



# State of New Jersey

## DEPARTMENT of ENVIRONMENTAL PROTECTION

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### MEMORANDUM

**TO :** OPS, PPS, and BTS Supervisors March 17, 2009

**FROM :** John Preczewski, Assistant Director  
Air Permitting Element

**SUBJECT :** Revised Interim Permitting and Modeling Procedures for Sources Emitting between 10-100 Tons per Year of PM<sub>2.5</sub> (Fine Particulate)  
**(Revised to include 2008 PM<sub>2.5</sub> Monitoring Data)**

The Division of Air Quality's February 4, 2009 memo on this issue has been revised so that the most recent available monitored PM<sub>2.5</sub> data from 2008 can be incorporated into the background measurements. As before, the revised procedures address the following.

1. Separates guidance for EPA defined PSD and 40 CFR Part 51, Appendix S major sources and major modifications from this document. Those sources would include any **new** facility that has the potential to emit 100 TPY or more of PM<sub>2.5</sub> emissions, or any **existing** facility that has the potential to emit 100 TPY or more of PM<sub>2.5</sub> emissions that is proposing net emissions increase of 10 TPY or more of PM<sub>2.5</sub>.
2. Revises the guidance for other sources to better reflect the *Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers (PM<sub>2.5</sub>), Final Rule* (May 16, 2008 Federal Register). Sources subject to this memo are defined as proposed projects with net emissions increases of PM<sub>2.5</sub> of 10 tons/year or more that trigger N.J.A.C. 7:27 Subchapter 18 (Emissions Offset Rule), but are not of a sufficient magnitude to trigger PSD or Appendix S applicability.
3. Changes the 24-hour PM<sub>2.5</sub> Significant Impact Level (SIL) to 1.2 ug/m<sup>3</sup>.

These procedures are designed to accomplish two objectives:

- Avoid the creation of new PM<sub>2.5</sub> NAAQS violations in areas where the monitored PM<sub>2.5</sub> levels are currently below the NAAQS, and
- Minimize the increase in ambient air impacts in areas where monitored PM<sub>2.5</sub> levels are currently above the NAAQS.

As of the date this memo is signed, applicable applications that are not out for public comment (where one will occur) or do not have a proposed permit will need to address the attached interim PM<sub>2.5</sub> permitting/modeling procedures.

c: William O'Sullivan (Director, DAQ)

# Revised Interim Permitting and Modeling Procedures for Sources Emitting between 10-100 Tons per Year of PM<sub>2.5</sub> (Fine Particulate)

## I. Background

The PM<sub>2.5</sub> NAAQS was originally promulgated by EPA in July 1997, and later revised in December 2006. EPA defines a nonattainment area as an area that is violating the PM<sub>2.5</sub> NAAQS (either 24-hour or annual), or a nearby area that is contributing to a violation of the PM<sub>2.5</sub> standards.

Pollutant	NAAQS	Averaging Times	Secondary Stds.
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <sup>a</sup>	Same as Primary
	35 ug/m <sup>3</sup>	24-hour <sup>b</sup>	Same as Primary

a. To attain this standard, the 3-year arithmetic mean of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 ug/m<sup>3</sup>.

b. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations must not exceed 35 ug/m<sup>3</sup>.

The following 13 New Jersey counties are currently designated nonattainment by EPA for the PM<sub>2.5</sub> NAAQS: Bergen, Burlington, Camden, Essex, Gloucester, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union. These counties are shown in yellow in Figure 1.

## II. Interim PM<sub>2.5</sub> Permitting Procedures

### 1. Determination of PM<sub>2.5</sub> Emissions

The applicant may either assume that PM<sub>2.5</sub> emissions are equivalent to PM<sub>10</sub> emissions or, if supporting data exists, quantify the portion of emissions that are PM<sub>2.5</sub>. While not currently required by EPA rules, the applicant is encouraged to include condensable particulate emissions in their applicability determination to avoid future compliance and permitting issues. After EPA promulgates a stack testing method for PM<sub>2.5</sub> inclusion of condensibles will be required.

