



west virginia department of environmental protection

Appendix F-3

EPA/FLM/Stakeholder Outreach and Presentations

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

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Appendix F-3a

Consultation Record

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

VISTAS
FLM/EPA Consultation Record
As of October 26, 2020

1. December 5-7, 2017 – Denver, national RH meeting, various presentations – FLMs, EPA OAQPS, Region 3, Region 4, RPOs, various VISTAS agency attendees
2. January 31, 2018 – teleconference, presentation – FLMs, EPA Region 4, CC/TAWG
3. August 1, 2018 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG
4. September 5, 2018 – teleconference, presentation – MJOs
5. June 3, 2019 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG
6. October 28-30, 2019 – St Louis national RH meeting, various presentations – FLMs, EPA OAQPS, Region 3, Region 4, RPOs, various VISTAS agency attendees
7. April 2, 2020 – teleconference, presentation – FLMS, EPA OAQPS, Region 3, Region 4, CC/TAWG
8. April 21, 2020 – teleconference, presentation – MJOs
9. May 11, 2020 – teleconference, presentation – FLMs, EPA OAQPS, Region 3, Region 4, CC/TAWG
10. May 20, 2020 – webinar, presentation – stakeholders, FLMs, EPA OAQPS, Region 3, Region 4, RPOs and member states, STAD, CC/TAWG
11. July 30, 2020 – webinar, presentation – EPA Region 3, Region 4, and OAQPS
12. August 4, 2020 – webinar, presentation, FLMs, EPA OAQPS, Region 3, Region 4, RPOs and member states, CC/TAWG
13. October 26, 2020 – webinar, presentation, EPA Region 3, Region 4 during the Fall 2020 air directors' meeting



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Appendix F-3b

National Regional Haze Meeting Denver, Colorado December 5-7, 2017

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304


Promoting a healthy environment



Georgia's Approach for Estimating Reasonable Progress in Round 1

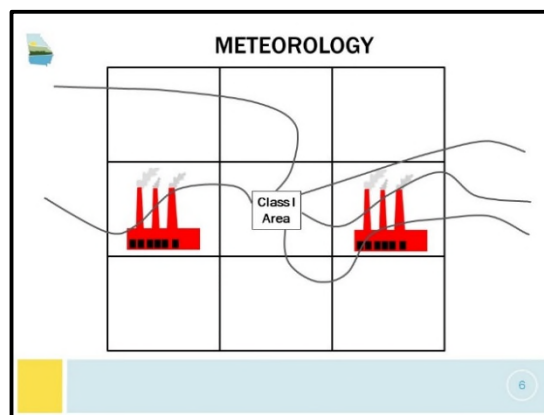
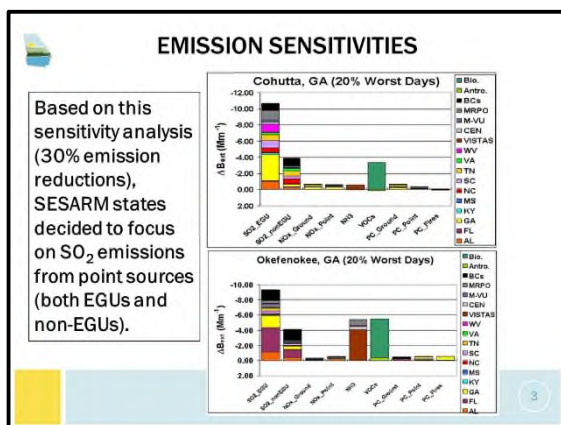
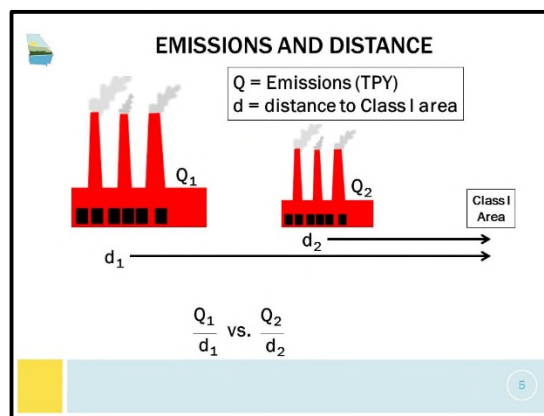
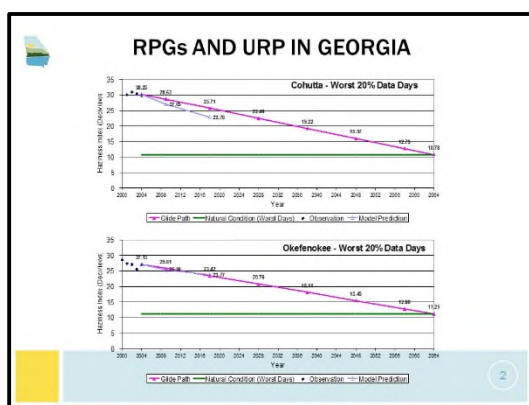
Jim Boylan
 Manager, Planning & Support Program
 Georgia EPD - Air Protection Branch

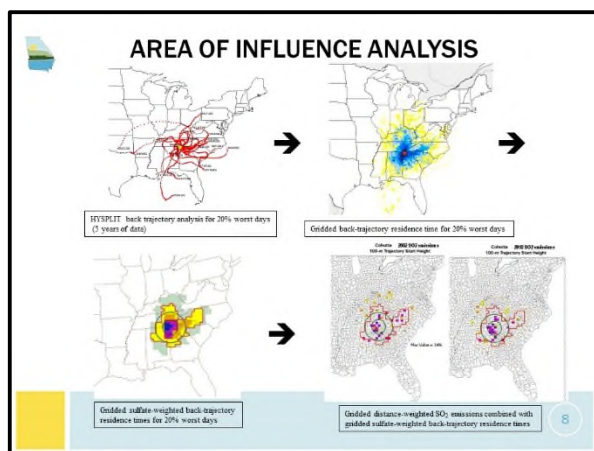
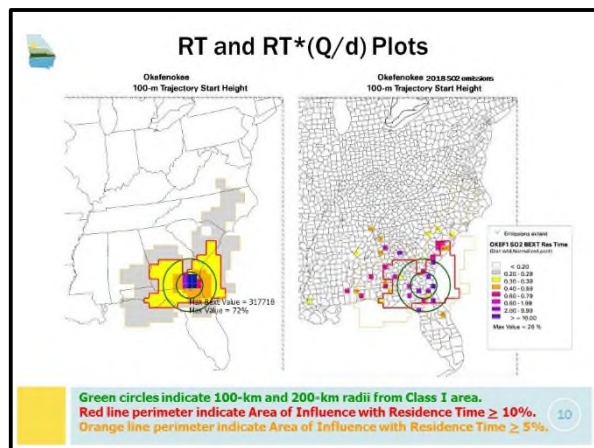
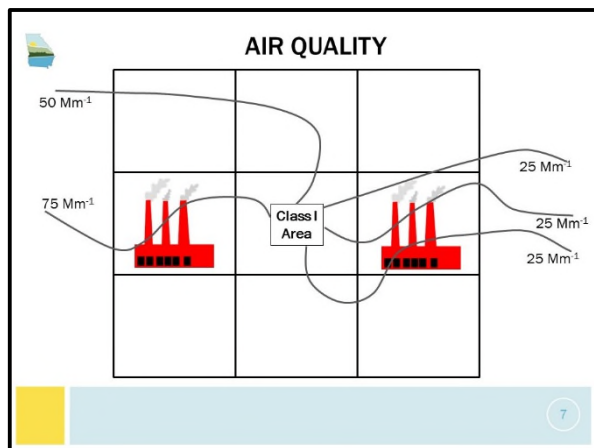
Round 2 Regional Haze Planning Workshop
 Denver, CO
 December 5, 2017



REASONABLE PROGRESS (RP)

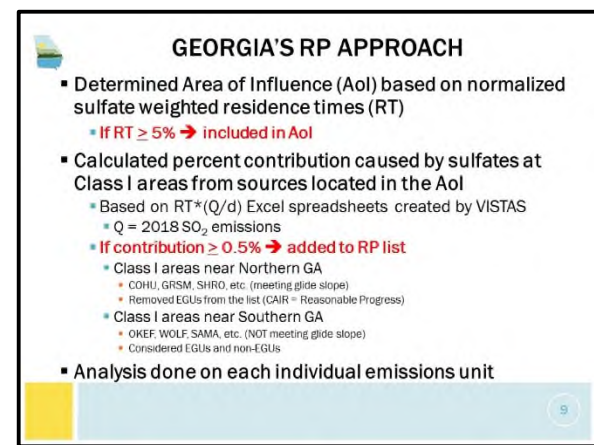
- Area of Influence (Q/d^*RT) analysis with 2002 and 2018 emissions
 - This work was performed by SESARM contractors
 - Can be used to screen sources for 4-factor analysis
 - 2018 emissions are more appropriate than 2002 since we are looking at additional controls beyond "on-the-books"
- 4-Factor Analysis
 - This work was performed by the individual SESARM states and was very time consuming (similar to BACT analysis)
 - Cost of compliance (GA EPD included visibility impacts)
 - Time necessary for compliance
 - Energy and non-air quality impacts
 - Remaining useful life of source





SOURCE CONTRIBUTION AT OKEF

			505 TONS						6.9134
Plant	ID	2002	2018	(2018 / 2002)	CE	d (km)	Q/d	RT	
FL SAINT JOHN'S RIVER	17	10,185	7,420	96	65.12	113.95	65.70	748.4	0.0167
FL SAINT JOHN'S RIVER	18	15,078	9,581	90	65.12	80.33	65.70	204.6	0.0325
FL JEFFERSON MANUFACTURING CORPORATION (US)	15	3,242	3,639	4	64.58	56.35	71.58	25.1	0.0000
FL CROOK BAY OPERATING COMPANY LLC	0811	0	2,207	66	61.17	56.41	65.30	239.2	0.0000
GA GEORGIA-PACIFIC BRUNSWICK OPERATIONS	171	1,842	1,862	4	75.46	24.41	71.47	174.5	0.0000
FL RAYONIER PERFORMANCE FIBERS LLC	5	1,078	1,256	6	63.34	19.83	71.58	14.9	0.0017
FL SEMINOLE ELECTRIC COOPERATIVE, INC.	1	10,912	6,779	86	121.63	50.64	126.5	0.0000	
FL SEMINOLE ELECTRIC COOPERATIVE, INC.	2	12,775	6,306	86	121.63	33.42	126.5	0.0000	0.0274
FL WHITE SPRINGS AGRICULTURAL CHEMICALS INC	66	1,140	1,495	0	69.86	21.30	48.81	914.0	0.0000
FL WHITE SPRINGS AGRICULTURAL CHEMICALS INC	67	586	1,306	0	69.86	18.68	48.81	100.2	0.0000
FL IFF CHEMICAL HOLDINGS, INC.	3	624	728	0	66.66	12.94	65.70	0.0000	0.0009
FL IFF CHEMICAL HOLDINGS, INC.	15	7,100	4,329	0	72.55	14.48	72.84	90.9	0.0007
GA INTERNATIONAL PAPER - SAVANNAH MILL	1712	1,482	3,319	4	70.54	27.75	55.31	742.0	0.0000
FL MILLER LUMBER SPECIALTY CHEMICALS	5	505	500	0	60.45	9.76	65.70	0.0000	0.0000
FL SAVANNAH ELECTRIC KRAFT STEAM ELECTRIC	0201	4,699	2,705	0	107.18	24.83	155.7	0.0000	0.0120
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1703	556	524	4	106.57	5.57	71.58	63.6	0.0000
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	2	30,728	15,241	0	205.50	74.06	5.47	369.0	0.0000
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	0202	3,962	4,424	0	206.69	65.78	5.47	369.0	0.0000
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	1	18,988	15,537	0	206.69	65.78	5.47	369.0	0.0000
GA GEORGIA POWER COMPANY, MICHIGAN STEAM ELECTRIC	0203	4,973	4,000	0	706.70	23.44	344.3	0.0000	0.0000
FL JEFFERSON MANUFACTURING CORPORATION (US)	15	3,242	3,639	4	64.58	56.35	71.58	33.3	0.0000
FL CROOK BAY OPERATING COMPANY LLC	0811	0	2,207	66	61.17	56.41	65.30	266.8	0.0000
FL MILLER LUMBER SPECIALTY CHEMICALS	5	505	500	0	60.45	9.76	65.70	0.0000	0.0000
SC SCOTTSBORO SPECIALTY CHEMICALS	002	8,585	5,144	0	290.50	17.42	10.79	26.4	0.0000
FL GEORGIA-PACIFIC CORP - PULP/PAPER MILL	16	1,334	1,561	4	120.33	12.98	122.84	26.9	0.0000
FL ANCHORAGE GLASS CONTAINER CORPORATION	4	181	212	0	59.64	3.60	65.70	295.6	0.0000
FL ANCHORAGE GLASS CONTAINER CORPORATION	16	156	206	0	59.64	3.48	65.70	229.1	0.0000
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1704	286	286	4	106.58	3.16	71.58	22.7	0.0000
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1705	289	333	0	106.22	3.14	71.58	22.4	0.0000



SOURCE CONTRIBUTION AT WOLF

Plant	ID	2002 Tons	2018 Tons	CE	d (km)	Q/d	RT	RT*(Q/d)	RT*(Q/d) / RT
GA GEORGIA-PACIFIC BRUNSWICK OPERATIONS	17	1,842	1,862	4	75.46	24.41	71.47	0.0000	
FL SAINT JOHN'S RIVER	17	10,185	7,420	96	65.12	110.95	65.12	0.5271	
FL SAINT JOHN'S RIVER	18	15,078	9,581	90	65.12	80.33	65.12	0.5271	
FL JEFFERSON MANUFACTURING CORPORATION (US)	15	3,242	3,639	4	64.58	56.35	71.58	0.0000	
FL CROOK BAY OPERATING COMPANY LLC	0811	0	2,207	66	61.17	56.41	65.31	0.0000	
GA GEORGIA-PACIFIC BRUNSWICK OPERATIONS	171	1,842	1,862	4	75.46	24.41	71.47	0.0000	
FL RAYONIER PERFORMANCE FIBERS LLC	5	1,078	1,256	6	63.34	19.83	71.58	0.0017	
FL SEMINOLE ELECTRIC COOPERATIVE, INC.	1	10,912	6,779	86	121.63	20.64	126.5	0.0000	
FL SEMINOLE ELECTRIC COOPERATIVE, INC.	2	5,775	6,306	86	121.63	33.42	126.5	0.0000	
FL WHITE SPRINGS AGRICULTURAL CHEMICALS INC	66	1,140	1,495	0	69.86	21.30	48.81	0.0000	
FL WHITE SPRINGS AGRICULTURAL CHEMICALS INC	67	586	1,306	0	69.86	18.68	48.81	0.0000	
FL IFF CHEMICAL HOLDINGS, INC.	3	624	728	0	66.66	12.94	65.70	0.0000	
FL IFF CHEMICAL HOLDINGS, INC.	15	7,100	4,329	0	72.55	14.48	72.84	0.0000	
GA INTERNATIONAL PAPER - SAVANNAH MILL	1712	1,482	3,319	4	70.54	27.75	55.31	0.0000	
FL MILLER LUMBER SPECIALTY CHEMICALS	5	505	500	0	60.45	9.76	65.70	0.0000	
FL SAVANNAH ELECTRIC KRAFT STEAM ELECTRIC	0201	4,699	2,705	0	107.18	24.83	155.7	0.0000	
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1703	556	524	4	106.57	5.57	71.58	0.0000	
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	2	30,728	15,241	0	205.50	74.06	5.47	0.0000	
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	0202	3,962	4,424	0	206.69	65.78	5.47	0.0000	
FL PROGRESS ENERGY FLORIDA, INC. CRYSTAL RIVER	1	18,988	15,537	0	206.69	65.78	5.47	0.0000	
GA GEORGIA POWER COMPANY, MICHIGAN STEAM ELECTRIC	0203	4,973	4,000	0	706.70	23.44	344.3	0.0000	
FL JEFFERSON MANUFACTURING CORPORATION (US)	15	3,242	3,639	4	64.58	56.35	71.58	0.0000	
FL CROOK BAY OPERATING COMPANY LLC	0811	0	2,207	66	61.17	56.41	65.31	0.0000	
FL MILLER LUMBER SPECIALTY CHEMICALS	5	505	500	0	60.45	9.76	65.70	0.0000	
SC SCOTTSBORO SPECIALTY CHEMICALS	002	8,585	5,144	0	290.50	17.42	10.79	0.0000	
FL GEORGIA-PACIFIC CORP - PULP/PAPER MILL	16	1,334	1,561	4	120.33	12.98	122.84	0.0000	
FL ANCHORAGE GLASS CONTAINER CORPORATION	4	181	212	0	59.64	3.60	65.70	0.0000	
FL ANCHORAGE GLASS CONTAINER CORPORATION	16	156	206	0	59.64	3.48	65.70	0.0000	
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1704	286	286	4	106.58	3.16	71.58	0.0000	
GA JESUP MILL - RAYONIER PERFORMANCE FIBERS	1705	289	333	0	106.22	3.14	71.58	0.0000	

PLANT	FACILITY	502 Yrns							FIRM			
		IO	2002	2016	CE	d (km)	GR	RY				
PL	PROGRESS ENERGY FLORIDA INC CRYSTAL RIVER	2	20	123	16,241	21	185.6	60	17.27	184.4	6.6717	
PL	PROGRESS ENERGY FLORIDA INC CRYSTAL RIVER	1	10	663	15,980	3	156.0	20	17.27	173.31	0.6537	
PL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	4	776	866	4	6148	13	50	75	1557.1	0.0546	
PL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	7	621	726	0	6148	10	10	75	55	801.6	0.0446
PL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	6	764	847	0	6148	14	14	53	75	296.5	0.041
PL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	2	449	524	0	6148	5	5	53	75	644.1	0.0333
PL	ST MARKS POWER INC & GENERAL DYNAMIC	11	247	66	0	1165	7	640	75	55	559.0	0.0289
PL	ST MARKS POWER INC & GENERAL DYNAMIC	1	10	663	15,980	3	156.0	20	17.27	173.31	0.6537	
PL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	11	355	450	0	6148	4	7	75	55	552.8	0.0286
GA	GEORGIA POWER COMPANY INTELLECT STEAMERS	35003	4	4173	4305	0	155.6	32	76	16	205.1	0.0274
PL	GULF POWER COMPANY SCHOLZ ELECTRIC GENER	1	1	2	1890	0	155.6	20	72	23	218.0	0.016
PL	GULF POWER COMPANY SCHOLZ ELECTRIC GENER	1	1	2	1890	0	155.6	20	72	23	218.0	0.016
PL	EXXONMOBIL PRODUCTION COMPANY	D14	10	1669	14,995	3	265.9	41	49	10	492.3	0.0255
PL	EXXONMOBIL PRODUCTION COMPANY	4	10	1669	14,995	3	265.9	41	49	10	492.3	0.0255
PL	STONE CONTAINER CORPORATION	6	1	271	2,198	0	155.6	20	72	23	218.0	0.016
PL	SANDERS LEAD CO	003	648	713	0	256.0	20	48	12	50	156.0	0.0184
PL	SANDERS LEAD CO	003	648	713	0	256.0	20	48	12	50	156.0	0.0184
PL	LONGLEAF ENERGY SERVICES	B014	0	3,227	3	164.3	30.86	12	40	260.2	0.0133	
PL	LONGLEAF ENERGY SERVICES	B014	0	3,227	3	164.3	30.86	12	40	260.2	0.0133	
PL	GEORGIA POWER CORPORATION CEDAR SPRING	0001	2,287	533	0	148.0	20	10	53	28	216.2	0.012
PL	FLORIDA CRUSHED STONE CO INC	18	2,905	2,564	4	237.9	12	12	12	12	209.3	0.0106
GA	GEORGIA PACIFIC CORPORATION CEDAR SPRING	13050	2	164	2,425	4	149.5	10	25	12	289	0.0108
PL	ALABAMA POWER COMPANY - BARKY	004	7801	9,320	0	362.7	24.37	61	91	195.2	0.0101	
PL	SAINT JOHNS RIVER	107	1,065	1,420	90	263.5	20	20	6.62	193.7	0.0100	
PL	GULF POWER COMPANY LAKESIDE CRYSTAL RIVER	1	1	6564	915	0	148.0	20	10	53	289	0.0095
PL	GULF POWER COMPANY - CRIST	7	21	548	4,648	0	266.9	15	15	11	172.7	0.0090

[illegible]

FL	WHEATCOTE ELECTRIC CO-OPERATIVE, INC.	2	12,775	5,658	95	247.26	26.32	4.49	170.8	0.0088
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	66	1,140	1,456	0	136.28	14.70	15.30	164.4	0.0065
FL	STONE CONTAINER CORPORATION	1	687	804	0	140.69	5.21	28.50	163.3	0.0084
FL	STANT JOBS INC.	16	1,078	5,883	99	253.61	22.19	1.02	153.5	0.0051
FL	STONE CONTAINER CORPORATION	19	714	744	0	140.69	5.21	28.50	155.2	0.0078
FL	STONE CONTAINER CORPORATION	15	629	705	0	140.69	5.22	28.49	148.9	0.007
GA	GEORGIA PACIFIC CORPORATION - OCEAN SPRING	1642	1,617	7,706	146	114.6	11.59	12.98	141.8	0.007
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	67	966	1,300	0	136.28	13.90	15.30	143.6	0.0074
AL	CONTINENTAL CARBON COMPANY	10	4,226	5,545	0	271.81	22.45	5.63	142.6	0.0074
AL	ALABAMA POWER COMPANY - BARRY	006	24,678	6,789	99	382.77	17.74	5.01	142.1	0.0073
GA	INTERNATIONAL PAPER, SAVANNAH MILL	PH13	7,743	5,578	0	286.39	24.52	5.81	136.1	0.0070
FL	GEORGIA PACIFIC CORP - PULP/PAPER MILL	15	3,763	4,329	0	243.67	17.76	6.49	115.3	0.0066
FL	GULF POWER COMPANY - CRIST	4	2,942	3,328	0	208.88	16.16	11.11	112.9	0.0050
FL	ALABAMA POWER COMPANY - BARRY	003	3,370	2,335	0	382.77	13.68	8.91	108.6	0.0047
AL	ALABAMA POWER COMPANY - BARRY	002	3,550	1,545	0	382.77	13.44	8.91	107.7	0.0046
GA	SAVANNAH ELECTRIC - MONTGOMERY STEAM - ELEC	1501	7,700	7,515	0	580.33	14.44	8.81	107.2	0.0056
FL	WILBER POWER CO.	003	2,465	2,465	0	184.29	17.74	12.98	106.9	0.0053
AL	ALABAMA ELECTRIC CO-OPERATIVE - CHARLES R	003	6,786	5,032	99	300.63	12.88	8.91	103.2	0.005
FL	GULF POWER COMPANY - CRIST	5	2,711	2,768	0	208.88	8.25	11.11	102.8	0.0053
AL	ALABAMA ELECTRIC CO-OPERATIVE - CHARLES R	004	7,241	4,655	99	300.63	12.74	11.11	101.4	0.0051
FL	TAMPA ELECTRIC COMPANY BIG BEND SECTION	4	3,985	4,023	0	507.91	15.90	6.23	96.6	0.0051
FL	CITY OF GAINESVILLE - GULF DEVEN-HAYEN GROUP	6	5,969	1,082	0	173.14	6.57	16.38	96.6	0.0051
FL	TAMPA ELECTRIC COMPANY BIG BEND SECTION	3	2,465	2,465	0	300.63	12.75	11.11	92.8	0.0051
GA	PACKAGING CORPORATION OF AMERICA - VALDO	1012	5,562	5,562	0	105.83	11.59	12.98	88.2	0.0051

Plant	CAIR = Reasonable Progress for EGU's	0.7145		
AL BOWLING GREEN		8.1107		
AL INTERSTATE HOLDINGS, INC.	001	1,837 2,530 44	52.47 77.62 92.90 6459.95	0.0657
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0001	1,652 807 86	134.27 131.41 129.97 287.4	0.0000
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0002	25,115 1,818	58 138.14 5.48 386.91 218.6	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0003	42,934 2,467	65 138.14 67.11 44.32 119.08	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0004	42,934 2,465	55 138.14 69.67 44.32 119.08	0.0000
GA FLUENT PAPERBOARD & PACKAGING, INC. - FLU	F4	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, FORTKNOX STEAM-ELECTRIC	0005	1,652 807 86	134.27 131.41 129.97 287.4	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0006	25,115 1,818	58 138.14 5.48 386.91 218.6	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0007	42,934 2,467	65 138.14 67.11 44.32 119.08	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0008	42,934 2,465	55 138.14 69.67 44.32 119.08	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0009	42,934 2,467	65 138.14 67.11 44.32 119.08	0.0000
GA GEORGIA POWER COMPANY, FORTH STEAM-ELECTRIC	0010	42,934 2,465	55 138.14 69.67 44.32 119.08	0.0000
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0011	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0012	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0013	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0014	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0015	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0016	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0017	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0018	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0019	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0020	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0021	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0022	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0023	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0024	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0025	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0026	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0027	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0028	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0029	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0030	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0031	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0032	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0033	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0034	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0035	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0036	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0037	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0038	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0039	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0040	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0041	5,253 3,095	4 87.55 42.22 78.57 32.997	0.0442
GA GEORGIA POWER COMPANY, LATES STEAM-ELECTRIC	0042			

[illegible]

AL	TVA - WIDOWS CREEK	006	4,467	4,707	0	103.54	45.46	20.39	927.0	0.0123
AL	TVA - WIDOWS CREEK	003	4,466	4,626	0	103.54	44.67	20.39	910.8	0.0121
AL	TVA - WIDOWS CREEK	007	4,699	4,660	0	103.54	43.95	20.39	896.1	0.0119
AL	TWIK ENERGY LLC	003	4,364	7,274	0	201.57	36.09	22.66	786.1	0.0106
TX	ALUMINUM COMPANY OF AMERICA - SOUTH PLANT	16	1,856	2,570	0	123.75	18.55	23.77	636.5	0.0084
TX	ALUMINUM COMPANY OF AMERICA - SOUTH PLANT	17	1,817	2,300	0	126.75	18.45	23.77	633.1	0.0084
GA	GEORGIA POWER COMPANY - WATKINS STEAM FLE	0352	34,421	3,992	95	130.00	19.12	13.95	290.7	0.0078
GA	GEORGIA POWER COMPANY - WATKINS STEAM FLE	0301	35,741	3,018	95	130.08	19.09	13.05	265.4	0.0035
GA	MECHANICAL INDUSTRIES - SOUTH HAMILTON STREET	0365	125	200	0	214.60	0.93	0.91	422.9	0.0069
GA	MECHANICAL INDUSTRIES - SOUTH HAMILTON STREET	0369	125	200	0	214.60	0.93	0.91	422.9	0.0068
TX	EASTMAN CHEMICAL COMPANY	02150	15,855	16,729	0	270.21	61.91	9.81	521.9	0.0069
AL	ALABAMA POWER COMPANY - GORGAS	004	8,140	9,884	0	266.85	36.65	13.76	504.1	0.0067
SC	DUK E ENERGY LLC	001	3,365	4,367	0	201.51	46	22.06	419.7	0.0063
SC	DUK E ENERGY LLC	002	6,845	4,440	0	209.50	24.50	22.06	453.1	0.0060
TX	U.S. DEPARTMENT OF ENERGY - Y-12 PLANT	002	2,354	2,354	0	137.55	16.99	24.66	418.0	0.0064
GA	MOHAWK ELECTRICITY INC - APPALACHE FABRIC	0033	224	351	4	213.25	2.95	8.23	41.1	0.0058
GA	MOHAWK ELECTRICITY INC - APPALACHE FABRIC	0033	224	351	4	213.75	3.18	7.84	40.5	0.0058

[illegible]

- **22 Emission Units at 12 Facilities**
 - Performed single source photochemical grid modeling for each facility → $\$/\text{Mm}^{-1}$
 - $(\$/\text{ton}) \times (\text{ton}/\text{Mm}^{-1}) = \$/\text{Mm}^{-1}$
 - 6 emission units at 3 facilities took voluntary limits to reduce contribution to <0.5%
 - 1 emission unit subject to BART
- **Four-Factor Analysis Conducted on 15 Emission Units**
 - No additional controls for 11 emission units at 6 facilities
 - Additional controls for 4 emission units at 3 facilities

20

[illegible]

18

[illegible]

- GEORGIA PACIFIC CORPORATION, CEDAR SPRING - UNITS R402, U500, U501
- GEORGIA-PACIFIC BRUNSWICK OPERATIONS - UNITS F1 and M24
- GEORGIA-PACIFIC CORP SAVANNAH RIVER MILL - UNITS B001, B002, B003
- INLAND PAPERBOARD & PACKAGING, INC. - UNIT F4
- INTERNATIONAL PAPER - SAVANNAH MILL - UNIT PB13
- INTERSTATE PAPER LLC - UNIT F1
- JESUP MILL, RAYONIER PERFORMANCE FIBERS - UNITS PB02, PB03, RF01, RF04
- PACKAGING CORPORATION OF AMERICA - VALDO - UNIT 1017
- SOUTHERN STATES PHOSPHATE & FERTILIZER CO. - UNIT SA02
- GEORGIA POWER COMPANY, MITCHELL STEAM-EL - UNIT SG03
- SAVANNAH ELECTRIC: KRAFT STEAM - ELECTRI - UNITS SG01, SG02, SG03
- SAVANNAH ELECTRIC: MCINTOSH STEAM - ELEC - UNIT SG01



Facility	Emissions Unit	Permit limit (typ of SO2, except as noted)	Estimated Tons Reduced
GA Pacific – Brenauville Cellulose	F1 Pwr. Boiler 4	Not more than 568 tons SO2 per 12 consecutive months, compliance date of January 1, 2012	1074
Georgia Pacific – Cedar Springs	Power Boiler U500 Power Boiler U500	135 pound SO2 per hour (same as BART exemption modeling limit) 135 pound SO2 per hour (same as BART exemption modeling limit)	1385 1385
International Paper – Savannah	Pwr. Boiler 13, including conservation of organic emissions	Not more than 4758 tons SO2 per 12 consecutive months, compliance date of January 1, 2016	2090
Packaging Corp. of America	CE Power Boiler	Not more than 690 tons SO2 per 12 consecutive months, compliance date of January 1, 2012	53
Rayonier Perf. Fibers	PHB2 Pwr. Boiler 2	Not more than 318 tons SO2 per 12 consecutive months, compliance date of June 4, 2008	306
	PHB3 Pwr. Boiler 3	Not more than 149 tons SO2 per 12 consecutive months, compliance date of June 4, 2008	1448
	RF01 No. 5 Rec. Furn.	Not more than 194 tons SO2 per 12 consecutive months, compliance date tied to facility modification	139
	RF04 No. 6 Rec. Furn.	Not more than 207 tons SO2 per 12 consecutive months, compliance date tied to facility modification	27
Southern States Phosphate and Fertilizer	SAO2 Arid Plant 2	Not more than 380 tons SO2 per 12 consecutive months, compliance date of January 1, 2014	228

22

23

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EPA PSAT RESULTS

Based on this analysis, SESARM states will likely focus on SO₂ emissions from point sources (both EGUs and non-EGUs).

