types of projects eligible for the exclusion to add-on controls and fuel switches at utilities. Thus, pollution control projects under the WEPCO rule are defined as:

any activity or project undertaken at an existing electric utility steam generating unit for purposes of reducing emissions from such unit. Such activities or projects are limited to:

---

<sup>2</sup>This guidance pertains only to source categories other than electric utilities, and EPA does not intend for this guidance to affect the WEPCO rulemaking in any way.

(A) The installation of conventional or innovative pollution control technology, including but not limited to advanced flue gas desulfurization, sorbent injection for sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) controls and electrostatic precipitators;

(B) An activity or project to accommodate switching to a fuel which is less polluting than the fuel in use prior to the activity or project . . .

[40 CFR 51.165(a)(1)(xxv) (emphasis added)].  
The definition also includes certain clean coal technology demonstration projects. Id.

The EPA built two safeguards into the exclusion in the rulemaking. First, a project that meets the definition of pollution control project will not qualify for the exclusion where the "reviewing authority determines that (the proposed project) renders the unit less environmentally beneficial . . ." [see, e.g., 51.165(a)(1)(v)(C)(8)]. In the WEPCO rule, EPA did not provide any specific definition of the environmentally-beneficial standard, although it did indicate that the pollution control project provision "provides for a case-by-case assessment of the pollution control project's net emissions and overall impact on the environment" [57 FR 32321]. This provision is buttressed by a second safeguard that directs permitting authorities to evaluate the air quality impacts of pollution control projects that could--through collateral emissions increases or changes in utilization patterns--adversely impact local air quality [see 57 FR 32322]. This provision generally authorizes, as appropriate, a permitting authority to require modelling of emissions increases associated with a pollution control project. Id. More fundamentally, it explicitly states that no pollution control project under any circumstances may cause or contribute to violation of a national ambient air

quality standard (NAAQS), PSD increment, or air quality related value (AQRV) in a class I area. Id.<sup>3</sup>

As noted, the WEPCO rulemaking was expressly limited to existing electric utility steam generating units [see, e.g., 40 CFR 51.165(a)(1)(v)(C)(8) and 51.165(a)(1)(xx)]. The EPA limited the rulemaking to utilities because of the impending acid rain requirements under title IV of the Act, EPA's extensive experience with new source applicability issues for electric utilities, the general similarity of equipment, and the public availability of utility operating projections. The EPA indicated it would consider adopting a formal NSR pollution control project exclusion for other source categories as part of a separate NSR rulemaking. The rulemaking in question is now expected to be finalized by early 1996. On the other hand, the WEPCO rulemaking also noted that EPA's existing policy was, and would continue to be, to allow permitting authorities to exclude pollution control projects in other source categories on a case-by-case basis.

### III. Case-By-Case Pollution Control Project Determinations

The following sections describe the type of projects that may be considered by permitting authorities for exclusion from major NSR as pollution control projects and two safeguards that permitting authorities are to use in evaluating such projects--the environmentally-beneficial test and an air quality impact assessment. To a large extent, these requirements are drawn from the WEPCO rulemaking. However, because the WEPCO rule was designed for a single source category, electric utilities, it cannot and does not serve as a complete template for this guidance. Therefore, the following descriptions expand upon the WEPCO rule in the scope of qualifying projects and in the specific elements inherent in the safeguards. These changes reflect the far more complicated task of evaluating pollution

---

<sup>3</sup>The WEPCO rule refers specifically to "visibility limitation" rather than "air quality related values." However, EPA clearly stated in the preamble to the final rule that permitting agencies have the authority to "solicit the views of others in taking any other appropriate remedial steps deemed necessary to protect class I areas. . . . The EPA emphasizes that all environmental impacts, including those on class I areas, can be considered. . . ." [57 FR 32322]. Further, the statutory protections in section 165(d) plainly are intended to protect against any "adverse impact on the AQRV of such [class I] lands (including visibility)." Based on this statutory provision, EPA believes that the proper focus of any air quality assessment for a pollution control project should be on visibility and any other relevant AQRV's for any class I areas that may be affected by the proposed project. Permitting authorities should notify Federal Land Managers where appropriate concerning pollution control projects which may adversely affect AQRV's in class I areas.

control projects at a wide variety of sources facing a myriad of Federal, State, and local clean air requirements.

Since the safeguards are an integral component of the exclusion, States must have the authority to impose the safeguards in approving an exclusion from major NSR under this policy. Thus, State or local permitting authorities in order to use this policy should provide statements to EPA describing and affirming the basis for its authority to impose these safeguards absent major NSR. Sources that obtain exclusions from permitting authorities that have not provided this affirmation of authority are at risk in seeking to rely on the exclusion issued by the permitting agency, because EPA may subsequently determine that the project does not qualify as a pollution control project under this policy.

#### A. Types of Projects Covered

##### 1. Add-On Controls and Fuel Switches

In the WEPCO rulemaking, EPA found that both add-on emissions control projects and fuel switches to less-polluting fuels could be considered to be pollution control projects. For the purposes of today's guidance, EPA affirms that these types of projects are appropriate candidates for a case-by-case exclusion as well. These types of projects include:

- the installation of conventional and advanced flue gas desulfurization and sorbent injection for SO<sub>2</sub>;
- electrostatic precipitators, baghouses, high efficiency multiclones, and scrubbers for particulate or other pollutants;
- flue gas recirculation, low-NO<sub>x</sub> burners, selective non-catalytic reduction and selective catalytic reduction for NO<sub>x</sub>; and
- regenerative thermal oxidizers (RTO), catalytic oxidizers, condensers, thermal incinerators, flares and carbon adsorbers for volatile organic compounds (VOC) and toxic air pollutants.

Projects undertaken to accommodate switching to an inherently less-polluting fuel such as natural gas can also qualify for the exclusion. Any activity that is necessary to accommodate switching to a inherently less-polluting fuel is considered to be part of the pollution control project. In some instances, where the emissions unit's capability would otherwise be impaired as a result of the fuel switch, this may involve certain necessary changes to the pollution generating equipment (e.g., boiler) in order to maintain the normal operating capability of the unit at the time of the project.

## 2. Pollution Prevention Projects

It is EPA's policy to promote pollution prevention approaches and to remove regulatory barriers to sources seeking to develop and implement pollution prevention solutions to the extent allowed under the Act. For this reason, permitting authorities may also apply this exclusion to switches to inherently less-polluting raw materials and processes and certain other types of "pollution prevention" projects.<sup>4</sup> For instance, many VOC users will be making switches to water-based or powder-paint application systems as a strategy for meeting reasonably available control technology (RACT) or switching to a non-toxic VOC to comply with maximum achievable control technology (MACT) requirements.

Accordingly, under today's guidance, permitting authorities may consider excluding raw material substitutions, process changes and other pollution prevention strategies where the pollution control aspects of the project are clearly evident and will result in substantial emissions reductions per unit of output for one or more pollutants. In judging whether a pollution prevention project can be considered for exclusion as a pollution control project, permitting authorities may also consider as a relevant factor whether a project is being undertaken to bring a source into compliance with a MACT, RACT, or other Act requirement.

Although EPA is supportive of pollution control and prevention projects and strategies, special care must be taken in classifying a project as a pollution control project and in evaluating a project under a pollution control project exclusion. Virtually every modernization or upgrade project at an existing industrial facility which reduces inputs and lowers unit costs has the concurrent effect of lowering an emissions rate per unit of fuel, raw material or output. Nevertheless, it is clear that these major capital investments in industrial equipment are the very types of projects that Congress intended to address in the new source modification provisions [see Wisconsin Electric Power Co. v. Reilly, 893 F.2d 901, 907-10 (7th Cir. 1990) (rejecting contention that utility life extension project was not a physical

---

<sup>4</sup>For purposes of this guidance, pollution prevention means any activity that through process changes, product reformulation or redesign, or substitution of less polluting raw materials, eliminates or reduces the release of air pollutants and other pollutants to the environment (including fugitive emissions) prior to recycling, treatment, or disposal; it does not mean recycling (other than certain "in-process recycling" practices), energy recovery, treatment, or disposal [see Pollution Prevention Act of 1990 section 6602(b) and section 6603(5)(A) and (B); see also "EPA Definition of 'Pollution Prevention,'" memorandum from F. Henry Habicht II, May 28, 1992].

or operational change); Puerto Rican Cement Co., Inc. v. EPA, 889 F.2d 292, 296-98 (1st Cir. 1989) (NSR applies to modernization project that decreases emissions per unit of output, but increases economic efficiency such that utilization may increase and result in net increase in actual emissions)]. Likewise, the replacement of an existing emissions unit with a newer or different one (albeit more efficient and less polluting) or the reconstruction of an existing emissions unit would not qualify as a pollution control project. Adopting a policy that automatically excludes from NSR any project that, while lowering operating costs or improving performance, coincidentally lowers a unit's emissions rate, would improperly exclude almost all modifications to existing emissions units, including those that are likely to increase utilization and therefore result in overall higher levels of emissions.

In order to limit this exclusion to the subset of pollution prevention projects that will in fact lower annual emissions at a source, permitting authorities should not exclude as pollution control projects any pollution prevention project that can be reasonably expected to result in an increase in the utilization of the affected emissions unit(s). For example, projects which significantly increase capacity, decrease production costs, or improve product marketability can be expected to affect utilization patterns. With these changes, the environment may or may not see a reduction in overall source emissions; it depends on the source's operations after the change, which cannot be predicted with any certainty.<sup>5</sup> This is not to say that these types of projects are necessarily subject to major NSR requirements, only that they should not be excluded as pollution control projects under this guidance. The EPA may consider different approaches to excluding pollution prevention projects from major NSR requirements in the upcoming NSR rulemaking. Under this guidance, however, permitting authorities should carefully review proposed pollution prevention projects to evaluate whether utilization of the source will increase as a result of the project.

Furthermore, permitting authorities should have the authority to monitor utilization of an affected emissions unit or source for a reasonable period of time subsequent to the project to verify what effect, if any, the project has on utilization. In cases where the project has clearly caused an increase in utilization, the permitting authority may need to reevaluate the

---

<sup>5</sup>This is in marked contrast to the addition of pollution control equipment which typically does not, in EPA's experience, result in any increase in the source's utilization of the emission unit in question. In the few instances where this presumption is not true, the safeguards discussed in the next section should provide adequate environmental protections for these additions of pollution control equipment.

basis for the original exclusion to verify that an exclusion is still appropriate and to ensure that all applicable safeguards are being met.

## B. Safeguards

The following safeguards are necessary to assure that projects being considered for an exclusion qualify as environmentally beneficial pollution control projects and do not have air quality impacts which would preclude the exclusion. Consequently, a project that does not meet these safeguards does not qualify for an exclusion under this policy.

### 1. Environmentally-Beneficial Test

Projects that meet the definition of a pollution control project outlined above may nonetheless cause collateral emissions increases or have other adverse impacts. For instance, a large VOC incinerator, while substantially eliminating VOC emissions, may generate sizeable NO<sub>x</sub> emissions well in excess of significance levels. To protect against these sorts of problems, EPA in the WEPCO rule provided for an assessment of the overall environmental impact of a project and the specific impact, if any, on air quality. The EPA believes that this safeguard is appropriate in this policy as well.

Unless information regarding a specific case indicates otherwise, the types of pollution control projects listed in III. A. 1. above can be presumed, by their nature, to be environmentally beneficial. This presumption arises from EPA's experience that historically these are the very types of pollution controls applied to new and modified emissions units. The presumption does not apply, however, where there is reason to believe that 1) the controls will not be designed, operated or maintained in a manner consistent with standard and reasonable practices; or 2) collateral emissions increases have not been adequately addressed as discussed below.

In making a determination as to whether a project is environmentally beneficial, the permitting authority must consider the types and quantity of air pollutants emitted before and after the project, as well as other relevant environmental factors. While because of the case-by-case nature of projects it is not possible to list all factors which should be considered in any particular case, several concerns can be noted.

First, pollution control projects which result in an increase in non-targeted pollutants should be reviewed to determine that the collateral increase has been minimized and will not result in environmental harm. Minimization here does not mean that the permitting agency should conduct a BACT-type review or necessarily prescribe add-on control equipment to

treat the collateral increase. Rather, minimization means that, within the physical configuration and operational standards usually associated with such a control device or strategy, the source has taken reasonable measures to keep any collateral increase to a minimum. For instance, the permitting authority could require that a low-NO<sub>x</sub> burner project be subject to temperature and other appropriate combustion standards so that carbon monoxide (CO) emissions are kept to a minimum, but would not review the project for a CO catalyst or other add-on type options. In addition, a State's RACT or MACT rule may have explicitly considered measures for minimizing a collateral increase for a class or category of pollution control projects and requires a standard of best practices to minimize such collateral increases. In such cases, the need to minimize collateral increase from the covered class or category of pollution control projects can be presumed to have been adequately addressed in the rule.

In addition, a project which would result in an unacceptable increased risk due to the release of air toxics should not be considered environmentally beneficial. It is EPA's experience, however, that most projects undertaken to reduce emissions, especially add-on controls and fuel switches, result in concurrent reductions in air toxics. The EPA expects that many pollution control projects seeking an exclusion under this guidance will be for the purpose of complying with MACT requirements for reductions in air toxics. Consequently, unless there is reason to believe otherwise, permitting agencies may presume that such projects by their nature will result in reduced risks from air toxics.

## 2. Additional Air Quality Impacts Assessments

### (a) General

Nothing in the Act or EPA's implementing regulations would allow a permitting authority to approve a pollution control project resulting in an emissions increase that would cause or contribute to a violation of a NAAQS or PSD increment, or adversely impact visibility or other AQRV in a class I area [see, e.g., Act sections 110(a)(2)(C), 165, 169A(b), 173]. Accordingly, this guidance is not intended to allow any project to violate any of these air quality standards.

As discussed above, it is possible that a pollution control project--either through an increase in an emissions rate of a collateral pollutant or through a change in utilization--will cause an increase in actual emissions, which in turn could cause or contribute to a violation of a NAAQS or increment or adversely impact AQRV's. For this reason, in the WEPCO rule the EPA required sources to address whenever 1) the proposed change would result in a significant net increase in actual emissions of any criteria pollutant over levels used for that source in the

most recent air quality impact analysis; and 2) the permitting authority has reason to believe that such an increase would cause or contribute to a violation of a NAAQS, increment or visibility limitation. If an air quality impact analysis indicates that the increase in emissions will cause or contribute to a violation of any ambient standard, PSD increment, or AQRV, the pollution control exclusion does not apply.

The EPA believes that this safeguard needs to be applied here as well. Thus, where a pollution control project will result in a significant increase in emissions and that increased level has not been previously analyzed for its air quality impact and raises the possibility of a NAAQS, increment, or AQRV violation, the permitting authority is to require the source to provide an air quality analysis sufficient to demonstrate the impact of the project. The EPA will not necessarily require that the increase be modeled, but the source must provide sufficient data to satisfy the permitting authority that the new levels of emissions will not cause a NAAQS or increment violation and will not adversely impact the AQRV's of nearby potentially affected class I areas.

In the case of nonattainment areas, the State or the source must provide offsetting emissions reductions for any significant increase in a nonattainment pollutant from the pollution control project. In other words, if a significant collateral increase of a nonattainment pollutant resulting from a pollution control project is not offset on at least a one-to-one ratio then the pollution control project would not qualify as environmentally beneficial.<sup>6</sup> However, rather than having to apply offsets on a case-by-case basis, States may consider adopting (as part of their attainment plans) specific control measures or strategies for the purpose of generating offsets to mitigate the projected collateral emissions increases from a class or category of pollution control projects.

(b) Determination of Increase in Emissions

The question of whether a proposed project will result in an emissions increase over pre-modification levels of actual emissions is both complicated and contentious. It is a question that has been debated by the New Source Review Reform Subcommittee of the Clean Air Act Advisory Committee and is expected to be revisited by EPA in the same upcoming rulemaking that will consider adopting a pollution control project exclusion. In the interim, EPA is adopting a simplified approach

---

<sup>6</sup>Regardless of the severity of the classification of the nonattainment area, a one-to-one offset ratio will be considered sufficient under this policy to mitigate a collateral increase from a pollution control project. States may, however, require offset ratios that are greater than one-to-one.

to determining whether a pollution control project will result in increased emissions.

The approach in this policy is premised on the fact that EPA does not expect the vast majority of these pollution control projects to change established utilization patterns at the source. As discussed in the previous section, it is EPA's experience that add-on controls do not impact utilization, and pollution prevention projects that could increase utilization may not be excluded under this guidance. Therefore, in most cases it will be very easy to calculate the emissions after the change: the product of the new emissions rate times the existing utilization rate. In the case of a pollution control project that collaterally increases a non-targeted pollutant, the actual increase (calculated using the new emissions rate and current utilization pattern) would need to be analyzed to determine its air quality impact.

The permitting authority may presume that projects meeting the definition outlined in section III(A)(1) will not change utilization patterns. However, the permitting authority is to reject this presumption where there is reason to believe that the project will result in debottlenecking, loadshifting to take advantage of the control equipment, or other meaningful increase in the use of the unit above current levels. Where the project will increase utilization and emissions, the associated emissions increases are calculated based on the post-modification potential to emit of the unit considering the application of the proposed controls. In such cases the permitting agency should consider the projected increase in emissions as collateral to the project and determine whether, notwithstanding the emissions increases, the project is still environmentally beneficial and meets all applicable safeguards.

In certain limited circumstances, a permitting agency may take action to impose federally-enforceable limits on the magnitude of a projected collateral emissions increase to ensure that all safeguards are met. For example, where the data used to assess a projected collateral emissions increase is questionable and there is reason to believe that emissions in excess of the projected increase would violate an applicable air quality standard or significantly exceed the quantity of offsets provided, restrictions on the magnitude of the collateral increase may be necessary to ensure compliance with the applicable safeguards.

#### IV. Procedural Safeguards

Because EPA has not yet promulgated regulations governing a generally applicable pollution control project exclusion from major NSR (other than for electric utilities), permitting authorities must consider and approve requests for an exclusion on a case-by-case basis, and the exclusion is not self-executing.

Instead, sources must receive case-by-case approval from the permitting authority pursuant to a minor NSR permitting process, State nonapplicability determination or similar process. [Nothing in this guidance voids or creates an exclusion from any applicable minor source preconstruction review requirement in any SIP that has been approved pursuant to section 110(a)(2)(C) and 40 CFR 51.160-164.] This process should also provide that the application for the exclusion and the permitting agency's proposed decision thereon be subject to public notice and the opportunity for public and EPA written comment. In those limited cases where the applicable SIP already exempts a class or category of pollution controls project from the minor source permitting public notice and comment requirements, and where no collateral increases are expected (e.g., the installation of a baghouse) and all otherwise applicable environmental safeguards are complied with, public notice and comment need not be provided for such projects. However, even in such circumstances, the permitting agency should provide advance notice to EPA when it applies this policy to provide an exclusion. For standard-wide applications to groups of sources (e.g., RACT or MACT), the notice may be provided to EPA at the time the permitting authority intends to issue a pollution control exclusion for the class or category of sources and thereafter notice need not be given to EPA on an individual basis for sources within the noticed group.

#### V. Emission Reduction Credits

In general, certain pollution control projects which have been approved for an exclusion from major NSR may result in emission reductions which can serve as NSR offsets or netting credits. All or part of the emission reductions equal to the difference between the pre-modification actual and post-modification potential emissions for the decreased pollutant may serve as credits provided that 1) the project will not result in a significant collateral increase in actual emissions of any criteria pollutant, 2) the project is still considered environmentally beneficial, and 3) all otherwise applicable criteria for the crediting of such reductions are met (e.g., quantifiable, surplus, permanent, and enforceable). Where an excluded pollution control project results in a significant collateral increase of a criteria pollutant, emissions reduction credits from the pollution control project for the controlled pollutant may still be granted provided, in addition to 2) and 3) above, the actual collateral increase is reduced below the applicable significance level, either through contemporaneous reductions at the source or external offsets. However, neither the exclusion from major NSR nor any credit (full or partial) for emission reductions should be granted by the permitting authority where the type or amount of the emissions increase which would result from the use of such credits would lessen the environmental benefit associated with the pollution control

project to the point where the project would not have initially qualified for an exclusion.

#### IV. Illustrative Examples

The following examples illustrate some of the guiding principles and safeguards discussed above in reviewing proposed pollution control projects for an exclusion from major NSR.

##### Example 1

PROJECT DESCRIPTION: A chemical manufacturing facility in an attainment area for all pollutants is proposing to install a RTO to reduce VOC emissions (including emissions of some hazardous pollutants) at the plant by about 3000 tons per year (tpy). The emissions reductions from the RTO are currently voluntary, but may be necessary in the future for title III MACT compliance. Although the RTO has been designed to minimize NO<sub>x</sub> emissions, it will produce 200 tpy of new NO<sub>x</sub> emissions due to the unique composition of the emissions stream. There is no information about the project to rebut a presumption that the project will not change utilization of the source. Aside from the NO<sub>x</sub> increase there are no other environmental impacts known to be associated with the project.

EVALUATION: As a qualifying add-on control device, the project may be considered a pollution control project and may be considered for an exclusion. The permitting agency should: 1) verify that the NO<sub>x</sub> increase has been minimized to the extent practicable, 2) confirm (through modeling or other appropriate means) that the actual significant increase in NO<sub>x</sub> emissions does not violate the applicable NAAQS,<sup>7</sup> PSD increment, or adversely impact any Class I area AQRV, and 3) apply all otherwise applicable SIP and minor source permitting requirements, including opportunity for public notice and comment.

##### Example 2

PROJECT DESCRIPTION: A source proposes to replace an existing coal-fired boiler with a gas-fired turbine as part of a cogeneration project. The new turbine is an exact replacement for the energy needs supplied by the existing boiler and will emit less of each pollutant on an hourly basis than the boiler did.

EVALUATION: The replacement of an existing emissions unit with a new unit (albeit more efficient and less polluting) does

---

<sup>7</sup>If the source were located in an area in which nonattainment NSR applied to NO<sub>x</sub> emissions increases, 200 tons of NO<sub>x</sub> offset credits would be required for the project to be eligible for an exclusion.

not qualify for an exclusion as a pollution control project. The company can, however, use any otherwise applicable netting credits from the removal of the existing boiler to seek to net the new unit out of major NSR.

#### Example 3

PROJECT DESCRIPTION: A source plans to physically renovate and upgrade an existing process line by making certain changes to the existing process, including extensive modifications to emissions units. Following the changes, the source will expand production and manufacture and market a new product line. The project will cause an increase in the economic efficiency of the line. The renovated line will also be less polluting on a per-product basis than the original configuration.

EVALUATION: The change is not eligible for an exclusion as a pollution control project. On balance, the project does not have clearly evident pollution control aspects, and the resultant decrease in the per-product emissions rate (or factor) is incidental to the project. The project is a physical change or change in the method of operation that will increase efficiency and productivity.

#### Example 4

PROJECT DESCRIPTION: In response to the phaseout of chlorofluorocarbons (CFC) under title VI of the Act, a major source is proposing to substitute a less ozone-depleting substance (e.g., HCFC-141b) for one it currently uses that has a greater ozone depleting potential (e.g., CFC-11). A larger amount of the less-ozone depleting substance will have to be used. No other changes are proposed.

EVALUATION: The project may be considered a pollution control project and may be considered for an exclusion. The permitting agency should verify that 1) actual annual emissions of HCFC-141b after the proposed switch will cause less stratospheric ozone depletion than current annual emissions of CFC-11; 2) the proposed switch will not change utilization patterns or increase emissions of any other pollutant which would impact a NAAQS, PSD increment, or AQRV and will not cause any cross-media harm, including any unacceptable increased risk associated with toxic air pollutants; and 3) apply all otherwise applicable SIP and minor source permitting requirements, including opportunity for public notice and comment.

#### Example 5

PROJECT DESCRIPTION: An existing landfill proposes to install either flares or energy recovery equipment [i.e., turbines or internal combustion (IC) engines]. The reductions from the project are estimated at over 1000 tpy of VOC and are

currently not necessary to meet Act requirements, but may be necessary some time in the future. In case A the project is the replacement of an existing flare or energy system and no increase in NO<sub>x</sub> emissions will occur. In case B, the equipment is a first time installation and will result in a 100 tpy increase in NO<sub>x</sub>. In case C, the equipment is an addition to existing equipment which will accommodate additional landfill gas (resulting from increased gas generation and/or capture consistent with the current permitted limits for growth at the landfill) and will result in a 50 tpy increase in NO<sub>x</sub>.

EVALUATION: Projects A, B, and C may be considered pollution control projects and may be considered for an exclusion; however, in cases B and C, if the landfill is located in an area required to satisfy nonattainment NSR for NO<sub>x</sub> emissions, the source would be required to obtain NO<sub>x</sub> offsets at a ratio of at least 1:1 for the project to be considered for an exclusion. [NOTE: VOC-NO<sub>x</sub> netting and trading for NSR purposes may be discussed in the upcoming NSR rulemaking, but it is beyond the scope of this guidance.] Although neither turbines or IC engines are listed in section III.A.1 as add-on control devices and would normally not be considered pollution control projects, in this specific application they serve the same function as a flare, namely to reduce VOC emissions at the landfill with the added incidental benefit of producing useful energy in the process.<sup>8</sup>

The permitting agency should: 1) verify that the NO<sub>x</sub> increase has been minimized to the extent practicable; 2) confirm (through modeling or other appropriate means) that the actual significant increase in NO<sub>x</sub> emissions will not violate the applicable NAAQS, PSD increment, or adversely impact any AQRV; and 3) apply all otherwise applicable SIP and minor source and, as noted above, in cases B and C ensures that NO<sub>x</sub> offsets are provided in an area in which nonattainment review applies to NO<sub>x</sub> emissions increases. permitting requirements, including opportunity for public notice and comment.

---

<sup>8</sup>The production of energy here is incidental to the project and is not a factor in qualifying the project for an exclusion as a pollution control project. In addition, any supplemental or co-firing of non-landfill gas fuels (e.g., natural gas, oil) would disqualify the project from being considered a pollution control project. The fuels would be used to maximize any economic benefit from the project and not for the purpose of pollution control at the landfill. However, the use of an alternative fuel solely as a backup fuel to be used only during brief and infrequent start-up or emergency situations would not necessarily disqualify an energy recovery project from being considered a pollution control project.

October 21, 1994

MEMORANDUM

SUBJECT: Classification of Emissions from Landfills for  
NSR Applicability Purposes

FROM: John S. Seitz, Director  
Office of Air Quality Planning and Standards (MD-10)

TO: Director, Air, Pesticides and Toxics  
Management Division, Regions I and IV  
Director, Air and Waste Management Division,  
Region II  
Director, Air, Radiation and Toxics Division,  
Region III  
Director, Air and Radiation Division,  
Region V  
Director, Air, Pesticides and Toxics Division,  
Region VI  
Director, Air and Toxics Division,  
Regions VII, VIII, IX and S

The EPA has recently received several inquiries regarding the treatment of emissions from landfills for purposes of major NSR applicability. The specific issue raised is whether the Agency still considers landfills gas emissions which are not collected to be fugitive for NSR applicability purposes.

The EPA's NSR regulations define "fugitive emissions" to mean "those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening" (40 CFR 51.165(a)(1)(x)). In general, where a facility is not subject to national standards requiring collection, the technical question of whether the emissions at a particular site could "reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening" is a factual determination to be made by the permitting authority, on a case-by-case basis. In determining whether emissions could reasonably be collected (or if any emissions source could reasonably pass through a stack, etc.) "reasonableness" should be construed broadly. The existence of collection technology in use by other sources in the

source category creates a presumption that collection is reasonable. Furthermore, in certain circumstances, the collection of emissions from a specific pollutant emitting activity can create a presumption that collection is reasonable for a similar pollutant-emitting activity, even if that activity is located within a different source category.

In 1987, EPA addressed whether landfill gas emissions should be considered as fugitive.<sup>1</sup> The Agency explained that for landfills constructed or proposed to be constructed with gas collection systems, the collected landfill gas would not qualify as fugitive. Also, the Agency understood at the time that, with some exceptions, landfills, were not constructed with such gas collection systems. The EPA explained that "[t]he preamble to the 1980 NSR regulations characterizes nonfugitive emissions as '. . . emissions which would ordinarily be collected and discharged through stacks or other functionally equivalent openings'" (see 45 FR 52693, Aug. 7, 1980).<sup>2</sup> Based on the "understanding that landfills are not ordinarily constructed with gas collection systems." the Agency concluded that emissions from existing or proposed landfills without gas collection systems are to be considered fugitive emissions." The Agency also made clear, however, that the applicant's decision on whether to collect emissions is not the deciding factor. Rather, it is the reviewing authority that makes the decision regarding

---

<sup>1</sup>See memorandum entitled "Emissions from Landfills," from Gerald A. Emison, Director, Office of Air Quality Planning and Standards, to David P. Howekamp, Director, Air Management Division, Region IX, dated October 6, 1987 (attached). It is important to note that the interpretation contained in this memorandum was only applicable to landfills.

<sup>2</sup>In fact, the 1980 preamble language recognized the concern that sources could avoid NSR by calling emissions fugitives, even if the source could capture those emissions. The EPA's originally-proposed definition of fugitive emissions was changed in the final 1980 regulations to "ensure that sources will not discharge as fugitive emissions those emissions which would ordinarily be collected and discharged through stacks or other functionally equivalent openings, and will eliminate disincentives for the construction of ductwork and stacks for the collection of emission." Id.

which emissions can reasonably be collected and therefore not considered fugitive.

The EPA believes its 1987 interpretation of the 1980 preamble may have been misunderstood, and in any case that its factual conclusions at that time are now outdated. Continued misunderstanding or application of this outdated view could discourage those constructing new landfills from utilizing otherwise environmentally- or economically-desirable gas collection and mitigation measures in order to avoid major NSR applicability.

Specifically with regard to landfill gas emissions, gas collection and mitigation technologies have evolved significantly since 1987, and use of these systems has become much more common. Increasingly, landfills are constructed or retrofitted with gas collection systems for purposes of energy recovery and in order to comply with State and Federal regulatory requirements designed to address public health and welfare concerns. In addition, EPA has proposed performance standards for new landfills under section 111(b) of the Clean Air Act and has proposed guidelines for existing landfills under section 111(d) that, when promulgated, will require gas collection systems for existing and new landfills that are above a certain size and gas production level (see 56 FR 24468, May 30, 1991). Under these requirements, EPA estimates that between 500 and 700 medium and large landfills will have to collect and control landfill gas. The EPA believes this proposal created a presumption at that time that the proposed gas collection systems, at a minimum, are reasonable for landfills that would be subject to such control under the proposal.

Thus, EPA believes it is no longer appropriate to conclude generally that landfill gas could not reasonably be collected at a proposed landfill project that does not include a gas collection system. The fact that a proposed landfill project does not include a collection system in its proposed design is not determinative of whether emissions from a landfill are fugitive. To quantify the amount of landfill gas which could otherwise be collected at a proposed landfill for NSR applicability purposes, the air pollution control authority should assume the use of a collection system which has been designed to maximize, to the greatest extent possible, the capture of air pollutants from the landfill.

In summary, the use of collection technology by other landfill sources, whether or not subject to EPA's proposed requirements or to State implementation plan or permit requirements, creates a presumption that collection of the emissions is reasonable at other similar sources. If such a system can reasonably be designed to collect the landfill's gas

emissions, then the emissions are not fugitive and should be considered in determining whether a major NSR permit is required.

Today's guidance is applicable to the construction of a new landfill or the expansion of an existing landfill beyond its currently-permitted capacity. To avoid any confusion regarding the applicability of major NSR to existing landfills, EPA does not plan to reconsider or recommend that States reconsider the major NSR status of any existing landfill based on the issues discussed in this memorandum. Also, nothing in this guidance voids or creates an exclusion from any otherwise applicable requirement under the Clean Air Act and the State implementation plan, including minor source review.

The Regional Offices should send this memorandum, including the attachment, to States within their jurisdiction. Questions concerning specific issues and cases should be directed to the appropriate Regional Office. Regional Office staff may contact Mr. David Solomon, Chief, New Source Review Section, at (919) 541-5375, if they have any questions.

Attachment

cc: Air Branch Chief, Regions I-X  
NSR Contacts, Regions I-X and Headquarters

October 6, 1987

MEMORANDUM

SUBJECT: Emissions from Landfills

FROM: Gerald A. Emison, Director Office of  
Air Quality Planning and Standard (MD-10)

TO: David P. Howekamp, Director  
Air Management Division, Region IX

This is in response to your September 1, 1987, memorandum requesting clarification regarding how landfill emissions should be considered for the purpose of determining nonattainment new source review (NSR) applicability under 40 CFR 51.18.

As you are aware, a landfill is subject to NSR if its potential to emit, excluding fugitive emissions, exceeds the 100 tons per year applicable major source cutoff for the pollutant for which the area is nonattainment. Fugitive emissions are defined in 40 CFR (j)(1)(ix) as ". . . those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening." Landfill emissions that could reasonably be collected and vented are therefore not considered fugitive emissions and must be included in calculating a source's potential to emit.

For various reasons, (e.g., odor and public health concerns, local regulatory requirements, economic incentives), many landfills are constructed with gas collection systems. Collected landfill gas may be flared, vented to the atmosphere, or processed into useful energy end products such as high-Btu gas, steam, or electricity. In these cases, for either an existing or proposed landfill, it is clear that the collected landfill gas does not qualify as fugitive emissions and must be included in the source's potential to emit when calculating NSR applicability.

The preamble to the 1980 NSR regulations characterizes nonfugitive emissions as ". . . those emissions which would ordinarily be collected and discharged through stacks or other functionally equivalent openings." Although there are some exceptions, it is our understanding that landfills are not ordinarily constructed with gas collection systems. Therefore, emissions from existing or proposed landfills without gas collection systems are to be considered fugitive emissions and are not included in the NSR applicability determination. This does not mean that the applicant's decision on whether to collect emissions is the deciding factor; in fact, the reviewing authority makes the decision on which emissions would ordinarily be collected and which therefore are not considered fugitive emissions.

It should be noted that NSR applicability is pollutant specific. Therefore, where the landfill gas is flared or otherwise combusted or processed before release to the atmosphere, it is the pollutant released which counts toward NSR applicability. As an example, landfill gas is composed mostly of volatile organic compounds, but when this gas is burned in a flare, it is the type and quantity of pollutants in the exhaust gas (e.g., nitrogen oxides and carbon monoxide) that are used in the NSR applicability determination.

If you have any questions regarding this matter, please contact Gary McCutchen, Chief, New Source Review Section, at FTS 629-5592.

cc: Chief, Air Branch  
Regions I-X

**Appendix F**

**Title V Operating Permits White Paper Number 2**

March 5, 1996

MEMORANDUM

SUBJECT: White Paper Number 2 for Improved Implementation of The Part 70 Operating Permits Program

FROM: Lydia N. Wegman, Deputy Director /s/  
Office of Air Quality Planning and Standards (MD-10)

TO: Director, Office of Ecosystem Protection, Region I  
Director, Environmental Planning and Protection  
Division, Region II  
Director, Air, Radiation and Toxics Division,  
Region III  
Director, Air, Pesticides and Toxics Management  
Division, Region IV  
Director, Air and Radiation Division, Region V  
Director, Multimedia Planning and Permitting Division,  
Region VI  
Director, Air, RCRA and TSCA Division, Region VII  
Assistant Regional Administrator, Office of Pollution  
Prevention, State and Tribal Assistance, Region VIII  
Director, Air and Toxics Division, Region IX  
Director, Office of Air, Region X

Please find attached White Paper Number 2 for improved implementation of part 70 operating permits programs. This guidance is intended to enable State and local agencies to take further steps to reduce the complexity and preparation costs of part 70 permit applications and of the part 70 permits themselves. It is intended to supplement, not obviate, the guidance provided in EPA's "White Paper for Streamlined Development of part 70 Permit Applications" (July 10, 1995). This guidance is consistent with and furthers the goals of the Presidential initiatives to streamline and reinvent government.

The attached guidance is divided into five sections as follows:

- II. A. Streamlining Multiple Applicable Requirements On The Same Emissions Unit(s).
- II. B. Development Of Applications And Permits For Outdated SIP Requirements.

II. C. Treatment Of Insignificant Emissions Units.

II. D. Use Of Major Source And Applicable Requirement Stipulation.

II. E. Referencing Of Existing Information In Part 70 Permit Applications And Permits.

Streamlining will lead to substantial reductions in permitting burdens and improved part 70 implementation by allowing for the first time multiple applicable emissions limits and work practices expressed in different forms and averaging times to be reduced to a single set of requirements (which can be an alternative to all those requirements being subsumed). It will also allow various monitoring, recordkeeping, and reporting requirements that are not critical to assuring compliance with the streamlined (most stringent) limit to be subsumed in the permit. Any such streamlining must provide that compliance with the streamlined limit would assure compliance with all applicable requirements. In addition, substantial reductions in burden are expected to result from the reduced confusion and cost where locally adopted rules differ from the EPA-approved State implementation plan, the streamlined treatment of insignificant emissions units, the use of stipulations by sources as to which regulations apply, and the cross referencing rather than repetition of certain existing information.

There is an immediate need for the implementation of this guidance. A large number of sources have filed complete part 70 applications, and increasing numbers of these submittals are being processed for permit issuance. I strongly encourage you to work with your States to effect near-term use of this guidance.

Substantial contributions to this White Paper have come from the California Title V Implementation Working Group. I want to thank you and your staff for your support and Region IX in particular for their leadership and considerable efforts in developing and completing this paper. I invite your suggestions on what additional guidance is needed to improve further the initial implementation of title V. If you should have any questions regarding the attached guidance, please contact Michael Trutna at (919) 541-5345, Ginger Vagenas of Region IX at (415) 744-1252, or Roger Powell at (919) 541-5331.

Attachment

cc: M. Trutna (MD-12)  
G. Vagenas (Region IX)  
R. Powell (MD-12)  
A. Schwartz (2344)

WHITE PAPER NUMBER 2 FOR IMPROVED IMPLEMENTATION  
OF THE PART 70 OPERATING PERMITS PROGRAM

U.S. ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF AIR QUALITY PLANNING AND STANDARDS

March 5, 1996

Contacts: Michael A. Trutna (919) 541-5345  
Ginger Vagenas (415) 744-1252  
Roger Powell (919) 541-5331

**WHITE PAPER NUMBER 2 FOR IMPROVED IMPLEMENTATION  
OF THE PART 70 OPERATING PERMITS PROGRAM**

March 5, 1996

**I. OVERVIEW.**

This guidance is intended to enable State and local agencies to take further steps to reduce the complexity and preparation costs of part 70 permit applications and of the part 70 permits themselves and to remove unintended barriers and administrative costs. It is also intended to build on and expand the guidance provided in the Environmental Protection Agency's (EPA) "White Paper for Streamlined Development of Part 70 Permit Applications" (July 10, 1995). White Paper Number 2 supplements, not obviates, the first White Paper. Both papers should be consulted for guidance in improving the implementation of title V of the Clean Air Act (Act) (i.e., part 70 operating permits programs). In particular, White Paper Number 2 is designed to simplify the treatment of overlapping regulatory requirements and insignificant emissions units and to clarify the use of citations and incorporation by reference in the part 70 permitting process. This effort is consistent with and furthers the goals of the Presidential initiatives to streamline and reinvent government.

Substantial contributions to this White Paper have come from the California Title V Implementation Working Group (Working Group). The California Air Resources Board and several California air districts and industries which (together with EPA) make up the Working Group have decades of experience with operating permits. These operating permits programs are generally just one component of air programs that, in many districts, also include local emissions standards (often with associated recordkeeping and reporting requirements), monitoring requirements, inspections, source testing, and new source review (NSR). The EPA has found the insights and recommendations of the Working Group extremely useful in integrating these various requirements using the part 70 permitting process. While much of the guidance contained herein addresses situations arising in California, it is available for use nationwide.

This guidance is divided into five sections and two attachments which are generally summarized as follows (the reader is, however, referred to the applicable main sections of the guidance for more detailed information):

Section II. A. Streamlining Multiple Applicable Requirements On The Same Emissions Unit(s).

The EPA and States have developed different and often overlapping applicable requirements governing the same emissions units to serve the purposes of different air programs. As a result, emissions units at a stationary

source may be subject to several parallel sets of requirements. This can result in some of the requirements being redundant and unnecessary as a practical matter, even though the requirements still legally apply to the source. In cases where compliance with a single set of requirements effectively assures compliance with all requirements, compliance with all elements of each of the overlapping requirements may be unnecessary and could needlessly consume resources. For example, a source could be subject to overlapping standards that result in two or more different emissions limits for the same pollutant and two or more source monitoring requirements for instrumentation, recordkeeping, and reporting.

Today's guidance describes how a source may propose streamlining to distill or "streamline" multiple overlapping requirements into one set that will assure compliance with all requirements. According to the guidance, multiple emissions limits may be streamlined into one limit if that limit is at least as stringent as the most stringent limit. (Limitations that apply to the streamlining of acid rain requirements are described in the main section of this guidance.) If no one requirement is unambiguously more stringent than the others, the applicant may synthesize the conditions of all the applicable requirements into a single new permit term that will assure compliance with all requirements. The streamlined monitoring, recordkeeping, and reporting requirements would generally be those associated with the most stringent emissions limit, providing they would assure compliance to the same extent as any subsumed monitoring. Thus, monitoring, recordkeeping, or reporting to determine compliance with subsumed limits would not be required where the source implements the streamlined approach.

It is important to emphasize that while streamlining may be initiated by either the applicant or the permitting authority, it can only be implemented where the permit applicant consents to its use.

## Section II. B. Development Of Applications And Permits For Outdated SIP Requirements.

Historically, long periods of time have been required to review and approve (or disapprove) SIP revisions. The EPA has undertaken a number of reforms to its SIP approval process and is continuing to make significant progress in reducing the amount of time required for taking action on SIP revisions. Despite the progress we have made to date, there are many local rules now pending EPA review and approval for inclusion in the SIP. The gap between the approved SIP and the State rules is of concern because States and local agencies enforce their current rules (which

are usually more stringent than the approved SIP rules) and often, as a practical matter, no longer enforce the superseded and outdated rules in the SIP. On the other hand, EPA only recognizes and can only enforce the SIP-approved rules. This situation can cause confusion and uncertainty because some sources are effectively subject to two different versions of the same rules. Part 70's application, certification, and permit content requirements highlight this longstanding concern.

The most problematic situation arising from the gap between the approved SIP and the State rules is where a technology-forcing rule that has been approved into the SIP is found by the State to be impossible to meet. Under these circumstances, the State would generally adopt a relaxation of this rule and submit it to EPA as a SIP revision. Until EPA is able to take action on the submitted relaxation, sources remain subject to a rule that is impossible to meet.

This section of the guidance largely addresses the problem by authorizing permitting authorities and their sources to base permit applications on State and local rules that have been submitted for SIP approval, rather than on the potentially obsolete approved SIP provisions that they would replace. Such reliance on pending State and local rules is proper when the permitting authority has concluded that the pending rule will probably be approved, or when the source believes it can show that the pending rule is more stringent than the rule it would replace. However, if the pending rule is not more stringent than the rule it would replace, the permit cannot be issued until the pending rule is approved.

#### Section II. C. Treatment Of Insignificant Emissions Units.

This section provides for the streamlined treatment of generally applicable requirements that apply to "insignificant" emissions units (IEU's). It is intended to address current concerns that resources will be unnecessarily consumed by matters of trivial environmental importance.

The guidance clarifies that the permitting authority has broad discretion to tailor the permit application and permit for small equipment and activities as long as compliance with Federal requirements is assured. For both the permit application and the permit, information on IEU's may be generically grouped and listed without emissions estimates, unless emissions estimates are needed for another purpose such as determining the amount of permit fees that are calculated using total source emissions. This approach would utilize standard permit conditions with minimal or no reference to any specific emissions unit or activity,

provided that the scope of the requirement and its enforcement are clear.

The EPA also believes that for IEU's, a responsible official's initial compliance certification may be based on available information and the latest cycle of required information.

The guidance further provides that the permitting authority can use broad discretion in determining the nature of any required periodic monitoring. The EPA's policy on IEU's is based on the belief that these emissions points are typically associated with inconsequential environmental impacts.

#### Section II. D. Use Of Major Source And Applicable Requirement Stipulation.

There have been concerns expressed that extensive new emissions data would be needed to verify major source status or the applicability of Federal requirements. White Paper Number 2 clarifies that for applicability purposes, a source familiar to the permitting authority may simply stipulate in its application that it is major or that Federal requirements apply as specified in the application. The paper clarifies that there is no need to prepare and submit extensive information about the source that "proves" it is subject to any requirements that it stipulates are applicable. This does not affect the requirement to provide information that is otherwise required by part 70.

#### Section II. E. Referencing Of Existing Information In Part 70 Permit Applications And Permits.

Concerns have been raised that a source must re-prepare and resubmit information that is readily available, or that the permitting authority already has, to complete part 70 permit applications. In addition, similar concerns have been voiced regarding the large and potentially unnecessary burden of developing permits which repeat rather than reference certain types of regulatory requirements that apply to the source (e.g., monitoring and testing protocols). The guidance clarifies that, in general, the permitting authority may allow information to be cited or cross-referenced in both permits and applications if the information is current and readily available to the permitting agency and to the public. The citations and references must be clear and unambiguous and be enforceable from a practical standpoint. After permits specify which emissions limits apply to identified emissions units, cross-referencing can be authorized for other requirements (e.g., monitoring, recordkeeping, and reporting).

Attachment A provides guidance on using the part 70 permit process to establish alternative test methods, while Attachment B provides example SIP language that could be used by both part 70 and non-part 70 sources to establish alternative requirements without the need for a prior source-specific SIP revision. This guidance should be particularly useful to those seeking greater certainty or to establish alternative test methods to those now approved by EPA. **[Note that Sections III. and beyond in Attachment B are currently in draft form.]**

Streamlining will lead to substantial reductions in permitting burdens by allowing for the first time multiple applicable emissions limits and work practices expressed in different forms and averaging times to be reduced to a single set of requirements. It will also lower current burden levels by allowing various monitoring, recordkeeping, and reporting requirements that are not critical to assuring compliance with the streamlined (most stringent) limit to be subsumed in the permit. In addition, substantial reductions in burden are expected to result from the reduced confusion and cost where locally adopted rules differ from the EPA-approved SIP, the streamlined treatment of insignificant emissions units, and the use of stipulations and the cross-referencing rather than repetition of certain existing information in part 70 applications and permits.

The EPA believes that the guidance contained herein may be implemented by permitting authorities and sources without revisions to part 70 programs, unless a provision is specifically prohibited by State regulations. In some situations, EPA will be proceeding in parallel to issue clarifying rules. The EPA strongly encourages States to allow sources to take advantage of the streamlining opportunities provided in this guidance. The Agency also suggests the permitting authority develop information about permits issued with successful streamlining and make it available to other similar sources to help avoid repetitive costs.

