



engineering and constructing a better tomorrow

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TO: Susan S.G. Wierman
Executive Director
Mid-Atlantic Regional Air Management Association, Inc.
711 W. 40th Street, Suite 312
Baltimore, MD 21211

FROM: Arthur Werner, MACTEC
William Hodan, MACTEC
MACTEC Project 827007G184

CONTRACT: PROP06RTPE-036

SUBJECT: Task 2 Final Memorandum: Summary of Source Selection and Identification of Control Scenarios for Priority Source Categories and Major Individual Sources for the Purpose of Assessing Reasonable Progress for Regional Haze in Mid-Atlantic North Eastern Class I Areas

This memorandum should be considered as one chapter of a document that will be presented by MACTEC to MARAMA in fulfillment of the final task of this project. The purpose of this memorandum is twofold:

1. To present a compilation of the efforts of the Reasonable Progress Workgroup that have taken place to determine the major contributors to visibility impairment in Mid-Atlantic North Eastern Class I Areas.
2. To identify potential control scenarios for priority source categories and major individual sources.

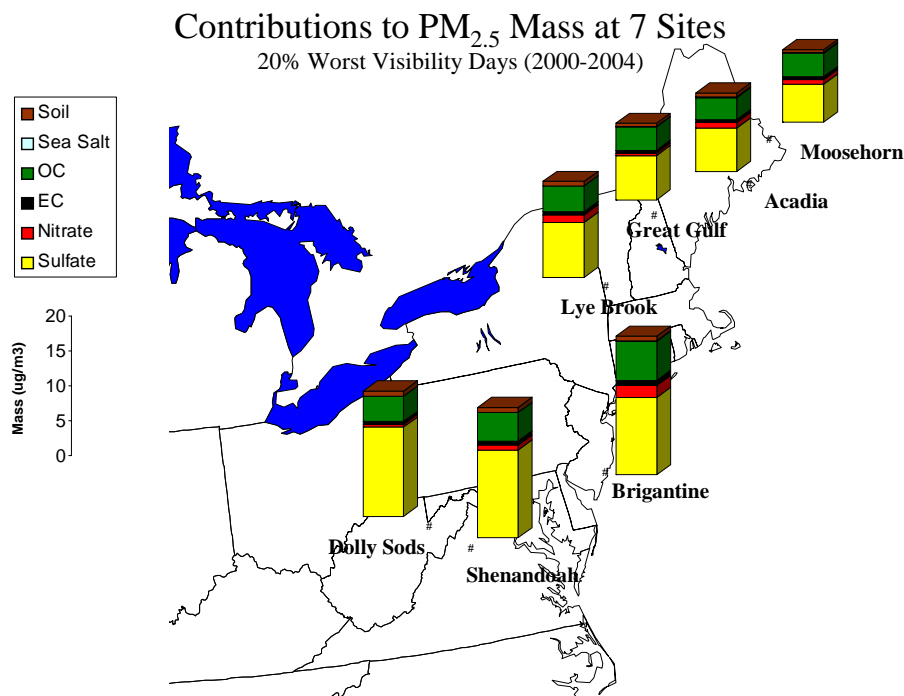
As we are currently working to obtain information about the emission units at the individual facilities, there are blanks in the attached spreadsheet. These will be filled in as we obtain the necessary information. Also, as work continues on this project, the elements of cost, time necessary for compliance, energy and non-air impacts, and remaining useful life of the source will be refined. The final report from this project will contain much more detail than the overview presented in this memorandum is designed to present.

The Regional Haze regulations set forth under 40 CFR 51.308(d)(1) require states to establish goals toward achieving reasonable progress toward natural visibility conditions as part of their State Implementation Plan for regional haze. The national visibility goal in Class I areas is defined in the CAA Section 169A(a)(1), as “the prevention of any future, and the remedying of any existing, impairment of visibility...”, and is expected to be satisfied by 2064 with a return to natural visibility conditions. Reasonable Progress Goals, (RPGs), are supposed to be designed to define future visibility conditions that are equal to, or better, than visibility conditions expected by the uniform rate of progress at any future year until natural conditions are achieved. RPGs

are to be established for the final year in the planning period, which in the case of the first SIP is 2018.

Following draft guidance from EPA, in establishing RPGs, states must set a baseline from which reasonable progress will be measured. The baseline year for reasonable progress towards visibility improvement for MANE-VU is 2002. The next task is to identify key pollutants affecting visibility impairment at each Class I area. Major contributors are identified by ranking emissions sources, comparing Q/d (emission impact over distance), and through modeling visibility impacts.