The charts show SO₂ emissions (lb./hr) over time (2002-2018) for two locations: Coughlin Wilderness, GA (COHU1) and Okatiebeek, GA (OKEF1). The charts include a 2020 US Air Quality (AQI) projection and a legend for various sources.

Coughlin Wilderness, GA (COHU1)

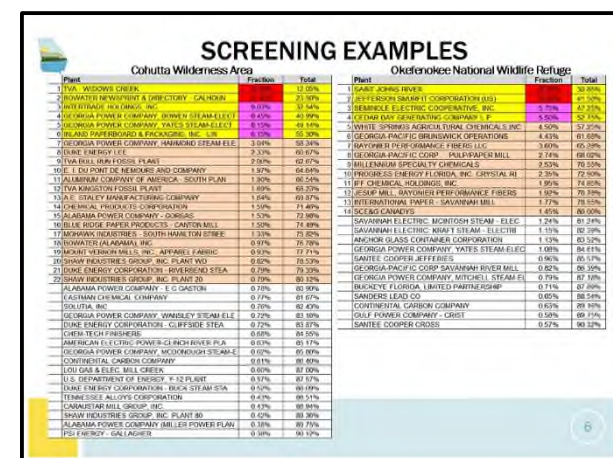
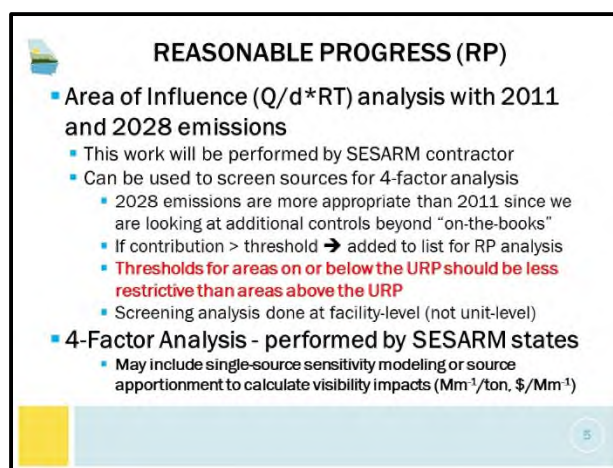
2020 US Air Quality (AQI) projection: 61.6% (EGU), 16.6% (Non-EGU), 20.3% (Point), 1.5% (Non-Point).


Okatiebeek, GA (OKEF1)

2020 US Air Quality (AQI) projection: 38.3% (EGU), 14.1% (Non-EGU), 38.7% (Point), 8.9% (Non-Point).

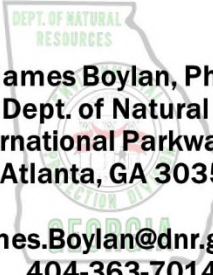
Legend:

- EGU
- CHURTAIL
- AMR_ND3
- AMR_S04
- EGU
- CHUR
- SEA_SALT
- KALLEGAN
- US Air Quality
- Point
- Non-Point
- International
- Natural
- Range
- Wildlife
- Impacted Area
- Trainer Aug
- Progress








CONTACT INFORMATION



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Projecting Emissions to 2028 in the Southeast

Jim Boylan
Manager, Planning & Support Program
Georgia EPD - Air Protection Branch


Round 2 Regional Haze Planning Workshop
Denver, CO
December 6, 2017



CONTACT INFORMATION


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404-363-7014



EPA PLATFORM

- SESARM plans to use EPA's 2011/2028 modeling platform (v6.3el)
 - SESARM will make adjustments to 2028 point sources
- Reasons for going with EPA's platform
 - Timing
 - Will not meet SIP deadline with any other option
 - Budget
 - Regional Haze budget significantly less in Round 2 compared to Round 1
 - Most of the sources sectors are reasonably represented in EPA's platform (i.e., SIP quality)



POINT SOURCE ADJUSTMENTS

- SESARM plans to make adjustments to point sources in EPA's 2011/2028 modeling platform
- EGU Point Sources
 - EPA modeling used IPM and assumed CPP controls
 - Option 1 – Use ERTAC EGU 2028 SMOKE files to replace IPM
 - Option 2 – Scale the EPA 2028 hourly EGU emissions up/down based on ERTAC EGU annual emission and/or state feedback
- Non-EGU Point Sources
 - Scale the EPA 2028 hourly non-EGU emissions up/down based on feedback from SESARM states
 - Plan to look at 2016 NEI and EPA's non-EGU updates in most recent 2017 and 2023 transport modeling

ERTAC EGU Projection Tool: Origin and Uses



Combined cycle facility under construction, slated to begin commercial operations in 2018

Doris McLeod ¹
Julie McDill, PE ²
Byeong-Uk Kim, PhD ³
Jin-Sheng Lin, PhD ¹
Joseph Jakuta ⁴
Mark Janssen ⁵

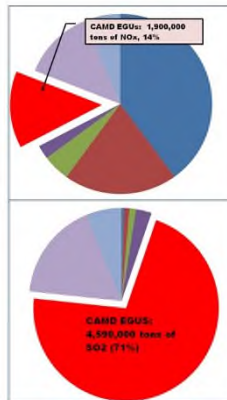
¹ Virginia Department of Environmental Quality
² Mid-Atlantic Regional Air Management Association
³ Georgia Environmental Protection Division
⁴ Ozone Transport Commission
⁵ Lake Michigan Air Directors Consortium

Attributes of ERTAC Model

- **Conservative** – no big swings in power generation.
- **Data intensive** – needs substantial state-supplied data.
- **Regional and fuel modularity.**
- **Calculates future hourly estimates based on base year activity.**
- **Test hourly reserve capacity.**
- **Quickly evaluates various scenarios;**
 - e.g., unit retirement, growth, and control

CAMD EGU Data

- **Clean Air Markets Division**
- High quality hourly data in electronic format reported under 40 CFR Part 75 for fossil fuel fired units > 25 MWs
 - Activity (heat input, gross load)
 - Emissions (usually NO_x, SO₂, and CO₂)
- Emission contributions of the EGU sector
 - 2011 CAMD data: ≈4,800 unique units
 - 14% of the NO_x inventory
 - 71% of the SO₂ inventory



*Data from 2011 NEI v1

2

Introduction to ERTAC EGU v2.7

State and planning organization collaboration to build a model to project future EGU emissions suited to state air quality planning

Starting Points

- **Base Year (BY)** hourly continuous emissions monitor (CEM) data
 - BY & FY unit activity matches meteorology
 - More realistic for SIP modeling
- **Regional growth rates (GRs)** – EIA AEO2017 & NERC
- **Information Supplied By States as of Spring 2017**
 - New units, retirements,
 - Controls, fuel-switches, other

ERTAC EGU Tool Generates Future Hourly Estimates

- **Regional unit capacity never exceeded**
 - Unmet demand applied to other units
 - Generation deficit units (GDUs) created if demand exceeds system capacity on an hourly basis



Hourly Emissions Converted to SMOKE Format for AQ Modeling

5

Eastern Regional Technical Advisory Committee (ERTAC)

- **ERTAC EGU growth convened 2009**

Goal: Build a low-cost, stable/stiff, fast, and transparent model to project electric generating unit (EGU) emissions including reasonable temporal profiles for activity and emissions

Uses: Provide EGU inventories suitable for

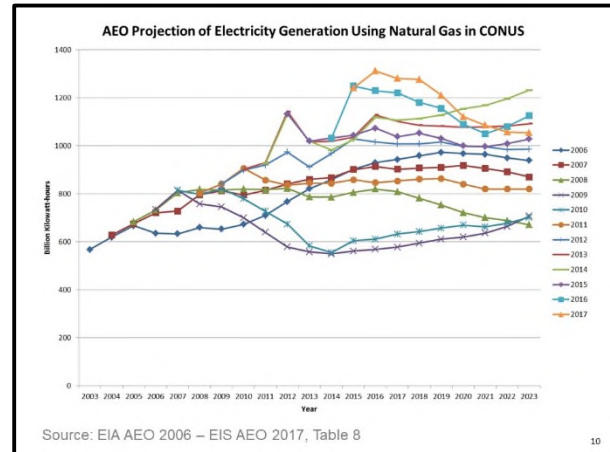
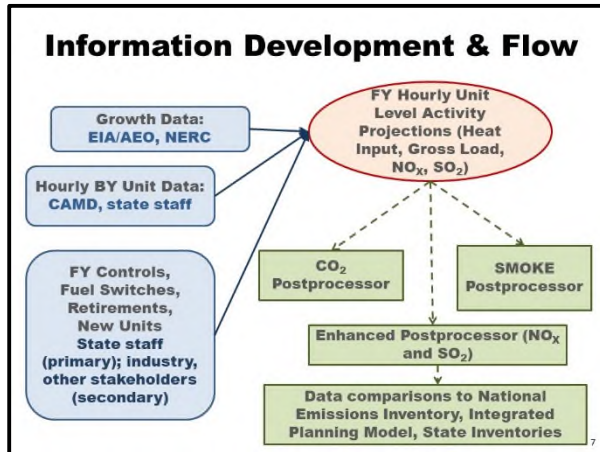
 - State Implementation Plan (SIP) submittals
 - Air quality modeling efforts

3

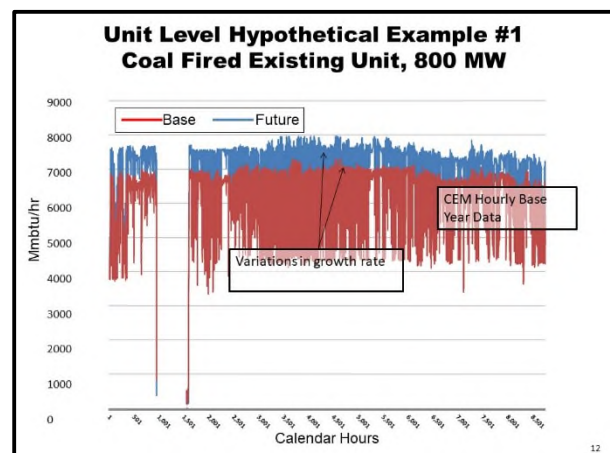
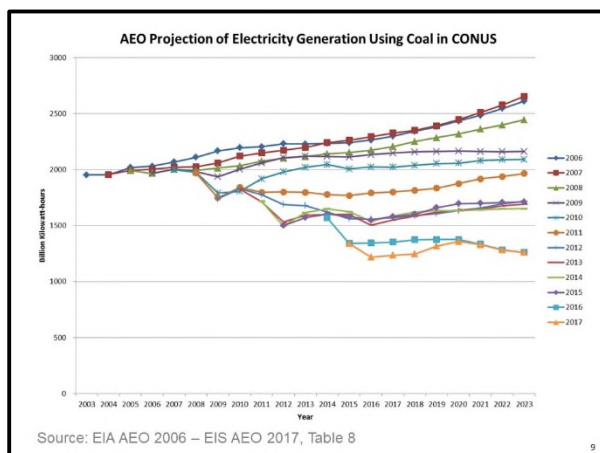
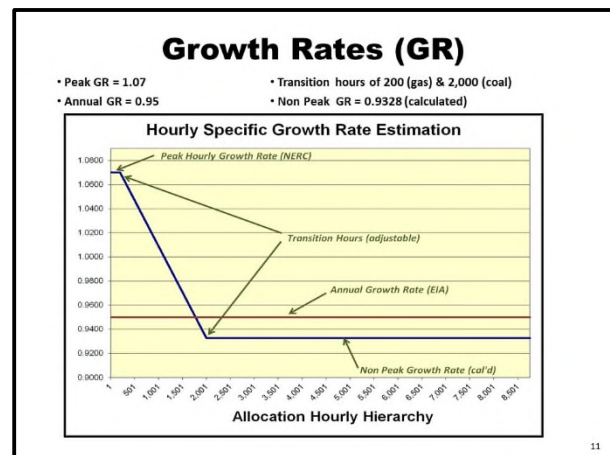
How the Model Works

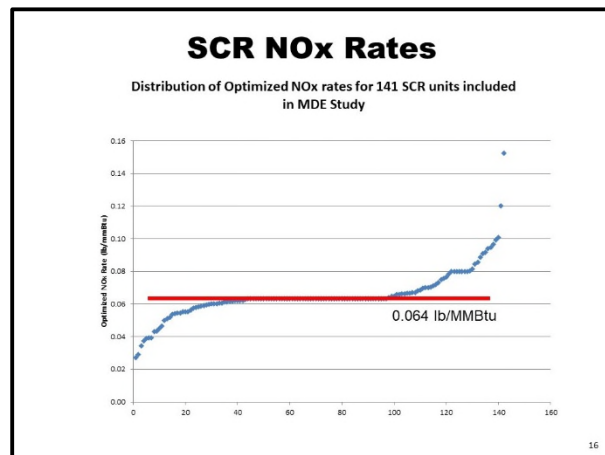
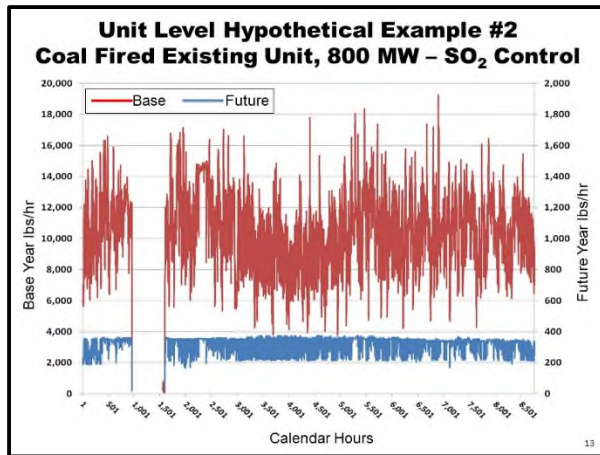
- **Unit-level inventory of EGUs** (capacity, fuel type, controls, hourly CEMs data for base year).
- **Apply EIA-AEO growth rates by region and fuel type** (model does not transfer generation between regions or between fuels).
- **Model matches available capacity to projected demand; creates "demand deficit" units if demand exceeds capacity.**
- **For units that exceed hourly or annual capacity limits, add generation to Excess Generation Pool.**
- **Empty Excess Generation Pool to other available units.**
- **Calculate emissions and convert to SMOKE and create reports** (model does not generate new controls).

6



- ### The Five Basic Files
- **Unit Availability File (UAF)**
 - Backbone of the tool
 - Unit level data
 - Sources: CAMD, EIA, NEEDS, State Staff
 - **Controls File**
 - Unit level data for SO₂ and NO_x
 - Emission rates or control efficiencies
 - May be supplemented with the Seasonal Controls File
 - **Growth Rates File**
 - Growth rates by region and fuel unit type
 - Annual based on EIA reference case
 - Peak based on NERC
 - **Input Variables File**
 - A variety of variables that can be changed for each region and fuel unit type
 - Many deal with new, planned units or GDUs
 - **CAMD Hourly Base Year Data**





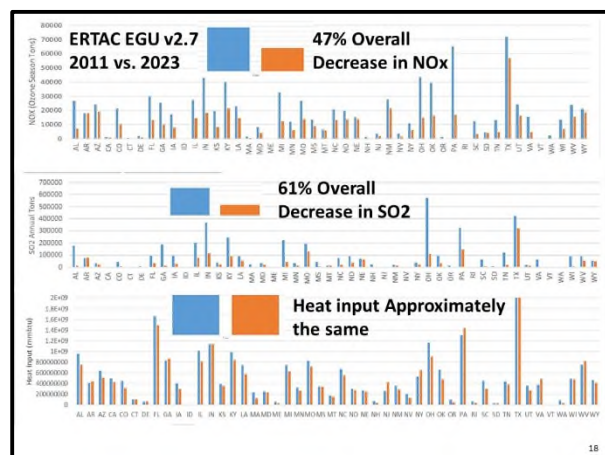
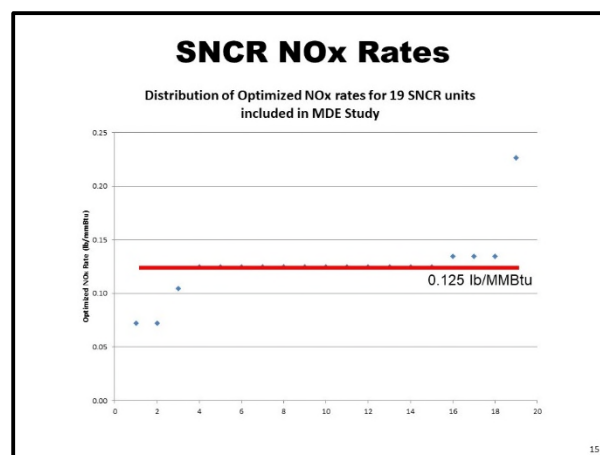
ERTAC EGU v2.7

- **ERTAC v2.7 reference case (no CSAPR)**
 - AEO2017 (Annual Growth) & NERC (Peak Growth) with two exceptions
 - SRVC and NYCW use IRP derived growth factors
 - State updates as of Spring 2017
 - Generation transfers to alternate fuels to correct specific issues
 - Transfer of Indian Point nuclear power plant generation to combined cycle NG (for years after 2021)
 - Transfer of power in a few hours from coal to NG in RFCE (missing generation)
 - Transfer of power from coal to NG in FRCC/FL to alleviate coal GDU
 - Unit characteristic updates in SRDA to alleviate coal GDU (one unit at Big Cajun 2/LA)
 - Transfer of power from coal to NG in NEWWE to alleviate coal GDU (2017 only)
- **ERTAC v2.7 CSAPR2 Compliant Scenario includes**
 - Emission rate adjustments on facilities with SCR & SNCR in CSAPR states for ozone season only
 - Units with SNCR's reduced to 0.125 lb/MMBtu (EPA did not reduce SNCR in their Analytics approach)
 - Units with SCR's reduced to 0.064 lb/MMBtu (EPA used 0.1 lb/MMBtu)
 - Similar to MD study of "best rates"
 - Emission rate adjustments on some facilities without post-combustion controls in OK

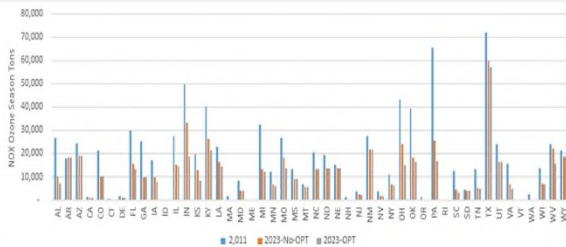
AEO2017 no CPP w/controls - Analysis

Region	State	Budget	Assurance Level	PT O&N (t/yr)	Over Budget?	Over Assurance?
CENSARA	AR	12,098	14,578	18,119	6,071	3,541
CENSARA	LA	11,272	13,639	7,801	(3,471)	(5,838)
CENSARA	KS	8,027	9,713	8,307	280	(1,406)
CENSARA	LA	18,639	22,553	14,426	(4,213)	(8,127)
CENSARA	MO	15,780	19,094	13,764	(2,016)	(5,330)
CENSARA	OK	11,641	14,086	16,240	4,599	2,154
CENSARA	TX	52,301	63,284	57,026	4,725	(6,258)
IADCO	IL	13,601	16,457	14,443	842	(2,014)
IADCO	IN	23,383	28,197	18,469	(4,944)	(9,738)
IADCO	IN	17,023	20,598	12,342	(4,781)	(8,356)
IADCO	OH	19,522	23,622	14,707	(4,815)	(8,915)
IADCO	WI	7,915	9,577	6,893	(1,022)	(2,684)
MANE VU	MD	3,828	4,632	3,980	152	(652)
MANE VU	NI	2,062	2,495	1,969	(93)	(526)
MANE VU	NY	5,135	6,213	6,193	1,058	(20)
MANE VU	PA	17,952	21,722	16,840	(1,112)	(4,882)
SESARM	AL	13,211	15,985	7,148	(6,063)	(8,837)
SESARM	KY	21,115	25,549	21,259	214	(4,223)
SESARM	MS	6,315	7,641	9,077	2,762	1,436
SESARM	TN	7,736	9,361	4,806	(2,930)	(4,556)
SESARM	VA	9,223	11,160	4,765	(4,458)	(6,395)
SESARM	WV	17,815	21,556	15,667	(2,148)	(5,889)
TOTAL		315,464		294,201		15,764.07
PENALTY						308,465
TOTAL W/PENALTY		315,464				

Need a 3:1 ratio for emissions above assurance level



2023 Optimized vs. Non-Optimized



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ERTAC EGU Contacts

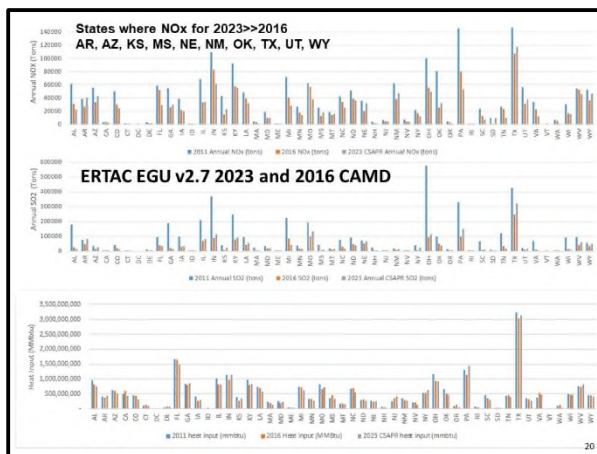
- States send comments to:
 - NE: Wendy Jacobs
Wendy.Jacobs@ct.gov
 - Southeast: John Hornback
Hornback@metro4-sesarm.org
 - Midwest: John Welch
JWelch@idem.in.gov
 - CENRAP: Mark Janssen
Janssen@ladco.org
ertacegufeedback@gmail.com

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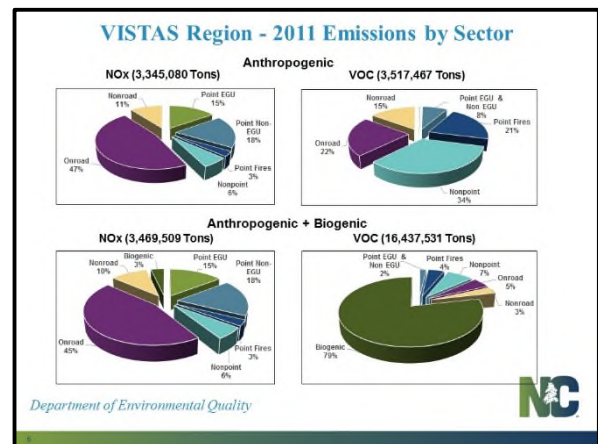
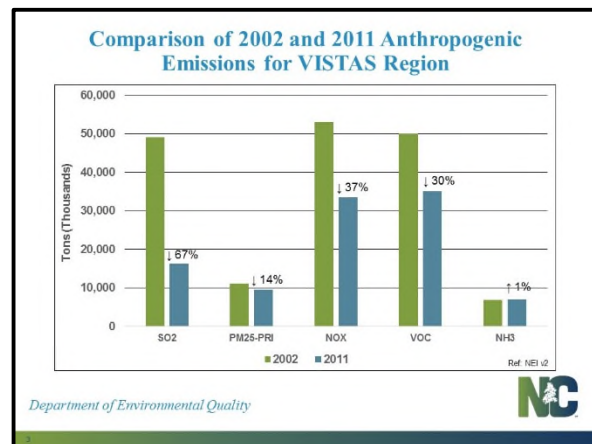
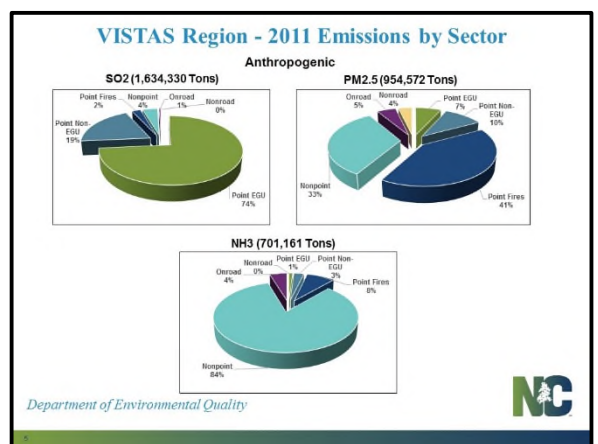
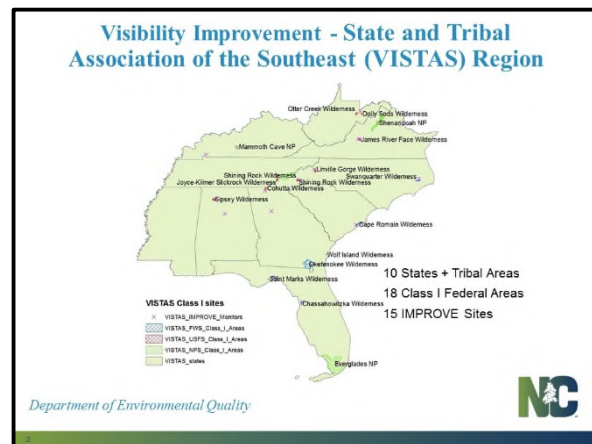
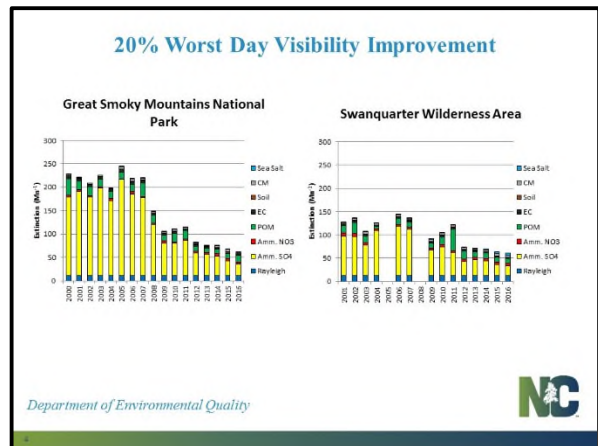
Additional Information

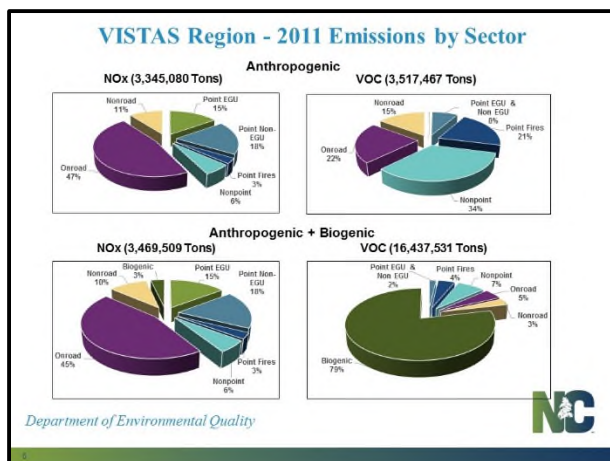
- ERTAC EGU files are located here:
 - <http://www.marama.org/2013-ertac-egu-forecasting-tool-documentation>
 - Currently the latest files on MARAMA webpage are v2.6
 - MARAMA expects to post v2.7 shortly
 - Also, 2028 ERTAC EGU files are available
- Other ERTAC materials are located here:
 - Sign In [URL:https://marama.sharefile.com/](https://marama.sharefile.com/)
 - Username:apaty@marama.org
 - Password:ERTACoutr3ach
- Next, will create a 2016 base year with new projections.

