STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CTDEP INTERIM PM2.5 NEW SOURCE REVIEW MODELING POLICY AND PROCEDURES

Policy Considerations

Effective December 15, 2006, the U.S. Environmental Protection Agency (EPA) revised the national ambient air quality standards (NAAQS) for particulate matter less than 2.5 micrometers (PM2.5), retaining the annual standard of 15 $\mu g/m^3$ and tightening the 24-hour average to 35 $\mu g/m^3$. Connecticut has monitored ambient levels of PM2.5 considerably higher than 35 $\mu g/m^3$, a concern as the revised standard is set to better protect public health. On May 16, 2008, EPA finalized the rule for the *Implementation of the New Source Review (NSR) Program for Particulate Matter Less than 2.5 Micrometers (PM2.5)*. This rule, effective July 15, 2008, established guidelines for states to follow in preparing state implementation plans (SIPs) to incorporate PM2.5 provisions into NSR programs and on how to proceed until such time SIPs are updated. Connecticut is required to revise its SIP-approved NSR program by May 2011. During this transitional period, the Connecticut Department of Environmental Protection (CTDEP) is developing strategies and implementing procedures to better protect public health and to help provide for attainment of both the 1997 and 2006 revised PM2.5 NAAQS.

This interim policy describes CTDEP's requirements for NSR permitting and modeling for sources of PM2.5. In particular, for permit applications subject to this policy, a demonstration of compliance with the PM10 NAAQS will no longer serve as a surrogate for compliance with the PM2.5 NAAQS. Instead, NSR permit applicants must consider PM2.5 as a criteria pollutant and address it in preparing an application. These interim procedures will serve the policy goal of public health protection by minimizing PM2.5 ambient air impacts from new stationary sources, particularly in Fairfield and New Haven Counties, which are designated as nonattainment for PM2.5.

This interim policy applies immediately to applications for NSR permits or modifications for which a tentative determination has not been issued. These procedures will be in effect until CTDEP adopts a regulation, a SIP revision, or a revised policy addressing the PM2.5 NAAQS.

New Source Review Permitting

Except as noted below, this policy applies a "business as usual" approach to taking PM2.5 into account in CTDEP NSR technology reviews and any necessary requirements to reduce PM2.5 impacts.

Nonattainment review. Fairfield and New Haven Counties have been designated by EPA as nonattainment for the annual and 24-hour PM2.5 NAAQS as modified in 2006. The remainder of Connecticut is currently designated as attainment for PM2.5. See Figure 1 for a map of the designations. In accordance with EPA's May 16, 2008 NSR rule, Connecticut will implement the revised provisions of EPA's *Emissions Offset Interpretive Ruling* at 40 CFR 51, Appendix S for new major stationary sources and major modifications of PM2.5 in nonattainment areas. Under Appendix S, the lowest achievable emission rate (LAER) and offsets will be required for all new major sources and major modifications of PM2.5. SO_2 and NOx will be regulated as precursors in all nonattainment areas for PM2.5. The offset ratio for direct emissions of PM2.5 shall be at least 1:1. The offset ratios for emissions of SO_2 and NOx shall be equal to the EPA recommended ratios of 40:1 and 200:1, respectively, unless CTDEP adopts, through its SIP, another ratio that will provide a net air quality benefit equal to or greater than a 1:1 PM2.5 offset.

PM2.5 emission limits. A permit applicant may assume PM2.5 emissions are equivalent to PM10 emissions or propose a PM2.5-specific emission limit based on supporting data. Applications should include separate emission estimates for filterable and condensable fractions of expected total PM2.5 emissions. Sources will be required to meet the filterable fraction using appropriate EPA reference stack test methods. A source will not be required to demonstrate compliance with an expected condensable emission limit until one year after the EPA promulgates a new reference stack test method for the condensable fraction. At that time, the PM2.5 emissions will be evaluated and the permit will be modified to reflect the results of the stack test for condensables.

New Source Review Modeling

Applications for new sources with potential PM2.5 emissions in excess of 15 tons per year must include an adequate PM2.5 modeling analysis to demonstrate compliance with both the PM2.5 NAAQS of 15 $\mu g/m^3$ (annual average) and 35 $\mu g/m^3$ (24-hour average). CTDEP's modeling procedures typically used in the NSR application process are unchanged, except for the

addition of PM2.5 as a pollutant to be assessed. The procedures for different source situations are summarized in Figure 2. The specific criteria to apply in performing a PM2.5 modeling demonstration are described below.