Sources are advised to consult with their permitting authority to understand how the policies of this White Paper will be implemented. In several situations (particularly those where sources have already filed complete applications), permitting authorities may choose to propose streamlining options and, if mutually agreeable, work with the source to support a draft permit containing a streamlined limit. Where EPA is the permitting authority pursuant to part 71 regulations, the Agency will implement both White Papers to the extent possible and promote similar implementation where EPA delegates responsibility for the part 71 program to a State.

The policies set out in this paper are intended solely as guidance, do not represent final Agency action, and cannot be relied upon to create any rights enforceable by any party.

## II. ADDITIONAL GUIDANCE ON STREAMLINED DEVELOPMENT OF PART 70 PERMITS AND APPLICATIONS.

### A. Streamlining Multiple Applicable Requirements<sup>1</sup> On The Same Emissions Unit(s).<sup>2</sup>

#### 1. Issue.

Can multiple redundant or conflicting requirements (emissions limits, monitoring, recordkeeping, reporting requirements) on the same emissions unit(s) be streamlined into a single set of understandable and enforceable permit conditions? May an applicant propose to minimize or consolidate applicable requirements? May a permitting authority develop such a proposal? How would a permit application with a streamlining proposal satisfy compliance certification requirements?

#### 2. Guidance.

A source, at its option, may propose in its application to streamline multiple applicable requirements into a single set of permit terms and conditions<sup>3</sup>. The overall objective would be to

---

<sup>1</sup>Title IV applicable requirements are an exception to this general rule. As set out in § 72.70(b), to the extent that any requirements of part 72 and part 78 are inconsistent with the requirements of part 70, part 72 and part 78 will take precedence and will govern the issuance, denial, revision, reopening, renewal, and appeal of the acid rain portion of an operating permit. The subsequent descriptions of streamlining therefore apply to requirements under parts 72 and 78 only to the extent that such requirements are, at the option of the applicant, used as streamlining requirements because they are the most stringent applicable requirements.

<sup>2</sup>Emissions unit(s) means any part or activity of a stationary source that emits or has the potential to emit any regulated air pollutant (as defined in section 70.2) or any pollutant listed under section 112(b) of the Act. It is used in this paper to include specifically a grouping of emissions units at a stationary source that shares the same applicable requirement and compliance demonstration method for a given pollutant.

<sup>3</sup>The EPA recognizes that the described streamlining process may not be allowed by all State regulations or be warranted or desired for all applicable requirements. Similarly, partial streamlining (i.e., the streamlining of some, but not all, applicable requirements that apply to the same emissions units) may be most cost effective where difficult comparisons or correlations are needed for streamlining the other remaining applicable requirements. In addition, there is no barrier to more extensive

determine the set of permit terms and conditions that will assure compliance with all applicable requirements for an emissions point or group of emissions points so as to eliminate redundant or conflicting requirements. Otherwise applicable requirements that are subsumed in the streamlined requirements could then be identified in a permit shield. The process would be carried out in conjunction with the submittal and review of a part 70 permit application, as an addendum to an application, or as an application for a significant revision to the part 70 permit (unless EPA in its revisions to part 70 authorizes permitting authorities to use a less extensive permit revision process). The EPA plans to revise part 70 to provide that the compliance certification required with initial application submittals may be based on the proposed streamlined applicable requirement where there is sufficient source compliance information on which to base such a certification.

The permitting authority, at its option, may evaluate multiple applicable requirements for a source category and predetermine an acceptable streamlining approach. Such evaluations should be made readily available to applicants. It is up to the applicant, however, to request in its application that such streamlined requirements be contained in the part 70 permit. Where streamlining would be of mutual interest, the permitting authority and the source could work together during the permit development stage to establish a basis for a streamlined limit prior to the issuance of a draft permit. This cooperative activity must result in a record consistent with this guidance which supports the draft permit containing the streamlined requirement. The approach might be particularly useful where a source has already submitted a complete part 70 permit application and the permitting authority does not want to require the source to submit a formal amendment to its application. Any streamlining demonstration must be promptly submitted to EPA upon its availability and in advance of draft permit issuance unless EPA has previously agreed with the permitting authority not to require it (e.g., the proposed streamlining is of a simple and/or familiar type with no new concerns).

In addition, general permits could be useful to allow the transfer of streamlined requirements from the first source to be covered by them to other similar sources or emissions units. The information development and review conducted as part of streamlining for an individual source can be used by the permitting authority to generate a general permit for similar sources or portions of sources. If a general permit were used, EPA and public review beyond that needed to issue the general permit would not be necessary when sources subsequently applied for the streamlined permit conditions established under the

---

streamlining occurring in the future.

general permit. Even where a general permit is not issued, the availability of information obtained from the streamlining of one source may be useful as a model for future streamlining actions involving other similar sources.

Streamlined permit terms should be covered by a permit shield. The permit shield will result in an essential degree of certainty by providing that when the source complies with the streamlined requirement, the source will be considered to be in compliance with all of the applicable requirements subsumed under the streamlined requirement. Where the program does not now provide for a permit shield, the permit containing streamlined requirements should clarify this understanding (See section II.A.3. discussion). Permitting authorities without provisions for permit shields are encouraged to add a permit shield provision at the first opportunity, if they wish to realize fully the benefits of streamlining.

Sources that opt for the streamlining of applicable requirements must demonstrate the adequacy of their proposed streamlined requirements. The following principles should govern their streamlining demonstrations:

a. The most stringent of multiple applicable emissions limitations for a specific regulated air pollutant on a particular emissions unit must be determined taking into account<sup>4,5</sup>:

o Emissions limitation formats (emissions limits in different forms must be converted to a common format and/or units of measure or a correlation established among different formats prior to comparisons);

o Effective dates of compliance (to the extent different);

---

<sup>4</sup>Applicable requirements mean those requirements recognized by EPA, as defined in § 70.2. State and local permitting authorities may modify, eliminate, or streamline "State-only" requirements based on existing State or local law and procedures.

<sup>5</sup>Sources may, in the interest of greater uniformity, opt to expand the scope of an applicable requirement to more emissions units so that the same requirements would apply over a larger section of the plant or its entirety, provided compliance with all applicable requirements is assured. Though a permit may through streamlining expand the scope of applicable requirements to include new emissions units, it may not change the basis on which compliance is determined (e.g., emissions unit by emissions unit, if that is the intent of the applicable requirement).

- o Transfer or collection efficiencies (to the extent relevant);
- o Averaging times<sup>6</sup>; and
- o Test methods prescribed in the applicable requirements<sup>7</sup>.

Limitations for specific pollutants can be subsumed by limitations on classes of pollutants providing the applicant can show that the streamlined limit will regulate the same set of pollutants to the same extent as the underlying applicable requirements. For example, a volatile organic compound (VOC) limitation could effectively subsume an organic hazardous air pollutant (HAP) limitation for a constituent such as hexane, provided the VOC limit is at least as stringent as the hexane limitation. Where a single VOC limit subsumes multiple HAP limits, the permit must be written to assure that each of the subsumed limits will not be exceeded. However, a limit for a single or limited number of compounds cannot be used to subsume a limit for a broader class (e.g., a hexane limit for a VOC limit) because this would effectively deregulate any of the class that are not covered by the more limited group.

b. Work practice requirements must be treated as follows:

- o Supporting An Emissions Limit. A work practice requirement directly supporting an emissions limit

---

<sup>6</sup>While the streamlining of requirements with varying averaging times is viable under this policy, in no event can requirements which are specifically designed to address a particular health concern (including those with short term averaging times) be subsumed into a requirement which is any less protective.

<sup>7</sup>The predominant case is expected to involve test methods which have been EPA approved either as part of the SIP or as part of a Federal section 111 or 112 standard. If a permitting authority is seeking to base a streamlined limit on an alternative or new test method relative to the ones already approved by EPA for the SIP or a section 111, or section 112 standard, some additional steps are needed to complete the proposed streamlining. As described in more detail in Attachment A, permitting authorities may only implement streamlining which involves alternative or new test methods within the flexibility granted by the SIP and any delegation of authority from EPA (where section 111/112 standards are involved). With respect to SIP requirements, the ability for a permitting authority to authorize use of a different test method depends on the governing language contained in the SIP. Attachment B contains example SIP language which provides a mechanism that can establish an alternative applicable requirement in such cases without the need for source specific SIP revisions.

(i.e., applying to the same emissions point(s) covered by the emissions limit) is considered inseparable from the emissions limit for the purposes of streamlining emissions limits. The proposed streamlined emissions limit must include its directly supporting work practices, but need not include any work practice standards that are associated with and directly support the subsumed limit(s);

o Not Supporting An Emissions Limit. Similar work practice requirements which apply to the same emissions or emissions point but which do not directly support an emissions limit may be streamlined (e.g., different leak detection and repair (LDAR<sup>8</sup>) programs). The streamlined work practice requirement may be composed of provisions/elements (e.g., frequency of inspection, recordkeeping) from one or more of the similar work practice requirements, provided that the resulting composite work practice requirement has the same base elements/provisions as the subsumed work practice requirements (e.g. has a frequency of inspection or has recordkeeping if the subsumed work practice requirements have these elements/provisions).

Multiple work practice requirements which apply to different emissions or emissions points cannot be streamlined.

c. Monitoring, reporting, and recordkeeping requirements should not be used to determine the relative stringency of the applicable requirements to which they are applicable.

d. Where the preceding guidance does not allow sufficient streamlining or where it is difficult to determine a single

---

<sup>8</sup>For LDAR programs, stringency comparisons likely will be based on the aggregate requirements of each LDAR program (screening levels, frequency of inspection, repair periods, etc.) and the resultant overall actual emissions reduction expected from the affected equipment. In cases where a convincing demonstration cannot be made based on existing information or the regulations themselves have not clearly defined the expected emissions reduction, verifying test data may be required. Alternatively, the applicant, the permitting authority, and EPA can work together to devise a method consistent with the principles of EPA's "Protocol For Equipment Leak Emissions Estimation" (EPA-453/R-95-017, November 1995) for determining relative stringency. Where a demonstration of the relative stringency of LDAR programs as applied to the affected equipment is not feasible, sources may modify elements of a particular LDAR program to produce a program that clearly (i.e., without further analysis) assures compliance with the other applicable LDAR programs.

most stringent applicable emissions limit by comparing all the applicable emissions limits with each other, sources may perform any or all the following activities to justify additional or different streamlining:

- o Construct an alternative or hybrid emissions limit<sup>9</sup> that is at least as stringent as any applicable requirement;
- o Use a previously "State-only" requirement as the streamlined requirement when it is at least as stringent as any applicable Federal requirement it would subsume (this requirement would then become a federally-enforceable condition in the part 70 permit);
- o Use a more accurate and precise test method than the one applicable (see footnote number 7) to eliminate doubt in the stringency determination; or
- o Conduct detailed correlations to prove the relative stringency of each applicable requirement.

e. The monitoring, recordkeeping, and reporting requirements associated with the most stringent emissions requirement are presumed appropriate for use with the streamlined emissions limit, unless reliance on that monitoring would diminish the ability to assure compliance with the streamlined requirements.<sup>10</sup> To evaluate this presumption, compare whether the monitoring proposed would assure compliance with the streamlined limit to the same extent as would the monitoring applicable to each subsumed limit. If not, and if the monitoring associated with the subsumed limit is also relevant to and technically feasible for the streamlined limit, then monitoring associated with a subsumed limit (or other qualifying monitoring<sup>11</sup>) would be

---

<sup>9</sup>Title V allows for the establishment of a streamlined requirement, provided that it assures compliance with all applicable requirements it subsumes. However, EPA recognizes that construction of such hybrid or alternative limits can be more complicated than the situation where the streamlined limit is one of the applicable emissions limits. Accordingly, sources and States may need more time to agree on acceptable demonstrations and may wish to defer such streamlining until after issuance of the initial part 70 permit.

<sup>10</sup>Quality assurance requirements pertaining to continuous monitoring systems should be evaluated using the same approach.

<sup>11</sup>The applicant may propose alternative monitoring of equal rigor. Permitting authorities may only implement streamlining which involves alternative or new monitoring methods within the

included in the permit.<sup>12</sup> The recordkeeping and reporting associated with the selected monitoring approach may be presumed to be appropriate for use with the streamlined limit<sup>13,14,15</sup>.

f. Permitting authorities must include citations to any subsumed requirements in the permit's specification of the origin and authority of permit conditions. In addition, the part 70 permit must include any additional terms and conditions as necessary to assure compliance with the streamlined requirement. In all instances, the proposed permit terms and conditions must be enforceable as a practical matter.

### 3. Process.

---

flexibility granted by the SIP and any delegation of authority from EPA (where section 111/112 standards are involved).

<sup>12</sup>Permitting authorities and sources should presume that existing monitoring equipment [such as continuous emissions monitors (CEMs)] required and/or currently employed at the source should be retained. A permitting authority or applicant would have the opportunity to demonstrate that retention of such monitoring equipment is inappropriate, such as when the monitoring equipment is no longer relevant or is technically infeasible (e.g., the source has switched to a closed loop process without emissions or the streamlined limit corresponds to levels too low for a monitor to measure, such as SO<sub>2</sub> emissions from a boiler firing pipeline quality natural gas.)

<sup>13</sup>Where recordkeeping is the means of determining compliance (e.g., in the miscellaneous metal parts and products coating rules, the typical role of monitoring is fulfilled by recordkeeping), the appropriate recordkeeping would be determined in the same manner described for monitoring.

<sup>14</sup>Where a standard includes recordkeeping associated with a limit in addition to recordkeeping linked to a monitoring device (e.g., a coating facility that has recordkeeping requirements pertaining to coating usage, as well as recordkeeping for monitoring associated with an add-on control), both types of recordkeeping must be incorporated into the permit.

<sup>15</sup>The result offers considerable potential to reduce the different reporting burdens associated with different applicable requirements well beyond what was previously available (e.g., synchronizing the required reporting cycles from different applicable requirements to coincide with the most stringent one beginning at the earliest required date). (See also Final General Provisions, § 63.10(a)(5), March 16, 1994.)

Streamlining may be accomplished through an applicant proposing to streamline multiple requirements applicable to a source, the permitting authority developing streamlining options for sources or source categories that would be subsequently accepted at the election of permittees, or the applicant working in agreement with the permitting authority after filing an initial complete application. The first six of the following actions would be taken by the source or, as appropriate, by the permitting authority. The level of effort to complete these actions will depend on the relative complexity of the streamlining situation. The permitting authority would then perform steps seven and eight.

**Step One** - Provide a side-by-side comparison of all requirements included in the streamlining proposal that are currently applicable and effective for the specific emissions units of a source<sup>16</sup>. Distinguish between requirements which are emissions and/or work practice standards, and monitoring and compliance demonstration provisions.

**Step Two** - Determine the most stringent emissions and/or performance standard (or any hybrid or alternative limits as appropriate) consistent with the above streamlining principles and provide the documentation relied upon to make this determination. This process should be repeated for each emissions unit pollutant combination for which the applicant is proposing a streamlined requirement.

**Step Three** - Propose one set of permit terms and conditions (i.e., the streamlined requirements) to include the most stringent emissions limitations and/or standards, appropriate monitoring and its associated recordkeeping and reporting (see section II.A.2.e.), and such other conditions as are necessary to assure compliance with all applicable requirements.

---

<sup>16</sup>A future applicable requirement (e.g., MACT standard newly promulgated under section 112 with a compliance date 3 years in the future) may be determined to be the most stringent applicable requirement if compliance with it would assure compliance with less stringent but currently applicable requirements. In such a case, the source may propose either a streamlined requirement based on immediate compliance with the future applicable requirement or it may opt for a phased approach where the permit would contain two separate time-sensitive requirements. Under the latter approach, one streamlined requirement addressing all currently applicable requirements would be defined to be effective until the future applicable requirement became effective. The permit would also contain a second streamlined requirement which also addressed the future applicable requirement and would become the new streamlined requirement after expiration of the first streamlined requirement.

**Step Four** - Certify compliance (applicant only) with applicable requirements. The EPA is planning to revise its part 70 regulations to provide that a source may certify compliance with only the proposed streamlined limit. Until this is accomplished, EPA recommends that a source certifying compliance only with the streamlined limit indicate this in an attachment to the certification, so that it is clear that the certification is being made with respect to a set of terms and conditions that the source believes "assure compliance" with all applicable requirements. In any event, a source may only certify compliance with a streamlined limit if there is source compliance data on which to base such a certification. (Such data should be available where the streamlined requirement is itself an applicable requirement and may be available if the streamlined limit is an alternative limit, e.g., a previously State-only emissions limitation). If there is not, then certifications must instead be made relative to each of the applicable requirements judged to be less stringent and must be based on data otherwise required under them to make this point clear.

**Step Five** - Develop a compliance schedule to implement any new monitoring/compliance approach relevant to the streamlined limit if the source is unable to comply with it upon permit issuance. The recordkeeping, monitoring, and reporting requirements of the applicable requirements being subsumed would continue to apply in the permit (as would the requirement for the source to operate in compliance with each of its emissions limits) until the new streamlined compliance approach becomes operative.

**Step Six** - Indicate in the application submittal that streamlining of the listed applicable requirements under a permit shield (where available) is being proposed and propose the establishment of a permit shield which would state that compliance with the streamlined limit assures compliance with the listed applicable requirements. All emission and/or performance standards not subsumed by the streamlined requirements must be separately addressed in the part 70 permit application.

**Step Seven** - Evaluate the adequacy of the proposal and its supporting documentation. The EPA recommends that the permitting authority communicate its findings to the applicant and provide reasonable opportunity for the applicant to accept the findings or propose a resolution of the differences before issuance of a draft permit for public review. Where the permitting authority determines that the streamlining proposal is inadequate, the source, to retain its application shield, must expeditiously resolve any problems identified by the permitting authority or update

its prior application based on the individual applicable requirements previously proposed for streamlining.

**Step Eight** - Note the use of this process in any required transmittal of a part 70 application, application summary, or revised application to EPA and include the streamlining demonstration and supporting documentation in the public record. When the source is required to provide a copy of the application (or summary) directly to EPA, it must note the proposed use of streamlining. A copy of the streamlining demonstration must be submitted promptly to EPA along with the required copy of the application or application summary (where a summary may be submitted to EPA in lieu of the entire part 70 permit application) unless EPA has previously agreed with the permitting authority not to require it (e.g., the proposed streamlining is of a simple and/or familiar type with no new concerns).

#### 4. Enforcement.

All terms and conditions of a part 70 permit are enforceable by EPA and citizens, unless certain terms are designated as being only State (or locally) enforceable. In addition, a source violating a streamlined emissions limitation in the part 70 permit may be subject to enforcement action for violation of one (or more) of the subsumed applicable emissions limits to the extent that a violation of the subsumed emissions limit(s) is documented.

Upon receiving a part 70 permit, a source implementing the streamlined approach would not be subject to an EPA enforcement action for any failure to meet monitoring, recordkeeping, and reporting requirements that are subsumed within the streamlined requirement and specified under the permit shield. These requirements would no longer be independently enforceable once the permit has been issued, provided that the source attempts in good faith to implement the monitoring, recordkeeping, and reporting requirements specified in the permit.

If subsequently the permitting authority or EPA determines that the permit does not assure compliance with applicable requirements, the permit will be reopened and revised.

#### 5. Discussion.

As sources subject to title V identify all applicable requirements for inclusion in part 70 permit applications, they may find that multiple applicable requirements affect the same pollutant or performance parameter for a particular emissions unit. Likewise, the requirements of federally-enforceable terms and conditions in preconstruction or operating permits may overlap with the requirements of other federally-enforceable rules and regulations.

In these instances, a source may be in compliance with the overall emissions limit of each of the applicable requirements, but be required to comply with a multitude of redundant or conflicting monitoring, reporting, or recordkeeping requirements. For example, a source owner faced with two emissions limits for the same pollutant at a specific emissions point may be required to install separate monitoring instrumentation and submit separate monitoring reports for each, even though one monitor can effectively assure compliance with both emissions limits. Furthermore, the recordkeeping and reporting associated with the unnecessary instrumentation may create an administrative burden for both the facility and the implementing agency without an associated gain in compliance assurance. Prior to title V there has been no federally-enforceable means to resolve this situation.

The EPA encourages permitting authorities to allow use by the permit applicant of the part 70 permit issuance process to streamline multiple applicable requirements to the extent the conditions of this policy can be met. In this way, the part 70 process with its procedural safeguards can be used to focus all concerned parties on providing for compliance with a single set of permit terms that assure compliance with multiple applicable requirements instead of maintaining the costs of multiple sets of controls, monitoring, recordkeeping, and reporting approaches.

The legal basis for streamlining multiple applicable requirements relies on section 504(a), which requires that title V permits contain emissions limits/standards and other terms as needed to assure compliance with applicable requirements. This section notably does not require repetition of all terms and conditions of an applicable requirement when another applicable requirement or part 70 permit condition (i.e., streamlined requirement) could be fashioned to otherwise assure compliance with that applicable requirement.

Section 504(f) lends additional certainty to permit streamlining. It specifically provides that the permitting authority may authorize that compliance with the permit may be deemed to be compliance with the Act provided that the permit includes all applicable requirements. Thus, this section allows the permitting authority to issue a permit containing a shield which protects a source against a claim that it is violating any applicable requirements listed in the permit shield as being subsumed under the streamlined requirement, provided that the source meets the permit terms and conditions that implement the streamlined requirement.

Part 70 is also receptive to the issuance of streamlined permits. It contains parallel language to the statute for emissions limits and for permit shields in §§ 70.6(a)(1) and (f). Although language in § 70.6(a)(3) may appear to restrict streamlining by requiring that all "applicable" monitoring,

recordkeeping, and reporting requirements be placed in the permit, EPA did not intend for these provisions to preclude streamlining. Instead, the Agency believes that the provisions should be consistent with the flexibility for streamlining provided in section 504(a) of the Act and in § 70.6(a)(1). To require otherwise would be anomalous and could frustrate legitimate streamlining efforts. The EPA intends to revise part 70 to reflect this understanding in a future rulemaking.

Streamlining may be limited in cases where an applicable requirement defines specific monitoring requirements as the exclusive means of compliance with an applicable emissions limit. Some interpret these cases to require that only one set of monitoring requirements may be used to determine compliance and that only these requirements may appear in the part 70 permit. The EPA believes instead that section 504(a) supersedes any need for such exclusive monitoring, but nonetheless recommends that States address any potential concerns by adopting certain SIP language in the future. States that choose to revise their existing SIP's to contain authorizing language to overcome any SIP exclusivity problems may use the example language in Attachment B. The EPA believes that similar flexibility should be provided to non-part 70 sources as well. To that end, Attachment B also provides a SIP process (currently in draft form) which would allow similar flexibility for non-part 70 sources.

With respect to NSR, States can process, in parallel with the part 70 permit issuance process, a revision to an existing NSR permit as necessary to resolve any exclusivity concerns within existing NSR permits (See first White Paper).

Currently the implementing regulations for section 112(1) at 40 CFR part 63, subpart E represent an additional constraint on the streamlining of applicable requirements in part 70 permits but only where a State or local agency has accepted a delegation of authority for a particular maximum achievable control technology (MACT) standard by virtue of its commitment to replace the Federal section 112 emissions standard with the State's own standard or program during the part 70 permit issuance process and using the procedures established in the Subpart E rule at § 63.94.. In § 63.94, EPA has specified the criteria for approving such alternative limits and controls to meet an otherwise applicable section 112 requirement. These criteria must be satisfied to ensure that, after a State accepts delegation under § 63.94, any change to the Federal rule results in permit requirements that, among other things:

- o Reflect applicability criteria no less stringent than those in the otherwise applicable Federal standards or requirements;

- o Require levels of emissions control for each affected source and emissions point no less stringent than those contained in the Federal standards or requirements;
- o Require compliance and enforcement measures for each affected source and emissions point no less stringent than those in the Federal standards or requirements;
- o Express levels of control and compliance and enforcement measures in the same form and units of measure as the Federal standard or requirement for § 63.94 program substitutions;
- o Assure compliance by each affected source no later than would be required by the Federal standard or requirement.

Thus, when a State or local agency, after receiving § 63.94 delegation, seeks to replace a Federal section 112 emissions standard with requirements arising from its own air toxics standard or program (such as a toxics NSR program) during the part 70 permit issuance process, streamlining must take place by meeting both the criteria of § 63.94 and, except where contradictory, the criteria of this guidance. However, because most States are planning to take straight delegation of Federal emissions standards through subpart E procedures that do not rely on the part 70 permit issuance process, the EPA believes that the subpart E criteria for streamlining applicable requirements will be necessary only in a minority of instances. In the majority of cases, where a State takes delegation of a Federal standard (e.g., through straight delegation), the applicable section 112 requirements could be streamlined by following only the criteria outlined in section A.2., above. Where there are a large number of sources in the same category subject to a MACT standard for which the State has a regulation with equivalent requirements, EPA recommends that the State explore delegation options under § 63.93 to best utilize available resources.

It should be noted that the current subpart E rule may be subject to change as a result of pending litigation. Currently, EPA intends to revise the rule within the parameters of the Court's decision to allow greater flexibility for approving State air toxics standards and programs and to minimize or remove (as appropriate) any constraint that subpart E might impose on the streamlining of applicable requirements in part 70 permits.

Finally, States are strongly encouraged to adopt regulatory provisions allowing permitting authorities to grant the permit shield where they cannot now do so. The permit shield is an effective means to clarify that for applicable requirements listed as subsumed under the streamlined requirements, compliance with the streamlined requirements is deemed to also be compliance with the subsumed requirements. Such an understanding is essential to support and defend the issuance of any permit which

provides for the streamlined treatment of multiple applicable requirements.

If a permit shield is not available, a permittee can still be afforded significant enforcement protection by an explicit agency finding that in its judgment the streamlined permit term indeed provides for full compliance with all the permit limits that it subsumes. In such a case, it is imperative that the permit contain language that lists the applicable requirements being subsumed into the streamlined requirement and states that compliance with the streamlined requirement will be deemed compliance with the listed requirements.

## **B. Development Of Applications And Permits For Outdated SIP Requirements.**

### 1. Issue.

Can sources file part 70 permit applications on the basis of locally adopted rules pending EPA SIP approval rather than the current SIP requirements? Can sources certify their compliance status on the same basis? Under what circumstances can permitting authorities issue and/or later revise part 70 permits based on such locally adopted rules?

### 2. Guidance.

a. General. In the first White Paper (section II.B.6.), EPA described a mechanism for simplifying permits where a source is subject to both a State adopted rule that is pending SIP approval and the approved SIP version of that rule. Under that approach, the pending SIP requirements would be incorporated into the State-only portion of the permit and would become federally enforceable upon EPA approval of the SIP. The EPA believes that in most instances, the approach described in the first White Paper adequately addresses the described problem. In some areas (most notably California), however, a sizable backlog of pending SIP revisions exists, and a more far-reaching solution is needed. In today's guidance, therefore, another approach that may be used by EPA and permitting authorities to address this situation is described.

Under this new alternative, the permitting authority may allow that application completeness initially be based on locally adopted rules including those which would relax current (i.e., federally-approved) SIP requirements, provided that (1) the local rule has been submitted to EPA as a SIP revision, and (2) the permitting authority reasonably believes that the local rule (not the current SIP rule) will be the basis for the part 70 permit.

Where the permitting authority or the source has demonstrated to EPA's satisfaction<sup>17</sup> that the local rule is more stringent and therefore assures compliance with the current SIP for all subject sources, a permit application relying on the local rule may be deemed to be complete and a permit containing the requirements of the local rule rather than the current SIP could be issued for part 70 purposes. That is, consistent with section 504(a) of the Act, the part 70 permit need only contain emissions limits and other terms and conditions (i.e., the more stringent local rule) as needed to assure compliance with the applicable requirement (i.e., the current SIP regulation).

An EPA finding that a submitted rule assures compliance with the approved SIP rule would be a preliminary indication of EPA's belief that a part 70 permit incorporating the terms of the submitted rule would also assure compliance with the approved SIP. Such a finding would not equate to rulemaking, and so would not constitute a revision of the SIP. Therefore, a preliminary finding would not necessarily ensure that the proposed revision would ultimately be approved by EPA, nor would it protect a source from enforcement of the approved SIP.<sup>18</sup> Further, such a finding would not predetermine the outcome of the part 70 permit proceeding. Reviewers would have the ability to evaluate any proposed permit terms or conditions based on pending SIP revisions to determine whether the permit assures compliance with applicable requirements, i.e., the approved SIP. However, EPA believes that a finding of this nature should provide the source and the permitting authority sufficient assurance to proceed with the issuance of a permit that reflects the terms of the submitted local rule rather than the approved SIP. Note that a part 70 permit can be based on a local rule even if the local rule is subsequently disapproved by EPA for SIP purposes (e.g., measure is more stringent than the current SIP but fails to meet SIP requirements for reasonably available control technology and/or to make reasonable further progress), provided: (1) a permit based on the local rule would assure compliance with all applicable requirements (including the approved SIP); and (2) the permit meets all part 70 requirements.

---

<sup>17</sup>Where resources allow and the situation calls for it, EPA will go on record with a letter to the permitting authority with a list of rules that it has preliminarily determined will assure compliance with the corresponding SIP approved rule.

<sup>18</sup>If a part 70 permit is issued based upon a pending SIP revision and a permit shield is incorporated in the permit, compliance with the permit would be deemed to be compliance with all applicable requirements. If EPA or the permitting authority later discovers that the permit terms do not assure compliance with all applicable requirements, including the applicable SIP, the permit would have to be reopened and revised.

Where the local rule submitted to EPA as a SIP revision represents a relaxation of the current SIP requirement (e.g., the local rule would replace an existing technology forcing rule that has been determined to be unachievable in practice), a part 70 source may propose in its permit application to base its permit on the local rule in anticipation of EPA approval. However, a permit based on the local rule could not be issued prior to EPA approval of the rule. This is because a permit based on the relaxed requirements of the local rule could not assure compliance with the more stringent applicable requirement (the approved SIP), as required by section 504 of the Act. Similarly, a part 70 source may be subject to pending SIP revisions that may tighten certain current SIP obligations and relax others for sources in that source category. Here again the permitting authority could allow initial application completeness to be determined relying on the locally adopted rule, but the permit could not be issued without the current SIP requirements unless a source opted to demonstrate that the submitted rule represents, for that specific source, a more stringent requirement than the current SIP. In such a case, the part 70 permit could subsequently be issued for that source on the basis of the local rule, since the permit terms would assure compliance with the approved SIP.

b. Initial actions by EPA and permitting authorities. The EPA is committed to working with States within available resources to assure that the timetable for overall permit issuance is not adversely affected by pending SIP revisions that are not straightforward tightenings. The extent of the problem, however, will vary greatly and, in some cases, may require a specific plan of action between EPA and certain States to expedite SIP processing where the problem is substantial.

In California, where this problem is believed to be most extensive, EPA, the districts, and the California Air Resources Board are in the process of identifying rules in the SIP backlog that are not straightforward tightenings or are relaxations of the currently approved SIP, and will target them for expeditious processing. These rules will be identified within a specified timeframe, generally within 1 year of the effective date of a district's part 70 program. The EPA's Region IX will enter into formal agreements with affected districts and will commit to take action on this "targeted" portion of the SIP backlog before comprehensive permit issuance for sources affected by the backlog would be required, provided this is consistent with the transition plan<sup>19</sup> (as it may be revised). Other EPA Regional Offices will determine the need and resources available for this type of exercise on a case-by-case basis. Region IX will also commit to process expeditiously any similar rules submitted or

---

<sup>19</sup>Transition plan refers to the 3-year transition strategy for initial part 70 permit issuance described in § 70.4(b)(11).

identified after the period of the formal agreement, although such processing would not necessarily occur before permits must be issued to sources affected by these rules.

Under Region IX's formal agreements, permitting authorities in the districts need not issue the portion of the part 70 permit covering emissions units affected by the targeted backlog until the rule adoption or change identified in the formal agreement has been acted on by EPA, consistent with the flexibility allowed in the permit issuance transition plan in the permitting authority's program. This should in most cases allow permitting authorities to delay issuing permits to sources to the extent they are affected by the targeted SIP backlog until EPA completes its review action on the pending SIP revisions. Where a transition plan contains a permit issuance schedule that would not allow postponing permit issuance until EPA has acted on the proposed SIP revisions, appropriate changes to the plan can still be made to defer permit issuance until EPA action on the targeted SIP backlog. Such changes would be made following the same approach described for changing application forms in EPA's first White Paper. Within these constraints, a permitting authority may allow for issuance of part 70 permits to the facility in phases such that permits covering those emissions units of the facility affected by the targeted SIP revision are issued later. This result is also consistent with the flexibility contained in § 70.2 (see definition of "Part 70 permit") for the permitting authority to issue multiple permits to one part 70 source if it makes sense to do so. Alternatively, the permitting authority could issue the permit in its entirety based on the current SIP.

The EPA agrees that delays in permit issuance described above will not be cause for an EPA finding of failure by the permitting authority to adequately administer or enforce its part 70 program. Any initial permit issued under a phased approach (i.e., the first phase involves all emissions units unaffected by the SIP backlog targeted by EPA), however, does not shield the source from the enforceability of the requirements excluded in the first phase permit and the obligation to obtain permit conditions covering the excluded emissions units after EPA has acted on the relevant SIP rule backlog.

c. Ongoing actions. The preceding guidance should address the most significant problems associated with the development of part 70 permit applications and the subsequent issuance of part 70 permits that result from the existence of a SIP backlog. The EPA recognizes, however, that areas experiencing the most significant start-up problems with respect to pending SIP rules may well require an ongoing program to manage the potential SIP backlog so as to prevent significant problems of this nature from occurring in the future. In some situations it may be appropriate on a continuing basis for EPA to determine preliminarily whether a submitted rule can be listed as one which would assure compliance with the SIP rule it seeks to replace.

This would enable the permitting authority to adjust its priorities for requiring application updates and for accomplishing permit issuance and revision.

For post application submittal, a source that has filed a complete application may opt to, or be required to, update its current application as a result of changes or pending changes to the SIP. The likelihood of these changes occurring will vary from area to area, and are most likely to affect sources scheduled later in the transition period for initial permit issuance. For example:

- o A local rule previously relied upon may be amended by the State or district.
- o Where a local rule that was previously listed in the formal agreement for expeditious SIP processing (because the rule is not a straightforward strengthening) is disapproved by EPA and the source has relied on that rule in preparing its application, the applicant must file an application update that either demonstrates that compliance with the local rule would assure compliance with the current SIP or demonstrates direct compliance with the current SIP.
- o The adoption and submission to EPA of a more stringent local rule after an applicant has filed its application may present a new and desired opportunity for streamlining. If so, the applicant could opt to file an application update to shift the compliance focus of its current application to the newly adopted local rule, which is pending SIP approval, provided it meets the streamlining criteria described in section II.A. above.

For post permit issuance, sources may also encounter changes to rule situations after initial permit issuance that could lead them to request a permit revision. For example, sources may propose a revision to an issued part 70 permit where a newly adopted local rule would present a desirable streamlining opportunity. The significant permit revision process would be required under the current part 70 to accomplish this change. Note that EPA in its revisions to part 70 may authorize permitting authorities to use a less extensive permit revision process.

To initiate the permit revision, the source must file an application to revise the permit to contain the requirements of local rule instead of the current SIP. This application must meet the previously defined and applicable streamlining criteria.

In response, the permitting authority may subsequently revise the permit based on the local rule in lieu of the current SIP where (1) the rule is listed by the EPA as one where compliance with it would assure compliance with the relevant

portions of the current SIP, or (2) the applicant has provided a source specific demonstration consistent with the streamlining criteria in section II.A.2. that assures this result. A permit shield or similar permit condition should be issued for purposes of certainty. In the absence of a shield or similar permit condition, all aspects of the approved SIP remain enforceable, regardless of the source's compliance status with respect to the permit. The EPA encourages permitting authorities currently without provisions for incorporating permit shields to add them at their first opportunity.

### 3. Process.

a. Initial Applications. An applicant proposing to submit its part 70 permit application based on a local rule that has been submitted for EPA approval rather than the current SIP would take one of two courses of actions depending on the status of the local rule with EPA and/or the permitting authority:

The first course of action would be appropriate for local rules that (1) have been previously demonstrated to EPA's satisfaction to be at least as stringent as the approved SIP rule so as to assure compliance with it for all subject sources, (2) are otherwise authorized by the permitting authority based on its judgement that such rules will likely be the basis for the part 70 permit (e.g. EPA approval of the rule is imminent), or (3) have been specifically identified in a formal agreement between the permitting authority and EPA for expeditious SIP processing, i.e., the "targeted backlog." Rules listed in a formal agreement will typically involve local rules pending SIP approval which do or could represent full or partial relaxations of the current SIP. Where they choose to use this approach, the permitting authority and EPA will maintain an up-to-date list of local rules which meet any of these criteria.

In preparing initial part 70 permit applications with respect to such local rules the applicant:

**Step One** - Will indicate in its application that it has opted for this approach, list or cross-reference all requirements from applicable local rules that are eligible for this approach, and refer to the list maintained for this purpose by the permitting authority.

**Step Two** - Will identify in the permit application the current SIP requirements that the pending SIP revision would replace.

**Step Three** - May choose to certify compliance with the requirement(s) of the pending local rule in lieu of the current SIP if there is sufficient source compliance data on which to base such a certification. (The EPA is proposing

to revise its part 70 regulations to provide that such a certification would meet the requirements of § 70.5(c)(10).)

**Step Four** - May propose that a permit shield would be in effect upon permit issuance. For those listed local rules which are recognized by EPA as being able to assure compliance with the current SIP rule, the applicant would indicate in the application that a permit shield (or alternatively, other similar language where authority for a permit shield is not available) is being proposed to be incorporated into the permit to confirm this understanding.

The second course of action would be appropriate where the criteria specified above have not been met for a particular rule and an applicant still wants to base its initial part 70 application on such local rules pending SIP approval. In this instance, the process would be essentially the same but the source would have to demonstrate that compliance with the local rule would assure compliance with the current SIP (i.e., make an adequate demonstration consistent with the streamlining criteria described in section II.A.2. above.) and submit it with the permit application in step one. Again, if a part 70 permit application has already been submitted without streamlining but the source agrees to subsequently pursue this option, the permitting authority may work with the source to support streamlining requirements during the permit development process.

b. Initial Permit Issuance Process. After receiving a complete application, the permitting authority must note where the applicant has proposed use of the approaches described above in section II.B.3.a. The note would be placed in the application summary, the application, or the revised application. Copies of the application summary, the application, or the revised application containing such proposals must be submitted promptly to EPA (unless EPA has agreed that the demonstration is of a type not required for advance submittal to EPA).

Where the rule is listed by EPA as one where compliance with it would assure compliance with the relevant portions of the current SIP, or the applicant has provided a source specific demonstration consistent with the streamlining outlined in section II.A.2., the permitting authority may proceed to issue the permit based on the local rule in lieu of the current SIP. A permit shield or similar permit condition which confirms this understanding should be issued for purposes of certainty.

If an applicant chooses to demonstrate that a local rule assures compliance with the applicable SIP for all affected emissions units, the permitting authority will evaluate this proposal and any supporting documentation. Upon completion of this evaluation and prior to releasing a draft permit public notice, the permitting authority is advised to communicate any concerns to the applicant and provide reasonable opportunity for

the applicant to accept the findings or propose a resolution of the differences. This may cause some revisions to the application as originally filed.

If the permitting authority or EPA are not satisfied that the local rule (as it applies to the applicant's facility) assures compliance with the applicable SIP rule, the applicant must revise its application to rely on the SIP rule. All required application updates must be submitted on or before the reasonable deadline required by the permitting authority for the source to maintain its application shield.

Consistent with the flexibility allowed in the permit issuance transition plan (as it may be revised), the permitting authority may delay issuance of those portions of a source's permit that are covered by a rule identified in a Region IX type formal agreement, which targets certain SIP rules for expeditious processing, until EPA has acted on the relevant rule(s). Alternatively, comprehensive permits may be issued to such a source prior to the time that EPA has acted on the rule provided that they are based on the current SIP (unless the source has provided an adequate streamlining demonstration).

#### 4. Enforcement.

All terms and conditions of the part 70 permit are enforceable by EPA and by citizens. In addition, a source violating the emissions limitation in the part 70 permit is also subject to enforcement action for violation of the current SIP emissions limits if a violation of this limit can be documented.

Upon issuance of a part 70 permit based on the local rule, the permit terms and conditions implementing the local rule would become federally enforceable. A source would not be subject to an EPA enforcement action for any failure to meet monitoring, recordkeeping, and reporting requirements that are required under the currently approved SIP, if such an understanding has been specified in the permit. These requirements would no longer be independently enforceable, provided the source attempts in good faith to implement the monitoring, recordkeeping, and reporting approach required under the local rule.

If subsequently the permitting authority or EPA determines that the permit does not assure compliance with applicable requirements, the permit must be reopened and revised.

#### 5. Discussion.

Sources in California districts currently are subject to several locally adopted rules which are pending before EPA as proposed SIP revisions. The majority of these local rules have been determined by the districts to be more stringent than the SIP rules that they seek to replace, although some of these rules

would relax the current SIP requirements for certain affected sources. In some cases, technology-forcing SIP rules have been found to be infeasible to achieve and, instead of seeking to enforce them, districts have adopted achievable local rules. Until the local rules are approved into the SIP, sources are subject to both the local rule and the federally-approved version of the rule.

The resulting "outdated SIP" presents special problems to sources which must file a part 70 permit application. In particular, questions arise as to whether sources must complete their applications and certify compliance based on SIP rules which have been superseded by more stringent local rules or by rules that have been relaxed where, for example, the permitting authority has found the current SIP rules to be unachievable. Those problems, while most apparent in their effect on the start-up of a part 70 program, are also ongoing in nature and may create a need to update initially complete permit applications and to revise issued permits. The EPA believes that these problems with outdated SIP rules are most extensive in California but are not unique to that State.

The EPA strongly believes that implementation of title V to the extent possible should complement, not complicate, the implementation of other titles, including title I, the purpose of which is to assure adoption of programs that will attain and maintain the national ambient air quality standards (NAAQS).<sup>20</sup> Accordingly, the Agency is providing this guidance which will allow sources and permitting authorities to rely on more stringent local rules for permit issuance. The overall strategy for sensitizing the SIP revision process to part 70 concerns presented in this guidance will allow sources to focus more on current air quality requirements in all aspects of part 70 permit application development and update, permit issuance, and permit revision.

The legal basis for recognizing a local rule pending SIP approval in lieu of the current, but less stringent, SIP requirement or for streamlining multiple applicable requirements is identical to the basis for adopting a streamlined emissions limit to replace multiple applicable requirements (see discussion in section II.A.5.). The opportunities for shifting to the more stringent local rule are correspondingly affected by the limitations previously described for the streamlining of applicable requirements.

---

<sup>20</sup>This guidance is designed primarily to alleviate situations where the SIP backlog is both large and longstanding. It is not to be used as a means of anticipating the outcome of pending attainment status redesignations.

## C. Treatment Of Insignificant Emissions Units.

### 1. Issue.

How must sources address insignificant emissions units (IEU's) subject to at least one applicable requirement?<sup>21</sup> (Insignificant emissions units are in most cases not directly regulated, and therefore could be left off the permit entirely, were it not for the presence of certain generic or facility-wide requirements that apply to all emissions units.) Must the application and the subsequent permit address each IEU individually and require periodic monitoring where it is not otherwise provided by a generically applicable requirement? On what basis can the initial and future compliance certifications be made for IEU's with generally applicable requirements?

### 2. Guidance.

The EPA interprets part 70 to allow considerable discretion to the permitting authority in tailoring the amount and quality of information required in permit applications and permits as they relate to IEU's. In general, permit applications must contain sufficient information to support the drafting of the part 70 permit (including certain information for IEU's subject to only generally applicable requirements) and to determine compliance status with all applicable requirements. The EPA, however, interprets part 70 to allow permitting authorities considerable discretion as to the format and content of permits, provided that compliance with all applicable requirements, including those for IEU's, is assured. The Agency believes that the clarifications contained herein afford permitting authorities sufficient flexibility to treat IEU's in a manner commensurate with the environmental benefits that may be gained from their inclusion in the permit.

a. Permit Applications - Information. With regard to part 70 requirements to describe and list IEU's in applications and permits, the permitting authority can use the generic grouping approach for emissions units and activities as discussed in the first White Paper. In addition, the requirement to identify all applicable requirements, as it related to IEU's subject to generally applicable requirements, can normally be addressed by standard or generic permit conditions with minimal

---

<sup>21</sup>An emissions unit can be an IEU for one applicable requirement and not for another. However, such a unit may be eligible for treatment as an IEU only with respect to those pollutants not emitted in significant amounts. The term "significant" as used in this policy statement does not have the meaning as used in § 52.21 (e.g., 15 tpy PM-10, 40 tpy VOC) but rather means that the emissions unit does not qualify for treatment in the application as an insignificant emissions unit.

or no reference to any specific emissions unit or activity. The EPA has reviewed and acquiesced in the issuance of permits wherein generally applicable requirements are incorporated through the use of tables describing a tiered compliance regime for these requirements as they affect different sizes of emissions units, including a distinct and more streamlined compliance regime for IEU's. Different generic permit tables may be necessary to cover the situation for a particular type of IEU which is governed by different applicable requirements. Similarly, the first White Paper provides that no emissions estimates need be provided for even regulated emissions streams where it would serve no useful purpose to do so. This should be the case for IEU's where the amount of emissions from a unit is not relevant to determining applicability of, or compliance with, the requirement. Except where the contributions of IEU's would need to be more precisely known to resolve issues of applicability or major source status would the permitting authority need to request emissions estimates for part 70 purposes.

b. Permit Applications - Initial Compliance Certifications. Section 70.5(c)(9) requires complete part 70 applications to contain a certification of compliance with all applicable requirements by a responsible official and a statement of the methods used for determining compliance. This certification must be based on a "reasonable inquiry" by the responsible official. The EPA believes that, for the generally applicable or facility-wide requirements applying to an IEU, reasonable inquiry for initial certifications need only be based on available information, which would include any information required to be generated by the applicable requirement. Regarding the latter, and as is true for any applicable requirement, the initial certification can be based on only the latest cycle of required information (e.g., a source could generally rely on a demonstration of compliance resulting from the most recent required monitoring, notwithstanding the existence of prior monitoring indicating non-compliance at a previous point in time). Where an applicable requirement (generally applicable or otherwise) does not require monitoring, the § 70.5(c)(9) requirement to certify compliance does not itself require that monitoring be done to support a certification. Similarly, there is no need to perform an emissions test to support this compliance certification if none is required by the applicable requirement itself. The EPA interprets § 70.5(c)(9) to allow for a certification of compliance where there is no required monitoring and, despite a "reasonable inquiry" to uncover other existing information, the responsible official has no information to the contrary.

c. Permit Content - Applicable Requirements. With regard to part 70 obligations to include all applicable requirements in the permit, the permitting authority can also use the generic grouping approach for emissions units and activities as discussed

in the first White Paper. That is, generally applicable requirements can normally be adequately addressed in the part 70 permit by standard permit conditions with minimal or no reference to any specific emissions unit or activity, provided that the scope of the requirement and the manner of its enforcement are clear. As noted above, different generic permit provisions may be necessary to cover the situation for which different types of IEU's are governed by different applicable requirements.

d. Permit Content - Monitoring, Recordkeeping, and Reporting. Section 70.6(a)(3)(i) requires all applicable requirements for monitoring and analysis procedures or test methods to be contained in part 70 permits. In addition, where the applicable requirement does not require periodic testing or monitoring (which may consist of recordkeeping designed to serve as monitoring), the permitting authority must prescribe periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit. Many of the generically applicable requirements for IEU's have a related test method, but relatively few have a specific regimen of required periodic testing or monitoring.

