93-14-04

D. Wilson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DEC 16 1992

MEMORANDUM

SUBJECT: The Ozone Attainment Test in the State Implementation Plan (SIP) Modeling Demonstrations

FROM: Joseph A. Tikvart, Chief
Source Receptor Analysis Branch, TSD (MD-14)

TO: Brenda Johnson, Ozone Modeling Contact
Region IV

This is in response to your September 28 memorandum to Richard Scheffe concerning an appropriate modeled air quality value to demonstrate attainment of the National Ambient Air Quality Standard (NAAQS) for ozone. In order to focus the problem, we have discussed the issue further with you as it applies to specific SIP's in Region IV. Based on these discussions, we understand that, for example, the State of Georgia would like for their SIP demonstration to be acceptable if the design concentration is reduced to .124 ppm, after controls are applied. In the intervening weeks, we have consulted with the staff of the Air Quality Management Division (AQMD), surveyed Regional Office Modeling Contacts, reviewed related past AQMD decisions on other pollutants and reviewed portions of the 1990 Clean Air Act (Act) which we believe to be pertinent. The recommendation provided below is consistent with the results of this review.

As you know, the level specified in the ozone NAAQS is 0.12 ppm. The Guideline for Regulatory Application of the Urban Airshed Model ("UAM Guideline") is clear (p.63) that to demonstrate attainment, predicted ozone must be 0.12 ppm or less throughout the modeling domain. Thus, a prediction of 0.13 ppm is not sufficient, whereas a prediction of 0.12 ppm is so. The question you raise is whether a value of 0.121 ppm or greater is acceptable in showing attainment in a SIP demonstration.

More specifically, our review of prior work addressing this issue for ozone and other criteria pollutants included:

1. section 181(a) of the Clean Air Act, in which Congress defines a "marginal area" as one having an ozone design value of

0.121 - 0.138 ppm (Attachment 1); nonattainment areas having modeled values within this range are consistent with the Act's classification as a marginal nonattainment area.

2. past correspondence from AQMD concerning interpretations of control targets for carbon monoxide and lead (Attachments 2 and 3); model estimates for comparison to the target value should not be rounded.

3. a survey of Regional Office Modeling Contacts (Attachment 4) in which the most common practice, with regard to rounding of model estimates, appears to interpret values like 0.121 ppm of ozone as not meeting the target concentration level.

Based on the attachments it appears in the majority of situations involving various criteria pollutants that for NAAQS demonstrations the numerical value of the standard is the "target" level to which model estimates should be reduced. For ozone this implies that for application of a model that estimates concentrations to three significant figures, the target level is actually .120 ppm. Attachments 2 and 3 provide a more elaborate discussion of this point.

Based on this analysis, we conclude that the State of Georgia's proposal to use .124 ppm as the target level would not be acceptable. Moreover, any value between .121 and .125 would also generally not meet the target for an acceptable attainment demonstration. However, I realize that until now, resolution of the issue you raise has not been clear. Thus, if the State has previously developed a protocol that specifically contains a value greater than .120 ppm as the SIP demonstration target level, and the Environmental Protection Agency has approved that protocol, it may qualify for grandfathering.

Please contact Ellen Baldridge (919-541-5684), or Dean Wilson (919-541-5683), respectively for ozone and for other criteria pollutants, if this matter requires further clarification.

Attachments

cc: Air Branch Chiefs, Regions I-X
Tom Helms, MD-15

Attachment 1

riods of peak use, through road use
surcharges, or other pricing mecha-
ed zones or periods, or vehicle reg-

breakdown and accident scene
urring congestion, and vehicle
o reduce congestion and emissions;

nsportation-related programs as the
nsultation with the Secretary of
vould improve air quality and would
cupancy vehicle capacity.
res, the State should seek to ensure
n, other commercial and residential
or relocating emissions and conges-
hem.
he emissions offset requirements of
ources or emissions units for which a
), the ratio of emission reductions to
least 2 to 1.
RTAIN.—(1) As expeditiously as prac-
inment date for any nonattainment
is after such date, the Administrator
ea's air quality as of the attainment
the standard by that date.
mination under paragraph (1), the
a notice in the Federal Register
and identifying each area that the
o have failed to attain. The Admini-
nt such determination at any time
mation or analysis concerning the
inment date.
URE TO ATTAIN.—(1) Within 1 year
es the notice under subsection (c)(2)
o attain), each State containing a
it a revision to the applicable im-
requirements of paragraph (2) of this

