

## PROPOSED PM<sub>2.5</sub> OPTIONS FOR PSD PROGRAM

On October 17, 2006, the U.S. Environmental Protection Agency (EPA) finalized the National Ambient Air Quality Standard (NAAQS) for fine particulate matter, i.e. particulate matter less than 2.5 micrometers in diameter or PM<sub>2.5</sub>. On September 21, 2007, the EPA released a proposed rule with options for setting Prevention of Significant Deterioration (PSD) Increments, Significant Impact Levels, and Significant Monitoring Concentrations for PM<sub>2.5</sub>. The implications of the proposed rule are far-reaching – affecting the PSD permitting process in all PM<sub>2.5</sub> attainment and unclassifiable areas.

The EPA is requesting comments on the options in the proposed rule. Comments must be submitted no later than November 20, 2007. Key elements of the proposed options are presented below.

### Background

The New Source Review (NSR) program is established under the Clean Air Act to authorize construction of new major air emission sources. The NSR program is intended to prevent degradation of air quality from construction and operation of new emission sources and to ensure that proper control technology is used. In areas that meet NAAQS (i.e. attainment areas), the specific program under NSR is the PSD Program. A cornerstone of the PSD program is air quality impact analyses using atmospheric dispersion models. The PSD program uses a system of PSD increments coupled with NAAQS to preserve air quality in attainment areas. PSD increments are the maximum allowable increase in criteria pollutant ambient air concentrations from a baseline concentration. New major sources of emissions are required to demonstrate that they will not cause or contribute to an increase in emissions above a PSD increment.

To make PSD air quality impact analyses more efficient, EPA establishes Significant Impact Levels (SILs) and Significant Monitoring Concentrations (SMCs) as screening criteria. If the impact of a project exceeds the SIL, then a comprehensive impact analysis is required. If the impact exceeds the SMC, then preconstruction monitoring may be required.

PSD increments, SILs, and SMCs are established for criteria pollutants, including PM<sub>10</sub>. Although PM<sub>2.5</sub> NAAQS was established in 1997, there have been no corresponding PSD increments, SILs, and SMCs established. EPA has been relying on the PSD increments, SILs, and SMCs for PM<sub>10</sub> as a surrogate for PM<sub>2.5</sub> in PSD modeling analyses. EPA is now proposing to develop these thresholds for PM<sub>2.5</sub>.

### PSD Increment Options

Three options have been proposed for setting PSD increments for PM<sub>2.5</sub>.

- Option 1 – EPA would treat PM<sub>2.5</sub> as a new pollutant rather than as a new indicator of PM. The increment level is set as a “safe harbor” increment using a certain percentage of NAAQS. The current NAAQS for PM<sub>2.5</sub> is 15 micrograms per cubic meter (µg/m<sup>3</sup>) for annual average and 35 µg/m<sup>3</sup> for 24 hour average.
- Options 2A and 2B – EPA would establish PSD increments for PM<sub>2.5</sub> based on the relationship between emissions to observable environmental impacts.

The proposed PSD PM<sub>2.5</sub> increments are presented in Table 1 below. Table 2 presents the current PM<sub>10</sub> increments for comparison.

Table 1. Proposed Increments in PM<sub>2.5</sub> Increments

Area Classification	Option	Annual (µg/m <sup>3</sup> )	24 Hour (µg/m <sup>3</sup> )
Class I	1	1	2
	2A	1	2
	2B	1	2
Class II	1	4	9
	2A	4	9
	2B	5	9
Class III	1	8	18
	2A	8	18
	2B	10	18

Table 2. Current PM<sub>10</sub> Increments for Comparison

Area Classification	Annual (µg/m <sup>3</sup> )	24 Hour (µg/m <sup>3</sup> )
Class I	5	10
Class II	17	30
Class III	34	60

Under Option 1, EPA proposes that the effective date of the rule will be the new trigger date and major source baseline date. Under Options 2A and 2B, EPA proposes to retain the PM<sub>10</sub> baseline date. Therefore, under Option 1, emission changes occurring before the new baseline date will be absorbed into the baseline concentration-meaning that, depending on the level of activity in each area, the Option 1 baseline concentration could be higher or lower than the Option 2A or 2B baseline concentration.

Compared with the current PM<sub>10</sub> increments, the proposed PM<sub>2.5</sub> increments are much tighter. Depending on an emission source's particle size distribution, the difficulty for facilities to achieve the new standard varies. For example, a Class II area source will be better off with the proposed 24-hour PM<sub>2.5</sub> increment of 9 µg/m<sup>3</sup> as opposed to the 24-hour PM<sub>10</sub> increment of 30 µg/m<sup>3</sup> if less than 30% of PM<sub>10</sub> emissions are PM<sub>2.5</sub>.

### Significant Impact Levels

The three options proposed for developing PM<sub>2.5</sub> SILs are presented below in Table 3. Table 4 presents the current PM<sub>10</sub> levels for comparison.