The EPA believes that the permitting authority in general has broad discretion in determining the nature of any required periodic monitoring. The need for this discretion is particularly evident in the case of generally applicable requirements, which tend to cover IEU's as well as significant emissions units. The requirement to include in a permit testing, monitoring, recordkeeping, reporting, and compliance certification sufficient to assure compliance does not require the permit to impose the same level of rigor with respect to all emissions units and applicable requirement situations. It does not require extensive testing or monitoring to assure compliance with the applicable requirements for emissions units that do not have significant potential to violate emissions limitations or other requirements under normal operating conditions. In particular, where the establishment of a regular program of monitoring would not significantly enhance the ability of the permit to assure compliance with the applicable requirement, the permitting authority can provide that the status quo (i.e., no monitoring) will meet § 70.6(a)(3)(i). For IEU's subject to a generally applicable requirement for which the permitting authority believes monitoring is needed, a streamlined approach to periodic monitoring, such as an inspection program to assure the proper operation and maintenance of emissions activities (e.g., valves and flanges), should presumptively be appropriate.

The EPA's policy on IEU monitoring needs is based on its belief that IEU's typically are associated with inconsequential environmental impacts and present little potential for violations of generically applicable requirements, and so may be good candidates for a very streamlined approach to periodic monitoring. As EPA noted in the first White Paper, generally

applicable requirements typically reside in the SIP. Permitting authorities therefore not only have the best sense of which requirements qualify as generally applicable, but also where it is appropriate to conclude that periodic monitoring is not necessary for IEU's subject to these requirements. Where the source ascertains that the permitting authority will not require periodic monitoring for IEU's, it can of course omit a periodic monitoring proposal from the application.

e. Permit Content - Compliance Certifications. Section 70.6(c)(5) requires in part that each permitted source submit no less frequently than annually a certification of its compliance status with all the terms and conditions of the permit. This certification will be based on available information, including monitoring and/or other compliance terms required in the permit. Where a particular emissions unit presents little or no potential for violation of a certain applicable requirement, the "reasonable inquiry" required by title V can be abbreviated. Since it can be determined in the abstract that violation of the requirement by these emissions units is highly improbable, it is reasonable in that instance to limit the search for information to what is readily available. As noted above, EPA believes that an IEU subject to a generally applicable requirement typically presents little or no potential for violation of those requirements. It follows that where, for instance, a permit does not require monitoring for IEU's subject to a generally applicable requirement, and there were no observed, documented, or known instances of non-compliance, an annual certification of compliance is presumptively appropriate. Similarly, where monitoring is required, an annual certification of compliance is also appropriate when no violations are monitored and there were no observed, documented, or known instances of non-compliance.

### 3. Discussion.

Many of the concerns expressed to EPA regarding the treatment of IEU's in the application and permit arise because IEU's are in most cases not directly regulated, and therefore could be left off the permit entirely, were it not for the presence of certain generic requirements that apply to all emissions units. Though the focus of concern is the applicability of the generic requirements to IEU's, response to these concerns derive primarily from the flexibility that exists in part 70 for dealing with generically applicable requirements. In implementing this flexibility, it may be appropriate for the permitting authority to further distinguish between units that have been designated as insignificant and those that have not. This is so because the relative size of a unit can be an important factor in deciding how to fashion permit terms even for a generically applicable requirement, and State-established IEU's normally define the smallest emissions points. However, EPA notes that, as a matter of part 70 interpretation, whether a unit

has been designated as insignificant is not necessarily critical to its treatment in the part 70 permit.

Concerns have been expressed that addressing in part 70 permits the relatively trivial portion of emissions attributable to IEU's will consume a disproportionate share of the total resources available to issue part 70 permits. That is, according to their understanding of part 70, applicants and permitting authorities will expend greater resources than warranted to determine the specific applicability of requirements to IEU's, how compliance with them will be assured, and the basis on which the certification of compliance status of the source with respect to these IEU's would be made.

The EPA believes that the policy described for addressing generically applicable requirements in applications and permits as they apply to IEU's allows permitting authorities sufficient flexibility to streamline the required administrative effort commensurate to the environmental significance of the varying types of IEU situations. This should prevent the potentially high but unintended level of costs identified by certain sources and permitting authorities from occurring in the future with respect to IEU's.

#### **D. Use Of Major Source And Applicable Requirement Stipulation.**

##### 1. Issue.

When an applicant stipulates that it is a major source and subject to specific applicable requirements, how much, if any, additional information related to applicability is necessary in the part 70 permit application?

##### 2. Guidance.

If an applicant stipulates that it is a major source<sup>22</sup> and subject to specific applicable requirements, it need not provide additional information in its application to demonstrate applicability with respect to those requirements, provided that (1) the permitting authority has had previous review experience with a particular source (e.g., issued it a permit), or (2) otherwise has an adequate level of familiarity with the source's operation (e.g., current emissions inventory information). This does not affect the requirement to provide information for other purposes under part 70, such as to support a compliance certification or a request for a permit shield or to describe the emissions activities of its site (see first White Paper).

---

<sup>22</sup>If an applicant stipulates it is a major source, it must list all pollutants for which it is major.

Accordingly, permitting authorities may allow the applicant to stipulate that:

- o Its facility is a major source and subject to part 70 permitting, without providing any additional information for the applicability determination;
- o It is subject to specific applicable requirements, to be included in its part 70 permit, without providing additional information to establish applicability for stipulated requirements; or
- o It is subject to only portions of an applicable requirement and state that it is not subject to other portions. Such a stipulation must explicitly state which portion of the rule applies and which does not and an explanation must be provided for this conclusion.

Stipulation by a source to major source status or specific applicable requirements in a part 70 application does not preclude the permitting authority from requesting additional information from the applicant for establishing the applicability of non-stipulated requirements or for verifying a stipulation that certain requirements are not applicable.

### 3. Discussion.

In general, part 70 requires that applications contain information to the extent needed to determine major source status, to verify the applicability of part 70 or applicable requirements, and to compute a permit fee (as necessary). Section 70.5(c) requires the application to describe emissions of all regulated air pollutants for each emissions unit.

In the first White Paper, EPA indicated a substantial degree of discretion for permitting authorities in this area. It indicates that States may adopt different approaches to meet the minimum program requirements established by the part 70 regulations depending on local needs. In many instances, a qualitative description of emissions will satisfy this standard. However, the applicant may need to provide more detailed information for purposes other than determining applicability and to foster efficiency in the permitting program.

For the purpose of determining the applicability of part 70 or other specific requirements, the information required in an application should be streamlined for the mutual benefit of the applicant and the permitting authority. An applicant that stipulates it is a major source subject to part 70 and to other applicable requirements should not be required to provide any additional information to verify those facts in its part 70 application. However, the applicant must provide sufficient information to allow the permitting authority to impose the

applicable requirement. In addition, the resulting application streamlining would not relieve the applicant from submitting, or the permitting authority from reviewing, emissions or other data for part 70 purposes other than determining applicability.

In the case where there is no dispute that a stationary source is subject to part 70, and the applicant stipulates that the source is a part 70 source in the application, no further information would be required for applicability determination. An example would be a source which is currently operating under a prevention of significant deterioration permit because it is major for PM-10. Both the source and the permitting authority agree that the source is subject to the State's part 70 program.

A source may also streamline the part 70 permit process by stipulating that specific applicable requirements apply. This does not relieve the source of its obligation to identify all applicable requirements or preclude the permitting authority from requesting additional information, including information pertaining to the applicability of requirements not covered in the stipulation. For example, a stationary source may stipulate it is subject to a SIP rule. However, the permitting authority may suspect that the source is also subject to a New Source Performance Standard (NSPS), but may need more information for confirmation. In this case, the permitting authority would request additional information related to the applicability of the NSPS.

Similarly, an applicant may stipulate that it is subject to only portions of an applicable requirement and state that it is not subject to other portions. In such case, the permitting authority may request the applicant to provide additional information to demonstrate that it is not subject to requirements in question. However, if a source requests a permit shield, additional information to demonstrate the non-applicability of these requirements must be submitted.

#### **E. Referencing Of Existing Information In Part 70 Permit Applications And Permits.**

##### 1. Issue.

Can an applicant in its permit application, and can the permit itself, reference existing information that is available at the permitting authority? Also, can the permit application and the permit reference applicable requirements through citation rather than by a complete reprinting of the requirements themselves in the part 70 permit application or permit?

##### 2. Guidance.

a. General. Information that would be cited or cross referenced in the permit application and incorporated by

reference into the issued permit must first be currently applicable and available to the permitting authority and public<sup>23</sup>. The information need not be restated in the part 70 application. Standardized citation formats should be established by the permitting authority to facilitate appropriate use of this mechanism.

Referenced documents must also be specifically identified. Descriptive information such as the title or number of the document and the date of the document must be included so that there is no ambiguity as to which version of which document is being referenced. Citations, cross references, and incorporations by reference must be detailed enough that the manner in which any referenced material applies to a facility is clear and is not reasonably subject to misinterpretation. Where only a portion of the referenced document applies, applications and permits must specify the relevant section of the document. Any information cited, cross referenced, or incorporated by reference must be accompanied by a description or identification of the current activities, requirements, or equipment for which the information is referenced.

b. Permit Applications. The applicant and the permitting authority should work together to determine the extent to which part 70 permit applications may cross reference agency-issued rules, regulations, permits, and published protocols, and existing information generated by the applicant. To facilitate referencing existing information, permitting authorities should identify the general types of information available for this purpose. To the extent that such information exists and is readily available to the public, the following types of information may be cited or cross referenced (as allowed by the permitting authority)<sup>24</sup>:

- o Rules, regulations, and published protocols.
- o Criteria pollutant and HAP emission inventories and supporting calculations.
- o Emission monitoring reports, compliance reports, and source tests.

---

<sup>23</sup>Referenced documents must be made available (1) as part of the public docket on the permit action or (2) as information available in publicly accessible files located at the permitting authority, unless they are published or are readily available (e.g., regulations printed in the Code of Federal Regulations or its State equivalent).

<sup>24</sup>Use of cross-referencing does not shift any burden of reproducing or otherwise acquiring information to the permitting authority.

- o Annual emissions statements.
- o Process and abatement equipment lists and descriptions.
- o Current operating and preconstruction permit terms.
- o Permit application materials previously submitted.
- o Other materials with the approval of the permitting authority.

Applicants are obligated to correct and supplement inaccurate or incomplete permitting authority records relied upon for the purposes of part 70 permit applications. The responsible official must certify, consistent with § 70.5(d), to the truth, accuracy, and completeness of all information referenced.

c. Permits. Incorporation by reference in permits may be appropriate and useful under several circumstances. Appropriate use of incorporation by reference in permits includes referencing of test method procedures, inspection and maintenance plans, and calculation methods for determining compliance. One of the key objectives Congress hoped to achieve in creating title V, however, was the issuance of comprehensive permits that clarify how sources must comply with applicable requirements. Permitting authorities should therefore balance the streamlining benefits achieved through use of incorporation by reference with the need to issue comprehensive, unambiguous permits useful to all affected parties, including those engaged in field inspections.

Permitting authorities may, after listing all applicable emissions limits for all applicable emissions units in the part 70 permit, provide for referencing the details of those limits, rather than reprinting them in permits to the extent that (1) applicability issues and compliance obligations are clear, and (2) the permit includes any additional terms and conditions sufficient to assure compliance with all applicable requirements<sup>25</sup>.

Where the cited applicable requirement provides for different and independent compliance options (e.g., boilers subject to an NSPS promulgated under section 111 may comply by use of low sulfur fuel or through add-on of a control device), the permitting authority generally should require that the part 70 permit contain (or incorporate by reference) the specific

---

<sup>25</sup>In the case of a merged permit program, i.e., where a State has merged its NSR and operating permits programs, previous NSR permits expire. This leaves the part 70 permit as the sole repository of the relevant prior terms and conditions of the NSR permit. Under these circumstances, it is not possible to incorporate by reference the expired NSR permits.

option(s) selected by the source. Alternatively, the permit could incorporate by reference the entire applicable requirement provided that (1) such reference is unambiguous in its applicability and requirements, (2) the permit contains obligations to certify compliance and report compliance monitoring data reflecting the chosen control approach, and (3) the permitting authority determines that the relevant purposes of title V would be met through such referencing. The alternative approach would not be allowable if changing from one compliance option to another would trigger the need for a prior review by the permitting authority or EPA (e.g. NSR), unless prior approval is incorporated into the part 70 permit (i.e., advance NSR).

The EPA does not recommend that permitting authorities incorporate into part 70 permits certain other types of information such as the part 70 permit application (see first White Paper).

### 3. Discussion.

Title V and part 70 do not define when citation or cross-referencing in permit applications would be appropriate, although it obviously would not be allowed where such citations or cross-references would not support subsequent development of the part 70 permit. The EPA's first White Paper states that a permitting authority may streamline part 70 applications by allowing the applicant to cross-reference a variety of documents including permits and Federal, State, and local rules. This guidance further provides that where an emissions estimate is needed for part 70 purposes but is otherwise available (e.g., recent submittal of emissions inventory) the permitting authority can allow the source to cross-reference this information for part 70 purposes.

Permitting authorities' files and databases often include information submitted by the applicant which can also be required by part 70. Development and review of part 70 permit applications could be streamlined if information already held by the permitting authority and the public is referenced or cited in part 70 permit applications rather than restated in its entirety. Similarly, specific citations to regulations that are unambiguous in their applicability and requirements as they apply to a particular source will reduce the burden associated with application development.

Incorporation by reference can be similarly effective in streamlining the content of part 70 permits. The potential benefits of permit development based on an incorporation by reference approach include reduced cost and administrative complexity, and continued compliance flexibility as enforceably allowed by the underlying applicable requirements.

Expectations for referencing with respect to permit content are somewhat better defined than for permit applications. Section 504(a) states that each permit "shall include enforceable emissions limitations and standards" and "such other conditions as are necessary to assure compliance with the applicable requirements." In addition, section 504(c) requires each permit to "set forth inspection, entry, monitoring, compliance certification, and reporting requirements to assure compliance with the permit terms and conditions." Analogous provisions are contained in §§ 70.6(a)(1) and (3). The EPA interprets these provisions to place limits on the type of information that may be referenced in permits. Although this material may be incorporated into the permit by reference, that may only be done to the extent that its manner of application is clear.

Accordingly, after all applicable emissions limits are placed in the part 70 permit and attached to the emissions unit to which they apply, the permitting authority may allow referencing where it is specific enough to define how the applicable requirement applies and where using this approach assures compliance with all applicable requirements. This approach is a desirable option where the referenced material is unambiguous in how it applies to the permitted facility, and it provides for enforceability from a practical standpoint. On the other hand, it is generally not acceptable to use a combination of referencing certain provisions of an applicable requirement while paraphrasing other provisions of that same applicable requirement. Such a practice, particularly if coupled with a permit shield, could create dual requirements and potential confusion.

Even where the referenced requirement allows for compliance options, the permitting authority may issue the permit with incorporation of the applicable requirement provided that the compliance options of the source are enforceably defined under available control options, appropriate records are kept and reports made, and any required revisions to update the permit with respect to specific performance levels are made. This treatment would be analogous to the flexibility provided to sources through the use of alternative scenarios.

## **Attachment A**

### **Approval of Alternative Test Methods**

The part 63 general provisions, as well as other EPA air regulations implementing sections 111 and 112 of the Act, allow only EPA-approved test methods to implement emissions standards that are established by States to meet Federal requirements. Accordingly, streamlining cannot result in any requirement relying on a State-only test method unless and until EPA, or the permitting authority acting as EPA's delegated agency, approves it as an appropriate method for purposes of complying with that streamlined standard. Currently, all States may be delegated authority to make decisions regarding minor revisions to EPA approved test methods (i.e., minor changes are those that have isolated consequences, affect a single source, and do not affect the stringency of the emissions limitation or standard). The EPA is exploring options for defining where delegation to States is appropriate for reviewing major revisions or new test methods, and for expediting the approval process where the Agency retains final sign-off authority. The EPA recognizes that its approval must generally occur in a timeframe consistent with the time constraints of the part 70 permit issuance process. Until further guidance on this subject is issued, States must obtain EPA approval for all State-only test methods which represent major changes or alternatives to EPA-approved test methods prior to or within the 45-day EPA review period of the proposed permit seeking to streamline requirements.

With respect to SIP requirements, the ability for a permitting authority to authorize use of a different test method depends on the governing language contained in the SIP. For example, some SIP's expressly connect a test method with a particular emissions limit but allow for the use of an equally stringent method. Other SIP's contain a more exclusive linkage between an emissions limit and its required test method (i.e., limit A as measured by test method B). The SIP-approved test method can be changed only through a SIP revision unless the SIP contains provisions for establishing alternative test methods. Attachment B contains example SIP language which provides a mechanism that can establish an alternative applicable requirement in such cases without the need for a source-specific SIP revision.

Permitting authorities may implement streamlining which involves alternative or new test methods within the flexibility granted by the SIP and any delegation of authority granted by EPA (where section 111/112 standards are involved). Permit applications containing a request for a streamlined requirement based on an alternative or new test method must, to be complete, demonstrate that the alternative or new test method would determine compliance at the same or higher stringency as the otherwise applicable method. The EPA expects to receive

expeditiously (i.e., well in advance of any draft permit issuance) those portions of an application dealing with a proposal for streamlining, including any demonstration of test method adequacy. Any required EPA approval of an alternative or new test method need not be obtained as a precondition for filing a complete application, but it must be secured before the final part 70 permit can be issued. As mentioned previously, EPA intends to structure its approval process to comport reasonably with the timelines for part 70 permit issuance.

## Attachment B

### SIP Provisions For Establishing Alternative Requirements

#### I. Overview.

States may revise their SIP's to provide for establishing equally stringent alternatives to specific requirements set forth in the SIP without the need for additional source-specific SIP revisions. To allow alternatives to the otherwise-applicable SIP requirements (i.e., emissions limitations, test methods, monitoring, and recordkeeping) the State would include language in SIP's to provide substantive criteria governing the State's exercise of the alternative requirement authority.

#### II. Example Language For Part 70 Sources To Establish Alternative SIP Requirements.

The following is an example of enabling language that could be used to provide flexibility in the SIP for allowing alternative requirements to be established for part 70 sources.

In lieu of the requirements imposed pursuant to (reference specific applicable sections(s) or range of sections to be covered), a facility owner may comply with alternative requirements, **provided** the requirements are established pursuant to the part 70 permit issuance, renewal, or significant permit revision process and are consistent with the streamlining procedures and guidelines set forth in section II.A. of White Paper Number 2.

For sources subject to an approved part 70 program, an alternative requirement is approved for the source by EPA if it is incorporated in an issued part 70 permit to which EPA has not objected. Where the public comment period precedes the EPA review period, any public comments concerning the alternative shall be transmitted to EPA with the proposed permit. If the EPA and public comment periods run concurrently, public comments shall be transmitted to EPA no later than 5 working days after the end of the public comment period. The Director's [permitting authority's] determination of approval is not binding on EPA.

Noncompliance with any provision established by this rule constitutes a violation of this rule.

#### III. Example Language For Non-Part 70 Sources To Establish Alternative SIP Requirements.

**[NOTE: This section is a draft that EPA expects to finalize after appropriate revisions in the near future.]**

For sources not subject to an approved part 70 program, the following is an example of enabling language that States may use

to revise/submit SIP rules which would provide flexibility in the SIP for allowing alternative requirements to be established.

**A. Procedures.**

1. General. In lieu of the requirements imposed pursuant to [reference applicable sections] of this plan, a source owner may comply with an alternative requirement, provided that the Director approves it consistent with the procedures of this paragraph and the criteria of paragraph B.

2. State Review Procedure. The Director may establish an alternative requirement in [a review process defined by the State], provided that the requirements of this paragraph are met for EPA and public review and for notification and access are met. The Director's determination of approval is not binding on EPA.

3. Public Review. The Director shall subject any proposed alternative to adequate public review but may vary the procedures for, and the timing of, public review in light of the environmental significance of the action. For the following types of changes [add list of de minimis actions subject to EPA review], no public review shall be necessary for the approval of the alternative.

4. EPA Review. The Director shall submit any proposed alternative to the Administrator through the appropriate Regional Office, except for the following types of changes [add list of de minimis actions subject to EPA review] no EPA review shall be necessary for the approval of the alternative. Until the specific alternative SIP requirement has completed EPA review, the otherwise applicable SIP provisions will continue to apply.

5. Periodic Notification And Public Access. For all actions taken by the State to establish an alternative requirement, the Director shall provide in a general manner for periodic notification to the public on at least a quarterly basis and for public access to the records regarding established alternatives and relevant supporting documentation.

6. Enforcement. Noncompliance with any alternative established by this provision constitutes a violation of this rule. The EPA and the public may challenge such an alternative limit on the basis that it does not meet the criteria contained in the SIP for establishing such an alternative. In addition, EPA and the public can take enforcement action against a source that fails to comply with an applicable alternative requirement.

## B. General Criteria for Evaluating Alternatives.

1. Applicability. The unit(s) to which the requirements apply must be specified in the underlying SIP and in the permit/alternative. If percentage reductions are required from the source, the baseline must be clearly set. The SIP must require the submission of all the information necessary to establish the baseline, and the alternative requirement must achieve the reduction called for in the SIP.

2. Time. The alternative must specify the effective date of the alternative requirement. The underlying requirement of the SIP shall remain in effect until the effective date of the alternative. The alternative must clearly specify any future-effective dates or any compliance schedules that apply to the source under regulations in effect at the time of issuance. For instance, a source may be due to comply with requirements promulgated before the permit/alternative was issued, but which are effective prior to the expiration of the permit/alternative.

3. Effect of changed conditions. If alternative emissions limitations or other requirements are allowed in the underlying SIP, the associated documentation with the changed conditions must clearly demonstrate the alternative requirement is no less stringent than the original SIP requirement.

4. Standard of conduct. The alternative proposal must clearly state what requirements the source must meet. For example, the SIP must specify the emissions limit and what alternatives are acceptable. The alternative proposal must contain limits, averaging times, test methods, etc., that are no less stringent and must address how they are no less stringent than the underlying SIP requirements. The alternative proposal must also show whether it applies on a per-source or per-line basis or is facility-wide.

5. Transfer Efficiency. Any SIP allowing alternative emissions limits and using transfer efficiency in determining compliance must explicitly state the circumstances under which a source may use improved transfer efficiency as a substitute for meeting the SIP limit. The improvement should be demonstrated through testing and an appropriate baseline and test method should be specified.<sup>1</sup> See draft "Guidelines for determining capture efficiencies" for criteria for evaluating alternative capture efficiency requirements.

---

<sup>1</sup>Implied improvements noted by the NSPS auto coating transfer efficiency table cannot be accepted at face value.

6. Averaging Time. Both the SIP and the alternative proposal must explicitly contain the averaging time associated with each emissions limit (e.g., instantaneous, three hour average, daily, monthly, or longer). The time must be sufficient to protect the applicable NAAQS. The alternative proposal must demonstrate that the averaging time and the emissions limit in the alternative are as stringent as those in the original SIP requirements.

7. Monitoring and Recordkeeping. The alternative proposal must state how the source will monitor compliance with the emissions requirement, and detail how the proposed method compares in accuracy, precision, and timeliness to the SIP-approved method. Records and monitoring data must be retained for at least the same period of time as required by the SIP. The method must enable compliance determinations consistent with the averaging time of the emissions standard.

8. Test Methods. The alternative proposal must detail how the proposed test method in association with its particular emissions requirement (or rule) is at least as stringent as the approved method in association with its emissions limit (or rule) considering the accuracy, reliability, reproducibility, and timeliness of each test method taken in combination with its emissions limit. The application or proposal must also address how the change affects measurement sensitivity and representativeness, describe the need for the change, and indicate if the change is needed for unique conditions related only to the source in question. The method must enable a compliance determination consistent with the averaging time of the emissions standard associated with it.

9. Act Requirements. The alternative must meet the all applicable Act requirements (e.g., for reasonably available control technology, 15% VOC reduction, etc.) and must not interfere with any requirements of the Act, including any regarding the SIP's attainment demonstration and requirements for reasonable further progress.

10. Production Level. The emissions are no greater than the SIP allowable emissions at the same production level. Pre-1990 production/operation scenarios cannot be used as part of any demonstration that the alternative requirements are as stringent as those in the SIP. Also, the demonstration must be performed using an EPA-approved test methods.

**Appendix G**

**Clean Air Act Section 111(d)**

### **Clean Air Act Section 111(d)**

(d)(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 110 under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 108(a) or 112(b)(1)(A) but (ii) to which a standard of performance under this section would apply if such existing source were a new source, and (B) provides for the implementation and enforcement of such standards of performance. Regulations of the Administrator under this paragraph shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.

(2) The Administrator shall have the same authority--

(A) to prescribe a plan for a State in cases where the State fails to submit a satisfactory plan as he would have under section 110(c) in the case of failure to submit an implementation plan, and

(B) to enforce the provisions of such plan in cases where the State fails to enforce them as he would have under sections 113 and 114 with respect to an implementation plan. In promulgating a standard of performance under a plan prescribed under this paragraph, the Administrator shall take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies.

**Appendix H**  
**40 CFR 60 Subpart B**

Subpart B -- Adoption and Submittal of State Plans  
for Designated Facilities

60.20 Applicability.

The provisions of this subpart apply to States upon publication of a final guideline document under section 60.22(a).

60.21 Definitions.

Terms used but not defined in this subpart shall have the meaning given them in the Act and in Subpart A:

(a) "Designated pollutant" means any air pollutant, emissions of which are subject to a standard of performance for new stationary sources but for which air quality criteria have not been issued, and which is not included on a list published under section 108(a) or section 112(b)(1)(A) of the Act.

(b) "Designated facility" means any existing facility (see section 60.2(aa)) which emits a designated pollutant and which would be subject to a standard of performance for that pollutant if the existing facility were an affected facility (see section 60.2).

(c) "Plan" means a plan under section 111(d) of the Act which establishes emission standards for designated pollutants from designated facilities and provides for the implementation and enforcement of such emission standards.

(d) "Applicable plan" means the plan, or most recent revision thereof, which has been approved under section 60.27(b) or promulgated under section 60.27(d).

(e) "Emission guideline" means a guideline set forth in Subpart C of this part, or in a final guideline document published under section 60.22(a), which reflects the degree of emission reduction achievable through the application of the best system of emission reduction which (taking into account the cost of such reduction) the Administrator has determined has been adequately demonstrated for designated facilities.

(f) "Emission standard" means a legally enforceable regulation setting forth an allowable rate of emissions into the atmosphere, or prescribing equipment specifications for control of air pollution emissions.

(g) "Compliance schedule" means a legally enforceable schedule specifying a date or dates by which a source or category of sources must comply with specific emission standards contained in a plan or with any increments of progress to achieve such compliance.

(h) "Increments of progress" means steps to achieve compliance which must be taken by an owner or operator of a designated facility, including:

- (1) Submittal of a final control plan for the designated facility to the appropriate air pollution control agency;
- (2) Awarding of contracts for emission control systems or for process modifications, or issuance of orders for the purchase of component parts to accomplish emission control or process modification;
- (3) Initiation of on-site construction or installation of emission control equipment or process change;
- (4) Completion of on-site construction or installation of emission control equipment or process change; and
- (5) Final compliance.
  - (i) "Region" means an air quality control region designated under section 107 of the Act and described in Part 81 of this chapter.
  - (j) "Local agency" means any local governmental agency.

60.22 Publication of guideline documents, emission guidelines, and final compliance times.

(a) Concurrently upon or after proposal of standards of performance for the control of a designated pollutant from affected facilities, the Administrator will publish a draft guideline document containing information pertinent to control of the designated pollutant from designated facilities. Notice of the availability of the draft guideline document will be published in the FEDERAL REGISTER and public comments on its contents will be invited. After consideration of Public comments and upon or after promulgation of standards of performance for control of a designated pollutant from affected facilities, a final guideline document will be published and notice of its availability will be published in the FEDERAL REGISTER.

(b) Guideline documents published under this section will provide information for the development of State plans, such as:

(1) Information concerning known or suspected endangerment of public health or welfare caused, or contributed to, by the designated pollutant.

(2) A description of systems of emission reduction which, in the judgment of the Administrator, have been adequately demonstrated.

(3) Information on the degree of emission reduction which is achievable with each system, together with information on the costs and environmental effects of applying each system to designated facilities.

(4) Incremental periods of time normally expected to be necessary for the design, installation, and startup of identified control systems.

(5) An emission guideline that reflects the application of the best system of emission reduction (considering the cost of such reduction) that has been adequately demonstrated for designated facilities, and the time within which compliance with emission standards of equivalent stringency can be achieved. The Administrator will specify different emission guidelines or

compliance times or both for different sizes, types, and classes of designated facilities when costs of control, physical limitations, geographical location, or similar factors make subcategorization appropriate.

(6) Such other available information as the Administrator determines may contribute to the formulation of State plans.

(c) Except as provided in paragraph (d)(1) of this section, the emission guidelines and compliance times referred to in paragraph (b)(5) of this section will be proposed for comment upon publication of the draft guideline document, and after consideration of comments will be promulgated in Subpart C of this part with such modifications as may be appropriate.

(d)(1) If the Administrator determines that a designated pollutant may cause or contribute to endangerment of public welfare, but that adverse effects on public health have not been demonstrated, he will include the determination in the draft guideline document and in the FEDERAL REGISTER notice of its availability. Except as provided in paragraph (d)(2) of this section, paragraph (c) of this section shall be inapplicable in such cases.

(2) If the Administrator determines at any time on the basis of new information that a prior determination under paragraph (d)(1) of this section is incorrect or no longer correct, he will publish notice of the determination in the FEDERAL REGISTER, revise the guideline document as necessary under paragraph (a) of this section, and propose and promulgate emission guidelines and compliance times under paragraph (c) of this section.

#### 60.23 Adoption and submittal of State plans; public hearings.

(a)(1) Unless otherwise specified in the applicable subpart, within 9 months after notice of the availability of a final guideline document is published under section 60.22a), each State shall adopt and submit to the Administrator, in accordance with section 60.4 of subpart A of this part, a plan for the control of the designated pollutant to which the guideline document applies.

(2) Within nine months after notice of the availability of a final revised guideline document is published as provided in section 60.22(d)(2), each State shall adopt and submit to the Administrator any plan revision necessary to meet the requirements of this subpart.

(b) If no designated facility is located within a State, the State shall submit a letter of certification to that effect to the Administrator within the time specified in paragraph (a) of this section. Such certification shall exempt the State from the requirements of this subpart for that designated pollutant.

(c)(1) Except as provided in paragraphs (c)(2) and (c)(3) of this section, the State shall, prior to the adoption of any plan or revision thereof, conduct one or more public hearings within the State on such plan or plan revision.

(2) No hearing shall be required for any change to an increment of pollutant in an approved compliance schedule unless

the change is likely to cause the facility to be unable to comply with the final compliance date in the schedule.

(3) No hearing shall be required on an emission standard in effect prior to the effective date of this subpart if it was adopted after a public hearing and is at least as stringent as the corresponding emission guideline specified in the applicable guideline document published under section 60.22(a).

(d) Any hearing required by paragraph (c) of this section shall be held only after reasonable notice. Notice shall be given at least 30 days prior to the date of such hearing and shall include:

(1) Notification to the public by prominently advertising the date, time, and place of such hearing in each region affected;

(2) Availability, at the time of public announcement, of each proposed plan or revision thereof for public inspection in at least one location in each region to which it will apply;

(3) Notification to the Administrator;

(4) Notification to each local air pollution control agency in each region to which the plan or revision will apply; and

(5) In the case of an interstate region, notification to any other State included in the region.

(e) The State shall prepare and retain, for a minimum of 2 years, a record of each hearing for inspection by any interested party. The record shall contain, as a minimum, a list of witnesses together with the text of each presentation.

(f) The State shall submit with the plan or revision:

(1) Certification that each hearing required by paragraph (c) of this section was held in accordance with the notice required by paragraph (d) of this section; and

(2) A list of witnesses and their organizational affiliations, if any, appearing at the hearing and a brief written summary of each presentation or written submission.

(g) Upon written application by a State agency (through the appropriate Regional Office), the Administrator may approve State procedures designed to insure public participation in the matters for which hearings are required and public notification of the opportunity to participate if, in the judgment of the Administrator, the procedures, although different from the requirements of this subpart, in fact provide for adequate notice to and participation of the public. The Administrator may impose such conditions on his approval as he deems necessary. Procedures approved under this section shall be deemed to satisfy the requirements of this subpart regarding procedures for public hearings.

#### 60.24 Emission standards and compliance schedules.

(a) Each plan shall include emission standards and compliance schedules.

(b)(1) Emission standards shall prescribe allowable rates of emissions except when it is clearly impracticable. Such cases will be identified in the guideline documents issued under

section 60.22. Where emission standards prescribing equipment specifications are established, the plan shall, to the degree possible, set forth the emission reductions achievable by implementation of such specifications, and may permit compliance by the use of equipment determined by the State to be equivalent to that prescribed.

(2) Test methods and procedures for determining compliance with the emission standards shall be specified in the plan. Methods other than those specified in Appendix A to this part may be specified in the plan if shown to be equivalent or alternative methods as defined in section 60.2(t) and (u).

(3) Emission standards shall apply to all designated facilities within the State. A plan may contain emission standards adopted by local jurisdictions provided that the standards are enforceable by the State.

(c) Except as provided in paragraph (f) of this section, where the Administrator has determined that a designated pollutant may cause or contribute to endangerment of public health, emission standards shall be no less stringent than the corresponding emission guideline(s) specified in Subpart C of this part, and final compliance shall be required as expeditiously as practicable but no later than the compliance times specified in Subpart C of this part.

(d) Where the Administrator has determined that a designated that a designated pollutant may cause or contribute to endangerment of public welfare but that adverse effects on public health have not been demonstrated, States may balance the emission guidelines, compliance times, and other information provided in the applicable guideline document against other factors of public concern in establishing emission standards, compliance schedules, and variances. Appropriate consideration shall be given to the factors specified in section 60.22(b) and to information presented at the public hearing(s) conducted under section 60.23(c).

(e)(1) Any compliance schedule extending more than 12 months from the date required for submittal of the plan shall include legally enforceable increments of progress to achieve compliance for each designated facility or category of facilities. Increments of progress shall include, where practicable, each increment of progress specified in section 60.21(h) and shall include such additional increments of progress as may be necessary to permit close and effective supervision of progress toward final compliance.

(2) A plan may provide that compliance schedules for individual sources or categories of sources will be formulated after plan submittal. Any such schedule shall be the subject of a public hearing held according to section 60.23 and shall be submitted to the Administrator within 60 days after the date of adoption of the schedule but in no case later than the date prescribed for submittal of the first semiannual report required by section 60.25(e).

(f) Unless otherwise specified in the applicable subpart on a case-by-case basis for particular designated facilities or

classes of facilities, States may provide for the application of less stringent emissions standards or longer compliance schedules than those otherwise required by paragraph (c) of this section, provided that the State demonstrates with respect to each such facility (or class of facilities):

(1) Unreasonable cost of control resulting from plant age, location, or basic process design;

(2) Physical impossibility of installing necessary control equipment; or

(3) Other factors specific to the facility (or class of facilities) that make application of a less stringent standard or final compliance time significantly more reasonable.

(g) Nothing in this subpart shall be construed to preclude any State or political subdivision thereof from adopting or enforcing

(1) emission standards more stringent than emission guidelines specified in Subpart C of this part or in applicable guideline documents or

(2) compliance schedules requiring final compliance at earlier times than those specified in Subpart C or in applicable guideline documents.

#### 60.25 Emission inventories, source surveillance, reports.

(a) Each plan shall include an inventory of all designated facilities, including emission data for the designated pollutants and information related to emissions as specified in Appendix D to this part. Such data shall be summarized in the plan, and emission rates of designated pollutants from designated facilities shall be correlated with applicable emission standards. As used in this subpart, "correlated" means presented in such a manner as to show the relationship between measured or estimated amounts of emissions and the amounts of such emissions allowable under applicable emission standards.

(b) Each plan shall provide for monitoring the status of compliance with applicable emission standards. Each plan shall, as a minimum, provide for:

(1) Legally enforceable procedures for requiring owners or operators of designated facilities to maintain records and periodically report to the State information on the nature and amount of emissions from such facilities, and/or such other information as may be necessary to enable the State to determine whether such facilities are in compliance with applicable portions of the plan.

(2) Periodic inspection and, when applicable, testing of designated facilities.

(c) Each plan shall provide that information obtained by the State under paragraph (b) of this section shall be correlated with applicable emission standards (see section 60.25(a)) and made available to the general public.

(d) The provisions referred to in paragraphs (b) and (c) of this section shall be specifically identified. Copies of such provisions shall be submitted with the plan unless:

(1) They have been approved as portions of a preceding plan submitted under this subpart or as portions of an implementation plan submitted under section 110 of the Act, and

(2) The State demonstrates:

(i) That the provisions are applicable to the designated pollutant(s) for which the plan is submitted, and

(ii) That the requirements of section 60.26 are met.

(e) The State shall submit reports on progress in plan enforcement to the Administrator on an annual (calendar year) basis, commencing with the first full report period after approval of a plan or after promulgation of a plan by the Administrator. Information required under this paragraph must be included in the annual report required by section 51.321 of this chapter.

(f) Each progress report shall include:

(1) Enforcement actions initiated against designated facilities during the reporting period, under any emission standard or compliance schedule of the plan.

(2) Identification of the achievement of any increment of progress required by the applicable plan during the reporting period.

(3) Identification of designated facilities that have ceased operation during the reporting period.

(4) Submission of emission inventory data as described in paragraph (a) of this section for designated facilities that were not in operation at the time of plan development but began operation during the reporting period.

(5) Submission of additional data as necessary to update the information submitted under paragraph (a) of this section or in previous progress reports.

(6) Submission of copies of technical reports on all performance testing on designated facilities conducted under paragraph (b)(2) of this section, complete with concurrently recorded process data.

#### 60.26 Legal authority.

(a) Each plan shall show that the State has legal authority to carry out the plan, including authority to:

(1) Adopt emission standards and compliance schedules applicable to designated facilities.

(2) Enforce applicable laws, regulations, standards, and compliance schedules, and seek injunctive relief.

(3) Obtain information necessary to determine whether designated facilities are in compliance with applicable laws, regulations, standards, and compliance schedules, including authority to require recordkeeping and to make inspections and conduct tests of designated facilities.

(4) Require owners or operators of designated facilities to install, maintain, and use emission monitoring devices and to make periodic reports to the State on the nature and amounts of emissions from such facilities; also authority for the State to

make such data available to the public as reported and as correlated with applicable emission standards.

(b) The provisions of law or regulations which the State determines provide the authorities required by this section shall be specifically identified. Copies of such laws or regulations shall be submitted with the plan unless:

(1) They have been approved as portions of a preceding plan submitted under this subpart or as portions of an implementation plan submitted under section 110 of the Act, and

(2) The State demonstrates that the laws or regulations are applicable to the designated pollutant(s) for which the plan is submitted.

(c) The plan shall show that the legal authorities specified in this section are available to the State at the time of submission of the plan. Legal authority adequate to meet the requirements of paragraphs (a)(3) and (4) of this section may be delegated to the State under section 114 of the Act.

(d) A State governmental agency other than the State air pollution control agency may be assigned responsibility for carrying out a portion of a plan if the plan demonstrates to the Administrator's satisfaction that the State governmental agency has the legal authority necessary to carry out that portion of the plan.

(e) The State may authorize a local agency to carry out a plan, or portion thereof, within the local agency's jurisdiction if the plan demonstrates to the Administrator's satisfaction that the local agency has the legal authority necessary to implement the plan or portion thereof, and that the authorization does not relieve the State of responsibility under the Act for carrying out the plan or portion thereof.

#### 60.27 Actions by the Administrator.

(a) The Administrator may, whenever he determines necessary, extend the period for submission of any plan or plan revision or portion thereof.

(b) After receipt of a plan or plan revision, the Administrator will propose the plan or revision for approval or disapproval. The Administrator will, within four months after the date required for submission of a plan or plan revision, approve or disapprove such plan or revision or each portion thereof.

(c) The Administrator will, after consideration of any State hearing record, promptly prepare and publish proposed regulations setting forth a plan, or portion thereof, for a State if:

(1) The State fails to submit a plan within the time prescribed;

(2) The State fails to submit a plan revision required by section 60.23(a)(2) within the time prescribed; or

(3) The Administrator disapproves the State plan or plan revision or any portion thereof, as unsatisfactory because the requirements of this subpart have not been met.

(d) The Administrator will, within six months after the date required for submission of a plan or plan revision, promulgate the regulations proposed under paragraph (c) of this section with such modifications as may be appropriate unless, prior to such promulgation, the State has adopted and submitted a plan or plan revision which the Administrator determines to be approvable.

(e)(1) Except as provided in paragraph (e)(2) of this section, regulations proposed and promulgated by the Administrator under this section will prescribe emission standards of the same stringency as the corresponding emission guideline(s) specified in the final guideline document published under section 60.22(a) and will require final compliance with such standards as expeditiously as practicable but no later than the times specified in the guideline document.

(2) Upon application by the owner or operator of a designated facility to which regulations proposed and promulgated under this section will apply, the Administrator may provide for the application of less stringent emission standards or longer compliance schedules than those otherwise required by this section in accordance with the criteria specified in section 60.24(f).

(f) If a State failed to hold a public hearing as required by section 60.23(c), the Administrator will provide opportunity for a hearing within the State prior to promulgation of a plan under paragraph (d) of this section.

#### 60.28 Plan revisions by the State.

(a) Plan revisions which have the effect of delaying compliance with applicable emission standards or increments of progress or of establishing less stringent emission standards shall be submitted to the Administrator within 60 days after adoption in accordance with the procedures and requirements applicable to development and submission of the original plan.

(b) More stringent emission standards, or orders which have the effect of accelerating compliance, may be submitted to the Administrator as plan revisions in accordance with the procedures and requirements applicable to development and submission of the original plan.

(c) A revision of a plan, or any portion thereof, shall not be considered part of an applicable plan until approved by the Administrator in accordance with this subpart.

#### 60.29 Plan revisions by the Administrator.

After notice and opportunity for public hearing in each affected State, the Administrator may revise any provision of an applicable plan if:

(a) The provision was promulgated by the Administrator, and  
(b) The plan, as revised, will be consistent with the Act and with the requirements of this subpart.

## APPENDIX I

### EMISSION GUIDELINES (SUBPART Cc) AND NEW SOURCE PERFORMANCE STANDARDS (SUBPART WWW), AMENDMENTS TO SUBPARTS Cc AND WWW AND APPENDIX A - REFERENCE METHODS (METHOD 2E, METHOD 3C, AND METHOD 25C)

- I1 Subparts Cc and WWW of 40 CFR Part 60 can be found as published in the Federal Register on March 12, 1996 (61 FR 9905) or on the internet at <http://www.epa.gov/docs/fedrgstr/EPA-AIR/1996/March>
- I2 Amendments to Subparts Cc and WWW appeared as a direct final notice in the Federal Register on June 16, 1998 (63 FR 32743) and can also be found on the internet at <http://www.epa.gov/docs/fedrgstr/EPA-AIR/1998/June>

## APPENDIX I1

Subparts Cc and WWW of 40 CFR Part 60 can be found as published in the Federal Register on March 12, 1996 (61 FR 9905) or on the internet at <http://www.epa.gov/docs/fedrgstr/EPA-AIR/1996/March>

§ 706.2 Certifications of the Secretary of the Navy under Executive Order 11964 and 33 U.S.C. 1605.

\* \* \* \* \*

TABLE FIVE

Vessel	No.	Masthead lights not over all other lights and obstructions. annex 1, sec. 2(f)	Forward masthead light not in forward quarter of ship. annex 1, sec. 3(a)	After masthead light less than 1/2 ship's length aft of forward masthead light. annex 1, sec. 3(a)	Percentage horizontal separation attained
USS PAUL HAMILTON .....	DDG 60	X	X	X	20.4

Dated: February 25, 1996.  
 R. R. Pixa,  
 Captain, JAGC, U.S. Navy, Deputy Assistant Judge Advocate General (Admiralty).  
 [FR Doc. 96-5837 Filed 3-11-96; 8:45 am]  
 BILLING CODE 3810-FF-P

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 51, 52, and 60**

[AD-FRL-5437-8]

RIN 2060-AC42

**Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule and guideline.

**SUMMARY:** This action adds subparts WWW and Cc to 40 CFR part 60 by promulgating standards of performance for new municipal solid waste landfills and emission guidelines for existing municipal solid waste landfills. This action also adds the source category "municipal solid waste landfills" to the priority list in 40 CFR Part 60, § 60.16, for regulation under section 111 of the Clean Air Act. These standards and emission guidelines implement section 111 of the Clean Air Act and are based on the Administrator's determination that municipal solid waste landfills cause, or contribute significantly to, air pollution that may reasonably be anticipated to endanger public health or welfare. The emissions of concern are non-methane organic compounds

(NMOC) and methane. NMOC include volatile organic compounds (VOC), hazardous air pollutants (HAPs), and odorous compounds. VOC emissions contribute to ozone formation which can result in adverse effects to human health and vegetation. Ozone can penetrate into different regions of the respiratory tract and be absorbed through the respiratory system. The health effects of exposure to HAPs can include cancer, respiratory irritation, and damage to the nervous system. Methane emissions contribute to global climate change and can result in fires or explosions when they accumulate in structures on or off the landfill site. The intended effect of the standards and guidelines is to require certain municipal solid waste landfills to control emissions to the level achievable by the best demonstrated system of continuous emission reduction, considering costs, nonair quality health, and environmental and energy impacts. **EFFECTIVE DATE:** Effective on March 12, 1996.

