

Suggestions for Documenting Modeling for SIP a Submittal?

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Disclaimer 1

On December 22, 2006, the U.S. Court of Appeals for the District of Columbia Circuit vacated and remanded EPA's Phase I rule implementing the 1997 8-hr ozone NAAQS. The Agency is still considering how to respond to the Court's remand and we do not yet know how issues related to 8-hr ozone will ultimately be affected. Direction from EPA HQ, Region 4 is required before formal comments on 8-hr ozone requirements are provided.




Disclaimer 2

- This presentation is not an all-inclusive or exhaustive compilation of the material that should or could be included in a State Implementation Plan (SIP) revision.
- Addressing only the items discussed in the presentation does not guarantee that the SIP, when submitted to EPA, will be approved.
- The presentation is provided as a resource for consideration in documenting a SIP.
- States have flexibility in how they document their SIPs.



Why Document?

- Necessary for EPA to review and process a SIP.
- Provides information on the procedures, assumptions, deviations from CAA, EPA policy and guidance, etc. that lead to conclusions, budgets, control strategies, regulations, CAA compliance, etc.
- Explains why revision is needed, why revision should be approved.
- Provides needed information to support the State requested action.
- Useful in drafts, finals, pre-hearings.
- For public and stakeholder review.
- Used by EPA in writing Federal Register analysis to support Agency action on the SIP revision.




How to summarize the technical data?

- Tables
- Plots (e.g., spatial concentrations)
- Maps
- Spreadsheets
- Reports
- Protocols
- Discussions
- No use of websites in Final SIP




Sample EPA References

- *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze* – photochemical guidance
- 40 CFR, Part 51, Appendix W: *Guideline on Air Quality Models* – dispersion guidance
- *AERMOD IMPLEMENTATION GUIDE*; September 27, 2005
- Location for modeling guidance:
(<http://www.epa.gov/ttn/scram/>)
- Regional haze Q&As




Examples of what should be documented in the Ozone, PM_{2.5} and Regional Haze SIP?

- Regional haze (RH)
 - Best Available Retrofit Technology (BART)
 - Eligible sources, exemption process, determinations (5 factors), etc.
 - Reasonable Progress (RP) strategy
 - Class I areas, 4 factors, glidepath, Long-term Strategy, 20% best and worst days, etc.
- PM_{2.5} and Ozone
 - Reasonably available control measures (RACM), Modeled attainment test, SMATS, Weight of evidence (WOE), control strategy, emissions reductions expected, etc.
- All Modeling
 - Emission inventories, episodes, air quality and meteorological models model performance
 - Relative reduction factor (RRF) analyses, WOE




So Many Questions Need Addressing?

- What models are being used and why?
- Why are the air quality and meteorological models performing at an acceptable level for predicting future strategies for the NAA? The Class I area? The Domain?
- How are emissions developed and projected?
- Quality assurance and control procedures?
- What emission rates were modeled for the point sources?
- How were deviations to protocols addressed?
- What were and where are the protocols?




So Many Questions Need Addressing?

- How were public hearing comments addressed?
- How were EPA and FLM BART modeling report comments addressed?
- Where are the modeling input/output files?
- How are these files archived and accessed?
- What are the BART sources and how were they exempted and evaluated?
- How was speciation used/developed for BART modeling?
- Deviations from EPA guidance were what and why?



So Many Questions Need Addressing?

- How is attainment achieved in the NAA and by what year?
- What is the Reasonably Available Control Measure (RACM) analysis?
- Was RACM modeled? Why Not?
- What control measures were modeled?
- How is a WOE demonstration used to show/support attainment for the NAA?
- How does the WOE support reasonable progress?
- How were the 4 factors for RP and 5 factors for Bart addressed?
- How was localized PM_{2.5} modeling developed?

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- These responses to these questions and many more are part of the documentation for the Regional Haze, ozone and PM2.5 SIP.
 - Let's discuss a few specific items.

Emissions Summary Tables

- Should be provided for ozone and PM SIPs
- Should address base year, future baseline and Attainment strategy emissions
- Addresses each county in the nonattainment area and each pollutant
- If interstate NAA, includes emissions from other state.

