United States Environmental Protection Agency
Office of Air Quality Planning and Standards Research Triangle Park, 27711
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Air

Guidelines for MACT Determinations under Section 112(j) Requirements

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ABSTRACT

Section 112(j) of the Clean Air Act as amended in 1990 requires owners or operators of major sources to apply for a Title V permit should the Environmental Protection Agency fail to promulgate emission standards for an applicable source category within 18 months after the date specified in the regulatory schedule established through Section 112(e) of the Act. The Title V permit that is issued must require the owner or operator to meet a maximum achievable control technology (MACT) emission limitation for all hazardous air pollutant (HAP) emissions within the source category. Regulations to implement Section 112(j) are codified in 40 CFR Part 63, Subpart B. This document provides guidance for complying with these regulations by identifying and evaluating control technology options to determine the MACT emission limitation. In this document, the term "control technology" is defined broadly to be consistent with section 112(d)(2) of the Clean Air Act to include measures, processes, methods, systems or techniques which reduce the volume of, or eliminate emissions of, HAP through process changes, substitution of materials or other modifications; enclose systems or processes to eliminate emissions; collect, capture or treat HAP when released from a process, stack, storage or fugitive emissions

point; are design, equipment, work practice, or operational standards; or a combination of the above.

Table of Contents

LIST OF FIGURES

Introduction

The purpose of this manual is to provide State and local agencies with guidance for establishing the case-by-case maximum achievable control technology (MACT) determinations required by Section 112(j) of the Clean Air Act in the event that EPA should miss the deadline for promulgating a Section 112(d) standard by more than 18 months. As with any guidance, this document does not impose legally binding requirements for either the permitting authority or an owner or operator. For a complete understanding of the regulatory requirements, readers should refer to the General Provisions for National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR Part 63, Subpart A) and sections 63.50 through 63.56 implementing the Section 112(j) requirements (40 CFR Part 63, Subpart B).

This manual is divided into seven chapters and four appendices. Chapter 1 of this manual provides an overview of the statutory and regulatory requirements and discusses the procedures for applying for a Notice of MACT Approval. Chapter 2 outlines the criteria a permitting authority should use when evaluating applications as well as possible approaches permitting authorities may use for determining the appropriate level of control for each source. Chapter 3 describes a process for selecting control technology that meets the criteria discussed in

Chapter 2. Chapter 4 provides a detailed discussion on determining the minimum level of control that can be MACT for the source (the MACT floor). Chapter 5 briefly discusses some calculation procedures for the equivalent (MACT) emission limitation. Chapter 6 describes the analysis that may be required to assess the costs of achieving the emission reduction, and any non-air quality health and environmental impacts and energy requirements associated with use of different control options. Chapter 7 discusses sources that may assist in the collection of available information.

Appendix A illustrates examples for defining a MACT-affected emission unit, and selecting a control technology to meet MACT. Appendix B contains the June 6, 1994 Federal Register clarifying EPA's use of the word "average" to determine how an average emission limitation should be computed for existing sources. Appendix C provides a suggested format for the Notice of MACT Approval, which the permitting authority may issue consistent with the requirements in 40 CFR 63.54 of Subpart B. Finally, Appendix D contains the Federal Register notice on the final amendments to Regulations Governing Equivalent Emission Limitations by Permit.

While the examples and methodologies in this guidance attempt to illustrate ways the EPA may determine the emission limitation for the purposes of a national Section 112(d) emission

standard, they may not represent the only methodology or they may not be the best methodology for establishing a MACT emission limitation. The methods used to establish an emission standard or case-by-case MACT emission limitation will be highly dependent upon the amount and type of information available, the complexity of the source, and the number of feasible control options. In some instances, a permitting authority's control technology determination procedures may yield the appropriate level of control without specifically following this guidance or making a MACT floor finding. The EPA is less concerned with the actual methodologies used, and more concerned that the outcome requires sources to comply with an emission limitation based on MACT.

Also, throughout this manual, the reader will find that the roles and responsibilities in the case-by-case MACT determination have been delineated between the permitting authority and the permit applicant. This delineation of roles and responsibilities is intended to indicate a lead role, but is not intended to establish any sole responsibilities. Permitting authorities and applicants should recognize that establishing the appropriate level of control is an iterative process that will require on-going communication and exchange of information between the permitting authority and the applicant.

In summary, the EPA encourages State and local agencies to cooperatively use this guidance, methods used by the EPA in

developing Section 112(d) MACT standards, and various State control technology determination procedures to establish timely, accurate, and consistent MACT emission limitations.

Chapter 1.0

An Overview of the MACT Determination Process for Section 112(j)

1.1 Overview of Statutory Requirements

Beginning after the effective date of an approved permit program, Section 112(j) of the Clean Air Act as amended in 1990 (the Act) requires an owner or operator of a major source to submit either a new Title V permit application or revise an existing permit if such major source incorporates a source category for which the promulgation deadline for a relevant Section 112(d) or 112(h) standard has been missed by 18 months. The promulgation deadline for each source category was established through the regulatory schedule in accordance with Section 112(e) of the Act. A final regulatory schedule was published on December 3, 1993 in the Federal Register (58 FR 63941). To obtain the most current list of categories of sources to be regulated under Section 112 of the Act, or to obtain the most recent regulation promulgation schedule established pursuant to Section 112(e) of the Act, contact the Office of the Director, Emission Standards Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency (C504-03), Research Triangle Park, North Carolina 27711.

Section 112(j) also requires States or local agencies with approved permit programs to issue permits or revise existing

permits for all of these major sources. These permits must contain either an equivalent emission limitation or an alternate emission limitation for the control of hazardous air pollutants (HAP) from the equipment within the source category. An equivalent emission limitation, also referred to as a MACT emission limitation, will be determined on a case-by-case basis by the permitting authority for each source category that becomes subject to the provisions of Section 112(j). The MACT emission limitation will be "equivalent" to the emission limitation that the source category would have been subject to if a relevant standard had been promulgated under Section 112(d) (or Section 112(h)).

In accordance with Section 112(d), the MACT emission limitation will require a maximum degree of reduction of HAP emissions, taking into consideration the costs of achieving such emission reductions and any non-air quality health and environmental impacts and energy requirements. For new sources, the MACT emission limitation will be no less stringent than the emission control that is achieved in practice by the best controlled similar source. For existing sources the MACT emission limitation will be no less stringent than:

1. The average emission limitation achieved by the best performing 12 percent of the existing sources (for which the Administrator has emissions information), excluding those sources that have, within 18 months before the emission standard is proposed or within 30 months before such standard is promulgated, whichever is later, first achieved

a level of emission rate or emission reduction which complies, or would comply if the source is not subject to such standard, with the lowest achievable emission rate (as defined by Section 171 (of the Act)) applicable to the source category and prevailing at the time, in the category or subcategory for categories and subcategories with 30 or more sources; or,

2. The average emission limitation achieved by the best performing 5 sources (for which the Administrator has or could reasonably obtain emissions information) in the category or subcategory for categories or subcategories with fewer than 30 sources. (Sections 112(d)(3)(A) and (B) of the Act.)

These minimum requirements for the MACT emission limitation for new and existing sources are termed the "maximum achievable control technology (MACT) floor".

An alternate emission limitation is a voluntary emission limitation that an owner or operator of a major source has agreed to achieve through the early reductions program (see 57 FR 61970; December 29, 1992). (This regulation is codified in Subpart D, 40 CFR 63.70.) The alternate emission limitation can be written into the permit in lieu of an equivalent emission limitation only if the source has achieved the required reduction in HAP emissions before the missed promulgation deadline for the relevant Section 112(d) (or 112(h)) standard.

Section 112(j) also requires the EPA to establish requirements for owners or operators and reviewing agencies to carry out the intent of Section 112(j). These regulatory requirements are contained in Chapter 40, Part 63, Subpart B of the Code of Federal Regulations.

1.2 Overview of the Section 112(j) Regulatory Requirements

The owner or operator of a major source is required to apply for a Title V permit or permit revision, when the statutory deadline for a relevant Section 112(d) emission standard is missed by 18 months. The content of applications, details of the application approval process, timing of submittals, reviews, and permit issuance are in sections 63.52 and 63.53 of the Section 112(j) rule.

The application for a case-by-case MACT determination is a two-part process. Part 1 of the application requests very basic information about the affected source; the substantive information required by the permitting authority to make its MACT determination is tied to submittal of the Part 2 application. The application content for a MACT determination is contained in section 63.53. Information available as of the date on which the first Part 2 MACT application is filed for a source in the relevant source category or subcategory in the State or jurisdiction will be considered by the permitting authority in making its case-by-case MACT determination. The definition of "available information" in section 63.51 specifies the type of information and sources of information available to the affected source owner or operator for use in completing the application or to the permitting authority in determining the terms and conditions of case-by-case MACT.

The cutoff date for what information may be considered by the permitting authority is in the context of the development of control technologies that could be considered in the MACT floor determination. The definition does not preclude the permitting authority from considering information that was brought to its attention after the cutoff date through public comment or other means, so long as the information (e.g., control technology) had been developed prior to the cutoff date.

The following is a synopsis of the approval process under several scenarios for existing sources, affected sources, and new affected sources as described in section 63.52 of the rule. This synopsis includes situations where an affected source is subject to Section 112(g) requirements and later becomes subject to Section 112(j) and area sources become major affected sources subject to Section 112(j). This synopsis is provided for information purposes only. To the extent the reader identifies any potential conflicts or errors compared to the actual rule language, the language in Subpart B governs.

Sources in existence at the Section 112(j) deadline:

(1) The owner or operator can reasonably determine the affected source is subject to the Section 112(j) rule and submits the Part 1 application as described under Section 63.53(a) of the rule by the Section 112(j) deadline.

(2) If an owner or operator submits a Part 1 application in error, the State is responsible for notifying them that they are not subject to Section 112(j). (That is, the source is not in a category or subcategory subject to Section 112(j)).

(3) The owner or operator of the affected source who does not submit a Part 1 application is notified by the State that he/she is subject to the Section 112(j) rule and submits the Part 1 MACT application within 30 days of the notification. Owners or operators who can reasonably determine they are subject and do not submit an application may be subject to enforcement action.

(4) The affected source has a Title V permit or application that addresses Section 112(g) emission limitation requirements:

- affected source has a Section 112(g) MACT determination and submits Part 1 MACT application per timing in (1) or (3) above;
- affected source has an application and completes the Title V permit process under Section 112(g). Within 30 days of issuance of the Title V permit containing the Section 112(g) MACT determination, affected source submits the Part 1 MACT application.

Sources that become subject after the Section 112(j) deadline and do not have a Title V permit addressing the Section 112(j) requirements:

(1) Installation at a major source or installation that results in the source becoming a major source, but Section 112(g) is not triggered. The owner or operator submits the Part 1 MACT application within 30 days of startup.

(2) The owner or operator has a Title V permit or application satisfying the requirements of Section 112(g). The owner or operator submits the Part 1 MACT application within 30 days of issuance of the Title V permit that addresses the emission limitation requirements of Section 112(g).

(3) Area source becomes major as a result of change in potential to emit (PTE). Source submits a Part 1 MACT application for a Title V permit or an application for a Title V permit revision within 30 days after such source becomes a major source.

(4) Area source becomes major as a result of a lesser quantity emission rate established by the Administrator. Source submits a Part 1 MACT application for a Title V permit or Title V permit revision within 6 months after such source becomes a major source.

Sources that become subject after the Section 112(j) deadline and have a Title V permit addressing the requirements of Section 112(j):

(1) If the "event" is covered by the permit, then the affected source owner or operator complies with the permit;

(2) If the "event" is not covered by the permit, then the existing source submits a Part 1 MACT application for a revision to the permit within 30 days of beginning construction.

Requests for applicability determinations and for Notice of MACT Approval:

(1) If a source owner or operator is unsure whether any of the above scenarios apply, then he/she may submit a Part 1 MACT application to ask the State for an applicability determination.

(2) Owners or operators of new affected sources can obtain preconstruction review through an application for a Notice of MACT approval under section 63.54 of the rule.

Figures 1 and 2 illustrate the obligations and associated timing requirements of sources subject to Section 112(j) requirements.

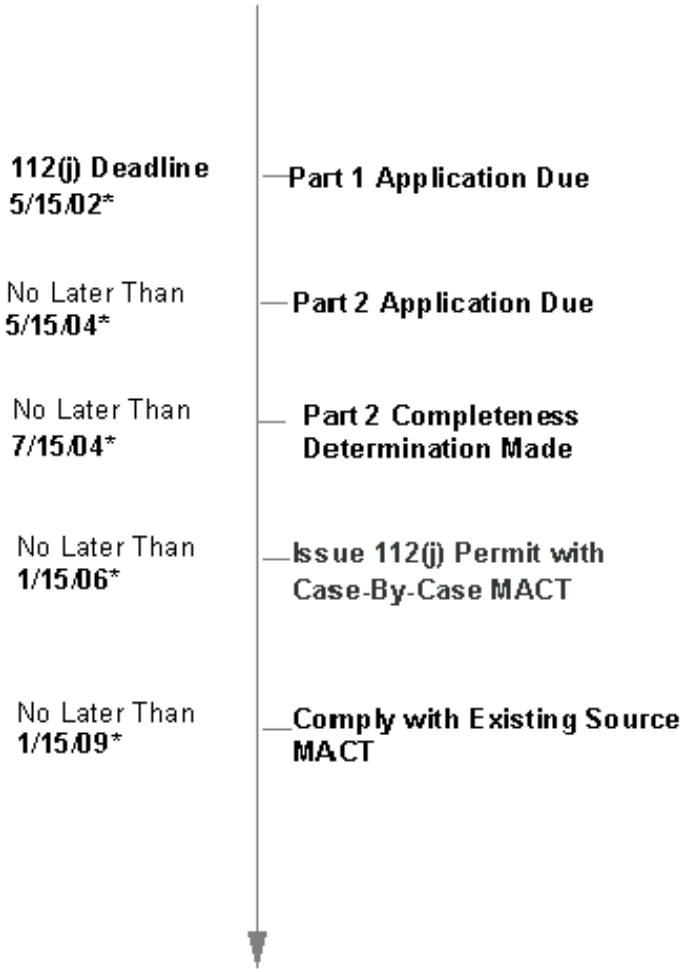


Figure 1. Sources in Existence and Subject to Section 112(j) at Deadline for Source Category (or Subcategory)

* Dates represent latest date possible for compliance

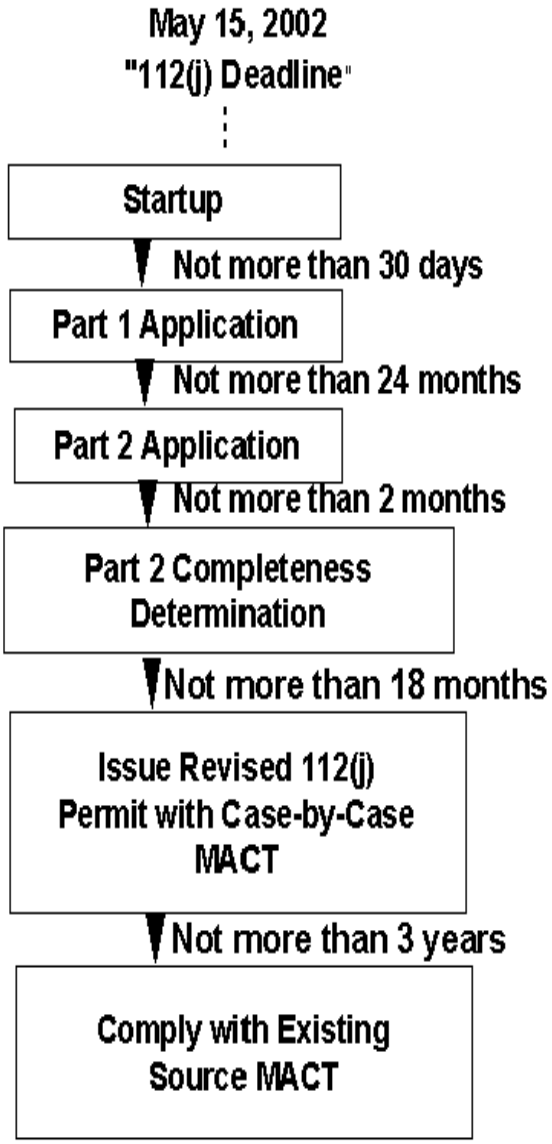


Figure 2. Source Becomes Subject to Section 112(j) After the 112(j) Deadline but before Issuance of Permit

1.3 Affected Source and New Affected Source Review

In some instances an owner/operator may be required to obtain preconstruction review or provide notice of intent to change a source subject to Section 112(j). If an owner or operator is not required to obtain or revise a Title V permit before construction of the new affected source (and has not elected to do so), but the new affected source is covered by any preconstruction or pre-operation review requirements established pursuant to Section 112(g) of the Act, then the preconstruction review requirements under Section 112(g) would fulfill the requirements of Section 112(j). If the new affected source is not covered by Section 112(g), the permitting authority, in its discretion, may issue a Notice of MACT Approval, or the equivalent, consistent with the requirements in 40 CFR 63.54 of Subpart B before construction or operation of the new affected source. Appendix C provides a suggested format for the Notice of MACT Approval. If a Section 112(j) case-by-case MACT determination has been made for such a source, it will include a determination of existing source MACT and new source MACT as well as the applicability of new source MACT. Such a case-by-case determination is the basis for preconstruction review. This process would require owners and operators of major sources to undergo preconstruction review before constructing a new affected source or reconstructing an affected source, if construction is

to commence after the Section 112(j) deadline. Details of the requirements for the approval process for affected sources and new affected sources are described in Section 63.52 of Subpart B; preconstruction review procedures for new affected sources are described in Section 63.54. Regardless of the review process, the MACT determination must be consistent with the principles established in Section 63.55.

