



Recommendations to MANE-VU for BART-related CALPUFF Modeling

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BART Exemption Modeling

- *MANE-VU has recommended to its states that no exemptions from BART should be allowed for eligible units*
- *However, states in MANE-VU should seriously consider allowing exemptions*



Why Should Exemptions be Allowed?

- *Due to the stringent visibility thresholds involved (0.5 dv, 20% best days), only sources with low emissions would be exempt*
- *As far as I know, all other RPOs are allowing exemptions, so without any exemptions,*
 - ❖ *BART procedures in MANE-VU states would be inconsistent with states in all other RPOs*
 - ❖ *States in MANE-VU would place their industrial sources at an economic disadvantage relative to industry in the rest of the country*



Exemptions from BART (cont.)?

- *EPA has been challenged in court once again for providing states with an option that prevents any exemptions in the final BART rule.*
- *The 2001 proposed BART rule that did not consider exemptions was remanded due to this issue.*
- *If it is remanded again, then MANE-VU may need to start all over again in BART assessments if it does not allow exemptions now.*



How Would Exemptions be Determined?

- *VISTAS is finalizing a common modeling protocol by November 30, 2005.*
- *The general approach used by this protocol could be considered as a starting point.*
- *Possible MANE-VU approaches*
 - ❖ *Follow VISTAS-like approach (common protocol to start, with consistent site-specific protocols)*
 - ❖ *Facilities submit their own modeling protocols and analyses to state agencies without common guidance*



VISTAS: Is a Source Subject to BART?

- *Source contributes to vis. impairment if > 0.5 dv impact*
- *Use CALPUFF to determine if source is subject to BART*
- *Apply CALPUFF for SO₂ + NO_x + PM across all eligible units, compare to 0.5 dv change from natural background*
 - ❖ *EPA: natural background is defined as 20% best days (not annual average)*
 - ❖ *use 98th % value: either 8th highest day in each year or 22nd highest day in 3-year period, whichever is highest*
 - ❖ *Define emissions for modeling using maximum 24-hr actual emission rate for most recent 3 or 5 years*



VISTAS: CALPUFF vs Alternative Models

- *VISTAS expects CALPUFF to be used to determine if a source is subject to BART*
- *If a source wants to use an alternative model, the source needs to submit a written justification to the state for review*



VISTAS: Is a Source Subject to BART?

- *VISTAS is considering Q/d as a presumptive indicator that a source is subject to BART.*
- *If Q/d > than 10, then State presumes that source is subject to BART; no exemption modeling required*
 - ❖ *If source agrees, then proceed to evaluate impacts of control options and perform engineering analyses.*
 - ❖ *If a source disagrees, may perform CALPUFF modeling to determine if impact is <0.5 dv*



VISTAS: BART Control Modeling

- *Use same model assumptions for pre-BART visibility impact and for BART control options*
 - ❖ *Baseline visibility from pre-BART run*
 - ❖ *Change one control at a time*
 - ❖ *Evaluate and contrast changes in visibility impact*
- *Visibility impact is one of five factors considered in engineering analysis*
 - ❖ *BART may be no control*
 - ❖ *If a source accepts best controls as BART, then engineering analyses not required*



Modeling of BART Control Options

- *The most common case will be that BART-eligible sources are subject to BART*
- *In recent discussions with EPA, ENSR has noted that CALPUFF modeling of visibility improvements for emission controls options should consider SO₂, NO_x, and PM emissions together*
- *The modeled visibility improvements would be considered, with 4 other factors, for the BART determination*



Modeling of Alternatives to BART (limited version of trading program)

- *Once BART is determined, alternative options to BART for a single facility could be considered without trading with other companies*
- *Could involve trading with other facilities owned by the company involved*
- *These alternatives could involve controls for non-BART units (including shutdown), or possibly applying additional controls to one or more pollutants (among SO₂, NO_x, and PM₁₀) for various emission units at the facility.*



Modeling of Alternatives to BART (limited or full trading program)

- *CALPUFF modeling of alternative case vs. BART case would determine whether alternative case will provide better visibility improvement.*
- *Due to changes in plume location or plume rise for alternative case, test for better visibility improvement would be unpaired in time and space*
 - ❖ *Tally number of days with extinction above 0.5 for each case over all Class I areas involved*



Evaluation and Selection of Regional Model to Confirm Progress

- *Model tests to date have focused upon predicting individual PM components*
- *In some cases, the regional models (e.g., CMAQ) can seriously overpredict nitrates in winter*
- *Besides individual PM components, the models should be tested for predicting observed reductions in PM from past emission reductions over a period of years*



In Models We Trust, or do we?