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20





Conclusions

- EPA's 2011/2028v6.3el modeling platform is a good starting point
 - Although a bit long-in-the-tooth:



Denver Museum of Nature and Science

- 2011 base year is well established and bench-marked
- Focus on updating 2028 inventory and bench-marking of model
- Should be able to develop reasonably accurate 2028 inventory regardless of base year starting point

Department of Environmental Quality

NC

Thank you!
Questions?



Randy Strait, randy.strait@ncdenr.gov
 Division of Air Quality
 North Carolina Department of Environmental Quality

NC



west virginia department of environmental protection

Appendix F-3c

Presentation to FLMs, EPA Region 4 CC/TAWG January 31, 2018

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment



VISTAS

FLM/EPA Discussion
January 31, 2018

Planned Approach (1)

- Similar to last regional haze planning effort
- About half of the time of the first project
- About 5% of the funding
- Will use EPA's 2011 base year and 2028 future year inventory and modeling platform
- Will provide slight adjustments to 2028 inventories for EGUs and some other major sources
- Will use EPA inventories for other categories



Planned Approach (2)

- Intentions
 - assess where we are currently
 - assess 2028 expected visibility and glide slope
 - evaluate progress
 - evaluate impacts on VISTAS Class I areas
 - evaluate downwind receptor impacts
 - consult with surrounding regions
 - consult with FLMs
 - interact with EPA
 - communicate with stakeholders
 - support state SIP submittals by July 31, 2021 deadline

VISTAS Organization

- STAD – State and Tribal Air Directors (policy)
- Coordinating Committee (operations)
- Technical Analysis Work Group
- Project Coordinator (John Hornback)
- EPA
- FLMs
- Stakeholders
- Other RPOs

Procurement Process

- RFP released December 21
- Proposal submittal deadline January 26
- 3 proposals received
 - 1 sole bid
 - 2 team bids
- Selection Committee formed and operating
- Recommendation goal by February 15

Contractor Arrangements

- Execute contract by March 1
- Develop concurrent work plan and QAPP
- Submit QAPP to EPA by March 15
- Receive QAPP approval from EPA by April 15
- Contractor queuing during April
- Technical work begins by May 1

Technical Project Components (2)

- Air quality modeling
- Source apportionment tagging
- Model performance evaluation
- Future year model projections
- Data handling and sharing
- Optional tasks

Technical Project Schedule

- States will begin preparing inventory updates after March 1
- Air quality modeling completed by December
- Other analysis and evaluation by next spring
- All deliverables including data and reports by June 20, 2019
- States begin developing their SIPs thereafter
- States submit SIPs by July 31, 2021

Discussion

- Q&A
- Feedback
- Next steps

Technical Project Components (1)

- Project management
- Emissions inventory updates
- Emissions processing
- Data acquisition and preparation
- Area of influence analysis

Contact Information

- Project Coordinator: John Hornback
- Phone: 404-361-4000
- E-mail: hornback@metro4-sesarm.org
- Web: www.metro4-sesarm.org
 - Technical center tab
 - Contractor web site
 - Cloud?









west virginia department of environmental protection

Appendix F-3d

VISTAS Call with FLMs August 1, 2018

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment


**Call with Federal Land Managers (FLMs)
August 1, 2018**

Jim Boylan, Georgia EPD
John Hornback, Metro 4/SESARM

1




VISTAS Technical Plan




- Similar to last regional haze planning effort
- EPA's 2011 el base year emissions (unchanged)
- EPA's 2028 el future year emissions with state specific adjustments for EGU and non-EGU point sources
- EPA's 2028 el inventories without adjustment for other categories
- CAMx v6.40 with PSAT

4



Presentation Outline



- Introductory comments
- VISTAS contractors
- Completed, ongoing, and future work
- Collaboration/consultation
- State SIP development
- Response to National Park Service questions
- Additional Q&A
- Concluding comments

2




VISTAS Contractors




- Contractor
 - Eastern Research Group
- Subcontractor
 - Alpine Geophysics




5




VISTAS Tasks




- Determine current visibility
- Determine 2028 expected visibility and glide slopes
- Perform Area of Influence (AOI) analysis
- Perform source apportionment analysis (PSAT)
- Produce documentation
- Support state SIP submittals by July 31, 2021 deadline
- **NOTE: Individual VISTAS states will assess reasonable progress for sources in their own state**

3



Progress Report (documents)



- December 21, 2017 – RFP released
- January 26, 2018 – Proposals received
- March 1, 2018 – Contract awarded
- April 4, 2018 – QAPP (approved by EPA Region 4)
- April 19, 2018 – Work plan approved
- June 27, 2018 – Modeling protocol approved *

*(review and input from EPA OAQPS and Region 4)

6



Progress Report (completed/in process)



- Emission inventory updates – complete
- Emission inventory update report – nearing completion
- Emission processing/merging – complete
- 2028 simulation - running
- Benchmarking – complete (draft report rec'd)
- Base year modeling – initiated

7



(Q/d)*EWRT Calculations



Q/d			Q/d *EWRT			Q/d *EWRT (%)		
1	2	3	1	2	3	1	2	3
0	8.33	0	0	208.33	0	0%	18%	0%
25	Class 1	0	965.28	Class 1	0	82%	Class 1	0%
0	0	0	0	0	0	0%	0%	0%

Row (i)	Col (j)	ΣQ [tpy]	d [km]	Q/d [tpy km ⁻¹]	Q/d*EWRT [tpy km ⁻¹ Mm ⁻¹]	Q/d*EWRT [%]
2	1	300	12	25	965.28	82%
1	2	100	12	8.33	208.33	18%

10



Progress Report (remaining schedule)



- September 1, 2018 – base year modeling
- September 1, 2018 – area of influence analysis
- October 1, 2018 – model performance evaluation
- December 1, 2018 – future year modeling
- December 31, 2018 – future year projections
- April 19, 2019 – PSAT modeling
- May 3, 2019 – PSAT results
- July 1, 2019 – final report and project ends

8



Consultation Plan



- Late 2017/early 2018 – initiated by MANE-VU
- December 5-7, 2017 – WESTAR Round 2 Regional Haze Planning Workshop
- January 31, 2018 – discussions with FLMs
- August 1, 2018 – discussions with FLMs
- Late summer 2018/spring 2019 – stakeholders
- Ongoing – EPA OAQPS and Regions 3 & 4
- Ongoing – FLMs – especially late-2018/early-2019
- 2019 – surrounding RPOs (to be initiated by VISTAS states)

11



Extinction Weighted Residence Time Calculations



EWRT			EWRT (%)		
1	2	3	1	2	3
0.00	25.00	0.00	0%	39%	0%
38.61	Class 1	0.00	61%	Class 1	0%
0.00	0.00	0.00	0%	0%	0.00

Row (i)	Col (j)	# Trajectory hours	Trajectory (k)	Extinction (bext _{ik}) [Mm ⁻¹]	τ _{ijk} [hrs]	(bext _{ik})τ _{ijk} [Mm ⁻¹ hrs]	Στ _{ij} [hrs]	Σ(bext _{ik})τ _{ijk} [Mm ⁻¹ hrs]	EWRT [Mm ⁻¹]
2	1	5	1 (Red)	75	5	375	18	695	38.61
		4	2 (Orange)	80	4	320			
1	2	4	1 (Yellow)	50	4	200	18	450	25
		5	2 (Purple)	50	5	250			

9



State SIP Development



- Underway via ...
 - Participation in VISTAS process
 - Collaboration and consultation with all interests
- State-specific considerations/analyses have begun and will continue as project deliverables are completed/distributed
- SIP submittals due – July 31, 2021

12



Questions/Answers



- Using EPA 2011 and 2028 inventories and modeling platform with some upgrades
 - Yes
- 2011 and 2028 inventories
 - 2011 was not adjusted
 - 2028 EGU and non-EGU point updates completed June 30, 2018
 - Inventory update report – final due by mid-August

13



Questions/Answers



- Will states be on their own to evaluate control strategies?
 - Each state is ultimately responsible for determinations of the content of their SIPs, as in the last round.
 - Yet, much collaboration will occur in this project leading up to determinations of sources to evaluate and evaluations of feasible controls.

16



Questions/Answers



- Area of influence analysis and SO₂/NO_x rankings for 2011 and 2028
 - To be completed by September 1, 2018
- 2028 projections:
 - Modeling to be completed by December 1, 2018
 - Projections to be completed by December 31, 2018
- Nature of 2028 modeling
 - “on-the books / on the way” (required/enforceable)

14



Questions/Answers



- How will states use data generated to screen sources for 4-factor analysis?
 - Specific approach(es) be determined.
 - FLM input will be considered.
 - Threshold options
 - Cumulative source contribution (e.g., 80%, 60%, 40%,...)
 - Individual contributions by unit or facility (e.g., 1%, 5%, 10%,...)

17



Questions/Answers



- VISTAS states' usage of project deliverables
 - AOI review – September-December 2018
 - Will use AOI to rank and select sources
 - Start 4-factor analysis early 2019
 - Source apportionment will be part of 4-factor analysis and can be used to adjust reasonable progress goals (RPGs) if additional controls are required
 - May use CoST tool, EPA's Air Pollution Control Cost Manual, data obtained from facilities, etc.
 - Will consult with FLMs regarding screening and selection methodology and process for sources

15



Questions/Answers



- Will a best-and-final run be conducted?
 - Not in contract at this time
 - PSAT can be used to adjust RPGs for new controls at individual facilities without another CAMx run
- Use of state-specific modeling domains?
 - Possible uses include brute force sensitivities, CAMx v6.5, fine grid modeling, best and final CAMx run, etc.

18



Questions/Answers



- Opportunities for FLM input
 - Ongoing
 - AOI will be used for ranking sources.
 - Expect this to occur September-December 2018.
 - FLMs may provide thoughts at anytime
 - Early sharing of FLM concerns and reasons would be helpful

19



For Further Information (Contact)



- Project Coordinator
 - John Hornback – Metro 4/SESARM hornback@metro4-sesarm.org
- Coord Committee Chair
 - Jim Boylan – Georgia james.boyland@dnr.ga.gov
- Tech Analysis WG Co-chairs
 - Randy Strait – North Carolina randy.strait@ncdenr.gov
 - Alanna Keller – West Virginia alanna.j.keller@wv.gov
- Web site
 - <https://metro4-sesarm.org>
 - Selected information will be made available from the Technical Center dropdown on this web site.
 - Other information will be made available upon request.

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Appendix F-3e

VISTAS Presentation to other RPOs September 5, 2018

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304


Promoting a healthy environment


Call with MJOs
September 5, 2018

John Hornback, Metro 4/SESARM

1




VISTAS Technical Plan




- Similar to last regional haze planning effort
- EPA's 2011 el base year emissions (unchanged)
- EPA's 2028 el future year emissions with state specific adjustments for EGU and non-EGU point sources
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4



Presentation Outline



- Introductory comments
- VISTAS contractors
- Completed, ongoing, and future work
- Collaboration/consultation
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- Response to National Park Service questions
- Additional Q&A
- Concluding comments

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VISTAS Contractors




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– Eastern Research Group
- Subcontractor
– Alpine Geophysics




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VISTAS Tasks




- Determine current visibility
- Determine 2028 expected visibility and glide slopes
- Perform Area of Influence (AOI) analysis
- Perform source apportionment analysis (PSAT)
- Produce documentation
- Support state SIP submittals by July 31, 2021 deadline
- **NOTE: Individual VISTAS states will assess reasonable progress for sources in their own state**

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Progress Report (documents)



- December 21, 2017 – RFP released
- January 26, 2018 – Proposals received
- March 1, 2018 – Contract awarded
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- April 19, 2018 – Work plan approved
- June 27, 2018 – Modeling protocol approved *

*(review and input from EPA OAQPS and Region 4)

6



Progress Report (completed/in process)



- 2028 emission inventory updates and report – complete
- Conversion of 2028 point source emission files – pre-processing – complete (report – nearing completion)
- 2028 emissions SMOKE modeling – ready to begin
- 2011 base year emissions modeling - complete
- Benchmarking – ongoing (1st three reports received – one approved)
- Model performance evaluation – initiated
- Area of influence analysis – nearing completion

7



State SIP Development



- Underway via ...
 - Participation in VISTAS process
 - Collaboration and consultation with all interests
- State-specific considerations/analyses have begun and will continue as project deliverables are completed/distributed
- SIP submittals due – July 31, 2021

10



Progress Report (remaining schedule)



- October 1, 2018 – model performance evaluation
- October 31, 2018 – AOI analysis & report
- December 1, 2018 – future year modeling (currently projected for early November)
- December 31, 2018 – future year projections
- April 19, 2019 – PSAT modeling
- May 3, 2019 – PSAT results
- July 1, 2019 – final report and project ends

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Questions/Answers



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Consultation Plan



- Late 2017/early 2018 – initiated by MANE-VU
- December 5-7, 2017 – WESTAR Round 2 Regional Haze Planning Workshop
- January 31, 2018 – discussions with FLMs
- August 1, 2018 – discussions with FLMs
- October 2018 – initial discussions with CenSARA
- Fall 2018/spring 2019 – stakeholders
- Early/mid-2019 – surrounding RPOs (to be initiated by VISTAS states)
- Ongoing – EPA OAQPS and Regions 3 & 4
- Ongoing – FLMs – especially late-2018/early-2019

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Questions/Answers



- Area of influence analysis and SO₂/NO_x rankings for 2011 and 2028
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Appendix F-3f

VISTAS Regional Haze Project Update June 3, 2019

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

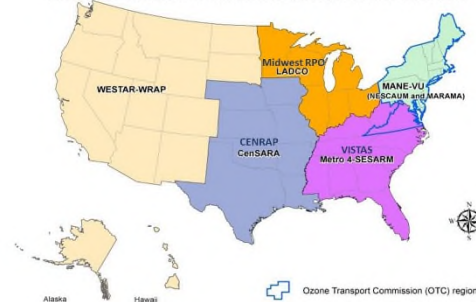
VISTAS Regional Haze Project Update



**Jim Boylan (GA DNR), Randy Strait (NC DAQ),
and John Hornback (Metro 4/SESARM)**

FLM and EPA Consultation Conference Call
June 3, 2019

REGIONAL PLANNING ORGANIZATIONS (RPOs) FOR REGIONAL HAZE



Presentation Outline

- Background
- Key VISTAS project tasks
- VISTAS technical analysis status
- What we've learned
- Consultation and communications
- Remaining work and projected schedule



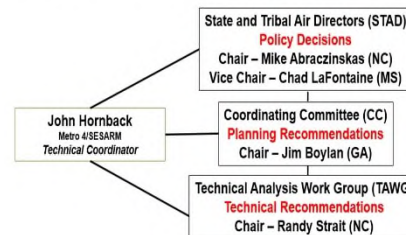
Participating Agencies in VISTAS Project

- **Visibility Improvement State and Tribal Association of the Southeast (VISTAS)**
- 10 SESARM states
- Knox County, Tennessee local agency
 - Represents the 17 local agencies in the Southeast
- Eastern Band of Cherokee Indians
 - Represents the 6 federally-recognized tribes in the Southeast

1999/2017 Regional Haze Rule

- Reduction of visibility impairment on the 20% "most impaired days" (anthropogenic impairment) in national park and wilderness (Class I) areas to natural conditions by 2064.
- No worsening of visibility on the 20% "clearest" days.
- Development of State Implementation Plans (SIPs) every 10 years to address emissions that contribute to regional haze.
- Round 2 SIP deadline extended to July 31, 2021

VISTAS Project Management Team



VISTAS Contractor Team

Primary Contractor

- Eastern Research Group, Inc
 - Regi Oommen, Project Manager



Subcontractor

- Alpine Geophysics, LLC
 - Greg Stella, Subcontractor Manager



VISTAS and Nearby Class I Areas

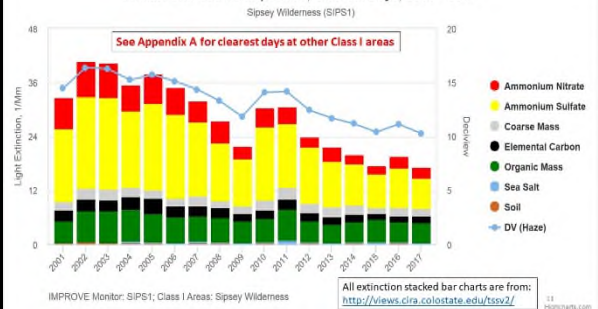
VISTAS FEDERAL CLASS I AREAS	NEARBY NON-VISTAS FEDERAL CLASS I AREAS
AL - Sipsey Wilderness Area (SIPS)	USDA Forest Service
CA - Channel Islands Wilderness Area (CIVA)	USDA Fish and Wildlife Service
CA - Cleveland National Park (CNSP)	USDI National Park Service
FL - Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA - Cohutta Wilderness Area (COHU)	USDA Forest Service
GA - Chatahoochee Wilderness Area (CHWA)	USDI Fish and Wildlife Service
GA - Wolf Island Wilderness Area (WOLF)	USDI Fish and Wildlife Service
NY - Massena State Natural Park (MNSP)	USDI National Park Service
NC - Little Gorge Wilderness Area (LIGO)	USDA Forest Service
NC - Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC - Swainson's Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC - Cape Romain Wilderness Area (CORA)	USDI Fish and Wildlife Service
TX/NM - Great Smoky Mountains National Park (GSMN)	USDI National Park Service
TX/NM - Jicarilla-San Juan Wilderness Area (JICA)	USDA Forest Service
VA - James River River Wilderness Area (JARR)	USDA Forest Service
VA - Shenandoah National Park (SHEN)	USDI National Park Service
WV - Dolly Sods Wilderness Area (DOSD)	USDA Forest Service
WV - Oyster Creek Wilderness Area (OCCO)	USDA Forest Service
AR - Caney Creek Wilderness Area (CACK)	USDA Forest Service
AR - Upper Gwynn's Wilderness Area (UGWA)	USDA Forest Service
LA - Bayou de l'Enfer Wilderness Area (BLEN)	USDI Fish and Wildlife Service
MO - Hardscrabble Wilderness Area (HBSA)	USDI Fish and Wildlife Service
MO - Mingo Wilderness Area (MING)	USDI Fish and Wildlife Service
RI - Bingham's Wilderness Area (BRIA)	USDI Fish and Wildlife Service

*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

VISTAS Project Tasks

- RFP
- Bids & contractor selection
- Contract development
- Work plan and QAPP
- Modeling protocol
- Contract management
- Data acquisition/analysis
- Emission updates
- Emission processing
- Air quality modeling
- Model performance evals
- Future year projections
- Area of influence analysis
- Source apportionment tags
- Reports and archival

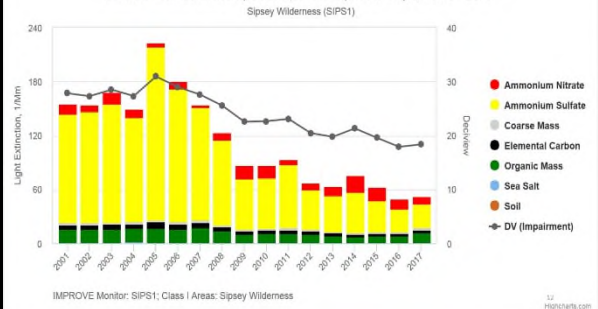
Annual Extinction Composition, Clearest Days, 2000 - 2017

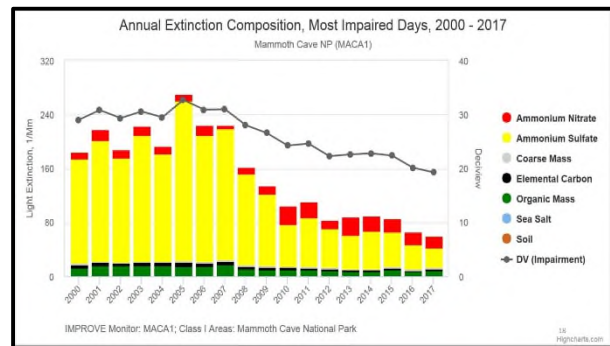
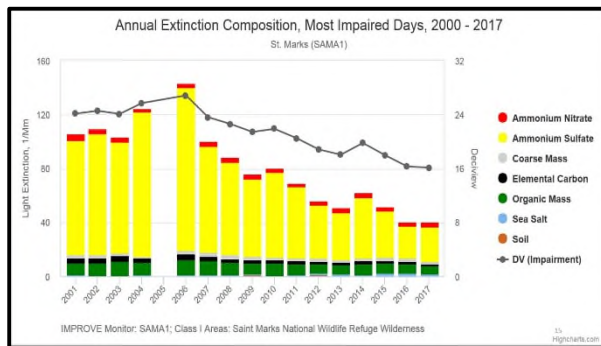
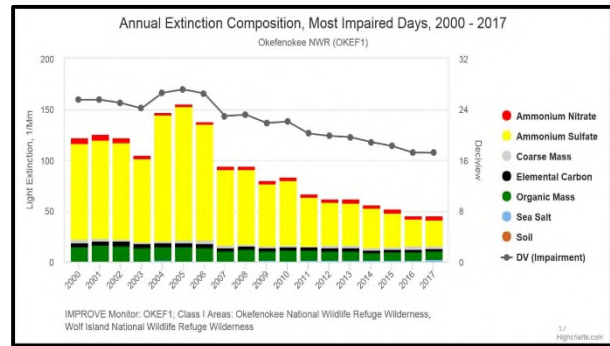
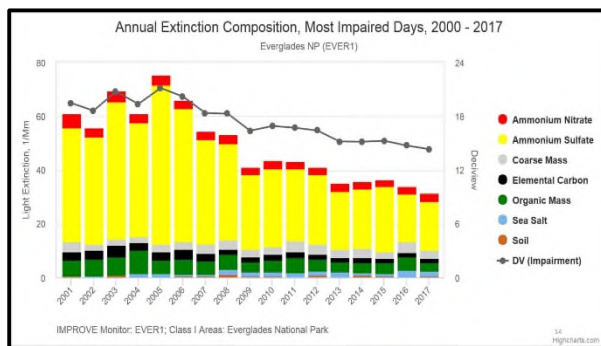
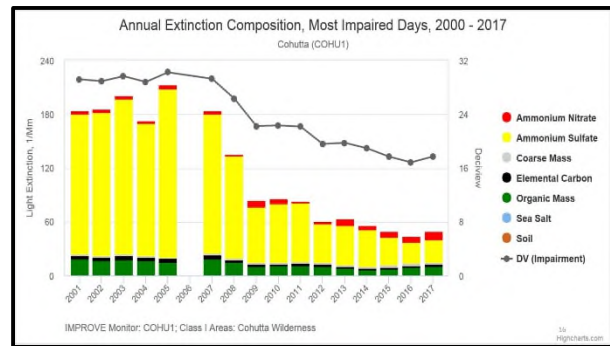
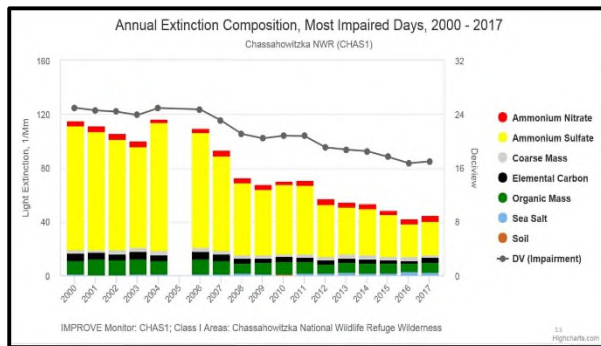


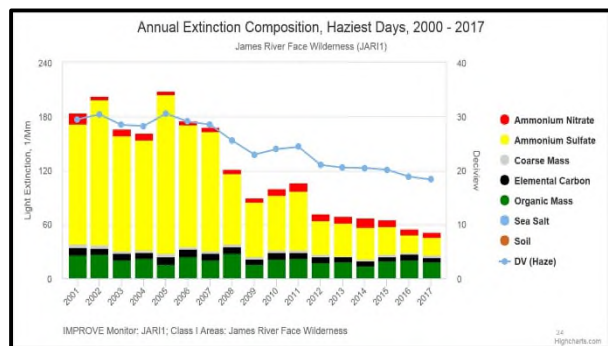
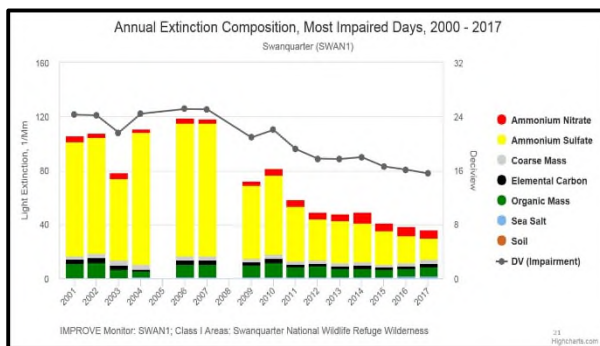
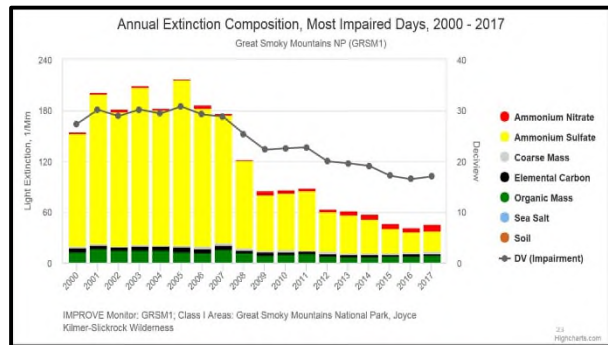
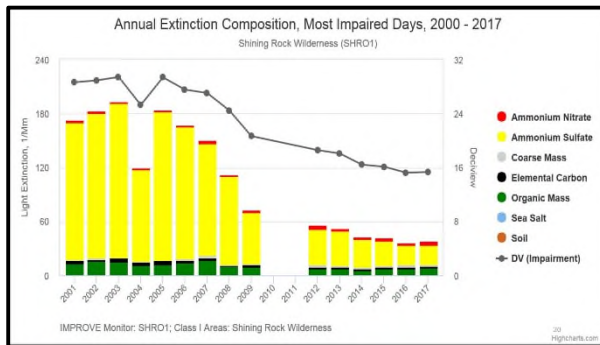
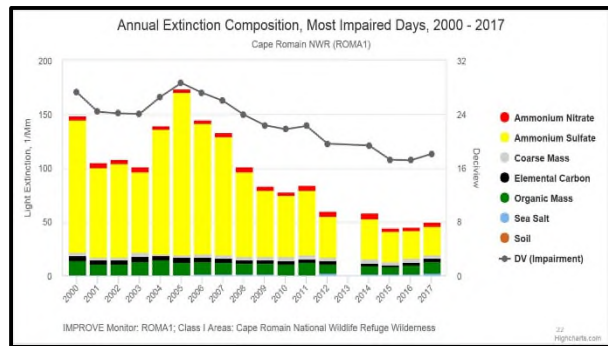
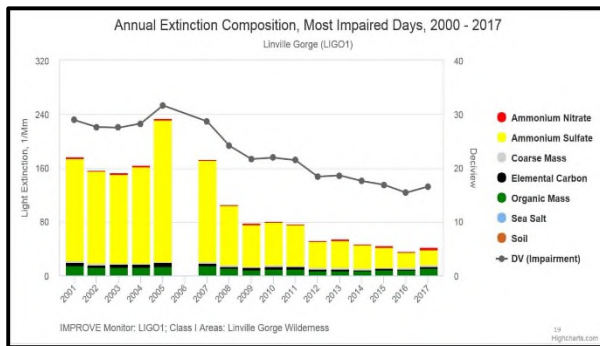
Mandatory Class I Areas