Chapter 2.0

The MACT Determination

2.1 Criteria for the MACT Determination

The process of determining an equivalent (MACT) emission limitation is called a MACT determination. For MACT determinations under Section 112(j), the MACT emission limitation should be comparable to the emission limitation(s) or requirements that would likely be imposed if a Section 112(d) or Section 112(h) emission standard had been promulgated for that source category. The Clean Air Act sets forth specific criteria for setting a hazardous air pollutant emission standard under Section 112(d) and Section 112(h). These criteria should also be used when establishing the MACT emission limitation under Section 112(j).

Permit conditions created through Section 112(j) of the Act should establish limitations that:

1) Are no less stringent than the MACT floor when a MACT floor can be determined; and,
2) Achieve a maximum degree of HAP emission reduction with consideration to the cost of achieving such emission reductions, and the non-air-quality health and environmental impacts, and energy requirements; and,

3) Limit the quantity, rate, or concentration of HAP emissions on a continuous basis; or,

4) Designate specific design, equipment, work practice, operational standard, or a combination thereof, that achieves a maximum degree of emission reduction, when it is not practicable (economically or technologically) to prescribe a specific numerical emission limitation.

The MACT emission limitation could be expressed as a numerical emission limitation on the total quantity of HAP emissions from the source in tons per year (tpy), a production ratio (e.g., 10 lbs of HAP/100 lbs of polymer), or as a concentration limit (e.g., 10 ppm HAP). The MACT emission limitation could also be a performance standard based on the expected efficiency of MACT in reducing HAP emissions. For example, a source may be required to reduce emissions by 90 percent from a 1990 baseline or to achieve a specified reduction from uncontrolled emission rates. The MACT emission limitation can also be based on a design, equipment, work practice, operational standard, or any combination of these. In some cases, the EPA found that it is appropriate to require a source to use a high efficiency spray gun in the coating process; to conduct a leak detection and repair program for various items of equipment; or to install a floating roof with primary and

secondary seals on a storage tank in lieu of establishing a numerical emission limitation.

If an individual hazardous air pollutant is of particular concern, a MACT limitation may also be placed on that pollutant based on the expected level of reduction with MACT in place. Reviewing agencies should consider whether it is appropriate to impose such a limitation on a specific hazardous air pollutant.

In addition to specifying the MACT emission limitation, the permit should establish the terms and conditions that are necessary to make the emission limitation federally enforceable as a legal and practical matter. This involves establishing appropriate operational and/or monitoring parameters to ensure compliance with the MACT emission limitation. The following section discusses compliance provisions in greater detail.

2.2 Compliance Provisions

Each Title V permit and Notice of MACT Approval must contain sufficient testing, monitoring, reporting, and recordkeeping requirements to assure compliance with the MACT emission limitation.

When the permit or Notice of MACT Approval requires an add-on control, operating parameters and assumptions that can be used to determine the efficiency of the device or its emission rate should be specified. For example, a source may have a MACT

emission limitation that requires a control device to be installed and operated at a 95-percent emission reduction efficiency. An operational limit on the range of temperatures that the device can be operated under could be sufficient to ensure compliance, if operating the control device within this temperature range ensures that the device achieves a 95-percent destruction efficiency.

If establishing operating parameters for control equipment is infeasible in a particular situation, a short term emission limit (e.g., lbs/hr) would be sufficient provided that such limits reflect the operation of the control equipment, and additional requirements are imposed to install, maintain, and operate a continuous emission monitoring system (CEMS) or other periodic monitoring that yields sufficiently reliable data to determine the source's compliance with the MACT emission limitation.

If parameter monitoring of the process is infeasible due to the wide variety of operating conditions, emission limits coupled with a requirement to calculate daily emissions may be required. For instance, a source could be required to keep the records of the daily emission calculation, including daily quantities and the HAP content of each coating used.

For limitations to be enforceable as a practical matter, the limitations should extend over the shortest practicable time

period, generally not to exceed one month. If it is not practicable to place a monthly limit on the source, a longer time can be used with a rolling average period. However, the limit should not exceed an annual limit rolled on a monthly basis.

In addition to conveying practical enforceability of a MACT emission limitation, the Title V permit or Notice of MACT Approval should require testing or monitoring that yields data that are representative of the source's operations and can be used to certify the source's compliance with the terms and conditions of the Title V permit or Notice of MACT Approval. Testing or monitoring must be performed in a manner to ensure that the limitations are achieved at all times, except during startup, shutdown, or malfunction. Such testing or monitoring requirements may be in the form of continuous emission monitoring systems, continuous opacity monitoring systems, or periodic monitoring. If periodic testing is required, the specific EPA-approved method or equivalent method that is to be used should be specified in the permit or notice.

2.3 Approaches to the MACT Determination

When the Administrator fails to promulgate a standard by the promulgation deadline, the EPA intends to make all non-confidential information collected during the development of a source category standard available to the public. If the

Administrator has conducted a MACT floor finding, this analysis will be made available as well. Information will be conveyed either through a Federal Register notice, a background information document, the Technology Transfer Network (TTN), or other available mechanism.

A permitting authority could use several different approaches for the MACT determination process. For example, a permitting authority could wait until all applications for permits are received to determine the equivalent emission limitations that would apply to all of the sources within its jurisdiction. Or, a permitting authority or a group of permitting authorities could conduct a "MACT analysis" based on available information before the first Part 2 MACT application is filed for a source in the relevant source category or subcategory in the State or jurisdiction.

The first approach requires less upfront coordination on the part of the permitting authority and is likely to be used when the EPA fails to collect sufficient information on the source category or subcategory during the standards development process. Once the permit applications are received, information from each application can be compiled to determine the appropriate emissions control level. When this approach is used, the EPA strongly encourages different permitting authorities to share information received through the permit application process.

After the appropriate level of control is determined using the permit application information, permit applicants may need to submit additional information to demonstrate how the required emission reductions will be met so that permit terms and conditions can be developed.

The second approach is most likely to be used when there is a substantial amount of information already available for a source category or subcategory, or when the EPA has already proposed standards for that source category or subcategory. Based on this available information, the permitting authority (or coalition of permitting authorities) could conduct a MACT analysis (See Chapter 3) to determine the appropriate level of control for each source. This control level could be made federally enforceable for all sources in the category through the use of general permits, or each applicant could undergo a separate review in the Title V permitting process. Section 2.5 discusses the concept of general permits in greater detail.

Regardless of the approach taken to issue or revise Title V permits under Section 112(j), permitting authorities are reminded that the equivalent emission limitation is to be determined on a case-by-case basis for each source category or subcategory for which a Section 112(j) MACT determination is required. This determination should be viewed as a "source category-by-source category" determination and terms and conditions in each permit

issued should yield an essentially equivalent degree of emission reductions for all affected sources in the category or subcategory.

2.4 Available Information

Section 112(j) states that permits issued pursuant to Section 112(j) shall contain an equivalent emission limitation. This emission limitation is to be "equivalent" to that which the source would have been subject had an applicable Section 112(d) or Section 112(h) emission standard been promulgated. In order to establish an emission limitation that would be equivalent, the permitting authority must determine the equivalent emission limitation with consideration of the MACT floor using available information as defined in 40 CFR 63.51.

It is not necessary for the MACT floor to be determined based on emissions information from every existing source in the source category or subcategory if such information is not available. The permitting authority, however, should check with EPA Regional Offices and EPA Headquarters for any available information that could be used in determining the MACT floor. Once a permitting authority has obtained available information, the MACT floor can be determined using this information if it is representative of the source category or subcategory. For example, suppose there are 100 sources in a source category or

subcategory. Control technology X and Y are generally considered to achieve the greatest amount of emission reductions among existing sources. Thirty sources in the category use these technologies. The MACT floor could be determined based on these technologies, even if information was not available on the other seventy sources.

2.5 General Permits

A general permit is a type of Title V permit. A single general permit could be issued by a permitting authority to cover a number of sources. The specific requirements for a general permit are contained in 40 CFR Part 70.6(d).

The general permit can be written to set forth requirements for an entire source category or subcategory, or portion of the source category or subcategory. The facilities that are covered by the general permit, should be homogenous in terms of operations, processes, and emissions. In addition, the facilities should have essentially similar operations or processes and emit pollutants with similar characteristics. The facilities should be subject to the same or substantially similar requirements governing operations, emissions monitoring, reporting, or recordkeeping.

Because the case-by-case determination under Section 112(j) is a source category-by-source category determination of an

equivalent emission limitation, the permitting authority could use the general permit as a mechanism to issue Title V permits to the entire source category or subcategory, or specific components within the source category or subcategory. By using this mechanism, a permitting authority would not be required to issue individual permits to sources covered by the general permit. Also, once the general permit has been issued and after opportunity for public participation, EPA review and affected State review, the permitting authority may grant or deny a source's request to be covered by a general permit without further outside review.

Major sources that do not require a specific Title V permit for any other reason, could be covered by the general permit indefinitely. For a major source that already has a Title V permit, the owner or operator can apply for coverage under the general permit, and then incorporate the general permit requirements into the source specific permit through an administrative amendment at permit renewal.

General permits would not be an appropriate mechanism to issue permit conditions if the terms and conditions necessary to establish federal enforceability as a legal and practical matter might vary from source to source within the category. For instance, if a MACT emission limitation restricted emissions from multiple emission points within the source category or

subcategory and the number of emission points varied from major source to major source, a general permit may not be appropriate.

Chapter 3.0

The MACT Analysis

For most source categories, the process by which the permitting authority will determine the appropriate level of control involves a number of different determinations. First, the emission points at the major source that are related to the activities and equipment in a source category or subcategory must be identified. There may be a number of emitting activities and equipment at a single major source. In some cases, not all of these emissions are from a single source category or subcategory. Only the emission points in the source category or subcategory undergoing the Section 112(j) MACT determination are subject to control through an equivalent emission limitation.

The collection of equipment and/or activities in the source category or subcategory at the source subject to Section 112(j) is the affected source as defined in 40 CFR 63.2. An affected source may have only one emission unit comprised of all of the emission points; or, it may have several emission units each comprised of some portions of the total number of emission points in the source category or subcategory. In this context the term "emission unit" is equipment or a grouping of equipment for which a floor determination and MACT will be determined. Note that this term has no regulatory or statutory meaning under Section

112(j). It is used here for convenience. Existing source MACT and new source MACT and their respective applicability must be determined for the affected source and new affected source consistent with 40 CFR 63.2, 40 CFR 63.5, and 40 CFR 63.52. The process of establishing the scope of the source category or subcategory, the affected source and new affected source, and the appropriate levels of control by the permitting authority requires ongoing communication and exchange of information between the permitting authority and applicants. This interaction between the permitting authority and applicants is essential in making these determinations.

The process by which these determinations are made is termed the MACT analysis. The following sections of this chapter describe a MACT analysis process that EPA has developed to meet the requirements of 40 CFR Part 63, Subpart B.

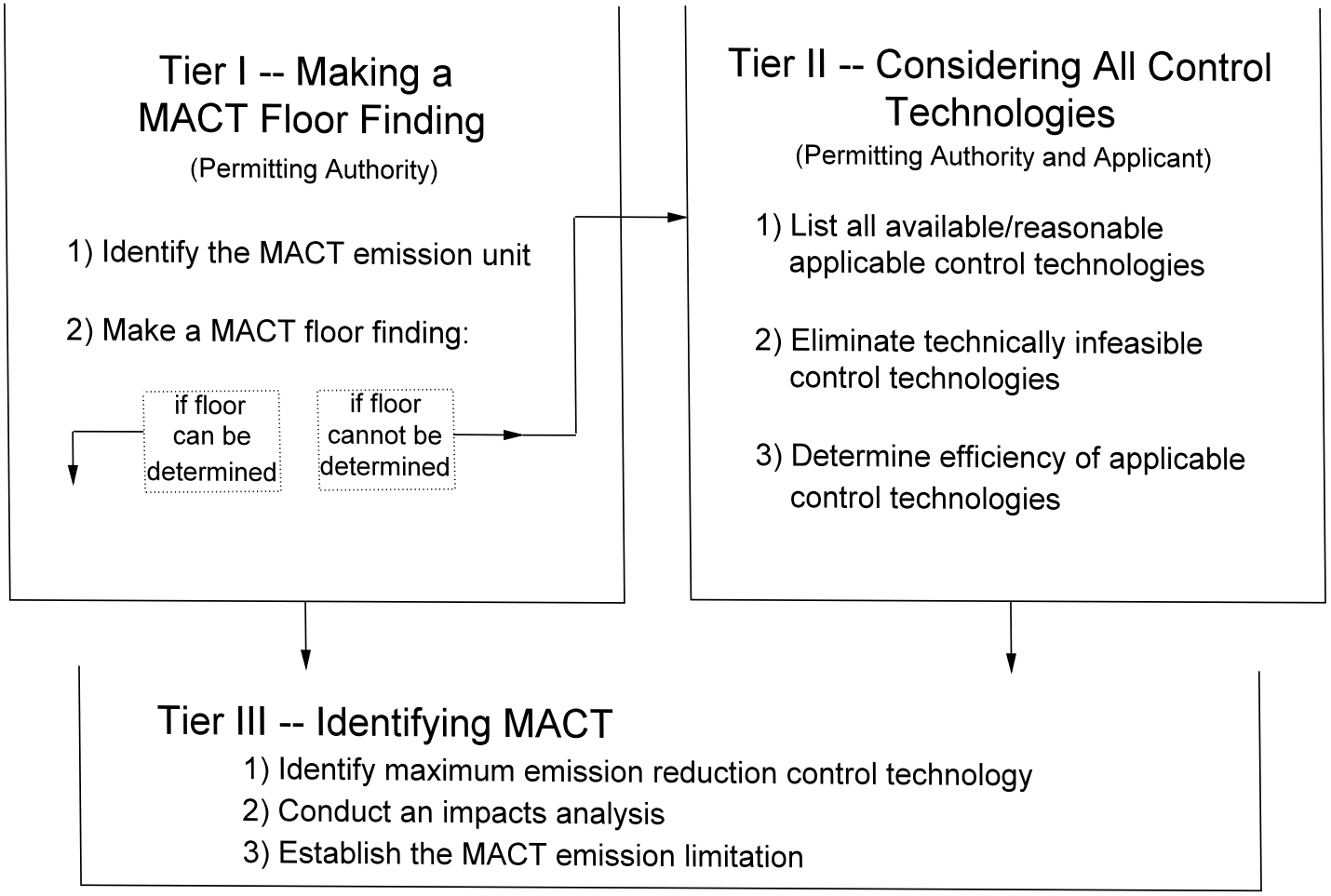
3.1 Overview of the MACT Analysis Process

The MACT analysis by the permitting authority uses available information to make a MACT floor finding. There are several possible situations that may arise in the course of conducting a MACT analysis. First, the MACT floor could be determined based on emission reductions currently being achieved by other controlled sources. A second possible outcome is that the MACT floor cannot be determined due to the nature of the pollutants

emitted from the source, or because of the lack of available data. A third possibility is that the MACT floor could equal "no control" if the group of sources on which the MACT floor determination is based are not currently controlling HAP emissions. In the latter two cases, the EPA believes that a more detailed analysis is required in order to determine the appropriate level of control.

Because of the variety of situations that could arise, the MACT analysis has been divided into three tiers. Figure 3 diagrams the steps for Tier I, Tier II and Tier III of the analysis. A MACT floor finding by the permitting authority is made during Tier I. During Tier II, the permitting authority, in consultation with the applicant, evaluates all commercially

Figure 3. The MACT Analysis



available and demonstrated controls that are reasonably applicable to such source. Tier III uses the information developed in Tier I or Tier II to establish a MACT emission limitation.

This process is presented here as suggested guidance in determining MACT. Permitting authorities are free to use the process with which they are most familiar to determine MACT. If a MACT floor is determined, it is only necessary to complete Tier I and Tier III of the MACT analysis. This analysis compares the costs, non-air quality health and environmental impacts and energy requirements associated with using control technologies that obtain a level of HAP emission reductions that are equal to or greater than the MACT floor. A key assumption is that the Tier I analysis yields sufficient information to conduct the Tier III MACT analysis. If additional information is needed, the permitting authority and the source would develop that information as part of the Tier III analysis.

If, under Tier I, the MACT floor cannot be determined or is equal to "no control," Tier II of the analysis should be completed before moving on to Tier III.

The purpose of Tier II is to identify all commercially available and demonstrated control technologies that are reasonably applicable to such source. Available control technologies include but are not limited to: reducing the volume

of, or eliminating emissions of pollutants through process changes, substitution of materials or other techniques; enclosing systems or processes to eliminate emissions; collecting, capturing, or treating pollutants when released from a process, stack, storage, or fugitive emission point; using design, equipment, work practices, or operational standards (including requirements for operator training or certification); or, a combination of any of these methods. The permitting authority in consultation with the applicant is responsible for developing a list of technologies that are reasonably applicable to the source.

Once a list of control technologies that are reasonably applicable to the source is developed, each control technology should be evaluated to consider the costs, non-air quality health and environmental impacts, and energy requirements associated with using each control technology.

In Tier III, the control technology(s) achieving the maximum degree of HAP emission reductions taking into consideration the costs of achieving such emission reductions and the non-air quality health and environmental impacts and energy requirements should be selected as MACT. Once MACT has been selected, a MACT emission limitation(s) should be established by the permitting authority based on the degree of emission reductions that can be achieved through the application of the maximum achievable

control technology (MACT). A design, equipment, work practice or operational standard, or combination thereof, may be designated as the MACT emission limitation, if it is not practicable, in the judgement of the permitting authority, to prescribe or enforce a numerical MACT emission limitation.