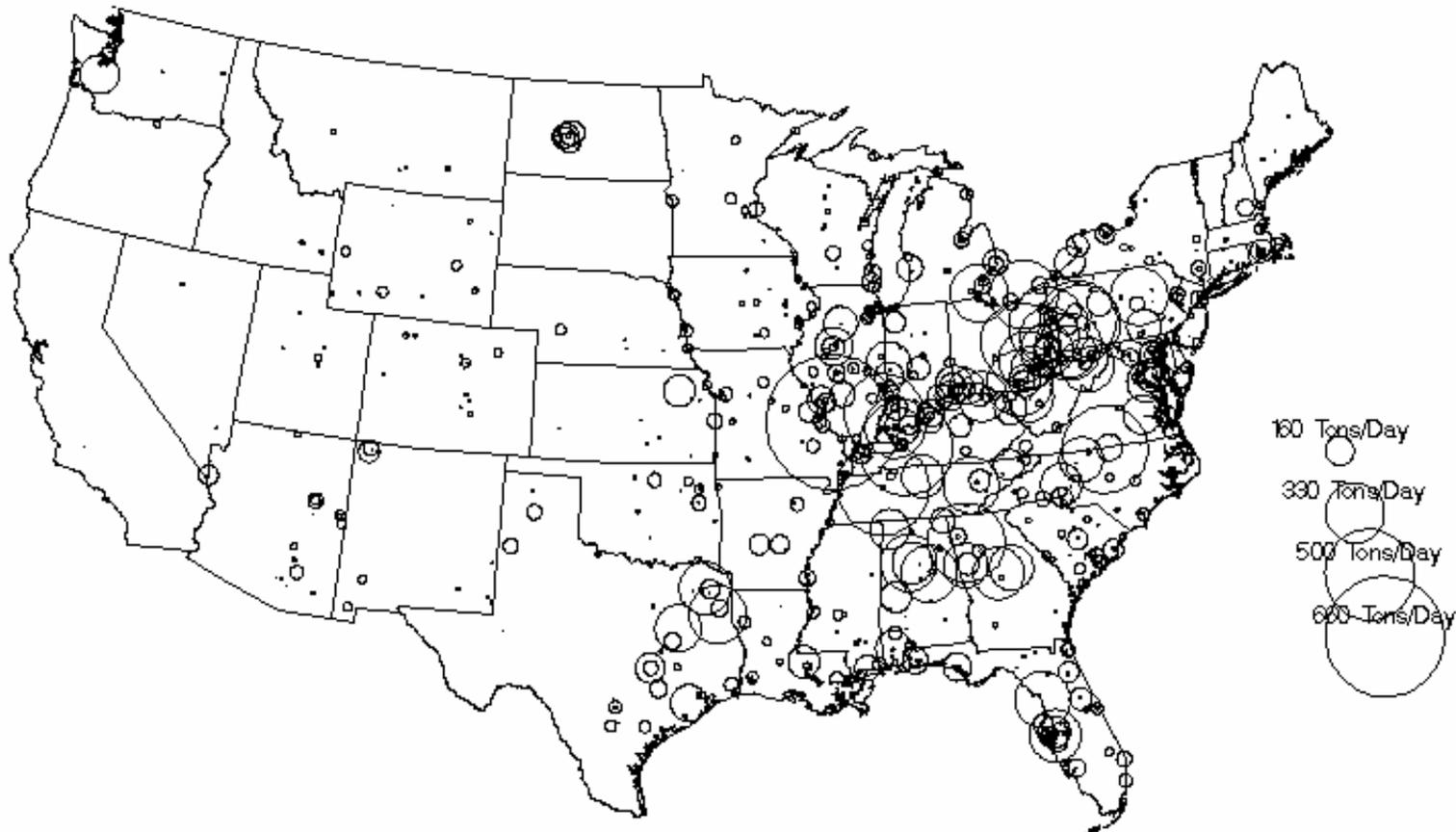
- *The regional models are being used to determine whether proposed emission reductions are adequate to reach attainment standards and RHR goals*
- *There is a lot at stake!*
- *The selected models and numerous technical options should be tested with past emission reductions and their beneficial effects to be trusted for these important decisions*
- *Consider changes between 1999-2002*



