

STATE OF MAINE

Department of Environmental Protection

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Air Quality Increment Guideline September 14, 1992

1. Scope.

This document specifies procedures for determination of point-source parameter values that must be input to air quality models for the purpose of evaluating air quality increment consumption in the State of Maine. The procedures described in this guideline apply to modeling evaluations of increment consumption in both Class I and Class II areas. Procedures for determination of model input parameters for modeling of fugitive, mobile, and area source emissions are beyond the scope of this document (however, emissions from these types of sources will often need to be included in increment analyses). The following reference documents were used in developing this guideline:

- » Federal Register notice, June 19, 1978.
- » Federal Register notice, August 7, 1980.
- » Federal Register notice, October 17, 1988.
- » New Source Review Workshop Manual, EPA, DRAFT, October 1990.
- » Air Regulations, State of Maine Department of Environmental Protection.

While the above documents provide a framework for determining which sources are considered to be increment consuming, this document will provide specific guidance with regard to:

- » How to determine whether a source consumes increment;
- » How to determine the pollutant emission rates and stack gas volume flow rates that should be used in increment modeling analyses to represent operations in the baseline year and in the present.

2. Background.

For purposes of air quality regulation, increment may be defined as the increase in ambient concentration of a pollutant at some location over the ambient concentration of the pollutant that occurred in the baseline year. Chapter 110 of the Maine DEP Air Regulations specifies limits on increment consumption for SO₂, TSP and NO₂.

Chapter 100 provides the regulatory definition of "Baseline Concentration". Unlike most other states, Maine has established state-wide baseline years of 1977 for SO₂ and TSP and 1987 for NO₂. Maine has no localized "PSD Baseline Areas" or "PSD Baseline Years" as there are in other states. Thus, 1977 and 1987 baseline fuel use records, production rates, license limits and other information must be obtained from a given licensed source in order to evaluate the level to which the source consumes SO₂, TSP and NO₂ increment (except that in cases where the Department determines that operations at a facility during 1977 or 1987 were not representative of normal facility operations for that period, or if the baseline operation violated ambient air quality standards, the Department will select a representative baseline date).

3. Purpose.

This document is to provide clear direction as to how increment regulatory requirements are interpreted by the State of Maine for purposes of modeling increment consumption by point emission sources. This guideline is intended to clarify requirements in those cases where regulations are unclear and/or impractical to apply. These cases are discussed in the remaining paragraphs of this section.

While the EPA recommends that short-term baseline emission rates be based on the highest actual emission rate that occurred in the baseline year for a given pollutant and averaging period, records are generally unavailable that would allow for determination of short-term baseline emission rates in this manner. A practical approach is provided in this policy which may be applied consistently to all point emission sources in the state, and for which the data required to determine the baseline emission rates is generally available.

Maine has identified a need for general guidance for derivation of stack volume flow rates for increment analyses. While it is appropriate to time-average emission rates, it is generally inappropriate to derive a flow rate based on a time-averaging scheme. This policy provides guidance for derivation of baseline and current volume flow rates for increment analyses.

While Maine regulations indicate that emission increases and decreases that occur after the baseline date will affect increment, the regulations are unclear as to the specific circumstances in which emission decreases may be included in an increment analysis. This policy provides guidance for evaluating those cases where it is appropriate to include emission decreases in an increment analysis.

4. Guideline

4.1 Identification of Increment Consuming Sources

A source may be considered to affect increment if the actual emissions from the baseline year differ from the current emissions (a, b and c below), or because of changes in stack and/or building configurations between the baseline year and the present (d below). Definitions of "actual emissions" and "normal operation" from Chapter 100 of the Air Bureau Regulations should be referred to when determining the actual emissions from the baseline year.

a. Short-term. Increases in actual short-term emission rates between the baseline year and current operations are considered to affect increment.

b. Annual. Increases in actual annual average emission rates between the baseline year and current operations are considered to affect increment.

c. Shutdowns/curtailments. The Department will allow an increment analysis to include the effects of shutdowns and/or curtailments only when the emissions associated with the shutdown and/or curtailment have been eliminated, either by permanent shutdown or federally enforceable license condition. However, any source that has not been modified since the baseline year will be allowed to retain its baseline impact levels, but once a source has been modified, the effects of the baseline impacts may be included in any increment analysis.

d. Stack/building changes. Changes in physical stack parameters and/or building downwash parameters may cause localized increment consumption by changing the locations where the source has its highest impacts.