If an owner or operator wishes to comply with the MACT emission limitation using a control strategy other than the control strategy selected as MACT, then the Title V permit application should be submitted or revised to demonstrate that this alternative strategy achieves the required level of emission reductions.

3.2 A Detailed Look at the MACT Analysis

Tier I - Making a MACT floor finding

Step 1 -- Identify the MACT-affected emission unit(s)

In accordance with the provisions established in 40 CFR 63.53, the owner or operator is required to identify all HAP emission points within the affected source. These emission points will be grouped into emission units (MACT emission units) that will be subject to a MACT determination by the permitting authority.

When a relevant emission standard has been proposed, the scope of the affected source and the emission units should be consistent with the scope of the affected source and the emission

units for which MACT was determined in the proposed emission standard, unless an alternative can be adequately supported. When no relevant emission standard has been proposed, the MACT emission unit will be determined on a case-by-case basis. Section 3.3 of this chapter discusses principles for determining the MACT emission unit on a case-by-case basis.

The collection of emission points (and hence the collection of emission units) at the source subject to Section 112(j) that are in the source category or subcategory subject to this subpart is the affected source as defined in 40 CFR 63.2.

Step 2 -- Make a MACT floor finding

Using the available information provided by the EPA, other permitting authorities, and/or the permit applications, a level of HAP emission control that is equal to the MACT floor for each type of emission unit undergoing review should be calculated by the permitting authority according to 40 CFR 63.55.

Chapter 4 discusses three ways to establish a MACT floor: using (1) State and local regulations, (2) control efficiencies, and (3) emission reduction ratios. Use of any of these methodologies to determine the floor depends on the format of available information. It is possible that a hybrid of these approaches may be necessary, or none of the methods may be appropriate given the format of the available information. These methods are provided in this guidance document to demonstrate the

types of methodologies that would be appropriate for establishing a MACT floor.

If the MACT floor cannot be determined or if it is equal to "no control", the permitting authority should proceed to Tier II of the analysis.

Tier II - Considering all control technologies

Step 1 -- List all available/reasonable applicable control technologies

Using available information, the permitting authority in consultation with source owners/operators should develop a list of commercially available control technologies that have been successfully demonstrated in practice for similar emission units and that are reasonably applicable to sources in the category or subcategory. Similar emission units are discussed in more detail in Section 3.4 of this chapter.

Step 2 -- Eliminate technically infeasible control technologies

All control technologies that could not be applied to the MACT emission unit because of technical infeasibility should be eliminated from the list. A technology is generally considered technically infeasible if there are structural, design, physical or operational constraints that prevent the application of the control technology to the emission unit. A technology may also be eliminated if the permitting authority deems it unreasonable. A technology is considered unreasonable if the operational

reliability and performance have not been demonstrated by approved methods under conditions representative of those applicable to the source for which MACT is being determined.

Step 3 -- Determine efficiency of applicable control technologies

The permitting authority should conduct a detailed analysis of all of the available reasonably applicable control technologies. The efficiency of each control technology in reducing overall HAP emissions should be determined. Generally, MACT has been selected based on an overall reduction of all HAP emissions. However, a permitting authority may also select MACT based on the degree of emission reductions achieved for one or more specific HAPs when the risk to human health and the environment warrants establishing MACT emission limitations specifically for these HAPs. It should also be noted that the application of more than one control technology may be necessary in order to address multiple types of HAP emissions.

Tier III - Identifying MACT

Step 1 -- Identify the maximum emission reduction control technology

When a MACT floor finding is made, the permitting authority will need to use available information to identify the control technology(s) that reduce HAP emissions from the MACT emission units to the maximum extent considering the factors in Section 112(d)(2) of the Act and to a level that is at least equal to or

greater than the MACT floor. Consideration can be given to transfer and innovative technologies used to control emissions from other emission units that use technologies that can be applied to the MACT emission unit.

As in Tier II, the permitting authority should conduct an analysis to eliminate any technically infeasible control technologies and to determine the efficiency of applicable control technologies.

While the Clean Air Act establishes that MACT shall be no less stringent than the MACT floor, in establishing MACT, the Administrator must take into consideration "the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements" [section 112(d)(2)]. In some cases, the EPA has developed MACT standards that are more stringent than the MACT floor when the following criteria are met:

(1) The economic impact and incremental cost-effectiveness are not unreasonable;

(2) The standard would control emissions of high risk or highly toxic pollutants, e.g., chromium; or

(3) The standard resulted from a negotiated rulemaking, e.g., the wood furniture NESHAP or the HON equipment leaks standard.

Step 2 -- Conduct an impacts analysis

The control technology that achieves the maximum degree of HAP emission reductions with consideration to costs, non-air quality health and environmental impacts, and energy requirements is MACT. The Act does not provide direction on the significance of one consideration to another. The EPA believes that it is inappropriate to provide specific guidance for determining the amount of consideration that should be given to any one factor. Such decisions will need to be made based on the information available at the time of the MACT determination. See Chapter 6 of this guidance document for a more detailed discussion on the analysis of the costs, non-air quality health and environmental impacts, and energy requirements.

Step 3 -- Establish the MACT emission limitation

The MACT emission limitation established by the permitting authority is based on the degree of emission reduction that can be obtained by the affected source if MACT is applied and is properly operated and maintained. See Chapter 5 for a detailed discussion on the MACT emission limitation and permit conditions.

3.3 Determining the MACT Emission Unit and "Affected Source"

In some cases available information is adequate to support a MACT floor determination for the grouping of equipment and activities comprising the affected source. However, in some cases the EPA has found it necessary to evaluate smaller

groupings of equipment and activities for the purpose of the MACT floor and MACT determination. This smaller grouping is referred to herein as a MACT emission unit.

There are four basic principles to follow when designating the MACT emission unit. The principles can be summarized as follows: 1) When a relevant Section 112(d) or Section 112(h) standard has been proposed, the permitting authority should refer to the relevant standard to determine the MACT emission unit; or, (2) The EPA's Office of Air Quality Planning and Standards should be consulted to determine if a suggested method for grouping affected emission points is available; or, (3) When a specific piece of equipment is designated as a source category or subcategory on the source category or subcategory list, the MACT emission unit is that piece of equipment or apparatus; or, (4) Emission points should be combined into a single MACT emission unit when the combination of points leads to a much more cost-effective method of control, and achieves a greater degree of emission reductions when compared to point-by-point compliance.

The best indicator of how a source category or subcategory may be regulated by a future promulgated relevant standard may be found in the proposed standard. For this reason, the EPA believes that permitting authorities should first consider the guidelines in the proposed standard to determine the MACT

emission unit for a Section 112(j) MACT determination. In addition, although there may be no proposed standard for the source category or subcategory, information on the source category or subcategory may have been collected which allows the EPA to recommend a specific method for determining the emission unit for a Section 112(j) MACT determination. Therefore, the EPA should be consulted before attempts are made to define the MACT emission unit on a case-by-case basis.

When a source category or subcategory is associated with a piece of equipment or apparatus specifically listed on the source category or subcategory list, that piece of equipment or apparatus is the MACT emission unit. The source category or subcategory list contains sources that are defined at various levels of complexity: from an integrated manufacturing or process operation to an individual piece of equipment. In developing the source category or subcategory list, the EPA determined that some individual pieces of equipment may be co-located with other HAP-emitting equipment that, independently or collectively, have the potential to emit major amounts of HAPs. For example, under the fuel combustion industrial grouping, stationary internal combustion engines are listed as a source category or subcategory. When a source category or subcategory is designated by a single type of apparatus, the EPA believes that the intent is for emission limitations and requirements to

be placed on that specific piece of equipment. As such, if a Section 112(j) determination is conducted for any one of these source categories or subcategories, the specific piece of equipment or apparatus should be designated as the MACT emission unit.

A single emission point such as a storage tank could be considered the MACT emission unit. By contrast, emission points from a distillation column, a condenser and distillate receiver could be consolidated into one emission unit. Larger groupings of emission points may be appropriate when a single control technology can be used to control the aggregation or when a pollution prevention or waste reduction strategy is considered. For instance, the entire wastewater treatment operation within the source category or subcategory could be considered one emission unit. Collectively, a single steam-stripper could be used at the beginning of the operation to remove HAPs from the wastewater and prevent downstream emissions from occurring. Another example is illustrated with a surface coating operation. Rather than individually controlling the emissions from a spray booth, flash-off area, and bake oven, switching to a water-based paint could reduce emissions from all of these emission points.

Another reason to combine affected emission points into a single emission unit is that many major sources are already subject to regulation under 40 CFR Part 60. In promulgating

these standards, "affected facility" definitions were developed to designate the apparatus to which a standard applies. It may make sense to use these same boundaries to designate the "MACT emission unit" subject to a MACT determination. It should be noted that a particular piece of apparatus or equipment should not be excluded from a MACT determination because of an applicability "cut-off" established under a Part 60 regulation.

Emission points could be consolidated into an emission unit that is as large as the source category or subcategory boundary for several reasons. First, the information that is available to calculate the MACT floor may only apply to the source category or subcategory as a whole, not individual points within the category. Also, the operations of some source categories are quite variable. Either the nature of the process requires a large latitude of flexibility in establishing the emission unit that should be controlled, or the types of facilities within the category are so diverse that it only makes sense to compare the existing sources on a source category or subcategory wide level. In these instances, a source category or subcategory wide MACT emission unit could allow some emission points to be under-controlled while others are controlled to a level that would exceed the level of control that would be placed on that individual point through the application of MACT.

Permitting authorities are cautioned that, consistent with the EPA's emissions averaging decisions, as prescribed in 40 CFR 63.150, it would be generally inappropriate to include emission points associated with equipment leak emissions together with other types of emission points in a MACT emission unit until the EPA determines that emissions can be appropriately estimated for this purpose.

There are some situations that would make the combination of emission points unreasonable. For example, the combination should not be done in order to generate an emission unit that is so unique that it precludes comparing the emission unit to other sources in the source category or subcategory. In other cases, the EPA has established thresholds for types of emission points within a MACT emission unit, which define whether such points are required to be further controlled in order to meet MACT. For example, as illustrated by Group 2 sources (40 CFR Part 63, Subpart G), the MACT floor for smaller or more dilute sources may be no control, and nothing more stringent than the floor may be justified.

Determining the MACT emission unit on a case-by-case basis is a complex undertaking. While this document includes this step as a separate component of the Tier I approach, in actual practice the identification of methods to control specific groups of emission units and the identification of control technology

options will be integrated processes. Some aggregations of emission points may be inappropriate because the information available to calculate the MACT floor would dictate combining emission points into certain emission units, or because controls applied to the unit would not achieve a MACT level of control when compared to point-by-point compliance or some other combination of emission units. Appendix A provides an example of ways in which available control technologies would affect the aggregation of emission points into an emission unit.

3.4 Similar Emission Units

The permitting authority should evaluate control technologies used by similar emission units in other source categories during Tier II. Whether control technologies from other source categories should be considered in the MACT analysis depends on whether the emission unit is "similar". At least two questions should be answered to determine if an emission unit is similar: 1) Do the two emission units have similar emission types, and 2) Can the emission units be controlled with the same type of control technology. If the two emission units do have similar emission types and are controllable to approximately the same extent with the same control technologies, then the two emission units can be considered similar for the purposes of a case-by-case MACT determination under Section 112(j).

For example, suppose Section 112(j) applies to the captan production source category or subcategory (a source listed on the source category or subcategory list), and a major source produces captan with equipment using product accumulation vessels (tanks) and additional pipes, pumps, flanges and valves to direct the product to the tanks. During Tier I of the MACT analysis, it is determined that there are no regulations controlling HAP emissions from pumps, etc. within this source category or subcategory. There is also not enough emission information available on other emission units within the source category or subcategory to calculate a MACT floor. During Tier II of the analysis, it is discovered that the Synthetic Organic Chemical Manufacturing Industry (SOCMI) source category or subcategory is currently subject to regulations controlling equipment leaks. Because the pipes, pumps, and flanges all have equipment leak emissions and can be controlled to the same extent by a leak detection and repair program, such equipment in the SOCMI source category or subcategory would be considered similar emission units. The regulations for SOCMI equipment leaks should be considered for the control of the MACT emission unit during Tier II of the analysis. When determining the existing source level of control, identification of a similar emission unit does not mean that the controls will automatically be applied to the MACT emission unit. Costs, non-air quality health and

environmental impacts, and energy requirements should be used to assess the technologies ability to meet MACT criteria.

Also during Tier I of the analysis, it may be determined that the best controlled tank within this source category or subcategory does not have state-of-the-art controls. Yet, tanks from outside the source category or subcategory storing similar organic liquids use state-of-the-art controls vented to an emission control device. The controls used on these tanks would be considered in establishing MACT.

After identifying MACT, the permitting authority proceeds to establish the MACT emission limitation, monitoring, and recordkeeping as outlined previously.

3.5 Subcategorization

When the source category list was developed, sources with some common features were grouped together to form a "category". During the standard-setting process, the EPA has found it appropriate to combine several categories or to further divide a category into subcategories. The EPA chose to establish broad source categories at the time the source category list was developed because there was too little information to anticipate specific groupings of similar sources that are appropriate for defining MACT floors for the purpose of establishing emission standards.

The broad nature of some source category descriptions may pose some difficulty in establishing an appropriate MACT emission limitation for a MACT emission unit on a case-by-case basis. Subcategorization within a source category for the purposes of a case-by-case MACT determination should be considered when there is enough evidence to clearly demonstrate that there are air pollution control engineering differences. Criteria to consider include process operations (including differences between batch and continuous operations), emissions characteristics, control device applicability and costs, safety, and opportunities for pollution prevention. When separate subcategories are established, the MACT floor and MACT are then determined separately for each such subcategory.

Chapter 4.0

The MACT Floor Finding

During Tier I of the MACT analysis, the permitting authority will make a MACT floor finding if there is enough information to determine an emission control level that is at least equal to the MACT floor. If a MACT floor cannot be determined due to the nature of the pollutant or process, or there is not enough emissions information to compute a MACT floor, then the analysis in Tier II would be completed. Similarly, if the MACT floor equals "no control," the permitting authority should proceed to the Tier II analysis.

The Act specifically directs EPA to consider the "average emission limitation" achieved in practice to establish the MACT floor for existing sources. Section 4.1 of this chapter discusses calculation procedures for determining an "average emission limitation".

Using the calculation procedures discussed in Section 4.1, this chapter explains four approaches for determining a MACT floor. If the emissions information is available, the first three methods should be considered before the permitting authority concludes that a MACT floor cannot be determined. The three emissions-based methods include using: (1) existing State and local air toxic control regulations; (2) control efficiency ratings; or (3) emission reduction ratios.

A fourth method, the technology approach, can be used when insufficient emissions data are available to determine an average emissions limitation.

The first method compares air pollution regulations in different States. The second method is applicable when the control technologies under consideration can be assigned an efficiency rating for HAP emission reductions. This is most likely to occur with add-on control devices. The third method can be used for add-on control devices, work practices, recycling, reuse or pollution prevention strategies. Depending on the format of available information, a hybrid of the three approaches may be necessary. The fourth method involves determining which technology is being used by the best performing sources in the category as defined in sections 112(d)(3)(A) and (B) and then determining the emissions limit that the technology is capable of achieving in practice on a continuous basis. Later in this chapter each of these methods is discussed in greater detail.

4.1 Calculation of the MACT Floor

Section 112(d) of the Act instructs the EPA to set emission standards for new sources based on the emissions control achieved in practice by the best controlled similar source and to set emission standards for existing sources based on an average

emission limitation achieved by the best performing 12 percent of existing sources or best performing five sources in the source category or subcategory for categories with fewer than 30 sources. For new sources, the direction provided by the Act is relatively clear. For existing sources, further clarification is required by the EPA to determine how an average emission limitation should be computed.

The word "average" can have several different meanings, including arithmetic mean, median, and mode. As stated previously, the EPA published a Federal Register notice describing these methods of determining the average as well as other common sense considerations at 59 FR 29196 et.seq., June 6, 1994. A copy of this notice is contained in Appendix B of this document.

The following examples illustrate the average as represented by the mean, median, and mode.

Example 1

The following emission limitations are representative of the best performing 12 percent of existing sources:

% reduction	
95	Average emission limitation
95	defined by the mean =
93	
93	644/7 = 92%
92	
88	

88

Total 644

Number of sources in the best performing 12% = 7

In this case the MACT floor would be 92%.

Under some circumstances the arithmetic mean results in a number that may not correspond to the application of a specific control technology. If there is a large discrepancy between the amount of emission reductions that can be achieved by available control options, other factors should be considered to determine the MACT floor. This is illustrated with the following example:

Example 2

An arithmetic mean is computed for the best performing 12 percent of storage tanks. There are 10 sources among the best performing 12 percent of storage tanks. Two tanks are controlled at 99 percent, and the remaining 8 tanks are not controlled. The emissions limitations considered in the floor calculation are:

% reduction

99
99
0
0
0
0
0
0
0
0

average emission limitation =

19.8% reduction

Total 198

Number of sources in top 12% = 10

In this example, no technology corresponds to 19.8-percent control, and it might be inappropriate to elevate the MACT floor to 99-percent control.

If there is a large discrepancy between the amount of emission reductions that can be achieved by available control options, the median should be used in lieu of the arithmetic mean to determine the average emission limitation equal to the MACT floor. A median is the value that falls in the middle of a set of numbers when those numbers are arranged in an increasing order of magnitude; in other words, there will be an equal number of values above and below the median. If the middle falls between two values, the median is equal to the arithmetic mean of those two numbers. This situation will occur when there is an even number of values in the set of numbers. In this example, the median would be 0-percent reduction, and this could be selected as the MACT floor.