nder paragraph (1) shall meet the
section 172. In addition, the revision
easures as the Administrator may
all measures that can be feasibly
ight of technological achievability,
nd other air quality-related health

icable to the revision required under
e as provided in the provisions of
applying such provisions the phrase
nder section 179(c)(2)' shall be sub-
he date such area was designated
07(d)' and for the phrase 'from the
ment'.".
Y PLANS.—Section 110(c)(1) of the
) is amended to read as follows: "(1)
gate a Federal implementation plan
the Administrator—

"(A) finds that a State has failed to make a required submission or finds that the plan or plan revision submitted by the State does not satisfy the minimum criteria established under section 110(k)(1)(A), or

"(B) disapproves a State implementation plan submission in whole or in part,

unless the State corrects the deficiency, and the Administrator approves the plan or plan revision, before the Administrator promulgates such Federal implementation plan.".

SEC. 103. ADDITIONAL PROVISIONS FOR OZONE NONATTAINMENT AREAS.

Part D of title I of the Clean Air Act is amended by adding the following new subpart at the end thereof:

"Subpart 2—Additional Provisions for Ozone Nonattainment Areas

"Sec. 181. Classifications and attainment dates.
"Sec. 182. Plan submissions and requirements.
"Sec. 183. Federal ozone measures.
"Sec. 184. Control of interstate ozone air pollution.
"Sec. 185. Enforcement for Severe and Extreme ozone nonattainment areas for failure to attain.
"Sec. 185A. Transitional areas.
"Sec. 185B. NOX and VOC study.

"SEC. 181. CLASSIFICATIONS AND ATTAINMENT DATES.

42 USC 7511.

"(a) CLASSIFICATION AND ATTAINMENT DATES FOR 1989 NONATTAINMENT AREAS.—(1) Each area designated nonattainment for ozone pursuant to section 107(d) shall be classified at the time of such designation, under table 1, by operation of law, as a Marginal Area, a Moderate Area, a Serious Area, a Severe Area, or an Extreme Area based on the design value for the area. The design value shall be calculated according to the interpretation methodology issued by the Administrator most recently before the date of the enactment of the Clean Air Act Amendments of 1990. For each area classified under this subsection, the primary standard attainment date for ozone shall be as expeditiously as practicable but not later than the date provided in table 1.

"TABLE 1

Area class	Design value*	Primary standard attainment date**
Marginal	0.121 up to 0.138	3 years after enactment
Moderate	0.138 up to 0.160	6 years after enactment
Serious	0.160 up to 0.180	9 years after enactment
Severe	0.180 up to 0.280	15 years after enactment
Extreme	0.280 and above	20 years after enactment

*The design value is measured in parts per million (ppm).
**The primary standard attainment date is measured from the date of the enactment of the Clean Air Amendments of 1990.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

Blue
Attach 2

27 JUN 1990

MEMORANDUM

SUBJECT: Carbon Monoxide Target Level for State Implementation Plan Revisions

FROM: G.T. Helms, Chief
Ozone/Carbon Monoxide Programs Branch (MD-15)

TO: George Able, Chief
Air Programs Branch, Region X

Your staff recently expressed concern regarding John Calcagni's letter of April 27, 1990 to Cheryl Richardson of the Alaska Clean Air Coalition (attached). Specifically they were concerned about the statement of what is the appropriate target carbon monoxide (CO) level for State implementation plan (SIP) revisions. In an attempt to clarify our reasoning, I offer the following comments.

The Calcagni letter stated that for planning purposes, 9 ppm, the current CO national ambient air quality standard (NAAQS), should be used as the target level. The problem arises because of the definition of a violation, which is 9.5 ppm due to the rounding convention explained in the letter. The 9.5 ppm value is used to allow for uncertainty in monitoring equipment and methodologies. This definition of a violation has no bearing on the target level for demonstrations of attainment. As for all other criteria pollutants, modeling should always apply the NAAQS (9 ppm for CO) as the appropriate level to be acheived. By designing a SIP around 9.5 ppm, a State has increased the likelihood of future violations and have not insured maintenance of the NAAQS as required in section 110(a) of the Clean Air Act. For proper planning, the design value for the area should be taken down to 9 ppm, giving you the amount of control necessary to attain and maintain the NAAQS.