Applicability thresholds. The modeling applicability thresholds apply to any new stationary source or modification subject to the provisions of sections 22a-174-2a and 22a-174-3a of the Regulations of Connecticut State Agencies (R.C.S.A.), including:

- New major PM2.5 sources (100 tons or more per year);
- Proposed modifications to existing major PM2.5 sources (100 tons or more per year) with a PM2.5 net emissions increase of equal to or more than 10 tons per year in a nonattainment area;
- Proposed modifications to existing major sources with a PM2.5 net emissions increase of equal to or more than 10 tons per year in an attainment area; and
- New minor sources or modifications with a proposed PM2.5 net emissions increase greater than 15 tons per year but less than 100 tons per year.

Any new source or modification that is required to receive a NSR permit, with a net PM2.5 emission increase of $\geq$ 3.0 tpy but < 15 tpy, should follow existing screening modeling procedures for PM. PM10 emissions can be used as a surrogate for PM2.5.

Background air quality. CTDEP's existing ambient PM2.5 monitoring network may be used to estimate background PM2.5 levels for all locations in Connecticut. The annual background PM2.5 value should be based on the average of the most recent three years of available data. The 24-hour background PM2.5 value should be based on the average of the 98th percentile 24-hour values measured over the last three years of available data. An applicant may choose to develop a more refined background PM2.5 value by performing a full year of on-site pre-construction monitoring. CTDEP may allow an applicant to define background values that are less than the observed design values, provided that the applicant provides sound technical reasoning for such an approach (e.g., a directional-specific analysis of monitored levels).

Ambient air quality modeling. Applications requiring air quality modeling must demonstrate expected compliance with the PM2.5 NAAQS based on a total expected PM2.5 emission rate that includes both filterable and condensable PM2.5.

When calculating impacts for comparison to the annual NAAQS of 15 $\mu g/m^3$, the maximum three-year average of annual PM2.5 predicted impacts from the new source at each receptor over the five years modeled should be added to the monitored background concentration. When calculating impacts for comparison to the 24-hour NAAQS of 35 $\mu g/m^3$, the three-year average of the yearly maximum 8th high 24-hour PM2.5 predictions at each receptor should be added to the monitored background concentration and the result compared to the NAAQS.

CTDEP is adopting the PM2.5 significant impact levels (SILs) recommended by the Northeast States for Air Use Management (NESCAUM) of 0.30 $\mu g/m^3$ (annual average) and 2.0 $\mu g/m^3$ (24-hour average). Background information regarding the selection of these SILs is available at http://www.nescaum.org/topics/permit-modeling.

Questions concerning the PM2.5 modeling procedures should be directed to Jude Catalano at 860-424-3384 or jude.catalano@ct.gov. The regulations that apply to NSR permitting, namely R.C.S.A. sections 22a-174-2a and 22a-174-3a, are available at: http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322184&depNav_GID=1619.