DaVinci NAA counties	Point	Area	Nonoad	Onroad	Total
Rosslyn					
Paris					
London					
Totals					

Area source emissions

Item	ASCT	Category Description	Total Activity	Pt Source Activity	Em VOC	Factors CO	NOx	Days/ Wk	Season Adj	Critri Factor	Emissions(lbs/day)			Emissions (TPY)		
											VOC	CO	NOx	VOC	CO	NOx
1	2501080053	TANK TRUCK UNLOADING	320,400	0	1.7	0	0	6	1.05	1.000	1,867	0	0	277.4	0.0	0.0
2	2501080001	UNDERGROUND TANK BREATHING	320,400	0	1.0	0	0	7	1.05	1.000	942	0	0	163.2	0.0	0.0
3	2501080052	VEHICLE REFUELING - DISPLACEMENT	320,400	0	1.1	0	0	7	1.05	1.000	1,036	0	0	179.5	0.0	0.0
4	2501080052	VEHICLE REFUELING - SPILLAGE	320,400	0	0.7	0	0	7	1.05	1.000	659	0	0	114.2	0.0	0.0
5	2505030120	TANK TRUCKS IN TRANSIT	803,700	0	0.12	0	0	6	1.05	1.000	325	0	0	48.2	0.0	0.0
6	2505020120	BARGE LOADING EVAP LOSSES	0	0	0	0	0	7	1.00	1.000	0	0	0	0.0	0.0	0.0
7	2505020120	BARGES IN TRANSIT EVAP LOSSES	0	0	0	0	0	7	1.00	1.000	0	0	0	0.0	0.0	0.0
8	2275000101	AIRCFT REFUEL-JET-STAND FLD	31,001	0	0.030	0	0	7	1.00	1.000	3	0	0	0.0	0.0	0.0
9	2275000101	AIRCFT REFUEL-AVGAS-STAND FLD	142	0	7.19	0	0	7	1.00	1.000	3	0	0	0.6	0.0	0.0
10	2275000101	AIRCFT REF-AVGAS-BOWMAN FLD	243	0	7.19	0	0	7	1.00	1.000	6	0	0	0.5	0.0	0.0
11	2501080200	LEAKING UNDERGROUND STG TANKS	20	0	1400	0	0	7	1.00	1.000	6	0	0	1.0	0.0	0.0
12	2420010370	DRY CLEANING-PETR SOLVENT	1,918	1,935	6.43	0	0	6	1.00	1.000	77	0	0	14.0	0.0	0.0
13	2415085000	COLD CLEAN-AUTOREPAIR	347	0	900	0	0	6	1.00	1.000	0	0	0	0.0	0.0	0.0




Emissions Inventories

- Point Sources

- For each nonattainment area provide tables or charts listing the point source data used in developing ozone and PM modeling
 - Emission rates modeled for each pollutant for base year, future baseline and attainment year
 - Controls assumed
 - Emission reductions achieved/estimated for new controls
 - Control factors