For now, the applicability of sources affected by the PM<sub>2.5</sub> nonattainment NSR described in this memo will be based on direct PM<sub>2.5</sub> emissions. Precursors will not be included in the applicability determination, nor can they be used to offset direct PM<sub>2.5</sub> emissions.

### 2. Netting Procedures

PM<sub>2.5</sub> nonattainment NSR applicability determinations will use the netting procedures described in N.J.A.C. 7:27-18.7 (Determination of a net emission increase or a significant net emission increase).

For determination of the contemporaneous period, only direct PM<sub>2.5</sub> emission changes since April 5, 2005 should be included in the netting equation unless a source will be using banked emission offsets generated before April 5, 2005. If a source uses banked

offsets generated before April 5, 2005, the contemporaneous period specified in N.J.A.C. 7:27-18.1 will be used.

### 3. Significant Impact Levels

EPA proposed three possible significant impact level (SIL) options in its September 21, 2007 Federal Register Notice. However, they are not expected to promulgate PM<sub>2.5</sub> 24-hour and annual SILs until September 2009. The interim PM<sub>2.5</sub> SILs that were specified in the May 11, 2007 memo were based on values recommended in the document entitled “*NESCAUM Technical Guidance on Significant Impact Levels (SILs) for PM-2.5*” ([www.nescaum.org/topics/permit-modeling/](http://www.nescaum.org/topics/permit-modeling/)). Since the NESCAUM guidance document was released, EPA has lowered 24-hour PM<sub>2.5</sub> NAAQS from 65 ug/m<sup>3</sup> to 35 ug/m<sup>3</sup>. Using a methodology consistent with that in the NESCAUM guidance document, the interim 24-hour Class II PM<sub>2.5</sub> SIL is being revised to reflect this lower NAAQS. The annual Class II PM<sub>2.5</sub> SIL remains unchanged. The following PM<sub>2.5</sub> values will be applied in the evaluation of both attainment and nonattainment sources:

Annual SIL - 0.30 ug/m<sup>3</sup>,  
24-hour SIL - 1.2 ug/m<sup>3</sup>.

### 4. Compliance Plan

If PM<sub>2.5</sub> emissions are assumed equal to the PM<sub>10</sub> emission limit in the permit, then no PM<sub>2.5</sub> emission limit shall be placed in the permit. If PM<sub>2.5</sub> emissions are not assumed equal to PM<sub>10</sub>, then a PM<sub>2.5</sub> emission limit shall be placed in the permit. Compliance with this PM<sub>2.5</sub> emission limit shall be determined using EPA’s OTM 27 for determining filterable particulate emissions and OTM 28 (Dry Impinger Method) for determining condensable particulate emissions.

EPA is expected to promulgate a PM<sub>2.5</sub> stack test method in the future. If no PM<sub>2.5</sub> limit is placed in the permit, a condition should be added stating the next operating or preconstruction permit modification or Title V renewal submitted after the PM<sub>2.5</sub> stack test promulgation date include a PM<sub>2.5</sub> emission limit for the source. Compliance with the PM<sub>2.5</sub> emission limit will be demonstrated with the promulgated stack test method.

### 5. Applicability

***These procedures will apply to permit applications with a proposed project net emissions increase of PM<sub>2.5</sub> of 10 tons/year or more that trigger Subchapter 18, but are not of a sufficient size to qualify as a PSD or an Appendix S major source or major modifications.***

As required in N.J.A.C. 7:27-18.2 applicability section, if a source is major for one criteria pollutant, it is considered major for all. Therefore, PM<sub>2.5</sub> nonattainment NSR would apply to all proposed major Subchapter 18 projects with a 10 ton/year or more significant net emissions increase in PM<sub>2.5</sub>.

The major source thresholds as defined in Subchapters 18 and 22 and the significant net emissions increase levels defined in Subchapter 18 are listed below.