If you have any further questions, please call Jill Vitas of my staff at FTS 629-5313.

Attachment

cc: Air Branch Chiefs, Regions I- IX

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

APR 2 7 1990

Ms. Cheryl Richardson
Anchorage Clean Air Coalition
1747 Laurence Court
Anchorage, Alaska 99501

Dear Ms. Richardson:

This letter is in response to your March 29, 1990 letter requesting clarification of the carbon monoxide (CO) national ambient air quality standards (NAAQS).

On April 30, 1971, the Environmental Protection Agency (EPA) promulgated the NAAQS for CO under section 109 of the Clean Air Act (36 FR 8186). Identical primary and secondary standards were set at levels of 9 parts per million (ppm), 8-hour average; and 35 ppm, 1-hour average; neither to be exceeded more than once per year. In 1978, EPA began its review of the CO standards and on September 13, 1985 EPA reaffirmed the primary standards and rescinded the secondary standards (50 FR 37484). Therefore, primary NAAQS for CO remain at 9 ppm, 8-hour average; and 35 ppm, 1-hour average.

As for the definition of a violation, EPA guidance since the late 1970's has been that in order to compare a monitor reading to the NAAQS, first the value must be rounded off to the same number of significant figures as the NAAQS with which the reading is being compared. Since the CO NAAQS (8-hour average) has only one significant figure, the monitored value must be rounded to the nearest whole number. Values of 0.5 and up are rounded up and values less than 0.5 are rounded down. Therefore, the lowest monitored value that could be considered a violation of the CO NAAQS is 9.5 ppm. This approach s described in 40 CFR 50.8(d) (copy enclosed).

With respect to the target CO level for State implementation plan revisions, EPA has employed the CO NAAQS (9 ppm) as the appropriate target level.

If you have any further questions, please call Jill Vitas of my staff at (919)541-5313.

Sincerely,

for John Calcagni
Director
Air Quality Management Division

Enclosure

Attachment 3

TSD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

July 24, 1992

NOTE TO AIR BRANCH CHIEFS

On June 24 I sent you the first set of questions and answers (Q's & A's) for lead implementation plans. Unfortunately, the second page of the Q's & A's was inadvertently left out of the package. I apologize for any inconvenience this may have caused you. In order to avoid any further confusion, I am resending the memorandum and entire attachment that went out in June.

Joe Paisie

Attachment

cc: John Calcagni, AQMD
Eric Ginsburg, AQMD
Gwen Jacobs, AQMD
Laura McKelvey, AQMD
Rich Ossias, OGC
Laurie Ostrand, AQMD
Vickie Patton, OGC
Joe Tikvart, TSD
Lydia Wegman, OAQPS
Dean Wilson, TSD
Lead Contacts, Regions I-X
Regional Meteorologists, Regions I-X

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

June 24, 1992

MEMORANDUM

SUBJECT: Questions and Answers (Q's & A's) for Lead

FROM: Joseph W. Paisie, Acting Chief
SO_2/Particulate Matter Programs Branch (MD-15)

TO: Chief, Air Branch
Regions I-X

Attached, you will find the first set of Q's & A's for lead implementation plans. The responses, which were developed with the lead contacts, have been reviewed both in this office and the Office of General Counsel. As more questions arise, we will be following this set with other sets of lead Q's & A's.

The Q's & A's serve as a supplement to the staff work product for lead which has been incorporated into the General Preamble for Title I of the 1990 Clean Air Act Amendments (CAAA) [see 57 FR 13498 and 18070, April 16 and 28, 1992, respectively]. In any instance where there may appear to be a discrepancy between the Q's & A's and the General Preamble, the General Preamble remains the more authoritative policy, and the Q&A's should be read in ways that support that document.