Gina McCarthy
Commissioner, CTDEP

2/11/09
Date

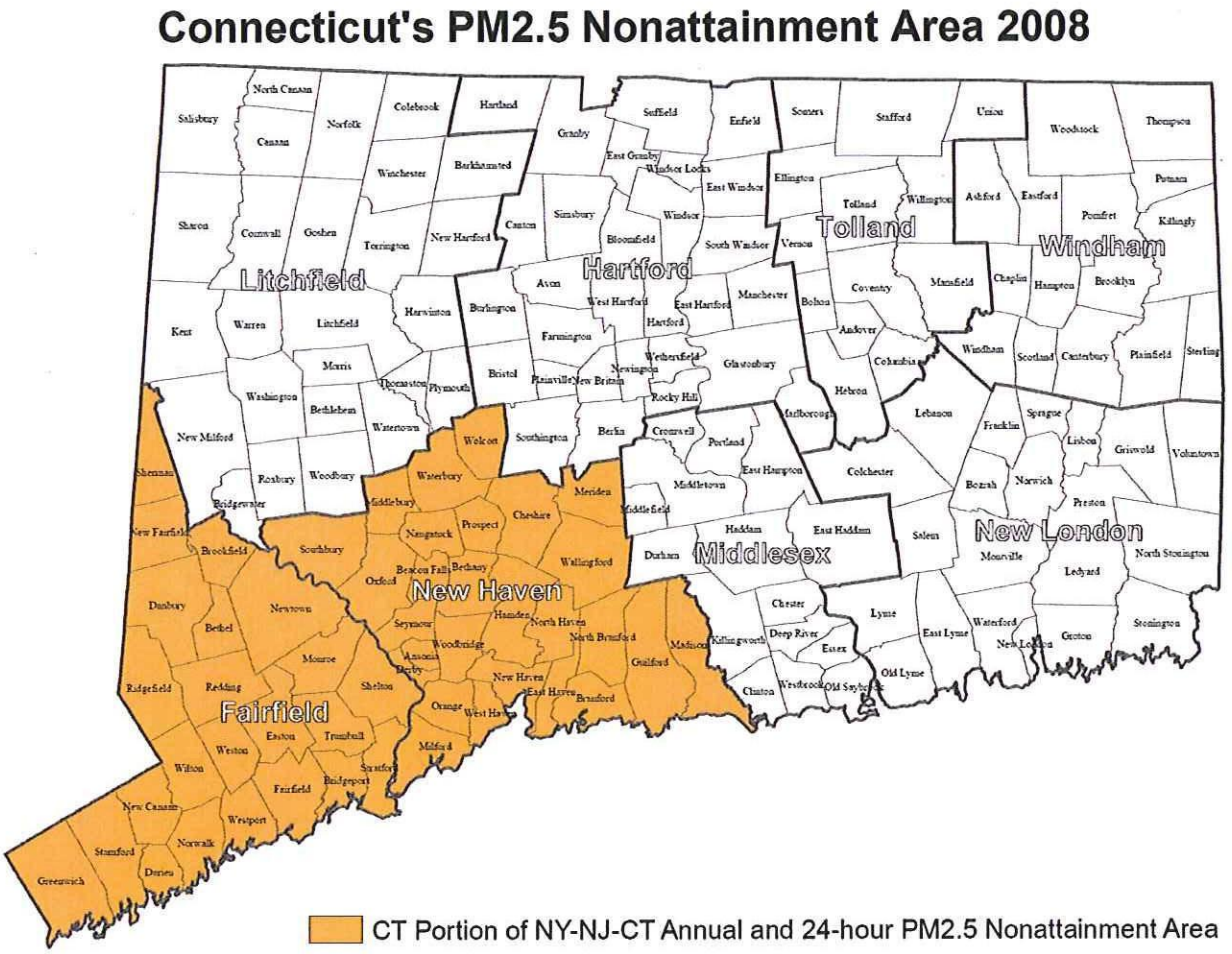

Figure 1. PM2.5 Nonattainment Designations
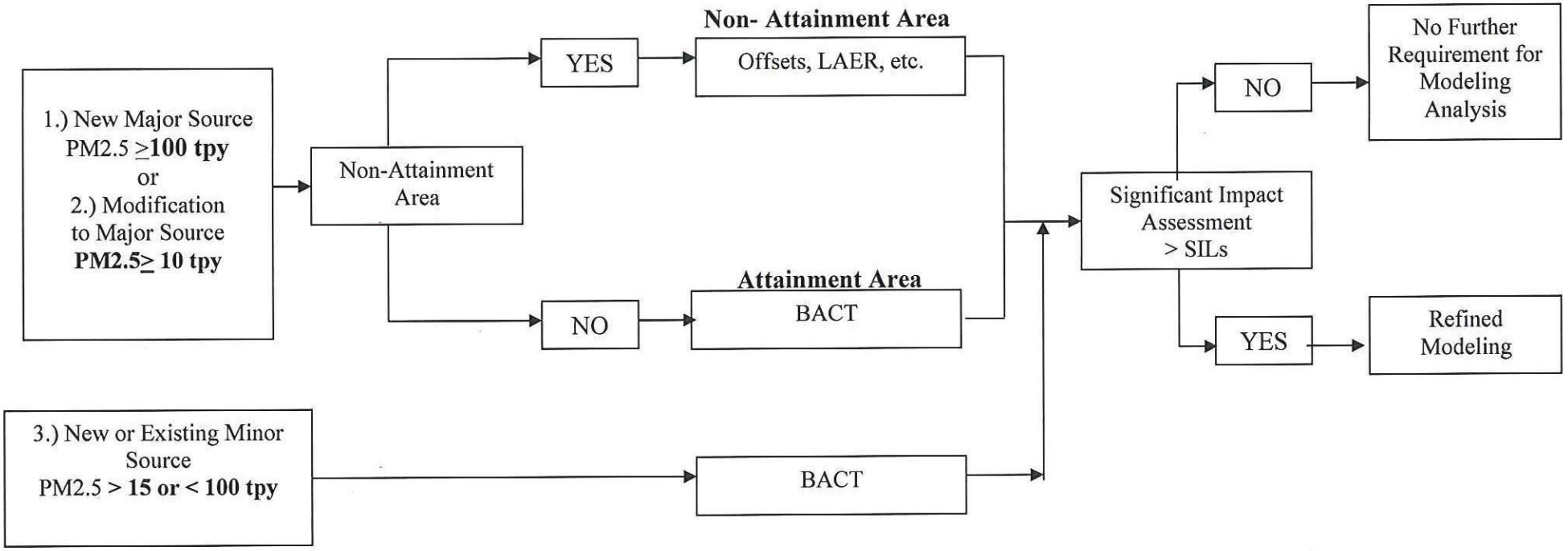
Figure 2. PM-2.5 NSR FLOW DIAGRAM