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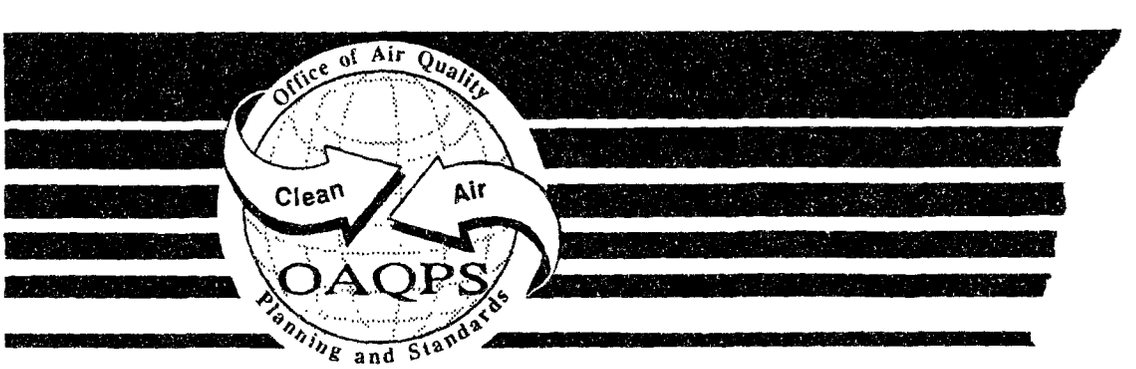
EPA LEAD GUIDELINE DOCUMENT



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1.0 INTRODUCTION

1.1 OVERVIEW OF THE MANUAL

The Lead Guideline is an integration and summary of existing policy and guidance information available for lead programs and does not present any new policy and guidance. The Guideline is divided into the following chapters:

Each chapter presents a distillation of key policy and guidance for various subjects that are important to lead programs. Each chapter also contains comprehensive references to the original material upon which the chapter is based. These references include relative statutory and regulatory requirements [i.e., the Clean Air Act as amended in 1990 (the "Act") and the *Code of Federal Regulations* (CFR)], *Federal Register* notices, Environmental Protection Agency (EPA) guideline documents, and Agency policy, guidance correspondence, and questions and answers. The reference sections include key excerpts from the policy and guidance that can be used as a quick reference. The Lead Guideline should not be cited in regulatory actions since any regulatory decisions should be based upon the original material, rather than the narrative in each chapter. In addition, in some instances it may be the case that only part of a document still represents current EPA policy. Therefore, before citing the part of the document not excerpted in the reference at the end of a chapter, please consult EPA to assure the information is current.

It is particularly important to consult with EPA because of the significant changes that were made to the Act in the 1990 Amendments. Section 193 of the Act provides that regulations and guidance issued by EPA prior to the 1990 Amendments remain in effect, except to the extent inconsistent with the Act or revised by EPA. EPA has not undertaken a systematic review of all of its previously-issued regulations and guidance to assess their consistency with the revised Act.

However, EPA has issued significant guidance since the 1990 revisions to the Act. Thus, the key sources to focus on in determining the SIP requirements applicable to lead nonattainment areas is, of course, the statute itself. Part D, Title I of the Act contains the statutory requirements applicable to lead nonattainment areas.

Finally, the underlying guidance and memoranda summarized in this document describe EPA's non-binding interpretations of certain SIP and SIP-related requirements. Therefore, for example, these interpretations will be given binding effect for a SIP submitted for a particular area only after final EPA rulemaking action on the submittal. During the course of this rulemaking action, the public will be afforded an opportunity to comment on the application of any guidance or memoranda to the particular area in question. Thus, EPA will consider the factual circumstances associated with a particular submittal and the submissions made by any persons before giving the preliminary interpretations expressed in guidance and memoranda binding legal effect. Further, use of words like "must", "shall" and "required" in this document or the underlying documents should not be treated as having binding legal effect unless the words are employed to describe or recite an already-adopted statutory or regulatory requirement.

Appendix A to this guideline contains copies of the memoranda and *Federal Register* notices cited in the reference sections. Lengthy documents have been excluded but can be obtained from the EPA. Appendix B contains a checklist for preparing and reviewing lead State Implementation Plan (SIP) revisions.

1.2 PROVISIONS FOR UPDATING THE MANUAL

This manual will be updated by adding new pages or by replacing existing pages, as appropriate. Revised pages will be dated and copies will be provided by EPA's Office of Air Quality Planning and Standards (OAQPS) to the EPA Regional Office lead contacts. Citations

to the CFR are to the most current version at the time of preparation of this guideline. Users of the guideline should refer to later versions of the CFR since it is updated on a regular basis.

Note that this manual has been prepared to address the SIP requirements for the lead standard in effect at the time of preparation. The EPA will update this manual when the lead standard is revised.

1.3 ADDITIONAL INFORMATION SOURCES

This Guideline is intended to be used in conjunction with other guidance documents and policy statements, including the following:

- *General Preamble* [see April 16, 1992 *Federal Register* (57 FR 13498) and April 28, 1992 (57 FR 18070)]
- *Air Programs Policy Guidance Notebook*
- *New Source Review/Prevention of Significant Deterioration and Nonattainment Area Guidance Notebook*, January 1988
- *Clean Air Act Compliance/Enforcement Policy Compendium*
- *Guidelines for the Review of State Implementation Plan (SIP) Revisions by EPA Regional Offices*
- *Guideline on Air Quality Models* (revised 1987 and including the 1988 supplement)
- *Processing Procedures for SIP Revisions for Part 52, Part 62 111(d) Plans, and Part 81 Redesignations*

Where existing guidance is insufficient, State and local agencies should seek clarification of policy and guidance relative to lead from their Regional Office contact. Regional Office personnel are encouraged to solicit additional lead guidance whenever necessary from EPA Headquarters personnel. Contact the SO_2/Particulate Matter Programs Branch, Air Quality Management Division (AQMD), at (919)541-5628.

2.0 STATE IMPLEMENTATION PLANS

2.1 GENERAL SIP INFORMATION

Section 101(b)(1) of the Act notes that one of the purposes of the Act is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." To this end, the Act establishes provisions for setting national ambient air quality standards (NAAQS). The NAAQS are set at levels to protect the public health (primary standards) and welfare (secondary standards).[1] The NAAQS for lead were promulgated in 1978.

The States have the primary responsibility for implementing the NAAQS. Section 110 of the Act establishes the system of SIPs as the method of ensuring that the NAAQS are met. Specifically, Section 110 of the Act requires that, after promulgation of the NAAQS, each State must adopt and submit to EPA a plan (i.e., SIP) which provides for implementation, maintenance, and enforcement of the NAAQS.

In addition, Sections 107(d)(1) and (5) of the Act provide for areas to be designated as attainment, nonattainment, or unclassifiable with respect to NAAQS. When any area's designation changes to nonattainment, the State must prepare a revision to the SIP pursuant to Section 172 of the Act showing how the area will be brought into attainment.

The general steps to development of a SIP or SIP revision are described below.

1. Determine the existing lead concentrations in the ambient air to establish the initial (baseline) air quality. Baseline air quality is usually determined by using measured air quality data. The baseline air quality determines the attainment status for an area with regard to lead.

2. Determine whether an area is meeting the NAAQS. If not, EPA will designate the area as nonattainment, and the State has 18 months to submit a SIP addressing how the nonattainment area will be brought into compliance with the NAAQS. The NAAQS for lead is 1.5 µg/m3, maximum quarterly average. A quarterly average is considered a violation of the standard if it is at least 1.6 µg/m3 when rounded to the tenths from the hundredths place when monitored. For modeling purposes, however, 1.51 $\mu g/m^3$ is considered a violation.

3. Prepare an emission inventory. Determining the type and impact of implementation of specific control strategies is based on the emission inventory. Emission inventory development is discussed in Section 4.

   Emission inventory projections are needed to determine if a given industrial sector or area will achieve or exceed the ambient standards in future years. The baseline inventory estimates current emissions. A baseline projection estimates future emissions by taking into account expected growth and air pollution control requirements in effect at the time the projection is made. A control strategy projection estimates future emissions by considering modified or additional control regulations which will affect baseline projections.

4. Evaluate ambient air quality. Developing an implementation plan requires a suitable method for relating pollutant emissions to ambient air quality. The most commonly used method is an atmospheric dispersion model. When dispersion models are applied to projected emissions, projected air quality can be determined and thus used to demonstrate attainment of the standard by the attainment deadline. Modeling is discussed in Section 6.

5. Develop control strategies that provide for the implementation of reasonably available control measures (RACM) (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]),[2] and ensure attainment of the NAAQS as expeditiously as practicable.[3] Specific control strategies needed to attain the NAAQS are based on projected controlled emissions and the associated ambient air quality. Control strategy development is discussed in Section 8.

6. Document the plan for attainment in the SIP. Requirements for content of the SIP are addressed in Section 2.2.

7. Perform post-SIP air quality monitoring to track air quality maintenance and progress toward attainment. Monitoring is discussed in Section 5.

REFERENCES FOR SECTION 2.1

1. Section 109 of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

2. Reference 1. Section 172(c)(1).

3. Reference 1. Section 192(a).

2.2 STATUTORY REQUIREMENTS FOR LEAD SIPs

Section 110(a)(2) of the Act specifies requirements and provisions that must be contained in each SIP. Section 172(c) of the Act specifies the provisions for SIP revisions necessitated by designation of an area as nonattainment for any of the NAAQS.

Pursuant to Section 110(a)(2), SIPs must include, among other things, the following:

- enforceable emissions limitations
- ambient air quality monitoring
- enforcement provisions
- provisions to prohibit sources from significantly affecting NAAQS attainment or maintenance, or conformance with prevention of significant deterioration (PSD) or visibility rules in a neighboring State
- assurance of adequate personnel, funding and authority to carry out the SIP
- requirements for emissions monitoring and reporting
- provisions for emergency powers and contingency plans
- provisions for plan revision
- provisions for nonattainment SIP revisions
- provisions for necessary air quality modeling
- provisions to collect permit fees required under the Act from major stationary sources adequate to recover the costs of reviewing and acting upon permit applications and administering the provisions of the permit
- provisions for participation of local political subdivisions affected by the plan

Pursuant to Section 172(c), nonattainment area SIPs must provide for the following:

- implementation of all reasonably available control measures (RACM) as expeditiously as practicable and attainment of the NAAQS. Reasonably available control technology (RACT) is discussed in Section 8.

- demonstration of reasonable further progress (RFP) toward attaining the NAAQS by the applicable attainment date. RFP is discussed in Section 8.

- a comprehensive, accurate, and current inventory of actual emissions from all sources of lead. Emission inventory development is discussed in Section 4.

- identification and quantification of lead emissions from the construction or operation of major new or modified sources. The SIP must demonstrate that these emissions will not interfere with the attainment of the NAAQS.

- permit requirements for construction and operation permits of major new or modified major sources.

- enforceable emission limits and schedules and timetables for compliance. Compliance schedules are discussed in Section 11.

- compliance with Section 110(a)(2).

- provisions for the implementation of specific measures to be taken if EPA determines that the nonattainment area fails to make RFP or to meet the NAAQS by the applicable date.

3.0 DETERMINING AIR QUALITY STATUS

3.1 SECTION 107 DESIGNATIONS

3.1.1 General

In August 1977, Congress amended the Clean Air Act to, among other things, require States to designate areas as attainment, nonattainment, or unclassifiable. This requirement only applied to those NAAQS in existence at the time of enactment of the 1977 Clean Air Act Amendments (1977 Amendments) (August 7, 1977).[1] Areas designated nonattainment had to meet the SIP requirements specified in Part D of the Act. Since the lead NAAQS were not promulgated until after the 1977 Amendments (i.e., October 5, 1978)[2], the Agency determined that implementation and maintenance of the lead NAAQS should be in accordance with the SIP requirements set forth in Section 110 and not Part D.[3,4]

The 1990 Clean Air Act Amendments (1990 Amendments) clearly define EPA's authority to designate areas for lead. Specifically, Section 107(d)(5) allows EPA to require States to designate areas as nonattainment, attainment, or unclassifiable with respect to the lead NAAQS in effect as of the date of enactment of the 1990 Amendments.[5] However, this is a discretionary requirement and, at this time, EPA has only requested that specified areas be designated.[6]

3.1.2 Designating Areas as Nonattainment

The 1990 Amendments specify procedures that must be followed when EPA decides that an area should be designated.[7] States are required to submit recommended designations for the areas for which the EPA seeks a designation in a timeframe that EPA deems reasonable.[8] If the State fails to submit the required designation, EPA is required to promulgate the designation that it deems appropriate.[9] The State, at any time it deems appropriate, may submit a request to designate an area as nonattainment for lead.[10,11]

States should identify the boundaries of the nonattainment areas when submitting nonattainment designations. EPA recommends that the lead nonattainment boundary be defined by the perimeter of the county in which the ambient monitor(s) recording the NAAQS violation is located. If the ambient monitor is located near another county, then EPA recommends that the other county also be included in the area designated nonattainment.[12]

States may choose to define the boundary of the lead nonattainment area by using the same approach that is used for PM-10 areas. These approaches are found in section 2.5 of the *PM-10 SIP Development Guideline* and in section 6.3 of the document entitled *Procedures for Estimating Probability of Nonattainment of a PM-10 NAAQS Using Total Suspended Particulate or PM-10 Data.*[13]

Section 172(a)(1)(A) of the Act allows EPA to apply classifications (e.g., severe, extreme, moderate) to areas designated as nonattainment. In determining such classifications, EPA may consider such factors as the severity of the nonattainment problem and the availability and feasibility of the control measures. Currently, no lead nonattainment areas have been classified.[14]

3.1.3 Designating Areas as Attainment

Following is an expanded discussion of the criteria which must be met before an area can be redesignated from nonattainment to attainment. The reader is referred to the September 4, 1992 memorandum from John Calcagni to the Regional Air Divisions Directors entitled "Procedures for Processing Requests to Redesignate Areas to Attainment" for an extended discussion of these criteria.[15]

- Attainment of the NAAQS

  The State must show that the area is attaining the lead NAAQS. There are two components involved in making this demonstration which should be considered interdependently. The first component relies on air quality data. For lead, the area must show no exceedances on a quarterly basis.[16]

  The second component relies on supplemental air quality modeling. Modeling may be necessary to determine the representativeness of the monitored data. For lead,

dispersion modeling will generally be necessary to evaluate comprehensively a source's impacts and to determine the area's expected high concentrations based upon current conditions. Regions should consult with OAQPS for further guidance addressing the need for modeling in specific circumstances.

- Approved 110(k) SIP for the area

The SIP for the area must be fully approved under Section 110(k) of the Act and must satisfy all requirements that apply to the area. An area cannot be redesignated if a required element of its plan is the subject of a disapproval; a finding of failure to submit or to implement the SIP; or partial, conditional, or limited approval. However, this does not mean that earlier issues with regard to the SIP will be reopened.

- Permanent and Enforceable Improvement in Air Quality

The State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. Attainment resulting from temporary reductions in emissions rates or usually favorable meteorology would not qualify as an air quality improvement due to permanent and enforceable emission reductions. In making this showing, the State should estimate the percent reduction achieved from Federal measures.

The following is a list of the core provisions that should be included in a maintenance plan:

- Attainment inventory - the State should develop an attainment emissions inventory to identify the level of emissions in the area which is sufficient to attain the lead NAAQS.

- Maintenance demonstration - A State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of lead will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emission rates will not cause a violation of the lead NAAQS. In

either case, the State should project emissions for the 10-year period following redesignation.

- Monitoring network - Once an area has been redesignated, the State should continue to operate an appropriate air quality monitoring network to verify the attainment status of the area.[15]

- Verification of continued attainment - Each State should ensure that it has the legal authority to implement and enforce all measures necessary to attain and to maintain the lead NAAQS. The State submittal should indicate how the State will track the progress of the maintenance plan.

- Contingency plan - The maintenance plan must contain contingency provisions that will promptly correct any violation of the lead NAAQS that occurs after redesignation. For the purposes of Section 175(A), a State is not required to have fully adopted contingency measures that will take effect without further action by the State in order for the maintenance plan to be approved. The contingency plan is considered to be an enforceable part of the SIP, however, and should ensure that contingency measures are adopted expediently once they are triggered. The plan should clearly identify the measures to be adopted, a schedule and procedure for adoption and implementation, and a specific time limit for action by the State.

  The EPA will review what constitutes a contingency plan on a case-by-case basis at a minimum and must require all measures contained in the Part D Nonattainment Plan for the area prior to redesignation. This language suggests that a State may submit a SIP revision at the time of its redesignation to remove or reduce the stringency of a submittal measure. The EPA can approve such a revision if it provides for compensating equivalent reductions. Alternatively, a State might be able to demonstrate that the measures are not necessary for maintenance of the standard.

- Fully Approved Maintenance Plan

Before an area can be redesignated to attainment, EPA must approve a maintenance plan which meets the requirements of Section 175(A). The maintenance plan will constitute a SIP revision and must provide for maintenance of the lead NAAQS in the area for at least 10 years after redesignation. In addition, the maintenance plan shall contain such contingency measures necessary to ensure prompt correction of any violation of the lead NAAQS. At a minimum, these measures must include a requirement that the State will implement all measures contained in the nonattainment SIP prior to redesignation.

- Section 110 and Part D Requirements

For the purposes of redesignation, a State must meet all requirements of Section 110 and Part D of the Act that were applicable prior to submittal of the complete redesignation request. Section 110(a)(2) contains general requirements for nonattainment plans. Part D consists of general requirements applicable to all areas designated nonattainment and specific requirements applicable to certain NAAQS. The general requirements are found in subpart 1. The lead specific requirements are found in subpart 5.

REFERENCES FOR SECTION 3.1

1. "Lead is not, however, subject to requirements of Section 107 of the current CAA which required States to designate areas with respect to attainment of the NAAQS in existence as of enactment of the 1977 CAA Amendments (August 7, 1977)." Memorandum from Seitz, J., OAQPS, to Director of Air, Pesticides, and Toxics Division, Regions I, IV, VI, Director of Air and Waste Management Division, Region II, Director of Air Management Division, Region III, Director of Air and Radiation Division, Region V, and Director of Air and Toxics Division, Regions VII, VIII, IX, X. Nonattainment Designations and Classifications. November 14, 1990.

2. *Federal Register* 43:46246-63. October 5, 1978. National Ambient Air Quality Standard for Lead.

3. "In 1978, when EPA promulgated the lead NAAQS, EPA believed that implementation and maintenance of the lead NAAQS should be in accordance with the SIP requirements set forth in section 110 and not Part D". Section E.1.(a) of the "State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990." U.S. Environmental Protection Agency. *Federal Register*, 57 FR 13498, April 16, 1992.

4. Reference 3. p. 13549. "The Agency believed that section 107--and the Part D requirements-- were intended by Congress to apply only to NAAQS which were set prior to 1977. In those cases SIP's had already been adopted, the attainment dates had already passed and the SIP's had proven to be inadequate. The designation process was intended as a mechanism to initiate new SIP revisions for those existing NAAQS."

5. Reference 3. p. 13549. "Section 107(d)(5) authorizes EPA to require States to designate areas (or portions thereof) as nonattainment, attainment or unclassifiable with respect to the lead NAAQS in effect as of the date of enactment of the 1990 CAAA."

6. Reference 3. p. 13549. Footnote 31. "Section 107(d)(5) of the amended Act does not indicate that all areas of the State must be designated. At this time, EPA has only requested that specified areas within affected States be designated. Therefore, most States and the vast majority of the areas within affected States will still have no designations, (i.e., will not be designated as attainment, nonattainment, or unclassifiable for lead)."

7. "After enactment, EPA must notify the Governor of each State of the requirements to designate areas with respect to lead". Memorandum from Seitz, J., OAQPS, to Director of Air, Pesticides, and Toxics Division, Regions I, IV, VI, Director of Air and Waste Management Division, Region II, Director of Air Management Division, Region III, Director of Air and Radiation Division, Region V, and Director of Air and Toxics Division, Regions VII, VIII, IX, X. Nonattainment Designations and Classifications. November 14, 1990.

8. Reference 3. p. 13549. "Section 107(d)(1)(A) permits EPA to require the Governors of affected States to submit recommended designations for the areas EPA seeks designated in a timeframe that EPA deems reasonable. This time frame, however, can be no sooner than 120 days nor later than 1 year after EPA notifies the State of the requirement to submit such designations. Section 107(d)(1)(B) requires that EPA must then promulgate these designations no later than 1 year after notifying the State of the requirement to designate areas for lead. The EPA may make any modifications deemed necessary to the areas submitted by the State (see generally section 107(d)(1)(B) of the Act). However, no later than 120 days before promulgating a modified area, EPA must notify the affected State and provide an opportunity for the State to demonstrate why the proposed modification is inappropriate."

9. Reference 3. p.13549. "If the Governor of an affected State fails to submit the required lead designations, in whole or in part, EPA is required to promulgate the designation that it deems appropriate for any area (or portion thereof) not designated by the State."

10. "The Administrator may, in the Administrator's discretion at any time the Administrator deems appropriate, require a State to designate areas (or portions thereof) with respect to the national ambient air quality standard for lead in effect as of the date of the enactment of the Clean Air Act Amendments of 1990, in accordance with the procedures under subparagraphs (A) and (B) of paragraph (1), except that in applying subparagraph (B)(i) of paragraph (1) the phrase "2 years from the data of promulgation of the new or revised national ambient air quality standard" shall be replaced by the phrase "1 year from the date the Administrator notifies the State of the requirement to designate areas with respect to the standard for lead."" Section 192(a) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

11. Reference 10. By such date as the Administrator may reasonably require, but not later than 1 year after promulgation of a new or revised national ambient air quality standard for any pollutant under section 109, the Governor of each State shall (and at any other time the Governor of a State deems appropriate the Governor may) submit to the Administrator a list of all areas (or portions thereof) in the State, designating as ...."

12. Reference 3. p. 13549. "States should identify boundaries of the nonattainment areas when submitting nonattainment designations for lead. A lead nonattainment area consists of that area which does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the lead NAAQS (see section 107(d)(1) of the Amended Act). Generally, EPA recommends that the lead nonattainment boundary be defined by the perimeter of the county in which the ambient lead monitor(s) recording the violation is located." Section E.1.(b).

13. Reference 3. p. 13549 "In some situations, however, a boundary other than the county perimeter may be appropriate. States may choose alternatively to define the lead

nonattainment boundary by using any one, or a combination, of the following techniques: Qualitative analysis, spatial interpolation of air monitoring data, or air quality simulation by dispersion modeling. These techniques are more fully described in 'Procedures for Estimating Probability of Nonattainment of a PM-10 NAAQS Using Total Suspended Particulate or PM-10 Data,' December 1986. The EPA recommends that the State submit a defensible rationale for the boundary chosen with the Governor's designation for an area."

14. Reference 3. p. 13549. "The EPA may, but is not required to, classify lead nonattainment areas. At this time, EPA does not intend to classify lead nonattainment areas with respect to the lead NAAQS in effect on date of enactment of the 1990 CAAA." Section E.1.(c).

15. "Once an area has been redesignated, the State should continue to operate an appropriate air quality monitoring network, in accordance with 40 CFR Part 58, to verify the attainment status of the area. The maintenance plan should contain provisions for continued operation of air quality monitors that will provide such verification." Memorandum from Calcagni, John, Director, Air Quality Management Division, to Directors, Air and Toxics Division, U.S. EPA Region I through X Offices. Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992.

16. "In general, all available information relative to the attainment status of an area should be reviewed. These data include the most recent eight quarters of quality-assured, representative ambient air quality data plus evidence of an implemented control strategy EPA had fully approved. Supplemental information, including air quality modeling data, etc., should be used to determine if the monitoring data accurately characterize the worst case air quality in the area." Memorandum from Myers, S., OAQPS, to Director of Air and Waste Management Division, Regions II-IV, VI-VIII, X, and Director of Air Management Division, Regions I, V, IX. April 21, 1983.

3.2 AMBIENT AIR

3.2.1 General

Ambient air is defined at 40 CFR 50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access." Generally, this definition signifies that ambient air would constitute any air to which the public could be exposed, even for a short period of time. The only exemption from the ambient air provision is the atmosphere over land that is owned or controlled by the source and to which public access (and, therefore, exposure) is precluded by a fence or other physical barrier.[1] It should be noted that for sources operating on leased property, ambient air is considered to exclude only the atmosphere over the land leased and controlled by the source.[2]

3.2.2 Location Aspects

The EPA considers ambient air to include such areas as elevated building sites and parking lots for public arenas. Although it may not be practical to analyze the air quality at every such location, the State should evaluate the air quality impact at these sites if it seems necessary to protect health and welfare.[3,4]

For modeling purposes, ambient air is to be considered air every where outside of contiguous plant property to which public access is precluded by an effective physical barrier. Therefore, modeling receptors should be placed anywhere outside of inaccessible plant property, including over bodies of water, unfenced plant property, on buildings, over roadways, and over property owned by other sources.[5,6]

A few examples should clarify potential uncertainties regarding receptor location. In the case of waterways, receptors should be placed over any body of water not privately owned and to which public access is allowed. Even where public recreational traffic is limited, the air above a body of water should be considered ambient air as long as the potential for public exposure exists.[7] With respect to roadways dividing plant property, the air above the roadway should have a receptor, even if the road separates otherwise inaccessible private property owned by a single source.[8,9] Regarding property owned by other sources, current policy requires that receptors be placed over neighboring property regardless of public accessibility. In other words, the

atmosphere above neighboring property is considered "ambient air" in relation to emissions from a given source.[10]

3.2.3 Time Aspects

Even if public access to a given site is time-limited, the site should not be excluded from the ambient air definition as long as the other conditions apply. Regardless of the period of exposure at a given site (or receptor), ambient air is defined in terms of public access not frequency of access, length of stay, age of person or other factors.[11]

3.2.4 Public Access

If an area is owned or leased by the source and public access is prevented, the area is not ambient air with respect to the source's own emissions. However, there should be sufficient barriers to prevent public access. Barriers considered sufficient to prevent public access are generally limited to fences. However, a clearly posted area alongside a river that is regularly patrolled by security guards would qualify as sufficient protection.[12]

3.2.5 Land Acquisition

Land acquisition and removal of the area from ambient air is not automatically considered a dispersion technique prohibited by Section 123; it is a situation that will be reviewed on a case-by-case basis. (Also see discussion on stack height regulations, Section 6.) In only a few instances has the EPA tolerated land acquisition to contain modeled violations of the NAAQS.[13]

3.2.6 Modeling Receptor Locations vs. Ambient Monitor Locations

With respect to receptor locations for modeling and ambient air purposes, EPA does not consider whether such sites could meet standard siting criteria for monitors. Although siting criteria may preclude the placement of ambient monitors at certain locations, this does not preclude the placement of model receptors at these sites.[14]

REFERENCES FOR SECTION 3.2

1. "We are retaining the policy that the exemption from ambient air is available only for the atmosphere over land owned or controlled by the source and to which public access is precluded by a fence or other physical barriers." Letter from Costle, D.M., EPA Administrator to Honorable J. Randolph, U.S. Senate. December 19, 1980. PN 123-80-12-19-001.

2. "We agree with your position that all property outside of the property leased and controlled by EFKI would be considered ambient air." Memorandum from Helms, G.T., OAQPS, to W.S. Baker, Air Branch Chief, Region II. Ambient Air Issue from New Jersey Department of Environmental Protection. July 27, 1987.

3. "While EPA considers ambient air to include elevated building receptor sites, it is not practical to analyze the air quality at every such existing location." Letter from Bennett, K.M., Office of Air Noise and Radiation (OANR), to H. Hovey, New York Department of Environmental Conservation. March 18, 1983. PN 110-83-03-18-063.

4. "There is no basis for excluding ambient air above a public parking lot from coverage by the SIP." Memorandum from James, M.A., OGC, to C. Simon, Air Programs Branch Chief, Region II. Attainment of National Standards in Open Air Parking Lots. September 27, 1972.