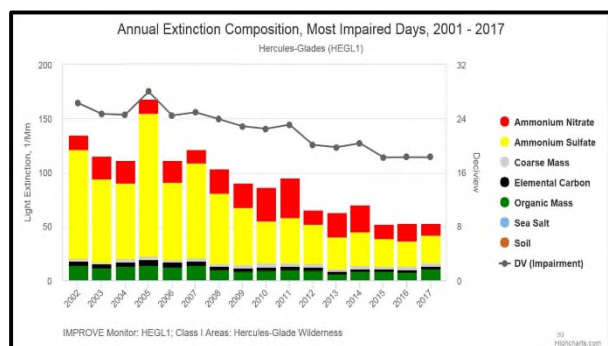
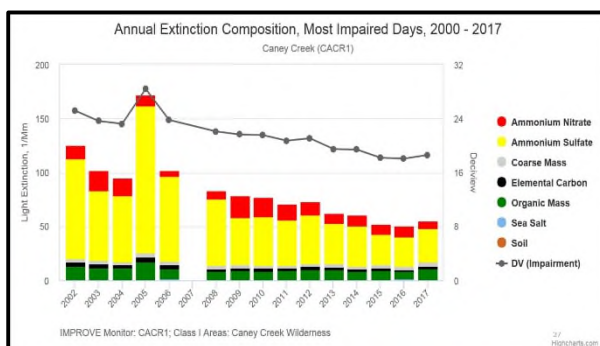
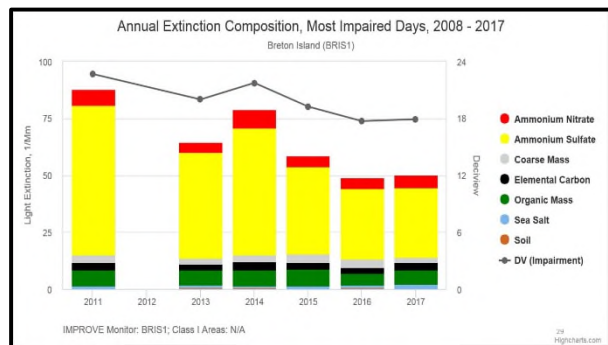
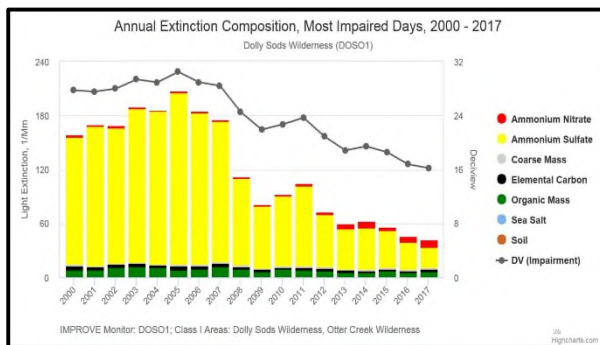
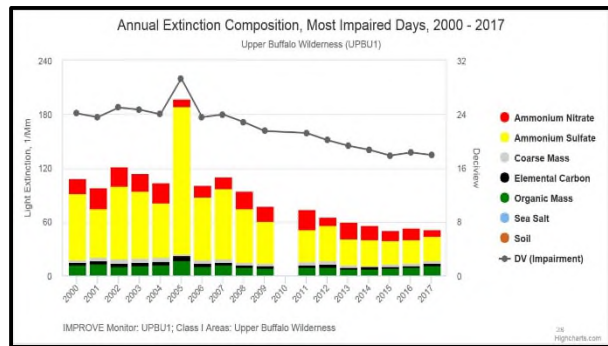
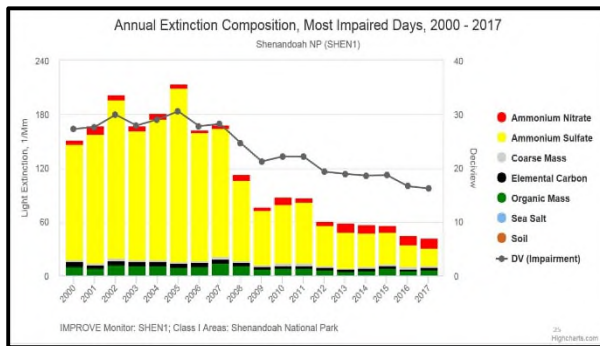


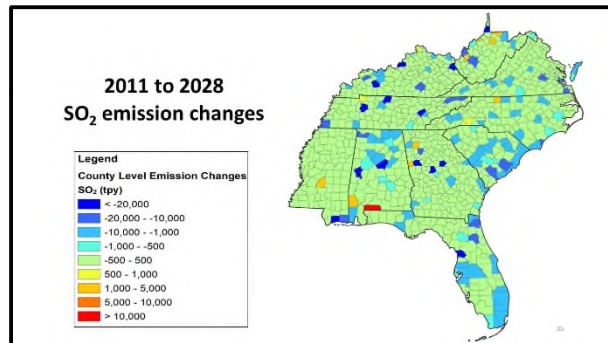
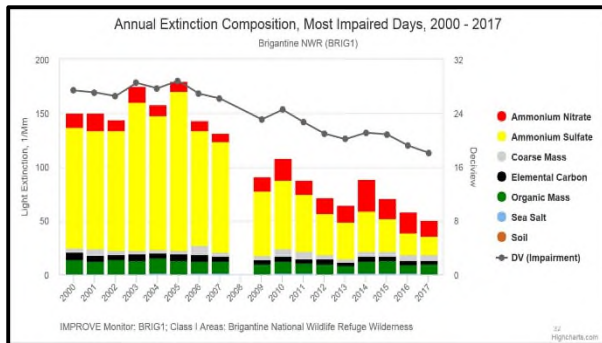
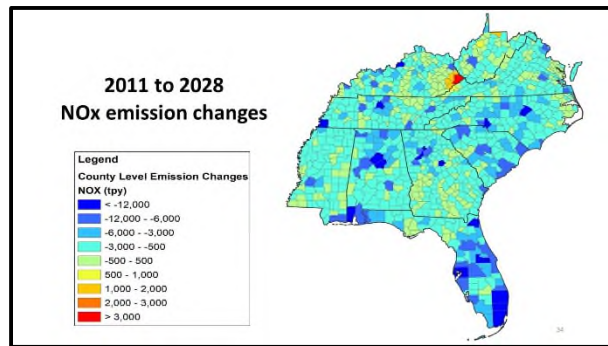
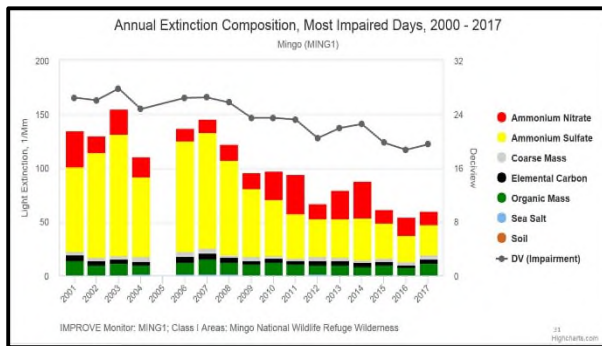
Annual Extinction Composition, Most Impaired Days, 2000 - 2017









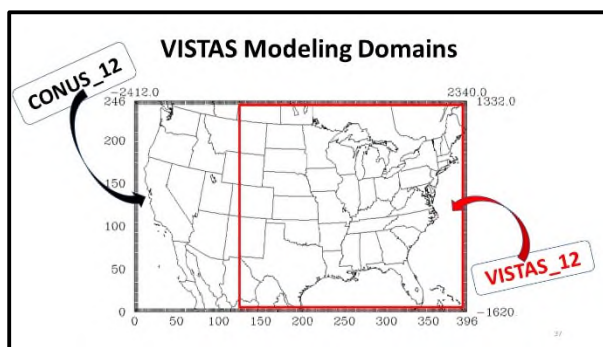


Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's 2028 projection year emissions
 - EGU and major non-EGU sources
 - Removed Clean Power Plan assumptions
 - Adjusted for changes in fuels and facility operating plans

VISTAS Air Quality Model

- Started with EPA's 2011/2028 modeling platform
 - Version 6.3el
 - CAMx v6.32
- Replaced CAMx v6.32 with CAMx v6.40
- Used 2011 meteorology
- Reasons for using EPA platform
 - Time limited
 - Budget limited
 - Most source sectors acceptably represented in EPA platform

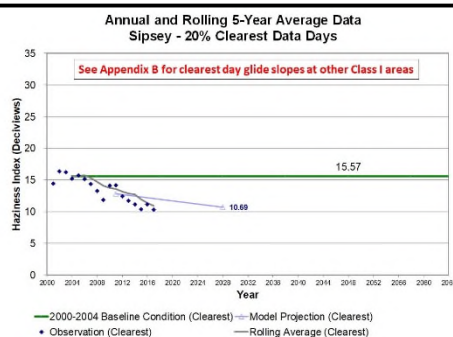


VISTAS Future Year Model Projections

- Calculation of relative response factors (RRFs)
- Gives average percent change in pollutant or species concentrations due to emission changes between 2011 and 2028
- Produces design values for 2028

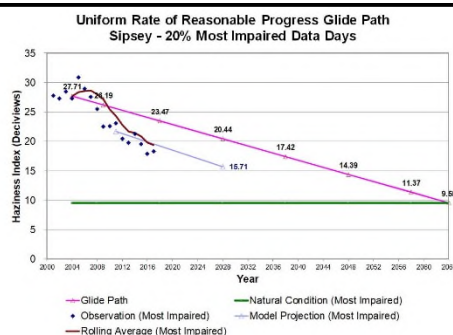
Benchmark Comparisons

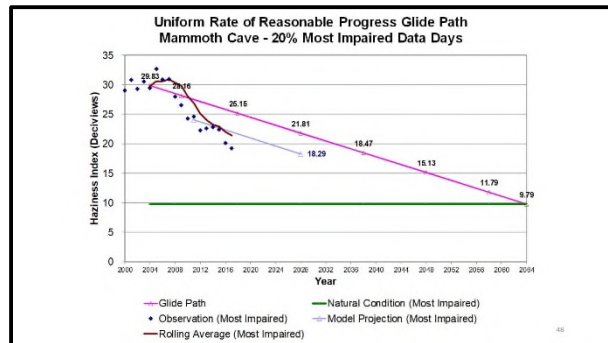
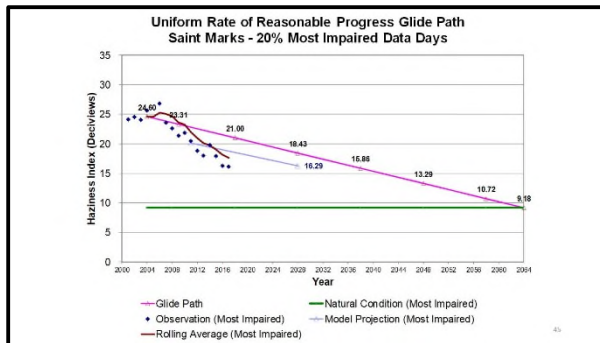
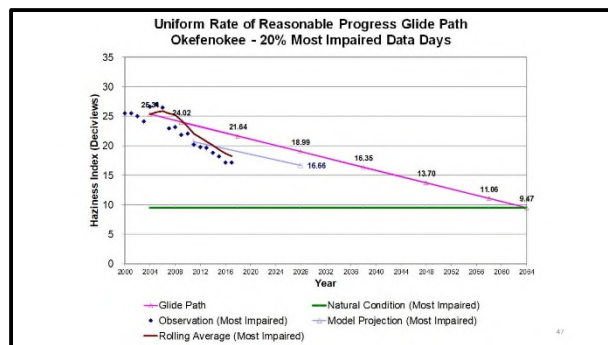
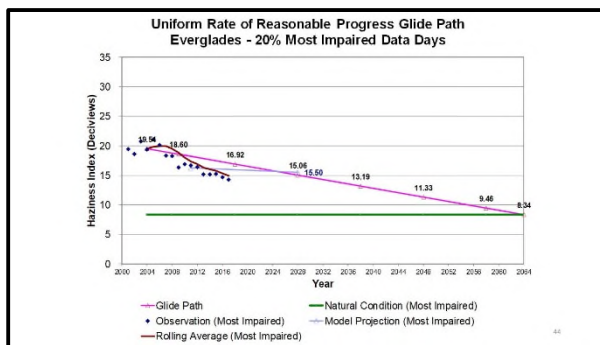
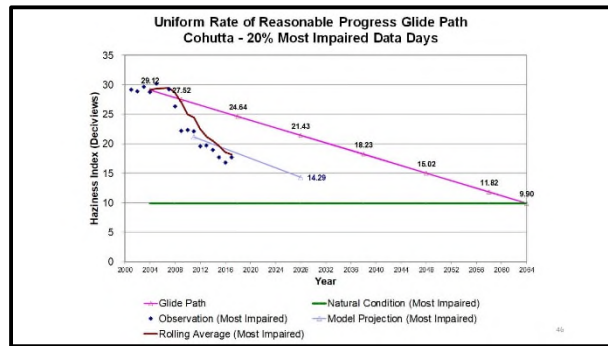
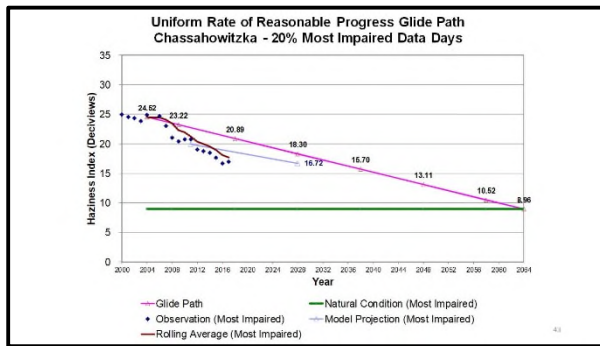
1. EPA 2011 with CAMx_6.32 (CONUS) vs. Alpine 2011 with CAMx_6.32 (CONUS)
2. Alpine 2011 with CAMx_6.32 (CONUS) vs. Alpine 2011 with CAMx_6.40 (CONUS)
3. Alpine 2011 with CAMx_6.40 (CONUS) vs. **Alpine 2011 with CAMx_6.40 (VISTAS)**
4. EPA 2028 with CAMx_6.32 (CONUS) vs. Alpine 2028 with CAMx_6.40 (CONUS)
5. Alpine 2028 with CAMx_6.40 (CONUS) vs. **Alpine 2028 with CAMx_6.40 (VISTAS)**

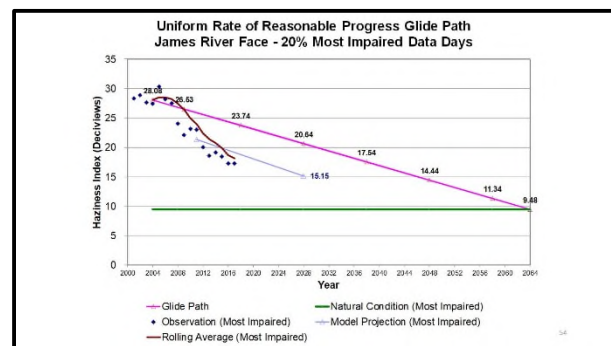
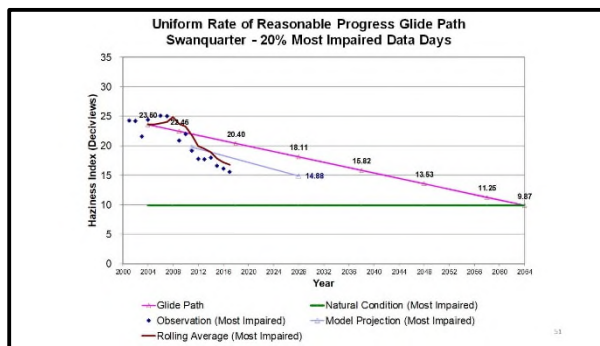
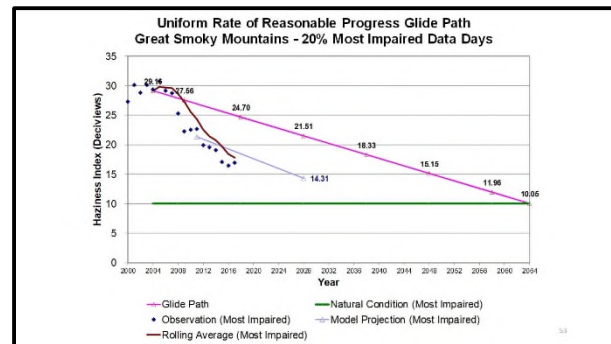
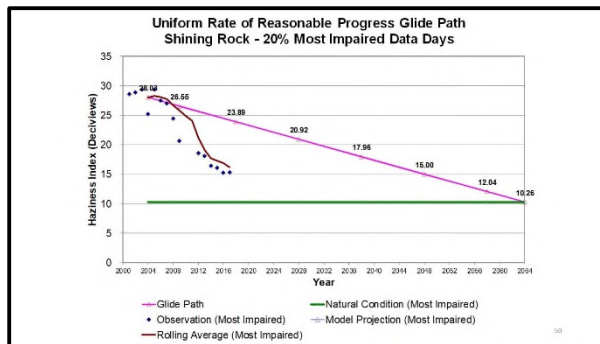
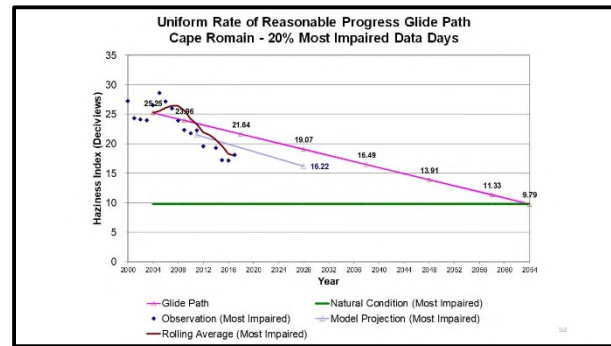
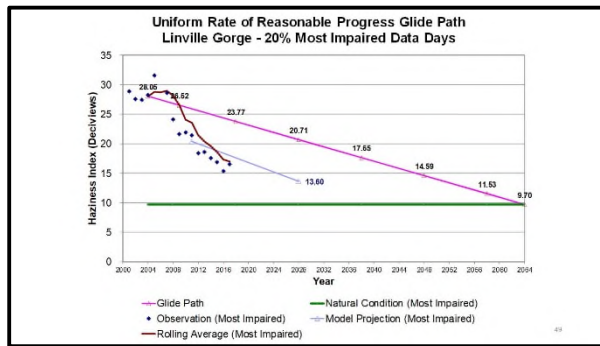


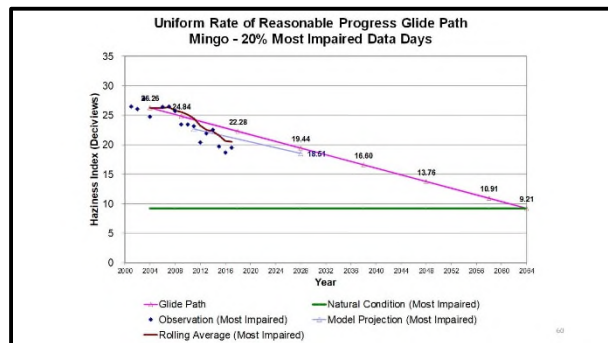
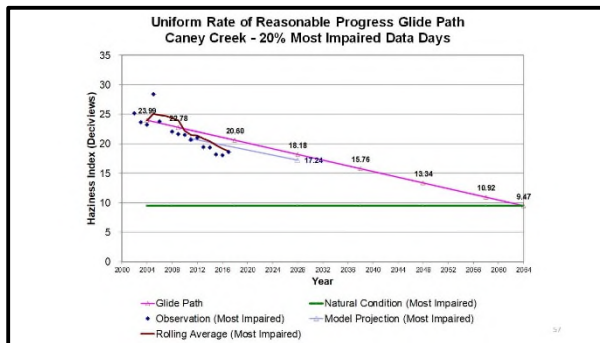
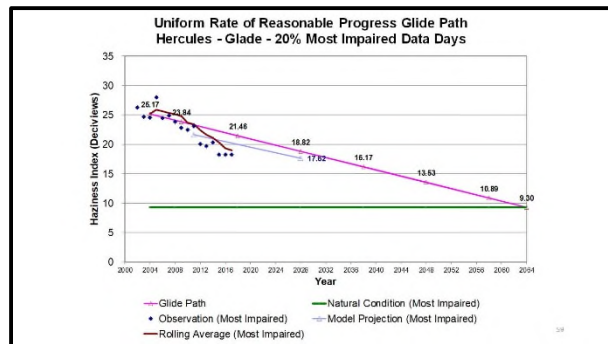
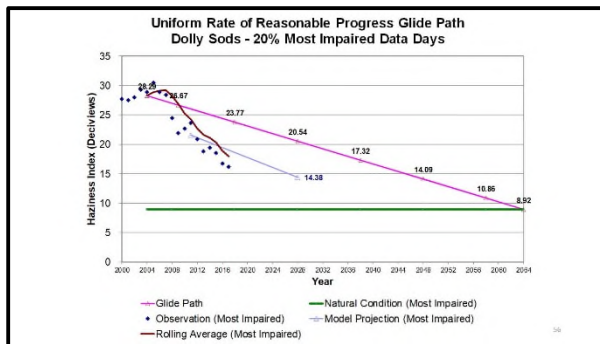
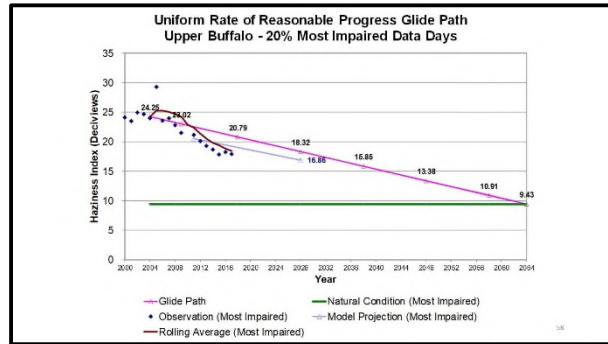
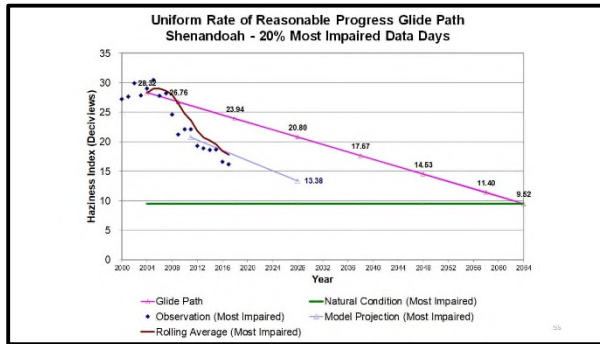
Model Performance Evaluation

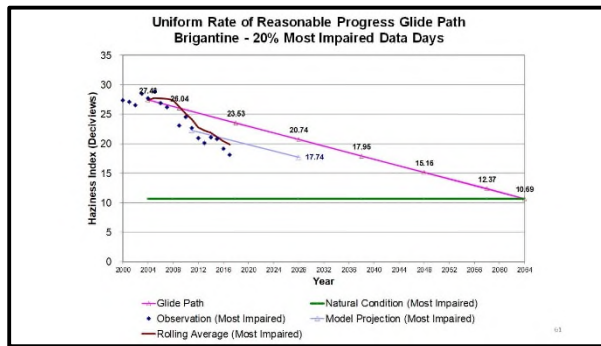
- Compared model results to observations. Looked at statistics, comparison plots, and spatial plots
 - Ozone
 - PM_{2.5} and light extinction
 - Wet and dry deposition
- Overall, the model performance is generally within the range deemed acceptable for regulatory applications





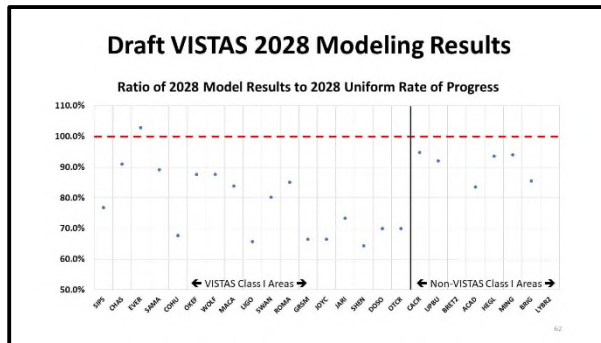






Draft AOI Source Categories for COHU

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.9%	3.1%	8.1%
NONROAD_MAR	0.1%	3.3%	3.4%
NONROAD_OTHER	0.2%	2.4%	2.6%
ONROAD	0.6%	6.4%	7.0%
POINT	68.0%	8.0%	75.9%
PT_FIRES_PRESCRIBED	2.5%	0.5%	3.1%
TOTAL	76.3%	23.7%	100.0%



Draft AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Eva Power Company - Plant Bowen	78.0	6,643.3	10,453.4	18.77%	1.13%
IN	INDIANA MICHIGAN POWER COA AEP - ROCKPORT	410.1	8,806.8	30,536.3	4.47%	0.13%
GA	TEMPLE INLAND	87.4	1,773.4	1,791.0	4.46%	0.17%
IN	Gibson	487.1	12,280.3	23,117.2	2.20%	0.10%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	10,665.5	18,141.9	2.09%	0.15%
NY	Benesse Valley Authority (LVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	2.08%	0.07%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	2.08%	0.13%
GA	Eva Power Company - Plant Hammond	88.5	864.9	777.5	1.90%	0.08%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	1.64%	0.02%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	6,916.5	8,427.3	1.32%	0.09%
NY	Ing. Wiers Electric Corp. - Wilson Station	380.0	1,151.9	6,958.2	1.02%	0.01%
OH	Public Energy Ohio, Wm. L. Zimmer Station (1413090154)	454.6	2,159.0	22,133.9	1.01%	0.06%
GA	Eva Power Company - Plant Wansley	156.8	2,052.5	4,856.0	1.01%	0.04%
NY	NY Utilities Co. - Ghent Station	441.5	7,919.9	10,106.3	1.00%	0.08%
IL	Joppe Steam	466.9	4,706.3	29,559.3	0.99%	0.05%
GA	Mohawk Industries Inc	32.0	66.5	77.3	0.97%	0.07%
TN	FAS-MAN CHEMICAL COMPANY	766.8	6,900.3	6,420.7	0.95%	0.08%
MO	PARKESTER MISSOURI-LEASQUE PLANT	609.4	9,865.5	41,740.5	0.92%	0.01%
TN	TATF & VLF, Loudon	109.0	883.3	477.8	0.89%	0.09%
IL	Newton	564.0	1,934.9	10,631.6	0.87%	0.01%

VISTAS Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
 - Formula: $(Q/d) \cdot EWRT$
- Establishes each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Ranks facilities based on projected contributions
- Facilities with highest contributions may be subject to 4-factor analysis

Draft AOI Source Categories for WOLF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.6%	1.5%	4.1%
NONROAD_MAR	1.4%	2.7%	4.1%
NONROAD_OTHER	0.3%	3.0%	3.3%
ONROAD	0.7%	5.2%	5.9%
POINT	70.4%	6.8%	77.1%
PT_FIRES_PRESCRIBED	4.7%	0.8%	5.5%
TOTAL	79.9%	20.1%	100.0%