**ADDRESSES:** Background Information Document. The background information document for the promulgated standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Air Emissions from Municipal Solid Waste Landfills—Background Information for Final Standards and Emission Guidelines," EPA-453/R-94-021. The Background Information Document contains: (1) A summary of all the public comments made on the proposed standards and the Notice of Data Availability as well as the Administrator's response to these

comments, (2) a summary of the changes made to the standards since proposal, and (3) the final Environmental Impact Statement, which summarizes the impacts of the standards.

**Docket.** Docket No. A-88-09, containing supporting information used in developing the promulgated standards, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, except for Federal holidays at the following address: U.S. Environmental Protection Agency, Air and Radiation Docket and Information Center (MC-6102), 401 M Street SW., Washington, DC 20460 [phone: (202) 260-7548]. The docket is located at the above address in Room M-1500, Waterside Mall (ground floor). A reasonable fee may be charged for copying.

**FOR FURTHER INFORMATION CONTACT:** For information on the regulation of municipal solid waste landfills, contact Ms. Martha Smith, Waste and Chemical Processes Group, Emission Standards Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-2421.

**SUPPLEMENTARY INFORMATION:**

**Judicial Review**

Under section 307(b)(1) of the Clean Air Act, judicial review of the actions taken by this notice is available *only* by the filing of a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged

later in civil or criminal proceedings brought by the EPA to enforce these requirements.

The following outline is provided to aid in locating information in the introductory text (preamble) to the final standards.

- I. Acronyms, Abbreviations, and Measurement Units
  - A. Acronyms
  - B. Abbreviations and Measurement Units
  - C. Conversion Factors and Commonly Used Units
- II. Background
- III. Summary of Considerations in Developing the Standards and Emission Guidelines
  - A. Purpose of the Regulation
  - B. Technical Basis of the Regulation
  - C. Stakeholders and Public Involvement
- IV. Summary of the Standards, Emission Guidelines, and Methods
- V. Impacts of the Standards and Emission Guidelines
  - A. Environmental Impacts
  - B. Cost and Economic Impacts
- VI. Significant Changes to the Proposed Standards and Emission Guidelines
  - A. Design Capacity Exemption
  - B. Emission Rate Cutoff
  - C. Collection System Design Specifications
  - D. Timing for Well Placement
  - E. Operational Standards
  - F. Surface Emission Monitoring
  - G. Model Default Values
- VII. Permitting
  - A. New Source Review Permits
  - B. Operating Permits
- VIII. Administrative Requirements
  - A. Docket
  - B. Paperwork Reduction Act
  - C. Executive Order 12866
  - D. Executive Order 12875
  - E. Unfunded Mandate Reform Act
  - F. Regulatory Flexibility Act
  - G. Miscellaneous
- I. Acronyms, Abbreviations, and Measurement Units

The following definitions, acronyms, and measurement units are provided to clarify the preamble to the final rule.

#### A. Acronyms

BDT—best demonstrated technology  
 BID—background information document  
 CAA—Clean Air Act  
 CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act  
 EG—emission guideline(s)  
 EPA—Environmental Protection Agency  
 FR—Federal Register  
 HAP—hazardous air pollutant  
 LFG—landfill gas  
 MSW—municipal solid waste  
 NMOC—nonmethane organic compounds  
 NPV—net present value  
 NSPS—new source performance standards

NSR—new source review  
 OMB—Office of Management and Budget  
 PSD—prevention of significant deterioration  
 RCRA—Resource Conservation and Recovery Act  
 VOC—volatile organic compound(s)

#### B. Abbreviations and Measurement Units

J/scm—joules per standard cubic meter  
 m—meter  
 Mg—megagram  
 mm—millimeter  
 ppm—parts per million  
 ppmv—parts per million by volume  
 tpy—tons per year  
 yr—year

#### C. Conversion Factors and Commonly Used Units

1 meter = 3.2808 feet  
 1 megagram = 1.1023 tons = 2204.6 pounds  
 1 cubic meter = 35.288 cubic feet = 1.3069 cubic yards  
 1 cubic meter = 0.0008101 acre-feet  
 Degrees Celsius = (degrees Fahrenheit - 32)/1.8

#### II. Background

The United States Environmental Protection Agency (EPA) originally considered regulating MSW landfill emissions under a RCRA subtitle D rulemaking. However, the Administrator decided to regulate MSW landfill emissions under the authority of the CAA, and announced the decision in the Federal Register on August 30, 1988 (53 FR 33314). The EPA decided to propose regulation of new MSW landfills under section 111(b) of the CAA and to propose EG for existing MSW landfills under section 111(d).

The EPA published a proposal of this NSPS and EG in the Federal Register on May 30, 1991 (56 FR 24468).

Following the receipt of new data and changes in the modeling techniques, the EPA published a Notice of Data Availability in the Federal Register on June 21, 1993 (56 FR 33790).

Under the authority of section 111(b)(1)(A) of the CAA, today's notice adds the source category MSW landfills to the priority list in 40 CFR 60.16 because, in the judgement of the Administrator, it contributes significantly to air pollution which may reasonably be anticipated to endanger public health and welfare. Further rationale for this finding is contained in section 1.1.1 of the promulgation BID (EPA-453/R-94-021).

Today's notice promulgates the final NSPS and EG for MSW landfills. The promulgation BID "Air Emissions from

Municipal Solid Waste Landfills—Background Information for Final Standards and Guidelines" (EPA 453/R-94-021) summarizes all public comments on the proposed NSPS and EG and the EPA responses. For further discussion of stakeholder and public involvement in the development of the rules see section III.C. of this preamble.

Recent information suggests that mercury might be emitted from landfills. The EPA is still looking at the possibility and will take action as appropriate in the future under the landfill national emission standards for hazardous air pollutants.

#### III. Summary of Considerations in Developing the Standards and Emission Guidelines

##### A. Purpose of the Regulation

Landfill gas emissions contain methane, carbon dioxide, and more than 100 different NMOC, such as vinyl chloride, toluene, and benzene. Studies indicate that MSW landfill gas emissions can at certain levels have adverse effects on both public health and welfare. The EPA presented concerns with the health and welfare effects of landfill gases in the preamble to the proposed regulations (56 FR 24468).

Briefly, specific health and welfare effects from LFG emissions are as follows: NMOC contribute to ozone formation; some NMOC are known or suspected carcinogens, or cause other noncancer health effects; NMOC can cause an odor nuisance; methane emissions present a well-documented danger of fire and explosion on-site and off-site, and contribute to global climate change as a major greenhouse gas. Today's rules will serve to significantly reduce these potential problems associated with LFG emissions.

##### B. Technical Basis of the Regulation

Today's regulations are based on extensive data analysis and consideration of several alternatives. Prior to proposal, the EPA developed an extensive data base, using survey information from approximately 1,200 landfills, along with emissions information from literature, State and local agencies, and industry test reports. The preamble to the proposed regulations presented a detailed discussion of the data used to develop the rule and the regulatory alternatives considered (56 FR 24476).

After proposal, the EPA continued to gather new information and received new data through public comments. The EPA published this new information in a Notice of Data Availability on June 21, 1993 (56 FR 33790). In addition to

public comments, the EPA held consultations with industry under the authority of Executive Order 12875 (See section VIII of this document for a detailed discussion of the Executive Order).

Based on the new information, the EPA re-assessed the impacts of the alternatives and made changes to the final regulation. The most significant changes to the regulation are summarized in section VI of this preamble. Detailed rationales for these changes as well as more minor changes are provided in the final BID (EPA 453/R-94-021).

In keeping with the EPA's common sense initiative, several of the changes were made to streamline the rule and to provide flexibility. Examples of this streamlining and increased flexibility include focusing control on the largest landfills, removing the gas collection system prescriptive design specifications, and more reasonable timing for the installation of collection wells. All of these changes are discussed further in section VI of this preamble.

#### C. Stakeholders and Public Involvement

Prior to proposal, in accordance with section 117 of the CAA, the EPA had consultations with appropriate advisory committees, independent experts, Federal departments and agencies. In addition, numerous discussions were held with industry representatives and trade associations.

After proposal, the EPA provided interested persons the opportunity to comment at a public hearing and through a written comment period. Comment letters were received from 60 commenters including industry representatives, governmental entities, environmental groups, and private citizens. A public hearing was held in Research Triangle Park, North Carolina, on July 2, 1991. This hearing was open to the public and five persons presented oral testimony on the proposed NSPS and EG.

On June 21, 1993, a supplemental notice of data availability to the May 30, 1991 proposal appeared in the Federal Register (58 FR 33790). The notice announced the availability of additional data and information on changes in the EPA's modelling methodology being used in the development of the final NSPS and EG for MSW landfills. Public comments were requested on the new data and comment letters were received from seven commenters.

Since the Notice of Data Availability, the EPA has held several consultations with State, local, and industry representatives in accordance with the October 26, 1993 Executive Order 12875

#### on *Enhancing the Intergovernmental Partnership*.

Major concerns expressed by participants in the consultations were identified by the EPA. These concerns included: the design capacity exemption level, collection system design and monitoring flexibility, and timing of well placement. These concerns and others raised at proposal and clarified in the consultations were addressed by revising the rule as described in section VI of this preamble.

#### IV. Summary of the Standards, Emission Guidelines, and Methods

The affected facility under the NSPS is each new MSW landfill. MSW landfills are also subject to the requirements of RCRA (40 CFR 257 and 258). A new MSW landfill is a landfill for which construction, modification, or reconstruction commences on or after the proposal date of May 30, 1991 or that began accepting waste on or after that date.

The EG require control for certain existing MSW landfills. An existing MSW landfill is a landfill for which construction commenced prior to May 30, 1991. An existing MSW landfill may be active, i.e., currently accepting waste, or have additional capacity available to accept waste, or may be closed, i.e., no longer accepting waste nor having available capacity for future waste deposition. The designated facility under the EG is each existing MSW landfill that has accepted waste since November 8, 1987.

The final rules (both the NSPS and EG) require affected and designated MSW landfills having design capacities below 2.5 million Mg or 2.5 million cubic meters to file a design capacity report. Affected and designated MSW landfills having design capacities greater than or equal to 2.5 million Mg or 2.5 million cubic meters are subject to the additional provisions of the standards or EG.

The final standards and EG for MSW landfill emissions require the periodic calculation of the annual NMOC emission rate at each affected or designated facility with a maximum design capacity greater than or equal to 2.5 million Mg or 2.5 million cubic meters. Those that emit more than 50 Mg/yr are required to install controls.

The final rules provide a tier system for calculating whether the NMOC emission rate is less than or greater than 50 Mg/yr, using a first order decomposition rate equation. The tier system does not need to be used to model the emission rate if an owner or operator has or intends to install controls that would achieve compliance.

Chapter 1 of the promulgation BID (EPA 453/R-94-021) presents a complete discussion of the components of the tier system.

The BDT for both the NSPS and the EG requires the reduction of MSW landfill emissions from new and existing MSW landfills emitting 50 Mg/yr of NMOC or more with: (1) A well-designed and well-operated gas collection system and (2) a control device capable of reducing NMOC in the collected gas by 98 weight-percent.

A well-designed and well-operated collection system would, at a minimum: (1) Be capable of handling the maximum expected gas generation rate; (2) have a design capable of monitoring and adjusting the operation of the system; and (3) be able to collect gas effectively from all areas of the landfill that warrant control. Over time, new areas of the landfill will require control, so collection systems should be designed to allow expansion by the addition of further collection system components to collect gas, or separate collections systems will need to be installed as the new areas require control.

The BDT control device is a combustion device capable of reducing NMOC emissions by 98 weight-percent. While energy recovery is strongly recommended, the cost analysis is based on open flares because they are applicable to all affected and designated facilities regulated by the standards and EG. If an owner or operator uses an enclosed combustor, the device must demonstrate either 98-percent NMOC reduction or an outlet NMOC concentration of 20 ppmv or less. Alternatively, the collected gas may be treated for subsequent sale or use, provided that all emissions from any atmospheric vent from the treatment system are routed to a control device meeting either specification above.

The standards and EG require that three conditions be met prior to capping or removal of the collection and control system: (1) The landfill must be permanently closed under the requirements of 40 CFR 258.60; (2) the collection and control system must have been in continuous operation a minimum of 15 years; and (3) the annual NMOC emission rate routed to the control device must be less than the emission rate cutoff on three successive dates, between 90 and 180 days apart, based upon the site-specific landfill gas flow rate and average NMOC concentration.

Section VI.E. of this preamble describes a new section of the NSPS, § 60.753, "Operational Standards for Collection and Control Systems." The EG also refer to this section. The

provisions in this section include: (1) Collection of gas from each area, cell or group of cells in which non-asbestos degradable solid waste has been placed for a period of 5 years or more for active areas or 2 years or more for closed areas; (2) operation of the collection system with each wellhead under negative pressure, with a nitrogen level less than or equal to 20 percent (revised from 1 percent in the proposal, based on public comments) or an oxygen level less than or equal to 5 percent (a new provision); (3) operation with a landfill gas temperature less than 55 °C (a new provision) at each well transporting the collected gases to a treatment or control device designed and operated in compliance with § 60.752(b)(2)(iii) of the NSPS and operated at all times when the collected gas is vented to it; and (4) a requirement that the collection system be operated to limit the surface methane concentration to 500 ppm or less over the landfill as determined according to a specified monitoring pattern.

Owners and operators must determine compliance with the standards for the collection systems and control devices according to § 60.755. Changes made to the final compliance determination and monitoring procedures as a result of comments are discussed in detail in the BID (EPA 453/R-94-021). The §§ 60.757 and 60.758 of the NSPS and § 60.35(c) of the EG contain recordkeeping and reporting requirements. Changes have been made to the recordkeeping and reporting requirements to allow for

consistency with the final compliance requirements.

V. Impacts of the Standards and Emission Guidelines

A. Environmental Impacts of Promulgated Action

The estimated environmental impacts have changed somewhat from those presented in the preamble to the proposed regulations as a result of changes in the final rules and changes in the estimation methodology. These changes were made in response to public comments. Additional data were also incorporated and are described in the supplemental Notice of Data Availability (56 FR 33790). The analysis of environmental impacts presented in this document, along with the proposal and promulgation BID's, and memoranda in the docket constitute the Environmental Impact Statement for the final standards and guidelines.

For most NSPS, emission reductions and costs are expressed in annual terms. In the case of the NSPS and EG for landfills, the final regulations require controls at a given landfill only after the increasing NMOC emission rate reaches the level of the regulatory cutoff. The controls are applied when the emissions exceed the threshold, and they must remain in place until the emissions drop below the cutoff. However, this process could take as long as 50 to 100 hundred years for some landfills. During the control period, costs and emission reductions will vary from year to year. Therefore, the annualized numbers for any impact will change from year to

year. Because of the variability of emission reductions and costs of the final standards and EG over time, the EPA judged that the NPV of an impact is a more valuable tool in the decision process for landfills and has used NPV in the development of both the proposal and final nationwide impacts. The NPV is computed by discounting the capital and operating costs and emission reductions that will be incurred throughout the control periods to arrive at a measure of their current value. In this way, the NPV accounts for the unique emission patterns of landfills when evaluating nationwide costs and benefits over different discrete time periods for individual sources. Thus, the impacts presented include both annualized estimates and estimates expressed in terms of NPV in 1992.

1. Air Emissions

The methodology for estimating the impacts of the NSPS and EG is discussed in the proposal BID and in memoranda in the docket. The analysis of impacts for the NSPS is based on new landfills (beginning construction after May 30, 1991) that are projected to begin accepting waste over the first 5 years of the standards. The NPV of the emission reduction achieved by the final standards is estimated to be 79,300 Mg, which reflects a 50 percent reduction from the NPV of the baseline emissions of 160,000 Mg. Substantial reduction of methane emissions is also achieved. Table 1 presents the emission reductions of the final NSPS in annualized values as well as NPV.

TABLE 1.—SUMMARY OF EMISSION REDUCTION AND COST IMPACTS FOR THE NSPS

	NPV	Annualized
Baseline NMOC Emissions <sup>a</sup> (Mg) .....	160,000	13,400
NMOC Emission Reductions (Mg) .....	79,300	4,860
% NMOC Emission Reduction .....	50%	36%
Baseline Methane Emissions <sup>a</sup> (Mg) .....	10,600,000	899,000
Methane Emission Reduction <sup>b</sup> (Mg) .....	3,890,000	193,000
% Methane Emission Reduction .....	37%	21%
Cost (Million \$) .....	97	4

<sup>a</sup>In the absence of an NSPS. This does not include landfills closed prior to November 8, 1987.  
<sup>b</sup>This does not include landfills expected to undertake profitable energy recovery.

For existing landfills, the NPV of the NMOC emission reduction achieved by the final EG is estimated to be 1.1 million Mg, or a 53 percent reduction from a baseline of 2.07 million Mg (NPV). The NPV of the methane reduction is estimated to be 47 million

Mg. Table 2 presents the emission reductions of the final EG in annualized values as well as NPV. Note that the baseline methane emissions do not include landfills closed prior to November 8, 1987, and that methane reductions shown in Tables 1 and 2 do

not include landfills expected to undertake profitable energy recovery. Total methane reductions are anticipated to be on the order of 7 million megagrams in the year 2000.

TABLE 2.—SUMMARY OF EMISSION REDUCTION AND COST IMPACTS FOR THE EMISSION GUIDELINES

	NPV	Annualized
Baseline NMOC Emissions <sup>a</sup> (Mg) .....	2,070,000	145,000
NMOC Emission Reductions (Mg) .....	1,100,000	77,600
% NMOC Emission Reduction .....	53%	54%
Baseline Methane Emissions <sup>b</sup> (Mg) .....	120,000,000	8,440,000
Methane Emission Reduction (Mg) .....	47,000,000	3,370,000
% Methane Emission Reduction .....	39%	40%
Cost (Million \$) .....	1,278	90

<sup>a</sup> In the absence of EG. This does not include landfills closed prior to November 8, 1987.

<sup>b</sup> This does not include landfills expected to undertake profitable energy recovery.

As existing landfills are filled, closed, and replaced by new landfills, the actual annual emissions reductions achieved by the guidelines will decrease, while the reductions achieved by the standards will increase.

Certain by-product emissions, such as NO<sub>x</sub>, CO, SO<sub>x</sub>, and particulates, may be generated by the combustion devices used to reduce air emissions from MSW landfills. The types and quantities of these by-product emissions vary depending on the control device. However, by-product emissions are very low compared to the achievable NMOC and methane emission reductions. Chapters 4 and 6 of the proposal BID (EPA-450/3-90-011a) present additional information about the magnitude of potential secondary air impacts.

## 2. Water

Landfill leachate is the primary potential source of water pollution from a landfill. Although there is no data on the effect of gas collection on leachate composition, the amount of water pollution present as NMOC in the leachate may be reduced under these standards and guidelines.

When LFG is collected, organics and water are condensed inside the header pipes of the gas collection system. This waste also contains NMOC and various toxic substances present in the LFG. The pH of this condensate is normally adjusted by adding caustic at the landfill and then routing it to a public treatment works where it would be treated and discharged. At this time, there is insufficient data available to quantify the effects of the rule on leachate.

## 3. Solid Waste

The final NSPS and EG will likely have little impact on the quantity of solid waste generated nationwide. Aside from the disposal of the collection and control system equipment once it can be removed from the landfill, no other solid wastes are expected to be generated by the required controls. The increased cost of landfill operation

resulting from the control requirements may cause greater use of waste recycling and other alternatives to landfill disposal, leading to a decrease in landfill use. However, quantification of such an impact is not possible at this time.

## 4. Superfund Sites

Municipal solid waste landfill sites comprise approximately 20 percent of the sites placed by the EPA on the national priorities list. Often, remedial actions selected at these sites include venting methane and volatile organic contaminants, which would be controlled as necessary to protect human health and the environment.

The final NSPS and EG may affect remedial actions under Superfund for MSW landfills. Section 121(d)(2) of CERCLA requires compliance with the substantive standards of applicable or relevant and appropriate requirements (ARAR) of certain provisions in other environmental laws when selecting and implementing on-site remedial actions. "Applicable" requirements specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Superfund site. "Relevant and appropriate" requirements are not legally applicable, but may address problems or situations sufficiently similar to those encountered so that their use is well suited to a particular site. See 40 CFR 300.5 (55 FR 8814, 8817, March 8, 1990).

These air emission rules will apply to new MSW landfills, as well as to those facilities that have accepted waste since November 8, 1987, or that have capacity available for future use. For CERCLA municipal landfill remediations, these requirements would be potential ARAR for all Records of Decision signed after the date of promulgation. These NSPS and EG will be applicable for those MSW landfill sites on the national priorities list that accepted waste on or after November 8, 1987, or that are operating and have capacity for future use. These standards may also be

determined relevant and appropriate for sites that accepted wastes prior to November 8, 1987. The determination of relevance and appropriateness is made on a site-specific basis pursuant to 40 CFR 300.400(g) (55 FR 8841, March 8, 1990). Because the NSPS and EG apply only to landfills with design capacities greater than or equal to 2.5 million Mg or 2.5 million cubic meters, the collection and control requirements may not be relevant and appropriate for smaller landfills.

Given the significant public policy benefits that result from the collection and processing of landfill gas, Congress, as part of the 1986 SARA Amendments, enacted CERCLA Section 124 to provide broad liability protection for companies engaged in landfill gas recovery or processing. Landfill gas emissions, in addition to being a significant source of air pollution, can leach underground and cause explosions in nearby residences. If recovered, landfill gas could supply as much as 1 percent of the U.S. energy requirements.

CERCLA Section 124 states that owners or operators of equipment installed "for the recovery or processing (including recirculation of condensate) of methane" shall not be liable as a CERCLA "owner or operator" under CERCLA Section 101 (20) nor shall they be deemed "to have arranged for disposal or treatment of any hazardous substance\* \* \*" pursuant to CERCLA Section 107. Exceptions are provided (1) where a release is primarily caused by activities of the landfill gas owner/operator or (2) where such owner/operator would be otherwise liable due to activities unrelated to methane recovery.

Since passage of CERCLA section 124, methane emissions have been targeted by the EPA as a large contributor to global warming (18 percent) and landfills are one of the largest source of methane emissions (36 percent). Because of this, the EPA's Atmospheric Pollution Prevention Division has initiated the Landfill Methane Outreach Program to promote landfill gas

collection projects at the 750 landfills where methane could profitably be recovered. Methane recovery, as compared with collection and flaring of landfill gas without recovery, results in significantly less emissions. It also can greatly reduce the financial burden on local governments (as well as taxpayers) since the energy recovered can be sold to utilities or other consumers and thereby create a revenue stream that may cover the costs of collection and recovery.

The EPA is aware that the standards and guidelines promulgated today for control of emissions at municipal solid waste landfills may change the focus of the landfill gas collection and processing for methane recovery. The landfill gas owner/operator will now need to consider how the collection and recovery of methane will impact on controlling the MSW landfill emissions. It is also likely that the landfill gas owner/operator will be asked to advise and in some cases help implement the MSW landfill's compliance obligations. These related objectives, the control of emissions at municipal solid waste landfills in order to comply with the Clean Air Act Amendments and the reduction of methane emissions in order to mitigate global warming, will need to be coordinated in carrying out common activities such as laying a system of collection piping at a given landfill.

In promulgating today's standards and guidelines, the EPA wants to promote the policy incorporated in CERCLA Section 124. Recognizing the chilling effect that potential CERCLA liability might otherwise have on landfill gas collection or processing activities, the EPA interprets CERCLA Section 124 in a manner that will encourage the beneficial recovery of methane. Specifically, EPA believes that Congress intended Section 124 to provide liability protection to owners and operators of equipment for the recovery or processing of methane with respect to all phases involved in landfill gas collection and methane processing. This includes any assistance (related to recovery or processing of methane) provided by the landfill gas equipment owner or operator to the landfill owner/operator for achieving compliance with the emission standards promulgated today or similar Federal, State, or local controls on landfill emissions. In general, Section 124 will be interpreted in a manner to provide owners and operators of equipment for the recovery or processing of methane with comprehensive protection from CERCLA liability, unless the release or threatened release was primarily caused by activities of the owners and operators

of the equipment, or unless such owners or operators would be otherwise liable under CERCLA.

### *B. Energy and Economic Impacts of Promulgated Action*

The energy and economic impacts are summarized in chapter 1 and fully discussed in chapter 3 and appendix A of the promulgation BID (EPA-453/R-94-021). The estimated impacts have changed somewhat as a result of changes in the final rules and changes in the impacts estimation methodology made in response to public comments.

#### 1. Energy Impacts

Affected and designated landfills with NMOC emission rates of 50 Mg/yr or more are required to install a gas collection system and control device. The gas collection system would require a relatively small amount of energy to run the blowers and the pumps. If a flare is used for control, auxiliary fuel should not be necessary because of the high heat content of LFG, commonly  $1.86 \times 10^7$  J/scm or more. If a recovery device such as an internal combustion (I.C.) engine or a gas turbine is used, an energy savings would result.

The EPA evaluated the overall energy impacts resulting from the use of flares, I.C. engines, or gas turbines for control of collected emissions at all affected landfills. The least cost control option was identified by taking the NPV costs of the three control options (flares, I.C. engines, and turbines), including any cost savings from the use of recovered landfill gas, and determining the option that costs the least. If landfills use the least cost control device, it is estimated that the NSPS will produce \$170 million of energy revenue as NPV in 1992. The EG are estimated to generate \$1.5 billion of energy revenue as NPV in 1992, if the least cost control device is used.

#### 2. Control Costs and Economic Impacts

Nationwide annualized costs for collection and control of air emissions from new MSW landfills are estimated to be \$4 million. The nationwide cost of the EG would be approximately \$90 million. These values are annualized costs. Tables 1 and 2 present costs in both annualized and NPV values. In comparison to other solid waste-related rules, the nationwide costs of the recently promulgated RCRA Subtitle D (40 CFR 257 and 258) rule are estimated to be \$300 million per year and the estimated nationwide costs of the MWC rules promulgated in 1991 are estimated to be \$170 million per year for new combustors and \$302 million per year

for existing combustors (56 FR 5488 and 5514).

The incremental costs and benefits of the different options are presented in tables 3, 4, 5, and 6 in section VIII.E. For NMOC, the average cost effectiveness is approximately \$1,200/Mg for both the NSPS and the EG. Preliminary economic analysis indicates that the annual cost of waste disposal may increase by an average of approximately \$0.60 per Mg for the NSPS and \$1.30 per Mg for the EG. Costs per household would increase approximately \$2.50 to \$5.00 per year, when the household is served by a new or existing landfill, respectively. Additionally, less than 10 percent of the households would face annual increases of \$15 or more per household as a result of the final EG. However, the EPA anticipates that many landfills will elect to use energy recovery systems, and costs per household for those areas would be less. The EPA has concluded that households would not incur severe economic impacts. For additional information, please refer to the regulatory impact analysis (Docket No. A-88-09, Item No. IV-A-7) and chapter 3 of the promulgation BID (EPA-453/R-94-021).

#### VI. Significant Changes to the Proposed Standards and Emission Guidelines

All of the significant public comments received on the proposed standards and EG and the Notice of Data Availability are addressed in the promulgation BID (EPA-453/R-94-021). This section of the preamble reviews the major changes to the standards and EG resulting from public comments. A more detailed rationale for these changes is provided in chapters 1 and 2 of the promulgation BID (EPA-453/R-94-021).

##### *A. Design Capacity Exemption*

A design capacity exemption of 100,000 Mg was included in the proposed NSPS and EG to relieve owners and operators of small landfills that the EPA considered unlikely to emit NMOC above the emission rate cutoff requiring control from undue recordkeeping and reporting responsibilities. Commenters indicated that the exemption level was too low, and would still impact many small businesses and municipalities. In response to these comments and as a result of changes to the nationwide impacts analysis, the design capacity exemption in the final NSPS was revised to 2.5 million Mg. The 2.5 million Mg exemption level would exempt 90 percent of the existing landfills while only losing 15 percent of the total NMOC emission reduction. Most of the exempt landfills are owned

by municipalities. The 2.5 million Mg level was chosen to relieve as many small businesses and municipalities as possible from the regulatory requirements while still maintaining significant emission reduction.

This cutoff excludes those landfills who would be least able to afford the costs of a landfill gas collection and control system and are less likely to have successful energy recovery projects. However, depending on site-specific factors including landfill gas characteristics and local markets, some landfills smaller than the design capacity exemption level may be able to make a profit by installing collection and control systems that recover energy. While the rule does not require control of landfills smaller than 2.5 million Mg, the EPA encourages energy recovery in cases where it is profitable. The EPA has developed a Landfill Methane Outreach Program to encourage more widespread utilization of landfill gas as an energy source. Information can be obtained by calling the Landfill Methane Outreach Program Hotline at (202) 233-9042. Available publications are identified in section 1.2.1 of the promulgation BID.

Since some landfills record waste by volume and have their design capacities calculated in volume, the EPA also established an equivalent design capacity exemption of 2.5 million m<sup>3</sup> of waste. The density of solid waste within different landfills varies depending on several factors, including the compaction practices. Any landfill that reports waste by volume and wishes to establish a mass design capacity must document the basis for their density calculation.

#### *B. Emission Rate Cutoff*

Some commenters asserted that the proposed emission rate cutoff of 150 Mg/yr should be made more stringent, while others favored the proposal cutoff or higher. The commenters favoring the more stringent level indicated that the EPA's data on NMOC concentration, the benefits of energy recovery and reduced global warming, and the reduced health risks all supported an increased stringency level.

The Climate Change Action Plan, signed by the President in October, 1993, calls for EPA to promulgate a "tough" landfill gas rule as soon as possible. This initiative also supports a more stringent emission rate cutoff that will achieve greater emission reduction.

Due to the small-size exemption, only landfills with design capacities greater than 2.5 million Mg of waste or 2.5 million cubic meters of waste will be affected by this rule. It is estimated that a landfill of 2.5 million Mg design

capacity corresponds to cities greater than about 125,000 people. On the whole, large landfills service areas with large population. A reasonable assumption is that many of these large landfills are in the 400 counties that have been designated as urban ozone nonattainment areas and are developing plans to address ozone nonattainment.

Finally, the new data and modeling methodologies, which were published in the Notice of Data Availability on June 21, 1993, significantly reduced the emission reduction and corresponding effectiveness of the rule. Therefore, a more stringent emission rate cutoff would achieve similar emission reductions at similar cost effectiveness to the proposed rule.

Based on all of these reasons, the EPA reevaluated the stringency level and chose an emission rate cutoff of 50 Mg/yr of NMOC for the final rules. This revision would affect more landfills than the proposal value of 150 Mg/yr of NMOC; however, the 50 Mg/yr of NMOC will only affect less than 5 percent of all landfills and is estimated to reduce NMOC emissions by approximately 53 percent and methane emissions by 39 percent. The 150 Mg/yr emission rate cutoff would have reduced NMOC emissions by 45 percent and methane emissions by 24 percent. The incremental cost effectiveness of control of going from a 150 Mg/yr cutoff level to a 50 Mg/yr cutoff level is \$2,900/Mg NMOC reduction for new landfills and \$3,300/Mg for existing landfills.

The values for NMOC cost effectiveness do not include any credit for the benefits for toxics, odor, explosion control, or the indirect benefit of methane control. A revised cost effectiveness could be calculated with an assumed credit value for one or more of the other benefits. As an example, assuming a \$30/Mg credit for the methane emission reduction, the incremental cost effectiveness from the proposal cutoff of 150 Mg/yr to the final cutoff of 50 Mg/yr would be reduced to \$660/Mg NMOC.

#### *C. Collection System Design Specifications*

Commenters indicated that the proposed design specifications for the collection system were overly prescriptive, discouraged innovation, and did not prevent off-site migration of LFG. In the new § 60.759 for design specifications, certain criteria still require proper landfill gas collection; however, the proposed design specifications for the LFG collection system were removed from the final regulations. Instead, the final rule

allows sources to design their own collection systems. Design plans must meet certain requirements and be signed by a registered professional engineer, and are subject to agency approval. These changes were made to provide flexibility and encourage technological innovation.

#### *D. Timing for Well Placement*

The proposed regulations required the installation of collection wells at applicable landfills within 2 years of initial waste placement. Commenters indicated that the installation of wells within 2 years was not practiced at many landfills, because many cells were still active (receiving waste) 2 years after initial placement. Collection wells installed at these cells would have to be covered over, which would decrease the operational life of the well and be costly and inefficient.

The proposed timing for the placement of collection wells has been revised to reduce costs and better coincide with common operational practices at MSW landfills. The final regulation allows for well installation up to 5 years from initial waste placement for active cells. An area that reaches final grade or closure must install collection wells within 2 years of initial waste placement.

#### *E. Operational Standards*

In response to commenters concerns about the operation of collection systems, the final NSPS contains a new section, § 60.753, "Operational Standards for Collection and Control Equipment." Various operational provisions that had previously been located throughout the proposed rule have been organized under this one section, and new provisions on collection and control systems have been added. The new section addresses the following areas: (1) Collection of gas from active areas containing solid waste older than 5 years (changed from 2 years at proposal); (2) operation of the collection system with negative pressure at each wellhead (except as noted in the rule); (3) operation of the collection system with a landfill temperature less than 55° (or a higher established temperature) and either an N<sub>2</sub> level less than or equal to 20 percent or an O<sub>2</sub> level less than or equal to 5 percent; (4) operation of the collection system with a surface concentration less than 500 ppm methane; (5) venting all collected gases to a treatment or control device; and (6) operation of the treatment or control device at all times when the collected gas is routed to the control device. The numerical requirements (for the N<sub>2</sub> or O<sub>2</sub> levels, landfill temperature,

and surface concentration) are new requirements that will verify that the system is being adequately operated and maintained. In conjunction with the new operational provisions, the compliance, testing and monitoring sections were revised to reference and support these new or relocated provisions.

#### F. Surface Emission Monitoring

Numerous commenters asserted that the proposed rules did not address surface methane emissions resulting from insufficient well spacing or from breaks in the cover material. The commenters recommended that monitoring of surface emissions be required to ensure the proper operation of collection system equipment. Upon further analysis, the EPA decided to require surface emission monitoring and the maintenance of negative pressure at all wells, except under specified conditions, to ensure proper collection system design and operation. Based on information submitted by commenters, a maximum surface concentration of 500 ppm methane should be demonstrated to indicate proper operation of the collection system. Monitoring is to be done quarterly, with provisions for increasing monitoring and corrective procedures if readings above 500 ppm are detected. Instrumentation specifications, monitoring frequencies, and monitoring patterns have been structured to provide clear and straightforward procedures that are the minimum necessary to assure compliance.

#### G. Model Default Values

The EPA received additional data after proposal on the model defaults that were included in the tier system calculations. These default values are used to calculate whether the NMOC concentration is above the cutoff level for control requirements of 50 Mg/yr. The new information received lead the EPA to revise the default values for the site-specific methane generation rate constant (k), the methane generation potential ( $L_0$ ), and the NMOC concentration ( $C_{NMOC}$ ). In the absence of site-specific data, the landfill owner or operator would use the default values for k,  $L_0$ , and  $C_{NMOC}$  in order to estimate the annual NMOC emission rate. More information on the model defaults may be found in the final BID (EPA-453/R-94-021) and the memorandum "Documentation of Small-Size Exemption Cutoff Level and Tier 1 Default Values (Revised)," October 21, 1993, (Docket No. A-88-09, Item No. IV-B-5).

The Tier 1 default values of k,  $L_0$ , and  $C_{NMOC}$  tend to overstate NMOC emission rates for most landfills, and are intended to be used to indicate the need to install a collection and control system or perform a more detailed Tier 2 analysis. It is recommended that these default values not be used for estimating landfill emissions for purposes other than the NSPS and EG. The EPA document "Compilation of Air Pollution Emission Factors" (AP-42) provides emission estimation procedures and default values that can be used for emissions inventories and other purposes.

### VII. Permitting

#### A. New Source Review Permits

Today's rulemaking under section 111(b) establishes a new classification of pollutants subject to regulation under the CAA: "MSW landfill emissions." Therefore, PSD rules now apply to all subject stationary sources which have increases in landfill gas above the significance level, 50 tpy or more of NMOC. Landfills below the 2.5 million Mg design capacity exemption, which are not required by the regulations to install controls, may exceed this significance level. In this case, the State will need to determine if controls should be installed for purposes of PSD or NSR compliance.

The proposed significance level for MSW landfill emissions of 40 tpy of NMOC was changed to 50 tpy after consideration of public comments. The PSD significance level for VOC emissions is 40 tpy. At proposal, the landfill gas emission level was set at 40 tpy of NMOC to be consistent with the 40 tpy level for VOC. However, NMOC contains organic compounds that are not VOC. An NMOC emission rate of roughly 50 tpy corresponds to a VOC emission rate of 40 tpy.

The components of MSW landfill emissions that are regulated as pollutants or precursors of an air pollutant listed under section 108 of the CAA are also regulated by other provisions of CAA as applicable. For example, the components of MSW landfill emissions that are emitted as photochemically reactive VOCs are regulated, as applicable, under the nonattainment provisions for ozone contained in part D of title I of the CAA.

#### B. Operating Permits

Section 502 of the CAA and § 70.3(a) require any source subject to standards or regulations under section 111 of the CAA to obtain part 70 operating permits. However, landfills below 2.5 million Mg design capacity are not

subject to standards under section 111 because they are not required to put on controls and are not subject to emission limits. These landfills are subject to a reporting requirement under the section 111 rule; however, this requirement determines applicability of the standard and does not make them "subject" for the purposes of part 70. Consequently, landfills below 2.5 million Mg design capacity are not subject to part 70, provided they are not major sources; and this is stated in § 60.752(a) of the rule. If landfills below 2.5 million Mg design capacity are major sources, they must obtain a part 70 permit under the same deadlines and requirements that apply to any other major source. States may request additional information to verify whether landfills have the potential to emit at major source levels.

For landfills above the 2.5 million Mg design capacity exemption, part 70 operating permits are required. These landfills are subject to emission limits and will most often be major sources. Since landfill emissions increase over time, a landfill over 2.5 million Mg may not be major in the beginning; however, as the landfill progresses to capacity, it may become major. Many of the landfills above the 2.5 million Mg exemption will be required to collect and control the gas under the regulation. The issuance of a permit will also help enforce and implement the standard. Therefore, the EPA has decided to require permits for all landfills with design capacities above 2.5 million Mg, whether or not the landfill will be required to install a collection and control system.

The regulation also provides for termination of operating permits. Landfill emissions, unlike emissions from other source categories, decrease over time after the landfill is closed. If a landfill has closed and a control system was never required or the conditions for control system removal specified in the regulation have been met, an operating permit is no longer necessary.

### VIII. Administrative Requirements

#### A. Docket

The docket (Docket No. A-88-09) is an organized and complete file of all the information considered by the EPA in the development of this rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking development. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can effectively participate in the rulemaking process. Along with

the statement of basis and purpose of the proposed and promulgated standards and the EPA responses to significant comments, the contents of the docket, except for interagency review materials, will serve as the record in case of judicial review [section 307(d)(7)(A)].

#### *B. Paperwork Reduction Act*

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. An Information Collection Request (ICR) document has been prepared by the EPA (ICR No. 1557.03) and a copy may be obtained from Sandy Farmer, OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, DC 20460, or by calling (202) 260-2740. The information requirements are not effective until OMB approves them.

The information required to be collected by this rule is necessary to identify the regulated entities who are subject to the rule and to ensure their compliance with the rule. The recordkeeping and reporting requirements are mandatory and are being established under authority of section 114 of the Act. All information submitted as part of a report to the Agency for which a claim of confidentiality is made will be safeguarded according to the Agency policies set forth in title 40, chapter 1, part 2, subpart B—Confidentiality of Business Information (see 40 CFR 2; 41 FR 36902, September 1, 1976, amended by 43 FR 39999, September 28, 1978; 43 FR 42251, September 28, 1978; 44 FR 17674, March 23, 1979).

The total annual reporting and recordkeeping burden for this collection, averaged over the first 3 years of the NSPS applicability to new MSW landfills, is estimated to be 3,379 person hours per year. This is the estimated burden for 299 respondents (e.g., MSW landfill owners/operators) per year, at an estimated annual reporting and recordkeeping burden averaging 11.3 hours per respondent. The rule requires an initial one-time notification of landfill design capacity. If the landfill is larger than the design capacity cutoff, annual reports are required. The capital cost to purchase required monitoring equipment is \$8,100 per monitor. The total annualized capital and startup costs for purchase of monitoring equipment are \$80,250. The total national annual cost burden including all labor costs and annualized capital costs for

recordkeeping and reporting is \$188,850.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

#### *C. Executive Order 12866*

Under Executive Order 12866, (58 FR 51735 (October 4, 1993)) the EPA must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of \$100 million or more or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations are documented in the public record.

#### *D. Executive Order 12875*

To reduce the burden of Federal regulations on States and small governments, the President issued E.O. 12875 on October 26, 1993. Under E.O. 12875, the EPA is required to consult with representatives of affected State, local, and tribal governments. Because this regulatory action imposes costs to the private sector and government entities in excess of \$100 million per year, the EPA pursued the preparation

of an unfunded mandates statement, consultations, and other requirements of the Unfunded Mandates Reform Act. The requirements are met as presented under the following unfunded mandates section (section VIII.E of this notice).

#### *E. Unfunded Mandate Reform Act*

Under section 202 of the Unfunded Mandates Reform Act of 1995 ("Unfunded Mandates Act"), signed into law on March 22, 1995, the EPA must prepare a statement to accompany any rule where the estimated costs to State, local, or tribal governments, or to the private sector, will be \$100 million or more per year. Section 203 requires the Agency to establish a plan for informing and advising any small governments that may be significantly or uniquely affected by the rule. Section 204 requires that the Agency "to the extent permitted in law, develop an effective process to permit elected officers of State, local, and tribal governments \* \* \* to provide meaningful and timely input in the development of regulatory proposals containing significant Federal intergovernmental mandates". Under section 205(a), the EPA must select the "least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule" and is consistent with statutory requirements.

The unfunded mandates statement under section 202 must include: (1) A citation of the statutory authority under which the rule is proposed, (2) an assessment of the costs and benefits of the rule including the effect of the mandate on health, safety and the environment, and the Federal resources available to defray the costs, (3) where feasible, estimates of future compliance costs and disproportionate impacts upon particular geographic or social segments of the nation or industry, (4) where relevant, an estimate of the effect on the national economy, and (5) a description of the EPA's consultation with State, local, and tribal officials.

Because this rule is estimated to impose costs to the private sector and governments entities in excess of \$100 million per year (based on tenth or fifteenth year annualized values), it is considered a significant regulatory action.

The EPA has thus prepared the following statement with respect to sections 202 through 205 of the Unfunded Mandates Act.

##### *1. Statutory Authority*

As discussed in section II of this preamble, the statutory authority for this rulemaking is section 111 of the CAA. The rule establishes emission guidelines

for existing MSW landfills and standards of performance for new MSW landfills. Section 111(a)(1) of the requires that standards of performance for new sources reflect the—

\* \* \* degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

Section 111(d) requires emission guidelines for existing sources to reflect a similar degree of emission reduction.

These systems are referred to as BDT for new and existing sources.

Properly operated gas collection and control systems achieving 98 percent emission reduction have been demonstrated on landfills of the size affected by the standards and EG, and represent BDT. Control technologies and their performance are discussed in the preamble to the proposed rules (56 FR 24476, May 30, 1991).

In selecting BDT, the EPA also considered which landfills should be required to apply collection and control systems. A range of landfill design capacity and emission rate cutoffs were evaluated, as described below in section 2.b "Regulatory Alternatives Considered." The promulgated standards contain a design capacity exemption of 2.5 million Mg or 2.5 million cubic meters and an emission rate cutoff of 50 Mg NMOC/yr.

The EPA considered emission reduction, costs, and energy requirements, as required by the statutory language of section 111 of the CAA, in selecting the promulgated standards and EG. The promulgated standards represent BDT. They achieve significant reductions in landfill gas emissions—a 53 percent reduction in NMOC emissions, and a 39 percent reduction in methane reduction emissions nationwide. The cost impacts of the standards are presented in section V.B and in section VII.E.2 (below). The public entities and affected industries who were consulted, as required by the Unfunded Mandates Reform Act, understand the cost impacts and

support the final rules (see Section 4, "Consultation with Government Officials" below). The energy impacts are discussed in section V.B of this notice. To the extent energy recovery devices are used to comply with the rules, the rules will result in a net energy savings (production of energy).

**Compliance with section 205(a):** Regarding the EPA's compliance with section 205(a), the EPA did identify and consider a reasonable number of alternatives, and presents a summary of these below. The EPA has chosen to adopt the alternative with a size cutoff of 2.5 million Mg capacity, and 50 Mg/yr emissions. The incremental cost effectiveness of this 50 Mg/yr option is \$6,250 per ton of NMOC reduced (versus the less stringent 75 Mg/yr option). This cost effectiveness is much higher than is typical for NMOC (or VOC) controls in NSPSs. However, the EPA also considers the reductions in methane achieved by this 50 Mg/yr option as necessary to "achieve the objectives" of section 111. The additional methane reductions achieved by this option are also an important part of the total carbon reductions identified under the Administration's 1993 Climate Change Action Plan. The EPA thus concludes that the chosen alternative is the most cost-effective to achieve the objectives of section 111, as called for in section 205(a).

2. Social Costs and Benefits

This assessment of the cost and benefits to State, local, and tribal governments of the guidelines is based on EPA's "Economic Impact Analysis for Proposed Emission Standards and Guidelines for Municipal Solid Waste Landfills" and updates to the analysis contained in "Air Emissions from Municipal Solid Waste Landfills—Background Information for Final Standards and Guidelines" (EPA-453/R-94-021). Measuring the social costs of the guidelines requires identification of the affected entities by ownership (public or private), consideration of regulatory alternatives, calculation of the regulatory compliance costs for each affected entity, and assessment of the market implications of the additional pollution control costs. Considering the social benefits of the guidelines requires

estimating the anticipated reductions in emissions at MSW landfills due to regulation and identifying the harmful effects of exposure to MSW landfill emissions. Quantitative valuation of the expected benefits to society was not done for this rule.

a. *Affected Entities.* The standards of performance for new sources will require control of approximately 43 new landfills constructed in the first 5 years the standards are in effect. The EG will require control of approximately 312 existing landfills. This represents less than 5 percent of the total number of landfills in the U.S.