5. "The Regional Meteorologists propose that for modeling purposes the air everywhere outside of contiguous plant property to which public access is precluded by a fence or other effective physical barrier should be considered in locating receptors. Specifically, for stationary source modeling, receptors should be placed anywhere outside inaccessible plant property. For example, receptors should be included over bodies of water, over unfenced plant property, on buildings, over roadways, and over property owned by other sources." Memorandum from Koerber, M., Region V, to J. Tikvart, OAQPS. Ambient Air. May 16, 1985.

6. "The Regional Meteorologists' memorandum to which you refer does not imply any change in [the] national policy and simply harmonizes modeling procedures with our long-standing policy. It is intended to ensure consistent Regional implementation of that policy and to dispel any questions about pollutant concentrations at locations where the general public has access." Letter from Emison, G.A., OAQPS, to W.F. O'Keefe, American Petroleum Institute, January 22, 1986.

7. "Case 3 (Wayne County, MI): This case involves the air over the Detroit River, the Rouge River, and the Short-cut Canal. We agree that the air over all three of these is ambient air, since none of the companies owns them or controls public access to them." Memorandum from Helms, G.T., OAQPS, to S. Rothblatt, Region V. Ambient Air. April 30, 1987. PN 110-87-04-30-083.

8. Reference 7. "Case 1 (Dakota County, MN): This case involves two noncontiguous pieces of fenced property owned by the same source, divided by a public road. We agree that the road is clearly ambient air and that both fenced pieces of plant property are not."

9. "Scenario One: We agree with you that the road and the unfenced property are ambient air and could be locations for the controlling receptor." Memorandum from Helms, G.T., OAQPS, to B. Miller, Air Programs Branch, Region IV. April 30, 1987. Ambient Air. PN 110-87-04-30-082.

10. Reference 7. "Case 5 (involves the placement of receptors on another source's fenced property): As mentioned in Case 2, we feel that present policy does require that receptors be placed over another source's property to measure the contribution of the outside source to its neighbor's ambient air."

11. "Regardless of whether any member of the public is expected to remain at a particular place for a specific period of time, ambient air is defined in terms of public access, not frequency of access, length of stay, age of the person or other limitations." Memorandum from Tyler, D.D., OAQPS, to A. Davis, Region VI. Definition of Ambient Air for Lead. May 26, 1983.

12. Reference 9. "We do not think that any of the barriers mentioned are sufficient to preclude public access so as to allow the source to dispense with a fence. An example of an unfenced boundary that would qualify is a property line along a river that is clearly posted and regularly patrolled by security guards."

13. "We have never either flatly stated that land acquisition in general is acceptable or unacceptable under Section 123 of the Clear Air Act...we will review individual situations on a case-by-case basis." Memorandum from Tyler, D., OAQPS, to I. Dickstein, Region VIII. Wyoming--Definition of Ambient Air. April 7, 1987.

14. "All receptor locations that may affect control strategy requirements, and meet the definition of 'ambient air', must be included in regulatory modeling applications. Ambient air is defined in 40 CFR Part 50.1(e) as 'that portion of the atmosphere external to buildings, to which the general public has access.' Receptor points 180 and 197 are adjacent to a roadway to which the public clearly has access; thus, they must be included in the SIP modeling analysis. Although siting criteria may preclude placement of ambient monitors at these receptors as was discussed by Asarco, this does not preclude the placement of model receptors at these sites." Letter from Skie, D.M., Region VIII, to Jeffrey T. Chaffee, Montana Department of Health and Environmental Sciences. March 13, 1992.

4.0 EMISSIONS INVENTORY

5.0 AMBIENT AIR QUALITY MONITORING AND DATA USAGE

5.1 GENERAL

According to the regulations established in 40 CFR Part 58, States are required to establish and maintain an air quality surveillance system for the purpose of measuring ambient concentrations of those pollutants to which national ambient air quality standards have been defined. The network of monitoring stations to be provided for in SIPs is designated as the State and Local Air Monitoring Stations (SLAMS) network. The general SIP monitoring requirements are contained in 40 CFR 58.20 and include, among other things, the following:[1]

(1) establishment of an air quality surveillance system for the purpose of measuring ambient concentrations of those pollutants for which national ambient air quality standards have been defined;

(2) meeting of requirements in Appendices A, C, D, and E of 40 CFR Part 58 which deal with quality assurance for monitoring stations, monitoring methodology, monitoring network design, and probe siting criteria, respectively;

(3) provide for the performance of an annual network review to verify that monitoring objectives are satisfied; and

(4) the provision of a SLAMS network description for public review and submission to the EPA Administrator.

Ambient air monitoring guidelines, for sources required to monitor air quality under the PSD regulations, are provided in the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration.*[2]

The SIP itself does not have to contain the network description. Network descriptions must be kept on file at the State agency's office, made available for public inspection and submitted to the Administrator upon request.[3] A State's prior SIP submission that covers air quality monitoring in general may meet the requirements for lead SIPs. The Regional Office should determine whether the State's prior monitoring submission includes lead. If the monitoring submission specifically excludes lead, the lead SIP must provide the necessary

information on lead monitoring. For further information on what the SIP itself must contain, the readers should consult *Guidelines for Implementation of the Ambient Air Monitoring Regulations*, EPA-450/4-79-038.

Any ambient air quality station other than a SLAMS or PSD station which a State intends to use data for demonstrating attainment or nonattainment or in computing a design value for control purposes must meet the requirements for SLAMS as described in 40 CFR Parts 58.13 and 58.22, as well as the requirements of Appendices A and E of Part 58.[4] Any ambient air quality station other than a SLAMS or PSD station from which a State intends to use data for SIP-related functions other than as an attainment or nonattainment demonstration or in computing a design value for NAAQS control purposes, need not necessarily satisfy the requirements for a SLAMS station, but must be operated in accordance with specifications approved by the Regional Administrator.[5]

Measurement of meteorological variables at the location of an air quality monitoring station provides a basis for correlating air pollutant levels with local weather patterns. Guidance on implementing a program of meteorological monitoring for regulatory purposes is provided in *On-Site Meteorological Program Guidance for Regulatory Modeling Applications.*[6] This document addresses all aspects of the installation and implementation of a meteorological program, from instrument siting and exposure to data reporting and quality assurance.

REFERENCES FOR SECTION 5.1

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58.20. July 1, 1991.

2. U.S. Environmental Protection Agency. *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA Publication No. EPA-450/4-87-007. May 1987.

3. "[T]he State shall adopt and submit to the Administrator a revision to the plan which will:...(e) Provide for having a SLAMS network description available for public inspection and submission to the Administrator upon request." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58.20(e). July 1, 1991.

4. "Any ambient air quality monitoring station other than a SLAMS or PSD station from which the State intends to use the data as part of a demonstration of attainment or nonattainment or in computing a design value for control purposes of the National Ambient Air Quality Standards (NAAQS) must meet the requirements for SLAMS described in section 58.22 and, after January 1, 1983, must also meet the requirements for SLAMS as described in section 58.13 and Appendices A and E to this part." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58.14(a). July 1, 1991.

5. "Any ambient air quality monitoring station other than a SLAMS or PSD station from which the State intends to use data for SIP-related functions other than described in paragraph (a) of this section is not necessarily required to comply with the requirements of a SLAMS station under paragraph (a) but must be operated in accordance with a monitoring schedule, methodology, quality assurance procedures, and probe or instrument-siting specifications approved by the Regional Administrator." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58.14(b). July 1, 1991.

6. U.S. Environmental Protection Agency. *On-Site Meteorological Program Guidance for Regulatory Modeling Applications*. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA Publication No. EPA-450/4-87-013. June 1987.

5.2 QUALITY ASSURANCE

Quality assurance requirements for SLAMS are specified in Appendix A of 40 CFR 58 and for PSD monitoring are specified in Appendix B. The requirements in Appendix A are general in nature in order to allow each State the opportunity to develop the most efficient and effective quality assurance system for its own circumstances.[1] Accuracy and precision tests for lead sampling are the essence of the quality assurance system established. Results of all valid precision and accuracy tests shall be reported on a quarterly basis to the Atmospheric Research and Exposure Assessment Laboratory (AREAL), formerly the Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. [Note, however, that the current practice is to report the precision and accuracy data base to Aerometric Information Retrieval System (AIRS). The EPA is in the process of revising 40 CFR Part 58, Appendix A, to reflect current practices.] A list of all lead monitoring sites and their AIRS site identification codes shall be kept updated and on file with the appropriate EPA Regional office and with the AREAL.[1] [AIRS was formerly known as the Storage and Retrieval of Aerometric Data (SAROAD) system.]

Quality assurance is also addressed in EPA's *Guideline for Lead Monitoring in the Vicinity of Point Sources*. This document points out the requirements for the semiannual system audit of the lead monitoring network, a requirement not mentioned in 40 CFR Part 58, Appendices A and B.[2] A description of this system audit is found in *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I - Principles* (EPA-600/9-76-005). This audit must be conducted by the State agency or Regional EPA Office.

Similarly, EPA's *Guideline for Lead Monitoring in the Vicinity of Point Sources*[3] also states that operators must participate in the national performance audit program conducted by EPA which addresses the high-volume sampler flow rate and lead analysis using glass fiber filter strips. Instructions for participation in the national performance audit program are addressed in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I - Principles* (EPA-600/9-76-005).

REFERENCES FOR SECTION 5.2

1. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Subpart B. Part 58, Appendix A. July 1, 1991.

2. "4.2.2 System Audit - Semiannually, the State agency or regional EPA must conduct system audits of the ambient lead monitoring network." U.S. Environmental Protection Agency. *Guideline for Lead Monitoring in the Vicinity of Point Sources.* Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA Publication No. EPA-450/4-81-006. January 1981.

3. Reference 2. "4.2.3 EPA's National Performance Audit Program - Operators must participate in the following national performance audit program conducted by USEPA: (a) The annual blind performance audit of the high-volume sampler flow rate using reference flow devices. (b) The semi-annual blind performance audit for lead analysis using glass filter strips containing lead. Instructions for participating in the national performance audit program may be obtained from the appropriate USEPA Regional Quality Control Coordinator, or from the Quality Assurance Division..."

5.3 AMBIENT MONITORING METHODOLOGY

5.3.1 General

Monitoring methods used in the SLAMS networks must be reference or equivalent methods as defined in 40 CFR 50.1.[1] The reference method used for measuring ambient levels of lead to determine compliance with the NAAQS is found at 40 CFR Part 50, Appendix G.[2]

According to the reference method, a standard high volume air sampler for total suspended particulate (TSP) draws a measured sample of air through a glass fiber filter for a 24-hour sampling period.[3] Samplers that are attended only once per 6 days may be equipped with a sample saver to minimize fallout during idle periods; 40 CFR Part 50 Appendix B does not require sample savers, however, and data from sites not using them are acceptable.[4]

5.3.2 Sampling Interval

Lead data collected at any SLAMS site must be at least one 24-hour sample every 6 days and there are no time-of-day requirements for this sample.[5]

5.3.3 Data Completeness

At least 75 percent of the possible individual 24-hour values (with a 1 in 6 day sampling schedule) must be valid to determine average concentration.[6]

5.3.4 Length of Sampling

Lead monitoring should be conducted for a minimum of 1 year after the monitoring network has been established. If the data show that the lead NAAQS is not being exceeded, most or all of the sampling network can be discontinued. If the NAAQS is being threatened (concentrations are equal to of greater than 90 percent of the NAAQS) or exceeded, then monitoring should continue for an additional year. Note that the discontinuance of monitoring should be determined by the State and source owner jointly.[7]

Monitoring is still required around a shut-down lead source if the shut-down is temporary (i.e., less than or equal to a two-year interruption of the source). If the shut-down is permanent, stack emissions do not require monitoring, and the monitor in that area could be shut-down immediately. The monitoring of fugitive emissions should continue for approximately 6 months after the source activity ceases.[8]

REFERENCES FOR SECTION 5.3

1. "(f) Reference method means a method of sampling and analyzing the ambient air for an air pollutant that is specified as a reference method in an appendix to this part, or a method that has been designated as a reference method in accordance with part 53 of this chapter; it does not include a method for which a reference method designation has been cancelled in accordance with 53.11 or 53.16 of this chapter." and "(g) Equivalent method means a method of sampling and analyzing the ambient air for an air pollutant that has been designated an equivalent method in accordance with part 53 of this chapter; it does not include a method for which an equivalent method designation has been cancelled in accordance with 53.11 or 53.16 of this chapter." U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Part 50.1. (f) and (g). July 1, 1991.

2. Reference 1. Appendix G - Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air.

3. Reference 2. "Ambient air suspended particulate matter is collected on a glass-fiber filter for 24 hours using a high volume air sampler."

4. Reference 1. Appendix B. Section 6.7. "Nonsampled particulate matter. Particulate matter may be deposited on the filter by wind during periods when the sampler is inoperative. (9) It is recommended that errors from this source be minimized by an automatic mechanical device that keeps the filter covered during nonsampling periods, or by timely installation and retrieval of filters to minimize the nonsampling periods prior to and following operation."

5. Reference 1. "(b) For manual methods (excluding PM-10 samplers) - at least one 24-hour sample every six days except during periods or seasons exempted by the Regional Administrator." Part 58.13(b).

6. "In the preamble to the lead SIP regulations of October 5, 1978 (43 FR 46264), it was stated that EPA would provide guidance regarding the minimum number of valid samples needed to determine quarterly average lead concentrations. The preamble also cited the general practice that at least 75 percent of the scheduled samples must be valid in order to determine average concentrations. OAQPS has reviewed this issue and has concluded that the '75 percent rule' is appropriate for determining attainment with the NAAQS for lead. This means that, at the sampling frequency of one 24-hour sample every six days (15 samples per quarter), at least 12 valid lead samples must be available to determine whether a State is attaining the national standard." Memorandum from Rhoads, Richard G., Director, Control Programs Development Division, to Air Directors in Regions I-X. "Minimum Number of Samples for Determining Quarterly Average Lead Concentration." November 21, 1979.

7. "3.5 Duration and Frequency of Sampling - A minimum of one 24-hour sample every sixth day is necessary, but more frequent sampling is encouraged. The lead monitoring should be conducted for a minimum of 1 year. If the data show that the lead NAAQS is not being exceeded, most or all of the sampling network could be discontinued. This would be jointly determined by the State and the lead source owner or operator after a review of the data. If the data show that the NAAQS is threatened (concentrations are equal or greater that 90 percent of the NAAQS), or is being exceeded, then in general monitoring should be continued for an additional year." U.S. Environmental Protection Agency. *Guideline for Lead Monitoring in the Vicinity of Point Sources.* Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA Publication No. EPA-450/4-81-006. January 1981.

8. "In answer to the question as to whether monitoring is required at a shut-down site, in this case a smelter in San Antonio, Texas, if the shut-down is temporary, monitoring should continue in both areas. The definition of temporary is arbitrary, but we feel that a two-year interruption of the source should warrant monitoring. If the shut-down is permanent, the need to monitor stack emissions disappears and the monitor in that area could be shut-down immediately. The monitor located to measure fugitive emissions should continue for approximately 6 months after the source activity ceases for the following reasons." Memorandum from Laxton, William G., Director, Technical Support Division, to Joe D. Winkle, Deputy Regional Administrator, Region VI. March 12, 1991.

5.4 NETWORK DESIGN

General criteria for the establishment of the SLAMS network for the selection of new monitoring stations is provided in Appendix D of 40 CFR Part 58. These criteria are employed by EPA in evaluating the adequacy of SLAMS networks.

A SLAMS network should be designed to comply with four basic monitoring objectives:[1]

(1) to determine the highest concentrations expected to occur in the areas encompassed by the network;

(2) to determine representative concentrations in areas of high population density;

(3) to determine the impact on ambient pollution levels of significant sources or source categories; and

(4) to determine general background concentration levels.

Proper siting of a monitoring station requires exact specification of the monitoring objective and commonly involves a definition of a spatial scale of representativeness.[2] As stated in Appendix D, the goal in siting stations is to correctly match the spatial scale that the sample of monitored air represents with the spatial scale of most appropriate for the monitoring objective of the station.[3] The spatial scales designated for lead SLAMS monitoring are the microscale, middle, neighborhood, urban and regional scales[4], and the definitions of which are provided in Appendix D.

Additional information on monitoring network design may be found in the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration.*[5]

Although specific lead monitoring requirements in Appendix D deal with lead as it originates from automobile exhaust, EPA has expanded its monitoring requirements for lead, focusing on point source emissions. Guidance on monitoring in the vicinity of lead point sources can be found in *Optimum Sampling Site Exposure Criteria for Lead* (EPA 450/4-84-012) and *Guideline for Short-Term Lead Monitoring in the Vicinity of Point Sources* (OAQPS 1.2-122, March 26, 1979.)

The objective of point source ambient lead monitoring is to determine the impact of individual point sources at ground level areas impacted by the source. The ambient concentrations measured must include background concentrations and peak concentration levels for stack emissions and fugitive emissions.[6]

For each reporting organization or source operating a lead monitoring network, one or more of the monitoring sites must duplicate or collocate sampling as follows:[7]

- For 1 to 5 sites, select 1 site;
- For 6 to 20 sites, select 2 sites; and
- For over 20 sites, select 3 sites.

The site selected for collocating samplers should be the site with the highest expected 24-hour pollutant concentration. This highest expected concentration is typically determined based on dispersion modeling results. At this site, two high-volume samplers must be located within four meters of each other, but at least two meters apart to preclude airflow interference. Both samplers must be operated at the same time.[8]

Samplers must be located in the ambient air as defined in 40 CFR Part 50.1(e), which states that ambient air includes, "That portion of the atmosphere, external to buildings, to which the general public has access." Ambient air is defined according to public access, not frequency of access, length of stay, age of the person, or any other limitations.[9]

REFERENCES FOR SECTION 5.4

1. "The network of stations which comprises SLAMS should be designed to meet a minimum of four basic monitoring objectives. These basic objectives are: (1) To determine highest concentrations expected to occur in the area covered by the network; (2) to determine representative concentrations in areas of high population density; (3) to determine the impact on ambient pollution levels of significant sources or source categories; and (4) to determine general background concentration levels." U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Part 58, Appendix D - Network Design for State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS) 1. SLAMS Monitoring Objectives and Spatial Scales. July 1, 1991.

2. Reference 1. "Proper siting of a monitoring station requires precise specification of the monitoring objective which usually includes a desired spatial scale of representativeness."

3. Reference 1. "The goal in siting stations is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring objective of the station."

4. Reference 1. "The most important spatial scales to effectively characterize the emissions from both mobile and stationary sources are the micro, middle, and neighborhood scales. For purposes of establishing monitoring stations to represent large homogeneous areas other than the above scales of representativeness, urban or regional scale stations would also be needed."

5. U.S. Environmental Protection Agency. *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD).* Office of Air Quality Planning and Standards. Research Triangle Park, NC. EPA-450/4-87-007. May 1987.

6. "3.1 Monitoring Objective and Data Uses - The objective for conducting point source ambient lead monitoring is to determine the impact of individual point sources at ground level areas impacted by the source...The ambient concentrations measured, as a minimum, must include background concentrations and peak concentration levels for stack and fugitive emissions." U.S. Environmental Protection Agency. *Guideline for Lead Monitoring in the Vicinity of Point Sources.* Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA-450/4-81-006. January 1981.

7. "For each network of manual methods, select one or more monitoring sites within the reporting organization for duplicate, collocated sampling as follows: for 1 to 5 sites, select 1 site; for 6 to 20 sites, select 2 sites and for over 20 sites, select 3 sites." U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Part 58, Appendix A - Quality Assurance Requirements for State and Local Air Monitoring Stations (SLAMS). Section 3.3. July 1, 1991.

8. Reference 6. "4.3.1 Assessment of Monitoring Data for Precision - For each monitoring network, one sampling site must have collocated samplers. A site with the highest expected 24-hour pollutant concentration must be selected. The two high-volume samplers must be located within 4 meters of each other but at least 2 meters apart to preclude airflow interference. Calibration, sampling and analysis must be the same for both collocated samplers and must be the same as for all other samplers in the network. Both samplers at the collocated site must be operated at the same time, namely, every sixth calendar day."

9. "Regardless of whether any member of the public is expected to remain at a particular place for a specific period of time, ambient air is defined in terms of public access, not frequency of access, length of stay, age of the person or other limitations." Memorandum from Tyler, Darryl D., Director, Control Programs Development Division, to Allyn Davis, Director, Air and Waste Management Division, Region VI. Definition of Ambient Air for Lead. May 26, 1983.

5.5 PROBE SITING CRITERIA

The criteria for placement of lead samplers are described in 40 CFR Part 58, Appendix E (Section 7 Lead) and are discussed further in the *Guideline for Lead Monitoring in the Vicinity of Point Sources.*[1] These criteria must be adhered to as strictly as possible. In the event that the siting criteria cannot be met, a written request to the EPA must be made justifying the differences in the proposed siting criteria.[2]

For samplers located so as to determine the maximum concentration from the lead source, the primary concern in siting is measuring the maximum impact from the lead source itself. For elevated stack emissions, a range of sampler heights of 2 to 15 meters is acceptable for the neighborhood scale, since sufficient mixing generally occurs during the transport from the stack to the ground. For a ground level source, the range of acceptable probe heights is 2 to 7 meters because the concentration gradient near the ground might be quite large.[3]

When located on the tops of buildings, samplers must be located at least 2 meters away from walls, parapets, and penthouses, with no furnace or incineration flues nearby. For macro scale, the samplers should be placed at least 20 meters from the dripline of trees. The sampler must be located away from obstacles such as buildings, so that the distance between obstacles and the samplers is at least twice the height that the obstacle protrudes above the sampler. There must be unrestricted airflow in an arc of at least 270 degrees around the sampler.[4,5]

Stations designed to measure the peak concentrations from mobile sources should be located at the distance most likely to produce the highest concentration. This varies from 5 to 15 meters from major roadways for microscale stations and 15 to 100 meters, depending on average traffic flows, for middle scale stations.[6]

REFERENCES FOR SECTION 5.5

1. U.S. Environmental Protection Agency. *Guideline for Lead Monitoring in the Vicinity of Point Sources*. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. Section 3.7 - Monitor Siting. EPA Publication No. EPA-450/4-81-006. January 1981.

2. "The probe siting criteria as discussed below must be followed to the maximum extent possible. It is recognized that there may be situations when the probe siting criteria cannot be followed. If the siting criteria cannot be met, this must be thoroughly documented with a written request for a waiver which describes how and why the siting criteria differ." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58, Appendix E - Probe Siting Criteria for Ambient Air Quality Monitoring. Section 1. July 1, 1991.

3. Reference 1. "For Case 1, the driving force for locating the siting area of the monitor as well as the specific location of the instrument shelter is the objective of measuring the maximum impact from the lead source itself. Two Case 1 examples follow. Consider the situation in which a source emits lead from an elevated stack. Under these circumstances, sufficient mixing generally occurs during the transport of the emissions from the stack to the ground so that vertical gradients near ground level are small, thus, a range of sampler heights of 2-15 meters is acceptable. For the same objective (maximum concentration from lead source), consider another example in which lead is emitted from a ground level source. In this case, the concentration gradient near the ground might be large, thereby requiring a much narrower range of acceptable probe heights. For ground level sources emitting lead with steep vertical concentration gradients, efforts should be made to locate lead monitors 2 to 7 meters above ground level."

4. Reference 1. "A minimum of 2 meters of separation from walls, parapets, and penthouses is required for samplers located on a roof or other structure. No furnace or incineration flues should be nearby. The height of the flues and the type, quality, and quantity of waste or fuel burned determine the separation distances from flues. For example, if the emissions from the chimney have a high lead content and there is a high probability that the plume would impact on the sampler during most of the sampling period, then other buildings/locations in the area that are free from the described sources should be chosen for the monitoring site. The sampler should be placed at least 20 meters from trees, since trees absorb particles as well as adversely affect airflow.

   The sampler must be located away from obstacles such as buildings, so that the distance between obstacles and the sampler is at least twice the height that the obstacle protrudes above the sampler. There must also be unrestricted airflow in an arc of at least 270° around the sampler, and the predominant direction for the season of greatest pollution concentration potential must be included in the 270° arc."

5. Reference 2. Section 7.2. "A minimum of 2 meters of separation from walls, parapets, and penthouses is required for rooftop samplers. No furnace or incinerator flues should be nearby. The height and type of flues and the type, quality and quantity of waste or fuel burned determine the separation distances. There must be unrestricted airflow in an arc of at least 270° around the sampler."

6. Reference 2. "For the microscale station, the location must be between 5 and 15 meters from the major roadway. For the middle scale station, a range of acceptable distances from the major roadway is shown in Table 4. [i.e., 15 to 100 meters]." Section 7.3 - Spacing from Roadways.

5.6 AMBIENT AIR QUALITY DATA REPORTING

On an annual basis States shall submit a summary report of all the ambient air quality monitoring data from their SLAMS samplers. These annual summaries must contain, at a minimum, the following:[1]

- site location and monitoring information including monitoring method and sampling interval (e.g., 24-hour or quarterly composites);
- the four quarterly arithmetic averages given to two decimal places; and
- the number of 24-hour samples included in the average.

In addition, a summary report must be submitted to AIRS within 120 days after the end of the quarterly monitoring period for monitors designated as National Air Monitoring Stations (NAMS).

REFERENCES FOR SECTION 5.6

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 58, 58.26, and Appendix F 2.6.1 and 2.6.2, and Appendix G. July 1, 1991.

5.7 AMBIENT AIR MONITORING NETWORK FOR MODEL EVALUATION

While it is generally not feasible to base point source emission limits solely on monitoring data, such data may be used to determine, through an evaluation study, the best available model for a particular application.[1] A difficult aspect of implementing this approach is the determination of the appropriate network size. A network too small would provide inadequate data and hence an invalid evaluation. A network too large would be prohibitively expensive to operate.[2] Based on experience with previously conducted model evaluation studies, the operation of approximately 15 monitors for a period of one year is considered the minimum network size to obtain a valid data base under normal (e.g., not complex terrain) circumstances.[3,4] The protocol and data base requirements for conducting a model performance evaluation study are described in the EPA report *Interim Procedures for Evaluating Air Quality Models (Revised).*[5]

REFERENCES FOR SECTION 5.7

1. "It is generally not feasible to establish emission limits for point sources based solely on monitoring data. [A]n alternative approach is to establish a monitoring network of reasonable size, use the resulting monitored data to evaluate the models for applicability to those particular conditions, and use the resulting 'best available' model to establish the emission limitation." Memorandum from Rhoads, R.G., OAQPS, to R.C. Campbell, OAQPS. September 1, 1981.

2. Reference 1. "One problem with this approach is defining the 'network of reasonable size' which would be used to evaluate the models. If the network is too small, the data would be inadequate to distinguish between models and the evaluation would have no validity. If the network is too large, the cost would be excessive."

3. Reference 1. "Based on our experience with these programs (all of which were reasonably successful, but with the exception of EPRI, none of which were 'data rich'), I believe that approximately 15 monitors operating for one year is probably the minimum network size to obtain a valid data base under normal circumstances."

4. "Although our experience with networks for this purpose is limited, we believe that an appropriate balance between the technical requirements of the analyses and the costs would result in approximately 15 monitors, depending upon the type of terrain, meteorological conditions, prior knowledge of air quality in the area, etc." Memorandum from Rhoads, R.G., OAQPS, to D. Kee, Region V. August 7, 1981.

5. U.S. Environmental Protection Agency. *Interim Procedures for Evaluating Air Quality Models (Revised).* Monitoring and Data Analysis Division, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. EPA-450/4-84-023. September 1984.

6.0 AIR QUALITY MODELING

6.1 GENERAL

Air quality modeling analyses are performed to demonstrate that a proposed control strategy can adequately attain and maintain the NAAQS [40 CFR 51.112(a) and 51.117(a)]. SIP submittals must include a description of how the modeling analysis was conducted by providing, in a Technical Support Document, information on the models used; the justification of model selection; the modes of models used; assumptions involved in model application; the meteorological data; ambient monitoring data used; the justification of off-site data, if used; the model input data; and the model output data.[1,2]

REFERENCES FOR SECTION 6.1

1. "(e) Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis." U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Chapter I. Subchapter C. Part 51. Appendix V. July 1, 1991 and as amended at *Federal Register* 56:42216. August 26, 1991.