<b>Air Contaminants</b>	<b>Major Source Thresholds (tons/year)</b>	<b>Significant Net Emission Increase Thresholds (tons/year)</b>
Carbon monoxide	100	100
PM-10	100	15
TSP	100	25
Sulfur dioxide	100	40
Oxides of nitrogen	25	25
VOC	25	25
Lead	10	0.6

The PM<sub>2.5</sub> significant net emissions increase of 10 tons/year is based on the level specified in the *Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers (PM<sub>2.5</sub>)* (Final Rule, May 16, 2008) and now listed in 40 CFR Part 51, Appendix S.

#### 6. Emission Offsets

The revised interim guidance continues to allow offset ratios of 1:1 and, on a case-by-case basis, offset ratios less than 1:1 for sources having a significant impact in a monitored nonattainment area (see Figure 1). The higher offset ratio and distance requirements listed in N.J.A.C.7:27-18 for PM<sub>10</sub> is not being applied to PM<sub>2.5</sub> at this time because PM<sub>2.5</sub> concentrations are more regional in nature than PM<sub>10</sub>. The offsets may be obtained anywhere in the monitoring nonattainment area where the source is located. Offsets may also be obtained outside the monitored nonattainment area. However, if this option is selected a modeling analysis must be submitted that demonstrates the proposed emission offsets will result in a reduction of PM<sub>2.5</sub> concentrations in the monitored nonattainment area that are approximately equivalent to the magnitude of the proposed increase.

In addition to considering offsets from existing stationary sources, applicants are encouraged to investigate possible PM<sub>2.5</sub> reductions from mobile and other ground-level PM<sub>2.5</sub> sources. Funding retrofit emission controls to on- road or off-road diesel vehicles or electrification of bays at a truck stop to reduce diesel idling emissions are examples of possible offset sources. A portion of banked particulate emission reductions credits may be used as PM<sub>2.5</sub> offsets if the PM<sub>2.5</sub> fraction can be reasonably established and other offset requirements met.

### III. Permit Procedures

A key feature of these permitting procedures is the determination of whether the source is located in an area of monitored PM<sub>2.5</sub> nonattainment or in an area of monitored PM<sub>2.5</sub> attainment. The monitored values 2006-2008 monitored values are presented in Table 1.

1. In EPA's designated New York/North New Jersey/Connecticut nonattainment area, the following locations in New Jersey are currently in monitored PM<sub>2.5</sub> nonattainment:

- a. Monitored PM<sub>2.5</sub> 24-hour Nonattainment Area  
Eastern portion of Union and Essex Counties, the extreme southern portion of Bergen County, and all of Hudson County.
- b. Monitored PM<sub>2.5</sub> Annual Nonattainment Area  
None

2. In EPA's designated Philadelphia/Camden/Wilmington nonattainment area, the following locations in New Jersey are currently in monitored PM<sub>2.5</sub> nonattainment:

- a. Monitored PM<sub>2.5</sub> 24-hour Nonattainment Area  
None
- b. Monitored PM<sub>2.5</sub> Annual Nonattainment Area  
None

The monitored nonattainment areas are shown graphically in Figure 1 (NJDEP will make the final determination of whether the source is in a PM<sub>2.5</sub> monitored nonattainment areas). Sources located near one of the boundaries of the monitored nonattainment area should contact BTS for specific guidance on their source. The location of most of the NJDEP PM<sub>2.5</sub> monitors can be found at [www.state.nj.us/dep/airmon/pm05.pdf](http://www.state.nj.us/dep/airmon/pm05.pdf).

3. Sources Located in an Area with Representative Monitored Values Above the PM<sub>2.5</sub> NAAQS (Monitored PM<sub>2.5</sub> Nonattainment Areas)

These procedures are designed to minimize the increase in ambient air impacts in areas where monitored PM<sub>2.5</sub> levels are currently above the NAAQS. Air quality modeling will be conducted for the proposed PM<sub>2.5</sub> net emissions increase. If the source's modeled PM<sub>2.5</sub> impact is above the PM<sub>2.5</sub> SIL for the relevant averaging time (24-hour or annual), the source should first try and take steps to reduce its ambient impact to less than the SIL. Possible strategies for reducing its impact include reducing the proposed PM<sub>2.5</sub> emissions increase or increasing the stack height.