However, if there is a large discrepancy between the control technologies used to establish a median such that no technology could realistically obtain a reduction close to the median, the mode should be used to calculate the MACT floor. A mode is the most frequent occurrence among a set of data. In Example 1,

there are two modes, 95-percent and 88-percent emission reductions. In Example 2, the mode would be equal to 0-percent emission reduction. When there is more than one mode in the data set, the MACT floor should be based on the least degree of emission control. However, the existence of more than one mode may be an indicator that the MACT should be established at a level of control more stringent than the MACT floor.

The mode may also be used as a method to compute an average emission limitation if the emissions data for a source category or subcategory are not numerically based. This situation could occur if sources were regulated by several different equipment or work practice standards. Unless a specific level of emission reduction can be associated with each different standard or unless the standards can be ranked in some order of increasing level of control, an arithmetic mean and median cannot be calculated. A mode could be used if one of the control options is used more frequently by the best performing 12 percent of existing sources. For example:

Example 3

There are 44 tanks in the source category or subcategory. Five sources are among the best performing 12 percent of existing sources. These five tanks are subject to the following regulations in the source category or subcategory:

3 of the 5 must be covered and vented to a carbon canister;

2 of the 5 must use a fixed roof.

The mode would be to cover and vent the tank to a carbon canister.

4.2 Method 1 - Computing the MACT Floor Using Existing State and Local Regulations

The steps for computing a MACT floor using this method are as follows:

Step A: Conduct a geographical survey.

Determine the total number of existing similar emission units in the source category or subcategory, and conduct a survey to determine the geographical location of these similar emission units. Group the emission units according to the State or locality in which they are located.

Step B: Review State or local air pollution regulations.

Review the different State or local air pollution control regulations that are applicable to the emission unit in each State or locality where an emission unit is located.

Step C: Rank the State or local air pollution regulations.

For the State and local regulations identified in Step B, rank the regulations in order of stringency. The regulations

that require the greatest level of control should be listed first.

Step D: Rank emission units.

Determine the total number of emission units and the number of emission units complying with each stringency level. Based on the level of regulation stringency, rank the emission units in order from most stringent to least stringent.

Step E: Make a MACT floor finding.

Based on the distribution of sources in the various States and the stringency of the respective State requirements, it may be possible to construct a database that would support a MACT floor determination as described in Section 4.1. Note that a determination must also be made that sources in the States actually achieve the required control levels.

4.3 Method 2 - Computing the MACT Floor Using Control Efficiency Ratings

To use this method to calculate the MACT floor, the permitting authority will evaluate emission units that use add-on control devices or other methods whose HAP control efficiencies have been clearly demonstrated in practice. The MACT floor and MACT emission limitation can be computed as follows:

Step A: Determine HAP emission reduction efficiency for each control device.

For each emission unit in the source category or subcategory, the ability of each control technology to reduce HAP emissions should be determined as a percentage of reduction efficiency. Acceptable methods for determining the efficiency rating are:

(1) Federal and State enforceable permits limits on operation of the control technology, where compliance has been demonstrated;

(2) Actual reported efficiencies.

In addition vendor data of demonstrated performance achieved in similar service may be used in conjunction with good engineering judgement.

Step B: Calculate the MACT floor using the methodology in Section 4.1.

4.4 Method 3 - Computing the MACT Floor Using Emissions Reduction Ratios

The emission reduction ratio is a fraction of uncontrolled emissions to controlled emissions. The MACT floor is computed using the emission reduction ratios. To compute the emission reduction ratio for each emission unit, the permitting authority must review emissions data or other information to determine uncontrolled and controlled emissions levels for these units. The step-by-step process is detailed below.

Step A: Compute an uncontrolled emission level for each emission unit.

The uncontrolled emission level for an emission unit is the maximum amount of HAP that could be emitted from the emission unit using current design specifications at full capacity utilization in the absence of controls.

Step B: Compute a controlled emission level for each emission unit.

The controlled emission level is the maximum amount of HAP that could be emitted from the emission unit under the source's current design specification and at full capacity utilization taking into consideration the application of federally enforceable controls. Ideally, a controlled emission level should be computed for all emission units, even when a single uncontrolled emission level is used. However, if only general information is known about the types of control technologies that are being used in practice, a controlled emission level could be estimated for each control scenario. Then a controlled emission level for each emission unit would be assigned based on the types of controls that major sources use. Readers should review Chapter 5 for more information on controlled emission levels.

Step C: Compute the emission reduction ratio for each emission unit.

The emission reduction ratio for each emission unit can be computed using the following formula:

$$\frac{\text{Uncontrolled Emission Limit - Controlled Emission Limit}}{\text{Uncontrolled Emission Limit}}$$

Step D: Determine the MACT floor using the methodology in Section 4.1.

4.5 Technology Approach

The technology approach is used when insufficient emissions data are available to determine an average emission limitation. Under this approach, EPA determines which technology is being used by the average of the best performing 12 percent of sources in the category, and then determines the average emission limit that this technology is capable of achieving in practice on a continuous basis. Available emissions data are used to assign a performance value for each emission control identified (percent removal, outlet grain loading, etc.). The MACT floor calculation is performed based on these performance values. Typically, a median is used rather than the arithmetic average since an arithmetic average generally would not correspond to any given control. The following example illustrates this approach.

A source category emitting metal HAP is comprised of 500 sources. A survey of the sources finds that 300 facilities use cyclones to control HAP emissions, 150 facilities use wet scrubbers, and 50 facilities use fabric filters. Based on available emissions data, it is determined that cyclones are 25-percent efficient at removing HAP emissions, wet scrubbers are 75-percent efficient, and fabric filters are 99-percent efficient. The best controlled 12-percent of sources would include 10 sources with wet scrubbers and 50 sources with fabric filters. The median corresponds to fabric filters. Therefore,

fabric filters would be identified as the MACT floor technology, and an emission limitation would be set based on the available performance data for fabric filters.

4.6 Other Methods to Compute the MACT Floor

As future MACT standards are proposed or promulgated for different source categories, more methods for determining the MACT floor could be developed. The reader is referred to the June 6, 1994 (59 FR 29196 et.seq.) in Appendix B and other Federal Register notices to locate any other methods for calculating the MACT floor that have been approved by the EPA and used in developing a MACT standard under Section 112(d) or 112(h) of the Act.

Chapter 5.0

The MACT Emission Limitation and Permit Conditions

5.1 MACT Emission Limitation

The MACT emission limitation established by the permitting authority is based on the level of emission reductions that can be obtained by the affected source when MACT is applied and properly operated and maintained. The MACT emission limitation should be based on an overall reduction of all HAP emissions. The MACT emission limitation may need to account for differing kinds of equipment within the affected source and may include emission averaging provisions to allow such equipment to achieve MACT in the most cost-effective manner possible. The permitting authority may establish a MACT emission limitation for an individual HAP when the risk to human health and the environment warrants such an emission limitation. If it is not practicable to establish a specific numerical or efficiency limitation, then a specific design, process, or control technology should be designated as the MACT emission limitation. For example, a floating roof with a primary and secondary seal on a storage vessel or an equipment leak detection and repair practice could be determined as MACT.

Determining the expected emission reductions from an add-on control may require some engineering judgement. In some

instances, the add-on control may achieve different levels of reduction efficiency even when it is applied to the same type of emission unit. Lower efficiency ratings may be due to different operational parameters or poor maintenance practices. The MACT emission limitation should be based on the level of control that the technology is likely to obtain for all emission units operating under good operational and maintenance practices.

Chapter 4 of this manual describes possible methodologies for calculating a MACT floor. It is likely that the regulatory format of the MACT emission limitation will be similar to the format of the MACT floor. For instance, if the MACT floor is computed to be a limit of 0.30 lbs/ton of feed, the regulatory format of the MACT emission limitation is also likely to be expressed as lbs/ton of feed. The following sections provide guidance on calculating the MACT emission limitation for a source category or subcategory. These sections also discuss how a permitting authority can determine what amount of control an individual source needs to achieve the required reductions.

When control efficiencies are used to establish a MACT floor, the MACT emission limitation could be expressed as this efficiency. In other words, all sources could be required to reduce emissions by some percent (i.e., 90-percent reduction). Additional terms and conditions would be necessary to make this practically enforceable, but such an emission limitation may be

appropriate when all emission units are operated relatively homogeneously within the source category or subcategory. For other source categories it may be appropriate to convert this efficiency rating into another format. This can be accomplished by multiplying the efficiency of MACT by the uncontrolled emission level of the emission unit as follows:

$$\text{MACT Emission Limit} = \text{Uncontrolled Emission Level} * \text{MACT efficiency}$$

The uncontrolled emission level for an emission unit is the maximum amount of HAP that could be emitted from the emission unit using current design specifications at full capacity utilization in the absence of controls. It could be computed using a variety of different formats, i.e. tons/yr, lbs/hr, lbs/ton, etc. The following sources of information may be acceptable:

(1) Engineering calculation using material balance or emission factors;

(2) Actual emission data from similar emission units;

(3) Average annual hourly emission rate multiplied by hours of operation;

(4) Emission limits and test data from EPA documents, including background information documents;

(5) State emission inventory questionnaires for comparable sources;

(6) Federal or State enforceable permit limits; or,

(7) For equipment leaks use, "Protocols for Equipment Leak Emission Estimates," EPA-453/R-93-026.

The selection of the uncontrolled emission level will likely require some engineering judgement on the part of the permitting authority. Typical throughputs, flow rates, concentrations, etc. should be used to estimate a uncontrolled emission level that can be applied to the source category or subcategory.

The definition of a control technology includes the use of pollution prevention and source reduction strategies. The permitting authority should take into consideration the use of such control measures when computing the uncontrolled emission level for an emission unit. For example, some MACT emission units in the source category or subcategory may use a high VOC solvent as a process input to the emission unit. Other units may use a lower VOC solvent as a process input to the same type of emission unit. No distinction in the type of process inputs have been made in designating the emission unit. The MACT for this emission unit is identified as control technology X. If this control technology was determined to have a control efficiency rating of 90 percent, then the current design specifications for each emission unit in the category would require all sources to

reduce emissions by 90 percent. However, this would not account for the different baseline emissions from different emission units in the source category or subcategory. By calculating the uncontrolled emission level for all emission units in the category based on the high VOC process input, emission units with inherently lower potentials to emit can take credit for the emission reduction in the controlled emissions calculation and the calculation of additional required control.

5.2 Alternative Ways to Comply

Once the permitting authority determines the MACT emission limitation, the applicant will determine a control strategy that allows the affected source to meet MACT. In many cases, this will be through the application of the MACT technologies. However, in some cases, the emission unit at the major source may already be controlled to some extent with an existing control technology. The owner or operator could demonstrate that using additional control strategies in combination with existing controls will allow the emission unit to achieve the required emission reductions. For instance, an emission unit may currently be controlled with a baghouse. The MACT emission limitation for the emission unit may be based on use of an electrostatic precipitator. The emission unit may be able to

meet the MACT emission limitation by installing a series of baghouses in lieu of the electrostatic precipitator.

Owners or operators are reminded that the application of a case-by-case MACT to an affected source does not exempt that owner or operator from complying with any future emission standards affecting that affected source. The applicability and impact of subsequently promulgated MACT standards is addressed in 40 CFR 63.56. Owners or operators may wish to consider these factors when selecting a control technology to meet the MACT emission limitation.

5.3 Applicable Monitoring, Reporting and Recordkeeping, and Compliance

The permitting authority should identify monitoring parameters in consultation with the applicant to assure compliance with the MACT emission limitation. However, the permitting authority is ultimately responsible for these monitoring parameters, as well as reporting and recordkeeping requirements at permit issuance. Section 2.2 of Chapter 2 discusses compliance provisions in greater detail.

Chapter 6.0

Costs, Non-Air Health and Environmental Impacts, and Energy Impacts

Section 112(d) of the Act specifies that if control technology alternatives are being considered to establish an emission standard that would result in emission limitations more stringent than the emission "floors," they must be evaluated by considering costs, non-air quality health and environmental impacts, and energy requirements associated with the expected emission reductions.

The costs, non-air quality health and environmental impacts, and energy requirements discussed below are illustrative only and are not intended as an exclusive list of considerations for MACT determinations. Some of these factors may not be appropriate in all cases, while in other instances, factors which are not included here may be relevant to the MACT determination. The discussion does not address the evaluation of each factor nor the weighing of any factor relative to another. Such determinations should be made on a case-by-case basis by the owner/operator and permitting authority. For the purpose of this guidance, terms such as "emission control system" or "MACT system" refer to design, equipment, or operating standards and inherently less polluting processes, as well as add-on control equipment.

In general, the impact analyses for MACT determinations should address the direct impacts of alternative control systems. Indirect energy or environmental impacts are usually difficult to assess, but may be considered when such impacts are found to be significant and quantifiable. Indirect energy impacts include such impacts as energy to produce raw materials for construction of control equipment, increased use of imported oil, or increased fuel use in the utility grid. Indirect environmental impacts include such considerations as pollution at an off-site manufacturing facility that produces materials needed to construct or operate a proposed control system. Indirect impacts generally will not be considered in the MACT analysis since the complexity of consumption and production patterns in the economy makes those impacts difficult to quantify. For example, since manufacturers purchase capital equipment and supplies from many suppliers, who in turn purchase goods from other suppliers, accurate assessment of indirect impacts may not be possible. Raw materials may be needed to operate control equipment, and suppliers of these resources may change over time. Similarly, it is usually not possible to determine specific power stations and fuel sources that would be used to satisfy demand over the lifetime of a control device.

In most cases, duplicative analyses are not required in preparing the MACT impact analyses. Any studies previously

performed for Environmental Impact Statements, air permits, water pollution permits, or other programs may be used when appropriate. The permitting authority also may consider any special economic or physical constraints that might limit the application of certain control techniques to an existing emission unit, such as retro-fitting costs that would not be borne by a new unit, or the remaining useful life of the emission unit. The result may be that the level of control required for an existing emissions unit may not be as stringent as that which would be required if the same unit were being newly constructed at an existing plant or at a "greenfield" facility. However, in no event shall the level of control yield an emission limit less stringent than the MACT floor when information is available to compute the MACT floor.

6.1 Cost Impacts

Cost impacts are the costs associated with installing, operating, and maintaining alternative emission control systems (add-on emission control devices or process changes.) Normally, the submittal of very detailed and comprehensive cost data is not necessary. Presentation of the quantified costs of various emission control systems (referred to as control costs,) coupled with quantities of HAP emission reductions associated with each of the emissions control systems, is usually sufficient.

Once the control technology alternatives and emission performance levels have been identified, total capital investment and total annual cost should be developed. Total capital investment (purchased equipment plus installation) and total annual costs of each emission control system should be presented separately. Total annual costs are comprised of operation and maintenance costs ("direct annual costs",) administrative charges ("indirect annual costs"), plus overhead, taxes, insurance, and capital recovery costs minus recovery credits (credit for product recovery and by-product sales generated from the use of control systems and other emission reduction credits.) These costs should be reported in equal end-of-year payments over the time of the equipment. Total annual costs should be reported on an overall basis, as well as an incremental basis. The various emission control systems should be presented or arrayed in terms of increasing total annual cost. The incremental annual cost of a particular emission control system is the difference in its cost and the cost of the next less stringent control.

A method for determining the acceptability of control costs is the comparison of the cost effectiveness of alternative control systems. Average cost effectiveness is the ratio of total annual costs (calculated using the above guidelines) to the total amount (tons or Mg) of HAP removed. Incremental cost effectiveness is calculated using the same procedure as outlined

for calculating incremental annual cost. Generally, cost-effectiveness values falling within the range of previously acceptable MACT decisions are considered acceptable. Therefore, consistency with the relative cost, or cost effectiveness, of a past MACT determination for a similar source is an indication that such a cost is reasonable for the MACT determination in question.

For most MACT determinations, a cost analysis focusing on incremental cost effectiveness of various MACT alternatives is sufficient. The analysis should include and distinguish the various components used to calculate the incremental cost effectiveness of the control alternatives (i.e., lifetime of the equipment, total annual costs, tons of total HAP removed, etc.).

If there is reason to believe that the control costs place a significant burden on the entity being controlled, then the cost analysis should include financial or economic data that provide an indication of the affordability of a control relative to the source. For example, if the per unit cost is a significant portion of the unit price of a product or if the economic status of the industry is declining, then the cost analysis should present the relevant economic or financial data. Financial or economic data should include parameters such as after-tax income or total liabilities.

6.2 Environmental Impacts

The environmental impacts concentrate on collateral environmental impacts due to control of emissions of the pollutant in question, such as solid or hazardous waste generation, discharges of polluted water from a control device, visibility impacts (e.g., visible steam plume), or emissions of other air pollutants. The permitting authority should identify any environmental impacts associated with a control alternative that has the potential to affect the selection or rejection of that control alternative. Some control technologies may have potentially significant secondary environmental impacts. Scrubber effluent, for example, may affect water quality and land use, and, similarly, technologies using cooling towers may affect visibility. Other examples of secondary environmental impacts could include hazardous waste discharges, such as spent catalysts or contaminated carbon. Generally, these types of environmental concerns become important when sensitive site-specific receptors exist or when the incremental emissions reduction potential of one control option is only marginally greater than the next most effective option.

The procedure for conducting an analysis of environmental impacts should be made based on a consideration of site-specific circumstances. In general, the analysis of environmental impacts starts with the identification and quantification of the solid,

liquid, and gaseous discharges from the control device or devices under review. Initially, a qualitative or semi-quantitative screening can be performed to narrow the analysis to discharges with potential for causing adverse environmental effects. Next, the mass and composition of any such discharges should be assessed and quantified to the extent possible, based on readily available information. As previously mentioned, the analysis need only address those control alternatives with any environmental impacts that have the potential to affect the selection or rejection of a control alternative. Pertinent information about the public or environmental consequences of releasing these materials should also be assembled. Thus, the relative environmental impacts (both positive and negative) of the various alternatives can be compared with each other.