2. "(2)(K)(ii) The submission, upon request, of data related to such air quality modeling to the Administrator." Section 110 of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

6.2 GUIDANCE ON AIR QUALITY MODELS

Air quality modeling techniques appropriate for use in SIP, New Source Review (NSR) and PSD analyses are specified in the *Guideline On Air Quality Models (Revised)* and *Supplement A (Guideline).*[1,2] The Guideline is a primary source of information on the proper selection and regulatory application of air quality models. Recommendations are made in the Guideline concerning air quality models, data bases, requirements for concentration estimates, the use of measured data in lieu of model estimates and model evaluation procedures.

Announcements of proposed and final revisions to the Guideline are made in the *Federal Register* as needed. Clarifications and interpretations of modeling procedures become official EPA guidance through several courses of action: (1) the procedures are published as regulations or guidelines; (2) the procedures are formally transmitted as guidance to Regional Office managers; (3) the procedures are formally transmitted as guidance to Regional Modeling Contacts as a result of a Regional consensus on technical issues; or (4) the procedures are a result of decisions by the Model Clearinghouse that effectively establish a national precedent.[3] Formally located in the Source Receptor Analysis Branch (SRAB) of the OAQPS, the Model Clearinghouse is the single EPA focal point for the review of criteria pollutant modeling techniques for specific regulatory applications.[4] The Clearinghouse serves a major role in promoting fairness and consistency in modeling decisions that deviate from the established modeling guidance.[5]

The time at which changes in modeling guidance affect modeling analyses in progress will depend on the type of agreement under which those analyses are being conducted.[6] Normally, ongoing analyses will be grandfathered if there is a written protocol with a legal or regulatory basis or if the analysis is complete and regulatory action is imminent or underway.[7]

REFERENCES FOR SECTION 6.2

1. "This guideline recommends air quality modeling techniques that should be applied to State Implementation Plan (SIP) revisions for existing sources and to new source reviews, including prevention of significant deterioration (PSD)." U.S. Environmental Protection Agency. *Guideline On Air Quality Models (Revised)*, Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. p. 1-1.

2. U.S. Environmental Protection Agency. *Supplement A to the Guideline On Air Quality Models (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1987.

3. "(C)hanges in EPA modeling procedures become official Agency guidance when: (1) they are published as regulations or guidelines, (2) they are formally transmitted as guidance to Regional Office managers, (3) they are formally transmitted as guidance to Regional Modeling Contacts as the result of a Regional consensus on technical issues, or (4) they are a result of decisions by the Model Clearinghouse that effectively establish a national precedent." Attachment 2 of Memorandum from Tikvart, J.A., OAQPS, to Regional Modeling Contacts. January 2, 1985. PN 110-85-01-02-070.

4. "The Model Clearinghouse is the single EPA focal point for reviewing the use of modeling techniques for criteria pollutants in specific regulatory applications." Memorandum from Tikvart, J.A., OAQPS, to Regional Chiefs, Air Branch Region VII, Technical Support Branch Region I, Air and Radiation Branch Region V, Air Programs Branch Regions II, III, IV, VI, VIII, IX, X. June 7, 1988.

5. Reference 4. "However, there is also a need to provide for a mechanism that promotes fairness and consistency in modeling decisions among the various Regional Offices and the States."

6. Reference 3. "(T)he time at which changes in modeling guidance affect on-going modeling analyses is a function of the type of agreement under which those analyses are being conducted."

7. Reference 3. "On-going analyses should normally be "grandfathered" if (1) there is a written protocol with a legal or regulatory basis (such as the Lovett Power Plant) or (2) the analysis is complete and regulatory action is imminent or underway."

6.3 MODEL SELECTION

Lead SIPs submitted to demonstrate attainment and maintenance of the NAAQS around specified point sources of lead must employ an atmospheric dispersion model.[1] Further information regarding air quality modeling techniques recommended for application to SIP revisions for existing sources and to new source reviews, including PSD, are provided in the Guideline.[2,3] Each SIP revision must identify and describe the air quality model selected.[4]

The model selected for application should in all situations be the one which most accurately represents atmospheric transport, dispersion, and chemical transformations in the area under analysis.[5] For example, models have been developed for both simple and complex terrain situations; some are designed for urban applications while others are designed for rural applications.

The acceptability of using an alternative model for a given regulatory application may be justified in certain situations.[6] Procedures for objectively evaluating alternative techniques are discussed in the EPA documents: *Interim Procedures for Evaluating Air Quality Models (Revised)* and *Interim Procedures for Evaluating Air Quality Models: Experience with Implementation.*[7,8]

Two levels of model sophistication exist: screening and refined. Screening techniques are used initially to eliminate more extensive modeling if it is clearly established, through their application, that the proposed source or control strategy will not cause or contribute to ambient concentrations in excess of either the NAAQS or the allowable PSD increments.[9] Refined air quality models require more detailed and precise input data and consequently provide more accurate estimates of source impact. These refined models are used if a screening technique indicates that a concentration resulting from the source causes or contributes to an exceedance of the PSD increment or the NAAQS.[10]

As noted above, the Guideline should be consulted on specific requirements for model selection. In some situations, receptor modeling may be used in conjunction with dispersion modeling to more precisely characterize specific source contributions. The EPA's existing guidance indicates that receptor modeling should not be used alone to develop a control strategy.[11-13] The use of receptor models in conjunction with dispersion models can help to more

precisely characterize specific source contributions. Where possible, the use of combined dispersion and receptor modeling is encouraged.[14]

REFERENCES FOR SECTION 6.3

1. "(2) For each point source listed in §51.117(a), that plan must employ an atmospheric dispersion model for demonstration of attainment." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 51.117(c)(2). July 1, 1991.

2. "This guideline recommends air quality modeling techniques that should be applied to State Implementation Plan (SIP) revisions for existing sources and to new source reviews, including prevention of significant deterioration (PSD)." U.S. Environmental Protection Agency. *Guideline On Air Quality Models (Revised)*. Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986.

3. "(1) All estimates of ambient concentrations required under this paragraph shall be based on the applicable air quality models, data bases, and other requirements specified in the 'Guideline on Air Quality Models (Revised)' (1986) which is incorporated by reference." *Federal Register* 51:32178. September 9, 1986.

4. Reference 1. "(4) A description of the dispersion models used to project air quality and to evaluate control strategies."

5. Reference 2. p. 1-3. "In all cases, the model applied to a given situation should be the one that provides the most accurate representation of atmospheric transport, dispersion, and chemical transformations in the area of interest."

6. Reference 2. p. 3-6. "An EPA document, 'Interim Procedures for Evaluation Air Quality Models,' has been prepared to assist in developing a consistent approach when justifying the use of other than the preferred modeling techniques recommended in this guide." U.S. Environmental Protection Agency.

7. U.S. Environmental Protection Agency. *Interim Procedures for Evaluating Air Quality Models (Revised)*. Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-84-023. September 1984.

8. U.S. Environmental Protection Agency. *Interim Procedures for Evaluating Air Quality Models: Experience with Implementation*. Office of Air Quality Planning and Standards. Research Triangle Park, EPA Publication No. EPA-450/4-85-006. July 1985.

9. Reference 2. p. 2-6. "The purpose of such techniques is to eliminate the need of further more detailed modeling for those sources that clearly will not cause or contribute to ambient concentrations in excess of either the National Ambient Air Quality Standards or the allowable prevention of significant deterioration concentration increments."

10. Reference 2. p. 2-6. "If a screening technique indicates that the concentration contributed by the source exceeds the PSD increment or the increment remaining to just meet the NAAQS, then the second level of more sophisticated models should be applied."

11. "EPA's guidance on receptor modeling (*Receptor Model Technical Series, Volume I — Overview of Receptor Model Application to Particulate Sources Apportionment*, EPA-450/4-81-016a) indicates that receptor modeling should not be used alone to develop a control strategy, but should be used in conjunction with dispersion modeling." Memorandum from Helms, G.T., Chief, Control Programs Operations Branch, CPDD, to Tom Harris, Montana Operations Office, Region VIII. Montana Lead SIP — Receptor and Dispersion Modeling. June 14, 1984.

12. "MDAD pointed out that EPA's existing guidance indicates that receptor modeling should not be used alone to develop a control strategy but that it should be used in conjunction with dispersion modeling." Memorandum from Helms, G.T., Chief, Control Programs Operations Branch, CPDD, to Jack Divita, Chief, Air Programs Branch, Region VI. Receptor Modeling and Dispersion Modeling in Lead SIP Development. June 8, 1984.

13. U.S. Environmental Protection Agency. *Receptor Model Technical Series, Volume I — Overview of Receptor Model Application to Particulate Sources Apportionment.* EPA Publication No. EPA-450/4-81-016a.

14. Reference 2. p. 7-4. "Where possible, the use of receptor models in conjunction with dispersion models is encouraged to more precisely characterize the emissions inventory and to validate source-specific impacts calculated by the dispersion model."

6.4 METEOROLOGICAL INPUT

Meteorological data utilized in air quality modeling should be spatially and climatologically (temporally) representative of the area of interest.[1] Use of site-specific data is preferred for air quality analyses provided one year or more of quality-assured data are available.[2] Suggestions for the collection and use of on-site data are provided in the Guideline and in the EPA documents *On-Site Meteorological Program Guidance for Regulatory Modeling Applications*,[3] *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*,[4] and *Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV. Meteorological Measurements*.[5]

If one year of site-specific data is not available, five years of other representative meteorological data can be used in the modeling analysis. These five years should be the most recent, readily available consecutive five years of data.[6] The five year period is defined to ensure that the model results adequately represent meteorological conditions conducive to the prediction of maximum ambient concentrations. When modeling previously permitted sources whose emission limitations are based on a specific year of meteorological data, that year of data should be added to any longer period involved in the modeling analysis.[7]

Hours of calm wind should not be included in Gaussian model calculations of ambient concentrations.[8] Proper procedures for calculating average concentrations during calm wind conditions are provided in the Guideline. Some air quality models recommended in the Guideline include algorithms to automatically recalculate concentrations during periods of calm wind.

As mentioned earlier, meteorological data collected on-site must be quality-assured prior to its application in air quality modeling analyses. At sites with collocated, continuous air quality monitors, the inspection, maintenance and calibration of each meteorological instrument operated must be conducted to guarantee a minimum of 90 percent data retrieval (80 percent for remote sites).[9] At the initiation of the monitoring program and at least every six months thereafter, routine system calibrations and audits should be performed.[10]

Meteorological audits, performed independently of the organization responsible for data collection and system maintenance, should be scheduled on a semiannual basis.[10] Aside from providing for on-site calibration of instruments, these independent evaluations should address

network installation; inspection, maintenance and calibration procedures; data reduction procedures; and data logging and tabulation procedures.[11]

As recommended in the *Quality Assurance Handbook*, meteorological data validation can be conducted using a three-fold approach of initial hardcopy audit of the data followed by screening of the data through a program designed to note and flag questionable values and finally passing of the data through a comparison program which evaluates how well the data fit the synoptic conditions prevalent in the area of on-site measurement.

REFERENCES FOR SECTION 6.4

1. "The meteorological data used as input to a dispersion model should be selected on the basis of spatial and climatological (temporal) representativeness as well as the ability of the individual parameters selected to characterize the transport and dispersion conditions in the area of concern." U.S. Environmental Protection Agency. *Guideline On Air Quality Models (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. p. 9-10.

2. Reference 1. p. 9-12. "If one year or more, up to five years, of site-specific data is available, these data are preferred for use in air quality analyses."

3. U.S. Environmental Protection Agency. *On-Site Meteorological Program Guidance for Regulatory Modeling Applications.* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-87-013. June 1987.

4. U.S. Environmental Protection Agency. *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-87-007. May 1987.

5. U.S. Environmental Protection Agency. *Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV. Meteorological Measurements.* Environmental Monitoring Systems Laboratory, Research Triangle Park, NC. EPA Publication No. EPA-600/4-82-060. February 1983.

6. Reference 1. p. 9-12. "Five years of representative meteorological data should be used when estimating concentrations with an air quality model. Consecutive years from the most recent, readily available 5-year period are preferred."

7. Reference 1. p. 9-12. "For permitted sources whose emission limitations are based on a specific year of meteorological data that year should be added to any longer period being used (e.g., 5 years of NWS data) when modeling the facility at a later time."

8. Reference 1. p. 9-24. "Hourly concentrations calculated with Gaussian models using calms should not be considered valid; the wind and concentration estimates for these hours should be disregarded and considered to be missing."

9. Reference 4. p. 55. "Inspection, servicing, and calibration of equipment must be scheduled throughout the measurement program at appropriate intervals to assure at least 90 percent data retrieval for each variable measured at sites where continuous air quality monitors are being operated. At remote sites, data retrieval for measured variables should not fall below 80 percent."

10. Reference 3. p. 8-38. "Routine system calibrations and system audits should be performed at the initiation of a monitoring program and at least every six months thereafter. More frequent calibrations and audits may be needed in the early stages of the program if problems are encountered, or if valid data retrieval rates are unacceptably low."

11. Reference 4. p. 55. "An independent meteorological audit (by other than one who conducts the routine calibration and operation of the network) should be performed to provide an on-site calibration of instruments as well as an evaluation of (a) the network installation, (b) inspection, maintenance, and calibration procedures, and logging thereof, (c) data reduction procedures, including spot checking of data, and (d) data logging and tabulation procedures. [S]uch independent meteorological audit-evaluations should be performed about each 6 months."

6.5 SOURCE INPUT

6.5.1 General

Emission input data to be used to evaluate SIPs and PSD analyses for compliance with the quarterly ambient standard are described in Table 9-1 of the *Guideline On Air Quality Models (Revised).*[1] The model input data requirements in this table apply to stationary point source control strategies.[2] Other model input criteria may apply with regard to emissions trading or NSR. Determination of emission limits for these purposes is discussed in Section 9.

6.5.2 Allowable Versus Actual Emissions

Quarterly average concentrations estimated from stationary point sources undergoing a SIP emission limit review must reflect the maximum allowable emission limit or federally enforceable permit limit of the source.[3] This is necessary to ensure that the attainment demonstration is based on enforceable emission limits and control measures.[4] A source's total emissions reflected in modeling analyses are determined as the product of the source's emission limit, operating level, and operating factor. The operating level used must be the actual or design capacity (whichever is greater) or the federally enforceable permit condition. Operating levels less than 100 percent of capacity should also be modeled for those cases in which the source operates at a capacity substantially less than design and in which changes in stack parameters associated with the operating conditions could result in higher ground level concentrations.[5] If a source operates at greater than 100 percent load for periods during normal operation that could result in violations of the NAAQS, this load should be modeled.

The operating factor (e.g., hours/year or hours/day) to be used in the case of quarterly averages should be the actual operating factor averaged over the most recent two years (unless it is determined that this period is not representative). Appropriate adjustment of the modeled emission rate may be made if operation does not occur continuously and the operation is constrained by a federally enforceable permit condition (i.e., modeling should be performed for only those hours during which the source is operating).[6]

Identical input requirements apply to sources defined as "nearby" background sources (here the term "nearby" refers to those sources expected to cause a significant concentration

gradient in the vicinity of the source or sources under consideration).[7] If other background sources are modeled, the maximum allowable emission limit or federally enforceable permit limit should be used in estimating quarterly average concentrations. The operating level used for estimating quarterly concentrations from these sources should be the annual level when actually operating, averaged over the most recent two years (unless this period is deemed unrepresentative). The operating factors used for other background sources are identical to those indicated previously in this section.

6.5.3 Background Concentration

Background concentrations are an essential element of the total air quality concentration to be considered in the determination of source impacts for SIPs.[8] These concentrations may include contributions from natural sources, nearby sources other than those currently under consideration, and unidentified sources. Recommendations for determining background concentrations are provided in the Guideline.[9]

In the case of isolated sources, air quality data monitored in the vicinity of the source(s) under consideration should be used to determine the background concentration for the averaging times of concern.[10] Concentrations recorded while the source in question is impacting the monitor should not be used in determining the background concentration.[11] Use of monitored air quality data is recommended for determining that portion of the background attributable to sources other than those nearby (e.g., natural sources, minor sources, and distant major sources).[12] However, the application of a model using Tables 9-1 and 9-2 of the *Guideline on Air Quality Models (Revised)* may be used for determining background concentration.

In multi-source areas, nearby sources that are anticipated to cause a concentration gradient in the vicinity of the source or sources under consideration for emission limit(s) should be explicitly modeled.[13,14] The impact of nearby sources should be examined at those locations where interaction exists between the plume of the source under consideration and those of the nearby sources (including natural background).

6.5.4 Design Value Calculation

Determination of the design value is inherent in the application of dispersion modeling to demonstrate attainment. Procedures for calculating the design value with dispersion models may be found in Section 8.2.1.1 of the *Guideline of Air Quality Models (Revised).*[3] To calculate the design value (design concentration), the background concentration is added to the estimated impact of the source as determined by dispersion modeling.[15] For lead, the highest estimated design concentration based on an individual calendar quarter averaging period should be used. If the measured air quality design values are higher than modeled values at the same receptors, and the Agency is certain that the modeling was done correctly, measured data should be used to determine baseline air quality. The State should consult with EPA before making this decision.

6.5.5 Stack Height Input to Air Quality Modeling

Specification of stack height is an important consideration in the development of source input for an air quality modeling analysis. Generally, the lesser of the actual stack height or good engineering practice (GEP) stack height is used for air quality modeling (refer to Section 5 for definition of GEP). Guidance on a number of particular modeling questions has been provided by EPA, as follows:[16]

- If the actual stack height is greater than GEP height and where it is necessary to reduce stack height credit below that which exists:
  - Use existing stack gas exit parameters -- temperature, flow rate and stack top diameter -- and model the stack at GEP height.
- If the actual stack height is less than GEP height and dispersion techniques are employed:
  - Two cases should be modeled in order to establish an appropriate emission limitation for the situation in which it is desired to construct a source at less than GEP height and use dispersion techniques to make up the difference in plume rise. First conduct a modeling analysis using the GEP stack height without enhanced dispersion parameters. Secondly, conduct a modeling analysis using the less than GEP stack height with the increased plume rise. The more stringent emission limitation resulting from each of

the two model runs should be the one specified as the enforceable limitation.

- Stack height input for point sources modeled for the purpose of demonstrating protection of the NAAQS:

  - The lesser of actual or GEP stack height should be used as input.

- Stack height for background sources:

  - The lesser of actual or GEP stack height should be used for each background source.

- Excluding the effects of prohibited dispersion techniques for modeling purposes:

  - Modeling to exclude the effects of prohibited dispersion techniques on the emission limitations will be accomplished by using the temperature and flow rates as the gas stream enters the stack, and recalculating stack parameters to exclude the use of prohibited techniques.

- If single-flued, merged stacks or multiflued stacks are involved in a modeling analysis refer to the *Guideline on Air Quality Models (Revised)* to determine if this merging is creditable.

- If plume merging from multiflued stacks is not allowed, then each flue/liner must be modeled as a separate source and the combined impact determined. For single flued, merged stacks where credit is not allowed, each unit should be modeled as a separate stack located at the same point. The stack exit velocity and temperature would be the same as for the existing merged stack conditions and the volume flow rate based on an apportionment of the flow from the individual units.

6.5.6 Stack Downwash and Building Wake Effects

Air quality modeling of sources with stacks which are less than GEP should consider the impacts associated with building wake effects both for the source in question and for nearby sources.[17] In determining which background sources constitute "nearby" sources, the reviewing agency must exercise judgement. Exercising judgement in these cases can minimize the resource burden associated with collecting building dimension data.[18]

REFERENCES FOR SECTION 6.5

1. U.S. Environmental Protection Agency. *Guideline On Air Quality Models (Revised)*, Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. p. 9-5.

2. "The EPA's policy for demonstrating stationary point source compliance with the NAAQS for SIP purposes clearly requires the use of emissions which are more closely tied to allowable emissions. The model emission input data requirements for such SIP demonstrations are contained in Table 9-1 of the 'Guideline for Air Quality Models (Revised)' ..." Memorandum from Calcagni, J., and Laxton, W., OAQPS, to T.J. Maslany, Air Management Division, Region III, and W.B. Hathaway, Air Pesticides, and Toxics Division Region VI. March 16, 1989.

3. "Procedures for calculating the design value with dispersion models are contained in the *Guideline on Air Quality Models (Revised) (GAQM)* (Section 8.2.1.1, Design Concentrations for SO_2, Particulate Matter, *Lead*, and NO_2)." Memorandum from Paisie, Joseph W., Acting Chief, SO_2/Particulate Matter Programs Branch, to Chief, Air Branch, Regions I-X. Questions and Answers for Lead. June 24, 1992.

4. Reference 3. "An attainment demonstration which provides a projection of allowable emissions to the year following full implementation of the SIP is required. This is necessary to ensure that the attainment demonstration is based on enforceable emission limits and control measures [see section 110(a)(2)(A) and 172 (c)(6) of the Act]."

5. Reference 1. "Where a source operates at substantially less than design capacity, and the changes in the stack parameters associated with the operating conditions could lead to higher ground level concentrations, loads such as 50 percent and 75 percent of capacity should also be modeled."

6. Reference 1. "In stationary point source applications for compliance with short term ambient standards, SIP control strategies should be tested using the emission input on Table 9-1. When using a refined model, sources should be modeled sequentially with these loads for every hour of the year. To evaluate SIP's for compliance with quarterly and annual standards, emission input data shown on Table 9-1 should again be used." Table 9-1: "If operation does not occur for all hours of the time period of consideration (e.g., 3 or 24 hours) and the source operation is constrained by a federally enforceable permit condition, an appropriate adjustment to the modeled emission rate may be made (e.g., if operation is only 8:00 am to 4:00 pm each day, only those hours will be modeled with emissions from the source. Modeled emissions should not be averaged across nonoperating time periods)."

7. Reference 1. "Nearby Sources: All sources expected to cause a significant concentration gradient in the vicinity of the source or sources under consideration for emission limit(s) should be explicitly modeled."

8. Reference 1. p. 9-7. "Background concentrations are an essential part of the total air quality concentration to be considered in determining source impacts."

9. Reference 1. "Background air quality includes pollutant concentrations due to: (1) natural sources; (2) nearby sources other than the one(s) currently under consideration; and (3) unidentified sources."

10. Reference 1. p. 9-8. "Use air quality data collected in the vicinity of the source to determine the background concentration for the averaging times of concern."

11. Reference 1. p. 9-8. "Determine the mean background concentration at each monitor by excluding values when the source in question is impacting the monitor."

12. Reference 1. p. 9-9. "Other Sources: That portion of the background attributable to all other sources (e.g., natural sources, minor sources and distant major sources) should be determined either by the procedures found in Section 9.2.2 or by application of a model using Table 9-1."

13. Reference 1. p. 9-8. "Nearby Sources: All sources expected to cause a significant concentration gradient in the vicinity of the source or sources under consideration for emission limit(s) should be explicitly modeled."

14. "Nearby sources which are expected to cause a significant concentration gradient in the vicinity of the source under consideration should be explicitly modeled (as 'background' sources)." Memorandum from Calcagni, J., OAQPS, to W. Laxton, OAQPS. May 3, 1989.

15. Reference 3. "In such an analysis, the background concentration is added to the estimated impact of the source as determined by dispersion modeling, to get the design concentration."

16. Memorandum from Helms, G.T., OAQPS, to Air Branch Chief, Regions I-X. October 10, 1985. (PN 123-85-10-10-007).

17. Reference 1. p. 7-7. "If stacks for new or existing major sources are found to be less than the height defined by EPA's refined formula [H + 1.5L] for determining GEP height, then air quality impacts associated with cavity or wake effects due to the nearby building structures should be determined."

18. "This guidance provides considerable flexibility and requires judgement to be exercised by the reviewing agency in identifying which background sources should be fully modeled. The burden collecting building dimension data may be mitigated somewhat by application of this judgement." Memorandum from Calcagni, J., OAQPS, to W.B. Hathaway, Air Pesticides, and Toxics Division, Region VI. March 31, 1989.

6.6 MODEL DEMONSTRATIONS

6.6.1 Attainment Demonstration - Control Technology

To demonstrate attainment, the EPA's existing guidance indicates that base year modeling, using base year emission inventory, should be used to compare modeling results (allowable for determining design concentration) to actual emissions. The model should be rerun with reduced emissions assuming the implementation of RACM, until attainment is demonstrated.[1]

The model is rerun again with the controlled emission inventory and expected emission increases resulting from growth. If attainment is reached, no further modeling is required. If attainment is not demonstrated with this model run (considering growth), additional emissions reductions should be achieved (with RACT) and the model rerun until attainment is demonstrated.[2]

For SIPs submitted in response to nonattainment designations, determining the necessary control measures should be consistent with EPA's interpretation of RACM (including RACT). For further information see the "General Preamble," 57 FR 13540-44, 13550, and 13560-61, April 16, 1992, which discusses the determination of RACM/RACT for lead and PM-10.[3]

6.6.2 Attainment Demonstration - Modeled Values

The EPA's existing guidance indicates that modeled results should not be rounded off and that attainment demonstration must show that the lead standard (of 1.5 $\mu g/m^3$) maximum arithmetic mean averaged over a calendar quarter will not be exceeded. Thus, if the modeled result is 1.51 $\mu g/m^3$, the lead standard is exceeded. Conversely, if the modeled result is 1.49 $\mu g/m^3$, the lead standard is not exceeded. If the modeled result equals the standard, the source would be in attainment.[4]

REFERENCES FOR SECTION 6.6

1. "Base year modeling should be run using the emission inventories discussed above, i.e., base year (actual) and modeling (allowable for determining design concentration). The model (using the modeling inventory) should be rerun with reduced emissions, for example, assuming the implementation of RACM (including RACT), until attainment is demonstrated." Memorandum from Paisie, Joseph W., SO_2/PM Programs Branch, to Chief, Air Branch, Regions I - X. Questions and Answers for Lead. June 24, 1992.

2. Reference 1. "The model should be rerun again with the controlled emission inventory (modeling inventory with, for example, RACM and RACT) and any emission increases expected to occur as a result of growth. If attainment is reached, no further modeling is needed. However, if attainment is not demonstrated with this model run (e.g., considering growth), more emissions reductions should be achieved and the model rerun again until attainment is demonstrated."

3. Reference 1. "For SIP's submitted in response to nonattainment designations, determining the necessary control measures should be consistent with EPA's interpretation of RACM (including RACT). For further information see the General Preamble, 57 FR 13540-44, 13550, and 13560-61, April 16, 1992, which discusses the determination of RACM/RACT for lead and PM-10."

4. Reference 1. "The attainment demonstration must show that the lead standard of 1.5 $\mu g/m^3$ maximum arithmetic mean averaged over a calendar quarter will not be exceeded (see 40 CFR 50.12). Modeled results should not be rounded off. Therefore, if the modeled result is 1.51 $\mu g/m^3$ the standard is exceeded. Conversely, if the result is 1.49 $\mu g/m^3$, the standard is not exceeded. It is extremely unlikely that a model will give a result of exactly 1.50 $\mu g/m^3$ but, if that did happen, it would equal, not exceed, the standard so the source would be in attainment."

6.7 RECEPTOR GRID

Definition of the receptor network used for air quality analyses in support of SIP revisions should be made on a case-by-case basis, taking into consideration the topography, the climatology, existing monitor locations, and results of the initial screening procedure.[1] Receptor sites for any analysis should be assigned in sufficient detail to estimate the highest concentrations and predict any potential violations of the NAAQS.[2]

A modeling analysis performed for the purpose of redesignating an area to attainment must follow the Guideline with respect to the scope of the receptor network and not necessarily address only the area to be redesignated.[3]

REFERENCES FOR SECTION 6.7

1. "The selection of receptor sites should be a case-by-case determination taking into consideration the topography, the climatology, monitor sites, and the results of the initial screening procedure." U.S. Environmental Protection Agency. *Guideline On Air Quality Models (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. p. 8-4.