Of the landfills required to install controls, about 30 percent of the existing landfills and 20 percent of the new landfills are privately owned. The remainder are publicly owned. (These percentages are taken from section 3.2.1 of the promulgation BID (EPA-453/R-94-021). While that analysis used a design capacity exemption level of 1 million Mg rather than the 2.5 million Mg exemption level contained in the final rule, the percentage of private versus publicly owned landfills would be similar.

b. *Regulatory Alternatives Considered.* Under section 205 of the Unfunded Mandates Act, the Agency must identify and consider a reasonable number of regulatory alternatives before promulgating a rule for which a budgetary impact statement must be prepared. The Agency must select from those alternatives the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule, unless the Agency explains why this alternative is not selected or the selection of this alternative is inconsistent with the law.

A number of alternatives were considered. These included design capacity exemption levels of 1, 2.5, and 3 million Mg and emission rate cutoffs of 50, 75, 100, and 150 Mg/year. Table 3 presents the impacts of alternative design capacity exemption levels for existing landfills. Table 4 presents the impacts of alternative emission rate cutoffs for existing landfills. Tables 5 and 6 present alternative design capacity exemption levels and emission rate cutoffs for new landfills.

TABLE 3.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE EMISSION GUIDELINES a,b.

Small size cutoff (millions Mg)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC incremental cost eff. (\$/Mg)
Baseline <sup>e</sup> 3,000,000 .....	273	73,356	3,220,000	84	1,145	1,145

TABLE 3.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE EMISSION GUIDELINES <sup>a,b</sup>—Continued

Small size cutoff (millions Mg)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC incremental cost eff. (\$/Mg)
2,500,000 .....	312	77,600	3,370,000	89	1,147	1,178
1,000,000 .....	572	97,600	3,990,000	119	1,219	1,500
No cutoff <sup>f</sup> .....	7,299	142,000	8,270,000	719	5,063	13,514

<sup>a</sup> Emission rate cutoff level of 50 Mg NMOC/yr.  
<sup>b</sup> All values are fifth year annualized.  
<sup>c</sup> NMOC emission reductions are from a baseline of 145,000 Mg NMOC/yr.  
<sup>d</sup> Methane emission reductions are from a baseline of 8,400,000 Mg methane/yr.  
<sup>e</sup> In the absence of an emission guidelines.  
<sup>f</sup> No emission rate cutoff and no design capacity exemption level.

TABLE 4.—ALTERNATIVE NMOC EMISSION RATE STRINGENCY LEVEL OPTIONS FOR THE EMISSION GUIDELINES <sup>a,b</sup>

Emission rate cutoff (Mg NMOC/yr)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC incremental cost eff. (\$/Mg)
Baseline <sup>e</sup> .						
150 .....	142	66,600	2,210,000	51	766	766
100 .....	201	72,700	2,720,000	66	908	2,459
75 .....	250	76,000	3,080,000	79	1,039	3,939
50 .....	312	77,600	3,370,000	89	1,147	6,250
No cutoff <sup>f</sup> .....	7,299	142,000	8,270,000	719	5,063	9,783

<sup>a</sup> Design capacity exemption level of 2,500,000 Mg of refuse.  
<sup>b</sup> All values are fifth year annualized.  
<sup>c</sup> NMOC emission reductions are from a baseline of 145,000 Mg NMOC/yr.  
<sup>d</sup> Methane emission reductions are from a baseline of 8,400,000 Mg methane/yr.  
<sup>e</sup> In the absence of an emission guidelines.  
<sup>f</sup> No emission rate cutoff and no design capacity exemption level.

TABLE 5.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE NEW SOURCE PERFORMANCE STANDARDS <sup>a, b</sup>

Small size cutoff (millions Mgr)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual <sup>e</sup> cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC <sup>f</sup> incremental cost eff. (\$/Mg)
Baseline <sup>g</sup> .						
3,000,000 .....	41	4,900	193,000	4	816	N/A
2,500,000 .....	43	4,900	193,000	4	816	N/A
1,000,000 .....	89	4,900	193,000	4	816	N/A
No cutoff <sup>h</sup> .....	872	13,115	881,000	81	6,176	N/A

<sup>a</sup> Emission rate cutoff level of 50 Mg NMOC/yr.  
<sup>b</sup> All values are fifth year annualized.  
<sup>c</sup> NMOC emission reductions are from a baseline of 13,400 Mg NMOC/yr.  
<sup>d</sup> Methane emission reductions are from a baseline of 899,000 Mg methane/yr.  
<sup>e</sup> Due to rounding off to the nearest million dollar, cost values do not appear to change for each option. However, actual costs are slightly less for a less stringent option.  
<sup>f</sup> Because the annual cost does not change enough to show a different cost from one option to the next, incremental cost effectiveness values are not applicable.  
<sup>g</sup> In the absence of a standard.  
<sup>h</sup> No emission rate cutoff and no design capacity exemption level.

TABLE 6.—ALTERNATIVE NMOC EMISSION RATE STRINGENCY LEVEL OPTIONS FOR THE NEW SOURCE PERFORMANCE STANDARDS <sup>a,b</sup>

Emission rate cutoff (Mg NMOC/yr)	Number landfills affected	Annual <sup>c,d</sup> NMOC emission reduction (Mg/yr)	Annual <sup>c,e</sup> methane emission reduction (Mg/yr)	Annual <sup>f</sup> cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC <sup>g</sup> incremental cost eff. (\$/ Mg)
Baseline <sup>h</sup> .						
150 .....	14	5,200	187,000	4	769	NA
100 .....	25	5,100	203,000	4	784	NA
75 .....	33	5,000	194,000	4	800	NA

TABLE 6.—ALTERNATIVE NMOC EMISSION RATE STRINGENCY LEVEL OPTIONS FOR THE NEW SOURCE PERFORMANCE STANDARDS <sup>a,b</sup>—Continued

Emission rate cutoff (Mg NMOC/yr)	Number landfills affected	Annual <sup>c,d</sup> NMOC emission reduction (Mg/yr)	Annual <sup>c,e</sup> methane emission reduction (Mg/yr)	Annual <sup>f</sup> cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC <sup>g</sup> incremental cost eff. (\$/ Mg)
50 .....	43	4,900	193,000	4	816	NA
No Cutoff <sup>h</sup> .....	872	13,115	881,000	81	6,176	NA

<sup>a</sup> Design capacity exemption level of 2,500,000 Mg of refuse.

<sup>b</sup> All values are fifth year annualized.

<sup>c</sup> Because of the small number of landfills and the longer time period of control for a given landfill at a more stringent option, the average annual emission reduction appears to decrease for a more stringent option. However, the emission reduction for a given year increase for more stringent options.

<sup>d</sup> NMOC emission reductions are from a baseline of 13,400 Mg NMOC/yr.

<sup>e</sup> Methane emission reductions are from a baseline of 899,000 Mg NMOC/yr.

<sup>f</sup> Due to rounding off to the nearest million dollar, cost values do not appear to change for each option. However, actual costs are slightly less for a less stringent option.

<sup>g</sup> Because the annual cost does not change enough to show a different cost from one option to the next, incremental cost effectiveness values are not applicable.

<sup>h</sup> In the absence of a standard.

<sup>i</sup> No emission rate cutoff and no design capacity exemption level.

The design capacity cutoff of 2.5 million Mg or 2.5 million cubic meters was chosen as a result of changes to the nationwide impacts analysis and to relieve as many small businesses and municipalities as possible from the regulatory requirements while still maintaining significant emission reduction. The 2.5 million Mg cutoff level exempts landfills that serve populations of less than about 125,000 people from periodic reporting and control requirements. This cutoff excludes those landfills who would be least able to afford the costs of a landfill gas collection and control system. A less stringent design capacity exemption level (e.g., 3 million Mg) was not selected because it would result in less emissions reductions. A more stringent design capacity exemption level (e.g., 1 million Mg) was not selected because it would increase the number of landfills required to apply control by over 80 percent (572 vs. 312 existing landfills) while only achieving an additional 25 percent NMOC emission reduction (see table 3). It would also increase national costs and subject smaller government entities to the regulatory requirements, since smaller governments typically operate smaller landfills.

The emission rate cutoff of 50 Mg/yr of NMOC was chosen because, in conjunction with the 2.5 million Mg design capacity cutoff, it will require control of less than 5 percent of all landfills, yet is estimated to reduce NMOC emissions by approximately 53 percent and methane emissions by 39 percent. The Climate Change Action Plan, signed by the President in October 1993, calls for the EPA to promulgate a "tough" landfill gas rule as soon as possible.

The average cost effectiveness is about \$1,150/Mg NMOC (see table 4). While the incremental cost effectiveness for NMOC control of going from a cutoff of 75 Mg/yr to a 50 Mg/yr cutoff is high (\$6,250/Mg NMOC), this value does not include any credit for the benefits of toxics, odor, explosion control, or the indirect benefit of methane control. The economic analysis indicated that the final rule (including the 50 Mg/yr cutoff level) would cause a relatively small increase in waste disposal costs compared to the current costs and would not result in severe economic impacts on households (see section C. "Social Costs" below).

A more stringent option (e.g., no cutoff) was not chosen because the average and incremental cost and cost effectiveness was not reasonable (see table 4). Less stringent emission rate cutoff levels were not chosen because they result in less NMOC and methane reduction, and would not be consistent with the section 111 statutory requirement to base emission standards on BDT.

The public entities with whom the EPA consulted understood the EPA's concerns regarding the loss of emission reductions by changing the proposed capacity exemption level from 100,000 Mg to 5 million Mg and agreed that 2.5 million relieved 90 percent of the landfills from the burden of regulation and was reasonable.

*c. Social Costs.* The regulatory compliance costs of reducing air emissions from MSW landfills include the total and annualized capital costs; operating and maintenance costs; monitoring, inspection, recordkeeping, and reporting costs; and total annual costs. The annualized capital cost is calculated using a 7 percent discount

rate. The total annual cost is calculated as the sum of the annualized capital cost; operating and maintenance costs; and the monitoring, inspection, recordkeeping, and reporting costs.

The total nationwide annualized cost for collection and control of air emissions from new MSW landfills are estimated to be \$4 million. The nationwide costs of the EG for existing landfills is estimated to be about \$90 million. The annual cost of waste disposal is estimated to increase by an average of \$0.60/Mg for the NSPS and \$1.30/Mg for the EG. Costs per household would increase by approximately \$2.50 to \$5.00 per year for households served by a new or existing landfill, respectively, that is required to install a collection and control system. Because the rule requires control of only about 5 percent of the landfills in the U.S. many households would experience no increase in disposal costs. Furthermore, if affected landfills choose to use energy recovery systems, the cost per household in those areas would be less. The EPA has concluded that households would not incur severe economic impacts. For additional information, please refer to the regulatory impacts analysis (Docket No. A-88-09, Item IV-A-7) and chapter 3 of the promulgation BID (EPA-453/R-94-021). There are no Federal funds available to assist State and local governments in meeting these costs.

*d. Social Benefits.* Society will benefit from the NSPS and EG through the reduction of landfill gas emissions, including NMOC and methane reductions. The total nationwide annualized emission reduction of the EG is estimated to be 77,600 Mg/yr of NMOC and 3,370,000 Mg/yr of methane.

The total nationwide annualized emission reduction for the NSPS is about 4,900 Mg/yr of NMOC and 881,000 Mg/yr of methane.

The NMOC's present several hazards to human health. The NMOC's participate in chemical reactions leading to the formation of ozone, which causes health effects. Also, certain NMOC's have cancer risks and cause noncancer health effects.

Ozone is created by sunlight acting on NO<sub>x</sub> and NMOC's in ambient air. Ozone leads to alterations in pulmonary function, aggravation of pre-existing respiratory disease, damage to lung structure, and adverse effects on blood enzymes, the central nervous system, and endocrine systems. Ozone also warrants control due to its welfare effects, specifically, reduced plant growth, decreased crop yield, necrosis of plant tissue, and deterioration of certain synthetic materials such as rubber (Docket No. A-88-09, Item Nos. II-A-26, II-I-16, etc.).

There is also concern about cancer risks from landfill NMOC emissions. In reviewing limited emissions data from MSW landfills, EPA identified both known and suspected carcinogens such as benzene, carbon tetrachloride, chloroform, ethylene dichloride, methylene dichloride, perchloroethylene, trichloroethylene, vinyl chloride, and vinylidene chloride. Prior to proposal, the EPA attempted to apply statistical methods to the limited data to generate the average annual increased cancer incidence and the maximum individual risk (MIR). In evaluating the result of the calculations for annual incidence and MIR, the EPA could not determine reasonable estimates of either an annual incidence or the MIR. The EPA concluded, at proposal, that the uncertainties in the database are too great to calculate credible estimates of the cancer risks associated with MSW landfills.

Another benefit of the NSPS and EG is reduced fire explosion hazard through reduction of methane emissions. The EPA has documented many cases of acute injury and death caused by explosions and fires related to municipal landfill gas emissions. In addition to these health effects, the associated property damage is a welfare effect. Furthermore, when the migration of methane and the ensuing hazard are identified, adjacent property values can be adversely affected (Docket No. A-88-09, Item Nos. II-I-6, II-I-7, etc.).

Another aspect of MSW landfill emissions is the offensive odor associated with landfills. While the nature of the wastes themselves contribute to the problem of odor, the

gaseous decomposition products are often characteristically malodorous and unpleasant. Various welfare effects may be associated with odors, but due to the subjective nature of the impact and perception of odor, it is difficult to quantify these effects. Studies indicate that unpleasant odors can discourage capital investment and lower the socioeconomic status of an area. Odors have been shown to interfere with daily activities, discourage facility use, and lead to a decline in property values, tax revenues, and payroll (Docket No. A-88-09, Item Nos. II-I-6, II-I-7, etc.).

An ancillary benefit from regulating air emissions from MSW landfills is a reduction in the contribution of MSW landfill emissions to global emissions of methane. Methane is a major greenhouse gas, and is 20 to 30 times more potent than CO<sub>2</sub> on a molecule-per-molecule basis. This is due to the radiative characteristics of methane and other effects methane has on atmospheric chemistry. There is a general concern within the scientific community that the increasing emissions of greenhouse gases could lead to climate change, although the rate and magnitude of these changes are uncertain.

In conclusion, while the social benefits of the rule have not been quantified, significant health and welfare benefits are expected to result from the reduction in landfill gas emissions caused by the rule.

### 3. Effects on the National Economy

The Unfunded Mandates Act requires that the EPA estimate "the effect" of this rule—

"on the national economy, such as the effect on productivity, economic growth, full employment, creation of productive jobs, and international competitiveness of the U.S. goods and services, if and to the extent that the EPA in its sole discretion determines that accurate estimates are reasonably feasible and that such effect is relevant and material."

As stated in the Unfunded Mandates Act, such macroeconomic effects tend to be measurable, in nationwide econometric models, only if the economic impact of the regulation reaches 0.25 to 0.5 percent of gross domestic product (in the range of \$1.5 billion to \$3 billion). A regulation with a smaller aggregate effect is highly unlikely to have any measurable impact in macroeconomic terms unless it is highly focused on a particular geographic region or economic sector. For this reason, no estimate of this rule's effect on the national economy has been conducted.

### 4. Consultation with Government Officials

The Unfunded Mandates Act requires that the EPA describe the extent of the EPA's consultation with affected State, local, and tribal officials, summarize the officials' comments or concerns, and summarize the EPA's response to those comments or concerns. These goals were addressed through meetings held with a number of public entities over the course of six months. Those entities included the US Conference of Mayors, the National League of Cities, the National Governor's Association, the National Association of Counties, and the Solid Waste Association of North America (SWANA). Through these meetings, these entities were informed of the rule, educated about it, and advised as to whether or not they would be impacted by it. These initial education and information sharing meetings were followed by meetings in which consultations and analysis of various alternatives took place. Documentation of all meetings and public comments can be found in Docket A-88-09.

Various concerns were discussed during the meetings. These concerns included: (1) The design capacity cutoff; (2) collection wells, their costing and installation requirements; (3) design specifications for collection systems; (4) well head nitrogen measurement of 20 percent; and (5) the surface monitoring requirements.

As a result of these consultations, the EPA decided to modify the final regulatory package to address these concerns. In the final regulatory package promulgated today: (1) The design capacity cutoff has been raised from the proposed level of 100,000 to 2.5 million Mg; (2) Changes were made to the way the costing algorithm calculates the number of vertical collection wells. The rule was also changed to require active areas to install wells 5 years from initial waste placement instead of 2 years. Closed areas or areas at final grade must install a collection system within 2 years; (3) Prescriptive design specifications have been removed from the rule and replaced with general criteria. The EPA is developing an Enabling Document to assist State and local permitting agencies in their review of designs; (4) Well head pressure monitoring can meet either 20 percent nitrogen or 5 percent oxygen; (5) Surface monitoring is to be done quarterly instead of monthly, not to exceed 500 ppm methane above background.

These changes were made in response to consultations held regarding burden of the regulation and as a result of new

data presented by the entities with whom the EPA met. A letter from the Solid Waste Management of North America and SWAC to the EPA demonstrates their support of this decision. Detailed summaries of the meetings and the letter can be obtained from the Docket A-88-09.

Documentation of the EPA's consideration of comments on the proposed standards and guidelines is provided in the BID's for the proposed and final standards and guidelines. Refer to the ADDRESSES section of this preamble for information on how to acquire copies of these documents.

The final rule reflects a minimization of burden on small landfills and does not create an unreasonable burden for large public entities. The EPA has considered the purpose and intent of the Unfunded Mandate Act and has determined the landfill NSPS and EG are needed.

**F. Regulatory Flexibility Act**

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires the EPA to give special consideration to the impact of regulation on small businesses, small organizations, and small governmental units. The Regulatory Flexibility Act specifies that EPA must prepare an initial regulatory flexibility analysis if a regulation will have a significant economic impact on a substantial number of small entities.

Pursuant to section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Administrator certifies that this rule will not have a significant economic impact on a substantial number of small entities.

The final NSPS and Eg exempt small landfills that have a design capacity below 2.5 million Mg of MSW. This design capacity exemption will exempt landfills that serve communities of 125,000 people or less, assuming the typical waste generation rate of 5 lb of waste per person per day and an average landfill age of 20 years. Section 601 of the Regulatory Flexibility Act defines a "small governmental jurisdiction" as governments of cities, counties, towns, or other districts with a population less than 50,000. The design capacity exemption will exempt landfills that serve small governmental jurisdictions. Therefore, the landfills NSPS and EG will have no impact on small entities.

The NSPS and EG will require periodic emissions calculations or control of emissions from only the largest 10 percent of landfills in the U.S. By controlling these large landfills, the rules will significantly reduce landfill gas emissions, which have adverse effects on human health and welfare,

contribute to global warming, and can create odors and explosion hazards. In consideration of the potential regulatory burden on small entities and in response to public comment, the landfill design capacity in the proposed rule was raised to 2.5 million Mg/yr, thereby exempting small entities.

**G. Miscellaneous**

The effective date of this regulation is March 12, 1996. Section 111(b)(1)(B) of the CAA provides that standards of performance or revisions thereof become effective upon promulgation and apply to affected facilities of which the construction or modification was commenced after the date of proposal, May 31, 1991.

As prescribed by section 111, the promulgation of these standards was preceded by the Administrator's determination that MSW landfills contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. In accordance with section 117 of the CAA, publication of these promulgated standards was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies.

This regulation will be reviewed 4 years from the date of promulgation as required by the CAA. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology, and reporting requirements.

Section 317 of the CAA requires the Administrator to prepare an economic impact assessment for any NSPS promulgated under section 111(b) of the CAA. An economic impact assessment was prepared for this regulation and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the standards to ensure that cost was carefully considered in determining the BDT. The economic impact assessment is included in the BID for the proposed standards and in Chapter 3 of the promulgation BID.

**List of Subjects**

**40 CFR Part 51**

Environmental protection, Air pollution control.

**40 CFR Part 52**

Air pollution control.

**40 CFR Part 60**

Environmental protection, Air pollution control, Intergovernmental relations, reporting and recordkeeping

requirements, Municipal solid waste landfills, Municipal solid waste.

Dated: March 1, 1996.

Carol M. Browner,  
Administrator.

For the reasons set out in the preamble, title 40, chapter 1, parts 51, 52 and 60 of the Code of Federal Regulations are amended as follows:

**PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION AND SUBMITTAL OF IMPLEMENTATION PLANS**

1. The authority citation for part 51 continues to read as follows:

Authority: 7401-7671q.

2. Section 51.166(b)(23)(i) is amended by adding an entry to the end of the *Pollutant and Emission Rate* list to read as follows:

**§ 51.166 Prevention of significant deterioration of air quality.**

\* \* \* \* \*

(b) \* \* \*

(23) \* \* \*

(i) \* \* \* Municipal solid waste landfill emissions (measured as nonmethane organic compounds): 45 megagrams per year (50 tons per year)  
\* \* \* \* \*

**PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS**

3. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

4. Section 52.21(b)(23)(i) is amended by adding an entry to the end of the *Pollutant and Emission Rate* list to read as follows:

**§ 52.21 Prevention of significant deterioration of air quality.**

\* \* \* \* \*

(b) \* \* \*

(23) \* \* \*

(i) \* \* \* Municipal solid waste landfills emissions (measured as nonmethane organic compounds): 45 megagrams per year (50 tons per year)  
\* \* \* \* \*

**PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES**

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

Authority: 42 U.S.C. 7401, 7411, 7414, 7416, and 7601.

6. Section 60.16 of subpart A is amended by adding an entry to the end to read under *Other Source Categories* as follows:

**§ 60.16 Priority list.**

\* \* \* \* \*

*Other Source Categories*

\* \* \* \* \*

Municipal solid waste landfills.<sup>4</sup>

\* \* \* \* \*

7. Section 60.30 is amended by adding a new paragraph (c) to read as follows:

**§ 60.30 Scope.**

\* \* \* \* \*

(c) Subpart Cc—Municipal Solid Waste Landfills.

8. Part 60 is further amended by adding the Subpart Cc to read as follows:

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

Sec.

- 60.30c Scope.
- 60.31c Definitions.
- 60.32c Designated facilities.
- 60.33c Emission guidelines for municipal solid waste landfill emissions.
- 60.34c Test methods and procedures.
- 60.35c Reporting and recordkeeping guidelines.
- 60.36c Compliance times.

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

**§ 60.30c Scope.**

This subpart contains emission guidelines and compliance times for the control of certain designated pollutants from certain designated municipal solid waste landfills in accordance with section 111(d) of the Act and subpart B.

**§ 60.31c Definitions.**

Terms used but not defined in this subpart have the meaning given them in the Act and in subparts A, B, and WWW of this part.

*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 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.

**§ 60.32c Designated facilities.**

(a) The designated facility to which the guidelines apply is each existing MSW landfill for which construction, reconstruction or modification was commenced before May 30, 1991.

(b) Physical or operational changes made to an existing MSW landfill solely to comply with an emission guideline are not considered a modification or reconstruction and would not subject an existing MSW landfill to the requirements of subpart WWW [see § 60.750 of Subpart WWW].

**§ 60.33c Emission guidelines for municipal solid waste landfill emissions.**

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

- (1) The landfill has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition;
- (2) The landfill has a design capacity greater than or equal to 2.5 million megagrams or 2.5 million cubic meters. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report; and
- (3) The landfill has a nonmethane organic compound emission rate of 50 megagrams per year or more.

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

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

- (1) An open flare designed and operated in accordance with the parameters established in § 60.18; or
- (2) A control system designed and operated to reduce NMOC by 98 weight percent; or
- (3) An enclosed combustor designed and operated to reduce the outlet NMOC concentration to 20 parts per million as hexane by volume, dry basis at 3 percent oxygen, or less.

**§ 60.34c Test methods and procedures.**

For approval, a State plan shall include provisions for: the calculation

of the landfill NMOC emission rate listed in § 60.754, as applicable, to determine whether the landfill meets the condition in § 60.33c(a)(3); the operational standards in § 60.753; the compliance provisions in § 60.755; and the monitoring provisions in § 60.756.

**§ 60.35c Reporting and recordkeeping guidelines.**

For approval, a State plan shall include the recordkeeping and reporting provisions listed in §§ 60.757 and 60.758, as applicable, except as provided under § 60.24.

**§ 60.36c Compliance times.**

(a) Except as provided for under paragraph (b) of this section, planning, awarding of contracts, and installation of MSW landfill air emission collection and control equipment capable of meeting the emission guidelines established under § 60.33c shall be accomplished within 30 months after the effective date of a State emission standard for MSW landfills.

(b) For each existing MSW landfill meeting the conditions in § 60.33c(a)(1) and § 60.33c(a)(2) whose NMOC emission rate is less than 50 megagrams per year on the effective date of the State emission standard, installation of collection and control systems capable of meeting emission guidelines in § 60.33c shall be accomplished within 30 months of the date when the condition in § 60.33c(a)(3) is met (i.e., the date of the first annual nonmethane organic compounds emission rate which equals or exceeds 50 megagrams per year).

9. Part 60 is amended by adding a new subpart WWW to read as follows:

**Subpart WWW—Standards of Performance for Municipal Solid Waste Landfills**

Sec.

- 60.750 Applicability, designation of affected facility, and delegation of authority.
- 60.751 Definitions.
- 60.752 Standards for air emissions from municipal solid waste landfills.
- 60.753 Operational standards for collection and control systems.
- 60.754 Test methods and procedures.
- 60.755 Compliance provisions.
- 60.756 Monitoring of operations.
- 60.757 Reporting requirements.
- 60.758 Recordkeeping requirements.
- 60.759 Specifications for active collection systems.

**Subpart WWW—Standards of Performance for Municipal Solid Waste Landfills**

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

(a) The provisions of this subpart apply to each municipal solid waste

<sup>4</sup>Not prioritized, since an NSPS for this major source category has already been promulgated.

landfill that commenced construction, reconstruction or modification or began accepting waste on or after May 30, 1991. Physical or operational changes made to an existing MSW landfill solely to comply with Subpart Cc of this part are not considered construction, reconstruction, or modification for the purposes of this section.

(b) The following authorities shall be retained by the Administrator and not transferred to the State: None.

#### § 60.751 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act or in subpart A of this part.

*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.

*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 § 60.7(a)(4). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed. A landfill is considered closed after meeting the criteria of § 258.60 of this title.

*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 either

- (1) A notification of intent to install a collection and control system or
- (2) A collection and control system design plan is submitted in compliance with § 60.752(b)(2)(i).

*Design capacity* means the maximum amount of solid waste a landfill can accept, as specified in the construction or operating permit issued by the State, local, or Tribal agency responsible for regulating the landfill.

*Disposal facility* means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

*Emission rate cutoff* means the threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required.

*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.

*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).

*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 title. 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. 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.

*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 § 60.754.

*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.

*Sludge* means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

*Solid waste* means any garbage, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.).

*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 part.

*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.

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

(a) Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Administrator as provided in § 60.757(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. For purposes of part 70 permitting, a landfill with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters does not require an operating permit under part 70 of this chapter. Submittal of the initial design capacity report shall fulfill the requirements of this subpart except as provided for in paragraphs (a)(1) and (a)(2) of this section.

(1) The owner or operator shall submit to the Administrator an amended design capacity report, as provided for in § 60.757(a)(3), when there is any increase in the design capacity of a landfill subject to the provisions of this subpart, whether the increase results from an increase in the area or depth of the landfill, a change in the operating procedures of the landfill, or any other means.

(2) If any increase in the maximum design capacity of a landfill exempted from the provisions of § 60.752(b) through § 60.759 of this subpart on the basis of the design capacity exemption in paragraph (a) of this section results in a revised maximum design capacity equal to or greater than 2.5 million megagrams or 2.5 million cubic meters, the owner or operator shall comply with the provision of paragraph (b) of this section.

(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams or 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures

specified in § 60.754. The NMOC emission rate shall be recalculated annually, except as provided in § 60.757(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams or 2.5 million cubic meters is subject to part 70 permitting requirements. When a landfill is closed, and either never needed control or meets the conditions for control system removal specified in § 60.752(b)(2)(v) of this subpart, a part 70 operating permit is no longer required.

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

(i) Submit an annual emission report to the Administrator, except as provided for in § 60.757(b)(1)(ii); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in § 60.754(a)(1) 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 NMOC emission rate, upon recalculation required in paragraph (b)(1)(ii) of this section, is equal to or greater than 50 megagrams per year, the owner or operator shall install a collection and control system in compliance with paragraph (b)(2) of this section.

(B) If the landfill is permanently closed, a closure notification shall be submitted to the Administrator as provided for in § 60.757(d).

(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall:

(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year:

(A) The collection and control system as described in the plan shall meet the design requirements of paragraph (b)(2)(ii) of this section.

(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 60.753 through 60.758 proposed by the owner or operator.

(C) The collection and control system design plan shall either conform with specifications for active collection systems in § 60.759 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to § 60.759.

(D) The Administrator shall review the information submitted under

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

(ii) Install a collection and control system within 18 months of the submittal of the design plan under paragraph (b)(2)(i) of this section that effectively captures the gas generated within the landfill.

(A) An active collection system shall:

(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 or treatment 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:

(i) 5 years or more if active; or

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

(3) Collect gas at a sufficient extraction rate;

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

(B) A passive collection system shall:

(1) Comply with the provisions specified in paragraphs (b)(2)(ii), (A) (1), (2), and (4) of this section.

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

(iii) 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) An open flare designed and operated in accordance with § 60.18;

(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 shall be established by an initial performance test, required under § 60.8 using the test methods specified in § 60.754(d).

(1) If a boiler or process heater is used as the control device, the landfill gas

stream shall be introduced into the flame zone.

(2) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in § 60.756;

(C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii) (A) or (B) of this section.

(iv) Operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§ 60.753, 60.755 and 60.756.

(v) The collection and control system may be capped or removed provided that all the conditions of paragraphs (b)(2)(v) (A), (B), and (C) of this section are met:

(A) The landfill shall be no longer accepting solid waste and be permanently closed under the requirements of § 258.60 of this title. A closure report shall be submitted to the Administrator as provided in § 60.757(d);

(B) The collection and control system shall have been in operation a minimum of 15 years; and

(C) Following the procedures specified in § 60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

**§ 60.753 Operational standards for collection and control systems.**

Each owner or operator of an MSW landfill gas collection and control system used to comply with the provisions of § 60.752(b)(2)(ii) of this subpart shall:

(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 shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in § 60.757(f)(1);

(2) Use of a geomembrane or synthetic cover. The owner or operator shall 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 shall be approved by the Administrator;

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

(1) The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of this subpart.

(2) Unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A except that:

(i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span;

(ii) A data recorder is not required;

(iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span;

(iv) A calibration error check is not required;

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

(d) 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 shall conduct surface testing around the perimeter of the collection area along a pattern that traverses the landfill at 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 shall 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.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with § 60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour; and

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

(g) If monitoring demonstrates that the operational requirement in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in § 60.752(a) (3) through (5) or § 60.755(c) of this subpart. If corrective actions are taken as specified in § 60.755, the monitored exceedance is not a violation of the operational requirements in this section.

**§ 60.754 Test methods and procedures.**

(a)(1) The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in paragraph (a)(1)(i) of this section or the equation provided in paragraph (a)(1)(ii) of this section. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for L<sub>o</sub>, and 4,000 parts per million by volume as hexane for the C<sub>NMOC</sub>.

(i) The following equation shall be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^n 2 k L_o M_1 (e^{-kt_i}) (C_{NMOC}) (3.6 \times 10^{-9})$$

where,

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

$k$  = methane generation rate constant, year<sup>-1</sup>

$L_0$  = methane generation potential, cubic meters per megagram solid waste

$M_i$  = mass of solid waste in the  $i^{\text{th}}$  section, megagrams

$t_i$  = age of the  $i^{\text{th}}$  section, years

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

$3.6 \times 10^{-9}$  = conversion factor

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 the documentation provisions of § 60.758(d)(2) are followed.

(ii) The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown.

$$M_{\text{NMOC}} = 2L_0 R (e^{-kc} - e^{-kt}) (C_{\text{NMOC}}) (3.6 \times 10^{-9})$$

where,

$M_{\text{NMOC}}$  = mass emission rate of NMOC, megagrams per year

$L_0$  = methane generation potential, cubic meters per megagram solid waste

$R$  = average annual acceptance rate, megagrams per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$t$  = age of landfill, years

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

$c$  = time since closure, years. For active landfill  $c = 0$  and  $e^{-kc} = 1$

$3.6 \times 10^{-9}$  = conversion factor

The mass of nondegradable solid waste may be subtracted from the average annual acceptance rate when calculating a value for  $R$ , if the documentation provisions of § 60.758(d)(2) are followed.

(2) *Tier 1.* The owner or operator shall 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 shall submit an emission rate report as provided in § 60.757(b)(1), and shall recalculate the NMOC mass emission rate annually as required under § 60.752(b)(1).

(ii) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, then the landfill owner shall either comply with § 60.752(b)(2), or determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph (a)(3) of this section.

(3) *Tier 2.* The landfill owner or operator shall determine the NMOC concentration using the following sampling procedure. The landfill owner or operator shall install at least two sample probes per hectare of 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 sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25C of appendix A of this part or Method 18 of appendix A of this part. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). If composite sampling is used, equal volumes shall be taken from each sample probe. If more than the required number of samples are taken, all samples shall be used in the analysis. The landfill owner or operator shall divide the NMOC concentration from Method 25C of appendix A of this part by six to convert from  $C_{\text{NMOC}}$  as carbon to  $C_{\text{NMOC}}$  as hexane.

(i) The landfill owner or operator shall recalculate the NMOC mass emission rate using the equations provided in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using the average NMOC concentration from the collected samples instead of the default value in the equation provided in paragraph (a)(1) of this section.

(ii) If the resulting mass emission rate calculated using the site-specific NMOC concentration is equal to or greater than 50 megagrams per year, then the landfill owner or operator shall either comply with § 60.752(b)(2), or determine the site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the procedure specified in paragraph (a)(4) of this section.

(iii) If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in § 60.757(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section.

(4) *Tier 3.* The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of appendix A of this part. The landfill owner or operator shall estimate the NMOC mass emission rate using equations in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using a site-specific methane generation rate constant  $k$ , 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 shall 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 site-specific methane generation rate and concentration of NMOC is equal to or greater than 50 megagrams per year, the owner or operator shall comply with § 60.752(b)(2).

(ii) If the NMOC mass emission rate is less than 50 megagrams per year, then the owner or operator shall submit a periodic emission rate report as provided in § 60.757(b)(1) and shall recalculate the NMOC mass emission rate annually, as provided in § 60.757(b)(1) using the equations in paragraph (a)(1) of this section and using the site-specific methane generation rate constant and NMOC concentration obtained in paragraph (a)(3) of this section. The calculation of the methane generation rate constant is performed only once, and the value obtained is 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  $k$  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 as provided in § 60.752(b)(2)(i)(B).

(b) After the installation of a collection and control system in compliance with § 60.755, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in § 60.752(b)(2)(v), using the following equation:

$$M_{\text{NMOC}} = 1.89 \times 10^{-3} Q_{\text{LFG}} C_{\text{NMOC}}$$

where,

$M_{\text{NMOC}}$  = mass emission rate of NMOC, megagrams per year

$Q_{\text{LFG}}$  = flow rate of landfill gas, cubic meters per minute

$C_{\text{NMOC}}$  = NMOC concentration, parts per million by volume as hexane

(1) The flow rate of landfill gas,  $Q_{\text{LFG}}$ , shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E of appendix A of this part.

(2) The average NMOC concentration,  $C_{\text{NMOC}}$ , shall 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 25C or Method 18 of appendix A of this part. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25C of appendix A of this part by six to convert from C<sub>NMOC</sub> as carbon to C<sub>NMOC</sub> 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 as provided in § 60.752(b)(2)(i)(B).

(c) The owner or operator of each MSW landfill subject to the provisions of this subpart shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in §§ 51.166 or 52.21 of this chapter using AP-42 or other approved measurement procedures. If a collection system, which complies with the provisions in § 60.752(b)(2) is already installed, the owner or operator shall estimate the NMOC emission rate using the procedures provided in paragraph (b) of this section.

(d) For the performance test required in § 60.752(b)(2)(iii)(B), Method 25 or Method 18 of appendix A of this part shall be used to determine compliance with 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by § 60.752(b)(2)(i)(B). If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The following equation shall be used to calculate efficiency:

$$\text{Control Efficiency} = \frac{(\text{NMOC}_{\text{in}} - \text{NMOC}_{\text{out}})}{(\text{NMOC}_{\text{in}})}$$

where,

NMOC<sub>in</sub> = mass of NMOC entering control device

NMOC<sub>out</sub> = mass of NMOC exiting control device

**§ 60.755 Compliance provisions.**

(a) Except as provided in § 60.752(b)(2)(i)(B), the specified methods in paragraphs (a)(1) through (a)(6) of this section shall be used to determine whether the gas collection system is in compliance with § 60.752(b)(2)(ii).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with § 60.752(b)(2)(ii)(A)(1), one of the following equations shall be used. The k and L<sub>o</sub> 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 § 60.754(a)(4), the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

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

$$Q_m = 2L_o R (e^{-kc} - e^{-kt})$$

where,

Q<sub>m</sub> = maximum expected gas generation flow rate, cubic meters per year

L<sub>o</sub> = methane generation potential, cubic meters per megagram solid waste

R = average annual acceptance rate, megagrams per year

k = methane generation rate constant, year<sup>-1</sup>

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<sup>-kc</sup> = 1)

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

$$Q_M = \sum_{i=1}^n 2 k L_o M_i (e^{-kt_i})$$

where,

Q<sub>M</sub> = maximum expected gas generation flow rate, cubic meters per year

k = methane generation rate constant, year<sup>-1</sup>

L<sub>o</sub> = methane generation potential, cubic meters per megagram solid waste

M<sub>i</sub> = mass of solid waste in the i<sup>th</sup> section, megagrams

t<sub>i</sub> = age of the i<sup>th</sup> 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, the equations 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 the equations in paragraphs (a)(1) (i) or (ii) or other methods shall 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 § 60.752(b)(2)(ii)(A)(2), the owner or operator shall 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 § 60.752(b)(2)(ii)(A)(3), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under § 60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

(4) Owners or operators are not required to install additional wells as required in paragraph (a)(3) of this section during the first 180 days after gas collection system start-up.

(5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in § 60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

(6) An owner or operator seeking to demonstrate compliance with § 60.752(b)(2)(ii)(A)(4) through the use of a collection system not conforming to the specifications provided in § 60.759 shall provide information satisfactory to the Administrator as specified in § 60.752(b)(2)(i)(C) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with § 60.753(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in § 60.752(b)(2)(i). Each well shall be installed within 60 days of the date in 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 shall be used for compliance with the surface methane operational standard as provided in § 60.753(d).

(1) After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a serpentine pattern spaced 30 meters apart (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 shall 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 shall be performed in accordance with section 4.3.1 of Method 21 of appendix A of this part, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 60.753(d).

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

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

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall 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 shall be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) 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 shall 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) shall 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 shall be installed within 120 calendar 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 shall 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 shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21 of appendix A of this part, except that "methane" shall replace all references to VOC.

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

(3) To meet the performance evaluation requirements in section 3.1.3 of Method 21 of appendix A of this part, the instrument evaluation procedures of section 4.4 of Method 21 of appendix A of this part shall be used.

(4) The calibration procedures provided in section 4.2 of Method 21 of appendix A of this part shall be followed immediately before commencing a surface monitoring survey.

(e) The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.

#### § 60.756 Monitoring of operations.

Except as provided in § 60.752(b)(2)(i)(B),

(a) Each owner or operator seeking to comply with § 60.752(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer or other temperature measuring device at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in § 60.755(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in § 60.755(a)(5); and

(3) Monitor temperature of the landfill gas on a monthly basis as provided in § 60.755(a)(5).

(b) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) using an enclosed combustor shall 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 an accuracy of  $\pm 1$  percent of the temperature being measured expressed in degrees Celsius or  $\pm 0.5$  °C, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity greater than 44 megawatts.

(2) A gas flow rate measuring device that provides a measurement of gas flow to or bypass of the control device. The owner or operator shall either:

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

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

(c) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) using an open flare shall 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.

(2) A device that records flow to or bypass of the flare. The owner or operator shall either:

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

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

(d) Each owner or operator seeking to demonstrate compliance with § 60.752(b)(2)(iii) using a device other than an open flare or an enclosed combustor shall provide information satisfactory to the Administrator as provided in § 60.752(b)(2)(i)(B) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator shall 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 § 60.759 or seeking to monitor alternative parameters to those required by § 60.753 through § 60.756 shall provide information satisfactory to the Administrator as provided in § 60.752(b)(2)(i)(B) and (C) 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 § 60.755(c), shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in § 60.755(d). 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.

#### § 60.757 Reporting requirements.

Except as provided in § 60.752(b)(2)(i)(B),

(a) Each owner or operator subject to the requirements of this subpart shall submit an initial design capacity report to the Administrator.

(1) The initial design capacity report shall fulfill the requirements of the notification of the date construction is commenced as required under § 60.7(a)(1) and shall be submitted no later than the earliest day from the following:

(i) 90 days of the issuance of the State, Local, Tribal, or RCRA construction or operating permit; or

(ii) 30 days of the date of construction or reconstruction as defined under § 60.15; or

(iii) 30 days of the initial acceptance of solid waste.

(2) The initial design capacity report shall contain the following information:

(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 provisions of the State, local, Tribal, or RCRA construction or operating permit;

(ii) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the State or local construction or RCRA permit, 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 shall be calculated using good engineering practices. The calculations shall be provided, along with such parameters as depth of solid waste, solid waste acceptance rate, and compaction practices as part of the 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.

(3) An amended design capacity report shall be submitted to the Administrator providing notification of any increase in the design capacity of the landfill, whether the increase results from an increase in the permitted area or depth of the landfill, a change in the operating procedures, or any other means which results in an increase in the maximum design capacity of the landfill above 2.5 million megagrams or 2.5 million cubic meters. The amended design capacity report shall be submitted within 90 days of the issuance of an amended construction or operating permit, or the placement of waste in additional land, or the change in operating procedures which will

result in an increase in maximum design capacity, whichever occurs first.

(b) Each owner or operator subject to the requirements of this subpart shall submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraphs (b)(1)(ii) or (b)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

(1) The NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in § 60.754(a) or (b), as applicable.

(i) The initial NMOC emission rate report shall be submitted within 90 days of the date waste acceptance commences and may be combined with the initial design capacity report required in paragraph (a) of this section. Subsequent NMOC emission rate reports shall be submitted annually thereafter, except as provided for in paragraphs (b)(1)(ii) and (b)(3) of this section.

(ii) 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 shall 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 shall be provided to the Administrator. This estimate shall 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 shall be submitted to the Administrator. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(2) The NMOC emission rate report shall 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 of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance with § 60.752(b)(2), during such time as the collection and control system is in

operation and in compliance with §§ 60.753 and 60.755.

(c) Each owner or operator subject to the provisions of § 60.752(b)(2)(i) shall submit a collection and control system design plan to the Administrator within 1 year of the first report, required under paragraph (b) of this section, in which the emission rate exceeds 50 megagrams per year, except as follows:

(1) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in § 60.754(a)(3) and the resulting rate is less than 50 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than 50 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within 180 days of the first calculated exceedance of 50 megagrams per year.

(2) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in § 60.754(a)(4), and the resulting NMOC emission rate is less than 50 Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of § 60.754(a)(4) and the resulting site-specific methane generation rate constant (k) shall be submitted to the Administrator within 1 year of the first calculated emission rate exceeding 50 megagrams per year.

(d) Each owner or operator of a controlled landfill shall 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 § 60.7(a)(4).

(e) Each owner or operator of a controlled landfill shall submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) The equipment removal report shall contain all of the following items:

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

(ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; 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.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in § 60.752(b)(2)(v) have been met.

(f) Each owner or operator of a landfill seeking to comply with § 60.752(b)(2) using an active collection system designed in accordance with § 60.752(b)(2)(ii) shall submit to the Administrator annual reports of the recorded information in (f)(1) through (f)(6) of this paragraph. The initial annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under § 60.8. For enclosed combustion devices and flares, reportable exceedances are defined under § 60.758(c).

(1) Value and length of time for exceedance of applicable parameters monitored under § 60.756(a), (b), (c), and (d).

(2) Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under § 60.756.

(3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating.

(4) All periods when the collection system was not operating in excess of 5 days.

(5) The location of each exceedance of the 500 parts per million methane concentration as provided in § 60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month.

(6) The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of § 60.755.

(g) Each owner or operator seeking to comply with § 60.752(b)(2)(i) shall include the following information with the initial performance test report required under § 60.8:

(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; and

(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.

#### § 60.758 Recordkeeping requirements.

Except as provided in § 60.752(b)(2)(i)(B),

(a) Each owner or operator of an MSW landfill subject to the provisions of § 60.752(b) shall keep for at least 5 years up-to-date, readily accessible, on-site records of the maximum design capacity, 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) Each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (b)(1) through (b)(4) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(ii):

(i) The maximum expected gas generation flow rate as calculated in § 60.755(a)(1). 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.

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in § 60.759(a)(1).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity greater than 44 megawatts:

(i) The average combustion 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 § 60.752(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 § 60.752(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 § 60.752(b)(2)(iii)(A) through use of an open 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 § 60.18; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent.

(c) Each owner or operator of a controlled landfill subject to the provisions of this subpart shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in § 60.756 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 shall be recorded and reported under § 60.757(f):

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of

operation during which the average combustion temperature was more than 28 °C below the average combustion temperature during the most recent performance test at which compliance with § 60.752(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)(i) of this section.

(2) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or 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 § 60.756.

(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 § 60.752(b)(2)(iii) shall 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 an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under § 60.756(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(d) Each owner or operator subject to the provisions of this subpart shall 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 shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 60.755(b).

(2) Each owner or operator subject to the provisions of this subpart shall 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 § 60.759(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in § 60.759(a)(3)(ii).

(e) Each owner or operator subject to the provisions of this subpart shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in § 60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

#### § 60.759 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with § 60.752(b)(2)(i) shall 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 § 60.752(b)(2)(i)(C) and (D):

(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall 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, and resistance to the refuse decomposition heat.

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

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall 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 shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the following equation:

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

where,

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

$k$  = methane generation rate constant, year<sup>-1</sup>

$L_o$  = 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

$3.6 \times 10^{-9}$  = conversion factor

(iii) The values for  $k$ ,  $L_o$ , and  $C_{NMOC}$  determined in field testing shall be used, if field testing has been performed in determining the NMOC emission rate or the radii of influence. If field testing has not been performed, the default values for  $k$ ,  $L_o$  and  $C_{NMOC}$  provided in § 60.754(a)(1) shall 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 § 60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components shall 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 shall extend as

necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall 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 shall 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 shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with § 60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with § 60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall 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 shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section shall be used.

(2) For new collection systems, the maximum flow rate shall be in accordance with § 60.755(a)(1).

