

**Summary of Preliminary Member Comments on the March 8 Revised Draft Final
Reasonable Progress Statutory Factors Technical Memorandum**

Prepared March 14, 2007

The Revised Draft Final of Technical Memorandum #3 under the MANE-VU Reasonable Progress project was completed by MACTEC on March 8th. It is entitled, “*Assessing Reasonable Progress for Regional Haze in the Mid-Atlantic North Eastern Class I Areas.*” MARAMA requested comments from the MANE-VU Reasonable Progress Workgroup by March 30th. Eight members have commented on the document thus far and their comments are summarized here. Comments were received from the following: the State of Delaware via Jack Sipple, OTC via Doug Austin and Anna Garcia, the State of New Hampshire via Liz Nixon and Andy Bodnarik, VISTAS via Pat Brewer, the State of Maryland via Brian Hug, the State of Pennsylvania via Nancy Herb, the State of Massachusetts via Stephen Dennis, MARAMA via Julie McDill, Susan Wierman, and Angela Crenshaw.

General Comments

It is requested that all of the tables include information about the source (i.e. the name of the organization and the date the information was received). It is also requested that the information source for tables be referenced in the reference section and include the name and contact details of the source.

It is requested that an acknowledgment section for individuals who supplied information for this section be added to the document that states the individual and the organization they represent.

It is requested that where a dollar amount is stated in the document, the year and a reference should be included.

It is requested that primary sources be added to the tables.

It is requested that consistent and comparable units be utilized in the document. If conversions are done, state that a conversion was done and describe the method.

It is requested that blanks in the tables be filled in with an applicable phrase (i.e. no controls, information not available).

It is suggested all references to “Mid-Atlantic North Eastern states” including headers, be changed to MANE-VU states.

MACTEC mentions the availability of ULSD (15ppm) largely a result of the on road rule. However, MACTEC did not discuss the increased availability of 500ppm LSD expected because of the non road rule coming into effect. ICI boilers might have an

easier time procuring 500ppm rather than 15ppm because of increased supply, and (expected) lower prices than 15ppm.

It is requested that a definition of marginal cost be added to the document. It should be noted that marginal cost is not an indicator of average costs and sentences where that is stated should be re-written.

Introduction

In the second paragraph, the fourth sentence should read, “ For residential wood combustion, open burning, and outdoor wood combustors, the pollutant of interest is organic carbon, however, analysis is presented for particulate matter smaller than 2.5 micrometers in diameter (PM_{2.5})

The following paragraphs about how the individual sources and source categories were chosen should be included in the introduction:

“Source apportionment and other analysis documented in MANE-VU’s Contribution Assessment indicated that a number of source categories have impacts on visibility at MANE-VU Class I areas. The largest contribution to visibility impairment at most sites was from coal-burning sources, including primarily utility and industrial sources in MANE-VU and nearby states. At forested rural sites biogenic organics are a moderate to large contributor to visibility impairment and other sources of secondary organics also contribute. Wood smoke and ammonium nitrate were identified as small to moderate contributors (see Appendix B of the Contribution Assessment).

The Contribution Assessment also included an analysis of haze-associated pollutant emissions. “SO₂ is the primary precursor pollutant for sulfate particles. Sulfate particles commonly account for more than fifty percent of particle light extinction at northeastern Class I areas on the clearest days and for as much as or more than eighty percent on the haziest days.” The assessment noted that point sources dominate SO₂ emissions in the MANE-VU region. Point source emissions sources primarily consist of stationary combustion sources for generating electricity, industrial industry, and heat. Commercial and residential heating are another important source category in MANE-VU states.”

An analysis of the largest sources in the region also indicates that a few large kilns are among the largest SO₂ sources in the region.

Based on the information above, including modeling and emissions inventory analysis, MANE-VU selected the following source categories for analysis in this project.”