The SO_2/Particulate Matter Programs Branch will be producing a general Q's & A's notebook with responses to questions concerning implementation of the CAAA. The goal is to have a resource that is specific enough to address individual concerns, but universal enough to be informative for all of the people who will be implementing the CAAA. If you have any suggestions regarding this process, please contact Gwen Jacobs at (919) 541-5295. Questions may be faxed to Gwen at (919) 541-5489 or mailed to OAQPS (Mail Drop 15). Thank you for your support of this project.

Attachment

cc: John Calcagni, AQMD
Eric Ginsburg, AQMD
Gwen Jacobs, AQMD
Laura McKelvey, AQMD
Rich Ossias, OGC
Laurie Ostrand, AQMD
Vickie Patton, OGC
Joe Tikvart, TSD
Lydia Wegman, OAQPS
Dean Wilson, TSD
Lead Contacts, Regions I-X
Regional Meteorologists, Regions I-X

QUESTIONS AND ANSWERS

FOR

LEAD

The EPA's responses to questions regarding implementation of the lead national ambient air quality standards (NAAQS) under the Clean Air Act as amended November 15, 1990 (Pub. L. No. 101-549, 104 stat. 2399) (CAA) are discussed in this document. See generally 42 U.S.C. §§ 7401 et seq. The answers set forth here do not establish or affect legal rights or obligations. They do not establish a binding norm and are not finally determinative of the issues addressed. Agency decisions in any particular case will be made by applying the applicable law and regulations to the specific facts of that case. In any proceeding in which the policies described in this document may be applied (e.g., rulemaking actions on lead SIP's), the Agency will thoroughly consider the policy's applicability to the facts, the underlying validity of the policy, and whether changes should be made in the policy based on submissions made by any person.

Developed by
SO_2/Particulate Programs Branch
Office of Air Quality Planning and Standards

June 1992

Lead Q's & A's

Note: with respect to the following Q's & A's, the Clean Air Act Amendments of 1990 included a General Savings Clause which provides that regulations (or guidance, etc.) in effect before enactment of the Amendments shall remain in effect after enactment (see section 193 of the amended Act). However, the Savings Clause also provides that such regulations (or guidance, etc.) shall remain in effect "except to the extent otherwise provided under this Act, inconsistent with the provision of this Act, or revised by the Administrator." Unless otherwise indicated, the regulations (or guidance, etc.) cited below remain in effect consistent with section 193 of the Clean Air Act.

Q: 1. Is it necessary to calculate a design value for lead SIP's? The July 1983 document entitled "Draft Updated Information on Approval and Promulgation of Lead Implementation Plans" indicates that determination of the design value for lead SIP's is only required when the demonstration is based on a "rollback" model and is not applicable if air dispersion modeling is used to demonstrate attainment.

A: 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 40 CFR 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 of Air Quality Models (Revised) (GAQM) (Section 8.2.1.1, Design Concentrations for SO_2, Particulate Matter, Lead, and NO_2).

Q: 2. How is the design value to be calculated--through modeling or ambient monitoring?

A: Again, see Section 8.2.1.1 of the GAQM which describes how to determine the design concentration (design value) for a lead air quality analysis. An air quality analysis is necessary to determine if the source will cause a violation of the NAAQS [and, it follows, to determine whether attainment is demonstrated in the area. See section 192(a)]. Note that Table 9.1 of the GAQM describes the model emissions input data needed to model point sources. 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. For lead, the highest estimated design concentration based on an individual calendar quarter averaging period should be used. The modeled design concentration is then used as a starting point to determine emission limits needed to attain the standards and to be included in the demonstration.

Theoretically, if the measured air quality values are higher than modeled values at the same receptors, and the Agency is certain that the modeling was done correctly (i.e., appropriate model, proper inputs), measured data should be used to determine baseline air quality. That is, the model estimates for the design value should not be used if the monitored data indicate an ambient problem that will not be corrected by a SIP based solely on modeling. However, the State should consult with EPA before making this decision.

Q: 3. What emission inventories are necessary for the upcoming lead nonattainment area SIP's? Besides the base year emission inventory (which is based upon actual emissions), are other inventories necessary? What are they to be based upon (allowable emissions before or after control, include growth, etc.)?

