DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Resources Impact Work Group
Final Summary of August 8, 2002 meeting
Revised September 3, 2002

The Air Resources Impact Work Group met for a third time on August 8, 2002, to continue its work to address issues regarding air quality impacts and the adequacy of the statewide air quality monitoring network. The Work Group accepted the summary of the July 18, 2002 meeting with a minor addition about air permitting requirements for sources that fall below the emission threshold to be classified as a major source. In response to requests made at the July meeting, DEQ provided a brief overview of the information listed below. The overview included: 1) charts of emissions contributions from point, area, mobile, and off-road sources in Virginia, 2) results of a study conducted by EPA using the Kriging methodology to evaluate the adequacy of the current air monitoring network sites for the measurement of ozone air pollution levels throughout of the State, 3) a map of power plants and ozone monitors (provided by PEC), 4) a list of the types of sources that emit PM2.5 air pollutants, 5) the budget for DEQ's FY 03 air monitoring program, and 6) EPA's criteria for siting and operating air monitoring equipment.

Prior to breaking into two subgroups--one for air monitoring and one for modeling--the full work group had further discussions about a number of issues. There was considerable debate about which pollutants the work group should address in its deliberations and in the final report, and what source sizes (i.e. tons per year of emissions) should be considered and what impacts specifically need to be analyzed. The group agreed that all pollutants (ozone, PM2.5 and PM10, SO2, and NOx) with the exception of CO should be considered by both the modeling and monitoring groups and that the source size cut-off should include sources with emissions less than 250 tons per year. Further discussions on these and other issues were deferred to the subgroups. The meeting information provided below contains the notes taken in each of the sub-group meetings. It is provided mostly as bullets and short phrases rather than a narrative summary of the extensive discussions from each group.

Notes from the modeling sub-group:

Attendees: Facilitator, UVA Institute for Environmental Negotiation
Tom Botkins, MeadWestvaco
Ed Rogers, Malcolm Pirnie, Inc
Monica Gibson, SELC
Tim Lough, SCC
Mark Scruggs, NPS
Cathy Taylor, Dominion Resources
Sheryl Raulston, International Paper

James Browder, Dominion Resources
Paul Greywall, Trinity Consultants
Jim Sydnor, DEQ
Ken McBee, DEQ
Chuck Turner, DEQ

Two key questions:
1) What type of source triggers an analysis (permit or not?)?

2) What kinds of emission sources are included in the analysis?

Currently:

1) What type of source triggers an analysis (permit or not?)?

- Applicants w/ > PSD (Prevention of Significant Deterioration) significant impact levels
- Minor/Synthetic. Minor – All do a PSD comparable procedure
  (– If > SIL (Significant Impact Level), must do a multi-source analysis)
- Regional office has discretion – If a source has never been modeled and the applicant analysis shows that it is close to (or above, if an existing source) PSD SIL's
- Existing source that may significantly impact NAAQS (National Ambient Air Quality Standards) – (found through another's modeling analysis)

2) What kinds of emission sources are included in the analysis?
  If > SIL, then:
- Major/minor point sources – NAAQS
- Do screening analysis – based on state inventory (applicant) accounts for size, distance
- Background included
- Look at the worst case meteorological event and maximum potential impact (all operating at maximum output)

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* Increment analysis – subset of major/minor point sources that consume or expand increments
- Class I requires different models and review
  - Park > 6,000 acres – pre Aug. 1977 (158 such parks nationwide), or wilderness > 5,000 acres
  - If < 100k away, must notify FLM – except for true minors
  - If PSD, FLM (Federal Land Manager) always get involved
  - If Synthetic Minor, land managers use their discretion

Key questions for determining options:

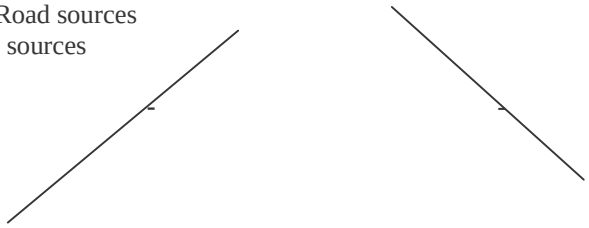
Q. If run multi-source analysis for non-SIL (<SIL) applicants, would it provide significant information? – for **Regulatory** purposes, the answer is NO