See Appendix C for draft AOI source categories at other Class I areas

Draft AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO ₂ _2028 (tons/year)	SO ₂ Contribution	NOx Contribution
GA	Brunswick & Cellulose, Inc.	77.9	1,524.7	784.2	8.61%	2.87%
FL	ROCKTENN CP, LLC	74.9	2,316.8	2,606.7	8.34%	0.38%
GA	International Paper - Savannah	85.9	1,560.7	1,945.4	7.34%	0.23%
FL	ISA	109.1	951.8	2,094.5	4.21%	0.09%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	951.5	1,880.2	2.58%	0.05%
IL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	113.6	112.4	3,197.4	2.34%	0.01%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	1.79%	0.00%
IL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,377.1	502.0	1.74%	0.37%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,733.4	1.72%	0.02%
OH	General James M. Davis Power Plant (0622010056)	805.3	8,222.5	41,505.8	1.62%	0.02%
SC	NANTHEC CORP/KRCHSOS GENERATING STATION	753.0	5,225.5	4,481.2	1.55%	0.08%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	597.1	1.51%	0.00%
IL	ISA CHEMICALS (INDIANA), INC.	118.5	37.7	898.9	1.19%	0.08%
FL	DUKE ENERGY FLORIDA, INC. (DFP)	296.0	2,489.8	5,306.4	1.10%	0.04%
GA	Isa Power Company - Plant Bowen	458.1	5,643.3	10,453.4	1.05%	0.03%
GA	Savannah Sugar Refinery	89.9	521.6	582.0	1.03%	0.07%
SC	INTERNATIONAL PAPER EASTOVER	288.2	1,780.3	3,212.4	0.83%	0.05%
GA	Isa Power Company - Plant McManus	27.1	72.2	30.1	0.91%	0.14%
AL	Paracomb Operating Company LLC	519.2	148.3	18,914.4	0.88%	0.00%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,463.7	0.87%	0.09%

See Appendix C for draft AOI point contributions at other Class I areas

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Round 1 Facility Tags

Facility State/Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO ₂ Tag
AL	VISTAS	03103-1440211 Escambia Operating Company LLC		1
AL	VISTAS	01063-98511 Escambia Operating Company LLC		1
AL	VISTAS	01073-1018711 DRUMMOND COMPANY, INC.		1
AL	VISTAS	01097-1066111 Ala Power - Barry		1
AL	VISTAS	01097-1061611 Union Oil of California - Churchula Gas Plant		1
AL	VISTAS	01097-949811 Akzo Nobel Chemicals Inc.		1
AL	VISTAS	01103-1000011 Nucor Steel Decatur LLC		1
AL	VISTAS	01109-985711 Sandens Iron Co.		1
FL	VISTAS	12005-535411 ROCKTENN CP LLC		1
FL	VISTAS	12017-640611 DUKE ENERGY (FLORIDA, INC. (DCE)	1	1
FL	VISTAS	12011-640711 F.A.		1
FL	VISTAS	12033-752711 SULF POWER - Crist		1
FL	VISTAS	12047-769711 WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.		1
FL	VISTAS	12057-538611 TAMPA ELECTRIC COMPANY (TEC)		1
FL	VISTAS	12057-716411 MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12089-753711 ROCK TENN CP, LLC	1	1
FL	VISTAS	12089-845811 RAYONIER PERFORMANCE FIBERS LLC		1
FL	VISTAS	12105-517711 MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12105-519811 MOSAIC FERTILIZER, LLC		1
FL	VISTAS	12123-752411 BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1	1

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VISTAS Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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Round 1 Facility Tags

Facility State/Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO ₂ Tag
GA	VISTAS	13015-2613011 Isa Power Company - Plant Bowen		1
GA	VISTAS	13015-3679811 International Paper - Savannah		1
GA	VISTAS	13177-3721011 Brunswick Cellulose Inc.		1
KY	VISTAS	21091-7352411 Century Aluminum of KY LLC		1
KY	VISTAS	21145-6037011 Tennessee Valley Authority (TVA) - Shawnee Fossil Plant		1
KY	VISTAS	21175-5196711 Tennessee Valley Authority - Paradise Fossil Plant		1
KY	VISTAS	21183-5561611 Big Rivers Electric Corp. - Wilson Station		1
NC	VISTAS	37013-8479311 PCS Phosphate Company, Inc. - Aurora		1
NC	VISTAS	37067-7202011 Blue Ridge Paper Products - Canton Mill		1
SC	VISTAS	45015-4839511 ALUMAX OF SOUTH CAROLINA		1
SC	VISTAS	45019-4978011 KAPSTONE CHARLESTON KRAFT LLC	1	1
SC	VISTAS	45043-5698811 INTERNATIONAL PAPER CO/GRANT TOWN MILL		1
TN	VISTAS	47001-6196001 TVA BULL RUN FOSSIL PLANT	1	1
IN	VISTAS	47009-9159211 Mc Ghee Tyson	1	1
TN	VISTAS	47091-4979911 Conoco - Knoxville Plant	1	1
TN	VISTAS	47105-4129211 OAS & OIL, London	1	1
IN	VISTAS	47145-4979111 TVA KINGSION FOSSIL PLANT		1
TN	VISTAS	47161-4979111 TVA CUMBERLAND FOSSIL PLANT		1
IN	VISTAS	47163-3982311 EASTMAN CHEMICAL COMPANY		1

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PSAT SO₂ and NOx Tags

Round 1 (124 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 51 tags
- NOx tags for individual VISTAS facilities = 21 tags

Round 2 (45 tags identified so far...)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ tags for individual non-VISTAS facilities = 13 tags
- NOx tags for individual non-VISTAS facilities = 4 tags

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Round 1 Facility Tags

Facility State/Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO ₂ Tag
VA	VISTAS	51027-5019811 Rowell Cement Company		1
VA	VISTAS	51077-4034811 Rowell Coke Company LP		1
VA	VISTAS	51540-5748711 Meacham & Co Packaging Resource Group		1
WV	VISTAS	54023-6257011 Dominion Resources, Inc. - MOUNT STORM POWER STATION	1	1
WV	VISTAS	54033-6271711 ALLI CHENY ENERGY SUPPLY CO, LLC HARRISON	1	1
WV	VISTAS	54041-6900311 EQUITRANS - CORLEY RUN CS 70		1
WV	VISTAS	54049-4864511 AMERICAN OILUMINOUS POWER GRANT TOWN PLT	1	1
WV	VISTAS	54051-6802011 MITCHELL PLANT		1
WV	VISTAS	54061-1632011 LONGVIEW POWER		1
WV	VISTAS	54061-6773811 MONONGAHELA POWER CO. FORT MARTIN POWER	1	1
WV	VISTAS	54061-6773811 MONONGAHELA POWER CO. FORT MARTIN POWER	1	1
WV	VISTAS	54073-4782811 MONONGAHELA POWER CO-PLEASANTS POWER STA	1	1
WV	VISTAS	54079-6789111 APPALACHIAN POWER COMPANY JOHN F. AMOS PLANT	1	1
WV	VISTAS	54083-6740511 ELADY BELESD		1
WV	VISTAS	54083-6790711 PILES CREEK CC-340		1
WV	VISTAS	54093-6327811 KINGSFORD MANUFACTURING COMPANY	1	1

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Round 2 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
MD	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MAHSLION		1
MD	MAINE-VU	24003-7763811	Luke Paper Company		1
PA	MAINE-VU	42005-3866111	GENON NE MGMT CO/WEYSTONE STA		1
PA	MAINE-VU	42003-3005711	HOMER CITY GEN IRY / CENTER TWP	1	1
IL	Midwest RPO	17327-7808911	Joppat Steam		1
IN	Midwest RPO	18051-7363111	Gibson		1
IN	Midwest RPO	18125-7362411	INDIANAPOLIS POWER & LIGHT - PELUSHBURG		1
IN	Midwest RPO	18129-8166111	Spiceco AB Brown South Indiana Gas & Ele		1
IN	Midwest RPO	18147-8017211	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT		1
OH	Midwest RPO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)		1
OH	Midwest RPO	39053-7983011	Ohio Valley Electric Corp., Rager Creek Station (0627000003)	1	1
OH	Midwest RPO	39053-8144511	General James M. Gavin Power Plant (0627010056)	1	1
OH	Midwest RPO	39081-8113711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	1	1

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What We've Learned

- The major facility landscape continues to change
 - Shutdowns, fuel switches, additional emission controls
- Emissions continue to go down
- SO₂ emissions are still the major haze contributor, but NOx emissions are becoming more important
- Regional haze levels continue to be reduced
- Visibility improvement is well ahead of schedule

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4-Factor Analysis

- States will evaluate certain sources and emissions to determine if reasonable controls are in place or available
- Considers four important factors
 - Potential costs of compliance
 - Time necessary for compliance
 - Energy and non-air quality environmental impacts of compliance
 - Remaining useful life of sources subject to this analysis

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VISTAS Consultation and Communications

- Sharing information with EPA OAQPS, Regions 3 and 4
- Sharing information and seeking input from Federal Land Managers (next call early June)
- Preparing for briefing to stakeholders (later this year)
- Considering a face-to-face VISTAS meeting – TBD
- Working with RPO colleagues towards a national regional haze meeting this fall
- VISTAS staff available to present information at meetings in your state upon request

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VISTAS Technical Work Status

Task	Status
Data collection/analysis	nearing completion
VISTAS 2011 modeling	done
Emission updates	done
Emission processing	done
2028 modeling	done
Benchmarking	nearing completion
Area of influence analysis	nearing completion
Source apportionment modeling	beginning in May
Future year model projections	draft results available

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VISTAS Remaining Work/Technical Schedule

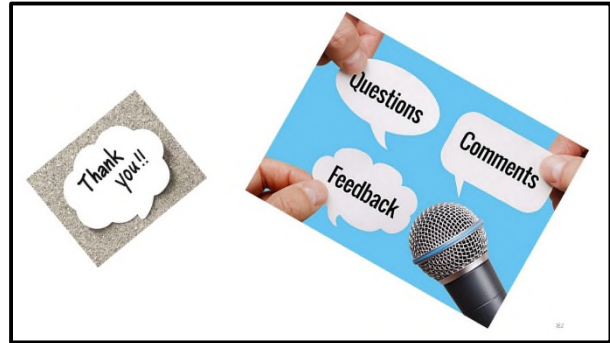
Task	Schedule
Benchmarking	May-June 2019
Area of influence analysis	May 2019
Source apportionment (tagging)	August 2019
Data collection/analysis	May-June 2019
Future year projections (RRFs)	August 2019
Best and final run???	Necessity uncertain
Final reports and documentation	December 2019
Web site updates and postings	Ongoing task

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VISTAS State Responsibilities

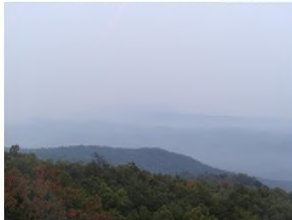
- Perform 4-factor analysis
- Consult and communicate with state stakeholders
- Consult with in-state FLM contacts if applicable
- Consult with surrounding states if applicable
- Complete state-specific analysis and documentation
- Follow state regulatory and SIP development processes
- Seek input and respond to public comment
- Submit regional haze SIPs to EPA by July 31, 2021
- Why all of this work?

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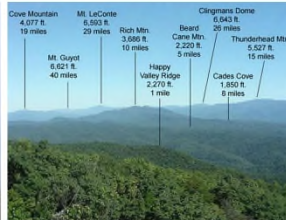


82

Look Rock Hazy Day



Look Rock Clear Day



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Appendix A

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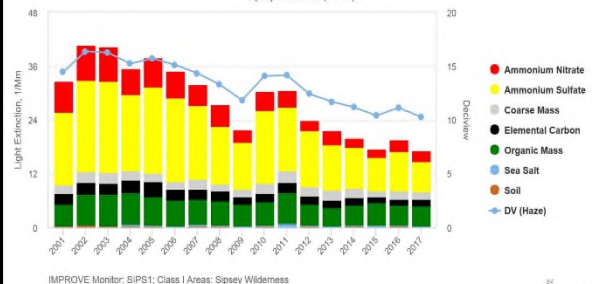
Contact Information

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 - Phone: 919-707-8721
- **John Hornback, Metro 4/SESARM**
 - Email: hornback@metro4-sesarm.org
 - Phone: 404-361-4000

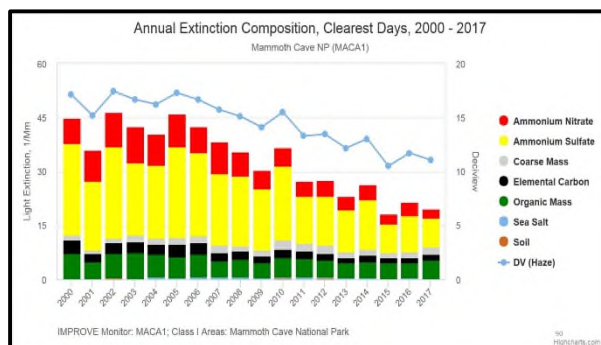
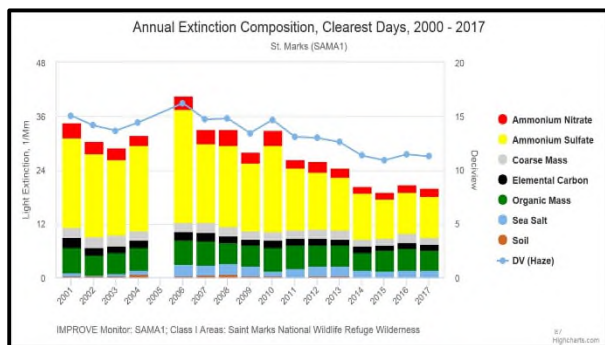
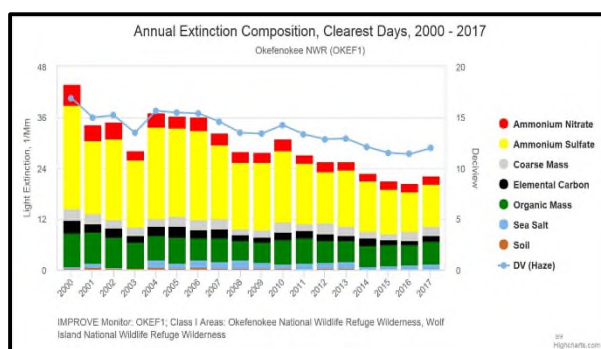
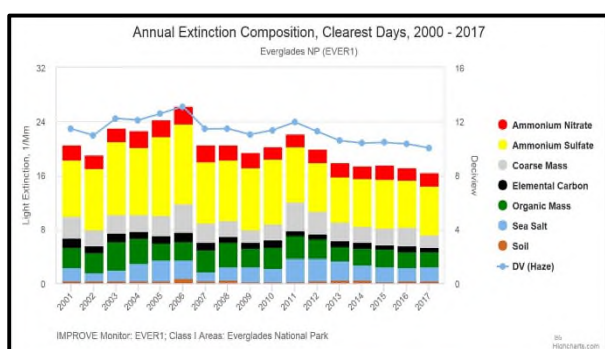
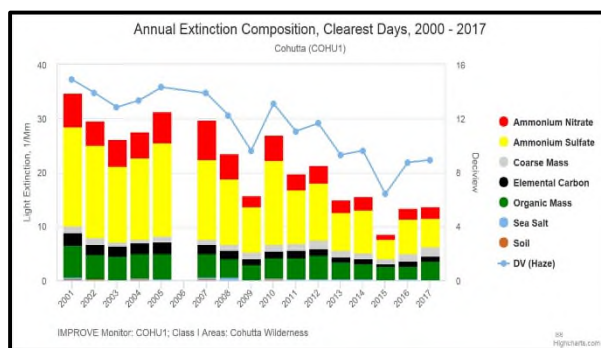
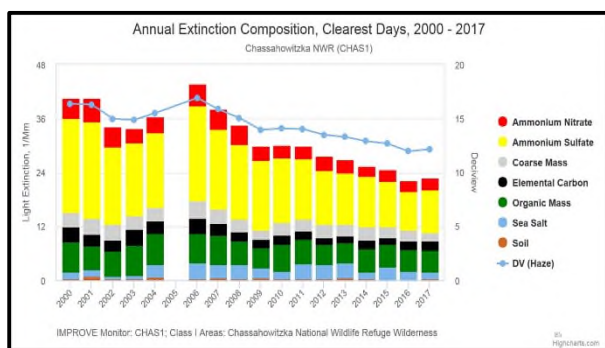


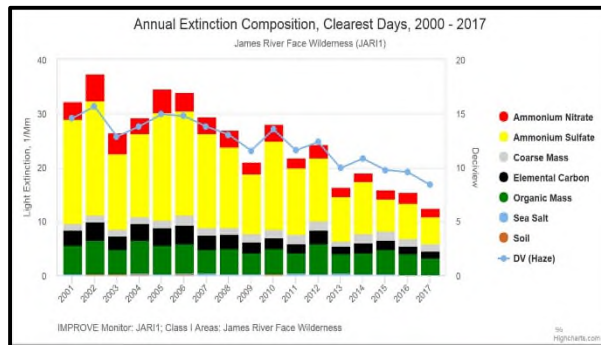
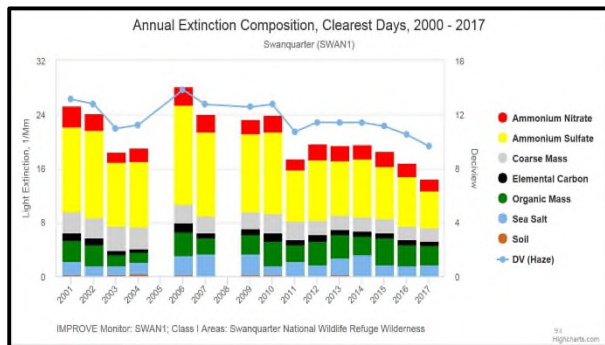
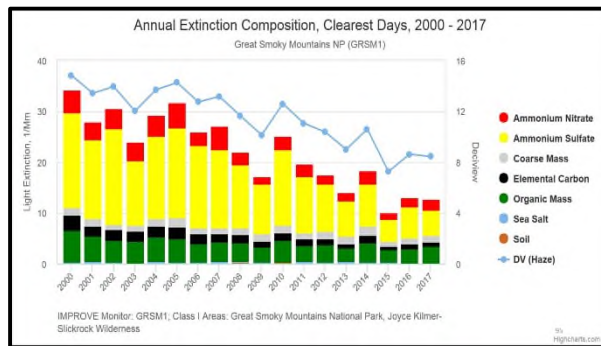
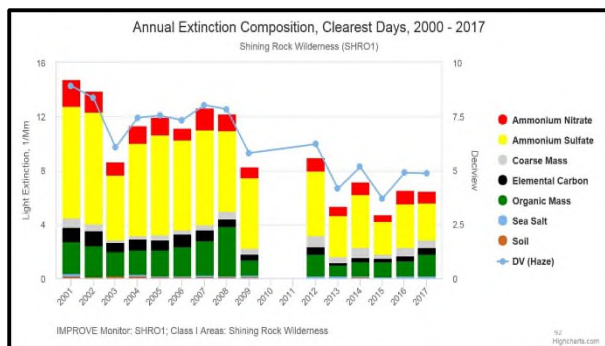
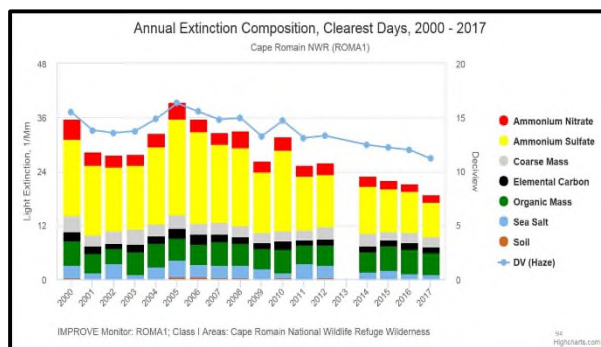
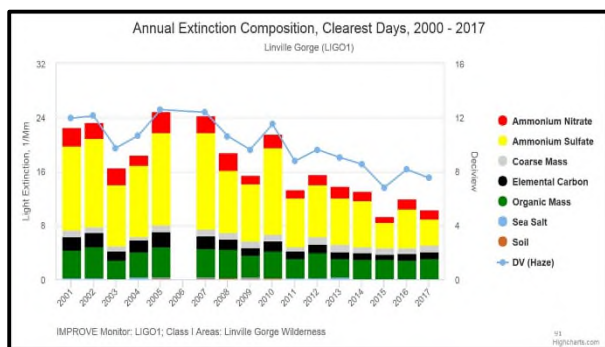
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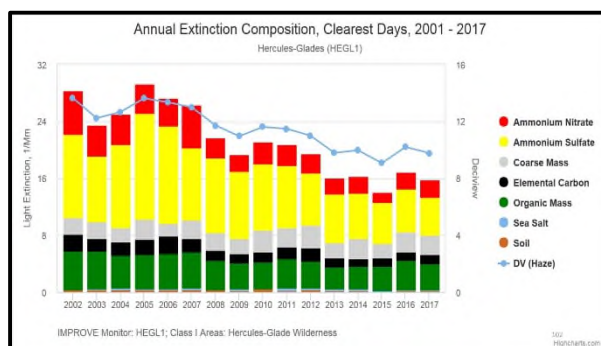
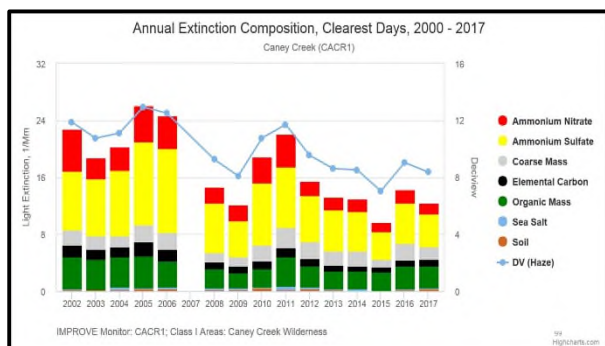
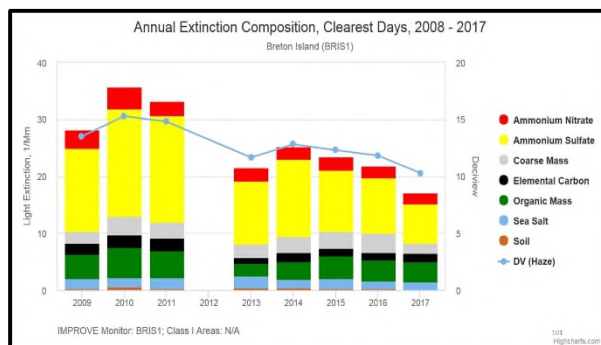
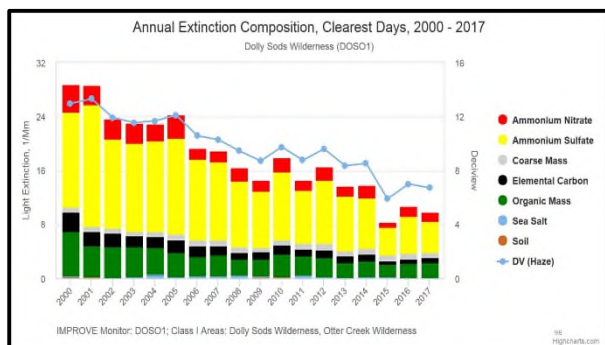
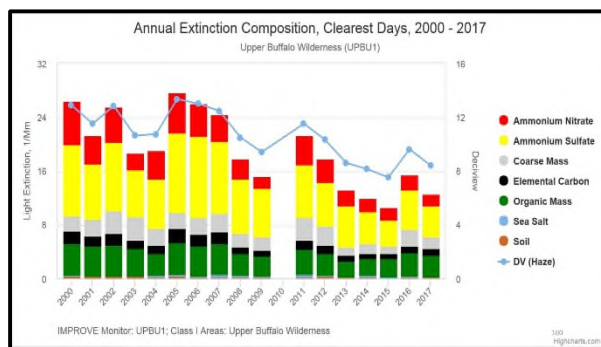
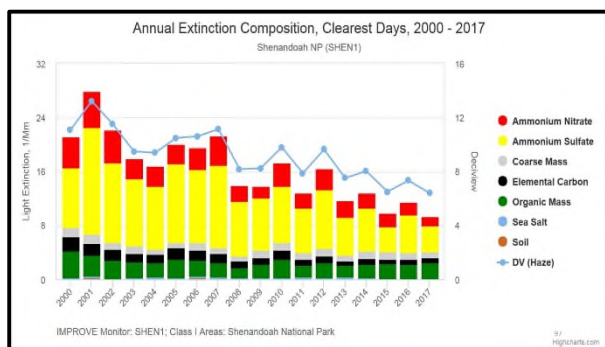
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Sipsey Wilderness (SIP51)

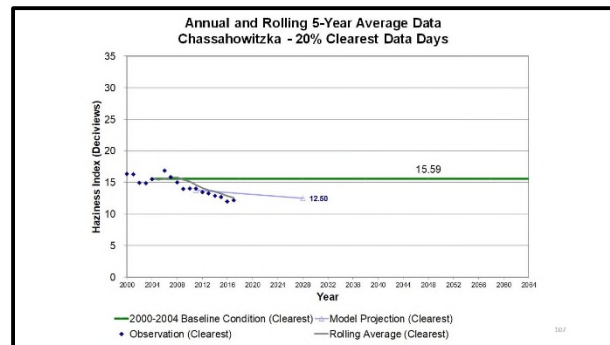
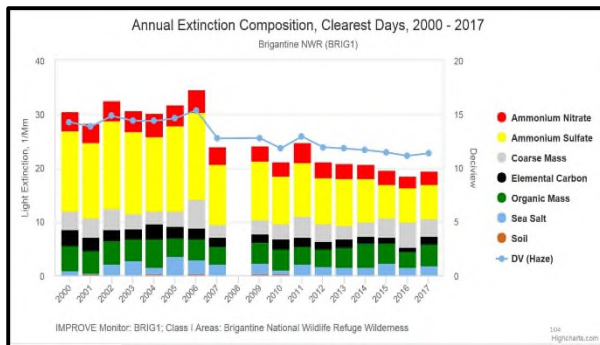
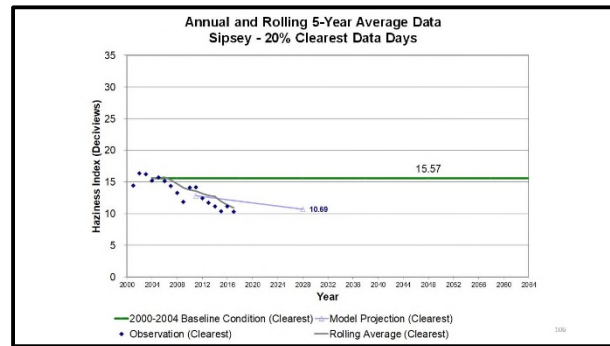
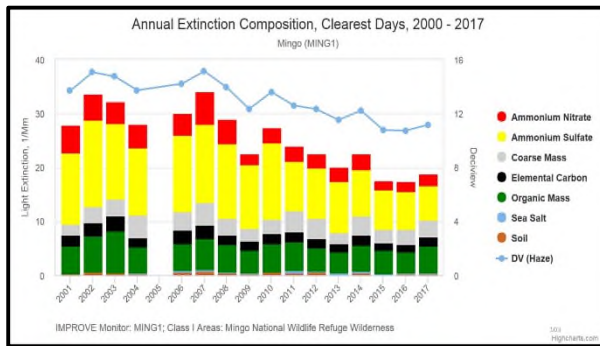


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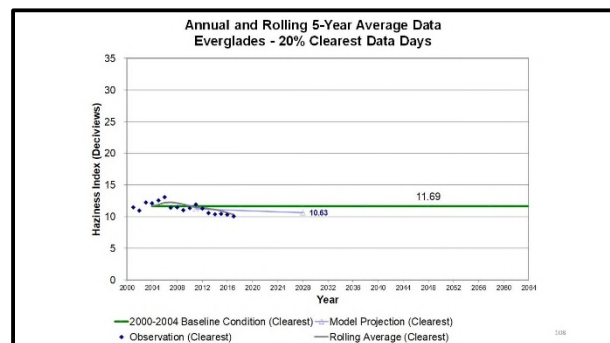