2. Reference 1. "Receptor sites for refined modeling should be utilized in sufficient detail to estimate the highest concentrations and possible violations of a NAAQS or a PSD increment."

3. "If a modeling analysis is required for any reason, that analysis must meet the requirements of the Guideline." Memorandum from Bauman, R.D., OAQPS, to J. Tikvart, OAQPS. February 15, 1989.

6.8 OTHER MODEL REQUIREMENTS

The *Guideline on Air Quality Models (Revised)* provides discussion and guidance relative to a number of special modeling considerations that may occur. Issues that may arise in modeling analyses of lead emissions are treatment of stagnation, particle settling and deposition, complex terrain, and other situations where model applications are limited.

6.8.1 Stagnation

Stagnation events are characterized by periods of calm or very light winds and variable wind direction. Such conditions may persist for several hours up to several days and may lead to high ground level concentrations. Treatment of calm wind conditions poses a special problem in model applications since Gaussian models assume that concentration is inversely proportional to wind speed. Thus concentrations become unrealistically large when wind speeds are less than 1 m/s.[1] Stagnation periods should be addressed in the air quality modeling analysis; however, special precautions are warranted. The user should consult with the appropriate EPA regional office prior to modeling stagnation events for regulatory applications.[2]

6.8.2 Settling and Deposition

Gravitational settling and deposition may be included in the modeling analysis if either is a significant factor. The Industrial Source Complex (ISC) model contains settling and deposition algorithms and is recommended for use when particulate emissions are quantified.[3]

6.8.3 Model Limitations

While modeling is the preferred method for determining emission limitations for both new and existing sources, there may be circumstances in which no applicable model to the situation at hand exists. These include complex terrain situations, land water interface areas, and urban locations where a large fraction of particulates originate from nontraditional sources. The Guideline provides criteria for determining the acceptability of measured data to be used in these instances.[4] Also, while not generally encouraged, model calibration of long-term (annual average) models may be acceptable in some situations as the best alternative for improving the accuracy of the predicted concentrations.[5]

REFERENCES FOR SECTION 6.8

1. "Treatment of calm or light and variable wind poses a special problem in model applications since Gaussian models assume that concentration is inversely proportional to wind speed. Furthermore, concentrations become unrealistically large when wind speeds less than 1 m/s are input to the model." *Guideline On Air Quality Models (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. p. 9-23.

2. "When stagnation periods such as these are found to occur, they should be addressed in the in the air quality modeling analyses. WYNDvalley, listed in Appendix B, may be applied on a case-by-case basis for stagnation periods of 24 hours or longer in valley-type situations. Caution should be applied when applying the model to elevated point sources. Users should consult with the appropriate Regional Office prior to regulatory application of WYNDvalley." *Guideline On Air Quality Models (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/2-78-027R. July 1986. (Draft Revised 9/90) p. 8-12.

3. Reference 1. p. 8-9. "Gravitational settling and deposition may be directly included in a model if either is a significant factor. At least one preferred model (ISC) contains settling and deposition algorithms and is recommended for use when particulate matter sources can be quantified and settling and deposition are problems."

4. Reference 1. p. 11-5. "Modeling is the preferred method for determining emission limitations for both new and existing sources. ...[T]here are circumstances where there is no applicable model, and measured data may need to be used. Examples of such situations are: (1) complex terrain locations; (2) land/water interface areas; and (3) urban locations with a large fraction of particulate emissions from nontraditional sources."

5. Reference 1. p. 8-13 "Calibration of long term multi-source models has been a widely used procedure even though the limitations imposed by statistical theory on the reliability of the calibration process for long term estimates are well known. In some cases, where a more accurate model is not available, calibration may be the best alternative for improving the accuracy of the estimated concentrations needed for control strategy evaluations."

7.0 STACK HEIGHT REGULATIONS

7.1 GENERAL REGULATIONS

Stack height regulations affect all criteria pollutants. Revised stack height regulations were promulgated on July 8, 1985 and implement provisions of Section 123 of the Act which dictate that the degree of emission limitation required for pollutant control under an applicable SIP shall not be affected by stacks in excess of GEP stack height or by any other dispersion technique.[1,2] Stacks in existence or dispersion techniques implemented before December 31, 1970 are exempt from these provisions (see Section 7.5.1 for definition of "in existence").[3] Sources defined in Section 110(a)(3) of the Act which were constructed, reconstructed or for which major modifications were performed after December 31, 1970 are not exempt from these provisions, however.[4]

A comprehensive overview of stack height policy is contained in the *Workshop on Implementing the Stack Height Regulations (Revised).*[5] This document includes a discussion of SIP stack height requirements and documentation in outline format and presents several checklists for GEP stack height review.

REFERENCES FOR SECTION 7.1

1. "Section 123, which was added to the Clean Air Act by the 1977 Amendments, regulates the manner in which techniques for dispersion of pollutants from a source may be considered in setting emission limitations. Specifically, Section 123 requires that the degree of emission limitation shall not be affected by that portion of a stack which exceeds GEP or by 'any other dispersion technique.'" *Federal Register* 50:27892. July 8, 1985.

2. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subchapter C, Parts 51.118, 51.164, and 52.21(h). July 1, 1991.

3. United States Congress. Clean Air Act, as amended November 1990. 42 U.S.C. 7401 et. seq. Section 123(a). Washington, D.C. U.S. Government Printing Office.

4. Reference 2. Part 51.118(b).

5. U.S. Environmental Protection Agency. *Workshop on Implementing the Stack Height Regulations (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. October 1985.

7.2 GOOD ENGINEERING PRACTICE STACK HEIGHT

7.2.1 General

Discussion of the technical basis and procedures for determining GEP stack height are provided in the *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations Revised).*[1] GEP, with respect to stack height, is defined by Section 123 of the Act as: "the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies or wakes which may be created by the source itself, nearby structures or nearby terrain obstacles." According to 40 CFR 51.100(ii), GEP stack height is determined, quantitatively, as the greatest of the following:

- <u>De Minimis</u>
  - 65 meters, measured from the ground-level elevation at the base of the stack;
- <u>Formula Height</u>
  - $Hg = H + 1.5L$

  where:

  Hg = good engineering practice stack height, measured from the ground-level elevation at the base of the stack,

  H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack,

  L = lesser dimension, height or projected width, of nearby structure(s).

  -- Provided that the EPA, State or local control agency may require the use of a field study or fluid modeling to verify GEP stack height for the source.

  - For stacks in existence prior to January 12, 1979 and after December 31, 1970 for which the owner or operator had obtained all applicable permits or approvals required under 40 CFR Parts 51 and 52:

Hg = 2.5H

-- Provided the owner or operator furnishes evidence that this equation was actually relied on in establishing an emission limitation.

- For stacks which existed prior to December 31,1970, use the actual stack height to set emission limits.

- Physical Demonstrations

  The height demonstrated by a fluid modeling or field study approved by the EPA, which ensures that the stack emissions do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features (see Section 7.6).

7.2.2 Definition of Nearby for GEP

For the purpose of determining GEP stack height, "nearby" is limited to five times the structure height or width, whichever is less (a distance not to exceed one-half mile) and in the case of a fluid model or field study is limited to one-half mile. This range may be extended, for the portion of a terrain feature which exists within a distance of up to 10 times the maximum height of the feature (not to exceed two miles), if such feature reaches a height, at one-half mile from the stack, that is at least 40 percent of the GEP stack height determined by $H_G = H + 1.5L$ or 26 meters, whichever is greater, as measured from the ground level elevation at the base of the stack.[2]

7.2.3 Definition of Excessive Concentration

The term "excessive concentration," as it applies to a physical (fluid or field) demonstration of GEP stack height, is defined in 40 CFR 51.100(kk) for several situations, all of which require showing a 40 percent increase in the maximum, ground-level concentration relative to the maximum concentration observed in the absence of downwash, wakes, or eddy effects. Certain situations also require a showing that the stack contributes to a total concentration, due to emissions from all sources, that exceeds the NAAQS. The stack emission rate shall be based on an NSPS emission rate applicable to the source category unless demonstrated unfeasible (see Section 7.6.4 for more detailed discussion).

REFERENCES FOR SECTION 7.2

1. U.S. Environmental Protection Agency. *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document For the Stack Height Regulations) (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-80-023R. June 1985.

2. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subchapter C, Part 51.100(jj). July 1, 1991.

7.3 DISPERSION TECHNIQUES

7.3.1 General

The revised, EPA stack height regulations generally prohibit stationary sources from taking credit for dispersion techniques in determining allowable emission limitations.

7.3.2 Prohibitions

As stated in 40 CFR 51.100(hh)(1), the following are prohibited dispersion techniques:

- using that portion of a stack in excess of good engineering practice stack height;
- varying the pollutant emission rate according to atmospheric conditions or ambient concentrations of that pollutant (referred) to as intermittent or supplemental control systems - ICS or SCS); or
- increasing final exhaust gas plume rise by manipulating source process parameters, exhaust gas parameters, stack parameters or combining exhaust gases from several existing stacks into one stack, or other selective handling of exhaust gas streams so as to increase the exhaust gas plume rise.

7.3.3 Exceptions

Although credit for selective handling of exhaust gas streams to increase the exhaust gas plume rise is generally prohibited, in certain circumstances credit is allowed for the following:

- merging of gas streams in original design and construction (also see Section 7.7);
- smoke management techniques involved in agricultural or silvicultural programs;
- episodic restrictions on residential wood burning and open burning; and
- reheating after a pollution control system.[1]

It is important to note that unlike SO_2, there is no de minimis level for lead for utilizing techniques which increase final exhaust gas plume rise.

REFERENCES FOR SECTION 7.3

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter I, Subchapter C, Part 51.100(hh)(2). July 1, 1991.

7.4 REMANDED REGULATIONS

Three portions of the revised, EPA stack height regulations, promulgated on July 8, 1985, were remanded to EPA for review:[1]

- Under the definition of excessive concentration -
  - Grandfathering pre-October 11, 1983 within-formula stack height increases from demonstration requirements [40 CFR 51.100(kk)(2)];
- Under the definition of dispersion technique -
  - Dispersion credit for sources originally designed and constructed with merged or multiflue stacks [40 CFR 51.100(hh)(2)(ii)(A)]; and
- Under the definition of good engineering practice stack height -
  - Grandfathering of pre-1979 use of the refined "H + 1.5L" formula [40 CFR 51.100(ii)(2)].

As a result of the remand, an interim policy on stack height regulatory actions is in effect. This policy provides that most actions affected by the remand may proceed, provided appropriate caveat language is incorporated indicating that the action is subject to review and modification on completion of EPA's response to the court decision.[2]

REFERENCES FOR SECTION 7.4

1. "Although the court upheld most provisions of the rules, three portions were remanded to EPA for review: 1. Grandfathering pre-October 11, 1983 within-formula stack height increases from demonstration requirements [40 CFR 51.100(kk)(2)]; 2. Dispersion credit for sources originally designed and constructed with merged or multiflue stacks [40 CFR 51.100(hh)(2)(ii)(A)]; and 3. Grandfathering of pre-1979 use of the refined H + 1.5L formula [40 CFR 51.100(ii)(2)]." Memorandum from Potter, J.C., OAR, to Air Management Division Director, Regions I, III, and IX, Air and Waste Management Division Director, Region II, Air, Pesticides, and Toxics Management Division Director, Regions IV, and VI, Air and Radiation Division Director, Region V, Air and Toxics Division Director, Regions VII, VIII, and X. Interim Policy on Stack Height Regulatory Actions. April 22, 1988.

2. "In general, actions taken at this time to approve or disapprove statewide stack height rules which are affected by the remand must include the qualification that they are subject to review and modification on completion of EPA's response to the court decision." Memorandum from Calcagni, J., OAQPS, to Air Branch Chief, Regions I-X. Application of the Interim Policy for Stack Height Regulatory Actions. May 17, 1988. (PN 123-88-05-17-016).

7.5 SPECIFIC STACK HEIGHT POLICIES

7.5.1 Definition of "In Existence"

In promulgating the 1982 stack height regulations, EPA adopted a definition of "stack heights in existence before December 31, 1970."[1] This definition allowed the grandfathering of stacks either: (a) physically completed; (b) for which continuous construction had begun; or (c) for which construction had not yet commenced, but for which binding contracts had been signed that could not be canceled without substantial loss to the source owner or operator. The revised stack height regulation promulgated on July 8, 1985 does not modify this definition except to restrict its applicability to facilities that have not undertaken major modifications or reconstruction and have not ducted effluent gas streams from post-1970 units into pre-1971 stacks.[2]

Grandfathering exemptions may be supported in one of three ways: [3]

- In the case of stacks physically completed prior to December 31, 1970 - proof of stack completion must be documented (an acceptable form of documentation, for example, would be a copy of the 1970 Federal Power Commission Report Form 67, which includes information on stack height);

- Evidence submitted to support the commencement date of stack construction can include any contemporaneous documentation such as building inspection records, delivery receipts of construction materials or news clippings that clearly indicate that construction activities were under way before December 31, 1970; or

- Date of signature on a contract for stack construction is acceptable for applying grandfathering exemptions provided the "binding contract" is one that commits the source owner or operator to financially undertake stack construction and that did not have an "escape" provision in effect on December 31, 1970 allowing cancellation by the owner or operator without penalty. If a contract contains provisions for assessing penalties for modification or cancellation that were in effect before December 31, 1970, then the provisions must be reviewed to determine whether the penalties and other costs of cancellation would have imposed a "substantial loss" on the owner or operator. In general, EPA will presume a substantial loss would have resulted in those situations in which penalties exceed 10 percent of the project cost.

Documentation supporting any of these grandfathering exemptions must be made available for public review by the State or source owner or operator.[4]

7.5.2 Tie-Ins to Existing Stacks

The definition of "source" that should be used in determining whether tie-ins to grandfathered stacks should be permitted or prohibited is that meaning a single emission unit. Hence, credit for tying a single, post-1970 unit(s) into a grandfathered stack serving a number of old units is prohibited under the revised stack height regulations.[5]

REFERENCES FOR SECTION 7.5

1. "3. Grandfathered Stack Height. The 1970 Clean Air Act became effective on December 31, 1970. Prior to that date some sources had constructed stacks taller than their GEP height. In Section 123, Congress recognized this and exempted those sources' stack heights. Section 123 allows credit for stack height in existence on December 31, 1970. A source's stack is considered to be 'in existence' if that stack was part of the design of a facility on which construction commenced prior to December 31, 1970." *Federal Register* 47:5865. February 8, 1982, p. 5865.

2. "The EPA's definition was upheld by the U.S. Court of Appeals for the D.C. circuit in Sierra Club v. EPA, 719 F.2d 436, and has not been modified in any way by the rule revisions promulgated on July 8, 1985, except to restrict its applicability to facilities that have not undertaken major modifications or reconstruction, and have not ducted the effluent gas streams from post-1970 units into pre-1971 stacks." Memorandum from D.D., Tyler, OAQPS, to Regional Air Management Division Director, Regions I-X. Determining Stack Heights "In Existence" Before December 31, 1970. October 28, 1985. (PN 123-85-10-28-010).

3. Reference 2. "Grandfathering exemptions may be supported in one of three ways: by showing that the stack was completed or was physically in existence prior to December 31, 1970; by showing that actual on-site continuous stack construction activities began on or before December 31, 1970; or by showing that a binding contract for stack construction was executed on or before that date...In cases where a stack was completed prior to December 31, 1970, the State may make a summary determination that the stack is grandfathered, but must provide an explanation of the reasons for its determination. One way in which it can be documented that the stack was physically in place before December 31, 1970, is to provide a copy of the 1970 Federal Power Commission report Form 67, which includes stack height, among other information. Evidence that may be submitted to support the date of commencement of stack construction can include virtually any contemporaneous documentation that clearly indicates that construction activities were under way as of December 31, 1970. This could consist of building inspection records, construction materials delivery receipts, correspondence, inter-office memoranda, photographic records, or news clippings. In the event that documentation is lacking or weak, EPA will consider affidavits which include detailed descriptions of efforts that were undertaken to obtain contemporaneous supporting documentation...The date of signature on a contract for stack construction will be acceptable for grandfathering exemptions if the contract itself meets certain minimum qualifications. A 'binding contract,' under the previously-discussed provisions is considered to be one that commits the source owner or operator financially to undertake stack construction and that did not have in effect on December 31, 1970, an 'escape' provision that allows cancellation by the owner without penalty...In the event that a contract contains provisions for assessing penalties for modification or cancellation by the owner or operator, and those provisions were in effect on December 31, 1970, then the provisions must be reviewed to determine

whether the penalties and other costs of cancellation would have imposed a 'substantial loss' on the owner or operator. For new facilities, EPA will presume that a substantial loss would have resulted where the penalties exceed ten percent of the project cost."

4. Reference 2. "The burden of proof for showing that a stack is eligible for grandfathering exemption lies with either the State or the source owner or operator, as appropriate, and documentation in support of exemptions must be made available for public review during the rulemaking process."

5. "Q: What 'source' definition should be used in determining whether tie-ins to grandfathered stacks should be permitted or prohibited? A: The term 'source' in this instance means a single emitting unit. Thus, credit for tying a single post-1970 unit(s) into a grandfathered stack serving a number of old units is prohibited under the regulation." Memorandum from Helms, G.T., OAQPS, to Air Branch Chief, Regions I-X. Questions and Answers on Implementing the Revised Stack Height Regulation. October 10, 1985. (PN 123-85-10-10-007).

7.6 DEMONSTRATIONS BY FLUID MODELING, FIELD STUDIES OR NUISANCE

7.6.1 Applicability

- Sources seeking credit for stack height above GEP formula height must demonstrate by a field study or fluid modeling analysis that this height is necessary to avoid excessive pollutant concentrations as a result of downwash, wakes or eddy effects created by the source itself, nearby structures or nearby terrain (refer to Section 7.2 for definitions of "excessive concentration" and "nearby").[1]

- Sources seeking credit within formula height may also need to conduct such demonstrations: (a) in those cases where it is believed that the formula may significantly overstate the appropriate stack height credit and (b) to justify certain increases in stack height.[2]

- Sources seeking credit for increases in stack heights up to formula GEP may justify the increase by demonstrating the actual presence of a local nuisance caused by the existing stack as determined by the authority administering the SIP.[3]

7.6.2 Field Studies

A field demonstration of GEP height involves the installation and operation of a monitoring network designed to clearly identify maximum downwind concentrations. Concentration patterns from two release points must be determined: one near the source in the presence of structure(s) and/or terrain and the other in the absence of such features. Except for differences due to structure(s) and/or terrain, the atmospheric flow at the latter location must be similar to that near the source, as verified by meteorological observations upwind of both sites.[4]

7.6.3 Fluid Modeling

7.6.3.1. Credit for Height Above GEP Formula. In performing fluid modeling demonstrations, sources seeking credit for stacks greater than formula height must use the appropriate emission rate for the source category (see Section 7.6.4) and add in the background air quality as determined by procedures described in Section 6.5.3.[5] The following "excessive concentration" criteria must be met: (a) exceedance of the NAAQS and (b) a concentration at least 40 percent in excess of the maximum concentration experienced in the absence of downwash, wakes or eddy effects. After these criteria are met, the source must use the lowest

stack height necessary to meet the more restrictive of the two excessive concentration criteria in order to set emission limitations. This lowest height becomes the new GEP height.[6]

7.6.3.2. Credit for Height Less than or Equal to GEP Formula. For sources seeking credit after October 11, 1983 for increases in existing stack height up to GEP formula height, the excessive concentration criteria (a) and (b) given above generally apply. For sources seeking credit after January 12, 1979 for a stack height less than or equal to formula height; for sources seeking credit after November 9, 1984 based on the aerodynamic influence of cooling towers; and for sources seeking credit after December 31, 1970 based on the aerodynamic influence of structures not adequately represented by GEP formula, the 40 percent excess concentration is the only criterion needed to demonstrate equivalence to formula height.[7]

7.6.4 Emission Rate for Physical Demonstrations

For sources seeking credit above formula GEP height, the stack height regulations require that a presumptive emission rate equivalent to the NSPS be established for the source in question before fluid modeling is initiated to determine the stack height necessary to avoid excessive concentrations due to downwash.[8] The NSPS emission rate is "presumptive" in that EPA presumes that all sources seeking to justify stack heights in excess of those established by GEP formulae are capable of controlling their emissions to NSPS levels. If it is infeasible for a source to control its emissions to NSPS levels, then an alternative emission limit representing the lowest feasible emission limit must be met before credit for stack height in excess of GEP formula height can be obtained. These alternative emission rates will be reviewed by EPA based on the Best Available Retrofit Technology (BART) guidelines.[9,10] Unless the source owner or operator demonstrates that the emission rate prescribed by the NSPS applicable to the source category is infeasible, the allowable emission rate to be used in conducting the field study or fluid modeling demonstrations must be the NSPS emission rate.[11] In cases where no NSPS limit is applicable, a BART analysis must be conducted to determine the emission rate to be used in studies demonstrating GEP stack height greater than formula height.[12]

The last case is particularly pertinent for lead emitters since only one NSPS emission limit has been prescribed for lead. Although lead-acid battery manufacturing plants[13] is the only source which has a specific emissions limit for lead, there are other sources that emit lead as a component of particulate matter.

For certain sources seeking credit for increases in existing stack heights up to GEP formula height, the emission rate used in the demonstration shall be the emission rate specified by the applicable SIP, or, in the case of no established limit, the actual emission rate shall be used.[14] For other sources for which verification of correct GEP height is requested, the satisfying 40 percent excess concentration criterion is sufficient demonstration.[15]

7.6.5 Not in Ambient Air

For the purpose of the physical demonstration, the exceedance of the NAAQS need not occur at a location meeting the definition of ambient air.[16]

7.6.6 Additional Guidance

Sources of guidance on conducting fluid modeling demonstrations have been identified by EPA.[17] Documents which form the basis of information include *Guideline for Use of Fluid Modeling to Determine Good Engineering Stack Height*;[18] *Determination of Good Engineering Practice Stack Height - A Fluid Model Demonstration Study for a Power Plant*;[19] *Guideline for Fluid Modeling of Atmospheric Diffusion*;[20] and *Fluid Modeling Demonstration of Good Engineering Practice Stack Height in Complex Terrain*.[21]

REFERENCES FOR SECTION 7.6

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter I, Subchapter C, Part 51.100(ii)(3). July 1, 1991.

2. "Nevertheless, in response to the court's remand, EPA is including in this final rule a provision for the authority administering these rules to require field studies or fluid modeling demonstrations, even for stacks built to formula height, in cases where it believes that the formula may significantly overstate the appropriate stack height credit. (Quite apart from any such regulatory provision, States have authority to require such demonstrations, on the terms outlined or on stricter or more lenient terms, under the savings provision of Section 116 of the Clean Air Act)." *Federal Register* 50:27900. July 8, 1985.

3. Reference 1. Part 51.100(kk)(2).

4. "A field demonstration of GEP stack height requires experiments to determine the concentration patterns from two release points -- one with the structure(s) and/or terrain; the other in the absence of structure(s) and/or terrain. [A] monitoring array must be arranged to clearly identify the maximum concentrations downwind of similar releases at both sites." U.S. Environmental Protection Agency. *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document For the Stack Height Regulations) (Revised).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-80-023R, June 1985. p. 47.

5. Reference 4. p. 52. "In conducting a demonstration, a source should use the modeled stack height, input the applicable emission rate that is equivalent to NSPS for that source category (however, sources may on a case-by-case basis demonstrate that such an emission is not feasible for their situations and determine their emission limitations based on Best Available Retrofit Technology), and add in the background air quality as determined by procedures contained in two EPA guidance documents (EPA, 1978, 1981)."

6. Reference 4. p. 52. "After demonstrating that both excessive concentration criteria are met as defined in Section 1, the source must determine the lowest stack height necessary to meet the more restrictive of the two excessive concentration criteria. This lower height is the new GEP height."

7. Reference 1. Part 51.100(kk)(3).

8. "The regulations require that a presumptive emission rate equivalent to the new source performance standards (NSPS) be established for the source in question before modeling may be conducted to determine stack height needed to avoid excessive concentrations due to downwash (where the NSPS has been subject to revision, and the source in question is not subject to the revised NSPS, the earliest standard will be applied; e.g.,

for power plants a rate of 1.2 lb/MM Btu would be used)." Memorandum from Tyler, D.D., OAQPS, to Regional Air Management Division Director, Regions I-X. Implementation of Stack Height Regulations - Presumptive NSPS Emission Limit for Fluid Modeling Stacks Above Formula GEP Height. October 28, 1985. (PN 123-85-10-28-009).

9. Reference 8. "This emission rate is described as 'presumptive' because it is EPA's presumption that all sources seeking to justify stack heights exceeding those provided by the GEP formulae are capable of controlling their emissions to NSPS levels. However, the regulations also allow source owners or operators to rebut this presumption, establishing an alternative emission rate that represents the most stringent level of control that can feasibly be met by that source in excess of the NSPS level. In the preamble to the regulations, EPA indicated that it will rely on the 'Guidelines for Determination of Best Available Retrofit Technology for Coal Fired Power Plants and other Existing Stationary Facilities EPA-450/3-80-009b' (BART Guidelines) when reviewing these rebuttals."

10. "In conclusion, we are in full agreement with the position taken by Region III that sources seeking credit above formula height must meet an emission rate consistent with BART/NSPS." Letter from Gerald A. Emison, G.A., OAQPS, to J.P. Proctor. April 20, 1989.

11. "Q: Can new or modified sources who have agreed to a case-by case best available control technology (BACT) emission rate be required to use this rate for fluid modeling rather than a less stringent new source performance standard (NSPS) emission rate? A: As set forth in 40 CFR 51.1(kk), the allowable emission rate to be used in making demonstrations under this part shall be prescribed by the NSPS that is applicable to the source category unless the owner or operator demonstrates that this emission rate is infeasible." Memorandum from Helms, G.T., OAQPS, to Air Branch Chief, Regions I-X. Questions and Answers on Implementing the Revised Stack Height Regulations. October 10, 1985. (PN 123-85-10-10-007).

12. "Issue: A source seeking stack height credit above formula GEP is required by regulation to demonstrate an exceedance of an ambient air quality standard. The regulation also provides that the allowable emission rate to be used in making the demonstration shall be the new source performance standard (NSPS), unless this is shown to be infeasible. The regulations, however, do not address what emission rates to use when there are no NSPS emission rates applicable. Answer: The preamble to the stack height regulation is clear that the emission rate must be limited to the NSPS or best available retrofit technology (BART) rate (50 FR 27898). The legislative history of the stack height requirement cautioned that credit for stacks above formula height be granted only in rare cases. For this reason, EPA determined that sources seeking credit above formula height should first attempt to reduce their emissions. In establishing an emission rate other than NSPS, the preamble states that EPA will rely on its BART guideline. Thus, we believe

that a BART analysis must be conducted to determine the emission rate to be used in studies demonstrating GEP stack height greater than formula height when no NSPS limit is applicable." Memorandum from Calcagni, J., to I.L. Dickstein. Stack Height Questions. November 27, 1990.

13. Reference 1. Subpart KK.

14. Reference 3.

15. Reference 7.

16. Reference 11. "Q: Must the exceedance of NAAQS or PSD increment due to downwash, wakes or eddies occur at a location meeting the definition of ambient air? A: No, the exceedance may occur at any location, including that to which the general public does not have access."

17. Memorandum from Tikvart, J.A., OAQPS, to D. Stonefield, OAQPS. Guidance on Fluid Model Demonstrations for Determining GEP Stack Height in Complex Terrain. September 19, 1985. (PN 123-85-09-19-006).

18. U.S. Environmental Protection Agency. *Guideline for Use of Fluid Modeling to Determine Good Engineering Stack Height.* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-81-003. July 1981.

19. U.S. Environmental Protection Agency. *Determination of Good Engineering Practice Stack Height - A Fluid Model Demonstration Study for a Power Plant.* Environmental Science Research Laboratory. EPA Publication No. EPA-600/3-83-024. April 1983.