10. Part 60 is further amended by adding Methods 2E, 3C and 25C to appendix A as follows:

Appendix A—Reference Methods

\* \* \* \* \*

Method 2E—Determination of Landfill Gas; Gas Production Flow Rate

1. *Applicability and Principle*

1.1 *Applicability.* This method applies to the measurement of landfill gas (LFG) production flow rate from municipal solid waste (MSW) landfills and is used to calculate the flow rate of nonmethane organic compounds (NMOC) from landfills. This method also applies to calculating a site-specific  $k$  value as provided in § 60.754(a)(4). It is unlikely that a site-specific  $k$  value obtained through Method 2E testing will lower the annual emission estimate below 50 Mg/yr NMOC unless the Tier 2 emission estimate is only slightly higher than 50 Mg/yr NMOC. Dry, arid regions may show a more significant difference between the default and calculated  $k$  values than wet regions.

1.2 *Principle.* Extraction wells are installed either in a cluster of three or at five locations dispersed throughout the landfill. A blower is used to extract LFG from the landfill. LFG composition, landfill pressures near the extraction well, and volumetric flow rate of LFG extracted from the wells are measured and the landfill gas production flow rate is calculated.

2. *Apparatus*

2.1 *Well Drilling Rig.* Capable of boring a 0.6 meters diameter hole into the landfill to a minimum of 75 percent of the landfill depth. The depth of the well shall not exceed the bottom of the landfill or the liquid level.

2.2 *Gravel. No fines.* Gravel diameter should be appreciably larger than perforations stated in sections 2.10 and 3.2 of this method.

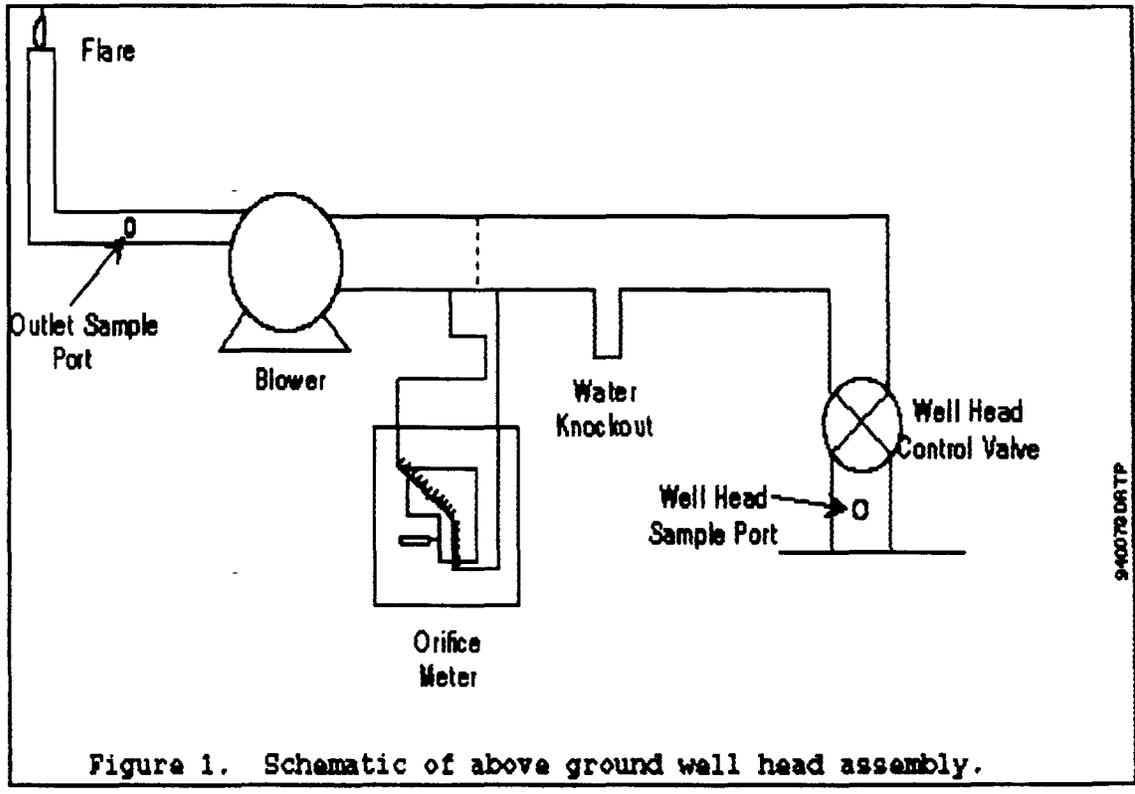
2.3 *Bentonite.*

2.4 *Backfill Material.* Clay, soil, and sandy loam have been found to be acceptable.

2.5 *Extraction Well Pipe.* Polyvinyl chloride (PVC), high density polyethylene (HDPE), fiberglass, stainless steel, or other suitable nonporous material capable of transporting landfill gas with a minimum diameter of 0.075 meters and suitable wall-thickness.

2.6 *Wellhead Assembly.* Valve capable of adjusting gas flow at the wellhead and outlet, and a flow measuring device, such as an in-line orifice meter or pitot tube. A schematic of the wellhead assembly is shown in figure 1.

BILLING CODE 6560-50-P



9-40078 D81TP

2.7 Cap. PVC, HDPE, fiberglass, stainless steel, or other suitable nonporous material capable of transporting landfill gas with a suitable wall-thickness.

2.8 Header Piping. PVC, HDPE, fiberglass, stainless steel, or other suitable nonporous material capable of transporting landfill gas with a suitable wall-thickness.

2.9 Auger. Capable of boring a 0.15 to 0.23 meters diameter hole to a depth equal to the top of the perforated section of the extraction well, for pressure probe installation.

2.10 Pressure Probe. PVC or stainless steel (316), 0.025 meters. Schedule 40 pipe. Perforate the bottom two thirds. A minimum requirement for perforations is slots or holes with an open area equivalent to four 6.0 millimeter diameter holes spaced 90° apart every 0.15 meters.

2.11 Blower and Flare Assembly. A water knockout, flare or incinerator, and an explosion-proof blower, capable of extracting LFG at a flow rate of at least 8.5 cubic meters per minute.

2.12 Standard Pitot Tube and Differential Pressure Gauge for Flow Rate Calibration with Standard Pitot. Same as Method 2, sections 2.1 and 2.8.

2.13 Gas flow measuring device. Permanently mounted Type S pitot tube or an orifice meter.

2.14 Barometer. Same as Method 4, section 2.1.5.

2.15 Differential Pressure Gauge. Water-filled U-tube manometer or equivalent, capable of measuring within 0.02 mm Hg, for measuring the pressure of the pressure probes.

### 3. Procedure

3.1 Placement of Extraction Wells. The landfill owner or operator shall either install a single cluster of three extraction wells in a test area or space five wells over the landfill. The cluster wells are recommended but may be used only if the composition, age of the solid waste, and the landfill depth of the test area can be determined. CAUTION: Since this method is complex, only experienced personnel should conduct the test. Landfill gas contains methane, therefore explosive mixtures may exist at or near the landfill. It is advisable to take appropriate safety precautions when testing landfills, such as installing explosion-proof equipment and refraining from smoking.

3.1.1 Cluster Wells. Consult landfill site records for the age of the solid waste, depth, and composition of various sections of the landfill. Select an area near the perimeter of the landfill with a depth equal to or greater than the average depth of the landfill and with the average age of the solid waste between 2 and 10 years old. Avoid areas known to contain nondecomposable materials, such as concrete and asbestos. Locate wells as shown in figure 2.

Because the age of the solid waste in a test area will not be uniform, calculate a weighted average to determine the average age of the solid waste as follows.

$$A_{avg} = \sum_{i=1}^n f_i A_i$$

where,

$A_{avg}$ =average age of the solid waste tested, year

$f_i$ =fraction of the solid waste in the  $i^{\text{th}}$  section

$A_i$ =age of the  $i^{\text{th}}$  fraction, year

BILLING CODE 6560-50-P

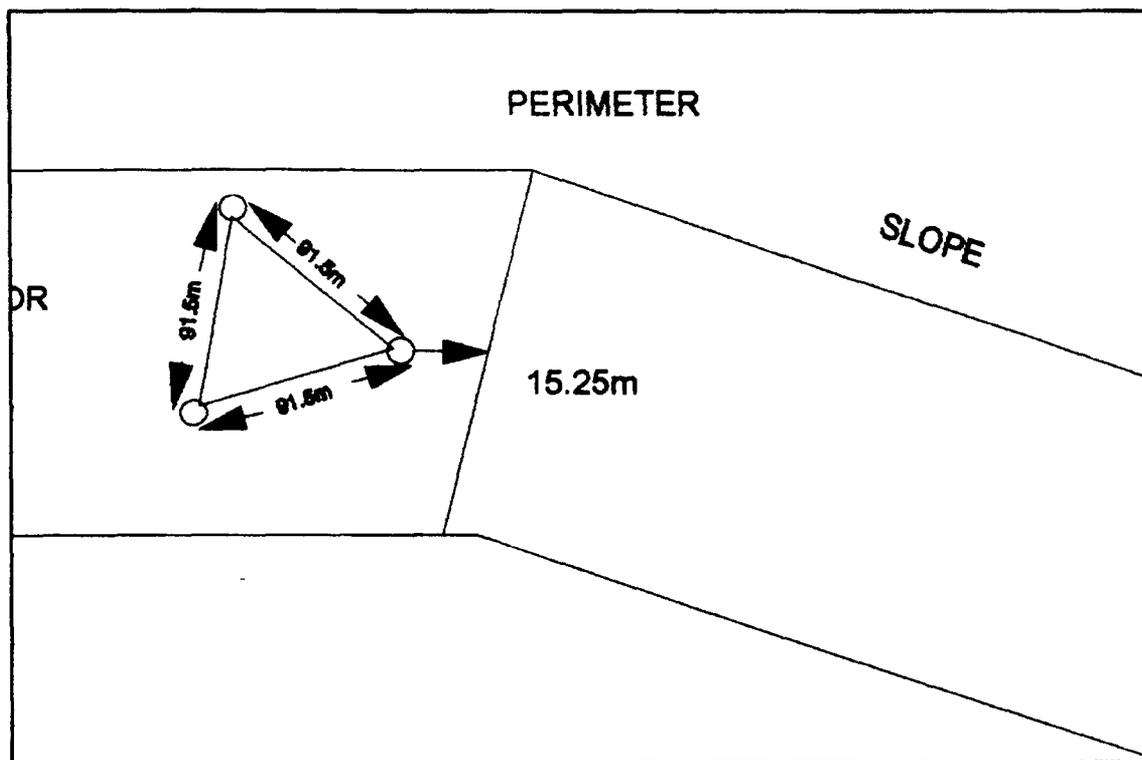


Figure 2. Location of Cluster Wells

3.1.2 Equal Volume Wells. This procedure is used when the composition, age of solid waste, and landfill depth are not well known. Divide the portion of the landfill that has had waste for at least 2 years into five areas representing equal volumes. Locate an extraction well near the center of each area. Avoid areas known to contain nondecomposable materials, such as concrete and asbestos.

3.2 Installation of Extraction Wells. Use a well drilling rig to dig a 0.6 meters diameter hole in the landfill to a minimum of 75 percent of the landfill depth, not to exceed the bottom of the landfill or the water table. Perforate the bottom two thirds of the extraction well pipe. Perforations shall not be closer than 6 meters from the cover. Perforations shall be holes or slots with an open area equivalent to 1.0 centimeter diameter holes spaced 90 degrees apart every 0.1 to 0.2 meters. Place the extraction well in the center of the hole and backfill with 2.0 to 7.5 centimeters gravel to a level 0.3 meters above the perforated section. Add a layer of backfill material 1.2 meters thick. Add a layer of bentonite 1.0 meter thick, and backfill the remainder of the hole with cover material or material equal in permeability to the existing cover material. The specifications for extraction well installation are shown in figure 3.

BILLING CODE 6560-50-P



3.3 Pressure Probes. Shallow pressure probes are used in the check for infiltration of air into the landfill, and deep pressure probes are used to determine the radius of influence. Locate the deep pressure probes along three radial arms approximately 120 degrees apart at distances of 3, 15, 30, and 45 meters from the extraction well. The tester has the option of locating additional pressure probes at distances every 15 meters beyond 45 meters. Example placements of probes are shown in figure 4.

The probes located 15, 30, and 45 meters from each well, and any additional probes located along the three radial arms (deep probes), shall extend to a depth equal to the top of the perforated section of the extraction wells. Locate three shallow probes at a distance of 3 m from the extraction well. Shallow probes shall extend to a depth equal to half the depth of the deep probes.

**BILLING CODE 6560-50-P**

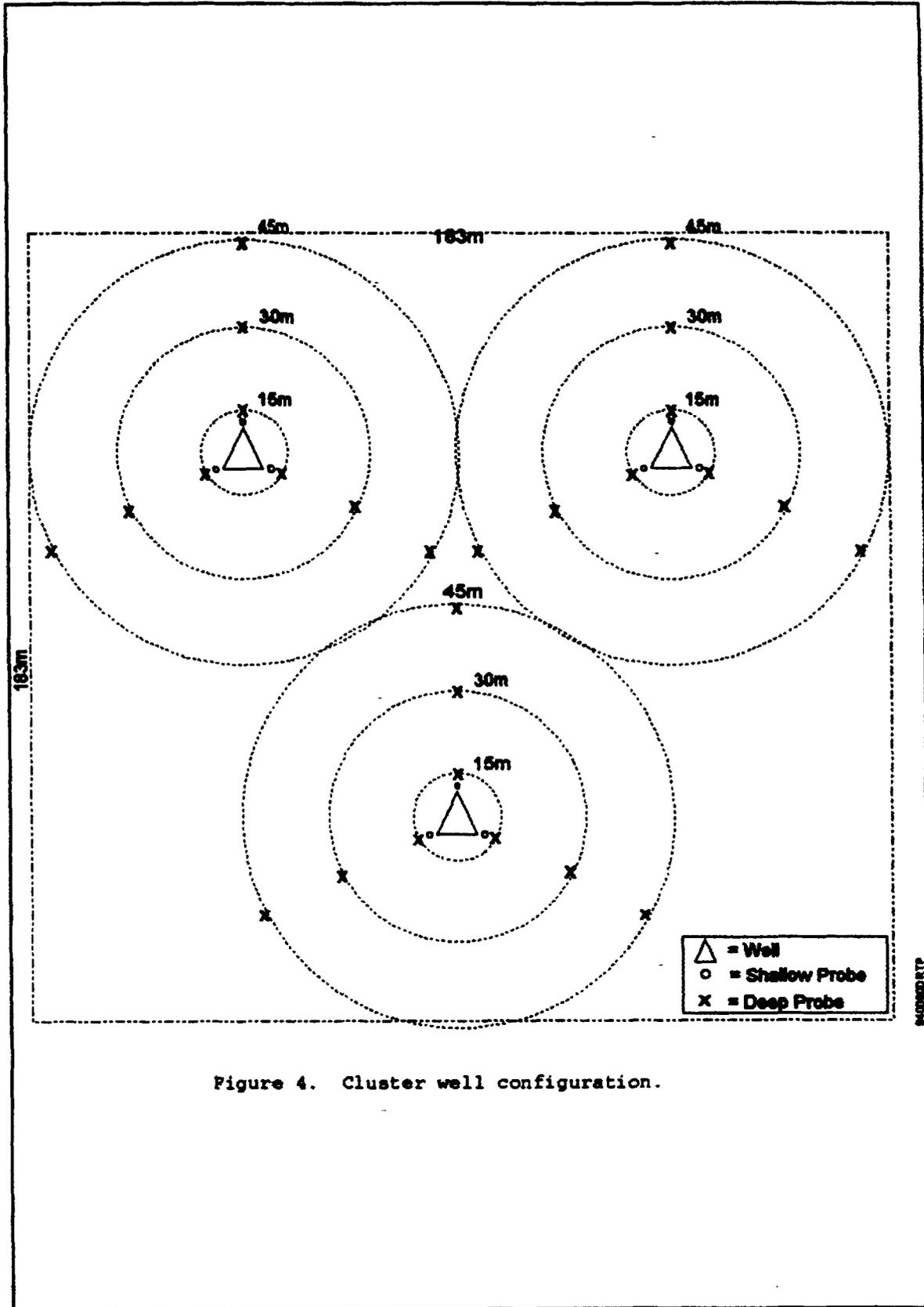


Figure 4. Cluster well configuration.

Use an auger to dig a hole, approximately 0.15 to 0.23 meters in diameter, for each pressure probe. Perforate the bottom two thirds of the pressure probe. Perforations shall be holes or slots with an open area equivalent to four 6.0 millimeter diameter holes spaced 90 degrees apart every 0.15 meters. Place the pressure probe in the center of the hole and backfill with gravel to a level 0.30 meters above the perforated section. Add a layer of backfill material at least 1.2 meters thick. Add a layer of bentonite at least 0.3 meters thick, and backfill the remainder of the hole with cover material or material equal in permeability to the existing cover material. The specifications for pressure probe installation are shown in figure 5.

BILLING CODE 6560-50-P

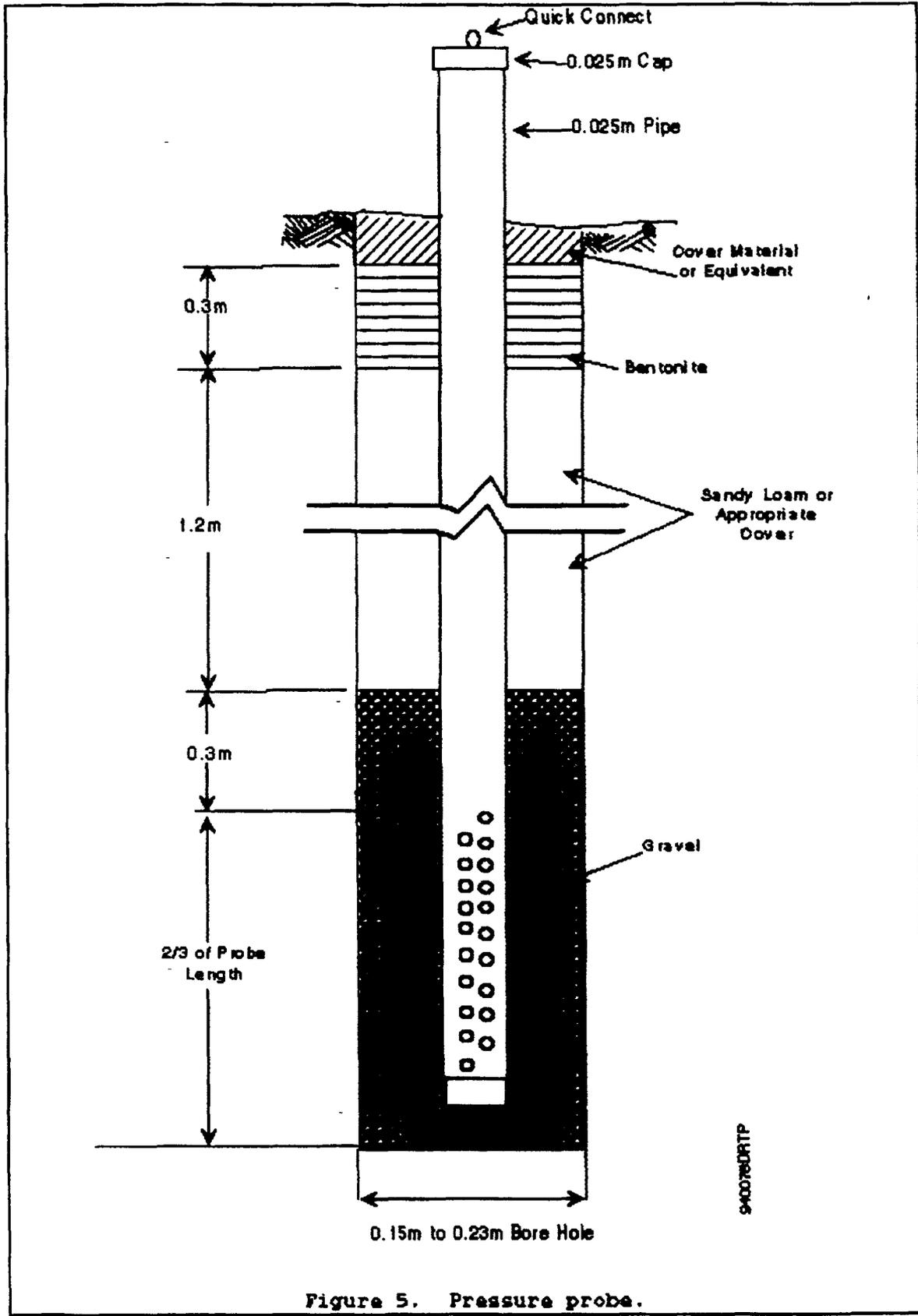


Figure 5. Pressure probe.

#### 3.4 LFG Flow Rate Measurement.

Determine the flow rate of LFG from the test wells continuously during testing with an orifice meter. Alternative methods to measure the LFG flow rate may be used with approval of the Administrator. Locate the orifice meter as shown in figure 1. Attach the wells to the blower and flare assembly. The individual wells may be ducted to a common header so that a single blower and flare assembly and flow meter may be used. Use the procedures in section 4.1 to calibrate the flow meter.

3.5 Leak Check. A leak check of the above ground system is required for accurate flow rate measurements and for safety. Sample LFG at the wellhead sample port and at a point downstream of the flow measuring device. Use Method 3C to determine nitrogen ( $N_2$ ) concentrations. Determine the difference by using the formula below.

$$\text{Difference} = C_o - C_w$$

where,

$C_o$  = concentration of  $N_2$  at the outlet, ppmv

$C_w$  = concentration of  $N_2$  at the wellhead, ppmv

The system passes the leak check if the difference is less than 10,000 ppmv. If the system fails the leak check, make the appropriate adjustments to the above ground system and repeat the leak check.

3.6 Static Testing. The purpose of the static testing is to determine the initial conditions of the landfill. Close the control valves on the wells so that there is no flow of landfill gas from the well. Measure the gauge pressure ( $P_g$ ) at each deep pressure probe and the barometric pressure ( $P_{bar}$ ) every 8 hours for 3 days. Convert the gauge pressure of each deep pressure probe to absolute pressure by using the following equation. Record as  $P_i$ .

$$P_i = P_{bar} + P_g$$

where,

$P_{bar}$  = Atmospheric pressure, mm Hg

$P_g$  = Gauge pressure of the deep probes, mm Hg

$P_i$  = Initial absolute pressure of the deep probes during static testing, mm Hg

3.6.1 For each probe, average all of the 8 hr deep pressure probe readings and record as  $P_{ia}$ . The  $P_{ia}$  is used in section 3.7.6 to determine the maximum radius of influence.

3.6.2 Measure the LFG temperature and the static flow rate of each well once during static testing using a flow measurement device, such as a Type S pitot tube and measure the temperature of the landfill gas. The flow measurements should be made either just before or just after the measurements of the probe pressures and are used in determining the initial flow from the extraction well during the short term testing. The temperature measurement is used in the check for infiltration.

3.7 Short Term Testing. The purpose of short term testing is to determine the maximum vacuum that can be applied to the wells without infiltration of air into the landfill. The short term testing is done on one well at a time. During the short term testing, burn LFG with a flare or incinerator.

3.7.1 Use the blower to extract LFG from a single well at a rate at least twice the static

flow rate of the respective well measured in section 3.6.2. If using a single blower and flare assembly and a common header system, close the control valve on the wells not being measured. Allow 24 hours for the system to stabilize at this flow rate.

3.7.2 Check for infiltration of air into the landfill by measuring the temperature of the LFG at the wellhead, the gauge pressures of the shallow pressure probes, and the LFG  $N_2$  concentration by using Method 3C.

CAUTION: Increased vacuum at the wellhead may cause infiltration of air into the landfill, which increases the possibility of a landfill fire. Infiltration of air into the landfill may occur if any of the following conditions are met: the LFG  $N_2$  concentration is more than 20 percent, any of the shallow probes have a negative gauge pressure, or the temperature has increased above 55°C or the maximum established temperature during static testing. If infiltration has not occurred, increase the blower vacuum by 4 mm Hg, wait 24 hours, and repeat the infiltration check. If at any time, the temperature change exceeds the limit, stop the test until it is safe to proceed. Continue the above steps of increasing blower vacuum by 4 mm Hg, waiting 24 hours, and checking for infiltration until the concentration of  $N_2$  exceeds 20 percent or any of the shallow probes have a negative gauge pressure, at which time reduce the vacuum at the wellhead so that the  $N_2$  concentration is less than 20 percent and the gauge pressures of the shallow probes are positive. This is the maximum vacuum at which infiltration does not occur.

3.7.3 At this maximum vacuum, measure  $P_{bar}$  every 8 hours for 24 hours and record the LFG flow rate as  $Q_s$  and the probe gauge pressures for all of the probes as  $P_f$ . Convert the gauge pressures of the deep probes to absolute pressures for each 8-hour reading at  $Q_s$  as follows:

$$P = P_{bar} + P_f$$

where,

$P_{bar}$  = Atmospheric pressure, mm Hg

$P_f$  = Final absolute pressure of the deep probes during short term testing, mm Hg

$P$  = Pressure of the deep probes, mm Hg

3.7.4 For each probe, average the 8-hr deep pressure probe readings and record as  $P_{fa}$ .

3.7.5 For each probe, compare the initial average pressure ( $P_{ia}$ ) from section 3.6.1 to the final average pressure ( $P_{fa}$ ). Determine the furthestmost point from the wellhead along each radial arm where  $P_{fa} \leq P_{ia}$ . This distance is the maximum radius of influence (ROI), which is the distance from the well affected by the vacuum. Average these values to determine the average maximum radius of influence ( $R_{ma}$ ).

The average  $R_{ma}$  may also be determined by plotting on semi-log paper the pressure differentials ( $P_{fa} - P_{ia}$ ) on the y-axis (abscissa) versus the distances (3, 15, 30 and 45 meters) from the wellhead on the x-axis (ordinate). Use a linear regression analysis to determine the distance when the pressure differential is zero. Additional pressure probes may be used to obtain more points on the semi-log plot of pressure differentials versus distances.

3.7.6 Calculate the depth ( $D_{st}$ ) affected by the extraction well during the short term test

as follows. If the computed value of  $D_{st}$  exceeds the depth of the landfill, set  $D_{st}$  equal to the landfill depth.

$$D_{st} = WD + R_{ma}^2$$

where,

$D_{st}$  = depth, m

$WD$  = well depth, m

$R_{ma}$  = maximum radius of influence, m

3.7.7 Calculate the void volume for the extraction well (V) as follows.

$$V = 0.40 \pi R_{ma}^2 D_{st}$$

where,

$V$  = void volume of test well,  $m^3$

$R_{ma}$  = maximum radius of influence, m

$D_{st}$  = depth, m

3.7.8 Repeat the procedures in section 3.7 for each well.

3.8 Calculate the total void volume of the test wells ( $V_v$ ) by summing the void volumes (V) of each well.

3.9 Long Term Testing. The purpose of long term testing is to determine the methane generation rate constant, k. Use the blower to extract LFG from the wells. If a single blower and flare assembly and common header system are used, open all control valves and set the blower vacuum equal to the highest stabilized blower vacuum demonstrated by any individual well in section 3.7. Every 8 hours, sample the LFG from the wellhead sample port, measure the gauge pressures of the shallow pressure probes, the blower vacuum, the LFG flow rate, and use the criteria for infiltration in section 3.7.2 and Method 3C to check for infiltration. If infiltration is detected, do not reduce the blower vacuum, but reduce the LFG flow rate from the well by adjusting the control valve on the wellhead. Adjust each affected well individually. Continue until the equivalent of two total void volumes ( $V_v$ ) have been extracted, or until  $V_t = 2 V_v$ .

3.9.1 Calculate  $V_t$ , the total volume of LFG extracted from the wells, as follows.

$$V_t = \sum_{i=1}^n 60 Q_i t_{vi}$$

where,

$V_t$  = total volume of LFG extracted from wells,  $m^3$

$Q_i$  = LFG flow rate measured at orifice meter at the  $i^{\text{th}}$  interval, cubic meters per minute

$t_{vi}$  = time of the  $i^{\text{th}}$  interval, hour (usually 8)

3.9.2 Record the final stabilized flow rate as  $Q_f$ . If, during the long term testing, the flow rate does not stabilize, calculate  $Q_f$  by averaging the last 10 recorded flow rates.

3.9.3 For each deep probe, convert each gauge pressure to absolute pressure as in section 3.7.4. Average these values and record as  $P_{sa}$ . For each probe, compare  $P_{ia}$  to  $P_{sa}$ . Determine the furthestmost point from the wellhead along each radial arm where  $P_{sa} \leq P_{ia}$ . This distance is the stabilized radius of influence. Average these values to determine the average stabilized radius of influence ( $R_{sa}$ ).

3.10 Determine the NMOC mass emission rate using the procedures in section 5.

3.11 Deactivation of pressure probe holes. Upon completion of measurements, if pressure probes are removed, restore the

integrity of the landfill cover by backfilling and sealing to prevent venting of LFG to the atmosphere or air infiltration.

4. Calibrations

Gas Flow Measuring Device Calibration Procedure. Locate a standard pitot tube in line with a gas flow measuring device. Use the procedures in Method 2D, section 4, to calibrate the orifice meter. Method 3C may be used to determine the dry molecular weight. It may be necessary to calibrate more than one gas flow measuring device to bracket the landfill gas flow rates. Construct a calibration curve by plotting the pressure drops across the gas flow measuring device for each flow rate versus the average dry gas volumetric flow rate in cubic meters per minute of the gas. Use this calibration curve to determine the volumetric flow from the wells during testing.

5. Calculations

5.1 Nomenclature.

- A<sub>avg</sub>=average age of the solid waste tested, year
- A<sub>i</sub>=age of solid waste in the *i*th fraction, year
- A=age of landfill, year
- A<sub>r</sub>=acceptance rate, megagrams per year
- C<sub>NMOC</sub>=NMOC concentration, ppmv as hexane (C<sub>NMOC</sub>=C<sub>i</sub>/6)
- C<sub>i</sub>=NMOC concentration, ppmv (carbon equivalent) from Method 25C
- D = depth affected by the test wells, m
- D<sub>st</sub>=depth affected by the test wells in the short term test, m
- D<sub>LF</sub>=landfill depth, m
- f = fraction of decomposable solid waste in the landfill
- f<sub>i</sub>=fraction of the solid waste in the *i*th section
- k=methane generation rate constant, year<sup>-1</sup>
- L<sub>o</sub>=methane generation potential, cubic meters per megagram
- L<sub>o</sub>'=revised methane generation potential to account for the amount of nondecomposable material in the landfill, cubic meters per megagram
- M<sub>i</sub>=mass of solid waste of the *i*th section, megagrams
- M<sub>r</sub>=mass of decomposable solid waste affected by the test well, megagrams
- M<sub>w</sub>=number of wells
- P<sub>bar</sub>=atmospheric pressure, mm Hg
- P<sub>g</sub>=gauge pressure of the deep pressure probes, mm Hg
- P<sub>i</sub>=initial absolute pressure of the deep pressure probes during static testing, mm Hg
- P<sub>ia</sub>=average initial absolute pressure of the deep pressure probes during static testing, mm Hg
- P<sub>r</sub>=final absolute pressure of the deep pressure probes during short term testing, mm Hg
- P<sub>ra</sub>=average final absolute pressure of the deep pressure probes during short term testing, mm Hg
- P<sub>s</sub>=final absolute pressure of the deep pressure probes during long term testing, mm Hg
- P<sub>sa</sub>=average final absolute pressure of the deep pressure probes during long term testing, mm Hg
- Q<sub>B</sub>=required blow flow rate, cubic meters per minute

- Q<sub>f</sub>=final stabilized flow rate, cubic meters per minute
- Q<sub>i</sub>=LFG flow rate measured at orifice meter during the *i*th interval, cubic meters per minute
- Q<sub>s</sub>=maximum LFG flow rate at each well determined by short term test, cubic meters per minute
- Q<sub>t</sub>=NMOC mass emission rate, cubic meters per minute
- R<sub>m</sub>=maximum radius of influence, m
- R<sub>ma</sub>=average maximum radius of influence, m
- R<sub>s</sub>=stabilized radius of influence for an individual well, m
- R<sub>sa</sub>=average stabilized radius of influence, m
- t<sub>i</sub>=age of section *i*, year
- t<sub>t</sub>=total time of long term testing, year
- V=void volume of test well, m<sup>3</sup>
- V<sub>r</sub>=volume of solid waste affected by the test well, m<sup>3</sup>
- V<sub>t</sub>=total volume of solid waste affected by the long term testing, m<sup>3</sup>
- V<sub>v</sub>=total void volume affected by test wells, m<sup>3</sup>
- WD=well depth, m
- ρ=solid waste density, m<sup>3</sup> (Assume 0.64 megagrams per cubic meter if data are unavailable)

5.2 Use the following equation to calculate the depth affected by the test well. If using cluster wells, use the average depth of the wells for WD. If the value of D is greater than the depth of the landfill, set D equal to the landfill depth.

$$D = WD + R_{sa}$$

5.3 Use the following equation to calculate the volume of solid waste affected by the test well.

$$V_r = R_{sa}^2 \pi D$$

5.4 Use the following equation to calculate the mass affected by the test well.

$$M_r = V_r \rho$$

5.5 Modify L<sub>o</sub> to account for the nondecomposable solid waste in the landfill.

$$L_o' = f L_o$$

5.6 In the following equation, solve for k by iteration. A suggested procedure is to select a value for k, calculate the left side of the equation, and if not equal to zero, select another value for k. Continue this process until the left hand side of the equation equals zero, #0.001.

$$ke^{-k} A_{avg} - \left( 5.256 \times 10^5 \right) \frac{Q_f}{2 L_o' M_r} = 0$$

5.7 Use the following equation to determine landfill NMOC mass emission rate if the yearly acceptance rate of solid waste has been consistent (±10 percent) over the life of the landfill.

$$Q_t = 2 L_o' A_r (1 - e^{-k} A) C_{NMOC} / (5.256 \times 10^{11})$$

5.8 Use the following equation to determine landfill NMOC mass emission rate if the acceptance rate has not been consistent over the life of the landfill.

$$Q_t = \frac{2 k L_o' C_{NMOC}}{(5.256 \times 10^{11})} \sum_{i=1}^n M_i e^{-k t_i}$$

6. Bibliography

1. Same as Method 2, appendix A, 40 CFR part 60.
2. Emcon Associates, Methane Generation and Recovery from Landfills. Ann Arbor Science, 1982.
3. The Johns Hopkins University, Brown Station Road Testing and Gas Recovery Projections. Laurel, Maryland: October 1982.
4. Mandeville and Associates, Procedure Manual for Landfill Gases Emission Testing.
5. Letter and attachments from Briggum, S., Waste Management of North America, to Thorneloe, S., EPA. Response to July 28, 1988 request for additional information. August 18, 1988.
6. Letter and attachments from Briggum, S., Waste Management of North America, to Wyatt, S., EPA. Response to December 7, 1988 request for additional information. January 16, 1989.

\* \* \* \* \*

Method 3C—Determination of Carbon Dioxide, Methane, Nitrogen, and Oxygen From Stationary Sources

1. Applicability and Principle

1.1 Applicability. This method applies to the analysis of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrogen (N<sub>2</sub>), and oxygen (O<sub>2</sub>) in samples from municipal solid waste landfills and other sources when specified in an applicable subpart.

1.2 Principle. A portion of the sample is injected into a gas chromatograph (GC) and the CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>, and O<sub>2</sub> concentrations are determined by using a thermal conductivity detector (TCD) and integrator.

2. Range and Sensitivity

2.1 Range. The range of this method depends upon the concentration of samples. The analytical range of TCD's is generally between approximately 10 ppmv and the upper percent range.

2.2 Sensitivity. The sensitivity limit for a compound is defined as the minimum detectable concentration of that compound, or the concentration that produces a signal-to-noise ratio of three to one. For CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>, and O<sub>2</sub>, the sensitivity limit is in the low ppmv range.

3. Interferences

Since the TCD exhibits universal response and detects all gas components except the carrier, interferences may occur. Choosing the appropriate GC or shifting the retention times by changing the column flow rate may help to eliminate resolution interferences.

To assure consistent detector response, helium is used to prepare calibration gases. Frequent exposure to samples or carrier gas containing oxygen may gradually destroy filaments.

4. Apparatus

4.1 Gas Chromatograph. GC having at least the following components:

4.1.1 Separation Column. Appropriate column(s) to resolve CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>, O<sub>2</sub>, and other gas components that may be present in the sample.

4.1.2 Sample Loop. Teflon or stainless steel tubing of the appropriate diameter.

Note: Mention of trade names or specific products does not constitute endorsement or recommendation by the U. S. Environmental Protection Agency.

4.1.3 Conditioning System. To maintain the column and sample loop at constant temperature.

4.1.4 Thermal Conductivity Detector.

4.2 Recorder. Recorder with linear strip chart. Electronic integrator (optional) is recommended.

4.3 Teflon Tubing. Diameter and length determined by connection requirements of cylinder regulators and the GC.

4.4 Regulators. To control gas cylinder pressures and flow rates.

4.5 Adsorption Tubes. Applicable traps to remove any O<sub>2</sub> from the carrier gas.

5. Reagents

5.1 Calibration and Linearity Gases. Standard cylinder gas mixtures for each compound of interest with at least three concentration levels spanning the range of suspected sample concentrations. The calibration gases shall be prepared in helium.

5.2 Carrier Gas. Helium, high-purity.

6. Analysis

6.1 Sample Collection. Use the sample collection procedures described in Methods 3 or 25C to collect a sample of landfill gas (LFG).

6.2 Preparation of GC. Before putting the GC analyzer into routine operation, optimize the operational conditions according to the manufacturer's specifications to provide good resolution and minimum analysis time. Establish the appropriate carrier gas flow and set the detector sample and reference cell flow rates at exactly the same levels. Adjust the column and detector temperatures to the recommended levels. Allow sufficient time for temperature stabilization. This may typically require 1 hour for each change in temperature.

6.3 Analyzer Linearity Check and Calibration. Perform this test before sample analysis. Using the gas mixtures in section 5.1, verify the detector linearity over the range of suspected sample concentrations with at least three points per compound of interest. This initial check may also serve as the initial instrument calibration. All subsequent calibrations may be performed using a single-point standard gas provided the calibration point is within 20 percent of the sample component concentration. For each instrument calibration, record the carrier and detector flow rates, detector filament and block temperatures, attenuation factor, injection time, chart speed, sample loop volume, and component concentrations. Plot a linear regression of the standard concentrations versus area values to obtain the response factor of each compound. Alternatively, response factors of uncorrected component concentrations (wet basis) may be generated using instrumental integration. Note: Peak height may be used instead of peak area throughout this method.

6.4 Sample Analysis. Purge the sample loop with sample, and allow to come to atmospheric pressure before each injection. Analyze each sample in duplicate, and calculate the average sample area (A). The

results are acceptable when the peak areas for two consecutive injections agree within 5 percent of their average. If they do not agree, run additional samples until consistent area data are obtained. Determine the tank sample concentrations according to section 7.2.

7. Calculations

Carry out calculations retaining at least one extra decimal figure beyond that of the acquired data. Round off results only after the final calculation.

7.1 Nomenclature.

- A = average sample area
- B<sub>w</sub> = moisture content in the sample, fraction
- C = component concentration in the sample, dry basis, ppmv
- C<sub>t</sub> = calculated NMOC concentration, ppmv C equivalent
- C<sub>tm</sub> = measured NMOC concentration, ppmv C equivalent
- P<sub>bar</sub> = barometric pressure, mm Hg
- P<sub>u</sub> = gas sample tank pressure after evacuation, mm Hg absolute
- P<sub>t</sub> = gas sample tank pressure after sampling, but before pressurizing, mm Hg absolute
- P<sub>tf</sub> = final gas sample tank pressure after pressurizing, mm Hg absolute
- P<sub>w</sub> = vapor pressure of H<sub>2</sub>O (from table 3C-1), mm Hg
- T<sub>u</sub> = sample tank temperature before sampling, °K
- T<sub>t</sub> = sample tank temperature at completion of sampling, °K
- T<sub>tr</sub> = sample tank temperature after pressurizing, °K
- r = total number of analyzer injections of sample tank during analysis (where j = injection number, 1 . . . r)
- R = Mean calibration response factor for specific sample component, area/ppmv

TABLE 3C-1.—MOISTURE CORRECTION

Temperature °C	Vapor Pressure of H <sub>2</sub> O, mm Hg
4	6.1
6	7.0
8	8.0
10	9.2
12	10.5
14	12.0
16	13.6
18	15.5
20	17.5
22	19.8
24	22.4
26	25.2
28	28.3
30	31.8

7.2 Concentration of Sample Components. Calculate C for each compound using Equations 3C-1 and 3C-2. Use the temperature and barometric pressure at the sampling site to calculate B<sub>w</sub>. If the sample was diluted with helium using the procedures in Method 25C, use Equation 3C-3 to calculate the concentration.

$$B_w = \frac{P_w}{P_{bar}} \quad 3C-1$$

$$C = \frac{A}{R(1-B_w)} \quad 3C-2$$

$$C = \frac{\frac{P_{tf}}{T_{tr}}}{\frac{P_t}{T_t} - \frac{P_u}{T_u}} \cdot \frac{A}{R(1-B_w)} \quad 3C-3$$

8. Bibliography

1. McNair, H.M., and E.J. Bonelli. Basic Gas Chromatography. Consolidated Printers, Berkeley, CA, 1969.

\* \* \* \* \*  
Method 25C—Determination of Nonmethane Organic Compounds (NMOC) in MSW Landfill Gases

1. Applicability and Principle

1.1 Applicability. This method is applicable to the sampling and measurement of nonmethane organic compounds (NMOC) as carbon in MSW landfill gases.

1.2 Principle. A sample probe that has been perforated at one end is driven or augered to a depth of 1.0 meter below the bottom of the landfill cover. A sample of the landfill gas is extracted with an evacuated cylinder. The NMOC content of the gas is determined by injecting a portion of the gas into a gas chromatographic column to separate the NMOC from carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and methane (CH<sub>4</sub>); the NMOC are oxidized to CO<sub>2</sub>, reduced to CH<sub>4</sub>, and measured by a flame ionization detector (FID). In this manner, the variable response of the FID associated with different types of organics is eliminated.

2. Apparatus

2.1 Sample Probe. Stainless steel, with the bottom third perforated. The sample probe shall be capped at the bottom and shall have a threaded cap with a sampling attachment at the top. The sample probe shall be long enough to go through and extend no less than 1.0 meter below the landfill cover. If the sample probe is to be driven into the landfill, the bottom cap should be designed to facilitate driving the probe into the landfill.

2.2 Sampling Train.

2.2.1 Rotameter with Flow Control Valve. Capable of measuring a sample flow rate of 500 ml/min or less (30.5±3.1 m<sup>3</sup>/min). The control valve shall be made of stainless steel.

2.2.2 Sampling Valve. Stainless steel.

2.2.3 Pressure Gauge. U-tube mercury manometer, or equivalent, capable of measuring pressure to within 1 mm Hg in the range of 0 to 1,100 mm Hg.

2.2.4 Sample Tank. Stainless steel or aluminum cylinder, with a minimum volume of 4 liters and equipped with a stainless steel sample tank valve.

2.3 Vacuum Pump. Capable of evacuating to an absolute pressure of 10 mm Hg.

2.4 Purging Pump. Portable, explosion proof, and suitable for sampling NMOC.

2.5 Pilot Probe Procedure. The following are needed only if the tester chooses to use the procedure described in section 4.2.1.

2.5.1 Pilot Probe. Tubing of sufficient strength to withstand being driven into the landfill by a post driver and an outside diameter of at least 6.0 millimeters smaller than the sample probe. The pilot probe shall be capped on both ends and long enough to go through the landfill cover and extend no less than 1.0 meter into the landfill.

2.5.2 Post Driver and Compressor. Capable of driving the pilot probe and the sampling probe into the landfill.

2.6 Auger Procedure. The following are needed only if the tester chooses to use the procedure described in section 4.2.2.

2.6.1 Auger. Capable of drilling through the landfill cover and to a depth of no less than 0.9 meters into the landfill.

2.6.2 Pea Gravel.

2.6.3 Bentonite.

2.7 NMOC Analyzer, Barometer, Thermometer, and Syringes. Same as in sections 2.3, 2.4.1, 2.4.2, 2.4.4, respectively, of Method 25.

3. Reagents

3.1 NMOC Analysis. Same as in Method 25, section 3.2.

3.2 Calibration. Same as in Method 25, section 3.4, except omit section 3.4.3.

4. Procedure

4.1 Sample Tank Evacuation and Leak Check. Conduct the sample tank evacuation and leak check either in the laboratory or the field. Connect the pressure gauge and sampling valve to the sample tank. Evacuate the sample tank to 10 mm Hg absolute pressure or less. Close the sampling valve, and allow the tank to sit for 60 minutes. The tank is acceptable if no change is noted. Include the results of the leak check in the test report.

4.2 Sample Probe Installation. The tester may use the procedure in sections 4.2.1 or 4.2.2. CAUTION: Since this method is complex, only experienced personnel should perform this test. LFG contains methane, therefore explosive mixtures may exist on or near the landfill. It is advisable to take appropriate safety precautions when testing landfills, such as refraining from smoking and installing explosion-proof equipment.

4.2.1 Pilot Probe Procedure. Use the post driver to drive the pilot probe at least 1.0 meter below the landfill cover. Alternative procedures to drive the probe into the landfill may be used subject to the approval of the Administrator.

Remove the pilot probe and drive the sample probe into the hole left by the pilot probe. The sample probe shall extend not less than 1.0 meter below the landfill cover and shall protrude about 0.3 meters above the landfill cover. Seal around the sampling probe with bentonite and cap the sampling probe with the sampling probe cap.

4.2.2 Auger Procedure. Use an auger to drill a hole through the landfill cover and to at least 1.0 meter below the landfill cover. Place the sample probe in the hole and backfill with pea gravel to a level 0.6 meters from the surface. The sample probe shall protrude at least 0.3 meters above the landfill cover. Seal the remaining area around the probe with bentonite. Allow 24 hours for the landfill gases to equilibrate inside the augered probe before sampling.

4.3 Sample Train Assembly. Prepare the sample by evacuating and filling the sample tank with helium three times. After the third evacuation, charge the sample tank with helium to a pressure of approximately 325 mm Hg. Record the pressure, the ambient temperature, and the barometric pressure. Assemble the sampling probe purging system as shown in figure 1.