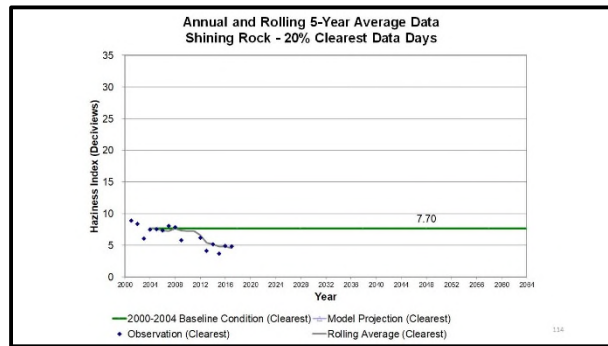
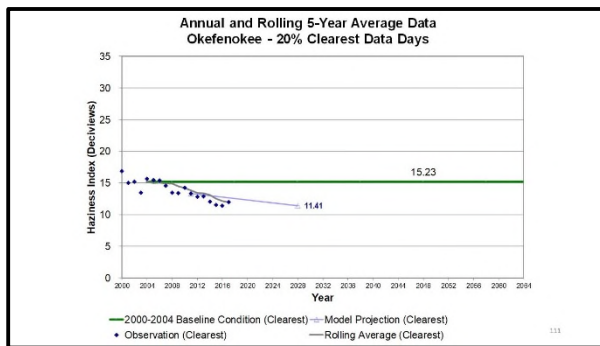
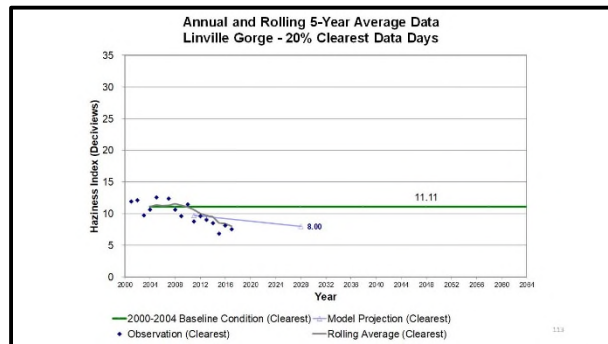
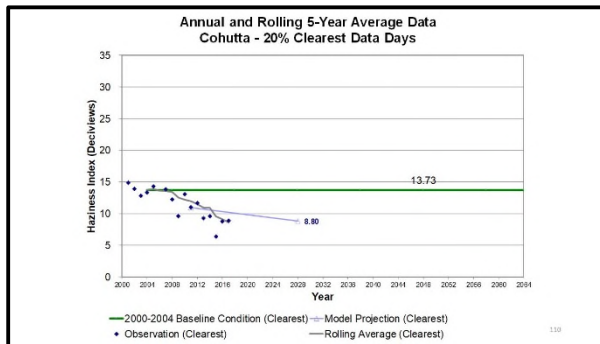
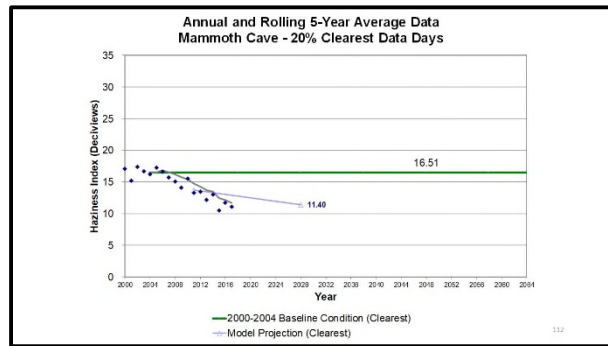
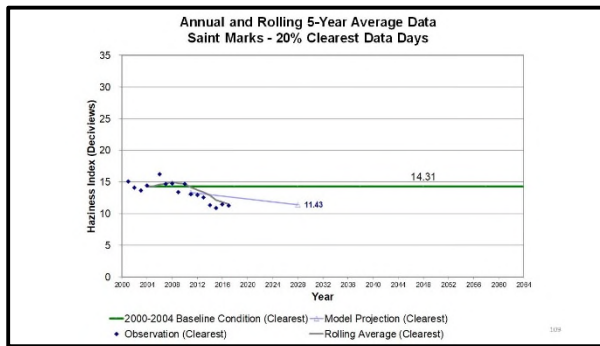


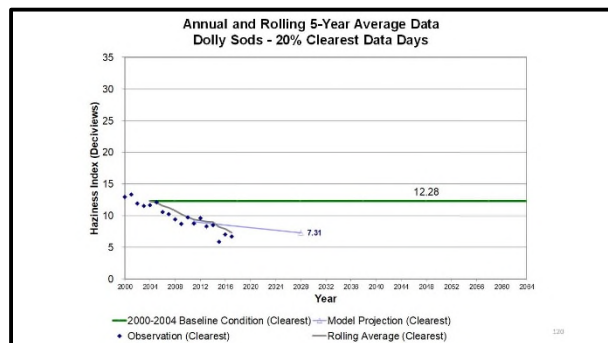
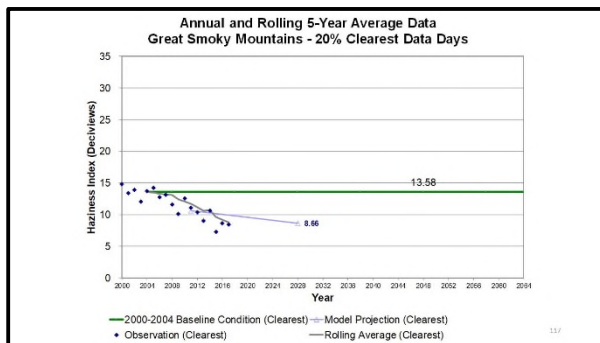
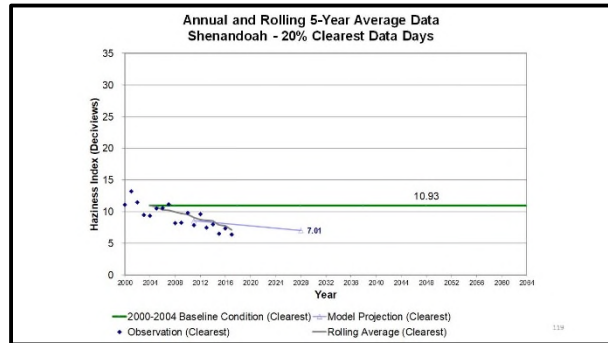
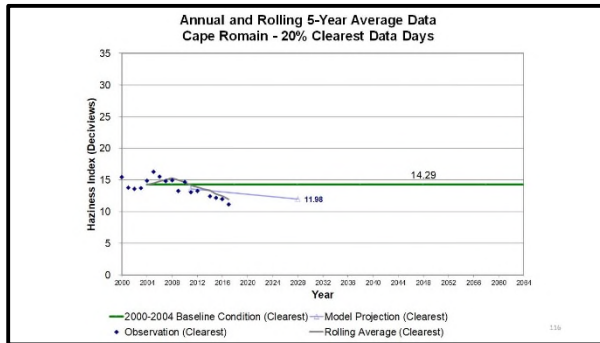
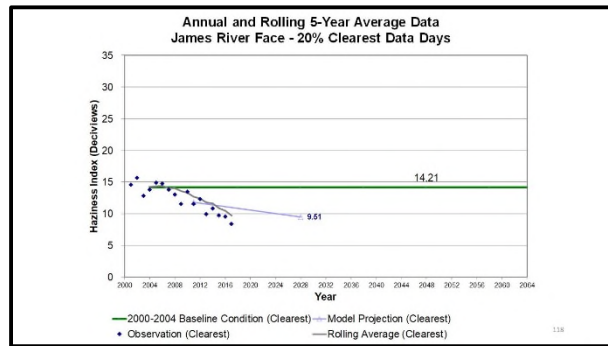
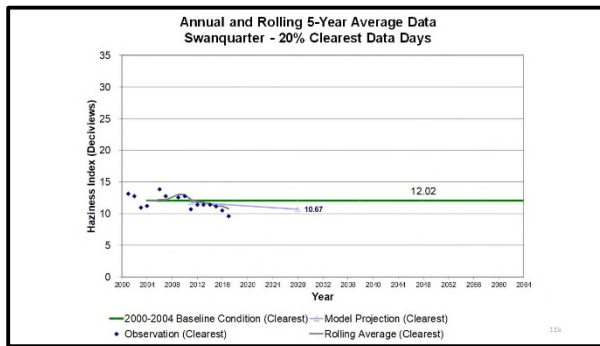


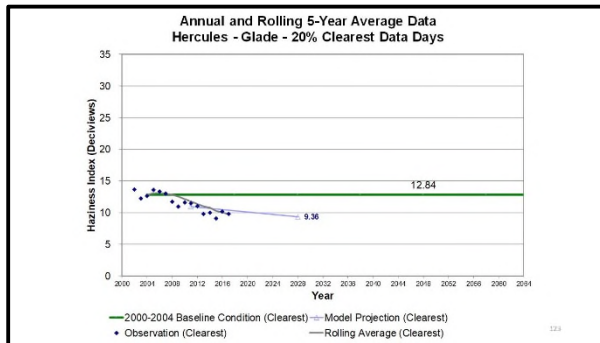
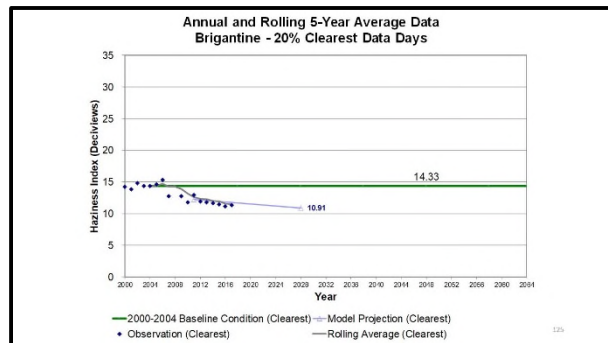
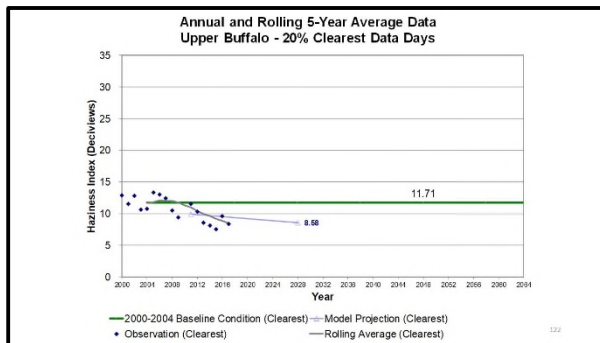
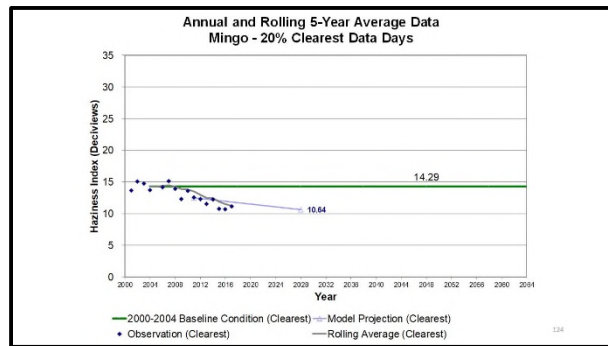
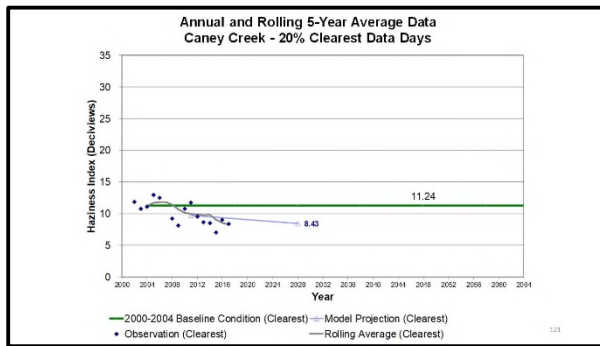
Appendix B

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Appendix C

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Draft AOI Source Categories for SIPS

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	9.8%	5.8%	15.5%
NONROAD_MAR	0.1%	4.1%	4.2%
NONROAD_OTHER	0.2%	4.2%	4.4%
ONROAD	0.3%	8.6%	9.0%
POINT	44.4%	13.6%	58.0%
PT_FIRES_PRESCRIBED	6.2%	2.7%	8.9%
TOTAL	61.0%	39.0%	100.0%

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Draft AOI Point Contributions for CHAS

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	DUKE ENERGY FLORIDA, INC. (DEE)	17.4	2,489.8	5,350.4	60.69%	1.86%
FL	TAMPA ELECTRIC COMPANY (TEC)	106.8	2,665.0	6,084.9	4.51%	0.23%
FL	MOCSAK FERTILIZER LLC	112.6	310.4	7,900.7	4.40%	0.02%
FL	CEMEX CONSTRUCTION MATERIALS FLORIDA LLC	21.5	631.6	335.0	4.11%	1.80%
FL	MOCSAK FERTILIZER, LLC	99.7	159.7	3,084.1	3.68%	0.02%
FL	E. D. MCINTOSH, JR. POWER PLANT	96.1	1,765.3	4,702.7	2.98%	0.17%
FL	MOCSAK FERTILIZER, LLC	112.2	141.0	4,425.6	2.22%	0.01%
FL	ORLANDO UTILITIES COMMISSION	138.8	4,013.4	2,690.6	1.13%	0.18%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	141.2	917.8	3,713.4	0.72%	0.02%
FL	MOCSAK FERTILIZER, LLC	123.0	29.5	1,123.5	0.54%	0.00%
AL	Inscambia Operating Company LLC	530.7	349.3	18,974.4	0.49%	0.00%
FL	CITY OF GAINESVILLE, GRI	113.1	410.0	881.4	0.47%	0.01%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	239.3	2,316.8	2,608.7	0.39%	0.01%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	189.0	312.4	3,197.8	0.38%	0.00%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	174.0	1,830.7	1,520.4	0.32%	0.02%
FL	JEA	209.9	651.8	2,094.5	0.30%	0.01%
FL	GEORGIA PACIFIC CONSUMER OPERATIONS LLC	133.7	1,187.6	735.6	0.24%	0.04%
FL	CEPUS	27.1	280.2	19.1	0.22%	0.20%
FL	BUCKINGHAM, LLC	355.3	1,404.9	2,980.9	0.22%	0.01%
FL	FLORIDA GAS TRANSMISSION COMPANY	33.6	7.1	4.0	0.18%	0.00%

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Draft AOI Point Contributions for SIPS

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	8,806.8	30,536.3	5.58%	0.30%
MO	NEW MADRID POWER PLANT MARSTON	314.5	4,394.1	16,783.7	3.40%	0.26%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	7,007.3	19,504.7	3.23%	0.55%
TN	TVA CUMBERLAND FOSSIL PLANT	228.9	4,916.5	8,427.3	3.11%	0.46%
IN	Edison	448.7	12,280.3	25,117.2	2.28%	0.28%
KY	Bla Blinn's Electric Corp. - Wilson Station	345.5	1,151.9	6,934.2	1.90%	0.07%
IL	Jopoka Steam	346.5	4,706.3	20,509.3	1.90%	0.24%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	464.4	10,665.3	18,141.9	1.68%	0.73%
AL	Pease Steel Decatur LLC	40.0	331.2	170.2	1.66%	0.75%
AL	DRUMMOND COMPANY, INC.	98.7	3,228.5	2,562.2	1.66%	0.16%
AL	Alabama Power - Ecogas	78.5	5,976.4	1,410.8	1.47%	0.80%
AL	Walton Cable, Inc.	99.6	781.8	2,279.2	1.43%	0.10%
MO	NUKATION POWER STATION-MERISON POWER STATION	349.1	1,826.0	12,252.1	1.26%	0.09%
MO	INDIANA ALUMINUM INC. NEW MADRID	314.5	39.1	5,876.5	1.19%	0.00%
IN	Stropco Mill Brown South Indiana Gas & Elec	395.7	1,578.6	7,664.7	1.17%	0.07%
AL	Ala power - MILLER	82.9	11,047.1	1,490.5	1.10%	3.03%
GA	Via Power Company - Plant Rossmore	274.1	6,643.1	10,453.4	1.04%	0.14%
AL	EC Gascon	148.7	2,629.8	2,286.9	0.98%	0.17%
IL	Newton	516.6	1,834.9	10,631.6	0.97%	0.07%
IN	ALCOA - WARRICK POWER PLT AGC DIV OF AL	396.3	11,158.6	5,071.3	0.89%	0.61%

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Draft AOI Source Categories for EVER

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	5.4%	6.4%	11.8%
NONROAD_MAR	12.9%	23.2%	36.1%
NONROAD_OTHER	0.4%	12.5%	12.9%
ONROAD	2.0%	17.2%	19.2%
POINT	10.2%	7.5%	17.7%
PT_FIRES_PRESCRIBED	1.8%	0.4%	2.3%
TOTAL	32.8%	67.2%	100.0%

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Draft AOI Source Categories for CHAS

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	0.5%	0.5%	1.0%
NONROAD_MAR	0.1%	0.3%	0.4%
NONROAD_OTHER	0.1%	1.2%	1.3%
ONROAD	0.2%	1.8%	2.0%
POINT	88.6%	4.0%	92.6%
PT_FIRES_PRESCRIBED	2.3%	0.4%	2.7%
TOTAL	91.8%	8.2%	100.0%

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Draft AOI Point Contributions for EVER

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	Miami Intl	58.6	4,171.9	424.9	8.75%	13.77%
FL	MOCSAK FERTILIZER, LLC	303.3	310.4	7,900.7	4.70%	0.02%
FL	MIAMI DADE WATER AND SEWER DEPARTMENT	38.1	29.5	61.1	3.73%	0.41%
FL	TAMPA ELECTRIC COMPANY (TEC)	316.6	2,665.0	6,084.9	2.85%	0.08%
FL	E. D. MCINTOSH, JR. POWER PLANT	322.8	1,765.3	4,702.7	2.68%	0.16%
FL	MOCSAK FERTILIZER, LLC	304.7	141.0	4,425.6	2.56%	0.01%
FL	MIAMI DADE WATER AND SEWER DEPARTMENT	66.1	51.2	131.8	1.97%	0.11%
FL	Port Lauderdale/Hollywood	40.1	1,922.6	207.7	1.91%	2.39%
FL	WASTE MANAGEMENT INC. OF FLORIDA	173.2	5.8	390.4	1.87%	0.00%
FL	FLORIDA POWER & LIGHT (FPL)	35.4	170.6	13.0	1.68%	2.35%
FL	MOCSAK FERTILIZER, LLC	322.3	150.7	3,084.1	1.47%	0.01%
FL	ORLANDO UTILITIES COMMISSION	346.1	4,013.4	2,690.6	1.33%	0.24%
TX	Martin Lake	1,552.8	12,258.3	56,110.3	1.11%	0.01%
FL	MOCSAK FERTILIZER, LLC	293.1	29.5	1,123.5	1.10%	0.00%
FL	WASTE MANAGEMENT INC. OF FLORIDA	112.0	64.5	375.3	0.92%	0.05%
FL	DUKE ENERGY (FLORIDA, INC.) (DEE)	443.2	2,489.8	5,308.4	0.79%	0.02%
TX	WIA PARKSH ELECTRIC OPERATING STATION	1,544.8	3,865.5	37,774.2	0.75%	0.00%
FL	CEMEX CONSTRUCTION MATERIALS FL. LLC	50.8	930.6	29.5	0.69%	2.74%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	480.3	917.8	3,713.4	0.68%	0.02%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,513.9	8,806.8	30,536.3	0.61%	0.04%

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Draft AOI Source Categories for SAMA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.5%	1.4%	3.9%
NONROAD_MAR	0.5%	1.4%	1.8%
NONROAD_OTHER	0.3%	2.1%	2.3%
ONROAD	0.5%	3.1%	3.5%
POINT	61.5%	4.3%	65.8%
PT_FIRES_PRESCRIBED	19.9%	2.7%	22.7%
TOTAL	85.2%	14.8%	100.0%

133

Draft AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Co Power Company - Plant Bowen	18.0	6,643.3	10,451.4	18.77%	1.10%
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	410.1	8,806.8	30,536.3	4.47%	0.13%
GA	TEMPLE INLAND	87.4	1,773.4	1,791.0	4.46%	0.17%
IN	Shorey	447.1	12,280.3	23,117.2	2.20%	0.10%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	10,665.3	18,141.9	2.09%	0.15%
KY	Immamocco Valley Authority (IVA) - Shawnee Fossil Plant	457.7	7,007.3	19,504.7	2.08%	0.07%
TN	TYVA KINGSTON FOSSEL PLANT	124.0	1,687.4	1,886.1	2.08%	0.13%
GA	Co Power Company - Plant Hammond	88.5	864.9	777.5	1.90%	0.08%
OH	Genex at James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,559.8	1.64%	0.02%
TN	TYVA CUMBERLAND FOSSEL PLANT	327.0	4,918.5	8,427.9	1.32%	0.09%
KY	Ing Rivers Electric Corp. - Wilson Station	360.0	1,151.0	6,954.2	1.02%	0.01%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,131.9	1.01%	0.06%
GA	Co Power Company - Plant Windsor	156.8	2,053.5	4,406.0	1.01%	0.04%
KY	KY Utilities Co. - Owsen Station	441.5	7,539.9	10,109.3	1.00%	0.08%
IL	Jopka Steam	466.0	4,706.3	20,509.3	0.99%	0.02%
GA	Matheson Industries Inc.	32.0	66.5	77.1	0.07%	0.01%
TN	FASTMAN CHEMICAL COMPANY	769.8	6,980.3	6,470.2	0.95%	0.08%
MO	AMEREN MISSOURI-LABADIE PLANT	695.4	9,685.5	41,740.3	0.92%	0.01%
TN	TAT & TIT, Loudon	109.0	883.3	477.8	0.89%	0.09%
IN	Newcom	564.0	1,524.9	10,031.6	0.87%	0.01%

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Draft AOI Point Contributions for SAMA

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
AL	Isacambia Operating Company LLC	317.6	145.3	18,974.4	17.07%	0.01%
FL	ROCKTECH CP LLC	140.8	3,404.9	2,590.9	7.26%	0.20%
FL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	61.4	1,830.7	1,520.4	5.65%	0.43%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	189.3	2,489.8	5,106.1	4.63%	0.20%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	157.7	112.4	3,197.8	4.29%	0.01%
AL	Isacambia Operating Company LLC	315.0	145.6	8,589.6	3.81%	0.00%
AL	Sanders Lead Co.	255.5	121.7	7,951.1	2.60%	0.00%
FL	MOSNAIC FERTILIZER LLC	373.9	310.4	7,900.7	1.70%	0.01%
FL	TAMPA ELECTRIC COMPANY (TEC)	307.1	2,665.0	6,084.9	1.62%	0.06%
AL	Isa Power - Barry	383.2	2,181.9	6,025.6	1.42%	0.02%
FL	SOLAR POWER - Crist	299.5	2,998.4	2,615.7	1.27%	0.06%
AL	Union Oil of California - Chenshula Gas Plant	396.3	348.2	2,773.2	0.97%	0.01%
LA	Columbian Chemicals Co. - North Bend Plant	709.9	640.1	2,814.0	0.94%	0.00%
FL	IEA	253.7	651.8	2,094.5	0.91%	0.03%
MO	AMEREN MISSOURI-LABADIE PLANT	1,121.8	9,685.5	41,740.3	0.86%	0.00%
AL	Continental Carbon Company	270.8	2,260.0	2,368.3	0.85%	0.02%
FL	MOSNAIC FERTILIZER, LLC	576.1	141.0	4,425.6	0.81%	0.00%
AL	Akzo Nobel Chemicals Inc.	383.2	20.7	3,355.7	0.77%	0.00%
AL	PowerSouth Energy Corp. - Norman	360.7	2,618.8	4,194.9	0.76%	0.03%
GA	Georgia-Pacific Corp Cedar Springs Operation	149.2	2,884.2	510.1	0.75%	0.24%

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Draft AOI Source Categories for OKEF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.8%	1.6%	3.4%
NONROAD_MAR	0.6%	5.6%	6.2%
NONROAD_OTHER	0.1%	1.6%	1.7%
ONROAD	0.5%	4.2%	4.6%
POINT	65.6%	5.5%	71.1%
PT_FIRES_PRESCRIBED	10.6%	2.4%	12.9%
TOTAL	79.3%	20.7%	100.0%

137

Draft AOI Source Categories for COHU

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.9%	3.1%	8.1%
NONROAD_MAR	0.1%	3.3%	3.4%
NONROAD_OTHER	0.2%	2.4%	2.6%
ONROAD	0.6%	6.4%	7.0%
POINT	68.0%	8.0%	75.9%
PT_FIRES_PRESCRIBED	2.5%	0.5%	3.1%
TOTAL	76.3%	23.7%	100.0%

135

Draft AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	112.4	1,124.4	3,197.8	16.11%	0.03%
FL	ROCKTECH CP LLC	64.8	2,316.8	2,605.7	12.12%	0.83%
FL	IEA	65.6	651.8	2,094.5	6.23%	0.17%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	122.6	917.8	3,723.4	3.68%	0.06%
FL	IEE CHEMICAL HOLDINGS, INC.	56.8	87.7	808.9	3.67%	0.01%
FL	PLANTING FERTILIZER FERTILISERS LLC	61.4	2,127.1	1,607.0	2.67%	0.86%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	2.60%	0.07%
FL	BUCKEYE FLORIDA LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	2.60%	0.13%
FL	PROCESSENZ LLC	59.8	66.3	569.5	1.85%	0.02%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,106.1	1.33%	0.05%
AL	Isacambia Operating Company LLC	501.9	349.3	18,974.4	1.20%	0.00%
AL	Sanders Lead Co.	384.6	121.7	7,951.1	1.05%	0.00%
AL	Isacambia Operating Company LLC	491.9	144.6	8,589.6	1.03%	0.00%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.99%	0.01%
GA	Isa Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.97%	0.05%
GA	Brunswick Cellulose Inc.	75.3	2,554.5	294.2	0.96%	0.12%
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.92%	0.00%
GA	IPCA Valdosta Mill	112.7	1,032.6	485.7	0.80%	0.08%
SC	NANTY COOPER CROSS GENERATING STATION	348.1	3,273.5	4,781.2	0.80%	0.07%
FL	CITY OF GAINESVILLE GRU	111.7	410.0	881.4	0.74%	0.03%

138

Draft AOI Source Categories for WOLF

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	2.6%	1.5%	4.1%
NONROAD_MAR	1.4%	2.7%	4.1%
NONROAD_OTHER	0.3%	3.0%	3.3%
ONROAD	0.7%	5.2%	5.9%
POINT	70.4%	6.8%	77.1%
PT_FIRES_PRESCRIBED	4.7%	0.8%	5.5%
TOTAL	79.9%	20.1%	100.0%

139

Draft AOI Point Contributions for MACA

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	118.0	8,806.8	30,536.3	16.11%	2.49%
KY	Big Rivers Electric Corp. - Wilson Station	89.9	1,151.9	6,934.2	6.42%	0.35%
IN	Kibson	198.2	12,280.3	23,117.2	4.97%	1.15%
KY	Tennessee Valley Authority - Paradise Fossil Plant	75.1	2,927.4	2,990.2	3.54%	1.15%
KY	Century Aluminum of KY LLC	106.0	197.7	5,044.2	8.43%	0.04%
IN	INDIANAPOLIS POWER & LIGHT - PATTERSON	167.9	10,665.5	16,141.9	2.95%	0.91%
IN	Shawna Hill Brown South Indiana Gas & Ele	102.9	1,578.6	7,644.7	2.00%	0.20%
IN	ALCOA - WARRICK POWER PLANT AGC DIV OF AL	136.1	11,158.6	5,071.3	1.91%	1.66%
IL	Jordan Station	241.0	4,706.3	20,509.3	1.72%	0.16%
KY	Century Aluminum Sebree LLC	119.2	79.5	4,191.4	1.63%	0.01%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	7,007.3	19,504.7	1.52%	0.14%
TN	TVA CUMBERLAND FOSSEL PLANT	157.6	4,916.5	8,427.3	1.51%	0.34%
IN	ALCOA INC. - WARRICK OPERATIONS	139.9	1,578.6	5,892.8	1.47%	0.00%
IN	SABIC INNOVATIVE PLASTICS MNT. VERNON LLC	179.3	1,751.8	4,703.4	1.38%	0.17%
OH	General James M. Gavin Power Plant (0627010056)	406.5	8,122.5	41,595.8	1.38%	0.04%
KY	Louisville Gas & Electric Co. - Mill Creek Station	104.6	4,360.1	6,335.3	1.29%	0.42%
OH	Duke Energy (Ohio, Wm. H. Zimmer Station (1413090154))	256.1	7,150.0	22,133.9	1.16%	0.13%
KY	KY UTILITIES Co. - Ghent Station	204.5	7,939.9	10,169.3	0.97%	0.22%
IN	POSSCO CEMENT CORP	146.5	2,365.0	4,681.2	0.96%	0.17%
MO	SIKESTON POWER STATION-SIKESTON POWER STATION	310.4	1,826.0	12,252.1	0.84%	0.03%