The following paragraphs should be substituted for the last three paragraphs of the introduction:

“MANE-VU reviewed emissions inventory and modeling results to select individual non-EGU sources for analysis in this report based on impacts on visibility in the baseline year (2002). Staff from the State of Delaware screened the National Emissions Inventory for 2002 to select the top SO₂ emitters in the states that had been previously identified as the most important contributors to regional haze in the MANE-VU Class I areas.¹ The initial inventory analysis was limited to kilns and industrial, commercial, and institutional (ICI) boilers, but a second search identified the largest SO₂ sources from all source categories.

Staff from the State of Vermont conducted impact modeling using CALPUFF at the process level. (A facility consists of one or more units, and each unit may have multiple processes.) A total of 194 non-EGU processes were modeled to determine their impacts on each of the MANE-VU Class I areas and nearby areas (Acadia, Lye Brook, Brigantine, Moosehorn, Great Gulf, and Shenandoah).

The MANE-VU Reasonable Progress Workgroup used this information to identify for each Class I area, the 20 sources with the highest sulfate impacts. These were listed side-by-side to identify sources that had impacts throughout the region. The top sources tended to affect all or most of the Class I areas analyzed. This information was used to select twenty individual non-EGU sources for analysis in this report. These twenty sources include seventeen ICI boilers and three kilns.

For each of these sources the Workgroup asked MACTEC to contact the appropriate state air quality agency to determine what controls were expected to reduce emissions from these twenty sources after 2002. In addition, the general analysis presented in this report would help identify the potential for emissions reductions from these sources.”

Chapter 2 - Source Category Analysis: EGUs

On Table 2.1 separate low sulfur coal and NG switching into two rows.

On page 2-1, paragraph 1, cite the MANE-VU Contribution Assessment (which uses several techniques, not just modeling), rather than “modeling conducted by NESCAUM.” Further, the reference to 26 categories is incorrect. The haze rule applies broadly to all sources contributing to regional haze.

¹ These states included Connecticut, Delaware, the District of Columbia, Georgia Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, and West Virginia. (A source from Missouri was initially included by mistake but later dropped when Missouri was selected instead of Michigan, and Michigan sources were added later in the process as a result.)

On page 2-1 show the information presented in 3rd paragraph in a table and provide more updated information, 1999 was a long time ago. Updated information is available in the NAS report on NSR. Discuss trend to install more SO₂ and NO_x controls that is currently underway.

On page 2-6, under the Cost of Compliance section, IPM predicts a least-cost solution to meet power production demands within emissions constraints. Emissions may be reduced by fuel-switching, use of controls, or by using power from a cleaner unit.

The text on page 2-8 is very repetitive and rambles. Please tighten this up into a single well focused paragraph.

On pages 2-9 to 2-11 the detailed cost and removal efficiency data located in each control technology section is excellent but to be really useful all \$ amounts should be dated and attribution of information shown. Also the data should be summarized in a matrix with consistent units (using reasonable assumptions, properly documented, to convert numbers). To the extent possible, using engineering economics, unit conversions, standard factors, and reasonable assumptions a cost for each technology should be developed on a \$/ton SO₂ basis and stated as such in the matrix. Assumptions and factors used should be stated in footnotes or appendix as is appropriate.

On page 2-12, in the paragraph above the Energy and Non-Air Impacts section it is requested that the last sentence be removed.

It is recommended that Table 2.3 should be re-worked to show information for the average monthly price (not 3 days). Please add four rows of information as follows:

Bituminous/Subbituminous
Heating value (BTU)
Percent Sulfur (%)
Average price per MMBTU

Table 2.4. Change header to read 2005 average U.S. Bituminous... and remove 2005 from column headers.

When tables are cited in the text please use the full designation. In some cases you have indicated Table 2, when the table is numbered Table 2-2.

It is recommended that a paragraph describing bituminous and subbituminous coal should be added to the document.

It is recommended that the data in that is in paragraphs be placed in tables. For example on page 2-10, the third paragraph under the Cost of Flue Gas Desulfurization (FGD)-Spray Dry section.

It is recommended that the information in this section should be made comparable to the information in the ICI boilers and kilns section.

It is requested that the heat input for EGUs should be in megawatts (MW).

