Meeting to Discuss Fine Particulate Matter (PM2.5) Issues and Relationship to Mirant's Potomac River Generating Station

February 20, 2008, 10 am – 3:00 pm
MWCOG, Rooms 4&5

Mike Dowd, Virginia DEQ, after introductions, stated that the purpose of the meeting was to answer three questions:

1) Has attainment modeling for the PM2.5 SIP been done in conformance with EPA requirements and guidance?
2) Is the PM2.5 monitoring network adequate to demonstrate compliance with the NAAQS ?
3) What is the appropriate mechanism to deal with the issues?

1. State Implementation Plan Overview

Brian Timin, EPA's Office of Air Quality, Policy and Standards (OAQPS) discussed EPA's national modeling guidance. The PM2.5 modeling guidance document covers both PM2.5 and regional haze. It uses an attainment test anchored by ambient data. For the purposes of Unmonitored Area Analysis, EPA has software to do this, but the software is not finalized yet. It uses interpolated design values. EPA does not have a definition of an Unmonitored Area and expects the state and region to work out the modeling. Local Area Analysis is an option for areas that have local hot spots and are not attaining the standard. If an area is attaining and there isn't a large gradient, there is no reason to do a Local Area Analysis. The EPA modeling guidance needs to be updated to address the new 24-hour standard for fine particles. He said there are two choices for addressing hot spots: 1) control the emissions or 2) put a new monitor in the area.

Tom Ballou of VA DEQ gave an overview of the State Implementation Plan for fine particles. The monitors in Northern Virginia meet both the annual and the 24-hour standards for fine particles. He presented data from the monitors and modeling to demonstrate that significant progress reducing fine particles has been made and will continue. He said emissions from the PRGS from 2002-2007 show a steady decline in sulfur dioxides and nitrogen oxides (actual emissions). He concludes that the Washington region's monitoring network is adequate, the entire area meets the standards for fine particles, and that no hot spots exist.

Maureen Barrett asked which emissions were used in the modeling. Mike Kiss said that projected actual emissions, not allowable, were used, which is consistent with attainment modeling methods. Lalit asked how one would know if there was a large gradient in concentrations. EPA said that monitoring data should be used. Lalit asked if EPA has released all of the guidance needed to

address local hotspots. EPA said yes, but that each situation is unique so there is no set protocol from EPA.

A definition of hot spot was discussed and EPA agreed that it does not have a single consistent definition of "hot spot." There are some inconsistencies between the term hotspot in the transportation conformity and SIP context.

2. Monitoring Guidance Overview

Lew Weinstock, EPA OAQPS, discussed EPA National Monitoring Guidance. The three key monitoring issues are 1) status of the PM2.5 monitoring methodology; 2) criteria for acceptance of monitors and sites; and 3) special considerations for ambient PM2.5. Regarding monitoring for PM2.5, there are 3 types of monitors: TEOM (continuous monitoring), FRM (filter-based) and EBAM (portable monitors used in emergency response situations). He presented side-by-side monitoring results showing that EBAM is much less reliable than the other methods (often substantially overstating concentrations measured by the other methods) and is therefore only appropriate for emergency response situations.The only monitors approved for attainment demonstrations are the filter-based FRM, Federal Reference Monitors. The siting criteria for these monitors contain limitations upon the vertical range of the monitoring probe, which must be placed within a vertical range of 2 to 15 meters. There is a FRM monitor on Marina Towers, the residence closest to the PRGS, but the monitor is 40 meters high and does not meet EPA's siting criteria.

Chuck Turner, VA DEQ Director of Air Quality Monitoring, said that Virginia DEQ has five PM2.5 monitors in Northern Virginia; three of these are in Fairfax County. In June 2005 EPA evaluated Virginia's PM2.5 monitor network and said that the Fairfax County monitors provided redundant data and that two were likely all that was needed. VA DEQ is preparing a new Monitoring Network Review plan and is looking into a site for a PM2.5 monitor in Alexandria. It will start off as a special purpose monitor with the ultimate goal being to install an FRM monitor, providing National Ambient Air Quality Standards-level data. The monitoring plan will be available for public comment in mid-March.

3. Differences in Application of Models for SIP Attainment Test and NSR

Denis Lohman, EPA Region III, discussed differences in applying models for SIP attainment tests and for New Source Review. Models used for attainment and for permitting are different. Modeling for attainment is done to test a hypothesis that actions taken will result in improvement. Permit modeling demonstrates that proposed emission increases won't violate NAAQS. In PSD areas, Significant Impact Levels (SIL) can be used to determine emissions significance. In

response to a question, Mike Kiss said that if a facility proposes a net emissions increase, the source must provide offsets.