Also the generation or reduction of toxic and hazardous emissions other than those for which the MACT determination is being made and compounds not regulated under the Clean Air Act are considered part of the environmental impacts analysis. A permitting authority should take into account the ability of a given control alternative for regulated pollutants to affect emissions of pollutants not subject to regulation under the Clean Air Act in making MACT decisions. Consequently, the ability of a given control alternative to control toxic or hazardous air

contaminants other than those for which the MACT determination is being made, should be considered in the MACT analysis.

6.3 Energy Impacts

Energy impacts should address energy use in terms of penalties or benefits associated with a control system and the direct effects of such energy use on the facility. A source may, for example, benefit from the combustion of a concentrated gas stream rich in volatile organic compounds; on the other hand, extra fuel or electricity is frequently required to power a control device or incinerate a dilute gas stream. If such benefits or penalties exist, they should be quantified to the extent possible.

In quantifying energy impacts, the direct energy impacts of the control alternative in units of energy consumption at the source (e.g., Btu, Kwh, barrels of oil, tons of coal) should be estimated. The energy requirements of the control options could be shown in terms of total and/or incremental energy costs per ton of pollutant removed. In many cases, because energy penalties or benefits can usually be quantified in terms of additional cost or income to the source, the energy impacts analysis can be converted into dollar costs and, where appropriate, be factored into the cost analysis.

Indirect energy impacts (such as energy to produce raw materials for construction of control equipment) are usually not considered. However, if the reviewing agency determines, either independently or based on a showing by the applicant, that an indirect energy impact is unusual or significant, the indirect impact may be considered. The energy impact should still, however, relate to the application of the control alternative and not to a concern over energy impacts associated with the project in general.

The energy impact analysis may also address the concern over the use of locally scarce fuels. The designation of a scarce fuel may vary from region to region, but in general a scarce fuel is one which is in short supply locally and can be better used for alternative purposes, or one which may not be reasonably available to the source either at the present time or in the near future.

Chapter 7.0

Sources of Information

There are currently several programs under development to house and disseminate toxics information. Some of these programs are designed for specific, narrow purposes, while others are employed in a broader range of uses. Most data collection programs are designed to be compatible with the Aerometric Information Retrieval System (AIRS)/AIRS Facility Subsystem (AFS).

The purpose of this chapter is to present various sources of toxics information which may be of assistance to States and industry in making MACT floor determinations. These sources of toxic information are available in a database format. The EPA believes the requirements of Section 112(j) can be less burdensome to both industry and States by employing a database system to document similar-category sources and provide a bibliography of information to make a sound MACT floor determination. The MACT floor determinations and MACT must be based on data demonstrating performance levels actually achieved in practice by sources. Performance claims, expectations, design plans, etc. should be substantiated by methods representative of those that sources will have to comply with.

Another significant resource to aid permitting authorities in developing case-by-case MACT will be proposed regulations for the subject source categories, or closely related regulations in similar industries. Proposed regulations will contain what EPA believes MACT is at the time of proposal. Although permitting authorities are not required to adopt proposed MACT, and the proposed rule should not be considered a default MACT, it can still serve as a suggestion for what the latest thinking is and would be the result of analysis of the largest body of information.

In addition to the following sources of information, the EPA home page on the World Wide Web includes a wealth of information, including some of the data bases described below. The reader may wish to consult the following websites for additional information:

1. EPA: http://www.epa.gov/epahome/index.html
2. Office of Air and Radiation: http://www.epa.gov/oar/oarhome.html
3. Office of Air Quality Planning and Standards: http://www.epa.gov/oar/oaqps
4. Air Toxics Website: http://www.epa.gov/ttn/atw/

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS) TOXICS PROGRAM

The AIRS is designed to accommodate the expansion of emissions data. The AIRS/AFS is a National Data System currently residing on the National Computer Center (NCC). The stationary source component of this system replaced the old National Emission Data System (NEDS) as the data repository for point source data (e.g., electric utilities, industrial plants and commercial enterprises). The AIRS/AFS system is expected to eventually provide the capabilities needed to house information from the Title V operating permits program.

Many States input their data directly into the AIRS and perform calculations and retrievals. When a converter (an interface between AIRS and the State system) is used, the data can be input directly to the State system and to the appropriate fields in AIRS in a single step. Data can also be retrieved from AIRS directly, or into the State format using a converter.

Because many data sources are fed into AIRS/AFS, some of this data may be useful for case-by-case MACT determinations and MACT standards. This advantage is expected to become more visible as the search for the 12-percent floor for a source category or subcategory becomes a common occurrence.

INFORMATION COLLECTION REQUESTS (ICR) DATA

For the national MACT standards program, the EPA is currently involved in data collection activities for many of the

source categories on the list. These data collection activities are designed to help answer, for a given category, a number of important questions:

- -- What are the sources of emissions for the category?
- -- Which HAPs are emitted and at what rates?
- -- What alternatives are available to reduce those emissions?
- -- What costs would be imposed for the control alternatives, and what economic impacts would the alternatives have on the business climate for the industry?
- -- Which alternatives meet or exceed the "MACT floor" (for new sources, the "best controlled similar source;" for existing sources, the level achievable by the "average of the best performing 12 percent" of sources in the category)?
- -- Given the alternatives available, which alternative represents the "maximum degree of reduction achievable," taking into account costs, benefits, and the constraints imposed by the "MACT floor?"

RACT/BACT/LAER CLEARINGHOUSE (RBLC)

The RBLC maintains a database consisting of 3,600 (and growing) Reasonably Available Control Technology (RACT), Best Available Control Technology (BACT), and Lowest Achievable Emission Rate (LAER) determinations made by State and local agencies for specific sources, as required by the Act. The RACT determinations address emission requirements for existing sources located in nonattainment areas. The BACT and LAER address emission requirements for major new or modified sources located

in attainment and nonattainment areas, respectively. Database parameters include: facility information; process description; pollutant information (including emission limit); pollution prevention and/or control technology method; compliance verification information; and cost information (if it exists). The Act requires agencies to submit LAER determinations to the RBLC. The RACT and BACT determinations are submitted on a voluntary basis.

The RBLC also maintains a regulation database that summarizes Federal new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP), and maximum achievable control technology (MACT) standards. The regulation database parameters are similar to those in the RACT/BACT/LAER database, but also include Federal Register and regulation background documentation information.

The RBLC can be accessed through the Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN) electronic bulletin board system. For more information, access the RBLC on the TTN or contact the EPA Information Transfer Group at (919) 541-5547.

GREAT WATERS PROGRAM

In order to provide information needed for decision making, the Great Waters program is evaluating HAPs emission data, especially for the Great Lakes region. (Section 112(c)(6) requires national emission inventories for alkylated lead; polycyclic organic matter; hexachlorobenzene; mercury; PCBs; 2,3,7,8-tetrachlorodibenzofurans; and 2,3,7,8-tetrachlorodibenzo-p-dioxin.) Periodic reports to Congress are required to provide information on: relative pollutant loading contributed to aquatic ecosystems from the atmosphere; adverse effects of that loading on human health and the environment; whether the atmospheric deposition causes or contributes to violations of water quality standards or criteria; and sources of the atmospherically deposited pollutants. The goal of the program is to determine if additional regulation is warranted, and if so, what it should entail. For additional information on the Great Waters Program, or for referral to related emission inventory efforts, call the EPA Visibility and Ecosystem Protection Group at 919-541-5531.

AIR TOXIC EMISSION FACTORS

Emission factors are used in lieu of emission estimates based upon source testing, and they can be used to estimate the emissions of a particular HAP per unit process rate (i.e., pounds

of nickel emitted for each ton of nickel ore processed). These emission factors can be based on controlled and uncontrolled processes, and can, therefore, be used to help determine which control measures are best suited to a particular process. The EPA has developed screening methods for the development of air toxics emission factors, and applies the screening methods to test results as they become available for use.

The toxic emission factors available through the Factor Information Retrieval System (FIRE) and the EPA document, Compilation of Air Pollution Emission Factors (AP-42) are rated A (most reliable, based on several tests meeting high confidence criteria) through E (least reliable, having limited available information). Toxic emission factors are being developed for about 170 the 189 HAPs on the Section 112(b) list, representing many (but not all) processes in Section 112 source categories.

About 40 of the HAPs in FIRE have been targeted as "critical" pollutants because they are found in a wide variety of industries, and/or are especially toxic. Many of the emission factors for this critical group have a rating of A or B, enabling users to arrive at the most accurate emissions estimates presently possible. For more information on FIRE, contact INFOCHIEF at 919-541-5285.

STATE AIR OFFICE DATABASES

Emission Standards Division (ESD) staff have worked with STAPPA/ALAPCO to better characterize the toxics information available in database form and hard copy within the State air offices.

Most States have compiled pollutant information in some form in response to State Implementation Plan (SIP) requirements. Many States also have toxics information collection systems, as well as State requirements for toxics programs. Most States find that although internally their system is widely used (intra-State system), to down load or upload data on an inter-State basis is nearly impossible (with the primary exception to this being States within a transport region, and then usually under limited circumstances).

TRADE JOURNALS AND VENDOR INFORMATION

Caution should be taken when employing information in trade journals and from vendors, especially in noting the method of emissions estimation, number of tests that were used in developing estimates, and the conditions under which tests were conducted. Other factors that may affect the emissions estimates should also be identified, and the effects of their differences quantified as accurately as possible. Because results applicable to only one or a small group of facilities cannot be completely accurate for other facilities, this source of information is not

regarded as highly accurate, but may provide some useful information on control alternatives.

Other sources of information that may be consulted in making MACT floor determinations are listed below. This list is not inclusive, but may provide useful information.

Air Pollution Training Institute (APTI). December 1983. Overview of PSD Regulations. EPA 450/2-82-008.

Air Pollution Training Institute (APTI). June 1983. Air Pollution Control Systems for Selected Industries. EPA 450/2-82-006.

Environmental Protection Agency (EPA). May 1992. Facility Pollution Prevention Guide. EPA 600/R-92/088.

Environmental Protection Agency (EPA). February 1992. Documentation for Developing the Initial Source category or subcategory List. EPA 450/3-91-030.

Environmental Protection Agency (EPA). June 1991. Hazardous Waste TSDF - Background Information for Proposed RCRA Air Emission Standards. EPA 450/3-89-023 (a) and (c).

Environmental Protection Agency (EPA). October, 1990. New Source Review Workshop Manual. EPA, Research Triangle Park, NC (Draft Document).

Environmental Protection Agency (EPA), January 1990. OAQPS Control Cost Manual. EPA 450/3-90-006.

Environmental Protection Agency (EPA). June 1991. Control Technologies for Hazardous Air Pollutants. EPA 625/6-91/014.

Air & Waste Management Association. 1992. Air Pollution Engineering Manual. Van Norstrand Reinhold.

Appendix A

Examples of MACT Analyses

The following detailed examples presented in this manual are for illustrative purposes only. Numbers and values presented in this Appendix do not necessarily reflect any known cases and are not meant to establish any official EPA position regarding MACT determinations for a particular MACT-affected source. These examples are hypothetical and are designed to highlight many of the subtle aspects of the MACT determination process. In many cases, the scenarios and available control technologies have been grossly oversimplified to streamline the presentation of the examples.

The following examples are presented in this Appendix:

Example 1 - Determining the MACT Emission Unit

Example 2 - Using Control Efficiency Ratings to Determine the MACT Floor

Example 3 - When the MACT Floor is Determined Using Emission Reduction Ratios

Example 4 - When the MACT Floor is Equal to "No Control"

Example 1

Determining the MACT Emission Unit

This example illustrates possible grouping mechanisms and rationale for developing one or more MACT emission units at a given facility subject to a MACT determination under Section 112(j).

Description of Source

In this example, a metal furniture manufacturer produces military-specification office furniture for use in military barracks. The plant currently operates 2,080 hr/yr and produces 12,000 units of furniture annually. The facility is considered a major source of HAP emissions.

Existing unit operations include:

1) Wood Processing

Raw wood and formica are glued together to form a laminate. The glue is applied using an automatic application system. Several laminates are then positioned in a press for glue curing. Next, the boards undergo various woodworking operations including, cutting, drilling, and routing. Boards are either transferred to assembly or directly packaged and shipped. Tetrachloroethylene is a component of the glue. Glue stations are vented to emission stacks on the ceiling. The stacks are currently uncontrolled.

The glue is stored in 50 gallon drums. Glue is transferred to the application equipment through a pumping mechanism. Estimated yearly emissions of HAP from this operation is 0.50 tpy.

2) Metal Processing

Metal stock is cleaned by immersion in a toluene dip tank. A toluene, grease, and dirt sludge is produced, which is pumped from the bottom of the tank for disposal. After cleaning, the metal undergoes various metalworking operations including cutting, punching, folding, and welding. Pieces are partially assembled, then transferred to one of two paint coating operations. The dip tank is currently controlled with a condensing unit and a freeboard ratio of 0.75. Yearly controlled emissions are estimated at 19 tons/yr. Uncontrolled emissions are estimated at 55 tpy.

3) Cleaning Operations

The spray coating operations begin with a five-stage cleaning process. The first stage is an alkaline-wash tank. Next, parts are sprayed with an iron phosphate solution. The fourth stage is a rinse tank. Finally, parts are sprayed with a rust preventive. After cleaning, the parts are conveyed to a dry-off oven and then to the paint coating line. No HAP emissions occur during this part of the operation.

4) Painting Operations

There are currently four spray booths in the paint coating operation and one coating dip-tank. Large metal parts are coated using the spray booths. A one-color coating is applied at a coating depth of 1 ml. Two of the booths are equipped with continuously recirculating water curtains to entrap paint overspray. Entrapped paint solids and wastewater are dumped to a holding tank periodically. Air filters are used in the two remaining spray booths. The air filters are periodically replaced. The used filters are placed in storage drums for later disposal.

All spray booths are equipped with hand-held spray guns. Transfer efficiency is estimated at 45 percent for both types of booths. The paint is a high solvent paint containing xylene and toluene with an estimated 35-percent solids content and 65-percent solvent content. The spray guns are periodically sparged and rinsed with acetone to prevent clogging. The acetone paint mixture is sent to storage tanks for later disposal. Emissions from the booths are currently vented to the roof with no control device.

After painting, parts are conveyed through a flash-off area to one of two dry-off ovens and then to assembly. Small metal parts are dip-painted in the coating dip-tank, allowed to air dry, and then transferred to the assembly area.

Total annual HAP emissions from this area are estimated at 55 tpy. Each spray booth contributes 8 tpy and each drying oven 4 tpy. Estimated emissions from the coating dip-tank are 15 tpy. No emission estimates are available for the flash-off area.

From this description, the following emission points are identified as potentially "affected emission points" by the Section 112(j) MACT determination process:

- Glue storage drums
- Glue stations (stack emissions)
  - --Application equipment
  - --Curing presses
- Toluene dip tank*
- Toluene storage tanks*
- Toluene/sludge waste storage tanks*
- Spray booths (stack emissions)
  - -- Feed and waste lines
  - -- Application equipment
- Coating dip-tank
- Flash-off area (large parts)
- Drying area (small parts)
- Paint storage tanks
- Solvent storage vessels
- Paint sludge storage tanks
- Drying ovens (stack emissions)
- Air filter storage drums

* These units would be eliminated from any MACT emission unit because the emission points would be part of the degreasing source category or subcategory, not the miscellaneous metal parts surface coating source category or subcategory.

Possible MACT emission unit scenarios:

Scenario #1: Five MACT emission units:

- Wood processing
- Spray coating operations

- Storage tanks
- Storage drums
- Equipment leaks

This scenario could make sense if a MACT floor could be identified or control technologies could be applied to the emission units. In wood processing, the emissions are vented to a stack on the roof. These emissions could be controlled with a variety of add-on control devices. The source could also consider switching to a glue that has a lower concentration of a HAP or does not contain any HAPs.

In the spray operations, the source could switch to a low-solvent paint or water-based paint. This control option would need to be weighed against controlling the individual emission points. Other control options to consider would be an add-on control device to control the stack emissions from the spray booth and oven, increasing the transfer efficiency of the spray application equipment, and controlling the drying, flash-off areas, and the coating dip-tank with separate control technologies.

Controlling the storage tanks as one emission unit may allow flexibility in meeting MACT. Some tanks could remain under controlled while others could be over-controlled. This option would need to be weighed against the cost effectiveness and emission reductions of applying controls to all of the storage

tanks. The storage drums could be placed in a contained area and the emissions vented to one control device.

Equipment leaks are not suitable for combination with other emission units because they are only controllable using work practice and other unquantifiable emissions reductions procedures.

Scenario #2: Four MACT-affected emission units:

- Stack emissions (spray booths, glue stations, drying ovens)
- Storage tanks and drums
- Coating dip-tank
- Equipment leaks

In this scenario, the stack emissions from the spray booths, glue stations and drying oven could all be vented to a single control device. This option would need to be weighed against the emission reductions that could be obtained by applying pollution prevention strategies to the individual operations. If the storage tanks and drums are stored in a common location, such that the emissions from the area could be vented to a control device, this emission point aggregation could make sense. The emission reduction would need to be weighed against controlling the emission points separately. If greater emission reductions could be obtained by controlling these points separately, this aggregation of points may not be acceptable.

Scenario #3: Seven MACT emission units:

- Each storage tank
- Each spray booth

- Stack emissions from glue stations and drying ovens
- Equipment leaks
- Each storage tank
- Each storage drum
- Coating dip-tank

If detailed data are available for each of these individual emissions units, then one approach would be to compile that data and develop a MACT floor data base for each type of emission unit. This scenario would generally be acceptable unless a pollution prevention method could be applied to one of the processes that could obtain a greater degree of emission reductions then point-by-point compliance.