A. For lead SIP's, two types of emission inventories should be submitted--a base year inventory and modeling inventories. The SIP base year inventory must be based on actual emissions [see sections 110(p) and 172(c)(3) of the Act]. The timeframe of the base year inventory, generally, should be representative of the period of record on which the decision to designate an area as nonattainment [pursuant to sections 107(d)(3) or (d)(5)] or call for a SIP revision [pursuant to section 110(k)(5)] was based. The modeling inventories must be based on allowable rather than actual emissions [see section 110(a)(2)(K) of the Act]. The primary role of the modeling inventories will be for use in the design value calculation and the attainment demonstration. 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].

Regions and States should refer to Table 9-1 of the GAQM to determine model emission input data requirements. This table specifies under emission limit: maximum allowable or federally enforceable permit limit; under operating level: actual or design capacity (whichever is greater), or federally enforceable permit condition; and under operating factor: actual operating factor averaged over most recent 2 years. The impact of growth on emissions should also be considered in all modeling analyses covering existing sources.

For further emission inventory guidance beyond the above discussion, the Regions and States should refer to the lead emission inventory document which is expected to be issued July 1992 in draft form.

Q: 4. What type of dispersion modeling demonstrations are necessary for the upcoming lead nonattainment area SIP's? We understand that a base year modeling demonstration, using the base year emission inventory, is used to compare model predictions to actual, base year ambient data for the purpose of model validation. What should be done next? Should the States then rerun the base year model after applying controls [e.g., reasonably available control measures (RACM) which include reasonably available control technology (RACT)] to adjust the base year inventory, to determine the level of control needed before growth is accounted for? Then should the States account for growth occurring up to the attainment year, by rerunning the model using a post-control, post-growth emission inventory? If the NAAQS are exceeded in this last scenario, should the model then be rerun with additional control strategies until the NAAQS are no longer exceeded?

A: 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.

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.

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.

Finally, note that background concentrations must be added to the modeled results as discussed in the GAQM.

Q: 5. What level constitutes an adequate attainment demonstration? For example, for one complete modeled attainment year, must no quarter exceed 1.5 $\mu g/m^3$ of lead? What if one quarter shows a projected value of exactly 1.5 $\mu g/m^3$ or 1.45 $\mu g/m^3$?

A. 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 <u>extremely</u> 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.

Attachment 4

Rounding Practice in The Regions-October 1992

Region I

There is no formal policy; it never has been an issue. No decimal places are generally reported for comparison to the NAAQS. One decimal place usually reported for comparison to PSD.

There is no Regional policy for ozone estimates but at least one State does practice rounding.

Region II

For monitoring data R-II follows rounding convention.

For model estimates there is no rounding but they ask the States not report anything more than 1 decimal place. i.e. 9.1 ppm is a CO exceedance. Same is true for ozone except there are no cases since 1982 to test this position.

Region III

No rounding of model estimates is allowed , including ozone. They do round monitoring data.

Region IV

For monitoring data Region IV follows the rounding convention.

For modeling for all pollutants except ozone, rounding is not acceptable. For ozone, both rounding and truncation are practiced.

Region V

Region V has historically not allowed rounding of model estimates for any pollutant, including ozone. They are not in favor of allowing rounding.

For monitoring data, the rounding convention is practiced.

Region VI

It has been the practice to round model estimates for all criteria pollutants, e.g. 9.4 ppm for CO is not an exceedance; it is rounded down to 9 ppm.

Region VII

Generally no rounding of model estimates is allowed for any criteria pollutant. For modeling for the St Louis ozone SIP with the Urban Airshed Model (UAM) they are allowing rounding on what they believe is verbal guidance from SRAB. Region VII is against rounding for UAM estimates.

Region VIII

For CO and SO@ clearly no rounding is allowed in model estimates.

For ozone modeling in Salt Lake City the State is using EKMA. While the SIP is not in yet they have asked the State to go all the way down to the .120 EKMA curves.

Region IX

Rounding of model estimates is not accepted for SIP's or

PSD, including UAM modeling. However for the AZ CO FIP, a few years back, rounding was allowed.

For monitoring data the Region follows the rounding convention.

Region X

They have no ozone SIP's so it is not an issue. For other crit eria pollutants no rounding is allowed.