1999 SO₂ Emissions

Circle Plot of SO₂ Sources

CASE: BaseE

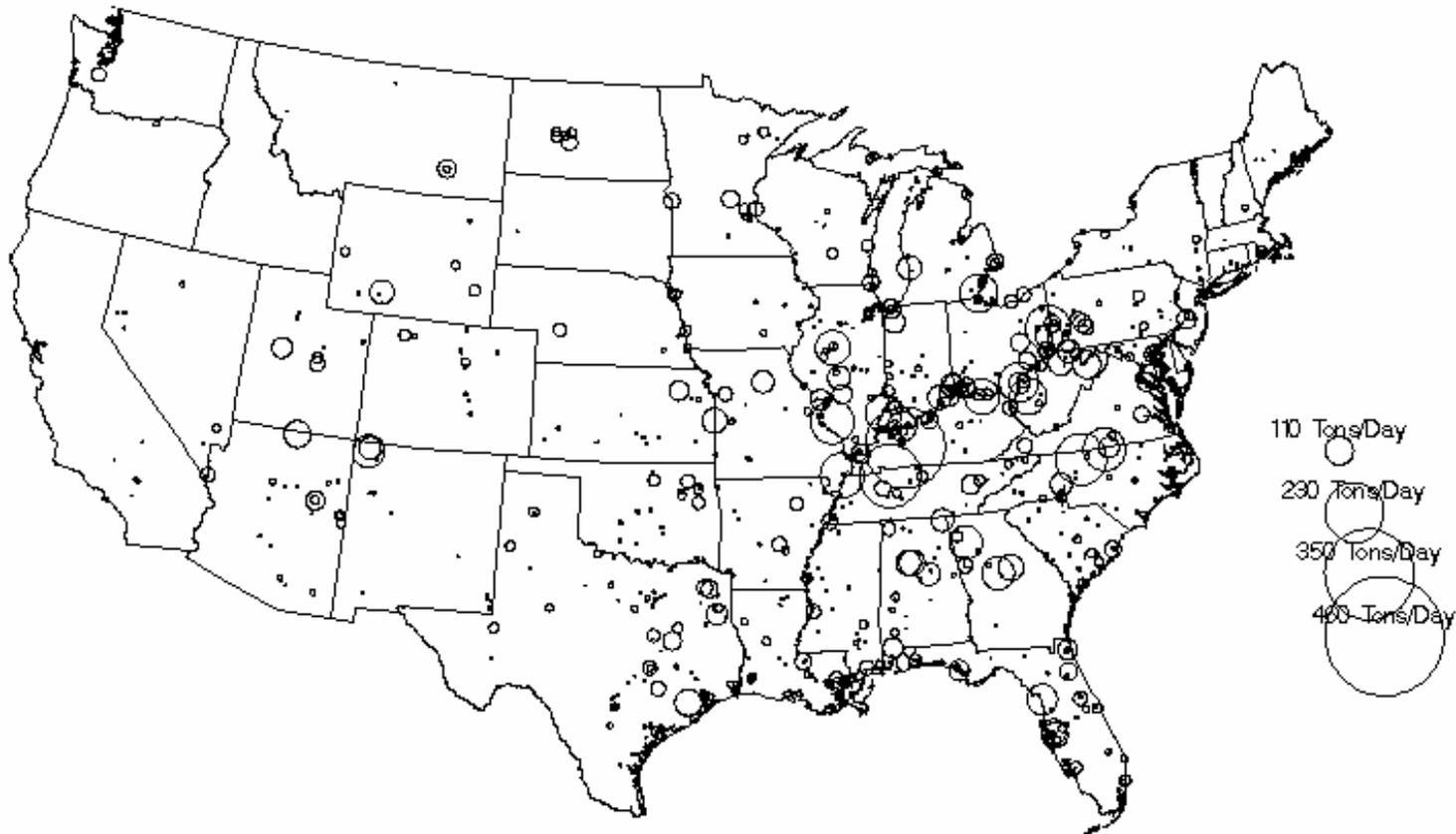




1999 NO_2 Emissions

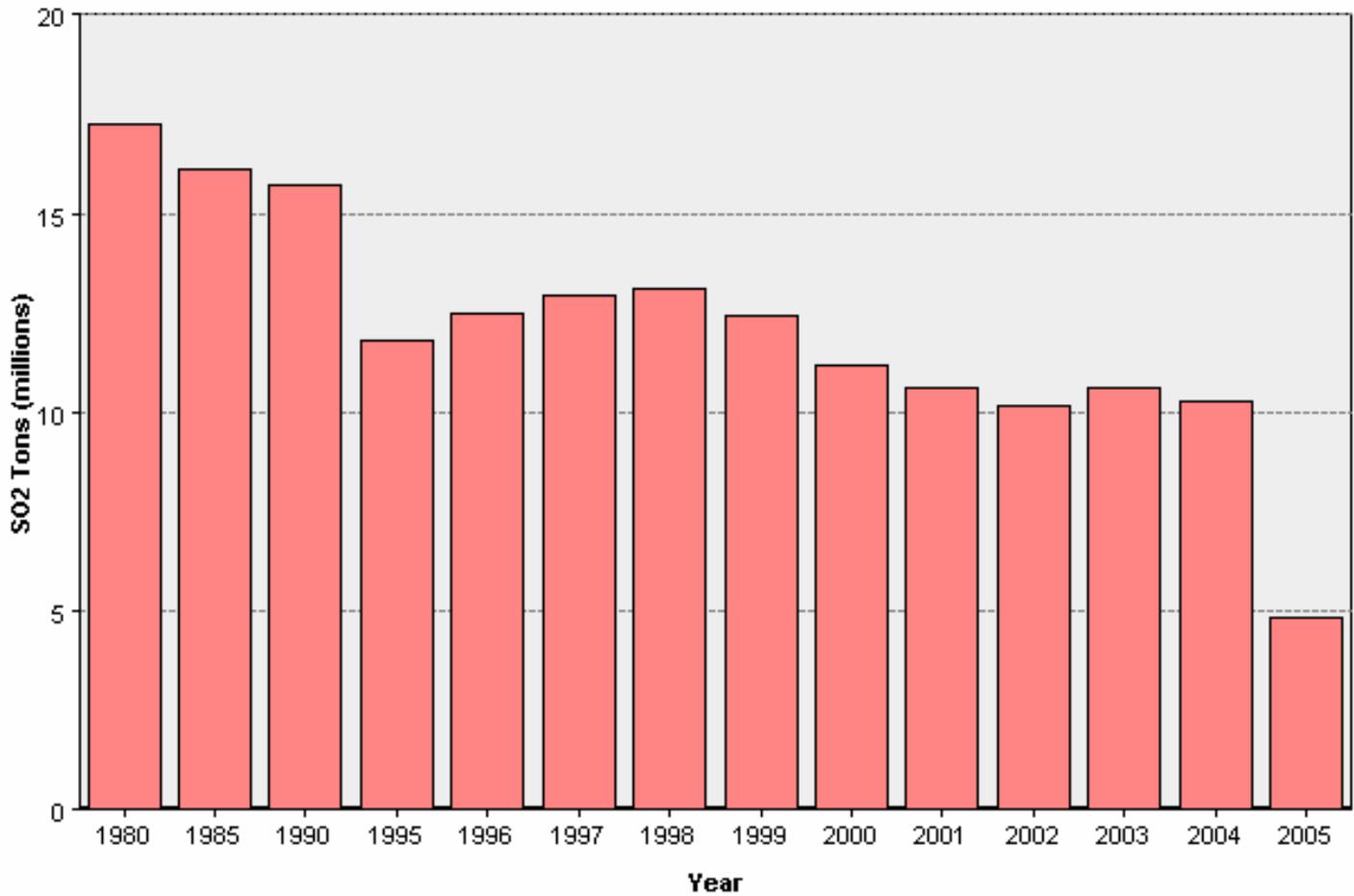
Circle Plot of NOX Sources

CASE: BaseE





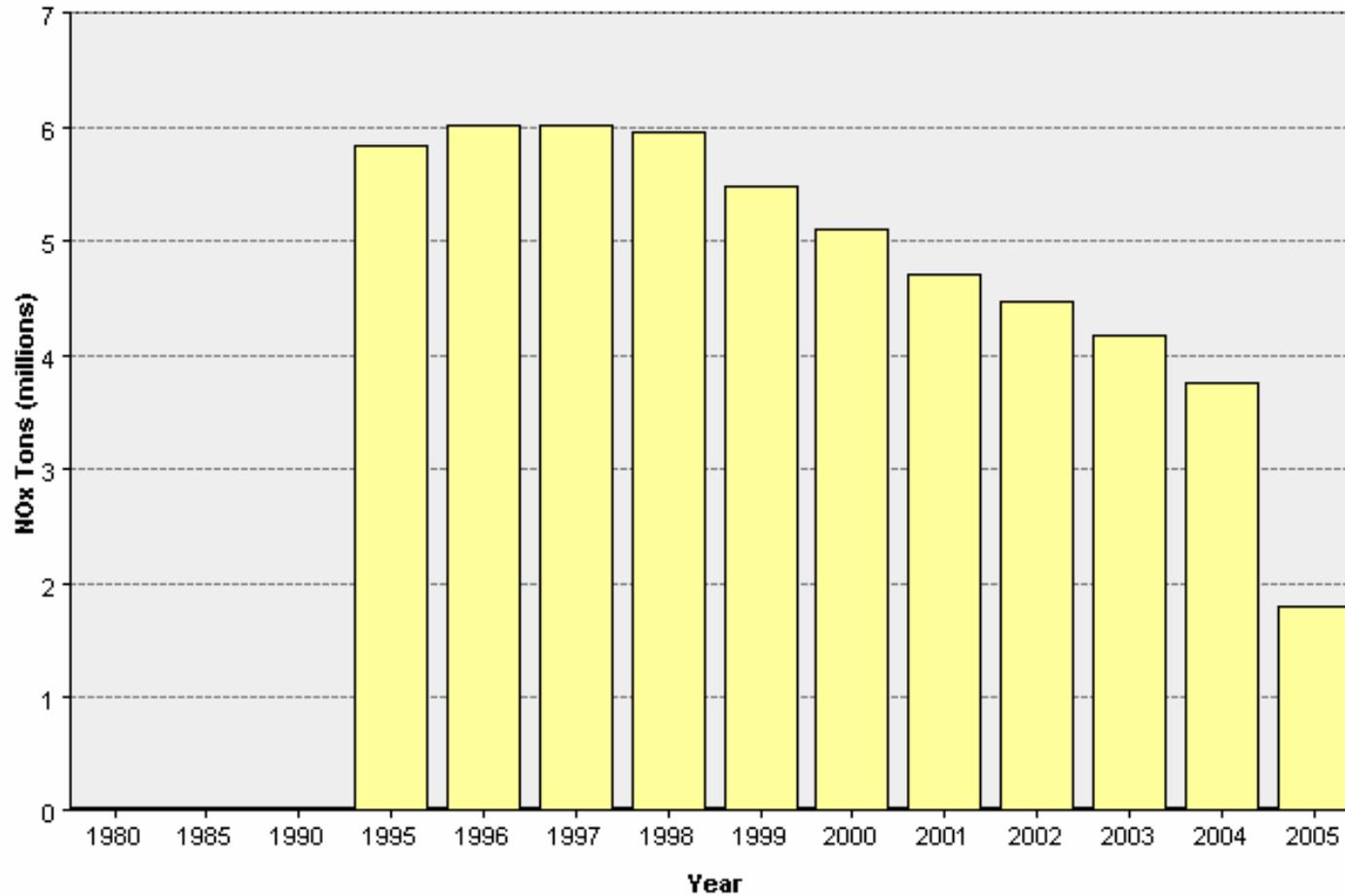
Acid Rain SO2 Emissions Trends, 1980 through 2004



Year	SO2 Tons
1980	17,261,667
1985	16,092,165
1990	15,733,283
1995	11,835,679
1996	12,513,767
1997	12,942,959
1998	13,093,281
1999	12,431,844
2000	11,202,056
2001	10,638,052
2002	10,196,291
2003	10,596,817
2004	10,259,165
2005	4,826,572



Acid Rain NOx Emission Trends, 1995 through 2004



Year	NOx Tons
1980	0
1985	0
1990	0
1995	5,841,113
1996	6,012,131
1997	6,026,695
1998	5,967,006
1999	5,488,381
2000	5,103,851
2001	4,705,775
2002	4,473,983
2003	4,170,231
2004	3,762,792
2005	1,796,956



Air & Waste Management Association's

Canadian Clean Air Policy Conference

January 23 - 25, 2006

Sheraton Ottawa Hotel, Ottawa, Ontario, Canada

<http://www.awma.org/events/confs/CanCleanAirPolicy06/CanCleanAirPolicy2006PrelimProgram.pdf?mtc=003>