Scenario #4: All emission points.

This scenario would generally be unacceptable because, as described in Scenario #1, equipment leak emissions should not be included in a source category- or subcategory-wide emission unit.

Scenario #5: Two MACT emission units:

- Equipment leaks
- Remaining emission points

This aggregation of emission units could be acceptable if emissions information were available on HAP emissions or control technologies from the source category or subcategory as a whole, or if the nature of the industry demanded a large degree of flexibility in the application of MACT.

Example 2

Using Control Efficiency Ratings

to Determine the MACT Floor

Description of Source

In this example, a MACT determination is to be conducted on a quenching process at a coke-by product plant. Hazardous emissions can be released when the hot coke in the quench car is sprayed with water to decrease the coke's temperature. Phenol and naphthalene emissions can occur in the gaseous state. Other pollutants can sorb to particulate matter and be collectively released. The permitting authority will need to conduct a MACT analysis to determine the MACT emission limitation based on the emission reduction that can be achieved by MACT. The permitting authority will begin with the Tier I analysis.

Step 1: Identify the MACT emission unit(s)

MACT unit: quenching tower and coke car # of existing sources: 36

The equipment used in this production process includes the quenching tower, coke car, water delivery system, and water storage system. The permitting authority decides that emission points from the quenching tower and coke car should be considered one MACT emission unit, and the water delivery system and water

storage system as another MACT emission unit. The example will be continued for only the quench tower/coke car emission unit.

Step 2: Make a MACT Floor Finding

	Technology	# of plants using	Emission control efficiency, %
1)	Use clean water to quench coke with baffles at the top of the quench tower	10	not quantifiable
2)	Use covered quenched car. Cool outside of car. Water does not impact coke. Place car on cooling rack after quenching for additional heat dissipation	1	almost 100%
3)	Wet scrubber, connected to fixed duct system	10	80-90%
4)	Wet scrubber, mobile unit attached to coke quench car	14	80-90%
5)	Dry quenching with inert gases. Heat transported to waste-heat boiler	1	99-100%

The permitting authority decides to use the control efficiency ratings to determine the MACT floor. There are a

total of 36 existing sources. The MACT floor would be equivalent to the arithmetic mean of the control efficiency ratings for the best five sources. If a specific control efficiency rating is not available for the best performing five sources, a median or mode could be used to calculate the MACT floor. Using the information provided, the median of the best performing 12 percent of sources would be equal to 80-90 percent or control technology 3 or 4. The mode would be technology number 4.

Step 3: Identify MACT

Technologies 2, 3, 4, or 5 could be chosen as MACT. Technology 1 could also be considered because its control efficiency is not quantifiable. If technology 1 is to be considered further, a more detailed analysis would be required to prove that the technology could obtain an equal or greater amount of emission reductions. In this case, the efficiency of technology 1 will vary by the concentration of hazardous constituents. Using clean water could result in a less toxic release when the concentration of toxins in the hot coke are less, but increased emissions could result with increased concentrations. The other proposed technologies would operate at a relatively constant efficiency rate, regardless of the pollutant concentration. Therefore, technology 1 would be considered inferior to the other technologies and should be eliminated as a potential candidate.

The permitting authority should identify MACT based on the control technology that achieves a maximum degree of emission reduction with consideration of the costs, non-air quality health and environmental impacts and energy requirements associated with use of each control technology. After identifying MACT, the permitting authority would proceed to Tier III of the analysis.

Example 3

When the MACT floor is Determined

Using Emission Reduction Ratios

Description of Source

A surface coating operation treats a product with its existing equipment consisting of a dip-tank priming stage followed by a two-step spray application and bake-on enamel finish coat. The product is a specialized electronics component (resistor) with strict resistance property specifications that restrict the types of coatings that may be employed.

Step 1: Identify the MACT emission unit(s)

MACT emission units:

- Dip-tank
- Feed and waste lines in prime coating operation
- Spray coat booth, spray coat application equipment
- Drying oven
- Storage tank in prime coating operation
- Storage tank in finish coating line
- Paint supply system

There are two process units within this source category or subcategory: the prime coating line and the finish coating line. Equipment within the prime coating line that have affected emission points are a dip-tank, storage containers, feed line to supply new coating into the dip-tank, and a waste line to drain the dip-tank. Because the feed line and waste lines have equipment leak emissions, these emission points should be

combined to form a MACT emission unit. The permitting authority will consider the dip-tank and each storage container a separate affected emission unit. Therefore, the three MACT emission units in this process unit are the dip-tank, the storage container, and the feed and waste lines.

The finish coating line consists of two spray booths, spray application equipment, paint supply system, a storage container, and a drying oven. The permitting authority decides to combine affected emission points to form the following MACT emission units: the spray application equipment and spray booths; the paint supply system, the storage container, and the drying oven. For simplicity of this example, the MACT analysis will be continued for only the spray application equipment and spray booths.

Step 2: Make a MACT floor finding

Parts A and B: Compute the Uncontrolled Emissions and Controlled Emissions

Table 1 presents an overview analysis of emissions information for similar emission units within the source category or subcategory.*

Table 1.

* The permitting authority should consider whether the process constraints resulting from production specification or other requirements (see Step 3) warrant subcategorization within the category for the purpose of MACT determinations. For the purpose of this example, it is assumed that there will be no subcategorization.

TECHNOLOGY	# OF SOURCES USING
1) Water-based coat	2
2) Low-VOC solvent/high solids coat	4
3) Electrostatic spray application to enhance transfer efficiency	7
4) Low-VOC solvent/high solids coating with electrostatic spray application	8
5) Powder coat paint with electrostatic spray application	1
6) High-VOC solvent coating	7
Total:	29

Table 2 presents the detailed analysis of emission information in this example.

Table 2.

SOURCE	TECHNOLOGY #	UNCONTROLLED EMISSIONS (TONS/YR)	CONTROLLED EMISSIONS (TONS/YR)	EMISSION REDUCTION RATIO
1	6	10	10	0
2	3	26	14	.46
3	2	48	22	.54
4	3	86	56	.35
5	3	98	55	.44
6	6	26	22	.15
7	6	35	34	.03
8	3	78	55	.29

9	2	69	25	.64
10	2	15	11	.27
11	6	11	11	0
12	6	12	12	0
13	6	23	22	.04
14	3	85	52	.39
15	2	141	89	.39
16	3	25	20	.20
17	4	159	100	.37
18	5	126	11	.91
19	4	35	14	.6
20	3	25	16	.36
21	4	68	22	.70
22	4	46	10	.78
23	1	95	10	.89
24	6	96	16	.83
25	4	64	25	.61
26	4	98	31	.68
27	4	168	45	.73
28	4	196	63	.68
	1	255	26	.90

Table 3 presents the top 5 ranked sources.

Table 3.

SOURCE	TECHNOLOGY #	UNCONTROLLED EMISSIONS (TONS/YR)	CONTROLLED EMISSIONS (TONS/YR)	EMISSION REDUCTION RATIO
18	5	126	11	.91
29	1	255	26	.90
23	1	95	10	.89
24	6	96	16	.83
22	4	46	10	.88

	Average of Top 5	618	73	.88

Part C: Compute the Emission Reduction Ratio for the MACT Emission Unit

One option is to calculate the MACT floor based on the average of the emission reduction ratio achieved by the top 5 existing emission units. The top 5 sources are used for this calculation because there are less than 30 sources in the source category. In this case, the MACT floor would be equal to the arithmetic mean of the emission reductions obtained by the top 5 sources in the source category or subcategory, or an 88 percent emission reduction ratio [1 - (sum of controlled emissions ÷ sum of uncontrolled emissions)] or the emission reductions that can be achieved when control technologies 1, 4, or 5 are used at the top-ranked sources.

Part D: Determine a MACT emission limitation (MEL)

Calculate an uncontrolled emission rate (UCEL) for the MACT emission unit based on the normal operation of the emission unit. Emission reductions obtained through a pollution prevention strategy would not be included in the UCEL calculation. The permitting authority calculates the UCEL for this emission unit to be 125 tons/yr total HAPs. Based on this UCEL, The MEL for this emission unit would be

MEL = 125 tons/yr * (1 - 0.88)

= 15 tons/yr

The permitting authority would advise the permit applicant of the MEL and allow the applicant to determine how this level of emission reductions will be achieved.

Step 3: Select a control technology to meet the MACT Emission Limitation

In this example, the nature of the product requires a specific type of coating, and the applicant is unable to use any of the reviewed technologies to meet the MEL. The owner and operator will analyze other control technologies that are applied to control similar emission points. In this example, the similar emission points have operational losses. Review of control technologies to control operational losses identifies add-on control devices such as a carbon absorber, a thermal or catalytic incinerator, or a condenser. The owner or operator should conduct a cost, non-air quality health and environmental impacts and energy requirements analysis on the available control technologies.

The major source already has a catalytic incinerator on site. The emissions from the spray application equipment and spray booth could be channeled to the incinerator. This would require the installation of a venting system including a pump mechanism. It would also require an increased volumetric flow

rate to the incinerator and increase auxiliary fuel requirements. The incinerator had been operating at a 90-percent efficiency. With an increased volumetric flow rate, the efficiency is projected to drop to 87-percent efficiency. The owner and operator must obtain an additional 1-percent emission reductions. Possible control technologies include increasing the operating temperature of the incinerator, or adding electrostatic application to the spray process to enhance transfer efficiency. Limiting the hours of operation at the MACT emission unit could be considered if the reduced production were part of an overall source reduction program.

Use of the specialized coating in this operation will increase the concentration of hazardous pollutants in the water used for the water curtain. The proposed control technology does not affect the concentration of pollutants in the wastewater. This could be considered a negative environmental impact and may be reason to consider another control technology to meet the MACT emission limitation. In this instance, the owner or operator will not violate the NPDES permit, so the control technology will not be eliminated from consideration.

The owner or operator uses this step to demonstrate that despite the increase in volumetric flow rate and the auxiliary fuel requirement, a significant increase in CO_2 emissions does

not occur. The owner or operator concludes that the impacts associated with use of this technology are reasonable.

After reviewing the technologies the owner or operator selects the incinerator with a limit on the hours of operation. The owner or operator proposes to start a training program for spray booth operators to decrease the error and product rejection rate. By doing this, the owner or operator can reduce the hours of operation and still meet customer demands for the product. This option is chosen over the other two because increasing the incinerator's operating temperature would require additional auxiliary fuel input, and enhancing the transfer efficiency with electrostatic application would be cost prohibitive. The owner or operator would document that use of the selected control technologies can reduce emissions to the required level.

Example 4

When the MACT floor is Equal to "No Control"

Description of Source

A commercial treatment storage and disposal facility receives off-site wastes from various pesticide manufacturers. A solvent/aqueous/pesticide mixed waste is passed through a distillation column where the organic solvents are vaporized and then condensed into a distillate receiver. The solvent is transferred using tank cars to a tank farm that is located at another portion of the plant. The low-grade solvent is then sold to industrial users. The pesticide-laden wastewater is then passed through a series of carbon adsorbers where the majority of pesticide is removed from the water. The water is then discharged to a Publically Owned Treatment Works (POTW). The carbon adsorbers are periodically steam stripped to regenerate the carbon.

Tier I - Step 1: Identify the MACT emission unit(s)

MACT emission units:

- Each storage tank
- Distillation column, condenser, and distillate receiver
- Three carbon absorbers
- Pumps, feed lines and transfer lines
- Loading racks

The two process units that contain emission points affected by this modification are the recycling process and the tank farm.

The equipment and apparatus associated with the affected emission points are pumps, feed lines, a distillation column, a condenser, a distillate receiving tank, three carbon absorber and transfer lines, and a loading rack. The permitting authority will consider the three carbon absorbers and the associated emission points as one emission unit because a single control technology could be practically designed to cover all three affected emission points. The permitting authority will also group the distillation column, distillate receiver and condenser into one MACT emission unit. The feed lines, pumps, and transfer lines would have equipment leak emission losses and would be another affected emission unit. The permitting authority decides to consider the emission points and equipment for the loading rack and tanks as separate MACT emission units. If all the tanks were structurally similar in design one determination could be made that would be applicable to all the tanks.

Step 2: Make a MACT floor finding

For simplicity of this example, the MACT analysis will only be continued for a tank emission unit. All the storage tanks will be structurally similar, so only one MACT determination will be required. The permitting authority reviews existing data bases and determines that less than 12 percent of tanks in the source category or subcategory are controlled. Therefore the

MACT floor is equal to "no control". This is not automatically an acceptable "control" measure, therefore Tier II of the MACT analysis must be completed. In Tier II of the analysis control technologies for similar emission points from outside the source category or subcategory will also be considered.

Tier II - Step 1: List all available control technologies

The following technologies have been identified as possible control technologies that can be applied to a storage tank to control working and breathing emission losses:

	Technology	Emission control efficiency, %
1)	Fixed-roof	93
2)	Fixed-roof plus internal floating roof	96
3)	Pressure tank	96
4)	Fixed-roof vented to a carbon canister	98
5)	Fixed-roof vented to a combustion device	99
6)	Fixed-roof vented to a carbon absorber	100

Step 2: Eliminate technically infeasible control technologies

All of the available control technologies are technically feasible.

Step 3: Conduct a non-air quality health, environmental, economic and energy impacts analysis

The following series of tables illustrate a non-air quality health, environmental, cost and energy impacts analysis for each control option.

Table 1 presents information describing the secondary air impacts and other resource demands of the various control technologies that are technically feasible.

Table 2 presents the control options along with their costs and emission reductions. The average cost effectiveness of each control option is also presented. The average cost effectiveness is the ratio of the total annual cost to the total amount of HAP removed compared to the baseline. Note that the control options are presented in terms of increasing emission reductions (i.e.,

Table 1.

CONTROL OPTION	SECONDARY AIR IMPACTS	RESOURCE DEMANDS
1) Fixed roof	None	None
2) Fixed roof + internal roof	None	None
3) Pressure tank	None	None
4) Cover and vented to carbon canister	Emissions if carbon regenerated	Disposal of container, solvents for regeneration
5) Cover and vent to combustion device	Increased CO, NOx, SOx, and particulate emissions	Fuel source, disposal of ash
6) Cover and vent to carbon absorber	Emissions when carbon regenerated	Disposal of spent carbon, solvents for regeneration

Table 2.

CONTROL OPTION	CONTROL EFFICIENCY	ANNUAL COST ($)	EMISSION REDUCTION (Mg/Yr)	AVERAGE COST EFFECTIVENESS ($/Mg)[a]
1	93	85,000	72	1,181
2	96	113,000	88	1,284
3	96	232,000	88	2,636
4	98	110,000	92	1,196
5	99	136,000	103	1,320
6	100	189,000	117	1,615

[a] Average cost effectiveness is the annual cost of each control option divided by the annual emission reduction of that option (e.g., $85,000/yr ÷ 72 Mg/yr = $1,181/Mg).

control option 1 has the smallest emission reduction, control option 2 has the second smallest emission reduction, etc.)

Using Table 2, several control options can be eliminated from further consideration. Control option 3 should be eliminated because control option 2 achieves the same amount of HAP reductions, but at a lower cost. Control option 2 should be eliminated because control option 4 achieves a greater degree of emission reduction for lower cost. The elimination of control options 2 and 3 reduces the number of technically feasible and economically efficient options to four control technologies.

Table 3 presents the incremental cost effectiveness of the remaining options. The incremental cost effectiveness of control option 1 is the same as its average cost effectiveness, because control option 1 is the first incremental option from the baseline. The incremental cost effectiveness of control option 4 is the ratio of the difference in cost between options 1 and 4 to the difference in HAP emission reductions between the two ratios.

Table 3.

CONTROL OPTION	ANNUAL COST ($)	EMISSION REDUCTION (Mg/Yr)	AVERAGE COST EFFECTIVENESS ($/Mg)[a]	INCREMENTAL COST EFFECTIVE-NESS ($/Mg)[b]
1	85,000	72	1,181	1,181
4	110,000	92	1,196	1,250
5	136,000	103	1,320	2,364
6	189,000	117	1,615	3,786

[a] Average cost effectiveness calculated as described in Table 2.

[b] Incremental cost effectiveness is the difference in the annual cost between two options divided by the difference in emission reductions between the same options (e.g., ($110,000/yr - $85,000/yr) ÷ (92 Mg/yr - 72 Mg/yr) = $1,250/Mg).

Tier III - Step 1: Identify MACT

Examination of the cost effectiveness of the remaining control options can lead to the elimination of other control options.[**] Control option 6 is eliminated because the incremental cost is deemed too high. The incremental cost of control option 5 is deemed acceptable, but, upon closer examination, the secondary air and energy impacts make this

[**] "Decisions" based on the cost-effectiveness values provided in this example are for illustrative purposes only. In real life situations, cost effectiveness would be evaluated on a case-by-case basis, and the results of one case would not determine absolute bounds on the circumstances under which one would select a level of emission reduction beyond the floor.

option undesirable. The incremental cost of both options 1 and 4 are deemed acceptable; however, control option 1 is eliminated because other considerations (secondary air impacts, etc) do not preclude the selection of control option 4 which achieves a greater degree of emission reductions.

Appendix B

Federal Register Notice on Determining an Average Emission Limitation for Existing Sources, June 6, 1994 (59 FR 29196).