4.2. Emission Rate Calculations

Pollutant emission rates must be determined for the baseline year and for the current year for the purpose of input to air quality dispersion models. Different emission rates are used for the purpose of evaluating short-term and annual increment consumption. (These emission rates are generally not the same as those used for evaluating impacts for comparison to air quality standards).

The procedures given in this section for calculating current emission rates apply only to nearby sources and on-site emissions units, which are not new or undergoing modification. "Current" emission rates for new sources and sources undergoing modification must be based on proposed maximum license-allowed emission rates in all cases.

a. Short-Term. An analysis of increment consumption on the short-term will ideally compare impacts resulting from the highest emission rate that occurred for the averaging time in the two years preceding submittal of an air emission license application to impacts resulting from the highest emission rate that occurred for that averaging time in the baseline year. In cases where fuel use records are not available, an analysis of increment consumption on the short term will compare the impacts resulting from license allowed emissions in the current license to impacts resulting from license allowed emissions from the baseline year.

Baseline emission rates must be determined based on records from the baseline year. *Current* emission rates must be determined based on records from the two calendar years preceding the Department's acceptance of the applicant's air emission license application.

Methods for calculating emission rates are listed below, in order of preference:

(1) Highest for averaging time. Using hourly fuel use or production records, determine the highest emission rate that occurred in the averaging time corresponding to the increment standard being addressed. For example, the highest 24-hour average emission rate in the period of record would be used to calculate 24-hour increment consumption, while the highest 3-hour average emission rate in the period of record would be used to calculate 3-hour increment consumption. The Department recognizes that records for determining the highest 24-hour or 3-hour emission rates in a one- or two-year period will generally be unavailable, and that this method, while preferred, will seldom be used.

(2) Highest monthly average. Based on monthly fuel use or production records, determine the month in which the highest hourly average emission rate occurred. The highest hourly average emission rate must be adjusted from the monthly average emission rate for hours of operation if the emission unit did not operate for all hours of the month. For example, if a unit operated ten hours per day, seven days per week, the hourly average emission rate for the month should be 24/10 of the monthly average of the emission rate (converted from monthly rate to hourly rate).

(3) Department Discretion. In absence of fuel use or production records, the Department will determine an appropriate emission rate based on available information.

b. Annual. An analysis of (annual) increment consumption will compare impacts based on current annual emissions to impacts based on annual emissions from the baseline year.

(1) Current. The current annual average emission rate is determined by selecting the highest calendar year emissions from the two years preceding submittal of an air emission license application, based on actual fuel use or production rates and Department approved emission factors. An alternate year within the five years preceding submittal of the license application may be required if operations during the two-year period are below typical levels.

(2) Baseline. The baseline year annual average emission rate shall be based on the total annual emissions from the baseline year. Total annual emissions from the baseline year shall be based on actual fuel use or production rates and Department approved emission factors.

4.3. Flow Rate Calculations.

The flow rates used in increment modeling analyses play an important role in determining how much increment a source consumes. Different flow rates are used for the purpose of evaluating short-term and annual increment consumption.

a. Short-term. The short-term flow rate is the flow rate associated with operating conditions that were used to determine the short-term emission rate.

b. Annual. Since the annual average emission rate is normally much lower than the rate at which a source actually operates, it is usually inappropriate to model a source using a flow rate which corresponds to the annual average emission rate. For the purpose of modeling impacts based on annual average emission rates, a median flow rate should be determined as follows:

(1) estimated typical flow rate (not greater than 70 of maximum design flow rate);

Applicants shall provide an explanation of how the typical flow rate was derived for typical flow rates above 70. The applicant shall provide records for support.

(2) Flow rate corresponding to annual emission rate (as calculated per section 4.2.b of this policy) if this flow rate is higher than that calculated in **(1)**;

(3) The Department may use a more representative value if evidence indicates a different median operating flow rate.

4.4. Increment Management

The Department recognizes that using current actual emissions to calculate increment impacts will not provide an indication when increased emissions might cause impacts that exceed increment standards. The potential for this condition increases as modeled increment impacts approach the increment standard. The following general increment management policy is established to increase the frequency of review as modeled increment consumption approaches the increment standard:

If the results of a combined-source increment analysis show that more than 90 of the increment is consumed at any point, the Department may require additional analyses on a regular basis.