20. U.S. Environmental Protection Agency. *Guideline for Fluid Modeling of Atmospheric Diffusion.* Environmental Science Research Laboratory. EPA Publication No. EPA-600/8-81-009.

21. U.S. Environmental Protection Agency. *Fluid Modeling Demonstration of Good Engineering Practice Stack Height in Complex Terrain.* Atmospheric Sciences Research Laboratory, EPA Publication No. EPA-600/3-85-022. April 1985.

7.7 MERGED STACKS

7.7.1 General

Dispersion credit for the retrofit combining or merging of gas streams is generally not allowed under the stack height regulations.[1] Originally designed and constructed merged streams are creditable at this time [40 CFR 51.100(hh)(2)]; however, this provision is affected by the stack height remand (see Section 7.4).

7.7.2 Exceptions

Credit for retrofit merging is allowed under circumstances where:[2]

- after July 8, 1985 such merging is part of a change in facility operation that includes the installation of pollution controls and is accompanied by a net reduction in the allowable emissions of a pollutant. This exclusion from the definition of "dispersion techniques" shall only apply to the emission limitation for the pollutant affected by such change in operation; and

- before July 8, 1985 such merging: (1) was part of a change in operation at the facility that included the installation of emission control equipment, (2) was conducted for sound economic or engineering reasons[3], or (3) was not "significantly motivated by an intent to obtain emissions credit for increased dispersion."[4] Such a demonstration could be made by submitting evidence showing that consideration of dispersion advantages was conspicuously absent in the intent of the source owner or operator.[5]

In addition, exemption from prohibitions on gas stream merging is provided for sources which constructed their stacks before December 31, 1970.

It is incumbent on the State or source owner or operator to demonstrate that any retrofit merging was not motivated by an intent to avoid emission controls. Information indicating that merging was specifically carried out to increase final exhaust gas plume rise serves as a demonstration of dispersion intent that justifies denial of credit for merged gas streams.[6]

REFERENCES FOR SECTION 7.7

1. Memorandum from Tyler, D.D., OAQPS, to Air Management Division Directors, Regions I-X. Implementation of Stack Height Regulations - Exceptions From Restrictions on Credit for Merged Stacks. October 28, 1985. (PN 123-85-10-28-008).

2. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter I, Subchapter C, Part 51.100(hh)(2)(ii). July 1, 1991.

3. Reference 1. "Sources that are not covered under these criteria may still qualify for exemption if they can show that merging was conducted for sound economic or engineering reasons."

4. Reference 1. "In some instances, a State or emission source owner may not be able to make a demonstration as described above, or believe that sound economic reasons existed for merging stacks, regardless of the relationship between financial savings attributable to reduced emission control requirements versus lower stack construction costs. In such cases, an opportunity should be provided to affirmatively demonstrate that merged stacks were not 'significantly motivated by an intent to obtain emissions credit for increased dispersion."

5. Reference 1. "For instance, such a demonstration could be made by submitting documentary or other evidence (e.g., internal company memoranda presenting the alternative construction opportunities available to the company) that indicates the intent of the source owner or operator and shows that consideration of dispersion advantages was conspicuously absent."

6. Reference 1. "Because merged gas streams are generally regarded as prohibited dispersion techniques under the regulations, it is incumbent on the State or the source owner or operator to demonstrate that such merging was conducted for sound economic or engineering reasons, and was not significantly motivated by an intent to avoid emission controls. Consequently, the first step should entail a review of State and EPA files to determine the existence of any evidence of intent on the part of the source owner or operator. Information showing that merging was conducted specifically to increase final exhaust gas plume rise serves as a demonstration of dispersion intent that justifies a denial of credit for merged gas streams."

7.8 STACK HEIGHT NEGATIVE DECLARATIONS

7.8.1 General

Following promulgation of the revised stack height regulations on July 8, 1985, each State was required to review its SIP and determine if any sources were credited with stack heights or dispersion techniques not in accordance with the revised regulations.[1] Where sources are found in compliance with the revised regulations, a "negative declaration" is issued in the *Federal Register* notice for that State. A *Federal Register* notice of negative declaration for the stack height requirements does not need to be incorporated into the SIP since it is not required under Section 110 of the Act.

7.8.2 Information Needed

There are three primary ways to declare a source as unaffected by the stack height rules:[2]

- source was constructed prior to December 31, 1970;
- source stack height is less than GEP formula height; and
- source emission limitation was not affected by stack height or by any other dispersion technique.

It is very important that a description of the grandfathering documentation is provided along with the date of documentation, so that proof of the grandfathering can be easily traced back to a specific document.[3]

7.8.3 Modeling Needed

Source remodeling would be required in those situations in which credit for excess stack height or dispersion techniques has been taken. Any remodeling must follow the *Guideline on Air Quality Models (Revised)* and *Supplement A*. If a source has never been analyzed for dispersion, then no modeling is required.[4]

REFERENCES FOR SECTION 7.8

1. "(2)(B) nine months after date of promulgation ..." United States Congress. Clean Air Act, as amended August 1977. 42 U.S.C. 1857 et. seq. Section 406(2)(b). Washington, D.C. U.S. Government Printing Office. November 1990.

2. U.S. Environmental Protection Agency. *Workshop on Implementing the Stack Height Regulations (Revised).* Control Programs Development Division, Office of Air Quality Planning and Standards, Research Triangle Park, NC. October 1985.

3. "For grandfathering documentation, the date the source was built is not essential, but the type and date of the documentation that the source was built prior to December 31, 1970, must be listed." Memorandum from Helms, G.T., OAQPS, to Air Branch Chief, Region I-X. Processing of Stack Height Negative Declarations. October 9, 1987. (PN 123-87-10-09-014).

4. "If a source has never been analyzed for dispersion, then it is not necessary to conduct a dispersion analysis now." Memorandum from Tyler, D.D., OAQPS, to Air Division Director, Regions I-X. Clarification of Existing Guidance on Dispersion Modeling Requirements for Plants with "Tall Stacks" and Other Prohibited Dispersion Techniques. February 11, 1986. (PN 123-86-02-11-012).

8.0 CONTROL STRATEGIES

8.1 GENERAL

Each SIP must contain an enforceable control strategy to ensure attainment and maintenance of all the NAAQS. According to 40 CFR 51.110(a), a control strategy must be selected "that provides the degree of emissions reductions necessary for attainment and maintenance of the national ambient air quality standards. The emission reductions must be sufficient to offset any increases in air quality concentrations that are expected to result from emission increases due to projected growth of the population, industrial activity, motor vehicle traffic, or other factors." [1]

In general, a control strategy will consist of emission limitations applicable to all sources within specified categories. The selected sets of emission limitations are established based on the judgement that they are adequate to bring about the NAAQS attainment.

REFERENCES FOR SECTION 8.1

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter 1, Part 51.110(a), July 1, 1991.

8.2 ESTABLISHING EMISSION LIMITATIONS

8.2.1 General

Emission limitations for point and area sources of lead are established based on ambient concentrations and source contributions to determine the level of control needed to demonstrate attainment of the NAAQS. This involves determination of design concentrations for the appropriate averaging intervals for each location that must be reduced to the level of the NAAQS. After design concentrations have been established, a proportioning method is used to estimate the required emission limitations.[1]

8.2.2 Design Value and Critical Ambient Air Lead Concentration

The design value (concentration) is the concentration of lead (expressed as $\mu g/m^3$) which must be used as the air quality baseline for computation of emissions reductions required to meet the lead air quality standard. That is, the design value is used as a starting point to determine emission limits needed to attain the standards and to be included in the demonstration.[2] (see section 6.5.4, Design Value Calculation, for further information.)

8.2.3 Averaging Periods

Enforceable emission limits must be sufficient to protect the lead NAAQS. Thus, SIP emission limits should be based on the NAAQS (quarterly) which result in the most stringent control requirements. Emissions limits must state the appropriate averaging time for that limit. Specific control measures designed to achieve the required emission limitations must then be implemented in the SIP (40 CFR 51.111). Some control measures for lead are discussed in Section 8.4 of this guideline.

8.2.4 Compliance Methods

Part 51.111 of the CFR requires that each SIP must identify methods for determining compliance with the emission limitations. These methods must be consistent with the averaging period appropriate to each limitation. Thus, a SIP may contain separate compliance test methods for each averaging period. According to Section 504(b) of the Act, compliance may be

determined by any method that provides sufficiently reliable and timely information for determining compliance, notwithstanding specific requirements elsewhere in the Act. Such methods include source testing, continuous emissions monitoring, or monitoring operating parameters related to the emission rate. Section 11.4 of this guideline provides a more detailed discussion of compliance monitoring.

REFERENCES FOR SECTION 8.2

1. "Once PM-10 design concentrations have been established through the use of air quality measurements or model estimates, a proportioning method can be used at each site to estimate control requirements for SIP development. This proportioning method differs from simple rollback in that the source contributions are determined from receptor or dispersion modeling and not directly from the emissions as in simple rollback." *PM-10 SIP Development Guideline.* Office of Air Quality Planning and Standards. U.S. Environmental Protection Agency. EPA-450/2-86-001. June 1987. p. 6-8.

2. "Forty CFR Part 51.117(c)(2) requires that lead SIP's employ dispersion modeling for demonstrating attainment in areas in the vicinity of the lead point sources listed in 40CFR 51.117(a). Determination of the design value is inherent in the application of dispersion modeling to demonstrate attainment. Procedures for calculating the design value with dispersion models are contained in the *Guideline on Air Quality Models (Revised)(GAQM)* (Section 8.2.1.1, Design Concentrations for SO_2, Particulate Matter, Lead, and NO_2)." Memorandum from Praisie, Joseph W. to Chief, Air Branch Regions I-X. Questions and Answers (Q's and A's) for Lead. June 24, 1992.

8.3 NONATTAINMENT AREA CONTROL REQUIREMENTS FOR LEAD SOURCES

Any State containing an area designated nonattainment for lead must develop and submit a Part D SIP. The general Part D plan provisions are contained in Section 172(c) of the Act. Among other things, Section 172(c) specifies that Part D SIPs include reasonably available control measures (RACM) [which includes reasonably available control technology (RACT)], provide for reasonable further progress (RFP), and contain contingency measures.

8.3.1 Determining RACM (including RACT)

It is recommended that States consult the list of available control measures for fugitive dust in the document entitled *Control of Open Fugitive Dust Sources* (EPA 450/3-88-008, September 1988) as a starting point for specifying RACM for area sources in each SIP. In addition, if a State receives considerable public comment and appropriate documentation that additional control measures may be reasonably available, those measures should be added to the list of available control measures for that area. The RACM should then be determined for the particular area to which the SIP applies. If it can be shown that one or more measures are unreasonable because emissions from the reentrainment of fugitive lead-bearing dust are insignificant, those measures may be excluded from further considerations since they would not represent RACM for the area. The State should evaluate the resulting available control measures for reasonableness, considering their technological and economic feasibility in the area in which the SIP applies. When full implementation would be infeasible, a State should consider the feasibility of implementing measures in part. The SIP submittal to EPA should contain a justification for partial or full rejection of any available control measures, including those considered or presented during the State's public review process that explains, with appropriate documentation, why each rejected control measure is infeasible. If the SIP demonstrates attainment of the lead national ambient air quality standards (NAAQS) by the required date, a State may be able to demonstrate that available and otherwise feasible control measures are unreasonable and do not constitute RACM for the area because they do not expedite attainment.[1]

States should follow EPA's historic definition of RACT. RACT is the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Stationary sources which actually emit a total of 5 tons per year of lead or lead compounds measured as

elemental lead should be the minimum starting point for RACT analysis. However, depending on the attainment needs of the area, it may be necessary to evaluate whether control technology is reasonably available for sources which actually emit less than 5 tons per year of lead or lead compounds.[2]

The SIPs for lead nonattainment areas that demonstrate attainment of the NAAQS should include implementation of available control measures for sources of lead (including available control technology for stationary sources of lead emissions) to the extent necessary to demonstrate attainment of the lead NAAQS as expeditiously as practicable but no later than the applicable statutory attainment date (see Section 192(a) of the Act). Therefore, it a State does not adopt all available measures but demonstrates, adequately and appropriately, that (a) RFP and attainment of the standards is assured, and (b) application of all such available measures would not result in attainment any faster, then a plan which requires implementation of less than all technologically and economically available measures may be approved (see Section 171(l) of the Act).[3]

8.3.2 Reasonable Further Progress (RFP)

The EPA recommends that SIPs for lead nonattainment areas provide detailed compliance schedules for the RACM (including RACT). Upon reviewing the SIP, EPA will determine whether, in light of the statutory objective of RFP to ensure timely attainment of the lead NAAQS, the annual incremental reductions to be achieved are reasonable.[4]

8.3.3 Contingency Measures

Section 172(c)(9) of the Act defines contingency measures as measures in a SIP which are to be implemented if an area fails to maintain RFP or to attain the NAAQS by the applicable attainment date. Upon determination by the Administrator that the area has failed to (1) maintain reasonable further progress or (2) attain the lead NAAQS by the applicable statutory deadline, contingency measures become effective without further action by the State or the Administrator. Contingency measures should consist of available control measures that are not included in the primary control strategy.[5]

REFERENCES FOR SECTION 8.3

1. "The suggested starting point for specifying RACM for area sources in each SIP is the listing of available control measures for fugitive dust contained in the document *Control of Open Fugitive Dust Sources* (EPA 450/3-88-008), September 1988). If a State receives substantive public comment demonstrating through appropriate documentation that additional control measures may well be reasonably available in a particular circumstance, those measures should be added to the list of available control measures for that area. The RACM is then determined for the particular area to which the SIP applies. If it can be shown that one or more measures are unreasonable because emissions from the reentrainment of fugitive lead-bearing dust are *de minimis* (*i.e.*, insignificant), those measures may be excluded from further consideration as they would not represent RACM for the area. The State should evaluate the resulting available control measures for reasonableness, considering their technological and economic feasibility in the area to which the SIP applies. A State should consider the feasibility of implementing measures in part when full implementation would be infeasible. The SIP submittal to EPA should contain a reasoned justification for partial or full rejection of any available control measures, including those considered or presented during the State's public review process that explains, with appropriate documentation, why each rejected control measure is infeasible or otherwise unreasonable. If the SIP demonstrates attainment of the lead national ambient air quality standards (NAAQS) by the required date then, in accordance with the discussion below, a State may be able to demonstrate that available and otherwise feasible control measures are unreasonable and do not constitute RACM for the area because they do not expedite attainment." Memorandum from Paisie, Joseph W., Acting Chief, AQMD, to Skie, Douglas M., Chief, Air Programs Branch, Region VIII. Questions for Lead State Implementation Plans (SIP's), April 23, 1992.

2. Reference 1. "We would recommend following EPA's historical definition of RACT which is the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Stationary sources which actually emit a total of 5 tons per year of lead or lead compounds measured as elemental lead should be the minimum starting point for RACT analysis; however, depending on the attainment needs of the area or in order to ensure that the area provides for attainment to expeditiously as practicable, it may be necessary to evaluate whether control technology is reasonably available for sources which actually emit less than 5 tons per year of lead or lead compounds."

3. Reference 1. "The SIP's for lead nonattainment areas that demonstrate attainment of the NAAQS should include implementation of available control measures for sources of lead (including available control technology for stationary sources of lead emissions) to the extent necessary to demonstrate attainment of the lead NAAQS "as expeditiously as practicable" but no later than the applicable statutory attainment date. See Section 192(a) of the Act. Therefore, if a State adopts less than all available measures but demonstrates, adequately and appropriately, that (a) reasonable further progress and attainment of the

standards is assured, and (b) application of all such available measures would not result in attainment any faster, then a plan which requires implementation of less than all technologically and economically available measures may be approved. The EPA believes it would be unreasonable and, therefore would not constitute RACM (including RACT) to require that a plan which demonstrates attainment include all technologically and economically available control measures even though such measures would not expedite attainment."

4. Reference 1. "The EPA recommends that SIP's for lead nonattainment areas provide a detailed compliance schedule for the RACM (including RACT) to be implemented in the area and accurately indicate the corresponding annual emission reductions to be realized from each milestone in the schedule. In reviewing the SIP, EPA will determine whether, in light of the statutory objective of RFP to ensure timely attainment of the lead NAAQS, the annual incremental emission reduction to be achieved are reasonable. See Section 171(1) of the Act."

5. Reference 1. "Section 172(c)(9) of the Act defines contingency measures as measures in a SIP which are to be implemented if an area fails to maintain RFP or fails to attain the NAAQS by the applicable attainment date. Contingency measures become effective without further action by the State or the Administrator, upon determination by the Administrator that the area has failed to (1) maintain reasonable further progress or (2) attain the lead NAAQS by the applicable statutory deadline. Contingency measures should consist of available control measures that are not included in the primary control strategy."

9.0 GENERAL PROVISIONS

9.1 GENERAL

The NAAQS are established at a level to protect the public health and welfare. The amount of time that areas are given to reach the NAAQS depends upon whether the standard is a primary standard (health based) or a secondary standard (welfare based).[1,2] The PSD prevents relative deterioration in air quality for different classes (i.e., Classes I, II, and III, of air quality).

SIPs and SIP revisions provide for the implementation, maintenance, and enforcement of measures needed to attain and maintain the NAAQS.[2] If the provisions in a SIP are found to be inadequate to attain or maintain the NAAQS or to otherwise comply with any requirement of the Act, a SIP call may be issued by EPA.[3] If a State does not correct the deficiencies after a SIP call, the EPA may impose sanctions and must develop a Federal Implementation Plan (FIP).[4,5] Alternatively, if EPA finds that an area is not attaining the NAAQS, EPA may request the Governor of the State to designate the area as nonattainment.[6] Once designated nonattainment, the State must submit a SIP revision which meets the requirements of Section 172 of the Act.[7]

REFERENCES FOR SECTION 9.1

1. Section 109 of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

2. Reference 1. Section 110(a).

3. Reference 1. Section 110(k).

4. Reference 1. Section 110(c).

5. Reference 1. Section 179.

6. Reference 1. Section 107(d).

7. Reference 1. Section 172.

9.2 CLEAN AIR ACT REQUIREMENTS: TIME LIMITS

9.2.1 General

Following the promulgation of a new or revised NAAQS, Section 110(a) of the Act requires each State to submit a plan for attainment and maintenance of the NAAQS to EPA. In general, SIPs are to be submitted within 3 years (or such shorter period prescribed by the Administrator) of when the new or revised NAAQS was promulgated and must provide for attainment of the primary NAAQS as expeditiously as practicable, but in no case later than 3 years from the date of plan approval.[1] With respect to the secondary NAAQS, attainment should be provided for by the SIP within a reasonable time. The term "reasonable time" is defined in 40 CFR Part 51 and can allow for consideration of technological and economic problems.[2] These requirements were adopted in 40 CFR Part 51.[3]

In accordance with Section 110(k)(5) of the Act, the Administrator shall require the State to revise the SIP as necessary if it is determined that the applicable implementation plan for any area is substantially inadequate to attain or maintain the relevant NAAQS. The Administrator shall establish deadlines (18 months maximum after date of notice) for the submittal of revised plans. Inadequate plan findings and notice shall be public. The Administrator may adjust attainment dates except for those which have not yet elapsed.

Generally, for areas designated nonattainment for the lead NAAQS under Section 107(d)(5) of the Act, the date by which a State must submit a plan and the area must attain the lead NAAQS is triggered by the promulgation date of the area's nonattainment designation. Section 191(a) of the Act requires that SIPs must be submitted within 18 months of the area's nonattainment designation. Section 192(a) of the Act provides that SIPs must provide attainment of the lead NAAQS as expeditiously as practicable but no later than 5 years from the date of an area's nonattainment designation.[4]

REFERENCES FOR SECTION 9.2

1. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I. Subchapter C, Part 51.110(b). July 1, 1991.

2. Reference 1. Subchapter C, Part 51.110(c).

3. Reference 1. Subchapter C, Parts 51.110 and 51.340.

4. "(d) *Plan submission.* Generally, the date by which a plan must be submitted for an area is triggered by the area's nonattainment designation. For areas designated nonattainment for the primary lead NAAQS in effect at enactment of the 1990 CAAA, States must submit SIPs which meet the applicable requirements of part D of the Act within 18 months of an area's nonattainment designation (see Section 191(a) of the amended Act)."

   (e) *Attainment dates.* Generally, the date by which an area must attain the lead NAAQS also is triggered by the area's nonattainment designation. For the areas designated nonattainment for the primary lead NAAQS in effect at enactment of the 1990 CAAA, SIPs must provide for attainment of the lead NAAQS as expeditiously as practicable but no later than 5 years from the date of an area's nonattainment designation (see section 192(a) of the amended Act)." State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Proposed Rule. *Federal Register* 57: 13550. April 16, 1992.

9.3 CURRENT NAAQS AND PSD PROGRAM

9.3.1 General

The authority for developing NAAQS is provided under Section 109 of the Act. The 1990 Amendments provide EPA the authority to require States to designate areas with respect to the lead NAAQS.[1] The lead NAAQS in effect on the date of the enactment of the Act and its associated requirements remain in effect. When and if a revised NAAQS is proposed, it should be noted that its requirements may differ from those currently in effect, and upon promulgation the revised requirements will supersede any existing ones.[2]

Part C of the Act (Section 160-169) establishes the basis for the PSD program. Section 112 of the Act exempts the hazardous air pollutants and categories listed in Section 112(b)(1) of the revised Act from PSD requirements.[3] This exemption applies to final Federal PSD permits issued on or after November 15, 1990 and permittees may request a revision to their PSD permit to reflect the exemption from Federal PSD applicability.[4] It is important to distinguish that while the provisions of Title III exempt lead compounds from Federal PSD, the elemental lead portion of lead compounds is considered a criteria pollutant and therefore subject to PSD regulations.[5,6]

9.3.2 National Ambient Air Quality Standards

The EPA is required, under Section 109 of the Act, to establish NAAQS for each pollutant for which air quality criteria are established (under Section 108 of the Act). There are two types of NAAQS: primary and secondary. The primary NAAQS are established to protect public health with an adequate margin of safety. The secondary NAAQS protect public welfare (soil, crops, vegetation, animals, visibility, building materials, etc.) from known or anticipated effects. For lead, the standard established for the primary and secondary NAAQS is the same. The current lead NAAQS is 1.5 $\mu g/m^3$ based on the "maximum arithmetic mean averaged over a calendar quarter".[7]

9.3.3 Prevention of Significant Deterioration Program

The PSD program mandated by Congress is required to balance three primary goals. These goals are specified in Section 160 of the Act. The first of these goals is to protect public

health and welfare. This goal includes avoiding air quality degradation in all areas that are attaining the NAAQS. The second goal emphasizes the protection of air quality in national parks, wilderness areas, and similar areas of special concern where air quality is considered particularly important. The third goal is to ensure that economic growth which causes environmental degradation in clean areas occurs only after careful deliberation by State and local communities. The primary requirements of the PSD regulations require that "major" new stationary sources and "major" modifications be carefully reviewed prior to construction to ensure compliance with the NAAQS, the applicable PSD air increments, and the requirement to apply BACT to minimize the project's emissions of air pollutants.[8]

The PSD requirements[9] (see Section 9.5.3 for additional detail) apply to "major" new stationary sources and "major" modifications located in Section 107 areas that are classified as attainment or unclassifiable.[10] Although, there are currently no attainment and unclassifiable areas designated for lead, all sources in attainment or unclassifiable areas are required to conduct PSD reviews for lead. First, no increment levels have been promulgated for lead, but lead emissions are a component of PM-10 emissions and therefore subject to the applicable particulate and PM-10 increments under the PSD requirements.[11] Second, PSD provisions provide that,

> " ...PSD review will apply to any source that emits any pollutant in major amounts, if the source would locate in an area designated attainment or unclassifiable for any criteria pollutant. If the source is subject to PSD review, then PSD review will be applied to each pollutant the source emits in greater than de minimis amounts, unless the area is designated as nonattainment under section 107(d)(1) for the particular pollutant."[12]

The PSD program requirements become effective when the net emissions increase for any pollutant emitted by a source is "significant" (i.e., above the de minimis threshold). The significance threshold established for lead is 0.6 tons per year.[13]

REFERENCES FOR SECTION 9.3

1. Section 107(d)(5) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

2. "The Act contains provisions which address the lead NAAQS in effect on the date of enactment of the Amendments as well as any new or revised NAAQS which are promulgated subsequent to the date of enactment of the Amendments. This lead guidance document only addresses the statutory requirements insofar as they are applied to the lead NAAQS in effect on the date of enactment of the Amendments. Some of the requirements applicable under a revised lead NAAQS may differ from the requirements for the lead NAAQS in effect on the date of enactment of the Amendments. When and if a revised NAAQS is proposed, EPA will discuss the applicable statutory requirements. However, it is important to note that the existing lead NAAQS and associated requirements remain in effect until they are finally changed, i.e., a revised lead NAAQS is finally promulgated and any new requirements supersede those that existed before." Memorandum from Calcagni, J., to Director, Air, Pesticides, and Toxics Management Division, Regions I, IV, VI; Director, Air and Waste Management Division Region II; Director, Air Management Division Regions III and IX; Director, Air and Radiation Division Region V; and Director, Air and Toxics Division Regions VII, VIII, and X. Lead Nonattainment Area State Implementation Plan (SIP) Guidance: Final Staff Work Product. May 31, 1991.

3. Reference 1. Sections 112(b)(1) and 112(b)(6).

4. "The Title III exemption applies to final Federal PSD permits (i.e., those issued in final form and for which administrative appeals, if any, under 40 CFR 124.19 have been exhausted) issued on or after the date of enactment of the 1990 Amendments (November 15, 1990). For Federal PSD permit applications now under review by either an EPA Regional Office or a delegated State, PSD permit requirements do not apply to the pollutants exempted by Title III. For Federal PSD permits containing PSD requirements for the pollutants exempted by Title III issued on or after November 15, 1990, the permittee may request a revision (e.g., removal of a BACT limit for benzene) to their PSD permit to reflect the Title III exemption from Federal PSD applicability." Memorandum from Seitz, J.S., to Addressees. New Source Review (NSR) Program Transitional Guidance. March 11, 1991.

5. Reference 1. Section 112(b)(7).

6. Reference 4. "Lead compounds are exempt from Federal PSD by Title III, but the elemental lead portion of lead compounds (as tested for in 40 CFR Part 60, Appendix A, Method 12) is still considered a criteria pollutant subject to the lead NAAQS and still regulated under PSD."

7. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter I. Subchapter C, Part 50.12. July 1, 1991.

8. United States Environmental Protection Agency. *New Source Review Workshop Manual* (Draft). Office of Air Quality Planning and Standards. October 1990. pg.5.

9. Reference 7. Subchapter C, Part 51.166.

10. Reference 1. Section 161.

11. Reference 4. "...particulates (including lead compounds and asbestos) are still regulated as particulates (both PM-10 and particulate matter) under the PSD regulations."

12. *Federal Register* 45:52711. August 7, 1980. Requirements for Preparation, Adoption, and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans.

13. Reference 7. Subchapter C, Part 51.166(b)(23)(i).

9.4 SIP REVISIONS

9.4.1 General

All SIP revisions must include a demonstration that the NAAQS and PSD increments are not violated in the area. Specific requirements for SIP processing are contained in *Guidelines for the Review of SIP Revisions by EPA Regional Offices*. Note that this document is a compilation of guidance information intended to guide the Regions in processing SIP revisions with a major focus on technical guidance.

9.4.2 SIP Completeness

In order to free EPA resources that would otherwise be consumed in processing incomplete and inherently unapprovable SIPs, EPA has created a completeness review process. Under this process, EPA will review a SIP for completeness when it is initially submitted to determine if all the necessary components have been included to allow the agency to properly review and act on the substance of the SIP revision. EPA will then promptly inform the submitting State whether the agency will proceed to process the SIP revision or if it must be modified by the State because it is incomplete.[1]

State submissions that do not meet the criteria are not considered official plan submissions under 40 CFR Part 51.[2] The criteria for determining whether a submittal is complete have been separated into the two categories: (a) administrative information, and (b) technical information.