1996 Point Source Emissions for Jeff County(lbs/day)

Item	ID	Plant Name	VOC	NOx	CO
60	0143	MARATHON OIL, LOU TERM	838.8	0.0	0.0
61	0144	MARCUS PAINT COMPANY	90.0	0.0	0.0
62	0145	ROGERS GROUP, AVOCA RD	0.0	0.0	0.0
63	0148	LOU MED CENTER STEAM PLANT	6.6	641.4	396.6
64	0149	MSD, MORRIS FORMAN PLANT	4.9	56.7	11.9
65	0150	RIVERSIDE PAVING COMPANY	0.0	0.0	223.0
66	0152	THE VALSPAR CORPORATION	58.0	0.0	0.0
67	0160	NATIONAL PRODUCTS INC	31.3	0.0	0.0
68	0161	NAVAL ORDNANCE STATION	96.0	19.6	4.9
69	0167	UNITED DIST, STITZEL-WELLER	2,296.3	0.0	0.0
70	0168	PPG ARCHITECTUAL FINISHES	235.0	0.0	0.0
71	0171	PHILIP MORRIS, MAPLE ST	2,077.3	238.0	55.5
72	0172	PHILIP MORRIS, LMCP	13.0	0.0	0.0
73	0174	PORCELAIN METALS CORP	0.0	33.0	0.0
74	0175	COURTAULDS COATINGS, PLANT #1	482.7	0.0	0.0
75	0176	COURTAULDS COATINGS, PLANT #2	46.5	0.0	0.0
76	0178	CONDEA VISTA COMPANY	0.0	0.0	0.0
77	0179	PROGRESS PAINT COMPANY	39.1	0.0	0.0
78	0180	PURINA MILLS INC	0.0	0.0	0.0
79	0185	AKZO COATINGS	579.0	45.9	0.0
80	0186	REYNOLDS METALS CO, PLANT #1	3,798.0	25.9	0.0
81	0187	REYNOLDS METALS CO, PLANT #3	688.8	41.3	10.3
82	0189	ROHM & HAAS KENTUCKY INC	922.9	589.7	42.7
83	0193	STONE CONTAINER CORP	778.1	0.0	0.0
84	0202	ALGOOD FOOD CO.	0.0	134.0	0.0
85	0204	SHIVELY WOOD PRODUCTS	43.3	0.0	0.0
86	0206	SOUTHERN GRAPHIC SYSTEMS	167.6	0.0	0.0
87	0212	NATIONAL LINEN SERVICE	301.0	0.0	0.0
88	0214	CHEVRON USA, LOU TERM	438.0	18.3	0.0
89	0220	SUN REFINING & MARKETING	260.8	0.0	0.0
90	0221	TECHNICAL PRODUCTS INC	3.1	0.0	0.0
91	0222	ITAPCO LOUISVILLE TERM	1.5	0.0	0.0
92	0223	TEXAS GAS TRANSMISSION	166.7	5,828.6	165.2
93	0225	CITGO PETROLEUM CORPORATION	216.4	0.0	0.0
94	0227	TUBE TURNS INC	6.1	28.9	7.2
95	0233	CHALLENGER LIFTS	62.3	0.0	0.0
96	0234	HENRY VOGT COMPANY	3.3	52.0	6.7
97	0242	SOUTHERN BAPTIST SEMINARY	0.0	0.0	0.0
98	0243	UNITED DIST PRODUCTION	5,623.4	0.0	0.0
99	0244	EARLY TIMES DIST	8,683.5	130.4	38.5
100	0245	FISCHER PACKING COMPANY	0.0	32.6	9.9
101	0246	ASHLAND CHEMICAL CO	0.0	0.0	0.0
102	0248	JOHNSON CONTROLS (closing)	0.0	0.0	0.0
103	0251	ALLIED READY MIX - CANE RUN	0.0	0.0	0.0
104	0251	ALLIED READY-MIX COMPANY, INC	0.0	0.0	0.0
105	0256	KY AIR NATIONAL GUARD	0.0	0.0	0.0
106	0258	CSR-HYDRO CONDUIT	0.0	0.0	0.0
107	0262	LAMINATING SERVICES INC	106.0	0.0	0.0
108	0266	DEVCO & RAYNOLDS COMPANY	101.6	0.0	0.0
109	0267	BRINLY-HARDY COMPANY	0.0	4.8	0.0
110	0283	ZEON CHEMICALS KY, INC	666.2	0.0	0.0
111	0288	WIRECRAFTERS, INC	192.0	0.0	0.0
112	0291	GOLDEN FOODS INC	9.1	98.7	45.2
113	0294	APPLIED SURFACE TECHNOLOGY	112.0	0.0	0.0
114	0296	LOU & JEFF CO. RIVERPORT	0.0	0.0	0.0
115	0299	BEECHMONT PRESS INC	48.6	0.0	0.0
116	0317	HESCO PARTS CORP.	52.0	0.0	0.0
117	0322	COMPONENT FINISHING UNLIMITED, INC	33.0	0.0	0.0
118	0333	V. G. REED & SONS, INC.	57.9	0.0	0.0



Relative Reduction Factors (RRF)

- List all days and data used for each RRF and every applicable monitor in NAA and Class I areas.
- Discuss how days and data were chosen (e.g., days, predicted and ambient concentrations, define nearby, thresholds, etc.).
- Excellent examples on how to present this data are found in several chapters of the photochemical modeling guidance.
- Document/explain deviations from guidance.