Mr. Lohman pointed out that certain concepts in point source modeling for other pollutants may not make sense when applied to $PM_{2.5}$ modeling. His example noted that the addition of the full background value of $PM_{2.5}$ to a modeled source impact for the purposes of determining compliance with standards may be much too conservative. His suggestion was to use approximately 20 ug/m^3 for quarterly calculations instead of 30+ug/m^3 .

4. Air Quality Analysis of PRGS Using Monitoring and Modeling Data

Bill Skrabak for the City of Alexandria, said that the SIP is the appropriate place to address issues with the Potomac River Generating Station. The unique circumstances are that the facility has short stacks, has a documented downwash issue, has caused monitored exceedences of the sulfur dioxide NAAQS, and fine particle emissions have increased due to sorbent injection. The City wants Local Area Analysis or hotspot or microscale analysis done by EPA or DEQ for the area where the plant is located. He said that EPA has indicated that a Gaussian dispersion model is the appropriate tool to assess local hotspots. If the modeling shows a compliance issue, the permit should be changed or new controls should be required.

Maureen Barrett discussed modeling performed for the City. She said the emissions reductions at PRGS were not achieved for the PM2.5 SIP. The proposed permit with 5 boilers and a stack merge is expected to increase daily emissions and degrade air quality. She discussed results from CALPUFF modeling to support her statements. Lalit Sharma said the City placed an EBAM monitor at Marina Towers in October 2006. It's a quick tool to monitor the situation. Ms. Barrett said one FRM monitor on Marina Towers isn't adequate to demonstrate NAAQS compliance. She also said that the TEOM monitor at the southeast fenceline of PRGS is not at the location of highest impact. There is varying loads for the burners and a highly variable wind direction. Opacity monitors were used to measure direct PM emissions from the stacks because opacity is correlated with PM2.5. Bill Skrabak said that the City has not yet received data requested from DEQ and Mirant on opacity and PM2.5. Maureen Barrett called for compliance assurance monitoring.

Dave Shea, ENSR, discussed air quality monitoring and modeling done for Mirant at PRGS. ENSR has been modeling PRGS since 2004. In 2006 sulfur dioxide monitoring began. He performed AERMOD modeling based on the PM2.5 and SO2 data from the monitors at PRGS. The data from these monitors at PRGS are consistent with regional monitors. He said the local monitor measurements don't indicate a hotspot. He said that analysis conducted by ENSR indicates that the point of maximum impact is the roof of Marina Towers. Highest concentrations are detected when the wind is from the south. The facility

is a large emitter of SO2. Regarding AERMOD modeling, he said AERMOD is not doing a good job of predicting PM2.5 levels in general.

Julie Crenshaw Van Fleet, Alexandria resident and member of the Air Quality Public Advisory Committee (AQPAC) said the Agency for Toxic Substances and Disease Registry (ASTDR) did a study of emissions at PRGS and that the results would be released this year. She said a monitor could be located at the SW corner of the facility, as shown by ATSDR.

5. PM2.5 Policy Update

Mike Kiss, Virginia DEQ, summarized the discussion. DEQ is encouraged by the fact that the 2006-2007 air quality measurements in the vicinity of the PRGS do not appear to be exceeding the NAAQS albeit it is only one year of data and there are other limitations in using these data such as siting criteria. He said that fine particle data collected during 2007 at the PRGS FRM monitor resulted in a 98^{th} percentile 24-hour value of 32 $\mu g/m^3$ and an annual average of 13.5 $\mu g/m^3$. These values are below both the 1997 and 2006 fine particle standards.

There is a general consensus that the largest percentage of air quality impact on Marina Towers, the City of Alexandria and throughout the Washington, D.C. MSA is the result of transported pollution. There is also consensus that the PRGS contributes a small fraction to the air quality impacts in the vicinity of the plant; however, the estimated impacts of the PRGS emissions vary depending on the analysis approach. The definition of a "significant gradient of direct PM2.5" requires national guidance.

There are several technical modeling issues that require further examination and that are critical to an accurate air quality assessment of the PRGS, including:

1. Uncertainty about the impact of condensable particulate matter on receptors located within a short distance of the PRGS stacks, such as those on Marina Towers.
2. Selection of representative ambient air quality background data.
3. Selection of the appropriate emission factors

Additionally, there are currently several technical deficiencies within AERMOD that also could adversely affect the accuracy of any air dispersion modeling exercise. A few of these issues are:

1. Enhanced plume rise feature
2. Area source meander feature
3. Characterization of light and variable wind conditions

It is hoped that EPA will address these issues in order to improve air quality predictions since these tools are critical to permit decisions.