If the source's impact can not be reduced by these means, direct PM<sub>2.5</sub> emission offsets should be obtained in the same monitored nonattainment area to reduce local PM<sub>2.5</sub> concentrations. A less than a 1:1 ratio for these offsets is acceptable. In addition, offsets may also be obtained outside the monitored nonattainment area. However, if the PM<sub>2.5</sub>

offsets are either at a less than 1:1 ratio or obtained outside the monitored nonattainment area, a modeling analysis must be submitted that demonstrates the proposed emission offsets will result in a reduction of PM<sub>2.5</sub> concentrations in the monitored nonattainment area that are approximately equivalent to the magnitude of the proposed increase.

4. Sources Located in an Area with Representative Monitored Values below the PM<sub>2.5</sub> NAAQS

These procedures are designed to avoid the creation of new PM<sub>2.5</sub> NAAQS violations in areas where the monitored PM<sub>2.5</sub> levels are below the NAAQS. Air quality modeling will be conducted for the proposed PM<sub>2.5</sub> net emissions increase. Inclusion of other nearby large PM<sub>2.5</sub> sources in the modeling, if needed to more accurately define background PM<sub>2.5</sub> levels, will be determined on a case-by-case basis.

If the modeled PM<sub>2.5</sub> impact plus representative background exceeds the 24-hour or annual PM<sub>2.5</sub> NAAQS, then a determination is made whether the source's contribution to the NAAQS violation exceeds the PM<sub>2.5</sub> SIL for the relevant averaging time. If so, the source must take steps to eliminate the violation or reduce its impact below the SIL. Potential strategies for reducing its PM<sub>2.5</sub> impact include the following: reducing emissions, increasing stack height or obtaining emission offsets from existing sources. The emission offsets and other mitigation measures secured must be modeled to verify they result in the elimination of the predicted violation or reduction in the source's impact to below the PM<sub>2.5</sub> SIL.

#### **IV. Interim PM<sub>2.5</sub> Modeling Procedures**

1. Modeling Direct PM<sub>2.5</sub> Emissions

PM<sub>2.5</sub> modeled annual and 24-hour ambient impacts will be based on direct PM<sub>2.5</sub> emissions only. Both filterable and condensable PM<sub>2.5</sub> emissions must be included in the air quality modeling evaluation. The impact of PM<sub>2.5</sub> precursors, such as sulfur dioxide, does not need to be evaluated.

2. Background PM<sub>2.5</sub> Air Quality

A NJDEP or neighboring state's PM<sub>2.5</sub> monitor will be selected that represents background PM<sub>2.5</sub> in the vicinity of the source's impact area. The annual background PM<sub>2.5</sub> value should be based on the average of the latest 3-years of available data. The 24-hour background PM<sub>2.5</sub> value should initially be based on the average of the 98<sup>th</sup> percentile 24-hour value measured over the latest 3-years of available data. The NJDEP 2005-2007 PM<sub>2.5</sub> monitoring data is presented in Table 1.

3. Calculation of Impacts for Comparison to SILs

a. The maximum annual PM<sub>2.5</sub> concentration predicted at any receptor during the five-years of modeling should be compared to the annual SIL (0.30 ug/m<sup>3</sup>) to determine if the source has a significant impact.

b. The maximum 24-hour  $PM_{2.5}$  concentration predicted at any receptor during the five-years of modeling should be compared to the 24-hour SIL ( $1.2 \text{ ug}/\text{m}^3$ ) to determine if the source has a significant impact. However, if BTS considers an applicant's modeling analysis technically complete by the date of this memo, the previous 24-hour SIL of  $2 \text{ ug}/\text{m}^3$  may be used.