[Federal Register: June 6, 1994]

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[AD-FRL-4892-5]

National Emission Standards for Hazardous Air Pollutants for Source Category: Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks; Determination of MACT ``Floor''

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On December 31, 1992, the EPA proposed standards to regulate the emissions of certain organic hazardous air pollutants from synthetic organic chemical manufacturing industry (SOCMI) production processes and seven other processes which are part of major sources under section 112 of the Clean Air Act as amended in 1990 (the Act). This rulemaking is commonly called the Hazardous Organic NESHAP or the HON. In the final action regarding the December 31, 1992 proposal, which was signed on February 28, 1994, and published in the Federal Register on April 22, 1994, EPA deferred taking final action regarding provisions applicable to medium storage vessels due to the need to resolve an issue of statutory interpretation of section 112(d)(3)(A) of the Act. On March 9, 1994, EPA reopened the comment period to request additional comment on the appropriate interpretation of this statutory provision and the effect of that interpretation on the appropriate control requirements for medium storage vessels at facilities subject to the HON.

This action announces EPA's final decision regarding the interpretation of Clean Air Act section 112(d)(3)(A) for purposes of the HON and the final decision regarding control provisions applicable to medium storage vessels in SOCMI facilities subject to the HON. The decision announced in this action regarding the interpretation of Clean Air Act section 112(d)(3)(A) for purposes of the HON will be presumptively followed in subsequent MACT rulemakings, but it will not be binding. Although EPA believes that Congress intended one interpretation--referred to as the ``Higher Floor Interpretation''--in Clean Air Act section 112(d)(3)(A), EPA also believes that the Agency retains discretion in important respects in setting Floors for MACT standards. EPA intends to exercise its discretion, within the statutory framework, to promulgate MACT standards that best serve the public interest.

EFFECTIVE DATE: June 6, 1994.
See Supplementary Information section concerning judicial review.

ADDRESSES: Dockets. The following dockets contain supporting information used in developing the proposed provisions. Docket Number A-90-19 contains general information used to characterize emissions and control costs for the industry and Docket A-90-21 contains information on storage vessels. These dockets are available for public inspection and copying between 8 a.m. and 4 p.m., Monday through Friday, at the EPA's Air and Radiation Docket and Information Center, Waterside Mall, room M1500, 401 M Street SW., Washington, DC 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: On technical issues, Dr. Janet S. Meyer, Standards Development Branch, Emission Standards Division (MD- 13), U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5254. For further information on the legal issue addressed in this notice, contact Michael S. Winer, Assistant General Counsel, Air and Radiation Division (2344), Office of General Counsel, Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, telephone number (202) 260-7606.

SUPPLEMENTARY INFORMATION:

Judicial Review

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of the actions taken by this document 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 rule. 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.

Public Comment: Approximately 55 comment letters were received in response to the March 9, 1994 (59 FR 11018) reopening of the comment period. The majority of these letters were from industries or industrial trade associations, arguing in favor of the less stringent ``Lower Floor Interpretation.'' Environmental groups, State or local governments and labor unions argued almost uniformly in favor of the more stringent ``Higher Floor Interpretation.'' The EPA considered all public comments in framing the final policy for MACT floor determination and in selection of the requirements for medium storage vessels. The major issues raised by the comments are addressed in this preamble. The EPA's responses to all the comments can be found in docket A-90-19, Subcategory VI-B.

I. Summary of Decision on MACT Floor Determination

This section describes EPA's decision with respect to the interpretation of Clean Air Act section 112(d)(3)(A) for purposes of this rulemaking. As set forth in more detail below, EPA believes that one of the interpretations of section 112(d)(3)(A)--referred to as the ``Higher Floor Interpretation''--is the better and more natural reading of the statutory language.

A. Background

Section 112(d)(3) of the Clean Air Act provides that Emissions standards promulgated under this subsection for existing sources * * * shall not be less stringent * * * than--

(A) The average emission limitation achieved by the best performing 12 percent of existing sources * * * 42 U.S.C. section 7412(d)(3). Existing sources for which the Administrator lacks emissions information and those that have recently achieved LAER are excluded from consideration. Id. (For categories or subcategories with fewer than 30 sources, standards may not be less stringent than ``the average emission limitation achieved by the best performing 5 sources.'' CAA section 112(d)(3)(B)). The minimum level of stringency defined by this language has come to be known as the MACT Floor.

In the March 9, 1994 Federal Register, EPA published a notice soliciting comment on ``the appropriate interpretation of'' section 112(d)(3)(A). Two interpretations of section 112(d)(3)(A) were discussed. Under the first, referred to as the ``Higher Floor Interpretation,'' EPA would look at emission limitations achieved by each of the best performing 12 percent of existing sources, and average those limitations. ``Average'' would be interpreted to mean a measure of central tendency such as the arithmetic mean or median. (The arithmetic mean of a set of measurements is the sum of the measurements divided by the number of

measurements in the set. The median is the value in a set of measurements below and above which there are an equal number of values, when the measurements are arranged in order of magnitude).

Under the second, ``Lower Floor Interpretation," EPA would look at the average emission limits achieved by each of the best performing 12 percent of existing sources, and take the lowest. This second interpretation groups the words ``average emission limitation" into a single phrase, and asks what ``average emission limitation" (accounting for variability over time, or between different pollutants being emitted from a facility) is ``achieved by" all members of the best performing 12 percent.

B. EPA's Interpretation of Section 112(d)(3)(A)

The EPA believes that the ``Higher Floor Interpretation" is a better reading of Clean Air Act section 112(d)(3)(A) than the ``Lower Floor Interpretation." This conclusion is based on a review of the statute, legislative history and comments received in response to EPA's March 9 notice. 1. The Statutory Language Section 112(d)(3)(A) requires that standards be no less stringent than ``* * * the average emission limitation achieved by the best performing 12 percent of existing sources * * *". The EPA believes that the most natural and straightforward reading of this language would have EPA first determine the emission limitations achieved by sources within the best performing 12 percent, and then average those limitations. This is the method described above as the ``Higher Floor Interpretation."

The EPA believes that if Congress had intended the Lower Floor Interpretation, language other than that actually used in section 112(d)(3)(A) would have been far more natural. For example, Congress could easily have expressed the Lower Floor Interpretation by requiring standards to be no less stringent than ``the emission limitation achieved by all sources within the best performing 12 percent." Similarly, Congress could have required standards to be no less stringent than ``the average emission limitation achieved by the worst performing member of the best performing 12 percent," or ``the emission limitation (averaged over time to take account of variability in the effectiveness of control) achieved by all sources within the best performing 12 percent." Any of such phrases would have been a more natural way to convey the Lower Floor Interpretation than the language Congress chose. However, the actual language of section 112(d)(3)(A) provides, in straightforward fashion, that standards may be no less stringent than the ``average emission limitation achieved by the best performing 12 percent * * *". To glean the Lower Floor Interpretation from this language is a strain; words and concepts not set forth in the statute must be added or inferred.

The language of section 112(d)(3)(B) makes this point even clearer. That section requires that standards for existing sources in categories or subcategories with fewer than 30 sources be no less stringent than, "The average emission limitation achieved by the best performing 5 sources * * *" 42 U.S.C. 7412(d)(3)(B).

If an interpretation parallel to the Lower Floor Interpretation were intended, it would have been more natural for this provision to read ``the emission limitation achieved by the 5th best performing source."

2. The Legislative History

The legislative history lends strong support to the view that, in passing section 112(d)(3)(A), Congress intended the Higher Floor Interpretation.

On the House side, the language that would eventually become section 112(d)(3)(A) was offered as a compromise amendment by Rep. Dingell on the House Floor on May 23, 1990. (The language of the amendment was identical to section 112(d)(3)(A) as ultimately enacted into law; only the numbers were different). Rep. Dingell yielded time to Rep. Collins ``for purposes of explaining the amendment." Legislative History of 1990 CAA Amendments at 2896. In doing so, Rep. Collins noted that she had originally supported slightly more stringent numbers than those included in the amendment, and that under her original proposal

> The average of emissions from the 10 percent cleanest sources would be the MACT standard. In cases where there are less than 30 sources in a category or subcategory, the average of the 3 cleanest sources would determine the standard.

Id. She went on to explain that under the compromise amendment introduced by Rep. Dingell

> MACT for existing stationary sources would be the average of the best 15 [percent] of technologies within each category or subcategory. For categories or subcategories where there are less than 30 sources, the standard is based on the average emissions from the best performing 5 sources.

Legislative History of 1990 CAA Amendments at 2897.

Rep. Collins' formulations are consistent with the Higher Floor Interpretation, not the Lower. The ``average of the 3 cleanest sources" cannot mean, as the Lower Floor Interpretation would require, the level of control achieved by all three of the ``cleanest sources." Nor can the ``average of the best 15 [percent] of technologies" mean a technology as good as that used by all sources within the top 15 percent.

Another discussion of section 112(d)(3) is similar. On October 27, 1990, Sen. Durenberger (a principal supporter of the Clean Air Act Amendments) explained the provision on the Senate floor. His explanation was as follows:

> The standard may not be less stringent than the average of the emission levels achieved by the best performing 12 percent of the existing sources within the category* * * The Administrator is to exclude from the calculation of the average of top 12 percent any source which met the following conditions* * *

Legislative History of 1990 CAA Amendments at 870 (Cong. Rec. S16929--Oct. 27, 1990). The second sentence of Sen. Durenberger's statement, in particular, is inconsistent with the Lower Floor Interpretation. Sen. Durenberger makes clear that the ``average" called for in the statute is of the ``top 12 percent," not the emission limitations achieved over time at each individual source.

No legislative history was found that supports the Lower Floor Interpretation. The EPA believes that the legislative history indicates that individual legislators--including those central to the drafting of section 112(d)(3)--understood the word ``average" to mean that once the emission limitations achieved by the best performers in a category had been determined, those results should be averaged. This is the method of the Higher Floor Interpretation, not the Lower.

3. Issues Raised in Public Comment

a. Arguments Concerning the Statutory Language.

(i) Plain Meaning of the Statute. Several commenters argued that the meaning of the statute was plain on its face and that Congress clearly intended the Higher Floor Interpretation. These commenters argued that when section 112(d)(3)(A) is read as a whole in its most natural way, the Congressional intent in favor of the Higher Floor

Interpretation is clear. They argued that if Congress had intended the Lower Floor Interpretation, it would have used different language in the statute.

The EPA agrees with these comments. As set forth in greater detail above, EPA believes the plain statutory language strongly favors the Higher Floor Interpretation.

(ii) Congress' Failure to Use the Words ``of the''. Several commenters argued that if Congress had meant the Higher Floor Interpretation, it would have added the words ``of the'' to the statute, so that section 112(d)(3)(A) would read ``the average of the emission limitations achieved by the best performing 12 percent.'' These commenters saw the absence of the words ``of the'' in the statute as evidence that Congress intended the Lower Floor Interpretation.

The EPA agrees that the statute would be more clear if Congress had used the words ``of the,'' but disagrees with the conclusion drawn by these commenters for two reasons. First, standard English usage often permits dropping the prepositions ``of the'' without changing the meaning of a phrase. (For example, ``the biggest mountain in North America'' has the same meaning as ``the biggest of the mountains in North America.'' ``Best singer in the band'' has the same meaning as ``best of the singers in the band.'') The same cannot be said, however, for the various phrases and concepts that must be read into section 112(d)(3)(A) in order to arrive at the Lower Floor Interpretation. Phrases like ``the worst performing member of...'' or ``averaged over time...'' simply are not dropped as part of standard English. Their absence from section 112(d)(3)(A)--unlike the absence of the words ``of the''--must be considered significant in interpreting the provision. Second, although the words ``of the'' do not appear in section 112(d)(3)(A), they were used by key legislators in summarizing that section prior to passage of the 1990 Clean Air Act Amendments. As noted above, when Sen. Durenberger (a principal supporter of the Clean Air Act Amendments) spoke on the Senate floor on October 27, 1990, he explained section 112(d)(3)(A) as follows:

> The standard may not be less stringent than the average of the emission levels achieved by the best performing 12 percent of the existing sources within the category* * *

Legislative History of 1990 CAA Amendments at 870 (Cong. Rec. S16929--Oct. 27, 1990) (emphasis added). As also noted above, when Rep. Collins introduced the provision in the House, she described it as follows:

> The average of emissions from the 10 percent cleanest sources would be the MACT standard. In cases where there are less than 30 sources in a category or subcategory, the average of the 3 cleanest sources would determine the standard.

Legislative History of 1990 CAA Amendments at 2896 (emphasis added) (describing a provision with identical language but different numbers than the one ultimately enacted into law).

In EPA's view, the fact that Congress did not use the words ``of the'' in section 112(d)(3)(A) is fully consistent with standard English. However, the fact that key legislators did use these words in describing the provision to their colleagues, in combination with the failure of those legislators to use the phrases on which the Lower Floor Interpretation depends, provides a strong indication that Congress intended the Higher Floor Interpretation in enacting section 112(d)(3)(A).

(iii) Purpose of the Word ``Average''. Several commenters argued that the word ``average'' in section 112(d)(3)(A) should be read to require averaging not of emissions from different sources within the top 12 percent, but instead of emissions from individual sources at different times, or from different emission points, or made up of different HAP. The EPA does not agree that the word ``average'' in section 112(d)(3)(A) can reasonably be read to serve this purpose. First, such a reading is difficult, if not impossible, to reconcile with the provision of section 112(d)(3) establishing a ``floor'' for new sources. Under those provisions, new source standards may not be less stringent than

> The emission control that is achieved in practice by the best controlled similar source.

42 U.S.C. 7412(d)(3). Notably, Congress did not use the word ``average'' in this provision. If the word ``average'' in section 112(d)(3)(A) was intended to refer to averages across time, or between emission points, or among different HAP, then Congress must have intended that such averaging would take place for existing source standards, but not for new source standards. There is no reason to believe Congress intended this implausible result.

There is a much more likely explanation: That to the extent Congress contemplated that averaging across time, or between emission points, or among HAP would play a role in either existing or new source MACT standards, it considered the terms ``emission limitation'' and ``emission control'' fully adequate to reflect that fact. In EPA's air program, emission limitations have routinely been expressed in terms of averages across time, for example, without any special statutory direction or authority. There is no reason to believe that Congress would have thought that special instructions were needed to ensure that EPA continued this practice, and even less reason to believe Congress would have thought special instructions were needed with respect to existing source standards, but not new source standards.

Furthermore, the legislative history of section 112 casts doubt on the interpretation of the word ``average'' offered by these commenters. When Congress comprehensively revised section 112 in the Clean Air Act Amendments of 1990, it based the revisions in substantial part on the Clean Water Act's effluent guidelines program. (See, e.g., Remarks of Sen. Durenberger, Cong. Rec. S516 (January 30, 1990) (``* * * this approach to regulation of toxic air pollutants is not without precedent. A program very similar to the one I have just described has already been implemented under the Clean Water Act'').) Under that program, certain limits (known as ``BPT limits'') have long been based on the ``average of the best'' performance at existing facilities. (See generally Remarks of Sen. Muskie, Legislative History of Federal Water Pollution Control Act of 1972 at 169-70 (``The Administrator should establish the range of `best practicable' levels based upon the average of the best existing performance by plants of various sizes, ages and unit processes.'')) In determining ``average of the best'' under the Clean Water Act, EPA has historically identified the best performers in an industrial category, and then averaged their performances. This methodology is consistent with the Higher Floor Interpretation and not the Lower.

(iv) Proximity of the Word ``Average'' to the Words ``Emission Limitation''. Several commenters argued that the proximity of the word ``average'' to the words ``emission limitation'' suggests that ``average'' modifies ``emission limitation,'' and not the entire phrase following those words. The EPA does not agree with this argument. In English, adjectives often modify not only the noun immediately following, but an entire phrase. In the phrase ``the biggest mountain in North America climbed by members of the Washington, D.C. Climbing Club,'' for example, the adjective ``biggest'' modifies the entire remainder of the phrase. There is no reason to conclude that the word ``average'' in section 112(d)(3)(A) plays a different role.

(v) Use of the Words ``Achieved By''. Several commenters argued that the use of the words ``achieved by'' in the statute

indicates that all sources within the top 12 percent must be achieving the emission limitations used to set the MACT Floor.

The EPA does not agree with this argument. The EPA believes the argument depends both on inferring the presence of the word ``all'' in section 112(d)(3)(A), and (as discussed above) on ignoring, or incorrectly construing, the meaning of the word ``average.'' Section 112(d)(3)(A) simply does not say ``the emission limitation achieved by all sources within the best performing 12 percent* * *''. Congress' use of the words ``achieved by'' cannot reasonably be stretched to accomplish such a rewriting of the statute.

b. Arguments Concerning Structure of the Statute. Several commenters argued that elements of the statute's structure support the Lower Floor Interpretation. For example, some commenters argued that the Lower Floor Interpretation best reflects EPA's authority to consider cost and other factors in setting standards more stringent than MACT Floor. Other commenters argued that the Lower Floor Interpretation best reflects the distinction between existing source MACT and new source MACT.

The EPA does not agree with these arguments. In fact, the Higher Floor Interpretation fully preserves both of these structural elements of the statute. With the Higher Floor Interpretation, just as with the Lower, EPA still has authority to establish existing source standards more stringent than the Floor based on enumerated criteria. With the Higher Floor Interpretation, just as with the Lower, there is still a distinction between the Floor for existing sources and the level of control required for new sources. (Under section 112(d)(3), standards for new sources must be at least as stringent as ``the emission control that is achieved in practice by the best controlled similar source''). The fact that there may be ``less distance'' to travel above the Floor with the Higher Floor Interpretation does not establish an inconsistency between that interpretation and other parts of the statute, nor does it mean that the interpretation is flawed in any way.