Administrative information includes the basic documentation that the State has followed the procedural requirements of the Act. This documentation includes a letter from the Governor requesting SIP approval and evidence that the revision has been adopted in final form (as a State regulation, permit, or consent agreement). The State must also provide documentation regarding legal authority for the revision and its enforceability, as well as a copy of the actual regulation or document submitted for approval and incorporation by reference. Finally, the State must verify that program procedures have been followed (public notice, hearings, compilation of comments and responses).

Technical support information includes all analyses demonstrating how attainment will be achieved. This information should establish that all applicable requirements, including requirements for attainment and maintenance of ambient standards, increment consumption, and control technology conform with statutory EPA requirements.[3]

9.4.3 Grandfathering

Generally, all SIP revisions are evaluated based on the requirements in existence at the time of EPA's rulemaking; however, EPA does have the flexibility to grandfather certain provisions in new regulations if the following conditions are met: (1) the new rule would represent an abrupt departure from existing practice, (2) affected parties must have relied on the old rule, (3) the new rule would impose a large burden on those affected, and (4) there would be little statutory interest in applying the new rule.[4] (For grandfathering of modeling analyses, see Section 6.2.)

Grandfathering is neither mandatory nor automatic. In determining whether to grandfather a State submitted rule, the decision-maker should focus on whether good-faith efforts were made to comply with the existing rules. Grandfathering should not allow sources to circumvent tighter requirements or agencies to avoid difficult decisions.[5]

Exceptions to the allowance of grandfathering provisions include:

- If a court ruling has explicitly changed a current Federal requirement,
- If the old regulation or policy was ill-founded,
- If it would have substantial adverse environmental impact, and
- If lack of compliance with the new requirements renders the SIP inadequate for NAAQS attainment.[6]

9.4.4 SIP Relaxations

All SIP relaxations for lead should contain in the *Federal Register* and/or technical support document the following information: (1) plant name and location; (2) facility size

(including number of units); (3) revised lead emission limit, existing SIP limit, and corresponding averaging times; and (4) actual and "paper" (allowable) emissions decrease or increase.[7]

9.4.5 SIP Tightening

In general, where a SIP revision will result in an emissions decrease at a specific source and there is no other change in the stack parameters, a new control strategy demonstration will not be required.

9.4.6 Approval Options

There are three alternatives to full approval or full disapproval of a complete SIP submittal: partial approval, limited approval and conditional approval.[8] In accordance with Section 110(k)(3), after reviewing a submitted SIP, EPA will approve those elements of the plan that meet the requirements of the Act and disapprove those elements that fail to meet those requirements. Where the disapproval portions of a SIP are separable, EPA will partially approve the SIP and disapprove those separate parts. Where the disapproval portions of a SIP are not inseparable, but the submittal as a whole serves to improve air quality, EPA will complete a limited approval and disapproval of the plan.

The SIP as a whole will not be treated as meeting the requirements of the Act until all of the required elements are approved. Under Section 110(m), the EPA may apply sanctions after finding that an element of the plan has not been submitted or must be disapproved. According to Section 179, sanctions may be applied if a SIP deficiency has not been corrected within 18 months of finding the deficiency. Under Section 110(k)(4), the EPA may conditionally approve SIP revisions that fail, in a minor way to meet all the requirements of the Act. If the condition is not met within 1 year, then the conditional approval must be treated as a disapproval.[8,9]

REFERENCES FOR SECTION 9.4

1. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subchapter C, Part 51. Appendix V. July 1, 1991 and as amended at 56 FR 42216 (August 26, 1991).

2. Reference 1.

3. Reference 1.

4. "However, an agency does have some flexibility to provide grandfathering provisions in new regulations. Generally, such provisions are appropriate where they meet a four-part test. First, the new rule represents an abrupt departure from well-established practice. Second, affected parties have relied on the old rule. Third, the new rule imposes a large burden on those affected. Fourth, there is no strong statutory interest in applying the new rule." Memorandum from Emison, G.A., OAQPS, to Director, Air Management Division Regions I, III, and IX; Director, Air, and Waste Management Division, Region II; Director, Air Pesticides and Toxics Division Region IV and VI; Director, Air and Radiation Division Region V; and Director Air and Toxics Division, Regions VII, VIII, and X. June 27, 1988. (PN 110-88-06-27-095).

5. Reference 4. "Grandfathering is not to be considered mandatory or automatic. In determining whether grandfathering should apply, and what the appropriate date should be, the decision maker should keep in mind the thrust of this guidance, i.e., to honor good faith effort on the part of the State/local agency submitting the revision, balancing equity with other considerations. This guidance expressly is not intended as a vehicle to allow circumvention of tighter requirements or to facilitate the avoidance of difficult decisions."

6. Reference 4. "B. There are certain exceptions to the general grandfathering guidance:" Items 2,3,4 and 6.

7. Memorandum from Rhoads, R.G., OAQPS, to Director, Air and Hazardous Materials Division, Regions I-V and VIII. Information Required in *Federal Register* Packages. June 12, 1980.

8. Memorandum from Calcagni, John, Director, Air Quality Management Division, OAQPS, to Director, Air, Pesticides and Toxics Management Division, Regions I and IV; Director, Air and Waste Management Division, Region II; Director, Air, Radiation, and Toxics Division, Region III; Director, Air and Radiation Division, Region V; Director, Air Pesticides, and Toxics Division, Region II; and Director, Air and Toxics Division, Regions VII, VIII, IX, and X. "Processing of State Implementation Plan (SIP) Submittals." July 9, 1992.

9. "(a) *Full, partial, and limited approval and disapproval.* The EPA has authority to fully approve or disapprove a State SIP submittal under section 110(k)(3). However, in some instances a State's submission of a SIP or SIP revision will include a provision that does not comply with one or more applicable requirements of the Act.

(b) *Conditional approval.* Under section 110(k)(4), the Administrator may approve a plan revision based on a commitment of the State to adopt specific enforceable measures by a specified date but not later than 1 year after the date of EPA approval of the plan revision that incorporated that commitment . . ." "State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990." U.S. Environmental Protection Agency. *Federal Register*, 57 FR 13565, April 16, 1992.

9.5 SANCTIONS AND FIP REQUIREMENTS

Section 179(a) of the amended Act sets forth specific criteria for EPA to determine when to apply sanctions. Two types of sanctions are specified under section 179(b): (1) highway funding restrictions, and (2) increased emissions offset ratios for new and modified sources. A third type of sanction, restrictions on air grant funding, is provided for under section 179(a). The construction ban provisions of section 110(a)(2)(I) of the 1977 Clean Air Act Amendments were largely repealed with the passage of the amended Act in 1990.[1]

9.5.1 Actions Triggering Sanctions and FIP Requirements

Section 179(a) of the amended Act sets forth four types of findings which may trigger sanctions. The first is a finding that a State has failed to submit a SIP or an element of a SIP, or that the submittal fails to meet the completeness criteria. The second is a finding that a SIP submission for a nonattainment area fails to meet one or more elements of the plan required by the Act. The third is a finding that the State has not made any other submission required by the Act that meets the completeness criteria or has made a required submission that is disapproved by EPA for not meeting the Act's requirements. The fourth is a finding that a requirement of an approved plan is not being implemented.[1,2]

Section 110(c) sets forth two types of findings that trigger FIP requirements: (1) a finding that a State fails to make a required submittal or that a submittal does not satisfy the minimum completeness criteria under section 110(k)(1)(A), and (2) a disapproval of a SIP submittal in whole or in part.[3]

9.5.2 Sanctions and FIP Clocks

The amended Act provides a "clock" for imposing sanctions and FIP requirements. Section 179(a) allows up to 18 months for the State to correct the deficiency that triggered EPA's disapproval before EPA can impose sanctions. Section 110(c)(1) gives the State two years to correct a deficiency and EPA to approve a new submittal before EPA is obligated to promulgate a FIP.[4]

The sanctions clock, triggered under section 179(a), can be stopped when the State corrects the deficiency prompting the finding. The EPA must apply one of the two sanctions specified under section 179(b) within 18 months after the date of the finding. If the deficiency persists, EPA must apply both sanctions at 24 months. Under section 179(a), EPA need not wait 24 months to apply both sanctions. EPA may apply both sanctions at 18 months if it determines a lack of good faith on the part of the State.[5] The FIP clock can be stopped only when EPA issues a final approval of the State submittal. Where the sanctions and FIP clocks were started by EPA disapproval of a plan, the sanctions and FIP clocks will run concurrently.[6]

9.5.3 Available Sanctions

The two sanctions available for EPA are provided under section 179(b) and include restriction of highway funding, and application of emission offset requirements. As part of the highway funding sanctions, EPA may prohibit approval by the Secretary of Transportation of projects or grants in the affected nonattainment area.[7] However, section 179(b)(1) of the amended Act provides exemptions for certain projects and grants that are intended to minimize air pollution problems.[8]

The emission offset sanction refers to the application of the emission offset requirements of section 173 and applies to new or modified sources. Under this sanction, the ratio of emissions reductions that must be obtained to offset increased emissions (caused by the new or modified source) in the sanctioned area must be at least 2 to 1.[8,9]

REFERENCES FOR SECTION 9.5

1. EPA Requirements; Sanctions and Other Safeguards; Available Measures Under 1990 CAAA. General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Proposed Rule. *Federal Register* 57: 13566. April 16, 1992.

2. "The Act in section 179 requires EPA to impose sanctions based on four types of actions (findings) provided in section 179(a): (1) a finding that the State has failed to submit a SIP, a SIP element, or has submitted a SIP or SIP element that does not satisfy the completeness criteria; (2) that EPA disapproval of a SIP submission for a nonattainment area based on its failure to meet one or more elements required by the Act; (3) a determination that the State has not made any other submission, has made an inadequate submission (as required by the Act), or that EPA disapproves such submission; or (4) a finding that a requirement of an approved plan is not being implemented." Memorandum from Calcagni, John, Director, Air Quality Management Division, OAQPS, U.S. EPA, Research Triangle Park, NC, to Director, Air, Pesticides, and Toxics Management Division, Regions I and IV; Director, Air and Waste Management Division, Region II; Director, Air, Radiation, and Toxics Division, Region III; Director, Air and Radiation Division, Region V; Director, Air, Pesticides and Toxics Division, Region VI; Director, Air and Toxics Division, Regions VII, VIII,IX, and X. "Processing of State Implementation Plan (SIP) Submittals." July 9, 1992.

3. Reference 2. "Under section 110(c)(1), EPA is required to promulgate a FIP based on two types of findings: (1) a finding that a State has failed to make a required submittal or that a submittal does not satisfy the minimum completeness criteria under section 110(k)(1)(A), or the EPA disapproval of a SIP submittal in whole or in part."

4. Reference 2. "For plan submittals required under Part D or in response to a SIP call, section 179(a) allows for up to 18 months for the State to correct the deficiency that is the subject of a finding or disapproval before EPA is required to impose sanctions. Section 110(c)(1) provides for up to 2 years for the State to correct the deficiency and for EPA to approve a new submittal before EPA is obligated to promulgated a FIP."

5. Reference 2. "Under section 179(a), in order to stop the sanctions clock, the State must correct the 'deficiency' prompting the finding. The EPA must apply one of the two sanctions available under section 179(b) within 18 months after the date of the finding and both sanctions at 24 months, unless the deficiency has been corrected. Section 179(a) also requires EPA to apply both sanctions after 18 months if EPA finds a lack of good faith on the part of the State."

6. Reference 2. "In other words, EPA must approve the State submittal in order to stop the FIP clock. Where the sanctions and FIP clocks were started by EPA disapproval of a plan, the clocks will run concurrently. In this case, to correct the deficiency for purposes of the sanctions clock, the State must make a submittal which EPA finds approvable.

Such a determination is not made until EPA issues a final approval of the plan. Final approval of a plan is also what is needed to stop the FIP clock."

7. Reference 2. "For plan submittals required under Part D or in response to a SIP call, if the State does not correct the specific deficiency within the 18-month period allowed under section 179(a), EPA must apply at least one of the two sanctions available under section 179(b) as described: (1) Highway funding sanctions: The EPA may impose a prohibition on the approval by the Secretary of Transportation of certain projects, or the awarding of certain grants."

8. EPA Requirements; Sanctions and Other Safeguards; Available Measures Under 1990 CAAA; Highway Trending Sanctions. General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Proposed Rule. *Federal Register* 57: 13566. April 16, 1992.

9. Reference 2. "(2) Offset sanctions. A ratio of at least 2-to-1 will be required for emissions reductions within the nonattainment area to offset emissions from new or modified major facilities (as required under section 173)."

9.6 INTERIM CONTROL STRATEGIES

In certain situations, air pollution control equipment may need to be repaired, upgraded or replaced to meet the applicable emission limitations in a revised SIP. During the period until new or upgraded control equipment is operational and the source is in compliance, emissions from the source must not be allowed to increase. The existing control equipment must remain operational to the maximum extent possible, with appropriate maintenance and repair, until construction or linking of new equipment requires its shutdown or removal. A source may choose to implement interim controls that offer a higher degree of emission reduction instead of maintaining existing equipment. However, the use of such interim controls should not be allowed to unnecessarily delay the installation of final control equipment.[1]

Additional interim controls or other interim measures are required to prevent excess emissions during periods when existing control equipment must be taken off line to link or complete construction of new or upgraded equipment. Such measures may include installing additional temporary control equipment or operational controls (such as curtailing production rates, relocating production to complying process lines, "purchasing power or product elsewhere," or temporary shutdown).[2]

The source should also be required to implement an interim continuous emissions monitoring program. This will enable the agency to monitor emissions from the source during the interim period.[3]

REFERENCES FOR SECTION 9.6

1. "During the interim period until the new or upgraded control equipment is operational and the source is in compliance, emissions from the source must not be allowed to increase. The existing though inadequate control equipment must remain operational to the maximum extent possible, including being maintained and repaired, until such time that construction or tie-in of new equipment requires its shut down or removal. In lieu of maintaining the existing though inadequate control equipment, interim controls which offer a higher degree of emission reduction and are readily and reasonably available may be installed. The use of such interim controls shall not unduly delay the installation of final control equipment." Memorandum. Seitz, John S., Director, Stationary Source Compliance Division, OAQPS, U.S. EPA, Washington, DC, to Air Management Division Directors, Regions I, III, and IX; Air and Waste Management Division Director, Region II; Air, Pesticides and Toxics Management Division Directors, Regions IV and VI; Air and Toxics Division Directors, Regions VII, VIII and X; and Air and Radiation Division Director, Region V. Transmittal of OAQPS Interim Control Policy Statement. March 31, 1988. PN-113-88-03-31-047.

2. Reference 1. "When existing control equipment must be taken off line to tie in or complete construction of new or upgraded equipment, additional interim controls or other interim measures are required to ensure no increase in excess emissions occurs during the tie in period. Such measures may include installation of additional temporary control equipment or operational controls, *e.g.*, curtailment of production rates, relocation of production to complying process lines or facilities, purchase of power or product elsewhere as needed, or temporary shutdown."

3. Reference 1. "The source should also be required to implement an interim continuous emissions monitoring program, to enable the agency to monitor the emissions performance of the source during the interim period."

9.7 SIP CALLS

In accordance with Section 110(k)(5) of the amended Act, the Administrator shall require the State to revise the SIP as necessary if it is determined that the applicable implementation plan for any area is substantially inadequate to attain or maintain the relevant NAAQS. The Administrator shall establish deadlines (18 months maximum after date of notice) for the submittal of revised plans. Inadequate plan findings and notice shall be public.

Section 110(a)(2)(H) requires that SIP's provide for plan revisions as necessary to take account of NAAQS revisions or the availability of improved or more expeditious methods for attaining the standards. Such revisions should also be provided for should the Administrator find that the plan is substantially inadequate to attain the applicable NAAQS, or to otherwise comply with any additional requirements of the Act. Relevant exceptions to these requirements for plan revisions are set forth in section 110(a)(3)(C).

Plan revisions for nonattainment areas are addressed in section 172(d) of the Act. Any plan revision for a nonattainment area that is required in response to a section 110(k)(5) finding must correct the plan deficiency and meet all other applicable plan requirements under sections 110 and 172 of the Act. EPA may reasonably adjust the applicable deadlines to achieve a consistent application of plan requirements. EPA will issue written guidelines, as necessary, to facilitate submittal of adequate and approvable plans.

10.0 PERMIT REQUIREMENTS: CONSTRUCTION AND MODIFICATION

The discussion below pertains to permit requirements for the construction of new sources or the modification of existing sources. The 1990 Amendments, however, do include provisions for operating permit programs in Title V. The EPA is required to promulgate regulations for federally enforceable operating permit programs. To the extent possible, operating permits will simply codify present SIP regulations. For this reason, it is important that SIPs are adequate and enforceable before operating permit programs are in place. The operating permit program is not discussed in this guideline; however, it will be addressed in future versions.

10.1 GENERAL

Generally, there are two size classes of sources, major and minor sources, which require permitting. The EPA regulations for major source permitting are located in 40 CFR 51.165 and 51.166. A discussion of the major source permitting requirements follows for nonattainment areas (Section 10.2), PSD areas (Section 10.3), and SIP permit requirements (Section 10.4).

Major new sources and existing sources that have undergone major modifications are generally required to obtain air pollution permits prior to construction/modification and operation. Permits are required to assure that sources do not jeopardize plans to attain or maintain NAAQS. The requirements for these permits vary depending on the size and location of the proposed source. For a complete compendium of new source review and permitting guidance see the *New Source Review/Prevention of Significant Deterioration and Nonattainment Area Guidance Notebook.* Additional information is available on the New Source Review Electronic Bulletin Board and the *New Source Review Workshop Manual.*[1]

The EPA's regulations for minor source permitting are located in 40 CFR 51.160 - 5.164. Generally, 40 CFR 51.160 - 51.164 requires States to adopt into their SIP general (minor) source permitting regulation requirements which provide for legally enforceable procedures to evaluate the construction of minor sources in order to determine whether the sources will violate an applicable control strategy or interfere with attainment of the NAAQS. The general source permitting regulations must also establish a basis for determining which sources will be reviewed.

With respect to lead sources, EPA has indicated that State's general permitting regulations should be written so as to eliminate any exemption of sources which have the potential to emit five tons/year or more of lead or lead compounds. The source size limit is based on the definition of point source of lead which is five tons/year of actual emissions of lead or lead compounds (see 40 CFR 51.100(k)(1)(ii).[2]

REFERENCES FOR SECTION 10.1

1. United States Environmental Protection Agency. *New Source Review Workshop Manual, (Draft).* Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711. October 1990. pp.F.2-F.4.

2. "The source size limit is based on the definition of a point source of lead which is five tons/year actual emissions of lead. The rationale for this limit is based on an analysis contained in the "Supplementary Guidelines of Lead Implementation Plans," pages 75-77. Briefly, this rationale indicates that sources which emit five tons/year of lead have the potential to violate the ambient standard for lead." Memorandum from Rhoads, R.G., OAQPS, to Directors, Air and Hazardous Materials Divisions, Region I-X, New Source Review Requirements for Lead. April 8, 1980.

10.2 NONATTAINMENT AREA NSR PERMITS

10.2.1 Applicability

All new or modified major stationary sources located within an area designated under Section 107 of the Act as nonattainment are required to obtain permits for construction and operation. Major lead sources have the potential to emit greater than 100 tons per year;[1] major modifications occur if they increase emissions by greater than 0.6 tons per year.[2]

10.2.2 Control Technology Requirements

All major sources subject to nonattainment area NSR requirements are required to control emissions to a degree that reflects the lowest achievable emission rate (LAER).[3] LAER is the most stringent emission control actually achieved in practice or contained in any SIP regulations. These control techniques must be applied to the proposed new source unless they are demonstrated to be technically infeasible, site-specific cost considerations notwithstanding.[4]

10.2.3 Emission Offsets

Offsetting reductions in actual emissions for sources locating in nonattainment areas must be obtained to offset increases in allowable emissions that result after the application of LAER.[5]

The emission offsets must exceed the net increase from the proposed source and other source growth previously accounted for so that reasonable progress toward attainment of the NAAQS continues. Consistent with provisions of 40 CFR 51.165(a), new sources for which emission offsets are required must also comply with procedures relating to the permissible location of offsetting emissions, which are equivalent or more stringent than those set out in 40 CFR Part 51 Appendix S Section IV.D.

10.2.4 Net Air Quality Benefit

For those sources that do not satisfy the location requirements for the emission offsets as specified in 40 CFR Part 51 Appendix S Section IV.D, a net air quality benefit must be demonstrated.[6] This demonstration is made with a modeling analysis that shows that with the

proposed emission increases, LAER and emission offsets proposed will not increase the concentration at an agreed upon number of receptors where NAAQS exceedances have been identified and will not significantly increase the concentration at all other receptors where NAAQS exceedances have been identified.

10.2.5 Other Requirements

In addition to the above requirements, any applicant for a new source permit within a nonattainment area must certify that other sources owned or operated by the applicant are in compliance with applicable air quality regulations. Compliance includes being on an approved compliance schedule.

Finally, the applicable implementation plan must be adequately implemented for the nonattainment area, and an analysis of alternative sites, sizes, production processes, and environmental control techniques must demonstrate that the benefits of the proposed source outweigh the environmental and social costs.[7]

10.2.6 NSR Transition

The amended Act makes numerous changes to the NSR requirements for nonattainment and PSD programs. These include creation of new and expanded nonattainment areas, extension of PSD coverage to Class I area boundaries, and a mandate for a PSD exemption for certain hazardous air pollutants. The EPA has provided its interpretation of the new or revised NSR nonattainment permit program requirements contained in Part D of the amended Act within the *General Preamble*, New Source Review Nonattainment Permit Requirements. The EPA intends to issue regulations setting forth specific requirements for an approvable NSR program.[8]

EPA has published transitional guidance on the most important issues involving the NSR program to be used in preparing SIP revisions in the interim between passage of the amended Act and adoption of the Agency's final regulations. This guidance appeared in a March 11, 1991 memorandum and is published in Appendix D of the *General Preamble.* The transitional guidance is not intended to replace existing State regulations or approved SIP's; however, it calls upon States to implement their NSR programs consistent with provisions of the amended Act that are applicable immediately.[9] The transitional guidance, since it does not represent final EPA

action, has not been subject to judicial review and is not intended, and cannot be relied upon, to create any rights enforceable in litigation with the United States. The EPA may decide to follow the transitional guidance, or to act at variance with it based on specific circumstances. The Agency may also change the guidance at any time without public notice.[10]

Major issues relating to NSR PM-10 nonattainment dealt with in the transitional guidance include the following:

- *NSR construction permit requirements in nonattainment areas.* In States where the existing Part D permit program covers all designated nonattainment areas in the State, the program will automatically cover any new or expanded areas under the amended Act and States should apply the requirements of their existing programs. In other States, where a Part D program may be limited to specific areas and does not apply to new or expanded areas, States must implement a transitional permit program until their existing programs are revised to meet the requirements of the amended Act, and expanded to cover all nonattainment areas in the State.[11]

- *Status of construction bans.* An existing construction ban that was imposed due to the absence of approved Part D NSR rules remains in effect until a revised NSR SIP is approved. Specific construction bans may be lifted where appropriate. The status of construction bans in general will be published in the Federal Register. If a construction ban is lifted in a nonattainment area, and the area lacks an approved Part D NSR rule, the State should meet the requirements of appendix S to 40 CFR part 51 in issuing permits for major new sources or major modifications until NSR rules meeting the requirements of the amended Act are adopted.[12]

- *Federal implementation plans.* The NSR permitting program in an existing FIP remains in effect until a SIP is approved or a revised AMENDED is adopted.[13]

- *Use of previously approved growth allowances.* Growth allowances in existing SIP's are invalidated [pursuant to section 173 (b) of the amended Act] in areas where a SIP call has been received either before or after enactment of the amended Act. In such areas, previously approved growth allowances cannot be used for NSR permits issued on or after November 15, 1990. Construction permits that rely on previously approved growth allowances cannot be issued in SIP call areas under existing, approved Part D programs. Emission offsets must be obtained on a case by case basis for any such permits, and any other existing Part D requirements must be met.[14]

In a September 3, 1992 memorandum, the EPA provided a supplement to the transitional guidance in order to clarify EPA's position regarding the NSR permitting when a State does not

submit a SIP revision implementing the additional Part D NSR provisions of the amended Act by the applicable statutory deadline. For PM-10, the statutory submittal deadline for such revisions was June 30, 1992. This supplemental guidance is nonbinding in the same sense as the initial transition guidance and does not affect EPA's interpretations of NSR provisions in the amended Act as published in the *General Preamble*.[15]

The supplemental guidance addresses conditions under which permits may be issued to sources and obtain EPA recognition as being in compliance with the Act. In general, sources that have submitted complete permit applications by the submittal deadline may receive permits and be recognized as complying with the Act, provided that specific conditions are met. These conditions are spelled out in the guidance.[16] Sources that have not completed applications by the submittal deadline may be considered as complying with the Act provided that the source obtains a permit from the State that is consistent with the substantive new NSR Part D provisions. Those applicable to PM-10 include new applicability thresholds, offset ratios, and section 173 offset requirements.[17] This guidance does not overrule any State rules or transitional guidance that may be more stringent.[18]

REFERENCES FOR SECTION 10.2

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40, Chapter I. Subchapter C, Part 51.165(a)(1)(iv). July 1, 1991.

2. Reference 1. Part 51.165(a)(1)(v).

3. Section 173(a)(2) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

4. Reference 1. Part 51, Appendix S.

5. Reference 3. Section 173(a).

6. Reference 4.

7. Reference 3. Section 173(a)(3),(4), and (5).

8. "The Clean Air Act Amendments of 1990 (1990 Amendments) make numerous changes to the NSR requirements of the prevention of significant deterioration (PSD) and nonattainment area programs. The 1990 Amendments create new and expanded nonattainment areas, extend PSD coverage to current Class I area boundaries, and mandate a PSD exemption for certain hazardous air pollutants. The Environmental Protection Agency (EPA) intends to propose by September of this year a regulatory package that will implement these and other changes to the NSR provisions. Final adoption of these revised regulations is projected for August 1992. In the interim period between passage of the 1990 Amendments and adoption of the Agency's final regulations EPA expects that numerous issues regarding the 1990 Amendments will arise." Appendix D — New Source Review (NSR) Program Transitional Guidance. *Federal Register* 57:18074. April 28, 1992.

9. "This guidance document does not supersede existing State regulations or approved State implementation plans. However, in some cases, it calls upon States to implement their NSR programs in a manner consistent with provisions of the 1990 Amendments that are applicable immediately and with the requirements that flow directly from these provisions." Memorandum from Seitz, John S., Director, OAQPS, U.S. EPA, Research Triangle Park, NC, to Addressees. *New Source Review (NSR) Program Transitional Guidance*. March 11, 1991.

10. Reference 9. "Nonetheless, the policies set out in the transition memorandum are intended solely as guidance and do not represent final Agency action. They are not ripe for judicial review for this reason. Moreover, they are not intended, nor can they be relied upon, to create any rights enforceable by any party in litigation with the United

States. The EPA officials may decide to follow the guidance provided in this memorandum, or to act at variance with the guidance, based on an analysis of specific circumstances. The Agency also may change this guidance at any time without public notice."

11. Reference 8. "In many States, the existing approved Part D permit program by its terms covers all designated nonattainment areas in the State, so Part D permit program will automatically apply to the new and expanded nonattainment areas which are established under provisions of Title I of the 1990 Amendments. Thus, until new rules are adopted for these new or expanded nonattainment areas, States should apply the requirements of their existing approved Part D permit program. However, in other States Part D program may be limited to specified areas and does not apply to new or expanded areas. In these cases, States must implement a transitional permitting program until their existing Part D programs are revised to meet the requirements of the 1990 Amendments and expanded to cover all nonattainment areas in the State. Otherwise, both the goals of part D and Congress' intent in creating new or expanded nonattainment areas will be frustrated." p. 18076.