The following figure generated by NESCAUM from modeling results demonstrates the components of PM_{2.5} mass at the seven Class I areas of concern on the 20% worst visibility days during the period from 2000-2004. Particles in the PM_{2.5} size range are directly responsible for visibility reduction.



From the figure, it is apparent that sulfate is the largest contributor to PM_{2.5} mass in the areas of concern. The second largest contributor to PM_{2.5} mass is organic carbon, but organic carbon emissions are dominated by natural sources, so they will not be a focus of control efforts.

Modeling conducted by NESCAUM demonstrated that the principal contributors to visibility impairment in Class I MANE-VU areas and Class I areas affected by emissions from sources within MANE-VU are:

- SO₂ from coal and oil-fired Electric Generating Units, (EGUs);
- SO₂ from point and area source industrial, commercial and institutional boilers;
- PM from residential wood combustion and open burning;
- SO₂ from the use of home heating oil;
- SO₂ from cement kilns; and
- SO₂ from lime kilns

Similar to the determination of major source categories responsible for regional haze, modeling of visibility impacts was used to determine the major individual facilities that contribute to visibility impairment in Class I MANE-VU areas and Class I areas affected by emissions from sources within MANE-VU. Non-EGU point source data for ICI boilers and kilns from the final Version 2 of the 2002 NEI were modeled. The results of the modeling showed the SO₂ emissions of the 100 highest emitting ICI boilers and kilns and the contribution of these sources toward the SO₂ concentration in each of the Class I areas. Proximity of the individual sources to Class I areas resulted in varying impacts from individual sources on each Class I area. In subsequent discussions with MARAMA and the Reasonable Progress Workgroup, MACTEC was instructed to focus on the emissions from the top 16 facilities for this analysis. The top 16 facilities includes (at a minimum) the 10 highest contributors toward SO₂ concentration in each of the seven Class I areas of interest. In a similar effort, modeling of visibility impacts was used to determine the 30 EGUs with the greatest contribution toward visibility impairment in the same area.

The spreadsheet attached to this memorandum entitled: "Source Category and Facility Control Analysis" contains three worksheets which identify the source categories and individual EGU and non-EGU sources that have been identified as the largest contributors to visibility impairment in MANE-VU Class I areas and Class I areas in adjacent regions. The worksheet entitled: "Source Category Controls" presents the seven major source categories that contribute to visibility impairment in Class I areas. For each source category, the SCCs of interest are listed and available control options are identified. Emission reduction and cost effectiveness estimates are presented for control options for which the information was available.

The second worksheet entitled "Non-EGU Individual Source Ctrl" presents 16 individual facilities that were identified as a sample of the major contributors to visibility impairment in Class I areas. These facilities were identified as a basis for gaining more information to assist in the determination of costs, compliance timeframe, and other factors which could be useful in determining further applicability of controls to these and other similar sources. For each facility, the emission unit or units at the facility are identified along with the associated SCC and SO₂ emissions from those units based on the 2002 NEI. Control options for each unit are listed next to the source, and associated emission reduction and cost effectiveness estimates are presented for control options for which information was available. Other information including the emission unit design capacity and information on existing controls is also provided where available in the 2002 NEI. MACTEC is currently in the process of contacting the appropriate state agencies for these 16 facilities to obtain available information on these sources such as existing capacity and control information, BART or consent decree applicability, and other relevant information from Title V permits or other sources available from the state. We will

continue to build on the information contained in this memorandum and attached spreadsheets, and the results will be included in the final project technical document and presentation.

The third worksheet entitled “EGU Individual Source Ctrl” contains the list of 30 EGUs that were identified as a sample of the major contributors to visibility impairment in Class I areas. The format of this worksheet is identical to the format of the non-EGU worksheet, but information on the individual sources has not been obtained. As with the non-EGU facilities, MACTEC is in the process of gathering information from the inventory on these facilities as well as obtaining information from states.

The next step in establishing the RPGs is application of the four factor analysis to assess the feasibility of the control options presented in this memorandum. MACTEC will apply the four factor analyses to control options for the source categories and sources in the attached spreadsheets. The four factor analysis consists of an assessment of the costs, compliance timeframe, energy and non-air quality environmental impacts, and remaining useful life for affected sources. The results of the analysis will be used by MARAMA to establish the RPGs for the current planning period which is from 2008-2018.