Table 3. Proposed PM<sub>2.5</sub> SILs

Area Classification	Option	Annual (µg/m <sup>3</sup> )	24 Hour (µg/m <sup>3</sup> )
Class I	1	0.04	0.08
	2	0.16	0.24
	3	0.06	0.07
Class II	1	1.0	5
	2	0.8	4
	3	0.3	1.2
Class III	1	1	5
	2	0.8	4
	3	0.3	1.2

Table 4. Current PM<sub>10</sub> SILs for Comparison

Area Classification	Annual (µg/m <sup>3</sup> )	24 Hour (µg/m <sup>3</sup> )
Class I	1	5
Class II	1	5
Class III	1	5

- Option 1 – Class I areas would be set to 4% of the Class I PM<sub>2.5</sub> increment. Class II and Class III areas would be the same as current PM<sub>10</sub> SILs.
- Option 2 – EPA would set the PM<sub>2.5</sub> SILs by adjusting the PM<sub>10</sub> SILs as a proportion of the typical point source emissions ratio of PM<sub>2.5</sub> to PM<sub>10</sub>.
- Option 3 – EPA would set the PM<sub>2.5</sub> SILs by adjusting PM<sub>10</sub> SILs as a proportion of the NAAQS ratio of PM<sub>2.5</sub> to PM<sub>10</sub>.

In the proposed rule, SIL levels are set up for each classified area. With the exception of Class I areas, Option 3 gives a much lower threshold to trigger NAAQS and PSD increment analyses, which will likely translate to a higher level of effort in conducting PSD analyses.

### Significant Monitoring Concentration

Current PM<sub>10</sub> SMC is 10 µg/m<sup>3</sup> for 24 hour average. Three options have been proposed for developing SMCs for PM<sub>2.5</sub>. The SMCs are for the 24 hour averaging period only.

- Option 1 - EPA proposes to base the PM<sub>2.5</sub> SMC on the lowest detectable concentration of PM<sub>2.5</sub> and multiplying this value by five. The resulting 24 hour average *de minimis* level is 10 µg/m<sup>3</sup>.
- Option 2 - EPA proposes to set the PM<sub>2.5</sub> SMC by multiplying the PM<sub>10</sub> SMC by the proportion of PM<sub>2.5</sub> emissions compared to PM<sub>10</sub> emissions on a national average basis. The proposed *de minimis* level is 7.9 µg/m<sup>3</sup>.
- Option 3 - EPA proposes to set the PM<sub>2.5</sub> SMC by multiplying the PM<sub>10</sub> by the ratio of PM<sub>2.5</sub> and PM<sub>10</sub> NAAQS. The proposed *de minimis* level is 2.3µg/m<sup>3</sup>.

### Effective Dates

*Increments:* Section 166(b) of the Clean Air Act specifies that new regulations become effective one year after the date of promulgation. As an option, EPA will consider the effective date of this rule as 60 days from promulgation because of the delay from the PM<sub>2.5</sub> NAAQS standard. In either case, EPA will require states to submit revised implementation plans within 21 months of promulgation. EPA also requests comment on whether they should delay implementation of the Federal Part 52 PSD program until 25 months after promulgation.

*Revocation of PM<sub>10</sub> increments:* PM<sub>10</sub> increments will be revoked when the new PM<sub>2.5</sub> increments are implemented either by states through an approved State Implementation Plan or by EPA through the Federal Part 52 PSD program.

*Transitional period:* EPA proposed that states determine whether to continue the existing PM<sub>10</sub> increment program or begin implementing the new PM<sub>2.5</sub> increment program during the transitional period for PSD permit applications.

*SILs and SMCs:* EPA requests comment on whether SILs and SMCs should be established as minimum program elements in State Implementation Plans based on the improved efficiency of the permitting process.

### **Closing Remarks**

The implications of the proposed rule are far-reaching. PM is a common pollutant that triggers PSD review. The modeling analysis for PM may either be favorably or unfavorably affected when the rule is promulgated. Quantification of PM<sub>2.5</sub> emissions may be a significant challenge for some facilities. Additionally, baseline inventories could become difficult to obtain for conducting ambient air

quality impact analyses. As such, those planning projects subject to PSD review should investigate PM<sub>2.5</sub> related issues early in the process.

EPA's 2005 PM staff paper on PM<sub>2.5</sub> NAAQS mentions that unlike PM<sub>10</sub> a significant portion of PM<sub>2.5</sub> in the atmosphere is formed from atmospheric reactions instead of from direct source emissions. The proposed PSD modeling thresholds do not consider these secondary PM<sub>2.5</sub> emissions in the source inventory. Facilities planning projects subject to PSD review should also be aware of this discrepancy for PSD applications.

*For further questions concerning this rule and other air quality management issues, please contact Yousheng Zeng, Ph.D., P.E. using the following contact information.*



**PROVIDENCE**

**1201 Main Street, Baton Rouge, Louisiana 70802**

**Phone: (225) 766-7400**

**Fax: (225) 766-7440**

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