12. Reference 8. "Pursuant to section 110(n)(3), an existing construction ban that was imposed due to the absence of approved Part D NSR rules remains in effect until a revised NSR SIP is approved. Existing construction bans imposed due to disapproval of primary sulfur dioxide NAAQS attainment plans also remain in effect. A *Federal Register* notice will be published soon announcing the status of construction bans in general and also lifting specific bans where appropriate. Should a construction ban be lifted in any area designated as nonattainment, and the area lacks an approved Part D NSR rule, the State should meet the requirements of 40 CFR part 51, appendix S, in issuing permits to major new sources or major modifications prior to the adoption of NSR rules meeting the requirements of the 1990 Amendments." p. 18076–7.

13. Reference 8. "The NSR permitting program in an existing FIP remains in effect until a SIP is approved or a revised FIP is adopted." p. 18077.

14. Reference 8. "Section 173(b) invalidates growth allowances in existing SIP's in areas that received a SIP call prior to enactment of the 1990 Amendments, or that received one thereafter. For NSR permits issued on or after November 15, 1990, previously-approved growth allowances cannot be used in these areas. Construction permits cannot be issued in SIP-call areas under existing EPA-approved Part D programs to the extent that such permits rely on previously-approved growth allowances. Case-by-case emission offsets must be obtained for any such permits, and other existing Part D requirements must be met." p. 18077.

15. "To address some immediate concerns generated by the 1990 CAAA, the Environmental Protection Agency (EPA) issued an initial NSR transitional memorandum on March 11, 1991, entitled 'New Source Review Program Transitional Guidance.' This memorandum

supplements that effort by clarifying EPA guidance regarding the permitting of new or modified sources in situations where a State does not submit a State implementation plan (SIP) revision implementing the augmented Part D NSR provisions of the 1990 CAAA by the applicable statutory deadline. The statutory deadlines for submission of revised NSR SIP's are listed in the attachment. Moreover, as more fully set forth in the March 11, 1991 transitional memorandum, this supplemental memorandum sets forth nonbinding guidance that does not create any rights or otherwise predetermine the outcome of any procedures. Also, many of EPA's interpretations of the new Part D NSR requirements are in the 'General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990' (General Preamble) (see 57 FR 1398, 13552-556, April 16, 1992). These interpretations are not affected by this memorandum." Memorandum from Seitz, John S., Director, OAQPS, U.S. EPA, Research Triangle Park, NC, to Addressees. New Source Review (NSR) Program Supplemental Transitional Guidance on Applicability of New Part D NSR Permit Requirements. September 3, 1992.

16. Reference 15. "Where States do not submit the Part D NSR SIP by the applicable statutory deadline ... sources submitted complete permit applications ... by the submittal deadline may receive final permits under existing State NSR rules. In this situation, such sources will be considered by EPA to be in compliance with the Act without meeting the amended Part D NSR provisions of the 1990 CAAA, provided they meet the following conditions:

    1. The State and source move expeditiously towards final permit issuance.

    2. Construction begins no later than 18 months from the date of permit issuance unless an earlier time is required under the applicable SIP.

    3. Construction is not discontinued for a period of 18 months or more.

    4. Construction is completed within a reasonable time. States may not grant permit extensions beyond these time periods unless the permittee is required in a federally-enforceable manner to meet the new Part D NSR provision."

17. Reference 15. "Also, under today's guidance, where States miss the statutory deadline for Part D NSR SIP submittal, for sources that have not submitted complete permit applications by the SIP submittal deadline, EPA will also consider the source to be in compliance with the Act where the source obtains from the State a permit that is consistent with the substantive new NSR Part D provisions in the 1990 CAAA. The substantive new provisions are the new applicability thresholds, the new offset ratios, the offset requirements of Section 173, and the NO_x requirements of section 182(f) for most O_3 nonattainment areas and the NOTR."

18. Reference 15. "Please note that the Act allows States to implement the new Part D NSR provisions prior to the statutory deadlines and in a manner more stringent than EPA guidance or rules. Thus, today's guidance does not apply in any State to the extent that the State's own rules or transitional guidance is more stringent."

10.3 PSD AREA PERMITS

10.3.1 Applicability

Major new stationary sources located within areas designated attainment or unclassifiable pursuant to Section 107 of the Act are required to undergo preconstruction review in accordance with regulations for the prevention of significant deterioration (PSD).[1] A new or existing major stationary source for PSD purposes is one which has the potential to emit 250 tpy or more (or 100 tpy, if the source category is one of the 28 categories specifically listed in the PSD regulations) of any pollutant subject to regulation under the Act.[2] Any existing major stationary source that proposes a physical or operational change that would increase emissions of lead by 0.6 tpy is also subject to PSD review for the resulting net emissions increase.

10.3.2 Control Technology Requirements

Major sources subject to PSD review for lead are required to control emissions of that pollutant to a degree that reflects BACT.[3] A BACT analysis is done on a case-by-case basis, and considers energy, environmental, and economic impacts in determining the maximum degree of reduction achievable for the proposed source or modification. In no event can the determination of BACT result in an emission limitation which would not meet any applicable standard of performance under 40 CFR Parts 60 and 61.

10.3.3 Air Quality Analysis

The applicant for a lead PSD permit is required to demonstrate via a modeling analysis that the proposed new emissions will be in compliance with the NAAQS, PSD increments, and any applicable emissions standard or standard of performance under the Act.[4] Although there are currently no PSD increments for lead, since lead is a component of particulate matter, applicants must satisfy the requirements for the PM increments. The NAAQS impose a ceiling on total ambient concentrations. Increments impose a limit on the amount of increase in ambient concentrations relative to a baseline maximum concentration. NAAQS for lead is expressed for a calendar quarter while PM increments are expressed for annual and 24-hour periods.

A demonstration of compliance with the NAAQS is based on a modeling analysis in a manner that is consistent with the *Guideline on Air Quality Modeling (Revised)* (see Chapter 6 for more detail). To meet preconstruction monitoring requirements under the PSD program, monitoring data may need to be provided by the applicant. When monitoring data is required, guidance is available in the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*[5] (see Chapter 5 for more detail).

The air quality analysis should also be used as a basis for establishing lead emission limits if BACT-derived limits are not sufficient. In either case, the limits must be sufficient to protect NAAQS. Thus, PSD emission limits that reflect the air quality analysis will need to be specified on a 24-hour basis.[6]

10.3.4 Other Impacts

Pursuant to 40 CFR 51.166(o), the applicant must prepare additional impact analyses for each pollutant subject to regulation under the Act which will be emitted by the proposed new source or modification. The analysis assesses the impacts of air, ground, and water pollution on soils, vegetation, and visibility caused by any increase in emissions of any regulated pollutant from the source or modification under review, and from associated growth.

Other impact analysis requirements may also be imposed on a permit applicant under local, State, or Federal laws which are outside the PSD permitting process. Receipt of a PSD permit does not relieve an applicant from responsibility to comply fully with such requirements. For example, two Federal laws which may apply on occasion are the *Endangered Species Act* and the *National Historic Preservation Act.* Such legislation may require additional analyses (although not as part of the PSD permit) if any federally-listed rare or endangered species, or any sites that are included (or are eligible to be included) in the National Register of Historic Sites, are identified in the source's impact area.

Secondary emissions (i.e., emissions caused by the new construction itself) must be included in the impact analyses.

An analysis of visibility impairment is conducted using a three-level screening technique. The analysis method is described in the EPA document entitled, *Workbook for Estimating Visibility Impairment.*[7]

10.3.5 Class I Areas

The PSD program is designed to provide the greatest degree of protection to Class I areas. Mandatory Class I areas are those specified by the Act. They are protected by (1) a stringent Class I PSD increment and (2) air quality related values (AQRVs) that the Federal Land Manager (FLM) has an affirmative duty to protect. AQRVs are those attributes of a Class I area that are dependent on the maintenance of a high level of ambient air quality. These may include, among other things, acid deposition effects and visibility impairment in Class I areas.

Sources located within 100 kilometers of a designated Class I area with ambient impacts greater than 1 microgram per cubic meter for a 24-hour average are required to notify the FLM, who may require the applicant to conduct a Class I area impact assessment. A Class I impact analysis must show that the source will not cause or contribute to a Class I increment violation. Otherwise, the applicant must demonstrate to the satisfaction of the FLM that no AQRVs are adversely affected. If no increment violations are shown to occur, then the FLM may call for denial of the PSD permit if adverse impacts on any AQRV can be demonstrated.

Procedures for Class I review, including responsibilities for both the FLM and the reviewing agency, are contained in the *New Source Review Workshop Manual* (draft October 1990, Chapter E)[8] and in guidance documents produced by the National Park Service, Forest Service, and Fish and Wildlife Service.

REFERENCES FOR SECTION 10.3

1. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subchapter C, Part 51.166(b)(1)(i), July 1, 1991.

2. "A new source is major if it has the potential to emit any pollutant regulated under the Act in amounts equal to or exceeding specified major source thresholds [100 or 250 tone per year (tpy)] which are predicated on the source's industrial category." U.S. Environmental Protection Agency. *New Source Review Workshop Manual, (Draft).* Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711. October 1990. Chapter A, p. A.1.

3. Section 165(a)(4) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

4. Reference 3. Section 165(a)(3).

5. U.S. Environmental Protection Agency. *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD).* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-87-007. May 1987.

6. "This is in response to your November 17, 1986 memorandum in which you requested comment on Region V's belief that PSD permits must contain short-term emission limits to ensure protection of the NAAQS and PSD increments. I concur with your position and emphasize that this position reflects our national policy." Memorandum from Emison, G., OAQPS, to D. Kee, Region V. November 24, 1986.

7. U.S. Environmental Protection Agency. *Workbook for Estimating Visibility Impairment.* Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA-450/4-87-031. November 1980.

8. Reference 2. Chapter E.

10.4 SIP PERMIT REQUIREMENTS

In addition to the special major source permit requirements listed above, SIP permit requirements are specified in 40 CFR Part 51.165(b). These requirements govern the permitting of major new and modified sources in attainment and unclassifiable areas where NAAQS violations exist or are discovered as part of the permitting analysis. Essentially, a source is required to demonstrate that its ambient impact would be less than the air quality significance levels in all areas and for all time periods where NAAQS violations are or will occur.[1] It is not necessary to demonstrate an insignificant impact everywhere in the impact area.

The 40 CFR Part 165(b)(3) requirements also provide for sources that cause or contribute to lead violations (i.e., that cannot demonstrate insignificance) at noncomplying receptors. In such situations, sources may devise lead emission reductions to offset their ambient impacts. The particular ambient criteria that must be satisfied to conform to SIP provisions developed pursuant to 40 CFR Part 51.165(b) must be discussed with the reviewing agency and reflect local plans for maintenance and attainment of the lead NAAQS.[2]

REFERENCES FOR SECTION 10.4

1. "I believe the most appropriate course of action to follow is the second approach which considers the significant impact of the source in a way that is spatially and temporally consistent with the predicted violations." Memorandum from Emison, G.A., OAQPS, to T.S. Maslany, Air Management Division, Region III. July 5, 1988.

2. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subpart C, Part 51.165(b). July 1, 1991.

10.5 VISIBILITY

With respect to visibility protection, PSD permit reviews for new or modified major stationary sources must provide for the following:

- written notification (including the visibility analysis) of FLMs of any affected Federal Class I areas within 30 days of receipt of and at least 60 days prior to public hearing or, in cases where the reviewing agency receives advance notification (e.g., early consultation with the source prior to submission of the application), written notification shall be provided to the affected FLM(s) within 30 days of such advance notification; and

- consideration of any analysis performed by the FLM that is provided within 30 days of written notification as specified above and concludes that the proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the reviewing agency finds that such an analysis does not demonstrate to the satisfaction of the State that an adverse impact will result in the Federal Class I area, the State must, in the notice of public hearing, either explain its decision or give notice as to where the explanation can be obtained.

NSR with respect to visibility protection must provide for review of any new major stationary source or major modification that:

- has an impact on any integral vista of a Federal Class I area, if the vista is identified in accordance with 40 CFR Part 51.304 by the FLM at least 12 months before submission of a complete permit application (or within 6 months if the FLM has provided notice and opportunity for public comment); or

- proposes to locate in an area classified as nonattainment under Section 107(d)(1)(A),(B),(C) or 107(d)(5) of the Act but which may have an impact on visibility in any Federal Class I area.

States may also require monitoring of visibility in any Federal Class I area near the proposed new stationary source or major modification. All NSRs with respect to visibility shall be performed in accordance with 40 CFR Part 51.320 and 40 CFR Part 52.24 and must ensure that the source's emissions will be consistent with making reasonable progress toward the national visibility goal referred to in 40 CFR Part 51.300(a).

10.6 EMISSIONS TRADING

10.6.1 General Policy Aspects

Emissions trading consists of bubbles, netting, offsets, and emission reduction banking. These trading alternatives do not alter existing air quality requirements (e.g., this policy and guidance do not affect the applicable NSR/PSD rules for offsetting and netting). Still, these trading alternatives provide flexibility to States and industry in meeting their requirements. Emission trading can result in reduced costs and faster compliance with applicable regulations. Any use of bubbles, banking, or similar emissions trading provisions must be approved by the EPA as a SIP revision or it must be approved by the State under an EPA-approved generic bubble rule. A summary of emissions trading alternatives follows.[1]

10.6.2 Bubbling

EPA's bubble lets *existing* plants (or groups of plants) increase emissions at one or more emission sources in exchange for compensating extra decreases in emissions at other emission sources. To be approvable, each bubble must produce results which are equivalent to or better than the baseline emission levels in terms of ambient impact and enforceability. Thus, bubbles should jeopardize neither ambient standards nor applicable PSD increments and visibility requirements. Under EPA's bubble, emission reductions from existing sources can not be used to meet technology-based requirements applicable to new or modified stationary sources.[2]

10.6.3 Netting

Netting may exempt "modifications" of existing major sources from certain preconstruction permit requirements under New Source Review (NSR), so long as there is no net emissions increase within the major source or any such increase falls below significance levels. By "netting out," the modification is not considered "major" and is therefore not subject to associated preconstruction permit requirements for major modifications under 40 CFR 51.160-166, 52.21, 52.24, 52.27, or 52.28. The modification must nevertheless meet applicable new source performance standards for hazardous air pollutants (NESHAPs), preconstruction applicability review requirements under 40 CFR 51.160-164, and SIP requirements.[3]

10.6.4 Offsets

In nonattainment areas, major new stationary sources and major modifications are subject to a preconstruction permit requirement that they obtain enough emission reductions to more than "offset" their emissions. This requirement is designed to allow industrial growth in nonattainment areas without interfering with attainment and maintenance of the NAAQS.[4]

10.6.5 Banking

Firms may store or "bank" qualified emission reduction credits (ERCs) in EPA-approvable banks for later use in bubble, offset, or netting transactions. Depending on the bank's rules, banked ERCs may also be sold or transferred to other firms which seek to meet certain regulatory requirements by use of emissions trades.[5]

10.6.6 Emission Reduction Credits

Emission reduction credits are the common currency of all trading activity. To ensure that emission trades do not contravene relevant requirements of the Act, only reductions which are surplus, enforceable, permanent, and quantifiable can qualify as emission reduction credits and be banked or used in an emissions trade.

REFERENCES FOR SECTION 10.6

1. *Federal Register* 51:43824-25. December 4, 1986. Emissions Trading Policy Statement; General Principles for Creation, Banking and Use of Emission Reduction Credits; Final Policy Statements and Accompanying Technical Issues Document.

2. Reference 1. p. 43830. "EPA's bubble lets *existing* plants (or groups of plants) increase emissions at one or more emissions sources in exchange for compensating extra decreases in emissions at other emission sources. Approved bubbles give plant managers the ability to implement less costly ways of meeting air quality requirements. To be approvable, each bubble must produce results which are equivalent to or better than the baseline emissions levels in terms of ambient impact and enforceability. Thus, bubbles should neither jeopardize ambient standards nor applicable PSD increments and visibility requirements. Under EPA's bubble, emission reductions from existing sources can not be used to meet technology-based requirements applicable to new or modified stationary sources."

3. Reference 1. p. 43830. "Netting may exempt 'modifications' of existing major sources from certain preconstruction permit requirements under New Source Review (NSR), so long as there is no net emissions increase within the major source or any such increase falls below significance levels. By 'netting out,' the modification is not considered 'major' and is therefore not subject to associated preconstruction permit requirements for major modifications under 40 CFR 51.18, 51.24, 52.21, 52.24, 52.27, or 52.28. The modification must nevertheless meet applicable new source performance standards for hazardous air pollutants (NESHAPs), preconstruction applicability review requirements under 40 CFR 51.18(a)-(h) and (l), and SIP requirements."

4. Reference 1. p. 43830. "In *nonattainment* areas, major new stationary sources and major modifications are subject to a preconstruction permit requirement that they secure sufficient surplus emission reductions to more than 'offset' their emissions. This requirement is designed to allow industrial growth in nonattainment areas without interfering with attainment and maintenance of ambient air quality standards. It is currently implemented through SIP regulations adopted by states to meet the requirements of 40 CFR 51.18(j)."

5. Reference 1. p. 43831. "Firms may store qualified emission reduction credits (ERCs) in EPA-approvable banks for later use in bubble, offset or netting transactions. Depending on the bank's rules, banked ERCs may also be sold or transferred to other firms which seek to meet certain regulatory requirements by use of emissions trades."

10.7 LEAD-SPECIFIC POLICY ASPECTS

With the passage of the 1990 Amendments, lead compounds are now subject to EPA policy regarding bubbles involving hazardous or toxic air pollutants. This policy states that when a bubble involves a pollutant which is listed under Section 112, but no NESHAP has yet been proposed for the relevant source category, there must be no net increase in actual emissions of the listed pollutant. In general, "all bubbles involving emissions of pollutants described above must use lower-of-actual or NESHAPs-allowable emissions baselines, and must take place within a single plant or contiguous plants."[1]

Generally, an emissions trading applicant must demonstrate that the proposed trades will not cause an increase in baseline emissions. The baseline emission depends upon the type of area in which the source operates. Usually, an air quality demonstration for lead via ambient dispersion modeling is required.[2]

The emissions trading policy offers four alternatives States can evaluate for approval of any bubble or offset:

(1) De Minimis. In general no modeling is needed to determine the ambient equivalence to trades in which applicable net baseline emissions do not increase and in which the gross sum of the emissions increases, after applicable control requirements, totals less than 0.6 tpy for lead.

(2) Level I. In general no modeling is needed to determine ambient equivalence if:

   (a) The trade does not result in an increase in applicable net baseline emissions;

   (b) The relevant sources are located in the same vicinity (within 250 meters of each other);

   (c) No increase in baseline emissions occurs in the source with the lower effective plume height as determined under EPA's *Guidelines on Air Quality Models*;

   (d) No complex terrain is within the area of significant impact of the trade or 50 kilometers, whichever is less;

(e) Stacks with increasing baseline emissions are tall enough to avoid possible downwash situations, as determined by the formula at 40 CFR Part 51.100(ii).

(f) The trade does not involve open dust sources.

(3) Level II. Bubble trades which are neither de minimis nor Level I may nevertheless be evaluated for approval based on modeling to determine ambient equivalence limited solely to the impacts of the specific emission sources involved in the trade, if:

(a) there is no increase in applicable net baseline emissions,

(b) the potential change in emissions before and after the trade will not cause a significant increase in pollutant concentrations at any receptor for any averaging time specified in an applicable ambient air quality standard, and

(c) such an analysis does not predict any increase in ambient concentrations in a mandatory Federal Class I area. The definition of "significant" as used above can be found in the Emission Trading Policy Federal Register Notice, 51 FR 43845 (December 4, 1986) footnote 38.[3]

(4) Level III. Full dispersion modeling considering all sources affecting the trade's area of impact is required to determine ambient equivalence if applicable net baseline emissions will increase as a result of the trade, or if the trade cannot meet criteria for approval under de minimis, Level I or Level II.[3]

For discussion on stack height emissions balancing policy see Section 7.5.

REFERENCES FOR SECTION 10.7

1. *Federal Register* 51.43824-25. December 4, 1986. Emissions Trading Policy Statement; General Principles for Creation, Banking, and Use of Emission Reduction Credits; Final Policy Statements and Accompanying Technical Issues Document.

2. Reference 1. "Bubble applicants must show that their proposed trades are at least equivalent in ambient effect to the SIP emission limits the bubble would replace. For some criteria pollutants (e.g., VOC or NOx) this test may generally be met by showing equal reduction in emissions. For other pollutants, (e.g., SO2, TSP, or CO) it was traditionally met, prior to the 1982 policy, through dispersion modeling."

3. Reference 1. p. 43844-45. "(1) *De Minimis.* In general no modeling is needed to determine the ambient equivalence of trades in which applicable net baseline emissions do not increase and in which the sum of the emissions increases, looking only at the increasing sources, totals less than 25 tons per year (TPY) for particulate matter, 40 TPY for sulfur dioxide, 100 TPY for carbon monoxide, 40 TPY for NO_x (where visibility impacts are of concern), or 0.6 TPY for lead, after applicable control requirements...(2) *Level I.* In general no modeling to determine ambient equivalence is needed if: (a) The trade does not result in an increase in applicable net baseline emissions; (b) The relevant sources are located in the same immediate vicinity (within 250 meters of each other); (c) No increase in baseline emissions occurs at the source with the lower effective plume height as determined under EPA's *Guidelines on Air Quality Modeling*; (d) No complex terrain is within the area of significant impact of the trade or 50 kilometers, whichever is less; (e) Stacks with increasing baseline emissions are sufficiently tall to avoid possible downwash situations, as determined by the formula described at 50 FR 27892 (July 8, 1985) (to be codified at 40 CFR Part 51); and (f) The trade does not involve open dust sources...(3) *Level II.* Bubble trades which are neither *de minimis* nor Level I may nevertheless be evaluated for approval based on modeling to determine ambient equivalence limited solely to the impacts of the specific emission sources involved in the trade, if there is no increase in applicable net baseline emissions, if the potential change in emissions before and after the trade will not cause a significant increase in pollutant concentrations at any receptor for any averaging time specified in an applicable ambient air quality standard, and if such an analysis does not predict any increase in ambient concentrations in a mandatory Federal Class I area...(4) *Level III.* Full dispersion modeling considering all sources affecting the trade's area of impact is required to determine ambient equivalence if applicable net baseline emissions will increase as a result of the trade, or if the trade cannot meet criteria for approval under *de minimis*, Level I or Level II."

11.0 COMPLIANCE AND ENFORCEMENT

11.1 GENERAL

Implementation and enforcement provisions must be included in a SIP to show how the requirements of the plan will be put into effect and how sources that are in violation of the plan's requirements will be brought into compliance. Therefore, the emission limits and other requirements (1) must be written so that they are enforceable; (2) must require continuous compliance with the SIP provisions and with the NAAQS; (3) must include provisions for monitoring, testing, and recordkeeping and reporting to determine compliance; and (4) must include specific, expeditious final compliance dates. A compendium of EPA's enforcement guidance is contained in, *The Clean Air Act Compliance/Enforcement Policy Compendium.*

11.2 ENFORCEABILITY CRITERIA

To be enforceable, the wording of SIP regulations must unambiguously describe what facilities are affected by the rule and what they are required to do to be in and to demonstrate compliance. The requirements should be within the statutory authority of the regulatory agency and, in all cases, the owner or operator of a source should be aware of the standard of conduct required by the regulation. A SIP regulation should explicitly set forth the following:

- who must comply with the regulation,[1] including a description of the facilities covered by the regulation;[2]
- quantity of emissions which cannot be exceeded (e.g., the emission limit);
- period over which compliance is determined (e.g., the averaging time);[1]
- date by which compliance is expected (or the date on which noncompliance will be considered a violation of the rule),[1] and the important dates required in any compliance schedule which the source is required to submit to the State;[2]
- recordkeeping and reporting requirements;[3]
- requirement of continuous compliance; and

- methods and monitoring to be used to determine compliance [1,3] (including the method for determining the level of emissions prior to implementing the controls for regulations expressed as a percentage reduction requirement).[2]

In addition, any exemptions to the regulation should also be clearly stated in the text of the regulation. For example, exemptions based on the size of the facility or on the emission levels from a source should state explicitly how the owner or operator of the source is to determine size and emission level (e.g., whether emissions are actual or design emissions, how actual emissions are calculated). Provisions of a regulation that allow for variations in the normal mode of compliance should be clearly specified. These variance provisions require prior EPA approval for a general variance or EPA approval on a case-by-case basis.[1,4]

If the SIP regulation includes provisions of Federal regulations that are incorporated by reference, those Federal regulations should be examined to check that they are appropriate and relevant.[2] To allow for future changes to the referenced Federal regulations, the SIP regulation could reference the current version of the Federal regulation or any subsequent version promulgated by EPA.

The SIP regulations should explicitly state recordkeeping and reporting requirements.[3] They should describe the records that are to be kept to demonstrate compliance, how long and where the records are to be maintained, accessibility for inspection, and schedules and content requirements for any required reports. Whenever possible, the SIP should specify the form and format of reports or it should give an example of an acceptable report. The SIP regulations should be written so that failure to submit a required report is itself a violation of the regulations.

REFERENCES FOR SECTION 11.2

1. "Your review should ensure that the rules in question are clearly worded and explicit in their applicability to the regulated sources." Memorandum from Potter, J.C., OAR, Adams, T.L., Jr., OECM, and Blake, F.S., General Counsel to Regional Administrators, Regions I - X, *et al. Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency.* September 23, 1987. (PN 113-87-09-23-041).

2. "The notion of enforceability encompasses several concepts. At the most basic level, a regulation must be within the statutory authority of the promulgating agency." Memorandum from Alushin, M.S., Associate Enforcement Counsel for Air Enforcement, *et al.* to Regional Administrators, Regions I - X, *et al.*

3. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40, Chapter I, Subpart K, Part 51.210-51.213. July 1, 1991.

4. "It is important that the underlying SIP is enforceable so that permits themselves will be enforceable." Memorandum from Baumer, R., AQMD, and Biondi, R, SSCD, to Air Branch Chiefs, Regions I-X - SO_2 SIP Deficiency Checklist. November 28, 1990.

11.3 CONTINUOUS COMPLIANCE

11.3.1 General

As a general rule, sources are required to meet all applicable emission limitations and other control requirements incorporated into a SIP regulation at all times. Emission limitations and other control requirements are established to prevent concentrations of pollutants in the ambient air from exceeding NAAQS or any other State and local standards. Ambient air should meet NAAQS at all times. An exceedance of the SIP emission limits and other requirements might result in an exceedance or the NAAQS; therefore, compliance with the SIP regulations must be continuous. Continuous compliance means that excess emissions should be avoided by proper design, installation, operation, and maintenance of air pollution sources and air pollution control equipment. It also means that excess emissions that occur as a result of a malfunction or other emergency situation are minimized and quickly terminated.[1]

All periods of excess emissions are violations of the standard. However, enforcement action might not be appropriate in all situations.[2] Even with proper design, operation, and maintenance of equipment, malfunctions might occur. Unusual startup and shutdown episodes might also cause exceedances to occur. A third situation during which exceedances might not require enforcement action is an emergency situation of fossil fuel shortages.

If a malfunction occurs such that bypassing pollution control equipment will prevent death, personal injury, or severe property damage, the pollution control agency can consider specific circumstances before choosing to take enforcement action.[3] During such a malfunction or emergency situation, the owner or operator of the pollution source is expected to minimize and eliminate emission limit exceedances as quickly as possible. When an emission exceedance occurs in emergency situations, the source operator or owner is responsible for proving that the excess emissions resulted from a true malfunction (e.g., unpreventable, unavoidable).

Exceptions to the continuous compliance requirement for malfunctions, unusual startup or shutdown, or fossil fuel shortages, can be included in a SIP. If they are included in a SIP, such regulations must be narrowly drafted. Since it might be difficult to write an unambiguous regulation which differentiates between a true malfunction and a malfunction which could have been prevented, a preferred approach is the enforcement discretion approach.[4] For the

enforcement discretion approach, rather than write exceptions into the regulation, the enforcement agency uses its discretion to determine when the enforcement action is inappropriate, although a violation did occur.