#### 4. Multisource Modeling

On a case-by-case basis, other  $PM_{2.5}$  sources in the vicinity of the source (<10 km) may be included in the modeling analysis if the proposed source impact is above the SILs and the selected  $PM_{2.5}$  background monitor does not adequately reflect existing  $PM_{2.5}$  concentrations in the area. Sources with  $PM_{10}$  emission limits will be converted to  $PM_{2.5}$  emissions using AP-42 and other available information.

#### 5. Calculation of Impacts for Comparison to NAAQS

a. Initially, the  $PM_{2.5}$  annual average impact should be calculated using the maximum annual  $PM_{2.5}$  concentration predicted at any receptor during the five-years of modeling. This value should be added to the 3-year average annual background value from a representative  $PM_{2.5}$  monitor and compared to the annual  $PM_{2.5}$  NAAQS. If a violation of the annual  $PM_{2.5}$  NAAQS of  $15 \text{ ug}/\text{m}^3$  is predicted, the modeled annual  $PM_{2.5}$  should be recalculated as the maximum three-year average  $PM_{2.5}$  prediction at any receptor. This value should be added to the representative 3-year average annual background value and compared to the annual NAAQS.

If the source being modeled is an existing source and is located close to the background monitor being used, the modeled impact from the existing source at the monitor (based on actual emissions) can be subtracted from the annual background value.

b. Initially, the  $PM_{2.5}$  24-hour impact should be calculated as the maximum 8<sup>th</sup> high 24-hour average  $PM_{2.5}$  prediction at any receptor during the five-years of modeling. This value should be added to the 3-year average 98<sup>th</sup> percentile 24-hour background value from a representative  $PM_{2.5}$  monitor and compared to the 24-hour NAAQS. If a violation of the 24-hour  $PM_{2.5}$  NAAQS of  $35 \text{ ug}/\text{m}^3$  is predicted, then the 24-hour  $PM_{2.5}$  total impact should be recalculated as the 3-year average of maximum 8<sup>th</sup> high 24-hour average  $PM_{2.5}$  predictions at any receptor. This value should be added to the representative 3-year average 98<sup>th</sup> percentile 24-hour background value and compared to the 24-hour NAAQS.

The applicant has the option of defining the applicable 24-hour background concentration in greater detail as described in Section 8.2.2(b) in EPA's *Guideline on Air Quality Models*. This guidance specifies that the meteorological conditions of concern be determined for the source, and that background concentrations used are those that exist during these meteorological conditions of concern. The source's impact during periods of high 24-hour background concentrations should also be evaluated.

**Table 1. New Jersey Background PM<sub>2.5</sub> Concentrations <sup>a</sup>**

City	County	2006-2008 98 <sup>th</sup> Percentile 24-Hour Avg. (ug/m <sup>3</sup> )	2006-2008 Annual Average (ug/m <sup>3</sup> )
Atlantic City	Atlantic Co	29.8	11.1
Fort Lee	Bergen Co	<b>35.0</b>	12.2
Camden Lab	Camden Co	33.0	13.1
Pennsauken	Camden Co	33.6	12.7
Newark – Willis Center	Essex Co	34.5	13.0
Union City	Hudson Co.	<b>37.8</b>	14.1
Gibbstown	Gloucester Co	27.5	11.7
Jersey City	Hudson Co	<b>36.0</b>	12.9
Trenton	Mercer Co	33.2	11.9
Washington Crossing	Mercer Co	28.1	10.1
New Brunswick	Middlesex Co	30.7	11.3
Chester	Morris Co.	28.0	9.4
Morristown	Morris Co	28.9	10.3
Toms River	Ocean Co	28.6	10.2
Paterson	Passaic Co	32.9	12.3
Elizabeth Lab	Union Co	<b>36.2</b>	13.6
Elizabeth	Union Co	<b>35.2</b>	12.6
Rahway	Union Co	33.6	12.3
Phillipsburg	Warren Co	31.1	11.8

a. Values in bold represent violations of the NAAQS.