DEQ indicated that the use of monitoring data is valuable. The City expressed the desire to site additional monitors.

VADEQ put a condition in the draft permit for Mirant to do an air quality analysis of the PRGS when an appropriate methodology is available. The City says tools are already available.

VADEQ is forming a PM2.5 Implementation Work Group to address this issue. The States have appealed to EPA for guidance, and VADEQ will develop its own policy as did PA, NY and NJ. VA DEQ would like EPA's help so that the state's policy will be consistent with national policy. The first meeting of the PM2.5 Work Group is tentatively scheduled for March and was advertised on the VADEQ Town Hall.

Dave Campbell discussed the status of EPA's implementation guidance for New Source Review for PM2.5. The transition guidance requires the use of PM10 as a surrogate for PM2.5. He said the rule will be signed soon, before April.

Mike Kiss asked EPA about AERMOD performance issues, since it doesn't model the PRGS very well. Chet Wayland, EPA OAQPS, said AERMOD is fairly new, it's evolving and there are no plans to develop a new model.

6. Discussion and Summary of Next Steps

Mike Dowd, VA DEQ, said the next steps for DEQ are to 1) submit a PM2.5 SIP by April 5, 2008; 2) to add an additional FRM monitor for Alexandria to the state monitoring plan; and 3) to work with the new PM2.5 Implementation Work Group to develop a PM2.5 Implementation Plan for existing sources. VA DEQ believes the modeling analysis in the SIP is complete and meets EPA requirements. There will be a condition in Mirant's permit that Mirant does additional analysis. The same requirement is also included in the SIP and says the analysis will be done when tools are available.

Asked about the scope of the PM2.5 Implementation Workgroup, Mike Kiss said it will be to develop policy to deal with new sources and compliance of existing sources in Virginia. It is intended to deal with permitting issues such as offsets and modeling.

Jeff Holmstead asked, based on the data, is there any reason to believe there's a microscale problem at PRGS. Mike Kiss said based on the monitoring there's no evidence of a hot spot. The modeling results give different answers. The best approach is a combination of AERMOD and monitoring. Mr. Holmstead directed the same question to EPA. Denis Lohman said they are not ready to draw conclusions based on the data. He said the downwash study turned out to be an overestimate. He said the PRGS is a unique situation and is on the edge of what AERMOD is designed to do.

Doris McLeod asked Mirant about its plans for the two monitors at PRGS. Mirant made no commitment to keep the monitors there. Mirant and VA DEQ agreed that the monitors provide valuable information.

Doris McLeod asked about the City's assertion that trona increases PM2.5 given stack test data that provides a contrary assessment. Bill Skrabak said that the stack test data is flawed because Mirant only tested one boiler which happens to have the lower impact.

Finally, Tom Ballou, VA DEQ said it appears that the SIP is approvable. Is there still disagreement about the SIP (to Alexandria). Bill Srabak said the draft stack merger doesn't have a PM2.5 limit. Mike Dowd said that is being addressed by the Virginia State Air Pollution Board. Bill Skrabak said the City wants more concrete language regarding methodology and timeframe for conducting the analysis in the SIP.

The meeting concluded at 3 pm.

Attendees

VA DEQ:
Mike Dowd,;Tom Ballou, Mike Kiss, Doris McLeod, Chuck Turner, Tamera Thompson, Tom Faha, Terry Darton

EPA Region III:
Dave Campbell,; Walter Wilkie, Denis Lohman

EPA Office of Air Quality, Policy and Standards (OAQPS):
Chet Wayland, Brian Timin, Lew Weinstock, Eric Ginsberg

City of Alexandria:
William Skrabak, Lalit Sharma, Khoa Tran, John Britton, Schnader; Maureen Barrett, Aero Engineering; Dennis Hlinka, Sullivan Environmental; Malay Jindal, MACTEC;

Mirant:
Bob Driscoll, Debra Raggio, Walter Stone, David Cramer.
Kevin Finto, Hunton & Williams; Jeff Holmstead, Bracewell & Giuliani; Dave Shea, ENSR

Stakeholders:
Julie Crenshaw Van Fleet, AQPAC; David Snyder, MWAQC

MWCOG Observers:
Joan Rohlfs, Jeff King, Sunil Kumar