11.3.2 Enforcement Discretion Approach

The enforcement discretion approach allows the enforcing agency to determine whether emission limit violations are cases which do not require enforcement actions. In these situations, the source is responsible for proving that enforcement action would be inappropriate. An advantage to this approach is that by using the enforcement discretion, an agency encourages sources to establish and follow proper operating and maintenance procedures. Proper procedures help to minimize periods of excess emissions.

To demonstrate that enforcement action is inappropriate, a source must prove that it has an active continuous compliance program and it must demonstrate that excess emissions were due to an unavoidable malfunction. Components of an active continuous compliance program might include a self-monitoring of emissions, and/or surrogate operating parameters, maintenance of spare parts inventories, and establishing procedures for correcting types of violations that are likely to occur.[1] The enforcing agency should consider the following criteria in determining whether enforcement actions are appropriate:

- equipment was properly sized, designed, and installed;
- equipment and processes were maintained and operated to minimize emissions;
- repairs were made quickly;
- the amount and duration of the excess emissions were minimized to the extent possible;
- all possible steps were taken to minimize the impact of excess emissions on ambient air quality;
- excess emissions were not part of a recurring pattern which would indicate the source was inadequately designed, operated, or maintained.[4]

Unless the above criteria are met, enforcement action should be taken for the violation.

11.3.3 Malfunctions and Unusual Startup or Shutdown

All excess emissions are violations of the applicable standard. A SIP may not allow "automatic exemptions" for malfunctions that sources allege have occurred. Instead, a SIP should provide for proceedings to determine whether enforcement actions should be taken. For such proceedings, the burden of proof that an actual malfunction occurred is upon the source. A malfunction is defined as a sudden unavoidable breakdown of process or control equipment.[5]

Startup and shutdown are part of normal process operations. Excess emissions during these periods should be avoided through careful planning. Likewise, excess emissions should not take place during scheduled maintenance periods because these periods can also be planned.[6] It is reasonable to expect that careful planning and proper equipment design, operation, and maintenance will eliminate violations of emission limitations during such periods.

In rare cases, excess emissions during a startup or shutdown cannot be avoided. An example of such a situation is when a process starts up only once or twice a year, and the condition of the emissions during a few hours is such that the effluent gas would severely damage the control equipment. For all such situations, the source must adequately show that excess emissions could not be prevented.[7]

REFERENCES FOR SECTION 11.3

1. "In the strict legal sense, sources are required to meet, without interruption, all applicable emission limitations and control requirements, unless such limitations specifically provide otherwise." Memorandum from Bennett, K.M., OANR, to Directors, Air and Waste Management Divisions and Air Management Divisions, Region I-X. June 21, 1982.

2. Memorandum from Bennett, K.M., OANR, to Regional Administrators, Regions I-X. September 28, 1982. (PN 113-83-02-15-017)

3. Memorandum from Bennett, K.M., OANR, to Regional Administrators, Regions I-X. February 15, 1983. (PN 113-83-02-15-017)

4. Reference 2. "EPA can approve SIP revisions which incorporate the 'enforcement discretion approach.'"

5. Reference 2. "If a SIP contains a malfunction provision, it cannot be the type that provides for automatic exemption where a malfunction is alleged by a source."

6. Reference 2. "Start-up and shutdown of process equipment are part of the normal operation of a source and should be accounted for in the design and implementation of the operating procedure for the process and control equipment. Accordingly, it is reasonable to expect that careful planning will eliminate violations of emission limitations during such periods."

7. Reference 3. "Therefore, during this latter situation, if effluent gases are bypassed which cause an emission limitation to be exceeded, this excess need not be treated as a violation if the source can show that the excesses could not have been prevented through careful and prudent planning and design and that bypassing was unavoidable to prevent loss of life, personal injury, or severe property damage."

11.4 COMPLIANCE MONITORING

11.4.1 Compliance Monitoring Strategy

The Compliance Monitoring Strategy (CMS) provides a flexible approach for determining State inspection commitments. The CMS stresses flexibility with accountability. This strategy recommends the development of a comprehensive inspection plan that identifies all the sources in a source category committed to be inspected by the State agency during the fiscal year. The four objectives of the CMS are as follows:

- To identify State monitoring objectives vis-a-vis available resources through the development of an inspection plan.
- To ensure effective national oversight of the air compliance monitoring program, to permit its evaluation, and to establish a feedback mechanism.
- To ensure emission standards are met through effective compliance monitoring activities.
- To assure that emission standards are met through effective use of compliance monitoring activities.

11.4.2 Compliance Monitoring Requirements

The EPA regulations require SIPs to contain legally enforceable procedures to require stationary sources to install and operate equipment for continuously monitoring, recording, and reporting emissions [40 CFR 51.214(a)]. The SIP should identify the types of sources (by source category and capacity) that must install, maintain, and operate the equipment; the planned use of the data; calculations, recordkeeping, reporting, and quality assurance procedures; and the pollutants that must be monitored [40 CFR 51.214(b)]. The monitoring data should also be used for compliance certification as outlined in Section 114(a)(3) of the Act.

Industries and control agencies benefit from routinely monitoring emissions, keeping records, and periodically reporting. The benefits include increased cost effectiveness by increasing the sources' energy efficiency, and through pollution prevention and better targeting of "problem sources." For most lead sources, continuous opacity monitoring systems (COMS) can provide a means for directly determining compliance with lead emission limitations. In some

situations, COMS might not be feasible, so alternative monitoring to determine compliance might be necessary. These alternative monitoring technologies might include continuous instrumental monitoring of process parameters such as temperature, pressure, and voltage, or manual monitoring of processes or work practice.

Whenever a control device is used to reduce lead emissions, a continuous monitoring system should be the required method to determine compliance. This is particularly true for all regulated sources located in nonattainment areas. Continuous monitoring systems should be used to monitor the continuous compliance of PSD and NSR sources. Continuous monitoring system requirements should also be incorporated into PSD and NSR preconstruction permits, operating permits, and the resolution of enforcement actions. Continuous monitoring system data should also be used to identify significant violators.

In situations where emissions control devices are utilized and continuous emission monitors for lead or COMS are not feasible, the regulation should require continuous monitoring of process and control system parameters sufficient to ensure that the pollution control devices are operating at maximum design efficiency to maintain continuous compliance. Where emission control devices are not utilized, then monitoring the level of production, operating conditions, and operation and maintenance procedures are to be monitored and recorded.

The primary purpose of requiring such continuous monitoring systems are to assure that sources (1) have timely and accurate compliance data; (2) have a quantitative basis to monitor the change in emissions caused by process or control equipment adjusted (e.g., the source modifies maintenance procedures); (3) have a basis for certifying whether compliance was continuous or intermittent during the reporting period as required by Part 70; and (4) can minimize energy and raw product usage rates by using the data made available by the COMS. Such monitoring assists agencies in ensuring continuous compliance and enforcing against sources that violate their emission limit.

11.4.3 State Inspection Plan Submittal

Each inspection plan submittal will present how that State will address national priorities and will justify exceptions to the national priorities. The plan will also identify specific sources

to be inspected, allocate the total inspection budget among source groups, and cover other issues that are necessary to meet the CEMS objectives and requirements.

The targeting model should be used to determine Group I and specific Group IV sources to be included in this inspection plan, in addition to their priority of inspection. Groups II and III will be addressed by their national strategy requirements and by the resources allocated to each group. For other Group IV source inspections, a block resource allocation will be made by the State in their plan submittal.

The above steps will allow the State agency to develop their initial comprehensive inspection plan which will be submitted to the EPA Region for review. To justify exceptions to national priorities, the State must submit the basis for their decisions, such as the inspection targeting model inputs and results.[1]

11.4.4 Negotiated Inspection Plans

State agencies are responsible for providing information and for running the inspection targeting model where applicable. State agencies are also responsible for meeting the commitments of their negotiated inspection plans. Finally, the State agencies are responsible for ensuring the appropriate data are reported in a timely and complete fashion to the Regional Office or directly into the compliance data system.

When preparing an inspection plan submittal, it is recommended that the State use the inspection targeting model for ranking Group I sources and those Group II sources that may be substituted for Group I source inspections on a Statewide level. The inputs and results are then presented at the inspection plan negotiation meeting with the EPA.[1]

REFERENCES FOR SECTION 11.4

1. Memorandum from Rasnic, John, Acting Director, Stationary Source Compliance Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Washington, D.C., to Air Management Division Directors, Regions I, II, and IX; Air and Waste Management Division Director, Region II; Air, Pesticides, and Toxics Management Division Directors, Regions IV and VI; Air and Toxics Division Directors, Region VII, VIII, and X; and Air and Radiation Division Director, Region V. "Revised Compliance Monitoring Strategy." March 29, 1991.

11.5 COMPLIANCE PLANS/SCHEDULES

The EPA regulations require each SIP to contain legally enforceable compliance schedules that set forth the dates by which all stationary and mobile sources or categories must be in compliance with the SIP.[1] Compliance plans/schedules should include the following:

- enforceable milestones,
- stipulated penalties,
- final compliance dates, and
- compliance test method.

The compliance schedules contained in the SIP must provide for attainment with the primary standards as soon as practicable, or no later than a specified date.[2] Section 192(a) of the Act requires SIPs to provide for the attainment of primary NAAQS as expeditiously as possible, but in no case later than five years from the date of nonattainment designation.[3]

The compliance schedules must provide for attainment of the secondary standards in a reasonable time, or no later than the date specified under 40 CFR 51.110(c).[4] For lead, primary and secondary NAAQS are the same.

If a SIP revision provides for the extension of the compliance date for a source, the State must demonstrate that the extension will not interfere with timely attainment and maintenance of the standards and, where relevant, that the source will make continued reasonable further progress towards attainment.[5]

REFERENCES FOR SECTION 11.5

1. "51.260 Legally Enforceable Compliance Schedules. (a) Each plan shall contain legally enforceable compliance schedules setting forth the dates by which all stationary or mobile sources or categories of such sources must be in compliance with any applicable requirement of the plan." U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 51.260(a). July 1, 1991.

2. Reference 1. "52.261 Final Compliance Schedules. (a) Unless EPA grants an extension under Subpart R, compliance schedules designed to provide for attainment of a primary standard must - (1) Provide for compliance with the applicable plan requirements as soon as practicable, or (2) Provide for compliance no later than the date specified for attainment of the primary standard."

3. "Implementation plans required under section 191(a) shall provide for attainment of the relevant primary standard as expeditiously as practicable but no later than 5 years from the date of the nonattainment designation." Section 192(a) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

4. Reference 1. "Unless EPA grants an extension under Subpart R, compliance schedules designed to provide for attainment of a secondary standard must - (1) Provide for compliance with the applicable plan requirements in a reasonable time, or (2) Provide for compliance no later than the date specified for attainment of the secondary standard under 51.110(c)."

5. Reference 1. "51.262 Extension beyond one year. (a) Any compliance schedule or revision of it extending over a period of more than one year from the date of its adoption by the State agency must provide for legally enforceable increments of progress toward compliance by each affected source or category of sources."

12.0 NEW SOURCE PERFORMANCE STANDARDS

12.1 GENERAL

Under Section 111 of the Act, EPA is required to develop emission regulations for a category of sources which ". . . causes, or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare." [1] These regulations, referred to as new source performance standards (NSPS), are to reflect the degree of emission reduction achievable through technology that has been adequately demonstrated, taking into consideration the cost of the emission reductions and any environmental and energy impacts on meeting the standard.[2]

Although lead acid battery manufacturing plants is the only source which has a specific emissions limit for lead, there are other sources that emit lead as a component of particulate matter. These other sources include primary and secondary lead smelters, secondary brass and bronze production plants, primary copper smelters, primary zinc smelters, incinerators, portland cement plants, and glass manufacturing plants. Summaries of the relevant NSPS provisions for particulate matter and visible emissions for these sources are provided in Section 12.2 and included in Table 12-1. Section 12.3 clarifies aspects of the provisions for modifications and reconstructions.

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.370 Subpart KK -- Standards of Performance for Lead-Acid Battery Manufacturing Plants

Affected Facility	Applicable Time Frame	Lead Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Grid casting, paste mixing, three-process operation, lead oxide manufacturing, lead reclamation and other lead-emitting operations at any lead acid battery manufacturing plant capable of producing in one day batteries with lead $\geq$ 5.9 mg (6.5 tons)	1/14/80	0.40 mg/dscm (0.000176gr/dscf) for grid casting facilities; 0% opacity 1.00 mg/dscm (0.00099 gm/dscf) for paste mixing, three-process operation, and any other lead emitting operation facilities; 0% opacity 4.50 mg/dscm (0.00198 gm/dscf) for lead reclamation facilities; 5% opacity 5.0 mg/kg of lead feed (0.010 16/ton) for lead oxide manufacturing facilities; 0% opacity	Performance Test in accordance with Section 60.8	Monitoring device that measures and records the pressure drop across the scrubbing system(s) at least once every 15 minutes with an accuracy of $\pm$ 5 percent over its operating range required. Method 9 for opacity. Method 12 for lead concentration and volumetric flow rate of the effluent gas. Min. sampling time and sample volume for Method 12, 60 minutes and 0.85 dscm (30 dscf).	

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.120 Subpart L -- Standards of Performance for Secondary Lead Smelters

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Pot furnaces with charging capacity > 250 kg (550 lb); blast (cupola) furnaces; reverberatory furnaces at any secondary lead smelter	6/11/73	50 mg/dscm (0.022gr/dscf) for blast or reverberation furnaces; 20% opacity 10% opacity for pot furnaces	Performance Test in accordance with Section 60.8	Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 0.90 dscm (31.8 dscf)	

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.130 Subpart M -- Standards of Performance for Secondary Brass and Bronze Production Plants

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Reverberatory and electric furnaces with production capacity $\geq$ 1000 kg (2205 lb); blast furnaces with production capacity $\geq$ 250 kg/hr (550 lb/hr) at any secondary brass and bronze ingot production plant	6/11/73	50 mg/dscm (0.022gr/dscf) for reverberatory furnaces; 20% opacity 10% opacity for blast and electric furnaces	Performance Test in accordance with Section 60.8	Method 5 for particulate matter emissions. Method 9 for opacity. *Min. sampling time and sample* volume for Method 5, 120 minutes and 1.80 dscm (63.6 dscf).	

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.160 Subpart P -- Standards of Performance for Primary Copper Smelters

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Dryer, roaster, smelting furnace and copper converter in primary copper smelters	10/14/74	50 mg/dscm (0.022 gr/dscf) for dryers; 20% opacity	Performance Test in accordance with Section 60.8	Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 0.85 dscm (30 dscf).	Any six-minute period during which average opacity, as measured by a continuous monitoring system exceeds the standard.

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.170 Subpart Q -- Standards of Performance for Primary Zinc Smelters

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Roaster and sintering machines in primary zinc smelters	10/16/74	50 mg/dscm (0.022 gr/dscf) for sintering machines; 20% opacity	Performance Test in accordance with Section 60.8	Continuous monitoring system to monitor and record opacity of gases discharged from sintering machines (span set at 80 to 100 percent apart). Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 0.85 dscm (30 dscf).	Any six-minute period during which average opacity, as measured by the continuous monitoring system, exceeds the standard.

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.180 Subpart R -- Standards of Performance for Primary Lead Smelters

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Sintering machines, sintering machine discharge end, blast furnace, dross reverberatory furnace, electric smelting furnace, and converter in primary lead smelters	10/16/74	50 mg/dscm (0.022gr/ dscf) for blast furnaces, dross reverberatory furnace, and sintering machine discharge end; 20% opacity	Performance Test in accordance with Section 60.8	Continuous monitoring system to monitor and record opacity of gases discharged from blast furnace, dross reverberatory furnace, or sintering machine discharge end (span set at 80 to 100 percent opacity). Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 0.85 dscm (30 dscf).	Any six minute period during which average opacity, as measured by the continuous monitoring system, exceeds the standard

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.50 Subpart E -- Standards of Performance for Incinerators

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Incinerators with charging rate >45 metric tons per day (50 tons/day)	8/17/71	0.18 g/dscm (0.08g/dscf)	Performance Test in accordance with Section 60.8	Method 5 for particulate matter emissions. Min. sampling time and sample volume for Method 5, 60 minutes and 0.85 dscm (30 dscf).	

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.60 Subpart F -- Standards of Performance for Portland Cement Plants

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems in portland cement plants.	8/17/71	From kilns: 0.15 kg/metric ton of feed (dry basis) to the kiln (0.30 lb/ton); 20% opacity. From clinker coolers: 0.050 kg/metric ton of feed (dry basis) to the kiln (0.10 lb/ton); 10% opacity. From affected facilities other than kiln and clinker cooler: 10% opacity.	Performance Test in accordance with Section 60.8.	Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 1.15 dscm (40.6 dscf) for the clinker cooler.	Any six-minute period during which average opacity exceeds the standard.

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.290 -- Standards of Performance for Glass Manufacturing Plants

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
Glass melting furnace	6/15/79	For furnaces fired with gaseous fuel: 0.1 g/kg of glass produced (container glass; pressed and blown glass; soda lime and lead recipes) 0.25 g/kg of glass produced (pressed and blown glass--other than borosilicate, soda-lime, and lead recipes; wool fiberglass) 0.225 g/kg of glass produced (flat glass)	Performance Test in accordance with Section 60.8.	Continuous monitoring system to measure opacity of emissions discharged from affected facilities. Method 5 for particulate matter emissions. Method 9 for opacity. Min. sampling time and sample volume for Method 5, 60 minutes and 0.90 dscm (31.8 dscf)	

(continued)

TABLE 12 - 1 SUMMARY OF NSPS LEAD REGULATIONS

40 CFR 60.290 -- Standards of Performance for Glass Manufacturing Plants

Affected Facility	Applicable Time Frame	Particulate Matter and Visible Emission Limits	Initial Performance Testing	Monitoring	Definition of Periods of Excess Emissions
		For furnaces fired with liquid fuel: 0.13 g/kg of glass produced (container glass; pressed and blown glass--soda-lime and lead recipes) 0.65 g/kg of glass produced (pressed and blown glass--borosilicate recipe) 0.325 g/kg of glass produced (pressed and blown glass--other than borosilicate, soda-lime, and lead recipes; wool fiberglass) 0.225 g/kg of glass produced (flat glass) For furnaces with modified-processes: 1.0 g/kg of glass produced (pressed and blown glass--borosilicate recipe) 0.5 g/kg of glass produced (container glass, flat glass, pressed and blown-glass--soda-lime recipe, textile fiberglass, wool fiberglass)			For furnaces with modified processes: Any six-minute period during which average opacity exceeds the opacity value corres-ponding to the upper confidence level.

REFERENCES FOR SECTION 12.1

1. Section 111(b)(1)(A) of the Act, 42 United States Code (U.S.C.) 7401. References herein are to the Clean Air Act as amended November 1990. The CAA is codified at 42 U.S.C. §§ 7401 et seq.

2. Reference 1. Section 111(a).

12.2 NSPS PROVISIONS FOR LEAD

12.2.1 Subpart KK--Lead-Acid Battery Manufacturing Plants [1]

This subpart applies to lead-acid battery manufacturing plants that produce or have the design capacity to produce in one day batteries containing an amount of lead equal to or greater than 5.9 Mg (6.5 tons) and that commenced construction or modification after January 14, 1980. A lead-acid battery manufacturing plant is defined as any plant that produces a storage battery using lead and lead compounds for the plates and sulfuric acid for the electrolyte. For this source category, the following standards apply: for grid casting facilities, lead emissions are limited to 0.40 mg/dscm of exhaust (0.000176 gr/dscf); for paste mixing, three-process operation, and any other lead emitting operation facilities, lead emissions are limited to 1.00 mg/dscm of exhaust (0.00044 gr/dscf); for lead reclamation facilities, lead emissions are limited to 4.50 mg/dscm of exhaust (0.00198 gr/dscf); and for lead oxide manufacturing facilities, lead emissions are limited to 5.0 mg per kilogram of lead feed (0.010 lb/ton). Lead reclamation facilities must limit visible emissions to 5% opacity and any facility other than a lead reclamation facility must limit visible emissions to 0% opacity. For this source category, compliance is generally determined by Method 12 to determine the lead concentration and if applicable the volumetric flow rate of the effluent gas; the sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Method 9 shall be used to determine opacity.

12.2.2 Subpart L--Secondary Lead Smelters [2]

This subpart applies to pot furnaces with a charging capacity of more than 250 kg (550 lb), blast (cupola) furnaces, and reverberatory furnaces in secondary lead smelters that commenced construction or modification after June 11, 1973. A secondary lead smelter is defined as any facility producing lead from a landbearing scrap material by smelting to the metallic form. For blast and reverberatory furnaces, particulate matter emissions are limited to 50 mg/dscm (0.022 gr/dscm). Opacity is limited to 10% for pot furnaces and to 20% for blast and reverberatory furnaces. Compliance is determined using Method 5 to determine the particulate matter concentration during representative periods of furnace operation, including charging and tapping; the sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Method 9 shall be used to determine opacity.

12.2.3 Subpart M--Secondary Brass and Bronze Production Plants [3]

This subpart applies to reverberatory and electric furnaces of 1,000 kg (2205 lb) or greater production capacity and blast (cupola) furnaces of 250 kg/h (550 lb/h) or greater production capacity in secondary brass and bronze production plants that commenced construction or modification after June 11, 1973. Secondary brass and bronze production plants are defined as any facility producing any metal alloy containing copper as its predominant constituent, and lesser amounts of zinc, tin, lead, or other metals. For this source category, particulate matter emissions from reverberatory furnaces are limited to 50 mg/dscm (0.022 gr/dscf) and 20% opacity and from blast or electric furnaces are limited to 10% opacity. Compliance is determined using Method 5 to determine particulate emission concentration during representative periods of charging and refining, but not during pouring of the heat. The sampling time and sample volume for each run shall be at least 120 minutes and 1.80 dscm (63.6 dscf). Method 9 shall be used to determine opacity.

12.2.4 Subpart P--Primary Copper Smelters [4]

This subpart applies to dryers, roasters, smelting furnaces, and copper converters in primary copper smelters that commenced construction or modification after October 16, 1974. A primary copper smelter is defined as any installation or any intermediate process engaged in the production of copper from copper sulfide ore concentrates through the use of pyrometallurgical techniques. For this source category, particulate emissions are limited to 50 mg/dscm (0.022 gr/dscf). Visible emissions are limited to 20% opacity. Compliance is determined using Method 5 to determine particulate matter concentration; sampling time and sampling volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Method 9 shall be used to determine opacity.

12.2.5 Subpart Q--Primary Zinc Smelters [5]

This subpart applies to roaster and sintering machines in primary zinc smelters that commenced construction or modification after October 16, 1974. A primary zinc smelter is defined as any installation engaged in the production, or any intermediate process in the production, of zinc or zinc oxide from zinc sulfide ore concentrates through the use of pyrometallurgical techniques. For this source category, particulate matter is limited to 50

mg/dscm (0.022gr/dscf). Visible emissions are limited to 20% opacity. Compliance is determined using Method 5 to determine the particulate matter concentration; sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Method 9 shall be used to determine opacity.

12.2.6 Subpart R--Primary Lead Smelters [6]

This subpart applies to sintering machine, sintering machine discharge end, blast furnace, dross reverberatory furnace, electric smelting furnace, and converters in primary lead smelters that commenced construction or modification after October 16, 1974. A primary lead smelter is defined as any installation or any intermediate process engaged in the production of lead from lead sulfide ore concentrates through the use of pyrometallurgical techniques. For this source category, particulate emissions are limited to 50 mg/dscm (0.022 gr/dscf). Visible emissions are limited to 20% opacity. Compliance is determined using Method 5 to determine particulate matter concentration; the sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Method 9 shall be used to determine opacity.

12.2.7 Subpart E--Incinerators [7]

This subpart applies to incinerators with a charging rate of more than 45 metric tons per day that commenced construction or modification after August 17, 1971. An incinerator is defined as any furnace used in the process of burning solid waste for the purpose of reducing the volume of the waste by removing combustible matter. For this source category, particulate emissions are limited to 0.18 g/dscm (0.08 g/dscf) corrected to 12% CO_2. Compliance is determined using Method 5 to determine the particulate matter concentration (c_s); sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30.0 dscf).

12.2.8 Subpart F--Portland Cement Plants [8]

This subpart applies to kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems in portland cement plants that commenced construction or modification after August 17, 1971. A portland cement plant is defined as any facility manufacturing portland cement by either the wet or dry process. For this source category,

particulate emissions from kilns are limited to 0.15 kg per metric ton of feed (dry basis) to the kiln (0.30 lb per ton) and 20% opacity. Particulate emissions from clinker coolers are limited to 0.050 kg per metric ton of feed (dry basis) to the kiln (0.10 lb per ton) and 10% opacity. Particulate emissions from affected facilities other than the kiln and clinker cooler are limited to 10% opacity. Compliance is determined using Method 5 to determine the particulate matter concentration (c_s) and the volumetric flow rate (Q_{sd}) of the effluent gas; sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30.0 dscf) for the kiln and 1.15 dscm (40.6 dscf) for the clinker cooler. Method 9 shall be used to measure opacity.

12.2.9 Subpart CC--Glass Manufacturing Plants [9]

This subpart applies to glass melting furnaces that commenced construction or modification after June 15, 1979. (This subpart does not apply to hand glass melting furnaces, glass melting furnaces designed to produce less than 4,550 kilograms of glass per day, and all-electric melters.) A glass melting furnace is defined as a unit comprising a refractory vessel in which raw materials are charged, melted at high temperature, refined, and conditioned to produce molten glass. For this source category, particulate matter emissions from any glass melting furnace fired exclusively with either a gaseous fuel or a liquid fuel are linked to the following rates:

	gaseous fuel	liquid fuel
container glass	0.1 g/kg of glass produced	0.13
pressed & blown glass		
borosilicate recipes	0.5	0.65
soda-lime and lead recipes	0.1	0.13
other	0.25	0.325
wool fiberglass	0.25	0.325
flat glass	0.225	0.225

Particulate matter emissions from any glass melting furnace fired simultaneously with gaseous and liquid fuels, particulate matter at emission rates exceeding STD, where STD = X [1.3(Y)+(Z)]

X = emission rate for furnace fires with gaseous fuel
Y = decimal fraction of liquid fuel heating value to total (gaseous and liquid) fuel heating value fired in the glass melting furnaces (joules/joules)
Z = (1-Y)

Particulate matter emissions from glass manufacturing facilities with modified processes are limited to 0.5 g/kg of glass produced (soda-lime recipe); (textile fiberglass & wool fiberglass) and 1.0 g/kg of glass produced (borosilicate recipe).

Compliance is determined using Method 5 to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Method 9 shall be used to measure opacity.

REFERENCES FOR SECTION 12.2

1. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart KK. July 1, 1991.

2. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart L. July 1, 1991.

3. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart M. July 1, 1991.

4. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart P. July 1, 1991.

5. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart Q. July 1, 1991.

6. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart R. July 1, 1991.

7. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart E. July 1, 1991.

8. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart F. July 1, 1991.

9. U.S. Environmental Protection Agency. *Code of Federal Regulations*. Title 40. Part 60. Subpart CC. July 1, 1991.

12.3 MODIFICATION/RECONSTRUCTION PROVISIONS

"Modification" refers to "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies . . . " as described in the NSPS general provisions. Some of the possible changes that do not qualify as modifications include (1) routine maintenance, repair, and replacement, (2) increases in production rate not accompanied by capital expenditures, (3) increased capacity utilization, (4) fuel switching, provided that facility was originally designed to handle the new fuel, (5) addition of air pollution control and related equipment, and (6) the change in ownership of an existing facility.[1]

"Reconstruction" generally includes "the replacement of components of an existing facility to such an extent that (1) the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and (2) it is technologically and economically feasible to meet the applicable standards . . ." [2]

REFERENCES FOR SECTION 12.3

1. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Part 60.14. July 1, 1991.

2. U.S. Environmental Protection Agency. *Code of Federal Regulations.* Title 40. Part 60.15. July 1, 1991.