Furthermore, structural arguments tend to favor the Higher Floor Interpretation more strongly than the Lower. Section 112 was passed in its current form to ensure quick and dramatic reductions in air toxics emissions. Congress was frustrated with the slow pace of toxics control prior to 1990, and many members in part blamed EPA for weak controls. See, e.g., H. Comm. Rep. 101-490 at 150-54, 322-23; S. Rpt. 101-228 at 128-33. The structure and purpose of section 112 as a whole indicates that section 112(d)(3)(A) was intended to establish a stringent minimum level of control for hazardous air pollutants.

c. Additional Arguments. Several commenters argued that the Higher Floor Interpretation would require EPA to set MACT Floors that failed to correspond to real-world control technologies.

The EPA does not agree with this argument. The EPA believes that the argument depends upon a flawed premise: That the word ``average'' can only mean ``arithmetic mean.'' In fact, there are a number of conventional methods for determining the average of a data set, including the median. Congress did not mandate a particular method of determining ``average'' or central tendency in section 112(d)(3)(A), and the choice of methodology--whether median, mean, or some other measure--can often change the results markedly. For example, if the five facilities that make up the top 12 percent of a source category are achieving reductions equal to 99 percent, 98 percent, 95 percent, 94 percent and 93 percent, EPA need not set the MACT Floor equal to the arithmetic mean of these values, which is 95.8 percent. Using the Higher Floor Interpretation, EPA could set the MACT Floor equal the median of these values, which is 95 percent.

This discussion responds to the most significant comments on legal issues received in response to the March 9, 1994 Federal Register document. Other comments on legal issues are addressed in item number VI-B-61 in docket A-90-19.

C. Conclusion

The EPA believes that Congress spoke with clarity in section 112(d)(3)(A) of the Clean Air Act. That provision--requiring standards to be no less stringent than ``the average emission limitation achieved by the best performing 12 percent of existing sources''--lends little support for an interpretation under which standards might be set at the emission limitation achieved by the worst performing member of the best performing 12 percent of existing sources. The legislative history offers no support for such an interpretation, and indeed points strongly in the opposite direction. The EPA believes that the Higher Floor Interpretation represents the best reading of the statutory language.

II. Discretion in Setting Floors for MACT Standards

In today's notice, EPA announces its conclusion that Congress intended the Higher Floor Interpretation. The effect of this decision, however, is not to identify any particular number (e.g. the 94th percentile) as the Floor for all MACT standards. EPA retains discretion in important respects in setting Floors for MACT standards, and intends to exercise its discretion, within the statutory framework, to promulgate MACT standards that best serve the public interest.

EPA believes the Agency retains substantial discretion, within the statutory framework, to set MACT Floors at appropriate levels. For example, because Congress did not define the term ``average'' in section 112(d)(3), or in the legislative history, it implicitly delegated the authority to EPA to do so. The choice of methodology-- whether mean, median, mode, or some other measure--can often change the results. (The mean of a set of measurements is the sum of the measurements divided by the number of measurements in the set. The median is the value in a set of measurements below and above which there are an equal number of values, when the measurements are arranged in order of magnitude. The mode is the value that occurs most often in a set of measurements). As some commenters noted, the ``average of the best performing 12%'' corresponds to the 94th percentile when the word ``average'' is construed to be the ``median.'' If, however, ``average'' is construed to be the ``arithmetic mean'' or ``mode,'' a different result may obtain. EPA construes the word ``average'' in section 112(d)(3) to authorize the Agency to use any reasonable method, in a particular factual context, of determining the central tendency of a data set. In addition, EPA has discretion to use its best engineering judgment in collecting and analyzing the data, and in assessing the data's comprehensiveness, accuracy and variability, in order to determine which sources achieve the best emission reductions. EPA also has discretion in determining how to analyze the data, and thus in determining the appropriate ``average'' in each category or subcategory.

There are other important ways that EPA retains discretion in setting MACT floors. For example, Congress authorized EPA to subcategorize source categories based on classes, types and sizes of sources, which will result in different Floors for different subcategories. CAA section 112(d)(1). Using this authority, EPA can tailor standards to certain characteristics of particular emission units and sources. EPA retains flexibility, for example, to conclude that the production processes used at particular sources in the relevant category are sufficiently different from processes used at other sources in the same category to justify the creation of a new subcategory.

These examples are not meant to be exhaustive. EPA has only begun the process of setting MACT standards. As EPA gains experience in setting MACT Floors, other issues may arise that will require EPA to exercise its discretion in determining, for

each case, what represents the average emission limitation achieved by the best performing 12% of existing sources (or the best performing five sources, in categories or subcategories with fewer than 30 sources).

III. Precedential Impact of Today's Determination

In its March 9, 1994 document, EPA stated that ``the MACT floor decision * * * in this rulemaking will have broad precedential effect, and will be presumptively followed in subsequent MACT rulemakings." 59 FR 11018. Several commenters objected this statement, arguing that the issue of how best to interpret section 112(d)(3)(A) should have been addressed in a separate, generally applicable rulemaking.

The EPA wishes to emphasize that, although today's decision concerning the interpretation of Clean Air Act section 112(d)(3) for purposes of the HON will be precedential for future rulemakings, it will not be binding. Specifically, EPA will fully consider all comments on individual MACT standards, including those regarding the proper interpretation of the language in sec. 112(d)(3)(A), received on or before the close of the comment periods for those standards.

IV. Application of MACT Floor Decision to Medium Storage Vessels at Facilities Subject to the HON

As described in the March 9, 1994 Federal Register reopening the comment period, EPA requested comment on whether the control requirements for medium storage vessels previously proposed by EPA would be appropriate in the event those proposed controls were to be determined to be more stringent than the floor. Only four commenters addressed the question of the appropriate controls requirement for medium storage vessels and provided rationale for their opinions. Of these commenters, only one submitted information which purported to represent control information for SOCMI storage vessels. This information was reviewed and found to not provide any information on control performance and to represent storage vessels associated with non-SOCMI processes (i.e., other source categories) as well as SOCMI processes. Therefore, the submitted information could not be used to revise the database. The EPA review of this information is contained in item VI-B-62 in docket A-90-19. This section of the preamble, therefore, only presents the basis for the final decision on control requirements for medium sized storage vessels.

For medium vessels, about 8 percent of the vessels are controlled with either a 90-percent efficient control device or an IFR or EFR with a continuous seal. All of the controlled medium-sized vessels contained liquids with vapor pressures of 13.1 kPa (1.9 psia). Because the arithmetic mean characteristics of the top 12 percent of the medium vessels would not represent the performance of any known technology, the EPA used the median as the average for these vessels. Thus, for medium-sized storage vessels, the floor determined by the average characteristics of the top 12 percent of the sources would require control of vessels storing liquids with vapor pressures of 13.1 kPa (1.9 psia) by either a 90-percent efficient control device or an IFR or EFR with a continuous seal.

In selection of the control provisions for medium-sized storage vessels, EPA considered the regulatory alternatives that were presented in the April 22, 1994 Federal Register document. These alternatives reflected a combination of: (1) The floor control for medium-sized storage vessels, which at the time of proposal, were equipped with the floor controls and (2) the proposed control provisions for medium-sized storage vessels which were equipped with no control or less efficient controls than the performance of the revised floor component for the source-wide floor. The EPA did not develop a regulatory alternative corresponding to application of the revised floor control level to all storage vessels. Such an alternative would have essentially the same control costs as the proposed control provisions, but would result in a lower emission reduction. Because the floor control would represent a less economically efficient option and would add to the complexity of the rule, this option was not formally evaluated.

For medium storage vessels at existing sources, control at the regulatory alternative used to represent the floor control was estimated to cost $2.4 million/yr and to result in an emission reduction of 370 Mg/yr (110 tons/yr). The regulatory option for control level beyond the floor component is estimated to further reduce emissions by less than 100 Mg/yr (110 tons/yr) at an additional cost of $4 million/yr, or $48,000/Mg for each additional Mg of emission reduction. Due to the relatively high incremental costs and low emission reductions of this alternative, the EPA believes that the control level for the medium storage vessels component of the source- wide floor represented the maximum reduction achievable considering cost and other impacts.

IV. Administrative Requirements

A. Docket

The docket is an organized and complete file of all the information submitted to or otherwise considered by EPA in the development of this rulemaking. The principal purposes of the docket are: (1) To allow interested parties to identify and locate documents so that they can effectively participate in the rulemaking process and (2) to serve as the record in case of judicial review (except for interagency review materials) (Section 307(d)(7)(A)).

B. Paperwork Reduction Act

The information collection requirements of these provisions in this rule have been submitted for approval to the OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. An Information Collection Request document has been prepared by the EPA (ICR No. 1414.02), and a copy may be obtained from Sandy Farmer, Information Policy Branch, EPA, 401 M Street, SW., (2136), Washington, DC 20460, or by calling (202) 260- 2740. These requirements are not effective until OMB approves them and a technical amendment to that effect is published in the Federal Register.

The reporting and recordkeeping burden of the information collection requirements of the provisions for medium sized storage vessels are included in the estimate of the overall reporting burden, which is presented in ICR No. 1414.02. The information collection requirements for the entire rule has an estimated annual reporting burden averaging 1,400 hours per response, and an estimated annual recordkeeping burden averaging 5,400 hours per respondent. These estimates include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, EPA, 401 M Street, SW., (Mail code 2136); Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked ``Attention: Desk Officer for EPA."

C. Executive Order 12866

This final action regarding provisions applicable to medium sized storage vessels in facilities subject to the HON has been reviewed in accordance with Executive Order 12866. Under the terms of the Order, the Administrator has assessed the potential costs and benefits of the regulatory action. The methods for and results of these cost and

benefit analyses are described in the HON's Regulatory Impact Analysis (RIA). The RIA was included in the HON docket at proposal, and thus it was made available for public comment.

Executive Order 12866 also requires that the record for ``significant'' rules include an assessment of the potentially effective and reasonably feasible alternatives to the planned action. The potentially effective and reasonably feasible alternatives to the control requirements in the HON were also analyzed as part of the rule development process. The methods for and results of these analyses are described in the HON's Background Information Document (BID). The BID was included in the HON docket at proposal, and thus it was also available for public comment. In addition, many of the alternative requirements considered by the Administrator were described in the preamble for the HON proposal.

The potential costs associated with selection of the final provisions are primarily the result of statutory requirements. All elements of the cost that are not directly attributable to statutory requirements were deemed appropriate because the Administrator determined that they were necessary for administering this program effectively and efficiently. In assessing the potential costs and benefits--both quantitative and qualitative--of this rule, the Administrator has determined that the benefits justify the costs.

The Administrator has also determined that this regulatory action does not unduly interfere with State, local and tribal governments in the exercise of their governmental functions.

D. Regulatory Flexibility Act Compliance

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires the EPA to consider potential impacts of Federal regulations on small business entities. If a preliminary analysis indicates that a proposed regulation would have a significant economic impact on 20 percent or more of small entities, then a regulatory flexibility analysis must be prepared.

Regulatory impacts are considered significant if any of the following criteria are met: (1) Compliance increases annual production costs by more than 5 percent, assuming costs are passed on to consumers; (2) compliance costs as a percentage of sales for small entities are at least 10 percent more than compliance costs as a percentage of sales for large entities; (3) capital costs of compliance represent a ``significant'' portion of capital available to small entities, considering internal cash flow plus external financial capabilities; or (4) regulatory requirements are likely to result in closures of small entities.

The potential costs of the requirements for medium sized storage vessels were considered as part of the economic impact analysis for the entire regulation. The assessment of the economic impacts of the overall regulation were presented in the April 22, 1994 Federal Register (59 FR 19449). Therefore, the addition of the final provisions to the standard does not alter the conclusion that the standard is not expected to have a significant economic impact on a substantial number of small firms.

Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that this attached rule will not have an economic impact on small entities because no additional costs will be incurred.

List of Subjects in 40 CFR Part 63

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

Dated: May 27, 1994.

Carol M. Browner,
Administrator.

For the reasons set out in the preamble, part 63, title 40, chapter I, of the Code of Federal Regulations is amended as follows:

PART 63--[AMENDED]

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

Authority: Sections 101, 112, 114, 116, and 301 of the Clean Air Act (42 U.S.C. 7401, et seq., as amended by Pub. L. 101-549, 104 Stat. 2399).

Subpart G--National Emission Standards for Organic Hazardous Air Pollutants from Synthetic Organic Chemical Manufacturing Industry Process Vents, Storage Vessels, Transfer Operations, and Wastewater

2. Table 5 of the appendix to subpart G is revised to read as follows:

Table 5.--Group 1 Storage Vessels at Existing Sources

Vessel capacity (cubic meters)	Vapor Pressure[1] (kilopascals)
75 ≤ capacity < 151	≥ 13.1
151 ≤ capacity	≥ 5.2

[1]Maximum true vapor pressure of total organic HAP at storage temperature.

[FR Doc. 94-13666 Filed 6-3-94; 8:45 am]

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Appendix C

EXAMPLE NOTICE OF MACT APPROVAL

Notice of MACT Approval
CFR 40, Part 63, Subpart B
Maximum Achievable Control Technology Emission Limitation
for
Constructed and Reconstructed Sources
under Section 112(j)

This notice establishes practicable, enforceable maximum achievable control technology emission limitation(s) and requirements for *Name of major source* for the MACT-affected emission unit(s) located at *location of all MACT-affected emission units*. The emission limitations and requirements set forth in this document are enforceable on *effective date of notice*.

A. Major Source Information

1. Mailing address of owner or operator:

2. Mailing address for location of major source:

3. Source category or subcategory for major source:

4. MACT-affected emission unit(s): *List all emission unit(s) subject to this Notice of MACT Approval along with the source identification number if applicable.*

5. Type of construction or reconstruction: *Describe the action taken by the owner or operator of the major source that qualifies as the construction of a new affected source or reconstruction of an affected source under the requirements of 40 CFR Part 63, Subpart B, sections 63.50-63.56*

6. Anticipated commencement date for construction or reconstruction:

7. Anticipated start-up date of construction or reconstruction:

8. List of the hazardous air pollutants emitted by MACT-affected emission unit(s): *List all hazardous air pollutants that are or will be emitted from the affected*

emission unit(s). Any pollutant not listed in this section cannot be emitted by the emission unit without an amendment to the Notice of MACT Approval.

B. MACT Emission Limitation

1. The above stated owner or operator shall not exceed the following emission limitation(s) for the above stated MACT-affected emission unit(s). *Write in emission standard or MACT emission limitation for overall hazardous air pollutant emissions from each affected emission unit. If the permitting authority determines that an individual pollutant emission limitation is appropriate, it should also be listed in this section.*

2. The above stated owner or operator shall install and operate the following control technology(s), specific design, equipment, work practice, operational standard, or combination thereof to meet the emission standard or MACT emission limitation listed in paragraph 1 of this section. *List all control technologies to be installed by the owner or operator and which emission units to which the control technologies apply.*

3. The above stated owner or operator shall adhere to the following production or operational parameters for the technologies listed in paragraph 2 of this section. *State all production or operational parameters. For example:*

   The owner or operator may, subject to [name of agency] approval, by-pass the emission control device for a limited period of time for purposes such as maintenance of the control device.

   The owner or operator shall operate and maintain the control equipment such that it has a 95% hazardous air pollutant destruction efficiency.

   The owner or operator shall not operate the MACT-affected emission unit for greater than 6 hours in any 24-hour period of time.

C. Monitoring Requirements

For each MACT emission limitation and operational requirement established in Section B (MACT emission limitation) the above

stated owner or operator shall comply with the following monitoring requirements. State all monitoring requirements. *For example:*

After installing the control equipment required to comply with Section B.1 visually inspect the internal floating roof, the primary seal, and the secondary seal, before filling the storage vessel

The owner or operator shall calibrate, maintain and operate a continuous monitoring system for the measurement of opacity of emissions discharged from the control device required in Section B.2 according to the following procedures: etc.

D. Reporting and Recordkeeping Requirements

List all reporting and recordkeeping requirements in this section. *For example:*

The owner or operator shall maintain at the source for a period of at least 5 years records of the visual inspections, maintenance and repairs performed on each secondary hood system as required in Section B.2.

E. Other Requirements

1. The above stated owner or operator shall comply with the General Provisions set forth in Subpart A of 40 CFR Part 63, as specified in 40 CFR 63.1(a) and as specified herein by the permitting authority.

2. In addition to the requirements stated in paragraph 1 of this section, the owner or operator will be subject to the following additional requirements. *If there are any specific requirements that the reviewing agency would like to clarify or add, those requirements should also be stated in this paragraph. This paragraph could also include requirements for emergency provisions and start-up and shut-down procedures.*

F. Compliance Certifications

The above stated owner or operator shall certify compliance with the terms and conditions of this notice according to the following procedures: *This section should include a*

description of the terms and conditions that the owner or operator will use to certify compliance, as well as the format and frequency of the certification.

Appendix D

Federal Register Notice on Final Amendments to Regulations Governing Equivalent Emission Limitations by Permit.

Also see: http://www.epa.gov/ttn/atw/112j/112jaypg.html

TECHNICAL REPORT DATA

(Please read Instructions on reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-453/R-02-001		

4. TITLE AND SUBTITLE	5. REPORT DATE
Guidelines for MACT Determinations under Section 112(j) Requirements	February 2002
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Emission Standards Division (C504-03) Office of Air Quality Planning and Standards U.S. Environmental Protection Agency Research Triangle Park, NC 27711	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. 68-D1-0118
12. SPONSORING AGENCY NAME AND ADDRESS Office of Air Quality Planning and Standards U.S. Environmental Protection Agency Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED Final
	14. SPONSORING AGENCY CODE EPA/200/04

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The section 112(j) rule, 40 CFR 63 subpart B, requires that permitting authorities develop case-by-case maximum achievable control technology (MACT) for major sources in source categories for which standards are not promulgated within 18 months after the date established under section 112(e). This document provides guidance to those permitting authorities on how to develop case-by-case MACT.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Hazardous Air Pollutants General Provisions Section 112(j)	Air Pollution Control	

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