BILLING CODE 6560-50-P

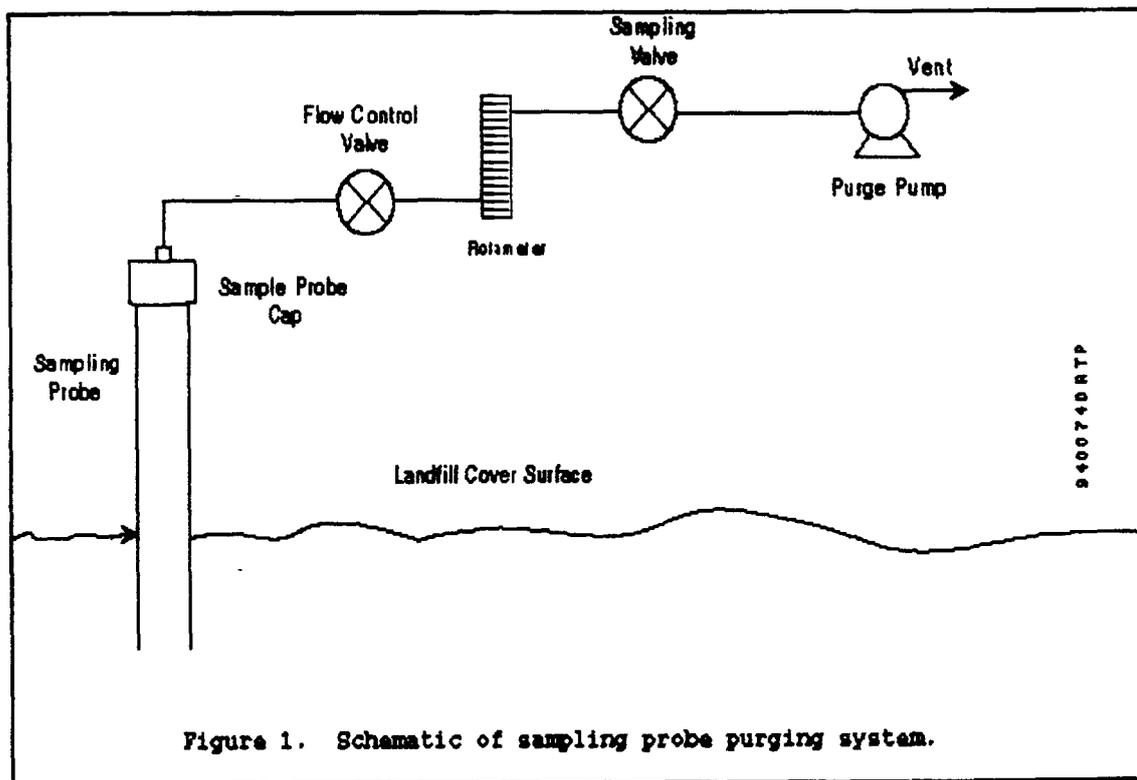


Figure 1. Schematic of sampling probe purging system.

4.4 Sampling Procedure. Open the sampling valve and use the purge pump and the flow control valve to evacuate at least two sample probe volumes from the system at a flow rate of 500 ml/min or less ( $30.5 \pm 3.1$  m<sup>3</sup>/min). Close the sampling valve and replace the purge pump with the sample tank apparatus as shown in figure 2. Open the sampling valve and the sample tank valves

and, using the flow control valve, sample at a flow rate of 500 ml/min or less ( $30.5 \pm 3.1$  m<sup>3</sup>/min) until the sample tank gauge pressure is zero. Disconnect the sampling tank apparatus and use the carrier gas bypass valve to pressurize the sample cylinder to approximately 1,060 mm Hg absolute pressure with helium and record the final pressure. Alternatively, the sample tank may

be pressurized in the lab. If not analyzing for N<sub>2</sub>, the sample cylinder may be pressurized with zero air. Use Method 3C to determine the percent N<sub>2</sub> in the sample. Presence of N<sub>2</sub> indicates infiltration of ambient air into the gas sample. The landfill sample is acceptable if the concentration of N<sub>2</sub> is less than 20 percent.

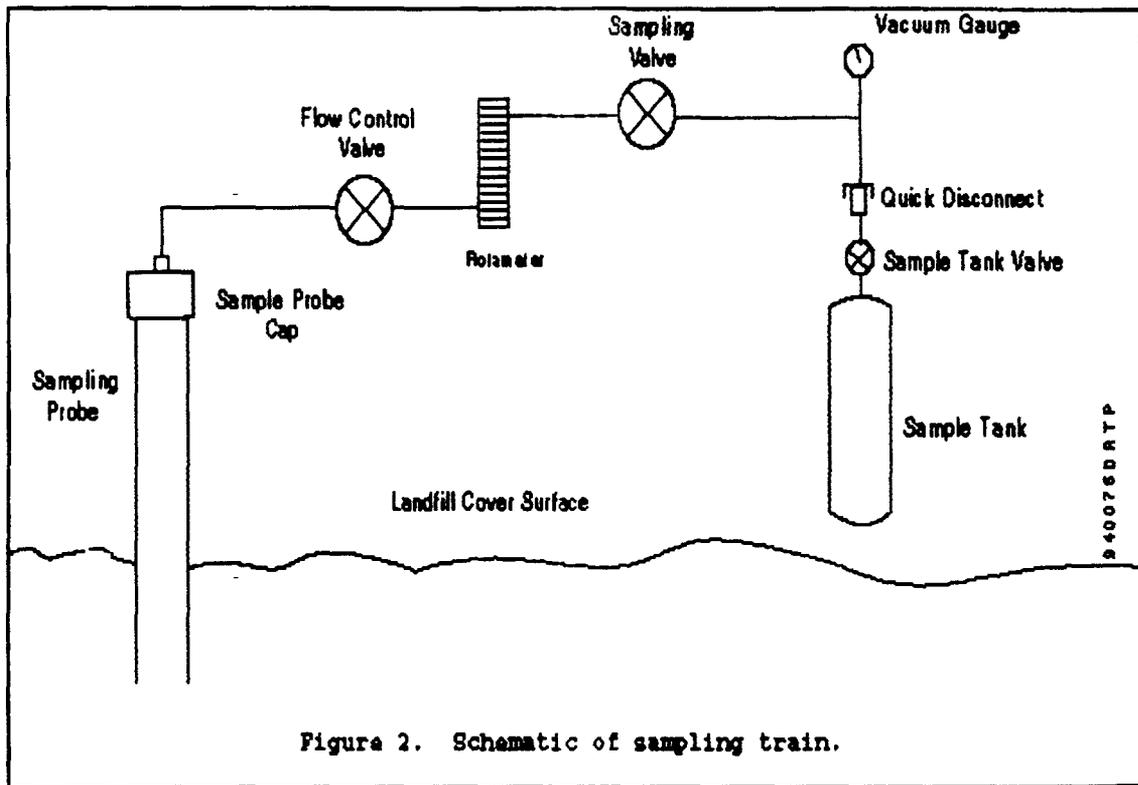


Figure 2. Schematic of sampling train.

4.5 Analysis. The oxidation, reduction, and measurement of NMOC is similar to Method 25. Before putting the NMOC analyzer into routine operation, conduct an initial performance test. Start the analyzer, and perform all the necessary functions to put the analyzer into proper working order. Conduct the performance test according to the procedures established in section 5.1. Once the performance test has been successfully completed and the NMOC calibration response factor has been determined, proceed with sample analysis as follows:

4.5.1 Daily Operations and Calibration Checks. Before and immediately after the analysis of each set of samples or on a daily basis (whichever occurs first), conduct a calibration test according to the procedures established in section 5.2. If the criteria of the daily calibration test cannot be met, repeat the NMOC analyzer performance test (section 5.1) before proceeding.

4.5.2 Operating Conditions. Same as in Method 25, section 4.4.2.

4.5.3 Analysis of Sample Tank. Purge the sample loop with sample, and then inject the sample. Under the specified operating conditions, the CO<sub>2</sub> in the sample will elute in approximately 100 seconds. As soon as the detector response returns to baseline following the CO<sub>2</sub> peak, switch the carrier gas flow to backflush, and raise the column oven temperature to 195 °C as rapidly as possible. A rate of 30 °C/min has been shown to be adequate. Record the value obtained for any measured NMOC. Return the column oven temperature to 85 °C in preparation for the next analysis. Analyze each sample in triplicate, and report the average as C<sub>m</sub>.

4.6 Audit Samples. Same as in Method 25, section 4.5.

4.7 Deactivation of Sample Probe Holes. Once sampling has taken place, either plug the sampling probes with a cap or remove the probes and refill the hole with cover material.

5. Calibration and Operational Checks

Maintain a record of performance of each item.

5.1 Initial NMOC Analyzer Performance Test. Same as in Method 25, section 5.2, except omit the linearity checks for CO<sub>2</sub> standards.

5.2 NMOC Analyzer Daily Calibration. NMOC response factors, same as in Method 25, section 5.3.2.

6. Calculations

All equations are written using absolute pressure; absolute pressures are determined by adding the measured barometric pressure to the measured gauge or manometer pressure.

6.1 Nomenclature.

- B<sub>w</sub>=moisture content in the sample, fraction
- C<sub>N2</sub>=measured N<sub>2</sub> concentration, fraction
- C<sub>i</sub>=calculated NMOC concentration, ppmv C equivalent
- C<sub>im</sub>=measured NMOC concentration, ppmv C equivalent
- P<sub>b</sub>=barometric pressure, mm Hg
- P<sub>u</sub>=gas sample tank pressure before sampling, mm Hg absolute
- P<sub>i</sub>=gas sample tank pressure at completion of sampling, but before pressurizing, mm Hg absolute
- P<sub>if</sub>=final gas sample tank pressure after pressurizing, mm Hg absolute
- P<sub>w</sub>=vapor pressure of H<sub>2</sub>O (from table 25C-1), mm Hg
- T<sub>u</sub>=sample tank temperature before sampling, °K

- T<sub>i</sub>=sample tank temperature at completion of sampling, but before pressurizing, °K
- T<sub>if</sub>=sample tank temperature after pressurizing, °K
- r=total number of analyzer injections of sample tank during analysis (where j= injection number, 1 . . r)

6.2 Water Correction. Use table 25C-1, the LFG temperature, and barometric pressure at the sampling site to calculate B<sub>w</sub>.

$$B_w = \frac{P_w}{P_b}$$

TABLE 25C-1.—MOISTURE CORRECTION

Temperature, °C	Vapor Pressure of H <sub>2</sub> O, mm Hg
4	6.1
6	7.0
8	8.0
1	9.2
12	10.5
14	12.0
16	13.6
18	15.5
20	17.5
22	19.8
24	22.4
26	25.2
28	28.3
30	31.8

6.3 NMOC Concentration. Use the following equation to calculate the concentration of NMOC for each sample tank.

$$C_t = \frac{\frac{P_{tf}}{T_{tf}}}{\frac{P_t}{T_t} - \frac{P_u}{T_u}} \frac{1}{(1 - B_w - C_{N2})} \sum_{j=1}^r C_{tm}^{(j)}$$

**7. Bibliography**

1. Salon, Albert E., Samuel Witz, and Robert D. MacPhee. Determination of Solvent Vapor Concentrations by Total Combustion Analysis: A Comparison of Infrared with Flame Ionization Detectors. Paper No. 75-33.2. (Presented at the 68th Annual Meeting of the Air Pollution Control Association. Boston, Massachusetts. June 15-20, 1975.) p. 14.

2. Salon, Albert E., William L. Oaks, and Robert D. MacPhee. Measuring the Organic Carbon Content of Source Emissions for Air Pollution Control. Paper No. 74-190. (Presented at the 67th Annual Meeting of the Air Pollution Control Association. Denver, Colorado. June 9-13, 1974.) p. 25.

[FR Doc. 96-5529 Filed 3-11-96; 8:45 am]

BILLING CODE 6560-50-P

**FEDERAL MARITIME COMMISSION**

**46 CFR Part 501**

**The Federal Maritime Commission—General**

**AGENCY:** Federal Maritime Commission.

**ACTION:** Final rule.

**SUMMARY:** The Federal Maritime Commission is revising its statement of delegations of authorities to include new authority delegated to the Director of the Bureau of Economics and Agreement Analysis to grant or deny applications for waivers of certain regulations.

**EFFECTIVE DATE:** March 12, 1996.

**FOR FURTHER INFORMATION CONTACT:** Austin L. Schmitt, Director, Bureau of Economics and Agreement Analysis, Federal Maritime Commission, 800 North Capitol Street, NW., Washington, DC 20573-0001, (202) 523-5787.

**SUPPLEMENTARY INFORMATION:** In Docket No. 94-31, *Information Form and Post-Effective Reporting Requirements for Agreements Among Ocean Common Carriers Subject to the Shipping Act of 1984*, the Federal Maritime Commission ("Commission") has amended its regulations set forth in 46 CFR Part 572 governing the filing, processing and review of agreements among ocean common carriers subject to the Shipping Act of 1984. The amended regulations provide that, upon a showing of good cause, the Commission may waive any part of their requirements, and set forth procedures and standards governing applications for a waiver.

This rule amends the Commission's statement of delegations of authorities in 46 CFR Part 501 to include a new delegation to the Director of the Commission's Bureau of Economics and Agreement Analysis to grant or deny applications for waivers of the agreement regulations. Review of the Director's grant or denial of a waiver is available under the procedures already in effect pursuant to 46 CFR 501.21(f).

Notice and opportunity for public comment were not necessary prior to issuance of this rule and because it deals solely with matters of agency organization and procedure. 5 U.S.C. 553.

**List of Subjects in 46 CFR Part 501**

Administrative practice and procedure; authority delegations; organization and functions; seals and insignia.

Therefore, pursuant to 5 U.S.C. 551-557, 701-706, 2903 and 6304; 31 U.S.C. 3721; 41 U.S.C. 414 and 418; 44 U.S.C. 501-520 and 3501-3520; 46 U.S.C. app. 801-848, 876, 1111 and 1701-1720; Reorganization Plan No. 7 of 1961, 26 FR 7315, August 12, 1961; Pub. L. 89-56, 79 Stat. 195; and 5 CFR Part 2638, Part 501 of Title 46, Code of Federal Regulations, is amended to read as follows:

**PART 501—THE FEDERAL MARITIME COMMISSION—GENERAL**

1. The authority citation for Part 501 continues to read as follows:

Authority: 5 U.S.C. 551-557, 701-706, 2903 and 6304; 31 U.S.C. 3721; 41 U.S.C. 414 and 418; 44 U.S.C. 501-520 and 3501-3520; 46 U.S.C. app. 801-848, 876, 1111 and 1701-1720; Reorganization Plan No. 7 of 1961, 26 FR 7315, August 12, 1961; Pub. L. 89-56, 79 Stat. 195; 5 CFR Part 2638.

2. In section 501.26, paragraph (f) is amended by changing the reference to "572.404" to "572.406," and by changing the references to "572.501 and 572.502" to "572.404 and 572.405;" paragraphs (g) through (m) are redesignated (i) through (o); newly redesignated (i) (6) is removed; and new paragraphs (g) and (h) are added, as follows:

**§ 501.26 Delegation to the Director, Bureau of Economics and Agreement Analysis.**

\* \* \* \* \*

(g) Authority to grant or deny applications filed under § 572.505 of this chapter for waiver of the information form requirements of §§ 572.503 and 572.504 of this chapter.

By the Commission.

(h) Authority to grant or deny applications filed under § 572.709 of

this chapter for waiver of the reporting and record retention requirements of §§ 572.701, 572.702, 572.703, 572.704, 572.705, 572.706, 572.707 and 572.708 of this chapter.

\* \* \* \* \*

By the Commission.

Ronald D. Murphy,

Assistant Secretary.

[FR Doc. 96-5807 Filed 3-11-96; 8:45 am]

BILLING CODE 6730-01-M

**FEDERAL COMMUNICATIONS COMMISSION**

**47 CFR Part 25**

[CC Docket No. 92-166; FCC 96-54]

**Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Band**

**AGENCY:** Federal Communications Commission.

**ACTION:** Final rule; petition for reconsideration.

**SUMMARY:** The Commission has adopted, upon reconsideration, changes to the rules and policies establishing service and licensing rules for the Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Band. Specifically, we conclude that the "interim plan," designed to avoid interference between the Big LEO systems and the Russian Global Navigation Satellite System ("GLONASS"), is unnecessary at this time. We also clarify our views concerning position determination capabilities in Big LEO earth terminals, and modifications to feeder link proposals. In order to ensure that United States licensees do not engage in practices that are contrary to the goal of competitive markets world-wide, we also adopt a rule concerning exclusive arrangements for provision of Big LEO service. We also clarify our "two-tiered" processing scheme for financial qualifications. In addition, we make a number of minor editorial and clarifying changes to our technical rules.

**EFFECTIVE DATE:** April 11, 1996.

**FOR FURTHER INFORMATION CONTACT:** Karl Kensinger, International Bureau, Satellite and Radiocommunication Division, Satellite Policy Branch, (202) 418-0773.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's *Memorandum Opinion and Order* in CC Docket No. 92-166; FCC 96-54, adopted February 12, 1996 and released February 15, 1996. The complete text of this *Memorandum Opinion and Order* is

## APPENDIX I2

Amendments to Subparts Cc and WWW appeared as a direct final notice in the Federal Register on June 16, 1998 (63 FR 32743) and can also be found on the internet at <http://www.epa.gov/docs/fedrgstr/EPA-AIR/1998/June>

transiting the ICW once the last tall ship in the parade clears the Savannah River and Fields Cut junction.

(3) From 2 p.m. until 5 p.m. EDT on July 3, 1998, and from 8 a.m. until 11 a.m. EDT on July 6, 1998, all waters bounded by the south bank of the Savannah River to the center of the Savannah River Channel, from the Talmadge Bridge to position 32-04.45, 081-04.45W. During these times no vessel shall be allowed to enter these safety zones unless authorized by the Captain of the Port.

(4) From 9 p.m. to 11 p.m. EDT on July 4, 1998, a 300 foot radius around a fireworks staging area in approximate position 32-05N, 081-05W. During this time no vessel shall be allowed to enter this safety zone unless authorized by the Captain of the Port.

(5) From 8 a.m. to 2 p.m. EDT on July 6, 1998, the center 300 feet of the Savannah River channel from the Talmadge Bridge to the entrance of Bloody Point Range. Vessels that cannot safely navigate outside of this safety zone and desire to depart the port of Savannah on July 6, 1998, would be required to begin the outbound transit in sufficient time to clear the Savannah Riverfront area prior to 8 a.m. Vessels that cannot safely navigate outside of this safety zone and desire to enter the port of Savannah on July 6, 1998, would be required to clear the Savannah Riverfront area prior to 8 a.m. If unable to clear the Savannah Riverfront area by 8 a.m., these vessels would be required to start the inbound transit after 2 p.m. The Captain of the Port will allow vessel traffic to resume outbound transits utilizing the entire navigational channel when the last tall ship in the parade clears longitude 080-51W. Vessels using the ICW will not be allowed to cross the Savannah River at the junction of the Fields Cut once the parade approaches within one (1) nautical mile of this area. Vessels will be allowed to resume transiting the ICW once the last tall ship in the parade clears the Savannah River and Fields Cut junction.

(6) From 10 a.m. to 2 p.m. EDT on July 6, 1998, an area bounded by 32-00.19N, 080-44.07W, 31-59.35N, 080-43.08W, 32-00.59N, 080-41.32W, and 32-01.43N, 080-42.28W. During this time no vessel shall be allowed to enter this safety zone unless authorized by the Captain of the Port.

**Note:** The regulations specified in paragraphs (a)(1) and (a)(6) apply only within the navigable waters of the United States. In the waters within the offshore staging area and pre-race staging area that are outside the navigable waters of the United States, the following nonobligatory guidelines apply.

(i) All unaffiliated Americas' Sail vessels should remain clear of the staging area and pre-race staging area and avoid interfering with any Americas' Sail participant or Coast Guard vessel. Interference with anchoring or race activities may constitute a safety hazard warranting cancellation or termination of all or part of the Americas' Sail activities by the Captain of the Port.

(ii) Any unauthorized entry into these zones by unaffiliated vessels constitutes a risk to the safety of marine traffic. Such entry will constitute a factor to be considered in determining whether a person has operated a vessel in a negligent manner in violation of 46 U.S.C. 2302.

(b) *Regulations.* In accordance with the general regulations in § 165.23 of this part, entry into these safety zones is subject to the following requirements:

(1) These safety zones are closed to all non-participating vessels, except as may be permitted by the Captain of the Port or a representative of the Captain of the Port.

(2) The "representative of the Captain of the Port" is any Coast Guard commissioned, warrant or petty officer who has been designated by the Captain of the Port, Savannah, GA, to act on his behalf. The representative of the Captain of the Port will be aboard either a Coast Guard or Coast Guard Auxiliary vessel.

(3) Non-participating vessel operators desiring to enter or operate within the safety zone shall contact the Captain of the Port or his representative to obtain permission to do so. Vessel operators given permission to enter or operate in the safety zone shall comply with all directions given them by the Captain of the Port or his representative.

(4) The Captain of the Port may be contacted by telephone via the Command Duty Officer at (912) 652-4353. Vessels assisting in the enforcement of the safety zone may be contacted on VHF-FM channel 16. Vessel operators may determine the restrictions in effect for the safety zone by coming alongside a Coast Guard vessel patrolling the perimeter of the safety zone.

(5) The Captain of the Port Savannah will issue a Marine Safety Information Broadcast Notice to Mariners to notify the maritime community of the safety zones and restrictions imposed.

(c) *Dates.* This section becomes effective at 9 a.m., Eastern Daylight Time (EDT) on July 2, 1998, and terminates at 2 p.m., EDT on July 6, 1998.

Dated June 3, 1998

**R.E. Seebald,**

*Commander, U.S. Coast Guard, Captain of the Port, Savannah, Georgia*

[FR Doc. 98-15965 Filed 6-15-98, 8:45 am]

**BILLING CODE 4910-15-M**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 60

[AD-FRL-6106-8]

#### Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Direct final rule.

**SUMMARY:** This action amends, corrects errors, and clarifies regulatory text of the "Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills," which was issued as a final rule and guideline on March 12, 1996.

**EFFECTIVE DATE:** This rule will become effective August 17, 1998 without further notice unless the Agency receives relevant adverse comment by July 16, 1998. Should the Agency receive such comments, it will publish a timely document withdrawing this rule.

**ADDRESSES:** Comments should be submitted (in duplicate if possible) to: Air and Radiation Docket and Information Center (MC-6102), Attn: Docket No. A-88-09/Category V-D, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. The EPA request that a separate copy also be sent to the contact person listed below. Refer to **SUPPLEMENTARY INFORMATION** for information regarding electronic submittal of comments.

**FOR FURTHER INFORMATION CONTACT:** For information concerning this notice and analyses performed in developing this rule, contact Ms. Michele Laur, Waste and Chemical Processes Group, Emission Standards Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5256. For implementation issues, contact Mary Ann Warner, Program Review Group, Information Transfer and Program Integration Division (MD-12), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-1192. For information on the Landfill

Model, contact Susan Thorneloe through the internet at: thorneloe.susan@epamail.epa.gov. For information concerning applicability and rule determinations, contact the appropriate regional representative:

#### Region I

Greg Roscoe, Air Programs Compliance Branch Chief, U.S. EPA/ASO, Region I, JFK Federal Building, Boston, MA 02203, (617) 565-3221

#### Region II

Christine DeRosa, U.S. EPA, Region II, 290 Broadway, 25th Floor, New York, NY 10007-1866, (212) 637-4022

#### Region III

James Topsale, U.S. EPA/3AP22, Region III, 841 Chestnut Building, Philadelphia, PA 10107, (215) 566-2190

#### Region IV

R. Douglas Neeley, Chief, Air and Radiation Technology Branch, U.S. EPA, Region IV, 61 Forsyth St., SW., Atlanta, GA 30303, (404) 562-9105

#### Region V

George T. Czerniak, Jr., Air Enforcement Branch Chief, U.S. EPA/5AE-26, Region V, 77 West Jackson Street, Chicago, IL 60604, (312) 353-2088

#### Region VI

John R. Hepola, Air Enforcement Branch Chief, U.S. EPA, Region VI, 1445 Ross Avenue, Suite 1200, Dallas, TX 75202-2733, (214) 655-7220

#### Region VII

Ward Burns, U.S. EPA/RME, Region VII, 726 Minnesota Avenue/ARTDAPCO, Kansas City, KS 66101-2728, (913) 551-7960

#### Region VIII

Vicki Stamper, U.S. EPA, Region VIII, 999 18th Street, Suite 500, Denver, CO 80202-2466, (303) 312-6445

#### Region IX

Patricia Bowlin, U.S. EPA/RM HAN/17211, Region IX, 75 Hawthorne Street/AIR-4, San Francisco, CA, (415) 744-1188

#### Region X

Catherine Woo, U.S. EPA, Region X, Office of Air Quality Planning and Standards-107, 1200 Sixth Avenue, Seattle, WA 98101, (206) 553-1814

**SUPPLEMENTARY INFORMATION:** A companion proposal to this final rule is being published in the proposed rules section of today's **Federal Register** and is identical to this direct final rule. Any

comments on this direct final rule should address the companion proposal. The proposal provides information on addresses for submittal of comments. If relevant adverse comments are timely received, such comments will be addressed in a subsequent final rule based on the proposed rule. A document informing the public that the direct final rule did not take effect will be published. If no relevant adverse comments are timely filed on any provision of this direct final rule, then the entire direct final rule will become effective 60 days from today's **Federal Register** document and no further action will be taken on the companion proposal published today.

#### Background

On March 12, 1996 (60 FR 9918), the U.S. Environmental Protection Agency (EPA) promulgated in the **Federal Register** standards of performance for new sources (NSPS) for municipal solid waste landfills and emission guidelines for existing municipal solid waste landfills. These regulations and guidelines were promulgated as subparts WWW and Cc of 40 CFR part 60.

This document revises the wording of the applicability sections of subparts WWW and Cc and related definitions to clarify the intent regarding which landfills are subject to subpart WWW versus subpart Cc. This notice also corrects typographical and cross referencing errors. A few editorial modifications are also being made to clarify the intent of certain provisions and correct inconsistencies between different sections of subpart WWW. These changes do not significantly modify the requirements of the regulation.

#### I. Description of Changes

##### A. Definitions

The NSPS applies to landfills that commence construction, modification, or reconstruction on or after May 30, 1991. A definition of "modification" is being added. The definition is specific to landfills but is consistent with the intent of section 60.14 of the NSPS General Provisions. Application of the NSPS General Provisions to landfills is problematic due to the fact that a landfill is not a typical production or manufacturing facility for which the General Provisions originally were written. The following discussion demonstrates the considerations made to apply the NSPS General Provisions to landfills. This limited definition of modification is uniquely appropriate for landfills, and EPA does not believe at

this time that such a rationale could be extended outside the landfill context.

As stated in 40 CFR 60.14(a), modifications are physical or operational changes to an existing facility that result in an increase in the emissions of any pollutant to which a standard applies. However, with respect to landfills, the concept of a physical or operational change leading to an increase in emissions is of limited application, since unlike more traditional sources of air pollution, increased emissions at landfills are based on the amount and character of waste placed in the landfill, rather than through physical or operational changes to equipment or production methods. Equipment at a landfill is essentially the landfill itself and while production can be roughly equated to the amount of waste placed in the landfill, total "production" for the entire life of the facility is controlled through the amount of design capacity specified in the permit. Although the amount and character of waste present at any given time may vary within the design capacity constraints set forth in the permit, emissions over the total life of the facility depend on the amount of waste a landfill can accept pursuant to its permitted design capacity. Accordingly, for landfills, it makes sense to consider only those physical or operational changes that increase the size of the landfill beyond its permitted capacity as modifications subjecting an existing facility to the NSPS. Therefore, if the design capacity of a landfill increases, a change leading to an increase in emissions is assumed to have occurred. For purposes of this NSPS, a landfill is considered modified and subject to the NSPS if its design capacity has been increased after May 30, 1991.

Operational changes at landfills, such as increasing the moisture content of the waste, increasing the physical compaction on the surface, changing the cover material or thickness of daily cover, and changing bailing or compaction practices, can typically be accomplished without a capital expenditure. Consequently, the landfill definition of modification does not include such operational changes. Existing landfills that make an operational change but do not increase the horizontal or vertical dimensions of the landfill continue to be subject to the emission guidelines rather than the NSPS. Therefore, for landfills, the only change which would constitute a modification is an increase in design capacity caused by an increase in the permitted horizontal or vertical dimensions of the landfill.

Reconstructions are unlikely for landfills. As specified in the NSPS General Provisions, reconstructions are "the replacement of components of an existing facility [landfill] to such an extent that: the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost of a comparable entirely new facility [landfill] \* \* \*." The Agency knows of no situation where this would occur at a landfill.

The definition of "design capacity" is being amended to clarify that the design capacity is determined by 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 that permit. This clarification addresses cases where a landfill may have multiple permits. It makes sense to use the most recent permitted design capacity to determine whether a landfill exceeds the design capacity exemption level. The words "construction or operating" permit have also been deleted and substituted with the word "permit." The use of the term "operating permit" could be misinterpreted to mean a title V permit. The permit intended was the State, local, or Tribal agency permit that establishes the design capacity.

The definition of design capacity is also being clarified to state that a permit may express design capacity on a volumetric or a mass basis. The revised definition also states that the owner or operator may choose to convert the design capacity from volume to mass or from mass to volume, using a site-specific density, in order to demonstrate that the design capacity is less than 2.5 million Mg or 2.5 million m<sup>3</sup>. If the density changes, the design capacity changes. Therefore, an owner or operator who converts from volume to mass or mass to volume must annually calculate the site-specific density. These revisions to the definition are clarifications that do not change the intent of the NSPS and emission guidelines as promulgated on March 12, 1996.

Under the NSPS and emission guidelines, design capacity is used to determine whether or not a landfill is below the design capacity cutoff. If the design capacity in the permit is below either 2.5 million megagrams (Mg) or 2.5 million cubic meters (m<sup>3</sup>), the landfill is exempt (except for design capacity reporting requirements). A landfill with a volumetric permit may choose to calculate design capacity on a mass basis (or vice versa) based on a site-specific density. The initial design capacity report must provide supporting documentation of this calculation. If such a conversion is made, records must

also be kept of the annual recalculation of the site-specific density and design capacity with supporting documentation.

For example, a landfill may have a permitted design capacity greater than 2.5 million m<sup>3</sup> by volume; but the landfill may have documented calculations showing that, based on the actual waste density, the design capacity is less than 2.5 million Mg by mass. Because the design capacity is less than 2.5 million Mg, the landfill is below the design capacity cutoff. If such a landfill changes its compaction practices such that the density of the waste placed in the landfill increases, the calculated design capacity could become greater than 2.5 million Mg, and the landfill would then need to submit an amended design capacity report. If the revised design capacity is over 2.5 million m<sup>3</sup> and 2.5 million Mg, the landfill must estimate emissions and must install controls if emissions are greater than or equal to 50 Mg/yr.

If an existing landfill makes an operational change (such as a change in compaction practices), this is not a "modification" (see the previous discussion on the definition of "modification"). Such a landfill will continue to be subject to the emission guidelines rather than becoming subject to the NSPS. The emission guidelines require the landfill to report any increase in design capacity that results in a capacity equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup>. The control requirements of the emission guidelines will apply if the design capacity increases to over 2.5 million Mg and 2.5 million m<sup>3</sup> due to an operational change and not due to modification as defined by this rule.

The definition of "closed landfill" and wording in section 60.752(b) are being revised to delete references to section 258.60. This reference is not appropriate for all landfills because some landfills closed prior to the October 1993 effective date of part 258 and are not subject to part 258. Section 60.752(b)(2)(v)(A) is being revised for clarification to refer to the definition of "closed landfill" in section 60.751 instead of the requirements of section 258.60.

The definition of "interior well" is being revised to clarify that an interior well is located inside the perimeter of the landfilled waste.

The definition of "radii of influence" is being added parenthetically in section 60.759(a)(3)(ii) for clarification. This definition makes it clear that the radii of influence is the distance from the well center to a point in the landfill where the pressure gradient applied by

the blower or compressor approaches zero.

#### B. Designation of Affected Facility

Section 60.750(a) of subpart WWW is being revised slightly to clarify which landfills are subject to the NSPS. The promulgated rule stated that "the provisions of this subpart apply to each municipal solid waste landfill that commenced construction, reconstruction, or modification or began accepting waste on or after May 30, 1991. The words "or began accepting waste" have been deleted. This change makes the applicability consistent with both the definition of "new source" in section 111 of the Clean Air Act (CAA) and the applicability of the emission guidelines in section 60.32c of subpart Cc. As stated in section 60.32c(a), the emission guidelines apply to landfills that commenced construction, modification, or reconstruction before May 30, 1991. A landfill that commenced construction before May 30, 1991, but began accepting waste after May 1991 should be subject to the emission guidelines rather than the NSPS. The change being made accomplishes this objective and is consistent with the CAA. The definitions of "commenced" and "construction" are contained in section 60.2 of the NSPS General Provisions (subpart A). A definition for "modification" is being added to subpart WWW, and "reconstruction" is described in section 60.15 of the NSPS General Provisions.

Section 60.750(b) of subpart WWW is being revised to clarify that authority for test methods are retained by the Administrator and shall *not* be transferred to the State. This is consistent with EPA's historical position on test methods.

Under applicability, we are also clarifying that activities conducted as part of CERCLA remedial actions or RCRA corrective actions are not considered construction, modification, or reconstruction and would not make a landfill subject to the NSPS. This is consistent with the provisions that changes made to an existing landfill solely to comply with the emission guidelines do not make the landfill subject to the NSPS. It is also consistent with the exemption of facilities subject to a CERCLA remedial action from permitting requirements. This provision is being added to section 60.750 of subpart WWW as paragraph (c).

Regarding applicability and the design capacity exemption, the wording "or" in several places in section 60.752 has been changed to "and" to clarify that if a landfill design capacity is less

than either 2.5 million Mg or 2.5 million m<sup>3</sup>, the landfill is exempt from all provisions except the design capacity report; whereas if the capacity is equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup>, the additional requirements of the rule apply. As previously discussed under the definition of design capacity, a landfill may calculate design capacity on either a mass or volume basis to determine if it qualifies for the design capacity exemption.

#### C. Compliance Dates

The compliance time in section 60.752(b)(2)(ii) is being revised to make it clear that landfills have 30 months to install a collection and control system once the landfill becomes affected (i.e., the annual report shows NMOC emissions equal to or greater than 50 Mg/yr). Section 60.752(b)(2)(ii) stated that a landfill has 18 months to install a collection and control system after submitting a design plan to the Administrator. Section 60.752(b)(2)(i) requires landfills to submit a design plan within 1 year of the annual report showing NMOC emissions equal to or greater than 50 Mg/yr. Therefore, the previous language in the rule would require landfills that submitted a design plan earlier than 1 year after becoming affected to install a collection and control system sooner than landfills that waited the full 1 year to submit the design plan. The intent was to allow landfills 30 months after the first report showing NMOC emissions equal to or greater than 50 Mg/yr to install controls.

Similarly, in the emission guidelines, section 60.36c(a) is revised to specify that installation of collection and control systems shall be accomplished within 30 months of the initial report showing NMOC emissions equal or exceed 50 Mg/yr rather than within 30 months of the effective date of the State rule. This is consistent with the timing in the NSPS, which allows 90 days to submit an initial report, and 30 months to install controls if the report shows that emissions equal or exceed 50 Mg/yr.

Section 60.755(b) is being revised to clarify that an affected landfill must install each well no later than 60 days after the date on which the initial solid waste has been in place (1) for five years or more if the area is active or (2) two years or more if the area is closed or at final grade. The only change is to specify "no later than 60 days after" instead of "within 60 days."

#### D. Clarification of Title V Permitting Requirements

The paragraphs on part 70 permitting requirements are being revised to refer

to both part 70 and 71. In States with approved part 70 operating permit programs, sources will apply for part 70 permits; in States without approved part 70 permit programs, EPA will implement the federal operating permits program under part 71.

Section 502(a) of the Act requires title V operating permits for a number of sources, including, but not limited to, major sources and sources (including nonmajor sources) which are subject to standards or regulations under section 111 or 112. Section 502(a) also states that the Administrator may exempt source categories (in whole or in part) from permitting requirements if the Administrator determines that compliance with such requirements is impracticable, infeasible, or unnecessarily burdensome on such categories, but not major sources.

At promulgation of this NSPS and EG (61 FR 9905, March 12, 1996), landfills with a design capacity less than 2.5 million Mg in mass or 2.5 million m<sup>3</sup> in volume were exempted from part 70 operating permit requirements based on the above provisions. Although these landfills are required to submit a design capacity report under this NSPS and EG, no control is required for landfills of this size. As a result, EPA believes that it would be unnecessarily burdensome for landfills, which are not major sources and which have design capacities less than 2.5 million Mg or 2.5 million m<sup>3</sup>, to apply for a title V permit when the NSPS or EG does not establish any emission limits or control requirements for such landfills.

If a MSW landfill is subject to title V permitting (40 CFR part 70 or part 71) as a result of this NSPS or EG standard (i.e., a source which meets or exceeds the design capacity of 2.5 million Mg and 2.5 million m<sup>3</sup>) it is not subject to the requirement to apply for a title V permit until 90 days after the earlier of the following dates: (1) the effective date of this NSPS (March 12, 1996); (2) the effective date of EPA's approval of a state's 111(d) plan; or (3) the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996, even if the design capacity report is submitted prior to the relevant deadline. Sentences have been added to section 60.752 and section 60.32c(c) to clarify the date the landfill becomes subject to title V. These dates for triggering title V applicability are consistent with the dates that NSPS sources are required to file design capacity reports. To maintain consistency between NSPS sources and EG sources, EG sources will not become

subject to the requirement to apply for a title V permit until 90 days after the effective date of EPA's approval of a state's 111(d) plan.

The permit provisions originally included as sentences within paragraphs (a) and (b) of section 60.752 have been moved to separate paragraphs (c) and (d) so that the detailed permit provisions are in one location. The wording has also been revised to clarify that landfills smaller than 2.5 million Mg or 2.5 million m<sup>3</sup> do not require a part 70 or 71 operating permit unless they are subject to part 70 or 71 for some other reason. A landfill of this size *could* be a major source, and, if so, would need to apply for a permit. This situation was discussed in the preamble to the promulgated rule (61 FR 9912, March 12, 1996). Also, a landfill of this size could be subject to title V for some other reason, e.g., subject to another NSPS or NESHAP.

Sources subject to the title V permitting program under parts 70 or 71 are required to file applications within 12 months after becoming subject to the program. Landfills which are subject to the title V permitting program as a result of being subject to this NSPS or EG are required to file title V applications within 12 months following the deadline to submit a design capacity report (which indicates that the landfill in question is equal to, or greater than, 2.5 million Mg and 2.5 million m<sup>3</sup>). In that the designation of size in the report triggers title V applicability, EPA believes that it is appropriate that the deadline for filing this report initiates the 12 month time frame for submitting a title V application. As provided in section 503(c) of the Act, permitting authorities may establish earlier deadlines, prior to the 12 month deadline, for submitting title V applications. If more than one requirement causes a source to be subject to title V permitting, the time frame for filing a title V application will be triggered by the requirement which first caused the source to be subject to title V.

Section 60.752(d) (formerly the last sentence in section 60.752(b)) is being revised. This paragraph stated that after a landfill is closed and either never required a control system or has met the criteria for control system removal, a title V permit is no longer needed. The phrase "if the landfill is not otherwise subject to the requirements of either part 70 or 71" has been added. As previously discussed, if a landfill is a major source or is subject to title V for some other reason (e.g., subject to another NSPS or NESHAP), it will still require a permit. Other format changes to this paragraph

are to improve clarity and do not change the intent.

Subpart Cc is being amended by adding paragraphs (c) and (d) to section 60.32c. These paragraphs, which cover when existing MSW landfills require part 70 or 71 operating permits, were excluded from the promulgated emission guidelines through an oversight. Part 70 permit provisions were included in the NSPS, but the Emission Guidelines inadvertently did not reference this section of the NSPS. The inclusion of these paragraphs makes subpart Cc consistent with subpart WWW with respect to part 70 or 71 operating permits. Specifically, paragraph (c) clarifies that an existing landfill smaller than 2.5 million Mg or 2.5 million m<sup>3</sup> does not require a part 70 or 71 operating permit unless it is subject to part 70 or 71 for some other reason. Paragraph (c) also clarifies that an existing landfill equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup> is subject to part 70 or 71 permitting requirements whether it is a major source or not. In addition, paragraph (d) clarifies that closed landfills that are only required to have title V permits due to 40 CFR part 60, subparts WWW or Cc and are not required to have a control system or meet the conditions for control system removal are not required to have part 70 or 71 operating permits, if they are not otherwise subject to title V permitting requirements. As with 40 CFR part 60, subpart WWW, under 40 CFR part 60, subpart Cc, the deadline for submitting a design capacity report initiates the time frame for submitting a title V application. Permitting authorities may, however, establish earlier dates by which applications are required from these title V sources.

#### E. Equations

Section 60.754(a)(1) is being revised to clarify that *both* the equation in section 60.754(a)(1)(i) and the equation in section 60.754(a)(1)(ii) may be used when the actual year-to-year solid waste acceptance rate is known for only part of the life of the landfill. This is the technically correct way to calculate emissions and was the intent of the rule.

Section 60.754(a)(1) is being amended by the addition of the methane generation rate constant (k) for geographical areas with low precipitation. A k value of 0.02 per year is provided for the tier 1 calculation for landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site. Landfills located in geographical areas with low

precipitation experience slower decomposition of their waste than landfills located in geographical areas with moderate to high rainfall. Consequently, the gas production rate at landfills located in drier areas is reduced. Rather than burden these landfills with pursuing tier 3 Method 2E testing and analysis for a site-specific k value, it is reasonable to allow an alternative default k value. In reviewing the information used to estimate the impacts of the final rule (Docket A-88-09, Item IV-M-4), a k value of 0.02 per year for landfills that meet this description is a reasonably conservative value consistent with the intent of the tier 1 analysis.

Sections 60.754(a)(1)(i) and (ii) are also being revised to clarify that only documentation of the nature and amount of nondegradable waste needs to be maintained when subtracting the mass of nondegradable waste from the total mass of waste when calculating the NMOC emission rate. The previous language specified that the documentation provisions of section 60.758(d)(2) were to be followed; however, these provisions are related to segregated areas within the landfill excluded from collection pursuant to section 60.759(a)(3)(i) or (ii) because asbestos or other nondegradable wastes were disposed in those areas or because the area is nonproductive. For the purposes of estimating emissions, only documentation of the nature and amount of nondegradable waste needs to be maintained to justify the subtraction of the mass of nondegradable waste.

#### F. Test Methods and Procedures

Section 60.754(a)(4)(ii) is revised to clarify that the site-specific methane generation rate constant is calculated only once and that this value is to be used in all subsequent annual NMOC emission rate calculations.

Section 60.752(b)(2)(iii)(B) is being revised to clarify that the initial performance test required under section 60.8 must be completed no later than 180 days after the initial startup of the approved control system. The promulgated regulation already required under section 60.757(f) that the initial performance test report must be submitted within 180 days of start-up of the collection system. This is being reiterated in section 60.752(b)(2)(iii)(B) for clarification.

Section 60.759(a)(3)(ii), which required the use of the values of k and CNMOC determined by field testing, if performed to determine the N<sub>MOC</sub> emission rate or radii of influence, is being revised to also refer to alternative

means for determining k or C<sub>NMOC</sub> allowed by section 60.754(a)(5). The reference to using L<sub>o</sub> values from testing is deleted because it was incorrect. The tier procedures do not include testing for L<sub>o</sub>. As previously mentioned, the definition of radii of influence is being added parenthetically for clarity.

#### G. Prevention of Significant Deterioration Determination

Section 60.754(c) is being revised to clarify that the intent of this provision was to establish the *method* by which prevention of significant deterioration determinations should be made, not to require a PSD determination. The original wording could have been misinterpreted to require PSD-related actions. PSD is a separate permit program that applies to new and modified sources. The PSD regulations, not this NSPS, establish whether a PSD determination is needed. New sources may be subject to PSD review.

In a July 1, 1994 guidance memorandum issued by the EPA (available on the Technology Transfer Network; see "Pollution Control Projects (PCP) and New Source Review (NSR) Applicability" from John S. Seitz, Director, OAQPS to EPA Regional Air Division Directors), the EPA provided guidance for permitting authorities on the approvability of PCP exclusions for source categories other than electric utilities. In the guidance, the EPA indicated that add-on controls and fuel switches to less polluting fuels meet the definition of a PCP and, provided certain safeguards are met, may qualify for an exclusion from major NSR. To be eligible to be excluded from otherwise applicable major NSR requirements, a PCP must, on balance, be "environmentally beneficial," and the permitting authority must ensure that the project will not cause or contribute to a violation of a national ambient air quality standard (NAAQS) or PSD increment, or adversely affect visibility or other air quality related value (AQRV).

A potential exclusion available under PSD is discussed here for informational purposes. In the July 1, 1994 guidance memorandum, the EPA specifically identified the installation of controls pursuant to the NSPS and EG rules as an example of add-on controls that could be considered a PCP and an appropriate candidate for a case-by-case exclusion from major NSR. The EPA considers installation of controls pursuant to the NSPS and EG rules for the control of landfill gases a PCP because the controls are installed to comply with the NSPS and will reduce emissions of NMOC. The EPA also

considers the reduction of these pollutants to represent an environmental benefit. However, EPA recognizes that the incidental formation of nitrogen oxides and carbon monoxide due to the destruction of landfill gas will occur. Consistent with the 1994 guidance, the permitting authority should confirm that in each case that the resultant increase in nitrogen oxides and carbon monoxide would not cause or contribute to a violation of the NAAQS and PSD increment or adversely affect an AQRV.

Finally, the 1994 guidance did not void or create an exclusion from any applicable minor source preconstruction review requirements in an approved State Implementation Plan (SIP). Any minor NSR permitting requirements in a SIP would continue to apply, regardless of any exclusion from major NSR that might be approved for a source under the PCP exclusion policy.

**H. Monitoring**

Section 60.756(a) is being revised to clarify that a temperature measuring device does not need to be permanently installed at each wellhead. It is common for wellheads to have an access port for temperature measurements so that a temperature measuring device can be shared across wellheads for the monthly temperature monitoring requirement. As long as the temperature is monitored monthly, the intent of the regulation is met.

Section 60.756(b)(2) is also being revised to clarify that the device for monitoring gas flow need only record the flow or bypass, not necessarily measure the rate at which gas is flowing to the control device.

**I. Compliance Provisions**

Section 60.755(a)(3) is being revised to allow an alternative timeline to be proposed for correcting an exceedance in collection header pressure at each well. Consistent with section 60.755(c)(4)(v), a sentence is being added to sections 60.755(a)(3) and 60.755(a)(5) to allow an alternate timeline to be proposed to the Administrator for correcting an exceedance. This revision makes the

sections consistent. Depending on the remedy selected to correct the problem, a different timeline may be needed, but any timeline extending more than 120 days must be approved by the regulatory agency.