Q. Does DEQ have authority to require this? Uncertain; DEQ does have significant authority to protect NAAQS and increments

Q. Basis for SIL was air pollutant detection level. What do these levels mean, why were they set at the levels they are at, and what do they mean now?
Important to distinguish between Ozone & PM (and other pollutants) analysis

Key Tasks

* (Need to determine Background of Sources)
    * DETERMINE AIR QUALITY EFFECTS OF NEW SOURCES ON EXISTING AIR QUALITY
        * Off-Road sources
        * Area sources



STATIONARY Sources **MOBILE Sources**

Major (PSD) ----and----- Minor

Effect = Ambient concentrations of primary & associated secondary pollutants & dry & wet deposition of those pollutants.

Models Coming on Line

Two types:
1) Localized models
2) Long range transport

1) Localized models

Advantages: Simpler, relatively cheap, in existence a long time
Problems: No chemistry, ozone, visibility, or deposition capability

- ISC – (Industrial Source Complex)

- AERMOD – New – will replace ISC but currently need EPA permission to use

Advantages: Better science – more accurate, better algorithm for dispersing pollutant; still < 50K-range limitation

- VISCREEN – single source; for coherent plume; just visibility
  - NO2, PM plumes
  - Sulfate? Maybe

- PLUVUE – go to PLUVUE for more refined analysis if flunk VISCREEN

2) Regional Models

Two Kinds: 1) Lagrangian (PUFF) – (could also be used < 50K). 2) Eulerian (GRIDDED)

1) Lagrangian
Advantages:
- Allows for meteorology to vary over time and place
- Includes secondary (chemical) pollutants
- Dry & wet deposition
- Can do visibility calculations

Weaknesses:
- Chemistry weak with multiple sources
- Expensive – labor & computer time
- Concerns with accuracy

CALPUFF < 300K Capability
- Not yet in regulatory application - "preferred but not required"
- Limited in number of sources it can handle ~25, so may get less accurate results if more sources are modeled

2) Eulerian Models

- For use by multi-state organizations (not applicants)– doing for Virginia as part of region; states will use for ozone analysis.
- No limit on number of sources and distance.
- Chemistry more accurate
- Provides the only ozone Model
- Set up costs high, then cheap to run, but not useful for a single source contributor below a certain emission threshold (some disagree).

Virginia is using this more, especially for ozone in Northern Virginia. DEQ has run the model for 16 new and proposed plants, but they're not certain if the numbers are real because of small size of the predicted air quality change (model not accurate enough)
Examples:
- CMAQ (Virginia using)
- CAMX (some states)
- RADM – EPA (not for ozone – for deposition)
  REMSAD (simpler version of CMAQ)

Notes from the air monitoring sub-group:

Attendees: Facilitator, UVA Institute for Environmental Negotiation
Dudley Rochester, MD, American Lung Association
Dan Holmes, Piedmont Environmental Council
Ellie Irons, EIR, DEQ
Tom Jennings, Air Monitoring, DEQ
Dan Salkovitz, Data Analysis Office, DEQ

Topics Discussed:

1) Acceptability of non-DEQ data for inclusion in the EPA AQS Database
   a. Fairfax Co. and Alexandria Health Dept.'s are part of the VA DEQ monitoring network
   b. Non-DEQ sites would have to meet EPA siting criteria, and QA/QC requirements (including maintenance, calibrations, span and precision checks, QA and audits)
   c. For DEQ to use non-DEQ data, it would be preferable if the sites operated year round

2) Gaps in Monitoring Data... Do they affect quality of information?
   a). Filling gaps is useful for other purposes such as health warnings, determining impact on Chesapeake Bay, impact on agriculture

3) Criteria for placement of monitors?
   a) Tools / Ideas
      - Use uncertainty areas developed by Kriging, i.e., place monitors in "highest" uncertainty areas identified by Kriging
      - place monitors where industry will be developed
      - Place monitors where data can be used for informed decisions about health and industry can be made (use modeling to help in this regard)
      - Place monitors where there are "holes" in the network
      - Use data (modeled or real) from other states to determine impact areas of emissions, and place monitors there
   b) Is there a better way to determine non-attainment areas (i.e., a way that is not based on or influenced by political boundaries?
   - Use modeling more actively to determine real (non-political) boundaries and place monitors in non-attainment areas
   - use modeling to determine "airsheds" and place monitors where we need more info on an "airshed"
   c) If data are not being used from a monitor, move monitor to where it can be useful

4) Which pollutants need to be monitored?