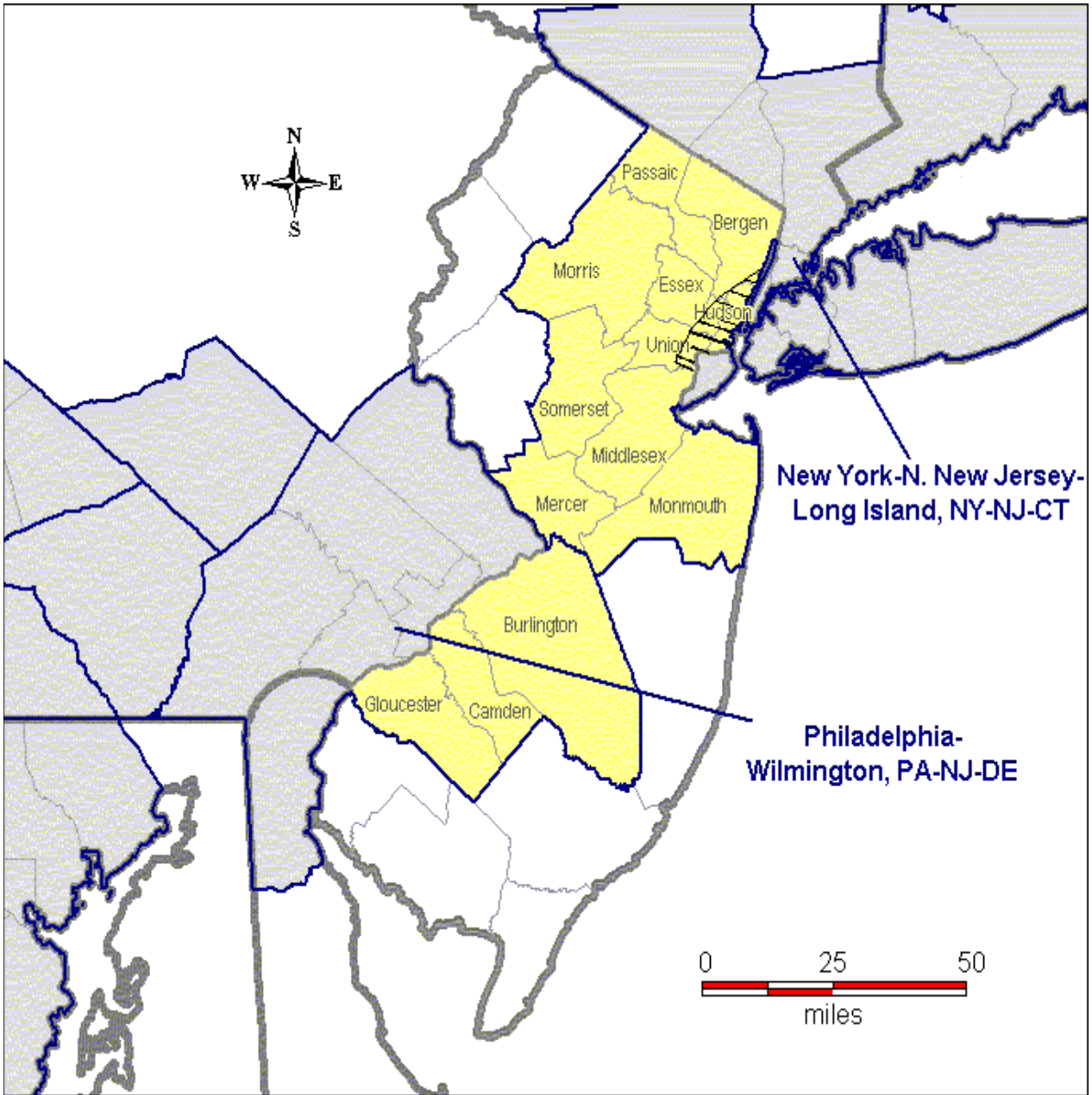


Figure 1. New Jersey PM-2.5 Nonattainment Areas

EPA designated nonattainment areas shown in yellow.  
Monitored nonattainment areas shown by hatched lines.