140

Draft AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
GA	Braslow & Cellulose, Inc.	27.9	1,554.5	294.2	8.61%	2.87%
FL	ROCKTENN CP, LLC	74.9	2,316.8	2,606.7	8.34%	0.38%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	7.34%	0.23%
FL	ISA	105.1	651.8	2,091.5	4.31%	0.09%
GA	Georgia Pacific Consumer Products LP (Savannah River Mill)	109.9	551.5	1,860.2	2.58%	0.05%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	112.4	3,197.8	2.24%	0.01%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	1.79%	0.00%
FL	BIACOMER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	1.74%	0.37%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	1.72%	0.02%
OH	General James M. Gavin Power Plant (0627010056)	405.3	8,122.5	41,595.8	1.67%	0.02%
SC	NANTHE COGENERATION GENERATING STATION	251.0	3,273.5	4,281.2	1.55%	0.08%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	597.1	1.51%	0.00%
FL	IVA CHEMICAL HOLDINGS, INC.	118.5	57.7	898.9	1.19%	0.00%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	1.16%	0.04%
GA	Isa Power Company - Plant Bowen	458.1	6,643.3	10,453.4	1.05%	0.03%
GA	Savannah Sugar Refinery	89.9	521.8	582.0	1.03%	0.01%
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.97%	0.05%
GA	Isa Power Company - Plant McManus	27.1	72.2	30.1	0.91%	0.14%
AL	Pascagoula Paper Mill Company LLC	508.2	348.3	18,974.4	0.88%	0.00%
SC	RAFFSTONE-CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.87%	0.09%

140

Draft AOI Source Categories for LIGO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	9.9%	1.7%	11.6%
NONROAD_MAR	0.1%	0.6%	0.7%
NONROAD_OTHER	0.1%	0.8%	0.9%
ONROAD	0.5%	1.9%	2.4%
POINT	80.0%	3.0%	83.1%
PT_FIRES_PRESCRIBED	1.2%	0.1%	1.3%
TOTAL	91.9%	8.1%	100.0%

141

Draft AOI Source Categories for MACA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.0%	6.4%	7.4%
NONROAD_MAR	0.1%	3.4%	3.5%
NONROAD_OTHER	0.1%	3.3%	3.4%
ONROAD	0.2%	8.1%	8.3%
POINT	62.0%	14.1%	76.1%
PT_FIRES_PRESCRIBED	0.8%	0.5%	1.3%
TOTAL	64.1%	35.9%	100.0%

141

Draft AOI Point Contributions for LIGO

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	FASTMAN CHEMICAL COMPANY	81.9	6,900.3	6,420.2	18.98%	0.67%
NC	Duke Energy Carolinas, LLC - Marshall Steam Station	57.2	7,511.3	4,139.2	6.25%	0.40%
OH	General James M. Gavin Power Plant (0627010056)	328.2	8,122.5	42,095.8	5.83%	0.04%
VA	Jewell Coke Company LLP	140.4	520.2	5,090.9	5.28%	0.00%
NC	ASL Carbon LLC	52.3	21.2	261.6	4.00%	0.01%
OH	Duke Energy (Ohio, Wm. H. Zimmer Station (1413090154))	380.3	7,150.0	22,133.9	2.79%	0.01%
NC	Duke Energy Carolinas, LLC - Cliffside Steam Station	85.3	1,947.7	1,082.3	2.35%	0.11%
WV	ACORN/ALBERTA POWER CO. PT. ASANTS POWER STA	381.0	5,497.4	16,817.4	2.01%	0.01%
NC	Duke Energy Carolinas, LLC - Belvoir Creek Steam Station	172.2	5,264.3	4,946.1	1.91%	0.08%
WV	APPALACHIAN POWER COMPANY - JOHN LAMOS PLANT	277.7	4,878.1	10,984.2	1.76%	0.02%
IN	ALCO INDIANAPOLIS - GREEN AND PLANT	94.7	2,068.3	441.6	1.72%	0.21%
IN	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	203.5	8,806.8	30,536.3	1.16%	0.01%
PA	SPRINGHOUSE MOUNTAIN COKE/SPRINGHOUSE STA	567.5	6,578.5	56,939.2	0.93%	0.00%
NC	Broughton Hospital	35.6	15.8	65.8	0.92%	0.01%
NC	Duke Energy Progress, LLC - Roxboro Steam Electric Plant	263.6	4,527.9	6,665.5	0.91%	0.03%
WV	ALLEGHENY ENERGY SUPPLY CO., LLC-HARRISON	404.3	11,830.0	10,082.9	0.78%	0.03%
SC	BP SCHELTZ PT LIG, INC.	156.8	1,800.7	2,521.8	0.76%	0.02%
NC	Blue Ridge Paper Products - Canton Mill	39.4	2,293.4	1,127.1	0.76%	0.00%
OH	Ascon Lake Power Plant (0242030013)	614.2	3,600.7	21,188.9	0.75%	0.00%
KY	KY UTILITIES Co - Ghent Station	412.9	7,939.9	10,169.3	0.71%	0.02%

142

Draft AOI Source Categories for SHRO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	12.2%	4.2%	16.4%
NONROAD_MAR	0.1%	1.1%	1.2%
NONROAD_OTHER	0.2%	2.7%	2.8%
ONROAD	0.7%	5.9%	6.6%
POINT	61.8%	9.7%	71.5%
PT_FIRES_PRESCRIBED	1.4%	0.2%	1.6%
TOTAL	76.2%	23.8%	100.0%

143

Draft AOI Point Contributions for SWAN

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
NC	PCS Phosphate Company (Inc. - Aurora)	52.5	495.6	4,847.9	37.59%	0.57%
PA	GENON NE MGMT CO/KEYSTONE STA	640.2	6,578.5	56,939.2	2.98%	0.08%
NC	Dominion Paper Company LLC	69.0	3,796.5	687.4	2.25%	1.01%
NC	Duke Energy Progress, LLC - Roanoke Steam Electric Plant	282.6	4,527.9	6,665.5	2.03%	0.18%
OH	General James M. Gavin Power Plant (0627010036)	651.5	8,122.5	41,595.8	1.76%	0.08%
MD	Roanoke Power East Smallwood LLC	414.7	4,387.8	10,947.9	1.75%	0.16%
NC	Marine Corps Air Station - Cherry Point	88.4	201.1	607.8	1.30%	0.05%
MD	Duke Paper Company	512.5	3,607.0	22,659.8	0.99%	0.07%
WV	MONONGAHELA POWER CO - PLEASANTS POWER STA	625.7	5,497.4	16,817.4	0.83%	0.07%
MI	St. Clair / Belle River Power Plant	977.5	8,488.2	25,225.9	0.83%	0.04%
NC	Weyerhaeuser NE Company - Vanceboro Pulp	86.8	773.6	286.7	0.74%	0.24%
MD	GenOn Energy, Inc. - Maryland	378.9	896.4	3,737.0	0.73%	0.07%
WV	ALLIUM POWER ENERGY SUPPLY CO., LLC - HARRISBURG	568.6	11,850.9	10,080.9	0.66%	0.08%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	806.7	7,150.0	22,133.9	0.65%	0.05%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	692.0	4,878.1	10,984.2	0.62%	0.04%
SC	SANTEE COOPER CROSS GENERATING STATION	426.9	3,273.5	4,281.2	0.55%	0.07%
PA	JOHN CRITY GEN. CO CENTER TWP	670.1	5,716.0	11,865.7	0.54%	0.05%
NY	NY UTILITIES Co. - Ghent Station	885.4	7,939.9	10,169.3	0.52%	0.07%
MO	JAMIE HEN MISSOURI LABADIE PLANT	1,345.4	5,685.5	41,740.3	0.51%	0.07%
OH	Department of Public Utilities, City of Greenville, Ohio (0285030288)	771.5	1,501.9	13,038.0	0.46%	0.01%

148

Draft AOI Point Contributions for SHRO

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
NC	Ryan Ridge Paper Products - Canton Mill	16.9	2,902.4	1,127.1	40.55%	6.53%
TN	EASTMAN CHEMICAL COMPANY	126.9	6,800.3	6,420.2	4.35%	0.39%
NC	Duke Energy Carolinas, LLC - Marshall Steam Station	166.0	7,511.3	4,139.2	2.16%	0.48%
GA	Ga Power Company - Plant Bowen	241.6	6,643.3	10,453.4	1.67%	0.07%
NC	Duke Energy Carolinas, LLC - Cliffside Steam Station	91.8	3,987.7	1,082.3	1.54%	0.28%
NC	Duke Energy Carolinas, LLC - Beliefs Creek Steam Station	264.4	5,264.3	4,946.1	1.40%	0.14%
TN	TVA KINGSTON FOSSIL PLANT	167.7	1,687.4	1,886.1	1.38%	0.13%
OH	General James M. Gavin Power Plant (0627010036)	397.3	8,122.5	41,595.8	1.30%	0.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	7,150.0	22,133.9	1.35%	0.02%
VA	Jewell Coke Company L.P.	224.7	520.2	5,090.9	1.31%	0.02%
WV	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	592.1	4,878.1	10,984.2	1.20%	0.08%
IN	INDIANA MICHIGAN POWER DIST A.P. - ROCKPORT	473.3	8,806.8	30,536.3	0.68%	0.01%
TN	TVA CUMBERLAND FOSSIL PLANT	454.1	4,916.5	8,427.1	0.51%	0.07%
GA	TPAMP INLAND	265.7	1,773.4	1,791.0	0.51%	0.07%
TN	TVA BULL RUN FOSSIL PLANT	143.0	964.2	622.5	0.53%	0.05%
WV	MONONGAHELA POWER CO - PLEASANTS POWER STA	480.0	5,497.4	16,817.4	0.51%	0.02%
TN	TATF & TTE, London	145.2	883.3	477.8	0.49%	0.07%
PA	GENON NE MGMT CO/KEYSTONE STA	657.6	6,578.5	56,939.2	0.48%	0.00%
NY	Big River Electric Corp. - Wilson Station	448.4	1,151.9	6,934.2	0.47%	0.01%
MO	JAMIE HEN MISSOURI LABADIE PLANT	799.0	5,685.5	41,740.3	0.46%	0.02%

149

Draft AOI Source Categories for ROMA

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	1.7%	1.1%	2.9%
NONROAD_MAR	1.7%	2.4%	4.0%
NONROAD_OTHER	0.1%	1.8%	1.9%
ONROAD	0.3%	2.8%	3.2%
POINT	79.3%	5.9%	85.1%
PT_FIRES_PRESCRIBED	2.5%	0.4%	2.9%
TOTAL	85.6%	14.4%	100.0%

149

Draft AOI Source Categories for SWAN

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	4.2%	3.6%	7.7%
NONROAD_MAR	0.3%	3.5%	3.8%
NONROAD_OTHER	0.2%	8.7%	8.9%
ONROAD	0.2%	4.1%	4.4%
POINT	66.9%	7.2%	74.1%
PT_FIRES_PRESCRIBED	0.8%	0.3%	1.1%
TOTAL	72.6%	27.4%	100.0%

147

Draft AOI Point Contributions for ROMA

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
SC	KAPSTONE CHARLESTON KRAFT LLC	29.3	2,355.8	1,863.7	28.97%	2.72%
SC	ALUMAX OF SOUTH CAROLINA	39.1	108.1	3,751.7	16.95%	0.03%
SC	SANTEE COOPER CROSS GENERATING STATION	63.8	3,273.5	4,281.2	6.53%	0.45%
SC	SANTEE COOPER WINNAH GENERATING STATION	51.4	1,772.5	2,456.9	4.57%	0.38%
SC	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	2,031.3	2,767.5	4.28%	0.35%
SC	NETCO WILLIAMS	262.7	992.7	397.5	3.98%	0.19%
SC	NUCOR STEEL BENLEY	22.1	440.0	348.3	1.82%	0.42%
GA	International Paper - Savannah	166.1	1,560.7	3,945.4	1.75%	0.04%
SC	SHOWA DENKO CARBON INC.	66.1	264.0	973.2	1.70%	0.03%
GA	Georgia Pacific Consumer Products LP (Savannah River Mill)	159.9	351.5	1,860.2	1.15%	0.02%
SC	INTERNATIONAL PAPER LANSINGOVER	139.0	1,780.5	5,212.9	1.05%	0.04%
SC	COOPER RIVER PARTNERS LLC	27.9	58.4	58.1	0.04%	0.07%
OH	General James M. Gavin Power Plant (0627010036)	703.0	8,122.5	41,595.8	0.83%	0.00%
SC	SC&G WATTELEC	133.1	1,344.0	2,376.8	0.66%	0.03%
SC	Charleston AFB Int Airport	26.8	358.4	46.2	0.43%	0.24%
GA	Ga Power Company - Plant Bowen	508.2	6,643.3	10,453.4	0.35%	0.01%
SC	GUANT CF MGMT CO	80.6	509.4	309.0	0.34%	0.04%
FL	WOLK REMN CO LLC	302.9	2,316.8	2,606.7	0.34%	0.02%
TN	EASTMAN CHEMICAL COMPANY	476.9	6,800.3	6,420.2	0.34%	0.01%
SC	SC&G COPE	136.5	644.0	962.3	0.33%	0.02%

150

Draft AOI Source Categories for GRSM

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	10.4%	8.3%	18.7%
NONROAD_MAR	0.1%	3.1%	3.2%
NONROAD_OTHER	0.3%	4.6%	4.9%
ONROAD	1.5%	11.3%	12.7%
POINT	50.9%	7.1%	58.0%
PT_FIRES_PRESCRIBED	2.3%	0.3%	2.6%
TOTAL	65.4%	34.6%	100.0%

123

Draft AOI Point Contributions for JOYC

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	TVA KINGSTON FOSSIL PLANT	73.7	1,687.4	1,886.1	7.35%	0.53%
TN	EASTMAN CHEMICAL COMPANY	179.2	6,900.3	6,420.2	5.51%	0.15%
OH	General James M. Gavin Power Plant (0627010056)	415.1	8,123.5	41,595.8	4.43%	0.04%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	8,806.8	30,536.3	4.05%	0.13%
IN	IATIE & LYLE, Loudon	48.1	883.3	472.8	4.05%	0.58%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	7,150.0	22,133.9	3.40%	0.08%
GA	Ga Power Company - Plant Bowen	166.2	6,643.3	10,453.4	3.38%	0.09%
TN	TVA BUREAU FOSSIL PLANT	70.3	964.2	622.5	2.33%	0.44%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	453.0	10,665.3	18,141.9	2.02%	0.13%
IN	Gibson	471.7	12,280.3	23,117.2	1.87%	0.10%
KY	Century Aluminum of KY LLC	317.1	197.7	5,044.2	1.58%	0.01%
TN	Mc Ghee Tyson	44.3	784.7	78.6	1.25%	0.67%
KY	Jessamine Coal & Electric Co., Mill Creek Station	340.9	4,169.1	4,335.1	1.14%	0.11%
KY	KY Utilities Co. - Ghent Station	383.0	7,939.9	10,109.3	1.03%	0.07%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	391.6	6,188.5	9,038.1	0.99%	0.04%
IN	ISSACAC CHAMONT COPE	360.5	2,865.0	4,481.2	0.96%	0.04%
IL	roppe Stream	482.1	4,706.3	20,509.3	0.96%	0.01%
VA	Jessell Coke Company LLP	267.5	520.2	5,090.9	0.93%	0.00%
KY	Big Rivers Electric Corp. - Wilson Station	358.1	1,151.9	6,934.2	0.85%	0.07%
MO	JAMEREN MISSOURI-LABADIE PLANT	703.9	5,685.5	41,740.3	0.84%	0.03%

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Draft AOI Point Contributions for GRSM

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
TN	TVA KINGSTON FOSSIL PLANT	60.0	1,687.4	1,886.1	6.67%	0.64%
TN	EASTMAN CHEMICAL COMPANY	160.1	6,900.3	6,420.2	5.43%	0.17%
TN	IATIE & LYLE, Loudon	36.1	883.3	472.8	4.74%	0.74%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	8,806.8	30,536.3	4.21%	0.19%
IN	Mc Ghee Tyson	19.7	594.7	78.6	3.89%	2.72%
TN	TVA BUREAU FOSSIL PLANT	47.1	964.2	622.5	3.76%	0.58%
OH	General James M. Gavin Power Plant (0627010056)	400.5	8,123.5	41,595.8	2.03%	0.04%
GA	Ga Power Company - Plant Bowen	189.7	6,643.3	10,453.4	1.90%	0.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	7,150.0	22,133.9	1.66%	0.08%
TN	Cemex - Knoxville Plant	41.3	711.5	121.5	1.55%	0.82%
IL	roppe Stream	414.4	4,706.3	20,509.3	1.47%	0.08%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	368.7	6,188.5	9,038.1	1.44%	0.11%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	425.8	10,665.3	18,141.9	1.34%	0.11%
KY	KY Utilities Co. - Ghent Station	379.2	7,939.9	10,109.3	1.29%	0.08%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	7,007.3	19,504.7	1.21%	0.02%
IN	Union	456.4	12,280.3	23,117.2	1.13%	0.06%
KY	Big Rivers Electric Corp. - Wilson Station	345.8	1,151.9	6,934.2	1.06%	0.07%
KY	Century Aluminum of KY LLC	340.5	197.7	5,044.2	0.97%	0.00%
KY	INDIANALAND & POWER CO. PT. CASANT'S POWER STA	475.9	5,497.4	16,817.4	0.96%	0.01%
WV	APPALACHIAN POWER COMPANY - JOHN E. AMOS PLANT	367.1	4,876.1	10,984.2	0.94%	0.03%

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Draft AOI Source Categories for JARI

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	5.7%	3.6%	9.3%
NONROAD_MAR	0.1%	2.4%	2.5%
NONROAD_OTHER	0.1%	1.7%	1.7%
ONROAD	0.4%	7.2%	7.6%
POINT	70.2%	7.4%	77.5%
PT_FIRES_PRESCRIBED	1.1%	0.2%	1.3%
TOTAL	77.5%	22.5%	100.0%

125

Draft AOI Source Categories for JOYC

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.5%	4.6%	12.1%
NONROAD_MAR	0.1%	2.2%	2.3%
NONROAD_OTHER	0.2%	2.6%	2.8%
ONROAD	0.8%	7.1%	7.9%
POINT	64.8%	6.4%	71.2%
PT_FIRES_PRESCRIBED	3.3%	0.4%	3.7%
TOTAL	76.6%	23.4%	100.0%

126

Draft AOI Point Contributions for JARI

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
VA	Midvale/Bravo Packaging Resource Group	46.51	1,985.69	2,115.31	12.46%	1.12%
OH	General James M. Gavin Power Plant (0627010056)	270.18	8,123.51	41,595.81	7.55%	0.14%
VA	Boushko Cement Company	46.43	1,972.97	2,290.17	6.26%	0.47%
WV	MONONGAHELA POWER CO - PLEASANTS POWER STA	247.97	5,497.37	16,817.43	3.82%	0.15%
WV	APPALACHIAN POWER COMPANY - JOHN E. AMOS PLANT	223.52	4,876.10	10,984.24	3.85%	0.15%
PA	CONED/NP MONTICLOUTY'S ONE STA	157.17	6,578.47	56,939.25	2.94%	0.06%
WV	ALLEGHENY ENERGY SUPPLY CO. LLC - HARRISON	207.56	11,830.88	10,082.94	2.72%	0.35%
MD	Duke Power Company	208.66	3,027.00	22,619.84	2.66%	0.04%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	435.18	7,249.97	22,133.90	1.87%	0.05%
NC	Duke Energy Progress, LLC - Roxboro Steam Electric Plant	132.76	4,527.87	6,665.48	1.49%	0.15%
OH	Cardinal Power Plant Cardinal Operating Company (0646260004)	366.40	2,487.51	7,460.79	1.51%	0.04%
PA	HYDRO-CTRY GEN. CO CENTER TWP	321.57	5,215.96	11,465.70	1.19%	0.03%
NC	Duke Energy Carolinas, LLC - Reids Creek Steam Station	156.88	5,764.28	4,946.09	1.07%	0.16%
VA	OP Big Island LLC	17.13	240.68	39.67	0.92%	0.56%
MI	ST CLAIR / BELLE RIVER POWER PLANT	625.38	8,448.19	25,225.90	0.86%	0.04%
KY	KY UTILITIES Co. - Ghent Station	499.52	7,939.91	10,169.35	0.81%	0.05%
NC	Duke Energy Progress, LLC - Mayo Electric Generating Plant	153.86	1,944.76	1,720.36	0.81%	0.04%
WV	MONONGAHELA POWER CO. - JOHN E. AMOS PLANT	234.03	15,743.32	4,881.87	0.80%	0.27%
VA	Jessell Coke Company LLP	272.64	520.17	5,090.95	0.77%	0.00%
PA	JPL MONTICLOUTY LLC/MONTICLOUTY SES	454.21	4,855.41	21,482.00	0.73%	0.02%

126

Draft AOI Source Categories for SHEN

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.9%	5.3%	13.2%
NONROAD_MAR	0.2%	1.8%	1.9%
NONROAD_OTHER	0.1%	2.4%	2.5%
ONROAD	0.3%	5.5%	5.8%
POINT	67.4%	8.2%	75.6%
PT_FIRES_PRESCRIBED	0.7%	0.2%	0.9%
TOTAL	76.6%	23.4%	100.0%

1247

Draft AOI Point Contributions for DOSO

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
WV	ALL COHENY ENERGY SUPPLY CO., LLC HARRISON	83.6	11,830.9	10,082.9	17.69%	1.77%
MD	Juke Paper Company	51.7	3,607.0	22,659.8	11.48%	0.12%
WV	Domination Resources, Inc. - MSOUNT STORM POWER STATION	17.5	3,984.1	2,123.6	9.88%	0.33%
OH	General James M. Garvin Power Plant (0627010056)	233.8	8,122.5	41,595.8	7.12%	0.09%
WV	MONONGAHELA POWER CO. - FORT MARTIN POWER	79.8	13,743.3	4,881.9	6.11%	1.00%
WV	MONONGAHELA POWER CO. - PLEASANTS POWER STA.	163.9	5,497.4	16,817.4	4.34%	0.11%
PA	GENCON NE MGMT CO/KEYSTONE STA	172.8	6,578.5	56,939.2	3.85%	0.01%
WV	APPALACHIAN POWER COMPANY - JOHN F AMOS PLANT	219.8	4,878.1	10,984.2	3.33%	0.10%
WV	LONGVIEW POWER	81.2	1,556.6	2,333.7	2.85%	0.11%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN P/LT	81.3	1,245.1	2,210.3	2.82%	0.10%
OH	Arvon Lake Power Plant (0241030013)	347.6	3,603.7	21,188.9	1.43%	0.01%
WV	MITCHELL PLANT	144.2	2,719.6	5,372.4	1.36%	0.06%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	2,130.0	22,133.9	1.31%	0.02%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	2,467.3	7,460.8	1.27%	0.03%
WV	MONONGAHELA POWER CO. - PLEASANTS POWER STA.	75.1	455.6	828.6	1.10%	0.05%
PA	HOMEAR CITY GEN LPV CENTER TWP	157.5	5,216.0	11,865.7	1.05%	0.04%
PA	NRG WHOLESALE GEN/SEWARD GEN STA	148.4	2,754.6	8,880.3	0.94%	0.01%
OH	Orion Engineered Carbons LLC (0684010009)	158.9	0.4	2,470.8	0.02%	0.00%
OH	Department of Public Utilities, City of Orrville, Ohio (0785010088)	278.2	1,901.9	13,038.0	0.93%	0.01%
OH	Cornesville Power Plant (0616000000)	242.3	9,957.9	6,356.2	0.67%	0.11%

1640

Draft AOI Point Contributions for SHEN

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
MD	Juke Paper Company	118.4	3,607.0	22,659.8	14.57%	0.21%
PA	GENCON NE MGMT CO/KEYSTONE STA	249.8	6,578.5	56,939.2	10.85%	0.09%
OH	General James M. Garvin Power Plant (0627010056)	313.4	8,122.5	41,595.8	4.82%	0.13%
WV	MONONGAHELA POWER CO. - PLEASANTS POWER STA.	265.0	5,497.4	16,817.4	4.55%	0.22%
WV	ALLEGHENY ENERGY SUPPLY CO. LLC-HARRISON	189.2	11,830.9	10,082.9	4.21%	0.91%
PA	HOMEAR CITY GEN LPV CENTER TWP	250.4	5,216.0	11,865.7	2.38%	0.17%
WV	MONONGAHELA POWER CO. - FORT MARTIN POWER	184.4	13,743.3	4,881.9	2.21%	1.16%
WV	Domination Resources, Inc. - MSOUNT STORM POWER STATION	104.2	3,984.1	2,123.6	1.93%	0.24%
WV	APPALACHIAN POWER COMPANY - JOHN F AMOS PLANT	295.6	4,878.1	10,984.2	1.93%	0.09%
PA	NRG WHOLESALE GEN/SEWARD GEN STA	215.5	2,254.6	8,880.3	1.65%	0.04%
PA	ORION NE MOUNT CO/KEYSTONE STA	213.6	6,024.9	8,655.7	1.59%	0.09%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	2,467.3	7,460.8	1.40%	0.07%
WV	MITCHELL PLANT	251.8	2,719.6	5,372.4	1.34%	0.10%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	505.4	2,130.0	22,133.9	1.20%	0.10%
MD	Raven Power Fort Smallwood LLC	180.7	4,387.8	10,942.9	1.20%	0.08%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN P/LT	188.9	1,245.1	2,210.3	1.19%	0.11%
OH	Department of Public Utilities, City of Orrville, Ohio (0785010088)	385.1	1,901.9	13,038.0	1.18%	0.02%
OH	Arvon Lake Power Plant (0241030013)	432.2	3,603.7	21,188.9	1.16%	0.04%
WV	LONGVIEW POWER	186.3	1,556.6	2,333.7	1.04%	0.13%
MD	AES Warrior Run	122.1	638.0	1,331.5	0.93%	0.04%

1248

Draft AOI Source Categories for OTCR

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	7.4%	3.7%	11.1%
NONROAD_MAR	0.1%	0.7%	0.8%
NONROAD_OTHER	0.0%	0.7%	0.7%
ONROAD	0.2%	1.4%	1.6%
POINT	78.1%	7.0%	85.2%
PT_FIRES_PRESCRIBED	0.5%	0.1%	0.6%
TOTAL	86.4%	13.6%	100.0%

1643

Draft AOI Source Categories for DOSO

SOURCE CATEGORY	SO2	NOx	TOTAL
NONPOINT	6.8%	2.8%	9.6%
NONROAD_MAR	0.1%	0.6%	0.7%
NONROAD_OTHER	0.0%	0.6%	0.7%
ONROAD	0.2%	1.3%	1.4%
POINT	81.2%	5.7%	86.9%
PT_FIRES_PRESCRIBED	0.5%	0.1%	0.6%
TOTAL	88.9%	11.1%	100.0%

1249

Draft AOI Point Contributions for OTCR

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	SO2 Contribution	NOx Contribution
WV	ALL COHENY ENERGY SUPPLY CO., LLC HARRISON	72.8	11,830.9	10,082.9	16.97%	1.77%
OH	General James M. Garvin Power Plant (0627010056)	214.2	8,122.5	41,595.8	10.22%	0.18%
WV	MONONGAHELA POWER CO. - PLEASANTS POWER STA.	148.3	5,497.4	16,817.4	8.00%	0.23%
WV	MONONGAHELA POWER CO. - FORT MARTIN POWER	82.7	13,743.3	4,881.9	4.86%	0.90%
WV	APPALACHIAN POWER COMPANY - JOHN F AMOS PLANT	198.0	4,878.1	10,984.2	4.26%	0.12%
MD	Juke Paper Company	71.7	3,607.0	22,659.8	4.11%	0.04%
PA	GENCON NE MGMT CO/KEYSTONE STA	186.5	6,578.5	56,939.2	3.64%	0.03%
WV	AMERICAN BITUMINOUS POWER-GRANT TOWN P/LT	77.0	1,245.1	2,210.3	2.56%	0.09%
WV	LONGVIEW POWER	83.4	1,556.6	2,333.7	2.38%	0.10%
OH	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	2,467.3	7,460.8	2.50%	0.05%
WV	Domination Resources, Inc. - MSOUNT STORM POWER STATION	99.9	3,984.1	2,123.6	1.85%	0.06%
WV	MITCHELL PLANT	136.8	2,719.6	5,372.4	1.57%	0.06%
OH	Orion Engineered Carbons LLC (0684010009)	129.6	0.4	2,470.8	1.11%	0.00%
OH	Cornesville Power Plant (0616000000)	232.8	9,957.9	6,356.2	1.10%	0.17%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	2,130.0	22,133.9	1.10%	0.02%
OH	Arvon Lake Power Plant (0241030013)	345.6	3,603.7	21,188.9	1.09%	0.01%
OH	Kraton Polymers U.S. LLC (0684010011)	175.1	555.8	2,061.8	1.00%	0.02%
OH	Orion Engineered Carbons LLC (0684010009)	169.6	391.8	1,933.3	0.97%	0.01%
WV	MONONGAHELA POWER CO. - PLEASANTS POWER STA.	76.3	455.6	828.6	0.89%	0.04%
PA	HOMEAR CITY GEN LPV CENTER TWP	172.6	5,216.0	11,865.7	0.87%	0.04%

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west virginia department of environmental protection

Appendix F-3g

VISTAS Regional Haze Meeting St. Louis, MO October 28-30, 2019

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS REGION PROJECT MANAGEMENT

A Comparison of Approaches Used in Planning Periods 1 and 2

John Hornback, Executive Director
Metro 4/SESARM/VISTAS
October 29, 2019

1

VISTAS What is it?