Pollutants considered:

a) Ozone -

-20 DEQ monitoring sites currently operating; Fairfax County and one by the National Park Service operate an additional 3 monitoring sites

- There is a gap in Central Virginia
- All agree that more ozone monitoring is needed in VA; the Kriging study did not include the ozone monitor at Natural Bridge Station;
- One or more ozone monitors are needed in Central VA; perhaps in the Charlottesville area

b) **PM2.5** (includes 24-hour mass sampling, continuous sampling, and speciation)

- Placement of PM2.5 monitors is strictly population driven. However, they could be placed where industry is located. Since 1999, DEQ has been monitoring PM2.5, but still doesn't know exactly the origin of the emissions. There are 3 "speciation" monitors in Virginia, which give a specific chemical fingerprint to enable identification of the source or sources of the emissions. These also provide information on S and N deposition. As an example, one speciation in the Midwest showed that PM2.5 was coming from China. Another example was cited that shows that we get dust form Chad and the Western Sahara.
- Another issue is the impacts of PM on rainfall. There is some (preliminary?) data that suggests PM may impact cloud formations and rainfall.
- Information needed: does industries that use natural gas emit more PM2.5?
- There are currently 23 Mass samplers at 20 monitoring site; 2 IMPROVE samplers; 3 Speciation samplers; and 2 TEOM continuous samplers. TEOM samplers give hourly values and can be used for PM forecasting.
- There is a gap in Central Virginia. If additional PM2.5 monitors are installed, they should go to population centers such as Charlottesville, then Martinsville/Danville area.
- PM2.5 speciation monitors have been placed in areas of high PM2.5 readings.

c) **PM10**- good database already exists

-18 monitors operate in different parts of the Commonwealth
-If there is a gap, it is in Central Virginia
-Most of the PM10 sample is rally PM2.5
-Use PM10 data to determine where PM2.5 data are needed

d) **VOC**- this is a new monitoring program (fall 2001) mostly federally funded; VOC's are precursors to ozone

- 1 monitor is operated in Henrico Country; this may be sufficient

e) PAMS (photochemical assessment monitoring station) - monitoring for ozone precursors; expensive

- 1 monitor operating at Lee District Park (Fairfax Co.); this may be sufficient

f) NO-NO2-NOx-

- Low NOx concentrations are measured across the State
- 9 DEQ monitoring sites operating and 2 additional sites operated by Fairfax County.
- No additional NOx monitors appear necessary, at this time

- Deposition is covered by the acid precipitation network

g) Acid Precipitation Monitoring Network

- 3 sites, one site is operated in each of these areas: Hampton, Rockbridge County, and Occoquan (Fairfax Co.)
- Sulfates and nitrates impact Chesapeake Bay watershed
- A new site is being established in Hampton; this will help determine deposition in the Bay.
- Langley is a possible new site
- The Occoquan, Hampton, and Rockbridge acid deposition monitoring sites are being converted from the Virginia Acid Precipitation Network to the National Acid Deposition Program (NADP) as part of the National Trends Network.
- Mason Neck on the Potomac is another possible site as a replace for Occoquan.
- JMU is establishing a monitor for the NADP because of ammonia released from turkey farms and processing plants.
- A major gap exists in the network on the Eastern Shore and in the Northern Neck (need to be in remote areas away from the localized interference from sources).

Questions not yet covered by the air monitoring subgroup:

1) New Monitoring Technology?

2) Which emission sources need to be monitored?

Near the end of meeting, the full group re-convened for brief presentations on the information discussed in each of the sub-groups. Also, at this time group members were requested to consider the issues of prime importance to them and describe those concerns and options for addressing them in issue papers to be discussed at the September meeting. A memo describing the information requested along with a suggested format for preparing this information was provided.

THE NEXT MEETING IS SCHEDULED FOR **SEPTEMBER 9, 2002.** THE MEETING WILL BE HELD AT DEQ'S CENTRAL OFFICE, IN THE FIRST FLOOR CONFERENCE ROOM AND START AT **10am.**

9/3/02