Chapter 3 - Point Source Analysis: EGUs

In Tables 3.1 and 3.3, the MD units are covered under the Maryland Healthy Air Act, thus they will get SCRs and FGDs in the 2009/2010 timeframe.

It was stated that there is an FGD planned for the Cheswick, Pennsylvania source and it is requested that MACTEC look into it.

It was stated that the VISTAS Base G Emissions Inventory Report previously completed by MACTEC contains information about planned controls for sources in the VISTAS states of Tennessee and West Virginia that were not included in the report. For example, the Johnsonville Tennessee source has significant SO₂ reductions planned due to fuel switching. It is requested that this information be integrated into the report.

Table 3.1, please add to heading in the last column to emphasize this is a CAIR Plus scenario. Also, keep information in the table heading.

It is requested that a section be added to the document that compares controls expected between Tables 3.1 and 3.3 (i.e. one is based on CAIR Plus modeling projections and the other contains information from the states).

It is requested that a table for EGUs (similar to Table 4.4 for ICI Boilers) be added to the document.

Chapter 4 - Source Category Analysis: ICI Boilers

Pages 4-1 to 4-4 (4 pages) serve to introduce a chapter that is only 14 pages long in total. Many ideas on these pages are repeated later in the text. Please shorten up this introduction and remove repetition. Separate the excellent regulatory section into its own header.

Tables 2.1 and 4.1, please separate switch to coal and switch to NG into two separate rows in the table and then treat these as separate control approaches in the text. In the text following Table 4.1 on page 4-6 please tighten up the text. Move misplaced information for low-sulfur coal, reduced sulfur oil and natural gas in to the appropriate sections.

Fuel switching is treated in chapters for EGU (Chapter 2) and ICI boilers (Chapter 4). Consolidate all fuel switching information into the first section (Chapter 2) and refer to that comprehensive section in Chapter 4. Check page 4-13 for more fuel switching information that could be added to this comprehensive section.

On page 4-7, it is requested that the combustion control section should be have a sub-section called dry sorbent injection and the two methods should be discussed in this section.

In Table 4.4, oil with the use of FGD (Wet) does not contain an SO₂ Reduction. It is requested that the reduction be added.

Page 4-11, Table 4.3 Add the words Dry Sorbent Injection to the title. Remove the column titled “Technology” from the table.

Page 4-12, Table 4.4. Add the words Flue Gas Desulfurization to the title. In the second column remove FGD from the individual rows and add it to the column header.

Chapter 5 - Point Source Analysis: ICI Boilers

Delaware is absent from Table 5.1. Sulfur limits for heating oil in Delaware range from 0.3 to 1.0%. Typically, the actual sulfur levels (based on fuel tests) are around 2500ppm.

In Table 5.1, NRG Energy Center Dover LLC is not BART eligible. Therefore, the commenter does not expect plans to be submitted to Air Quality Management section. Unfortunately, one of the permit engineers erred in her discussions with Lori Cress of MACTEC. Also, that unit is an EGU not an ICI boiler

Chapter 6 - Kilns

On page 6-4 the last paragraph is too detailed for the introductory section. All information here related to fuel switching should be moved to the Fuel Switching section.

Additional discussion of the cost of SO₂ removal from kiln exhaust should be highlighted in the text. Costs are between \$2000-\$7000 for kilns, while for EGUs they are an order of magnitude lower.

Chapter 7 - Heating Oil

More discussion of low sulfur fuel oil availability is needed. Hopefully this will be forthcoming from stakeholders.

The technology needed to remove sulfur at the refineries should be discussed. Based on the first paragraph of chapter 8, it seems that less than 50% of all distillate oil currently has sulfur removed. How difficult and expensive (on a \$/ton SO₂) will it be for refineries to remove the sulfur from 100% of the distillate oil processed? How quickly can equipment be installed to accomplish this? This chapter should address these questions that decision makers will ask. Using some reasonable assumptions, engineering

economics analysis, and standard factors, this should be developed from the information in Table 8-2. This analysis should be documented.

Page 8-2, Table 8.2., add the words Ultra Low Sulfur Diesel to the title.

At the bottom of page 8-3, 5000ppm should be 500pm.