Section 60.755(c)(1) is being revised slightly to indicate that surface monitoring of methane shall be performed along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30-meter intervals. This change makes the wording consistent with other sections of the rule (e.g., section 60.753(d)).

**J. Recordkeeping and Reporting**

Sections 60.757(a)(1) and (b)(1)(i) are being revised to clarify that subject landfills that commenced construction, modification, or reconstruction after May 30, 1991 (date of proposal) but before the date of promulgation had until June 10, 1996 (90 days from the promulgation date) to submit an initial NMOC capacity report and an initial NMOC emission rate report to the Administrator. The previous language was not clear as to when landfills that commenced construction, modification, or reconstruction between proposal and promulgation would be required to submit an initial design capacity report or NMOC emission rate report. However, it is obvious that the reports could not be required prior to promulgation of the regulation. Therefore, instead of submitting the reports 90 days after commencing construction, landfills that were constructed before promulgation have 90 days after the promulgation date to submit the reports.

Also paragraphs (a)(1)(i) and (ii) in the promulgated rule were somewhat repetitive and contradictory. Paragraph (a)(1)(iii) reflected an unrealistic scenario in that this date would always occur later than the date in paragraphs (a)(1)(i) and (ii). For this reason, the previous paragraph (a)(1)(iii) was unnecessary and confusing. Therefore, that paragraph has been deleted, and paragraphs (a)(1)(i) and (ii) have been revised to state that the report is due on June 10, 1996 or within 90 days after the date of commencement of construction,

modification, or reconstruction, depending on when the construction, modification, or reconstruction commenced.

The wording of section 60.757(a)(2)(ii) is being revised to require calculation of design capacity submitted as part of the design capacity report to include "relevant parameters" rather than the specific list of parameters in the promulgated rule. Some of the previously listed parameters (e.g., compaction practices) would not apply to landfills that calculate design capacity on a volumetric rather than mass basis. Other parameters that were not listed will be needed to perform the calculation in some cases.

The wording of section 60.757(a)(3), which requires amended design capacity reports, is being revised for clarity and consistency with the definitions of modification and design capacity discussed under I.A. It also clarifies that a report is required only if capacity increases above 2.5 million Mg and 2.5 million m<sup>3</sup>. This was the original intent, but the original wording was confusing.

Several paragraphs in section 60.758 are being revised to clarify that the recordkeeping requirements in paragraphs (b), (c), (d), and (e) do not apply if an alternative to the operational standards, test methods, procedures, compliance measures, monitoring, or reporting provisions has been submitted with the design plan and approved by the Administrator.

**II. Cross-Referencing and Typographical Errors**

Errors in cross-referencing one section to another within subpart WWW are being corrected. Typographical errors are also being corrected.

**III. Corrections to Promulgation Preamble**

Tables 3 and 5 in the promulgation preamble contained typographical errors. The units for the small size cutoff (column 1) are stated to be in millions of megagrams (millions Mg); however, the values presented are actually in megagrams. These tables are corrected and provided below for clarification.

TABLE 3.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE EMISSION GUIDELINES <sup>a b</sup>

Small size cutoff (mg)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC incremental cost eff. (\$/Mg)
Baseline <sup>e</sup> .....						
3,000,000 .....	273	73,356	3,220,000	84	1,145	1,145
2,500,000 .....	312	77,600	3,370,000	89	1,147	1,178
1,000,000 .....	572	97,600	3,990,000	119	1,219	1,500

TABLE 3.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE EMISSION GUIDELINES <sup>a b</sup>—Continued

Small size cutoff (mg)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC incremental cost eff. (\$/Mg)
No cutoff <sup>f</sup> .....	7,299	142,000	8,270,000	719	5,063	13,514

<sup>a</sup> Emission rate cutoff level of 50 Mg NMOC/yr.

<sup>b</sup> All values are fifth year annualized.

<sup>c</sup> NMOC emission reductions are from a baseline of 145,000 Mg NMOC/yr.

<sup>d</sup> Methane emission reductions are from a baseline of 8,400,000 Mg methane/yr.

<sup>e</sup> In the absence of an emission guidelines.

<sup>f</sup> No emission rate cutoff and no design capacity exemption level.

TABLE 5.—ALTERNATIVE DESIGN CAPACITY EXEMPTION LEVEL OPTIONS FOR THE NEW SOURCE PERFORMANCE STANDARDS <sup>a b</sup>

Small size cutoff (mg)	Number landfills affected	Annual <sup>c</sup> NMOC emission reduction (Mg/yr)	Annual <sup>d</sup> methane emission reduction (Mg/yr)	Annual <sup>e</sup> cost (million \$/yr)	NMOC average cost eff. (\$/Mg)	NMOC <sup>f</sup> incremental cost eff. (\$/Mg)
Baseline <sup>g</sup> .....						
3,000,000 .....	41	4,900	193,000	4	816	NA
2,500,000 .....	43	4,900	193,000	4	816	NA
1,000,000 .....	89	4,900	193,000	4	816	NA
No cutoff <sup>h</sup> .....	872	13,115	881,000	81	6,176	NA

<sup>a</sup> Emission rate cutoff level of 50 Mg NMOC/yr.

<sup>b</sup> All values are fifth year annualized.

<sup>c</sup> NMOC emission reductions are from a baseline of 13,400 Mg NMOC/yr.

<sup>d</sup> Methane emission reductions are from a baseline of 899,000 Mg methane/yr.

<sup>e</sup> Due to rounding off to the nearest million dollar, cost values do not appear to change for each option. However, actual costs are slightly less for a less stringent option.

<sup>f</sup> Because the annual cost does not change enough to show a different cost from one option to the next, incremental cost effectiveness values are not applicable.

<sup>g</sup> In the absence of a standard.

<sup>h</sup> No emission rate cutoff and no design capacity exemption level.

#### IV. Judicial Review

Under section 307(b)(1) of the CAA, judicial review of the actions taken by this final rule is available only on the filing of a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this action. Under section 307(b)(2) of the CAA, the requirements that are subject to today's document may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

#### V. Administrative

##### A. Paperwork Reduction Act

The information collection requirements of the previously promulgated NSPS were submitted to and approved by the Office of Management and Budget (OMB). A copy of this Information Collection Request (ICR) document (OMB control number 1557.03) may be obtained from Sandy Farmer, OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M Street, SW; Washington, DC 20460 or by calling (202) 260-2740.

Today's changes to the NSPS should have no impact on the information collection burden estimates made previously. The changes consist of new definitions and clarifications of requirements; not additional requirements. Consequently, the ICR has not been revised.

##### B. Executive Order 12866 Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of this Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligation of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this action is not "significant" because none of the listed criteria apply to this action. Consequently, this action was not submitted to OMB for review under Executive Order 12866.

##### C. Regulatory Flexibility

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this direct final rule. EPA has also determined that this direct final rule amendment will not have a significant economic impact on a substantial number of small entities. Today's action clarifies the applicability of control requirements in the Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills and does not include any

provisions that create a burden for any of the regulated entities.

The changes in today's action do not increase the stringency of the rule or add additional control requirements. Nor is the scope of the rule changed so as to bring any entities not previously subject to the rule within its scope or coverage. Today's action does not alter control, monitoring, recordkeeping, or reporting requirements of the promulgated rule.

#### D. Submission to Congress

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. This rule is not a "major rule" as defined by 5 U.S.C. 804(2).

#### E. Executive Order 12875 and Unfunded Mandates Reform Act

Under the executive order EPA must consult with representatives of affected State, local, and Tribal governments. Under the unfunded mandates reform act, EPA must prepare a statement to accompany any rule where the estimated costs to State, local, or Tribal governments, or to the private sector, will be \$100 million or more per year. The EPA held consultations and prepared such a statement at the time of promulgation of subpart Cc and WWW (61 FR 9913, March 12, 1996). Today's changes consist of new definitions and clarifications and do not impose costs on government entities or the private sector. Consequently, a new unfunded mandates statement has not been prepared.

#### F. Children's Health Protection

This direct final rule is not subject to E.O. 13045, entitled "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997), because it does not involve decisions on environmental health risks or safety that may disproportionately affect children.

#### List of Subjects in 40 CFR Part 60

Environmental protection, Municipal solid waste landfills, Air pollution control.

Dated May 28, 1998

**Carol M. Browner,**  
*Administrator.*

For the reasons set out in the preamble, title 40, chapter 1, part 60 of the Code of Federal Regulations is amended as follows:

### PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

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

**Authority:** 42 U.S.C. 7401, 7411, 7414, 7416, 7429, and 7601.

#### Subpart Cc—[Amended]

2. Amend § 60.32c by adding paragraphs (c) and (d) to read as follows:

##### § 60.32c Designated facilities.

\* \* \* \* \*

(c) For purposes of obtaining an operating permit under title V of the Act, the owner or operator of a MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under part 70 or 71 of this chapter, unless the landfill is otherwise subject to either part 70 or 71. For purposes of submitting a timely application for an operating permit under part 70 or 71, the owner or operator of a MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters on the effective date of EPA approval of the State's program under section 111(d) of the Act, and not otherwise subject to either part 70 or 71, becomes subject to the requirements of §§ 70.5(a)(1)(i) or 71.5(a)(1)(i) of this chapter 90 days after the effective date of such 111(d) program approval, even if the design capacity report is submitted earlier.

(d) When a MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain an operating permit under part 70 or 71 of this chapter for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met.

(1) The landfill was never subject to the requirement for a control system under § 60.33c(c) of this subpart; or

(2) The owner or operator meets the conditions for control system removal specified in § 60.752(b)(2)(v) of subpart WWW.

3. Amend § 60.33c by removing in paragraph (a)(2) the phrase "2.5 million

megagrams or 2.5 million cubic meters" and adding, in its place "2.5 million megagrams and 2.5 million cubic meters."

4. Amend § 60.36c by revising paragraph (a) to read as follows:

##### § 60.36c Compliance times.

(a) Except as provided for under paragraph (b) of this section, planning, awarding of contracts, and installation of MSW landfill air emission collection and control equipment capable of meeting the emission guidelines established under § 60.33c shall be accomplished within 30 months after the date the initial NMOC emission rate report shows NMOC emissions equal or exceed 50 megagrams per year.

\* \* \* \* \*

#### Subpart WWW

5. Amend § 60.750 as follows:

a. In paragraph (a), remove the words "or began accepting waste".

b. In paragraph (b), remove the word "None" and add, in its place "§ 60.754(a)(5)".

c. Add paragraph (c) to read as follows:

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

\* \* \* \* \*

(c) Activities required by or conducted pursuant to a CERCLA, RCRA, or State remedial action are not considered construction, reconstruction, or modification for purposes of this subpart.

6. Amend § 60.751 as follows:

a. Remove the last sentence in the definition of "closed landfill."

b. Revise the definitions of "controlled landfill," "design capacity," and "interior well" and add a definition of "modification" to read as follows:

##### § 60.751 Definitions.

\* \* \* \* \*

*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).

*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.

\* \* \* \* \*

*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.

\* \* \* \* \*

*Modification* means an increase in the permitted volume design capacity of the landfill by either horizontal or vertical expansion based on its permitted design capacity as of May 30, 1991.

7. Amend § 60.752 by revising paragraph (a), the introductory text of paragraph (b), paragraphs (b)(2)(ii), (b)(2)(iii)(B), and (b)(2)(v)(A), and adding paragraphs (c) and (d) to read as follows:

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

(a) Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Administrator as provided in § 60.757(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. Submittal of the initial design capacity report shall fulfill the requirements of this subpart except as provided for in paragraphs (a)(1) and (a)(2) of this section.

(1) The owner or operator shall submit to the Administrator an amended design capacity report, as provided for in § 60.757(a)(3).

(2) When an increase in the maximum design capacity of a landfill exempted from the provisions of § 60.752(b) through § 60.759 of this subpart on the basis of the design capacity exemption in paragraph (a) of this section results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator shall comply with the provision of paragraph (b) of this section.

(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in § 60.754. The

NMOC emission rate shall be recalculated annually, except as provided in § 60.757(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements.

(1) \* \* \*

(2) \* \* \*

(ii) Install a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(A) or (B) and (b)(2)(iii) of this section within 30 months after the first annual report in which the emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the emission rate is less than 50 megagrams per year, as specified in § 60.757(c)(1) or (2).

\* \* \* \* \*

(iii) \* \* \*

(A) \* \* \*

(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 shall 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 § 60.754(d).

\* \* \* \* \*

(v) \* \* \*

(A) The landfill shall be a closed landfill as defined in § 60.751 of this subpart. A closure report shall be submitted to the Administrator as provided in § 60.757(d);

\* \* \* \* \*

(c) For purposes of obtaining an operating permit under title V of the Act, the owner or operator of a MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under part 70 or 71 of this chapter, unless the landfill is otherwise subject to either part 70 or 71. For purposes of submitting a timely application for an operating permit under part 70 or 71, the owner or operator of a MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic

meters, and not otherwise subject to either part 70 or 71, becomes subject to the requirements of §§ 70.5(a)(1)(i) or 71.5(a)(1)(i) of this chapter, regardless of when the design capacity report is actually submitted, no later than:

(1) June 10, 1996 for MSW landfills that commenced construction, modification, or reconstruction on or after May 30, 1991 but before March 12, 1996;

(2) Ninety days after the date of commenced construction, modification, or reconstruction for MSW landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

(d) When a MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain an operating permit under part 70 or 71 of this chapter for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met:

(1) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of this section; or

(2) The owner or operator meets the conditions for control system removal specified in paragraph (b)(2)(v) of this section.

8. Amend § 60.753 by revising the introductory text of § 60.753 and the second sentence of paragraph (d) and the first sentence of paragraph (g) to read as follows:

**§ 60.753 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 § 60.752(b)(2)(ii) of this subpart shall: \* \* \*

(d) \* \* \* To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. \* \* \*

\* \* \* \* \*

(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in § 60.755(a)(3) through (5) or § 60.755(c) of this subpart. \* \* \*

9. Amend § 60.754 as follows:

a. In the last sentences of paragraph (a)(1)(i) and (a)(1)(ii) remove the phrase "if the documentation provisions of § 60.758(d)(2) are followed" and add, in

its place, "if documentation of the nature and amount of such wastes is maintained";

b. In paragraph (a)(4)(ii) remove the last sentence and add in its place, "The calculation of the methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.";

c. In paragraphs (a)(5) and (b)(3) remove the phrase "as provided in § 60.752(b)(2)(i)(B)";

d. In paragraph (d), remove the words "Method 25" and add, in its place "Method 25C";

e. Revise the introductory text of paragraph (a)(1) and revise paragraph (c) to read as follows:

**§ 60.754 Test methods and procedures.**

(a)(1) The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in paragraph (a)(1)(i) of this section or the equation provided in paragraph (a)(1)(ii) of this section. Both equations may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i), for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii), for part of the life of the landfill. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for  $L_0$ , and 4,000 parts per million by volume as hexane for the  $C_{NMOC}$ . For landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.

(c) When calculating emissions for PSD purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in §§ 51.166 or 52.21 of this chapter using AP-42 or other approved measurement procedures.

10. Amend § 60.755 as follows:

a. In paragraphs (a)(3) and (a)(5), add a sentence at the end of each paragraph reading "An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.";

b. Revise paragraph (a)(4) to read as follows:

**§ 60.755 Compliance provisions.**

(a) \* \* \*

(4) Owners or operators are not required to expand the system as required in paragraph (a)(3) of this section during the first 180 days after gas collection system startup.

\* \* \* \* \*

c. In paragraph (b) introductory text, in the last sentence, remove the phrase "within 60 days of the date in which" and add in its place, "no later than 60 days after the date on which";

d. In paragraph (c)(1), delete the phrase "and along a serpentine pattern spaced 30 meters apart (or a site-specific established spacing)" and add in its place, "and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing)".

11. Amend § 60.756 as follows:

a. In paragraph (a) introductory text, remove the phrase "or other temperature measuring device" and add, in its place, "other temperature measuring device, or an access port for temperature measurements";

b. In paragraph (b)(1), remove the phrase "an accuracy of" and add in its place, "a minimum accuracy of";

c. In paragraph (b)(2), introductory text, remove the phrase "A gas flow rate measuring device that provides a measurement of gas flow" and add, in its place, "A device that records flow";

12. Amend § 60.757 by revising paragraphs (a)(1), (a)(2), (a)(3), (b)(1)(i) and (g) introductory text to read as follows:

**§ 60.757 Reporting requirements.**

\* \* \* \* \*

(a) \* \* \*

(1) The initial design capacity report shall fulfill the requirements of the notification of the date construction is commenced as required by § 60.7(a)(1) and shall be submitted no later than:

(i) June 10, 1996, for landfills that commenced construction, modification, or reconstruction on or after May 30, 1991 but before March 12, 1996 or

(ii) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

(2) The initial design capacity report shall contain the following information:

(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 shall be calculated using good engineering practices. The calculations shall be provided, along with the relevant parameters as part of the 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.

(3) An amended design capacity report shall 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 or above 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 § 60.758(f).

(b) \* \* \*

(1) \* \* \*

(i) The initial NMOC emission rate report may be combined with the initial design capacity report required in paragraph (a) of this section and shall be submitted no later than indicated in paragraphs (b)(1)(i)(A) and (B) of this section. Subsequent NMOC emission rate reports shall be submitted annually thereafter, except as provided for in paragraphs (b)(1)(ii) and (b)(3) of this section.

(A) June 10, 1996, for landfills that commenced construction, modification, or reconstruction on or after May 30, 1991, but before March 12, 1996, or

(B) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

\* \* \* \* \*

(g) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) shall include the following information with the initial performance test report required under § 60.8:

\* \* \* \* \*

13. Amend § 60.758 as follows:

a. Remove the introductory text;

b. At the beginning of paragraphs (a), (b) introductory text, (c) introductory text, (d) introductory text, and (e), add the phrase "Except as provided in § 60.752(b)(2)(i)(B).";

c. In paragraph (a), remove the phrase "on-site records of the maximum design capacity" and add, in its place "on-site records of the design capacity report which triggered § 60.752(b)";

d. Add paragraph (f) to read as follows:

**§ 60.758 Recordkeeping Requirements.**

\* \* \* \* \*

(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", shall 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.

14. Amend § 60.759 as follows:

a. In paragraph (a)(3)(iii), remove the sentence "The values for k, L<sub>O</sub>, and C<sub>NMOC</sub> determined in field testing shall be used, if field testing has been performed in determining the NMOC emission rate or the radii of influence." and add, in its place, the sentence "The values for k and C<sub>NMOC</sub> determined in field testing shall 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)."

b. In paragraph (a)(3)(iii), remove the sentence "If field testing has not been performed, the default values for k, L<sub>O</sub>, and C<sub>NMOC</sub> provided in § 60.754(a)(1) shall be used" and add, in its place, the sentence "If field testing has not been performed, the default values for k, L<sub>O</sub> and C<sub>NMOC</sub> provided in § 60.754(a)(1) or the alternative values from § 60.754(a)(5) shall be used."

[FR Doc. 98-15007 Filed 6-15-98; 8:45 am]

BILLING CODE 6560-50-P

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Parts 180, 185 and 186**

**[OPP-300663; FRL-5793-5]**

**RIN 2070-AB78**

**Quizalofop-p ethyl ester; Pesticide Tolerance**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** This regulation establishes tolerances for combined residues of quizalofop-p ethyl ester [ethyl (R)-(2-[4-((6-chloroquinoxalin-2-yl)oxy)phenoxy]propanoate), and its acid metabolite quizalofop-p [(R)-(2-[4-((6-chloroquinoxalin-2-yl)oxy)phenoxy]propionate) and the S enantiomers of the ester and the acid, all expressed as quizalofop-p ethyl ester in or on canola seed, canola meal, peppermint tops and spearmint tops. DuPont Agricultural Products requested the tolerances for canola and the Interregional Research Project Number 4 (IR-4) requested the tolerances for peppermint and spearmint. These tolerances were requested under the Federal Food, Drug, and Cosmetic Act, as amended by the Food Quality Protection Act of 1996 (Pub. L. 104-170).

**DATES:** This regulation is effective June 16, 1998. Objections and requests for hearings must be received by EPA on or before August 17, 1998.

**ADDRESSES:** Written objections and hearing requests, identified by the docket control number, [OPP-300663], must be submitted to: Hearing Clerk (1900), Environmental Protection Agency, Rm. M3708, 401 M St., SW., Washington, DC 20460. Fees accompanying objections and hearing requests shall be labeled "Tolerance Petition Fees" and forwarded to: EPA Headquarters Accounting Operations Branch, OPP (Tolerance Fees), P.O. Box 360277M, Pittsburgh, PA 15251. A copy of any objections and hearing requests filed with the Hearing Clerk identified by the docket control number, [OPP-300663], must also be submitted to: Public Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. In person, bring a copy of objections and hearing requests to Rm. 119, CM #2, 1921 Jefferson Davis Hwy., Arlington, VA.

A copy of objections and hearing requests filed with the Hearing Clerk may also be submitted electronically by sending electronic mail (e-mail) to: opp-docket@epamail.epa.gov. Copies of objections and hearing requests must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Copies of objections and hearing requests will also be accepted on disks in WordPerfect 5.1/6.1 file format or ASCII file format. All copies of objections and hearing requests in electronic form must be identified by the docket control number [OPP-300663]. No Confidential Business

Information (CBI) should be submitted through e-mail. Electronic copies of objections and hearing requests on this rule may be filed online at many Federal Depository Libraries.

**FOR FURTHER INFORMATION CONTACT:** By mail: Sidney Jackson, Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. Office location, telephone number, and e-mail address: Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA, (703) 305-7610; e-mail: jackson.sidney@epamail.epa.gov.

**SUPPLEMENTARY INFORMATION:** In the Federal Register published on October 29, 1997 (62 FR 56176 (mint)) (FRL-5749-7) and December 17, 1997, 62 FR 66080 (canola)) (FRL-5758-3), EPA, issued notices pursuant to section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. 346a(e) announcing the filing of pesticide petitions (PP) 6E4652 and 5F4545 for tolerances by the IR-4 and DuPont Agricultural Products, Wilmington, Delaware. These notices included a summary of the petitions prepared by DuPont Agricultural Products, Wilmington, Delaware, the registrant. There were no comments received in response to these notices of filing.

The petitions requested that 40 CFR 180.441 be amended by establishing tolerances for combined residues of the herbicide quizalofop-p ethyl ester [ethyl (R)-(2-[4-((6-chloroquinoxalin-2-yl)oxy)phenoxy]propanoate), and its acid metabolite quizalofop-p [(R)-(2-[4-((6-chloroquinoxalin-2-yl)oxy)phenoxy]propionate) and the S enantiomers of the ester and the acid, all expressed as quizalofop-p ethyl ester, in or on canola seed at 1.0 part per million (ppm), canola meal at 1.5 ppm, and peppermint tops and spearmint tops at 2.0 ppm. .

**I. Risk Assessment and Statutory Findings**

New section 408(b)(2)(A)(i) of the FFDCA allows EPA to establish a tolerance (the legal limit for a pesticide chemical residue in or on a food) only if EPA determines that the tolerance is "safe." Section 408(b)(2)(A)(ii) defines "safe" to mean that "there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information." This includes exposure through drinking water and in residential settings, but does not include occupational exposure. Section 408(b)(2)(C) requires EPA to give special consideration to exposure of infants and

## **Appendix J**

### **Key Elements of an Acceptable Section 111(d) State Plan**

## **Key Elements of an Acceptable Section 111(d) State Plan**

States must submit to the Environmental Protection Agency (EPA) State Plans to implement and enforce the Emission Guidelines promulgated for Municipal Solid Waste (MSW) landfills pursuant to Section 111(d) of the Act. Section 111(d) requires that the state submit the State Plan not later than 9 months after EPA promulgates the Emission Guidelines. EPA promulgated the Emission Guidelines (40 CFR Part 60, Subpart Cc) on March 12, 1996, thus, the State Plans are due no later than December 12, 1996.

States must adopt their State Plans according to state procedures prior to official submittal to EPA. [60.23 (a)] The official procedures for adopting and submitting State Plans are codified in 40 CFR Part 60, Subpart B. EPA promulgated the original provisions on November 17, 1975, and then amended them on December 19, 1995, to incorporate changes specific to solid waste incineration. These changes, which were necessary to conform with the solid waste incineration requirements under Section 129 of the Act, are not relevant to MSW landfills. Thus, the procedures described in the original provisions for adopting and submitting State Plans still apply to MSW landfills and are reflected in the key elements given below.

The following pages include information about legal authority, emission inventories, emission standards and other emission limitations, process for review of design plans, compliance schedules, public participation, source surveillance, compliance assurance, enforcement, as required by 40 CFR Part 60, Subparts B and Cc. In addition, cross-references to relevant sections of the subparts are provided.

### **A. Legal Authority [60.26(a)]**

1. The State Plan shall include demonstration of the state's legal authority to:
  - (a) adopt emission standards (enforceable conditions) and compliance schedules applicable to the designated facilities and designated pollutants for which the State Plan is submitted
  - (b) enforce applicable laws, regulations, standards, and compliance schedules, and seek injunctive relief
  - (c) obtain information necessary to determine compliance
  - (d) require recordkeeping, make inspections, and conduct tests
  - (e) require the use of monitors and require emission reports of owners or operators
  - (f) make emission data publicly available [60.26(a)]

2. The state must specifically identify the provisions above and include copies of the provisions of the law establishing such legal authority unless they have been approved as a portion of a previous Section 111(d) State Plan or SIP. To facilitate its review of State Plans, EPA encourages states to submit an opinion by the state's Attorney General as part of the demonstration required above. States may use previously submitted Attorney General opinions (for example, under Title V) to the extent those documents specifically address the requirements of Section 60.26 as they apply to the designated facilities and the designated pollutants. [60.26(b)]
3. The legal authority shown must be in effect at time of State Plan submission. [60.26(c)]
4. The state may authorize another state governmental agency to carry out a portion of the State Plan, provided the state demonstrates that the state governmental agency has adequate authority. [60.26(e)]
5. The state may authorize a local agency to carry out a portion of the State Plan provided that the state demonstrates that the local agency has adequate legal authority to implement that portion of the State Plan and the state is not relieved of responsibility. [60.26(e)]

If earlier demonstrations of legal authority by the state meet the requirements of § 60.26, the state will simply need to include copies of such demonstrations in the State Plan.

#### **B. Source and Emission Inventories**

The State Plan must include a complete source inventory of existing MSW landfills in the state that are regulated by the Emission Guidelines. [60.25(a)] The inventory must include the name and location of all existing landfills, whether open or closed, that have accepted waste since November 8, 1987 or have additional capacity for future waste acceptance. Landfills with design capacities both above and below the 2.5 million Mg/yr or 2.5 million M<sup>3</sup>/yr design capacity cutoffs must be included. New landfills (i.e., those that commenced construction, modification, or reconstruction on or after May 30, 1991) do not have to be included in the inventory.

For each landfill in the source inventory, the State Plan must include emission data for the designated pollutants (MSW landfill emissions, measured as NMOC). [60.25(a)] Emission data must be included where available, but emission estimates can be used if emission data is not available. States can use emission estimation procedures from AP-42, "Compilation of Air Pollutant Emission Factors" to estimate landfill NMOC emission rates for the state inventory. (AP-42 procedures should not be used to determine applicability of, or compliance with, the Emission Guidelines.)

In addition to the initial inventory, updates are required. [60.25(f)(5)] The updated information is required to be submitted annually in the 51.321 reports. [60.24(e)(1)] The emission data should be submitted to the Aerometric Information Retrieval System (AIRS) [51.321-51.323]

**C. Emission Standards**

1. The emission standards shall be no less stringent than the Emission Guidelines. [60.24(c)]  
However, under certain limited conditions and on a case-by-case basis, states may apply less stringent emission standards or longer compliance schedules. This reduced stringency is allowed if the state demonstrates with respect to the designated facility or class of facilities that:
  - a. the cost of control would be unreasonable because of plant age, location, or basic process design;
  - b. it would be physically impossible to install necessary control equipment; or
  - c. there are other factors specific to the facility or class of facilities that make application of a less stringent standard or final compliance time significantly more reasonable. [60.24f]

NOTE: Nothing in the Clean Air Act nor the CFR restricts the state from having standards and schedules more stringent than the Emission Guidelines. [60.24(g)]

2. The State Plan shall include the specific emission limitations, preferably cross-referenced to the specific Emission Guideline requirements. [60.24(a)]
3. Test methods and procedures for determining compliance shall be specified. [60.24(b)2]
4. If the methods and procedures are not identical to those in Sections 60.34c, 60.755, and 60.756, the state must demonstrate equivalence or request EPA approval of acceptable alternatives per current EPA method review procedures. [60.24(b)(2)]
5. If emission standards are adopted by local agencies or other state agencies, they must also be included in the State Plan and if not identical to the Emission Guidelines, then the state must show that they are at least as protective as the emission guidelines except as specified in "1," above. [60.24(a)]

**D. Process for Review of Design Plans**

Subpart Cc requires site-specific design plans for the required gas collection and control systems. The State Plan must also include a process for state review and approval of design

plans. These landfill State Plan requirements are unique to landfills because they are required by Subpart Cc, rather than Subpart B.

The design plan must be prepared by a professional engineer, must meet the design criteria in Section 60.752(b)(2)(ii) of Subpart WWW, and must be submitted to the state for approval. For further information about the design criteria and for examples of alternative designs, refer to "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills" (EPA-453/R-96-004).

1. For approval, a State Plan shall include the installation of a collection and control system meeting the conditions provided in Section 60.752(b)(2)(ii) of Subpart Cc at each MSW landfill meeting the conditions of Section 60.33c(a). [60.33c(b)]
2. The State Plan shall include a process for state review and approval of the site-specific design plans for the gas collection and control system(s). [60.33c(b)] The description of the process in the State Plan could include information on review responsibilities, schedules, and notification procedures such as communication of reasons for disapproval.

#### **E. Compliance Schedules**

1. Compliance schedules must match the Cc and B specifications except as specified above in "1" under Emission Standards. [Subpart Cc,60.36c]
2. For compliance schedules for MSW landfills extending more than 12 months beyond the date required for submittal of the plan (December 12, 1996), the compliance schedule must include legally enforceable increments of progress towards compliance for that MSW landfill. Each increment of progress in Section 60.21(h) of Subpart B must have a compliance date and must be included as an enforceable date in the State Plan. The State Plan may include such additional increments of progress as may be necessary to permit close and effective supervision of progress towards final compliance. [60.24(e)(1), & 60.21(h)]

The minimum increments of progress are as follows:

- (a) Submittal of Final Control Plan (Design Plan); [60.21(h)(1)] For landfills, the design must include the information specified in § 60.752(b)(2) of Subpart WWW.
- (b) Awarding of contracts for controls systems or process modifications or orders for purchase of components; [60.21(h)(2)]

- (c) Initiation of on-site construction or installation of the air pollution control device(s) or process changes; [60.21(h)(3)]
- (d) Completion of on-site construction or installation of control equipment or process changes; [60.21(h)(4)]
- (e) Final compliance. [60.21(h)(5)]

These increments of progress can be set as calendar dates or floating dates tied to the effective date of EPA's approval of the State plan for MSW landfills or the date of the first Annual Emission Rate Report that shows that NMOC emissions equal to or exceeding 50 Mg/yr. For example, the date for submitting a final control plan (design plan) could be set as 1 year after the date of the first Annual Emission Rate Report showing that the NMOC emission rate is 50 Mg/yr or greater. This timing is consistent with Subparts Cc and WWW.

3. The State Plan may include one set of increments with compliance dates applicable to all MSW landfills, or the State Plan may vary the compliance dates to address specific issues relevant to individual landfills. However, the enforceable increments of progress must be arranged chronologically and the compliance dates must be set to ensure full compliance with the applicable requirements *as expeditiously as practicable*. [60.24(c)] For example, a State Plan that requires an MSW landfill to "submit a final control plan (design plan) no later than 24 months after the effective date of a State emission standard" will be closely examined to determine whether the state is requiring the MSW landfill to comply as expeditiously as practicable.

#### **F. Public Participation**

Public participation, under the Clean Air Act, is an important right and responsibility of citizens in the state process of developing, adopting, and implementing the required Section 111(d) State Plans. Under 40 CFR Part 60, Subpart B, the minimum requirements for the state to conduct public hearings on the adoption of State Plans and any revisions thereof are as follows:

1. Reasonable notice of one or more public hearing(s) at least 30 days prior to the hearing(s). [60.23(d)]
2. One or more public hearing(s) on the State Plan (or revisions) conducted in location(s) within the state. [60.23(c)(1)]
3. Date, time and place of hearing(s) prominently advertised in each region affected. [60.23(d)(1)] "Region" is defined as "air quality control region". [60.21(i)]
4. Availability of draft State Plan for public inspection in at least one location in each region to which it will apply. [60.23(d)(2)]

5. Notice of hearing provided to: (a) EPA Regional Administrator, (b) local affected agencies, and (c) other states affected. [60.23(d)(3),(4), &(5)]
6. Retention of hearing records (for example, list of commenters and their affiliation and summary of each presentation and comments submitted and the state's responses to those comments) for at least 2 years. [60.23(e) and (f)]
7. Certification that public participation was conducted in accordance with Subpart B and state procedures. [60.23(f)] Upon written application by the state agency, EPA may (expected only for limited special cases) approve different procedures provided that they ensure adequate public participation. [60.23(g)]

No hearing is required on a state or local emission standard in effect prior to March 12, 1996, the effective date of Subpart Cc, if it was adopted after a public hearing and is at least as stringent as the Emission Guidelines. [60.23(c)(3)]

Similarly, no public hearing is required for any change to an increment of progress unless the change is likely to cause the facility to be unable to comply with the final compliance date. [60.23(c)(2)]

#### **G. Source Surveillance, Compliance Assurance & Enforcement**

The State Plan must provide for monitoring the status of compliance. As a minimum, the State Plan shall include:

1. Provisions for legally enforceable procedures to:
  - (a) require recordkeeping on nature and amount of emissions and reports to the state. [60.25(b)(1)]
  - (b) require any additional information to judge compliance. [60.25(b)(1)]
2. Provisions for periodic inspection and testing, if necessary. [60.25(b)(2)]
3. Provisions for emission data and other compliance monitoring information to be correlated with applicable emission standards and be made available to the public. "Correlated" means showing the relationship between the measured or estimated amounts of emissions and the amounts of such emissions allowable. For example, the emissions should be in the same units and averaging times. This would include the annual emission rate reports, in Mg/yr, that must be submitted by uncontrolled landfills. The reported annual emission rate would be compared to

the 50 Mg/yr threshold to determine whether controls must be installed.<sup>1</sup>  
[60.25(a) and (c)]

4. MSW landfill requirements for Testing, Monitoring, Recordkeeping, and Reporting that are identical to those specified in 60.34c, 60.35c [Subpart Cc], and 60.755, 60.756, 60.757, 60.758. [Subpart WWW, referred to by Subpart Cc]
5. Specific identification of the provisions in 1 through 4 above. Copies of such provisions should be included unless they have been approved as portions of a preceding Section 111(d) State Plan or State Implementation Plan (SIP) and the state demonstrates that the provisions are applicable and the requirements of 60.26 (legal authorities) are met. [60.25(d)]
6. Commitment to submit reports on progress in plan enforcement to the EPA Regional Administrator on an annual basis and include it in the reports required by 51.321. [60.25(e) and (f)] Each progress report shall include: enforcement actions, achievement of increments of progress, identification of sources that have ceased operation, emission inventory information for sources that were not in operation at the time of plan development, updated emission inventory and compliance information, and copies of technical reports on all performance testing, including concurrent process data. [60.25(f)(1) through 60.25(f)(6)]

Note: Some states and regions have developed more specific or tailored reporting and recordkeeping procedures via Memoranda of Agreements, Program Specific Guidance for Section 105 Grants, and the Timely and Appropriateness Guidance that should also be followed. For example, some regions prefer that the state retain the performance test report until the region needs to review it as part of a compliance determination or other action.

---

<sup>1</sup>For landfills that require control, the emission standards are expressed in terms of design criteria and operational requirements for the gas collection system and a percent reduction for the control device, instead of emission rate limits. Therefore, the Subpart B requirement to "correlate" the annual emission inventory information (in Mg/yr, discussed in Section 3.4) with the MSW landfill emission standards is not helpful for controlled MSW landfills. Thus, the more appropriate correlation is to the NMOC threshold in Mg/yr. The performance testing, monitoring, and recordkeeping procedures in the Emission Guidelines are appropriate for determining compliance with the percent reduction limit and collection system requirements.

## **Appendix K**

### **Memo: Emission Inventory for MSWLF State Plans**

January 27, 1997

MEMORANDUM

SUBJECT: Emission Inventories for Existing Municipal Solid Waste (MSW) Landfills with Design Capacities below 2.5 million Mg or 2.5 million m<sup>3</sup>

FROM: Bruce C. Jordan, Director  
Emission Standards Division (MD-13)

Robert G. Kellam, Acting Director  
Information Transfer and Program Integration Division (MD-12)

TO: Regional Air Directors, Regions I-X

Introduction

The States are required to prepare and submit State plans for existing MSW landfills [landfills that have accepted waste since November 8, 1987 or have the capacity to accept future waste and are not new; i.e., not subject to 40 CFR Part 60, Subpart WWW, new source performance standards (NSPS)]. This State plan is required under 40 CFR 60, Subparts B and Cc [Emission Guidelines (EG's)]. The plan will state the requirements that existing MSW landfills will need to comply with to meet the EG's. Also, as part of the State plan, 40 CFR 60.25 requires the States to include "an inventory of all designated facilities, including emissions data for the designated pollutants." Id.

In addition to the requirement for State plans, owners and operators of MSW landfills with design capacities of less than 2.5 million Mg or 2.5 million m<sup>3</sup> are required to submit a design capacity report under the EG's and NSPS [40 CFR 60.752 (a), 60.757. See also, 40 CFR 60.35(c)]. However, unlike owners and operators of larger MSW landfills who must also submit a nonmethane organic compound (NMOC) emissions rate report and possibly install gas collection and controls, no additional requirements apply to landfills with design capacities of less than 2.5 million Mg or 2.5 million m<sup>3</sup>. As noted in the preamble to the

final rule, "small landfills below 2.5 million Mg design capacity are not subject to (emission) standards under section 111 because they are not subject to controls and are not subject to emission limits," 61 FR 9905, 9912 (March 12, 1996).

### Summary

In view of the limited requirements of the EG and NSPS on landfill owners and operators of MSW landfills below 2.5 million Mg or 2.5 million m<sup>3</sup>, the Environmental Protection Agency (EPA) will allow States, in limited circumstances, to submit emission inventories as part of State plans without requiring that, in all cases, that States develop emissions data for MSW landfills below 2.5 million Mg or 2.5 million m<sup>3</sup> where development of such data would be unreasonable and impractical. However, where accurate data are already available, or can reasonably be generated without undue expense or effort, States should require and include such data in their State plans. Example situations of "reasonable and practical" are given below in the section, Requirements of State Plans: Emissions Data. This easing of the NMOC emission inventory requirement, however, does not relieve States of the obligation to provide, as part of their State plan, an inventory of all existing MSW landfills within the State.

The EPA believes that allowing States to provide emissions data for such MSW landfills with design capacities below 2.5 million Mg or 2.5 million m<sup>3</sup> only where accurate and reasonably available information can be generated, is reasonable given that the applicable NSPS and the EG simply require a design capacity report and do not require additional emissions monitoring or controls. The EPA also believes that requiring such information in all cases will either lead to the submission of inaccurate, misleading and provisional information or to additional and costly testing inconsistent with EPA's previous determination to only require design capacity reports for such landfills. [See e.g., 61 FR 9905, 9916 (March 12, 1996), which states that "The design capacity cutoff of 2.5 million Mg or 2.5 million cubic meters was chosen . . . to relieve as many small businesses and municipalities as possible from the regulatory requirements while still maintaining significant emission reduction."

This guidance memo does not, however, preclude States from including emissions information from these existing MSW landfills in their State plans and in their annual reporting of emissions to EPA if they choose to do so. As noted previously, it also does not relieve States from the requirement to provide an inventory of existing landfills in State plans.

The EPA reserves the right to request emissions information under section 114(a) of the Clean Air Act, if it determines that such information can be obtained reasonably and practically.

### Requirements of State Plans: Emissions Data

In summary of the previous discussion, States need not include NMOC emissions from MSW landfills with a design capacity below 2.5 million Mg or 2.5 million m<sup>3</sup> from the State plan emission inventory where the estimation of these emissions is unreasonable and impractical. This section addresses specific situations of "unreasonable and impractical" and "reasonable and practical."

It may be unreasonable and impractical for an MSW landfill below 2.5 million Mg or 2.5 million m<sup>3</sup> to estimate NMOC emissions when a landfill is closed and there are no records of waste in place. However, States should require emissions data when it is reasonable and practical to obtain the information needed to calculate NMOC emissions, for example, when the amount of waste deposited and age of the waste can be reasonably obtained. If waste has been recently deposited such that this information would be reasonably expected to be available, then these NMOC emissions should be included in the emission inventory. Also, if a landfill has a design capacity below but close to 2.5 million Mg or 2.5 million m<sup>3</sup>, greater consideration should be given before a decision is made to not require NMOC emissions in the emission inventory because the public may have more interest in the environmental impact of the emissions from such a landfill.

In the situation where an MSW landfill is subject to title V operating permits because it is a major source or because of another reason [e.g., subject to another NSPS or national emission standard for hazardous air pollutants (NESHAP)], this landfill should comply with the emission inventory requirement even if the landfill is below 2.5 million Mg or 2.5 million m<sup>3</sup> in design capacity. The reason is that emissions from title V permitted landfills must be reported under title V and thus, it would be reasonable to include these emissions estimates in the emission inventory for the State plan.

In addition to the requirement to report NMOC emissions in the State plan, 40 CFR 60.25 also requires the annual reporting of emissions by States to EPA for existing landfills whose emissions have changed more than 5 percent from the most recently submitted emissions data. For States with landfills with design capacities below 2.5 million Mg or 2.5 million m<sup>3</sup> for which emissions data were not initially reported, this emissions reporting requirement would not necessarily be reasonable or practical and, thus, States are not required to meet this reporting requirement for such landfills. However, where a State previously did not require emissions data for a landfill close to or at the 2.5 million Mg or 2.5 million m<sup>3</sup> cutoff, and there is reason to believe emissions may have increased by greater than 5 percent, a State may want to reconsider whether emissions data should be required.

The allowance for exclusion of NMOC emissions from certain landfills below 2.5 million Mg or 2.5 million m<sup>3</sup> from the emission inventory does not affect the requirement for States to submit an inventory of existing MSW landfills with the State plans. The 40 CFR

60.25 requires such an inventory of landfills in the State plan and this memo does not modify this requirement. It is reasonable to expect States to know what landfills are in their geographic area and to provide this information in their State plans.

If you have any questions on this guidance, please feel free to contact Mary Ann Warner at (919) 541-1192.

cc: Patricia Bowlin, R-IX  
Valerie Broadwell, OAQPS (MD-12)  
Ward Burns, R-VII  
Jeanne Cosgrove, R-I  
Mick Cote, R-VI  
Renaldo Crooks, Air Resources Board, Sacramento, CA  
Eric Crump, OAQPS (MD-15)  
John Dale, R-VIII  
Scott Davis, R-IV  
Christine DeRosa, R-II  
Gus Eghneim, Natural Resources Conserv. Comm., Austin, TX  
Allen Geswein, OSW (2306W)  
Michael Goo, OGC (2344)  
Charles Hatten, R-V  
K.C. Hustvedt, OAQPS (MD-13)  
Tom Kerr, OAP (6202J)  
Zofia Kosim, OECA (2242A)  
Scott Koschwitz, Bureau of Air Mgmt., Hartford, CT  
Margaret McCourtney, Min. Pollution Control Agency, St. Paul, MN  
John Seitz, OAQPS (MD-10)  
Racqueline Shelton, OAQPS (MD-12)  
Martha Smith, OAQPS (MD-13)  
James Topsale, R-III  
Mary Ann Warner, OAQPS (MD-12)  
Lydia Wegman, OAQPS (MD-10)  
Catherine Woo, R-X

OAQPS:ITPID:MWArner:JClevenger:1-1192:MD-12:1/17/97  
C:JULIE\WARNER\INDF-EI

### TECHNICAL REPORT DATA

<b>TECHNICAL REPORT DATA</b>		
1 REPORT NO <b>EPA 456/R/98-009</b>	2	3 RECIPIENT'S ACCESSION NO
4 TITLE AND SUBTITLE  <b>Municipal Solid Waste Landfills, Volume 2: Summary of the Requirements for Section 111(d) State Plans for Implementing the Municipal Solid Waste Landfills Emission Guidelines</b>		5 REPORT DATE <b>November 1998</b>  6 PERFORMING ORGANIZATION CODE
7 AUTHOR(S) <b>Mary Ann Warner, EPA/OAQPS/ITPID/PIRG Joe Fanjoy, Eastern Research Group</b>		8 PERFORMING ORGANIZATION REPORT NO
9 PERFORMING ORGANIZATION NAME AND ADDRESS		10 PROGRAM ELEMENT NO
12 SPONSORING AGENCY NAME AND ADDRESS  <b>Office of Air Quality Planning and Standards</b>		11 CONTRACT/GRANT NO  13 TYPE OF REPORT AND PERIOD COVERED  <b>Final</b>
15 SUPPLEMENTARY NOTES  <b>Project Officer is Mary Wilkins, Mail Drop 12 (919-541-5229) Work Assignment Manager is Mary Ann Warner, Mail Drop 12 (919-541-1192)</b>		
16 ABSTRACT  <b>This document summarizes the requirements for section 111(d) State plans for municipal solid waste (MSW) landfills. The March 12, 1996 Emission guidelines required States to submit State plans that explain how they will implement and enforce the guidelines for existing MSW landfills. This document explains the required content of State plans, outlines the time line and responsibilities for developing and submitting State plans, and answers general questions about how to prepare State plans.</b>		
17 KEY WORDS AND DOCUMENT ANALYSIS		
a DESCRIPTORS	b IDENTIFIERS/OPEN ENDED TERMS	c
<b>Air pollution Municipal solid waste landfill Emission guidelines Section 111(d) Clean Air Act</b>	<b>Nonmethane organic compounds Methane State plan Implementation guidance Existing municipal solid waste landfills</b>	
18 DISTRIBUTION STATEMENT  <b><a href="http://www.epa.gov/ttn/uatw/landfill/landflpg.html">http://www.epa.gov/ttn/uatw/landfill/landflpg.html</a></b>	19 SECURITY CLASS ( <i>Report</i> ) <b>Unclassified</b>	21 NO OF PAGES 272
	20 SECURITY CLASS ( <i>Page</i> ) <b>Unclassified</b>	22 PRICE

LASTPAGE