BART Applicability Summary for Individual Sources

BART-Eligible Unit Name	Date Built or Modified	PM ₁₀ PTE (TPY)	SO ₂ PTE (TPY)	NO _x PTE (TPY)	Ammonia PTE (TPY)	BART Eligible
Pulp Mill and Evaporators (NCG Emissions)	31-Dec-63	N/A	N/A	N/A	N/A	no
#1 Brown Stock Washer Line	31-Dec-63	N/A	N/A	N/A	N/A	no
#2 Brown Stock Washer Line	31-Dec-65	N/A	N/A	N/A	N/A	no
#3 Brown Stock Washer Line	31-Dec-76	N/A	N/A	N/A	N/A	No
Recovery Boiler	01-Oct-74	388	452	602	3	yes
					43	
Smelt Dissolving Tank	01-Oct-74	5	0	12		
Lime Kiln 1	31-Dec-63	56	1	254	N/A	Yes
Lime Kiln 2	31-Dec-74	56	1	254	N/A	yes
Power House – Boiler # 3	31-Dec-63	762	2,406	343	6	Yes
Paper Machine 1	31-Dec-65	N/A	N/A	N/A	N/A	No
Paper Machine 2	31-Dec-73	N/A	N/A	N/A	N/A	no
Total Potential Emissions		1,267	2,860	1,465	52	
Does BART Apply?		Yes	Yes	Yes	Yes	



Ozone and PM_{2.5} Modeling

- Emission rates for point sources in the nonattainment counties should be explicitly stated.
- Controls applied to the point sources should be clearly documented.
- Plots that show for days with highest exceedances, the NAA and the level of improvement due to the control strategy.

Summarizing BART Controls

- **BART-eligible Source**
- **Source Location**
- **Unit ID**
- **Emission rates modeled**
- **SO₂ PTE**
- **NO_x PTE**
- **PM PTE**
- **Existing controls**
- **Proposed BART controls**
- **Tons pollutant reduced**
- **Proposed emission limits**
- **Rationale for why no controls, if BART determination required.**

Statewide Summary of BART

Exemption Modeling -- Spreadsheet

- Summarizes every individual source requiring BART exemption modeling. Columns could include:
 - Parent Name (e.g., Georgia Power, TVA)
 - Plant Name (e.g., Bowen, Monroe, Yates)
 - City, County, State
 - BART source category (ies)
 - Class I areas impacted by the source
 - Distance to each of the 17 Class I areas
 - Delta Visibility Impacts
 - (indicate how determined, 98th percentile, max high from 12km results, old or new IMPROVE algorithm, sea salt with other than Cl⁻)



Summary of how BART Exemption modeling was developed -- Spreadsheet

- BART-eligible source parent name
- Plant name
- Protocol used (VISTAS ,source-specific)
- Model used
- Resolution of met data
- Comments section to identify and provide rationale for deviations from VISTAS protocol.



Documentation Recommendations

- Know your customer.
- Share drafts and outlines early.
- Utilize appendices for details, protocols, reports, etc.
- Utilize an Executive Summary.
- Utilize reference section for EPA policy and guidance, etc.
- Minimize use of references to websites for final submittal.
- Assume that the reader knows nothing about what the State did in developing the technical analyses.



Bottom Line

- Document assumptions, procedures
 - conclusions for attainment, BART and reasonable progress strategies
 - acceptable model performance by Class I areas and NAA
 - RACM, emissions inventories
 - modeling results, concentrations, visibility
 - Rationale for deviations from guidance and regulations

Who you gonna call?

- *Not The Ghostbusters!*
- **Modeling**
 - Brenda Johnson; johnson.brenda@epa.gov
 - Rick Gillam; gillam.rick@epa.gov
- **State SIP Contacts**
 - AL & GA: Stacy Harder; harder@epa.gov
 - KY & FL: Heidi LeSane; lesane.heidi@epa.gov
 - NC & SC: Nacosta Ward; ward.nacosta@epa.gov
 - TN & MS: Jimmy Hou; hou.james@epa.gov
- **Ozone:** Jane Spann; spann.jane@epa.gov
- **PM2.5:** Joel Huey; huey@epa.gov
- **Regional Haze:** Temporarily Brenda Johnson and Rick Gillam