- **Visibility Improvement State and Tribal Association of the Southeast**
- **Formed in 2001**

4

PRESENTATION Outline

- **Region**
- **Organization**
- **Resources**
- **Technical Approaches**
- **Collaboration/Consultation**
- **Schedule**
- **Summary**

2

VISTAS Participating Agencies



- **U.S. EPA Region 3 states (2)**
 - Virginia, West Virginia
- **U.S. EPA Region 4 agencies (10)**
 - Alabama, Florida
 - Georgia, Kentucky
 - Mississippi, North Carolina,
 - South Carolina, Tennessee
 - Eastern Band of Cherokee Indians
 - Knox County, TN local air agency

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THE VISTAS REGION

3

VISTAS The 18 Southeastern Class I Areas



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VISTAS PROJECT ORGANIZATION

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VISTAS

Policy / Operations / Analysis – 2nd Planning Period

- STAD
- Coordinating Committee (CC)
- Technical Analysis Work Group (TAWG)
- Occasional sub-groups
 - (e.g., Data Collection and Analysis)
- CC/TAWG generally functioning together

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VISTAS Governance

- Southeastern States Air Resource Managers, Inc.
 - Board of Directors
- State and Tribal Air Directors (STAD)
 - States
 - Tribe
 - Local Agency
 - Governance, policy, general direction
- Similar structure for both planning periods

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VISTAS

Project Management – 1st Planning Period

- Project Manager – John Hornback
- Technical Coordinator – Pat Brewer
- Technical Advisors
- Contracts – 24
- MOUs - 3
- Key VISTAS agency staff

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VISTAS

Policy / Operations / Analysis – 1st Planning Period

- STAD
- Coordinating Committee
- Planning Work Group
- Data Work Group
- Technical Analysis Work Group
- Various sub-groups and teams

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VISTAS

Project Management – 2nd Planning Period

- Project Manager – John Hornback (much larger role)
- Coordination and Technical Analysis – Jim Boylan
- Coordination and Technical Analysis – Randy Strait
- 1 contract with a lead contractor and a sub-contractor

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VISTAS PROJECT RESOURCE\$

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VISTAS PROJECT Technical Approaches

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VISTAS Resources – 1st Planning Period

- Staffing – Metro 4/SESARM, coordinators, advisors
- In-kind services from SESARM states
- Contractor services – many contractors
- Shared expenses - VIEWS data warehouse, ERTAC
- Budget resources – approximately \$10,000,000
- Leveraged federal work products – limited
- Federal coordination - significant

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VISTAS Technical Approaches for 1st & 2nd Rounds

ACTIVITY	1 ST PLANNING PERIOD	2 ND PLANNING PERIOD
Monitoring and Data Collection/Analysis	Yes	Data collect/analysis
Emissions Inventories (base and future years)	Yes	EPA with updates
Emissions Processing	Yes	Yes
International Emissions, Air Quality, BART Modeling	Yes	Air Quality
Area of Influence Analysis	Yes	Yes
Source Apportionment Modeling/Tagging/Projections/RRFs	Yes	Yes
Support – Coordination, Advice, GIS, Archival	Yes	Limited

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VISTAS Resources – 2nd Planning Period

- Staffing – Metro 4/SESARM
- In-kind services from SESARM states
- Contractor services – 1 lead plus 1 subcontractor
- Shared expenses - none
- Budget resources ... ~ 5% of first round funds
- Leveraged federal work products – significant
- Federal coordination - limited

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VISTAS PROJECT Collaboration/Consultation

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VISTAS COLLABORATION/CONSULTATION

1st Planning Period

- Extensive face-to-face meetings
- Some VISTAS/FLM conference calls
- Some VISTAS/stakeholder conference calls
- MANE-VU/VISTAS consultation meeting
- Frequent federally-coordinated calls
- Weekly RPO calls during certain phases
- Resources and time were available

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VISTAS

Schedule – 1st Planning Period

- 2001 – created the VISTAS organizational plan
- 2002-2006 – focused technical work
- 2006-2007 – continued technical work and SIP development
- December 17, 2007 – SIPs were due
- At least 7 years to design and complete the project plus state SIP submittals to EPA

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VISTAS COLLABORATION/CONSULTATION

2nd Planning Period

- No face-to-face meetings to-date
- Several VISTAS/FLM/EPA conference calls
- No VISTAS/stakeholder conference calls (to-date)
- MANE-VU/VISTAS consultation calls
- Federally-coordinated regional haze calls (limited)
- Monthly MJO calls include periodic regional haze topics
- Overall goals remains same
- Resources and time are limited for face-to-face meetings

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VISTAS

Schedule – 2nd Planning Period

- December 2017 – Denver – created initial plan
- April 2018 – executed contract
- December 2019 – most technical work will be completed
- 2020-2021 – completion of any remaining technical work and SIP development
- July 31, 2021 – SIPs due
- 3 ½ years for technical work and SIP development

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VISTAS PROJECT SCHEDULE

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VISTAS PROJECT SUMMARY

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VISTAS PROJECT Summary (1 of 2)

- Similar basic organizational structure but streamlined
- Similar oversight and standards of performance including QA
- Similar internal participation –
 - states, locals, tribes
- Similar external participation –
 - RPOs, FLMs, EPA

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VISTAS PROJECT Summary (2 of 2)

- Fewer resources (~ 5% of 1st planning period funding)
- Less time (~ 50% of 1st planning period time)
- Similar desired outcomes
 - Technically sound, credible, approvable regional SIPs
 - Maintenance of relationships developed in 1st round
 - Continued progress toward 2064 goals

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COMMENTS / QUESTIONS?



- **Jim Boylan**
 - Chair, Coordinating Committee
 - james.boyland@dnr.ga.gov
- **Randy Strait**
 - Chair, Technical Analysis Work Group
 - randy.strait@ncdenr.gov
- **John Hornback**
 - Project Coordinator, VISTAS Project
 - hornback@metro4-sesarm.org

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VISTAS 2028 Emissions and Modeling Analyses



Jim Boylan (GA DNR), Randy Strait (NC DAQ), and
John Hornback (Metro 4/SESARM)

2019 National Regional Haze Meeting
St. Louis, MO - October 28, 2019

VISTAS Air Quality Model

- Started with EPA's 2011/2028 modeling platform
 - Version 6.3el
 - CAMx v6.32
- Replaced CAMx v6.32 with CAMx v6.40
- Used 2011 meteorology
- Reasons for using EPA platform
 - Time limited
 - Budget limited
 - Most source sectors acceptably represented in EPA platform

4

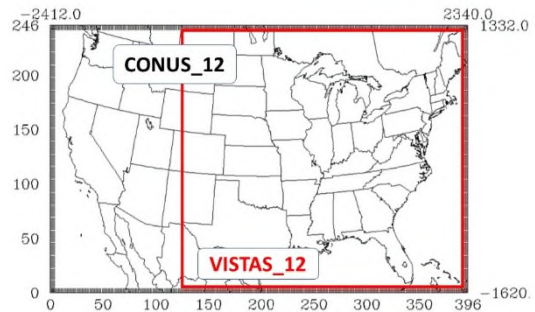
Outline

- Modeling Overview
- 2028 Emission Projections
- 2028 Model Projections
- Next Steps



2

VISTAS Modeling Domains



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MODELING OVERVIEW

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Benchmark Comparisons

1. EPA 2011 with CAMx_6.32 (CONUS) vs.
Alpine 2011 with CAMx_6.32 (CONUS)
2. Alpine 2011 with CAMx_6.32 (CONUS) vs.
Alpine 2011 with CAMx_6.40 (CONUS)
3. Alpine 2011 with CAMx_6.40 (CONUS) vs.
Alpine 2011 with CAMx_6.40 (VISTAS)
4. EPA 2028 with CAMx_6.32 (CONUS) vs.
Alpine 2028 with CAMx_6.40 (CONUS)
5. Alpine 2028 with CAMx_6.40 (CONUS) vs.
Alpine 2028 with CAMx_6.40 (VISTAS)

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Model Performance Evaluation

- Compared model results to observations. Looked at statistics, comparison plots, and spatial plots
 - Ozone
 - PM_{2.5} and light extinction
 - Wet and dry deposition
- Overall, the model performance is generally within the range deemed acceptable for regulatory applications

7

Point Source Adjustments

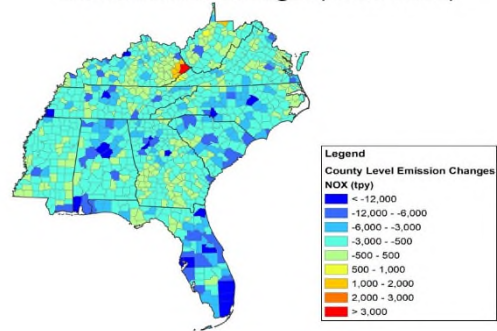
- **EGU Point Sources**
 - EPA modeling used IPM and assumed CPP controls
 - Adjust the EPA 2028 EGU emissions up/down based on ERTAC EGU annual emission, 2023 “en” emissions (based on 2016 NEI), and/or other emissions provided by individual states
- **Non-EGU Point Sources**
 - Adjust the EPA 2028 non-EGU emissions up/down based on feedback from SESARM states
 - States looked at 2014-2016 NEI and EPA’s non-EGU 2023 “en” emissions

10

2028 EMISSION PROJECTIONS

8

NOx Emission Changes (2028-2011)



11

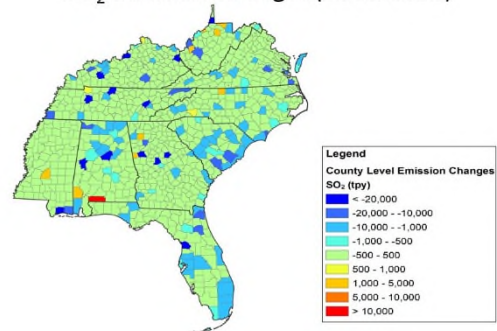
Emissions Updates

- Used EPA’s 2011 base year emissions without change
- Updated EPA’s 2028 projection year emissions
 - EGU and major non-EGU sources
 - Removed Clean Power Plan assumptions
 - Adjusted for changes in fuels and facility operating plans



9

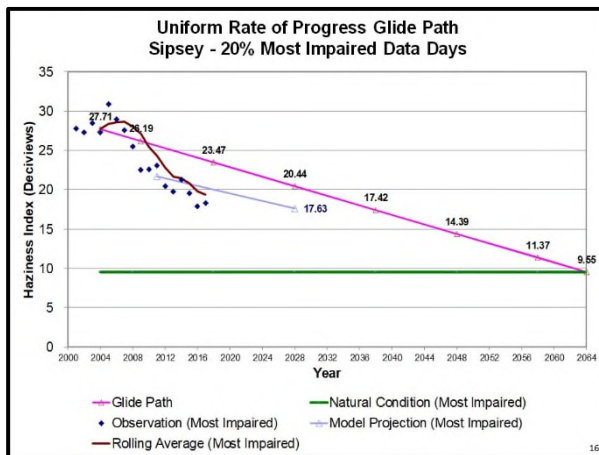
SO₂ Emission Changes (2028-2011)



12

2028 MODEL PROJECTIONS

13

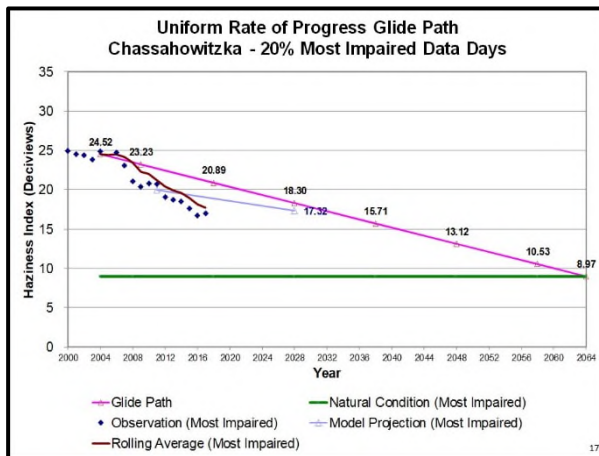


16

Class I Areas of Interest to VISTAS States



14



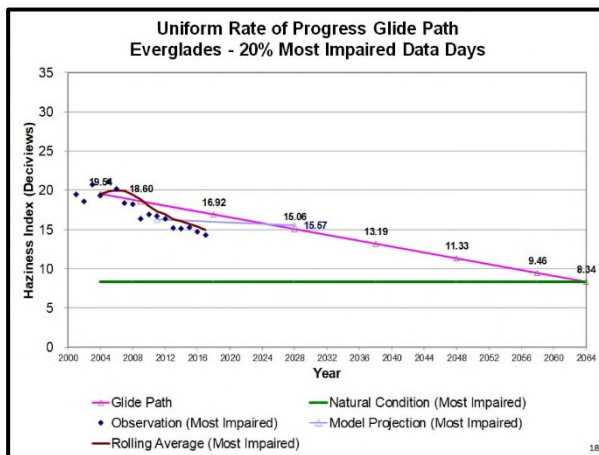
17

VISTAS Class I Areas

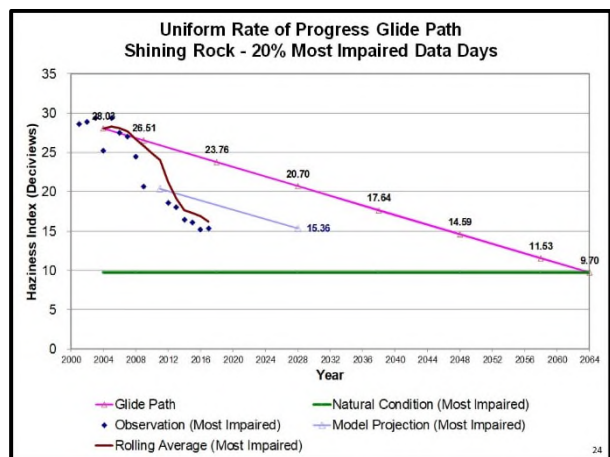
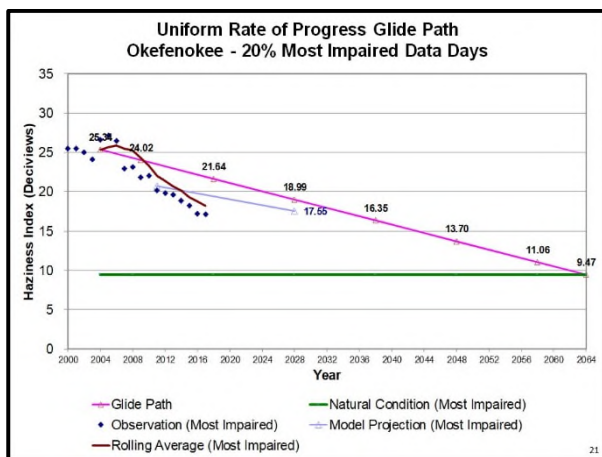
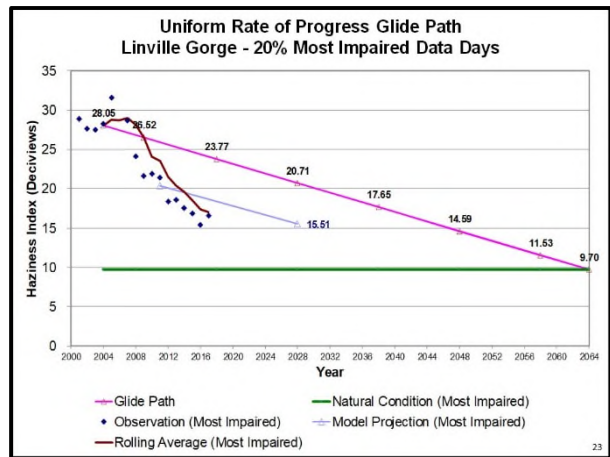
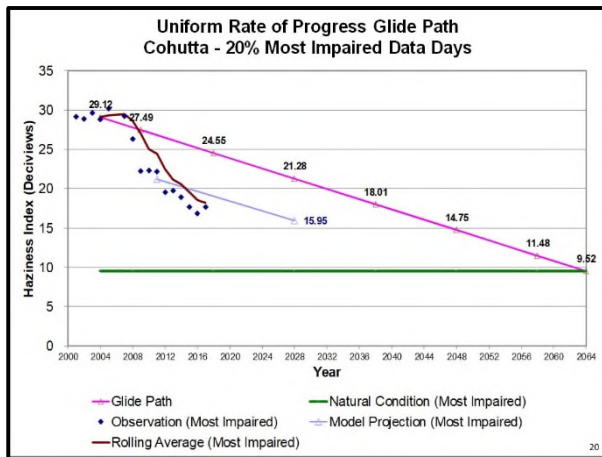
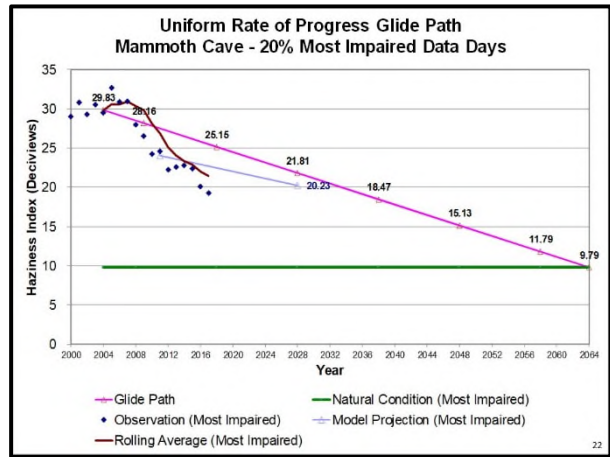
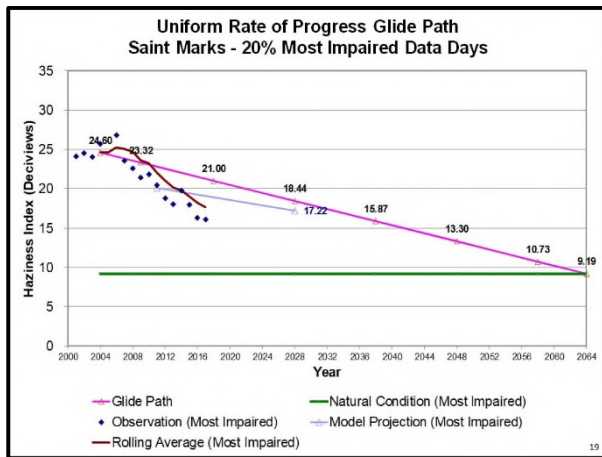
VISTAS FEDERAL CLASS I AREAS	
AL - Sipsey Wilderness Area (SIPS)	USDA Forest Service
FL - Chassahowitzka Wilderness Area (CHAS)	USDI Fish and Wildlife Service
FL - Everglades National Park (EVER)	USDI National Park Service
FL - Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA - Cohutta Wilderness Area (COHU)	USDA Forest Service
GA - Okefenokee Wilderness Area (OKEF)	USDI Fish and Wildlife Service
GA - Wolf Island Wilderness Area (WOLF)*	USDI Fish and Wildlife Service
KY - Mammoth Cave National Park (MACA)	USDI National Park Service
NC - Linville Gorge Wilderness Area (LIGO)	USDA Forest Service
NC - Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC - Swanquarter Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC - Cape Romain Wilderness Area (ROMA)	USDI Fish and Wildlife Service
TN/NC - Great Smoky Mountains National Park (GRSM)	USDI National Park Service
TN/NC - Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	USDA Forest Service
VA - James River Face Wilderness Area (JARI)	USDA Forest Service
VA - Shenandoah National Park (SHEN)	USDI National Park Service
WV - Dolly Sods Wilderness Area (DOSD)	USDA Forest Service
WV - Otter Creek Wilderness Area (OTCR)*	USDA Forest Service

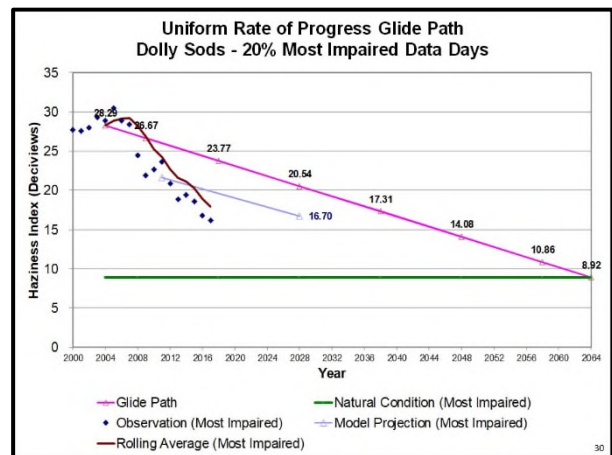
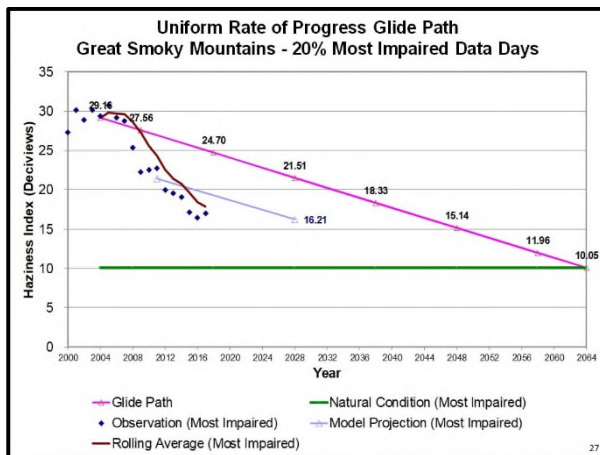
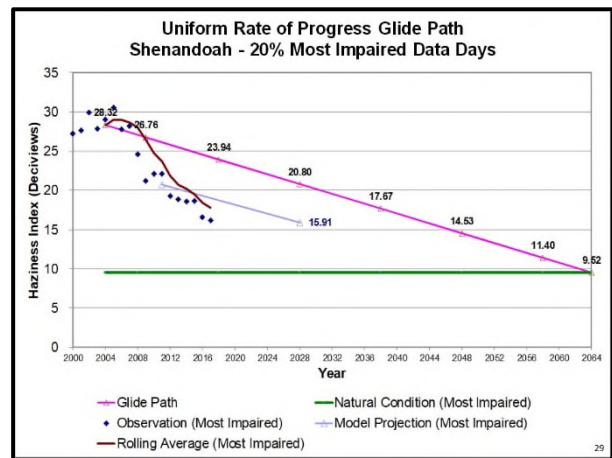
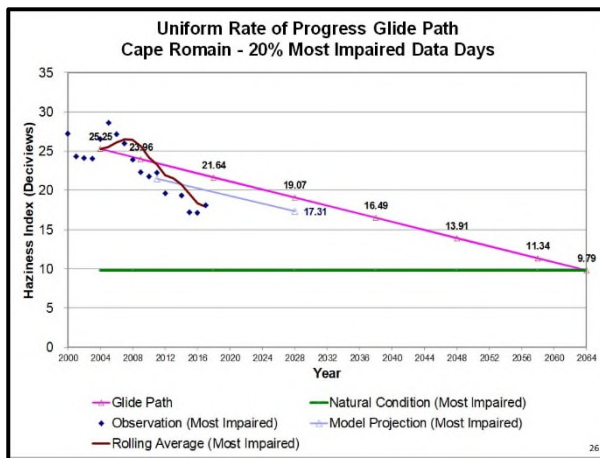
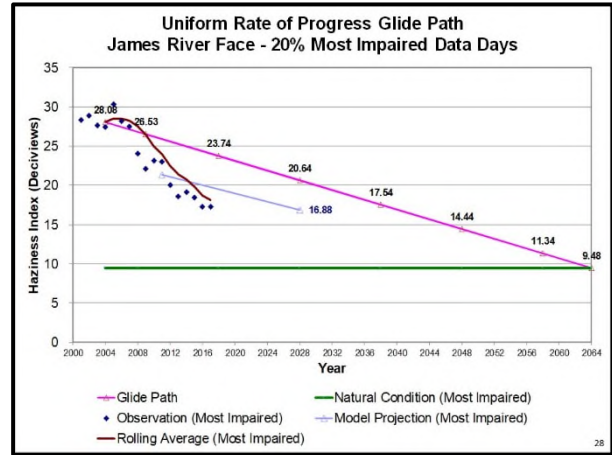
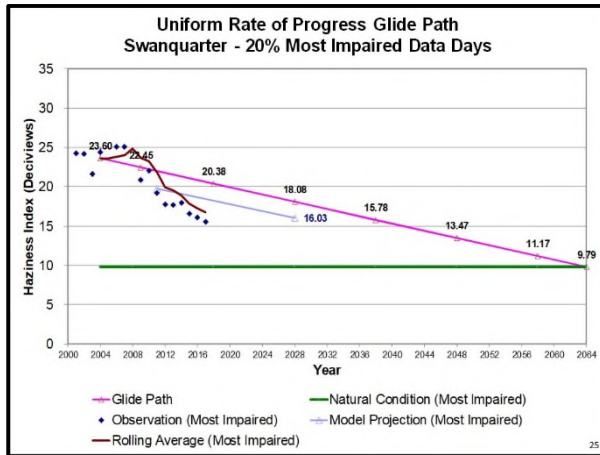
*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

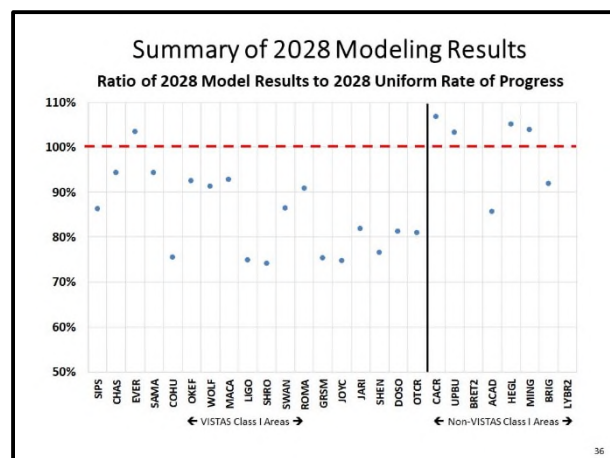
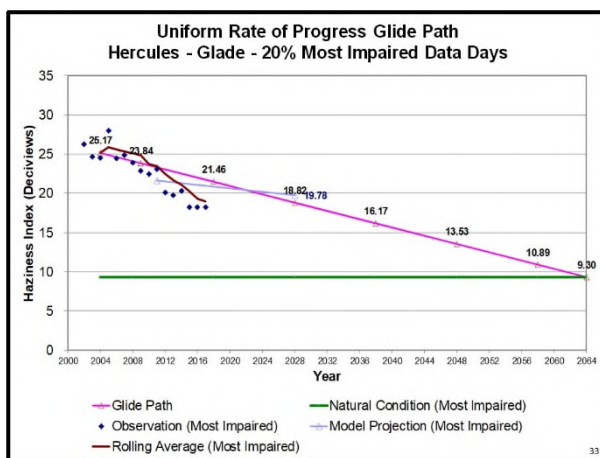
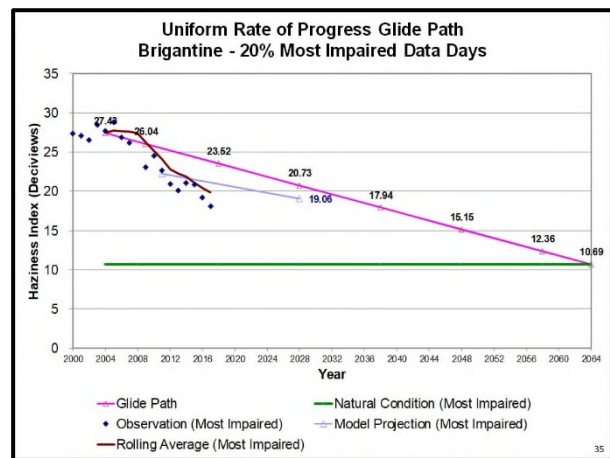
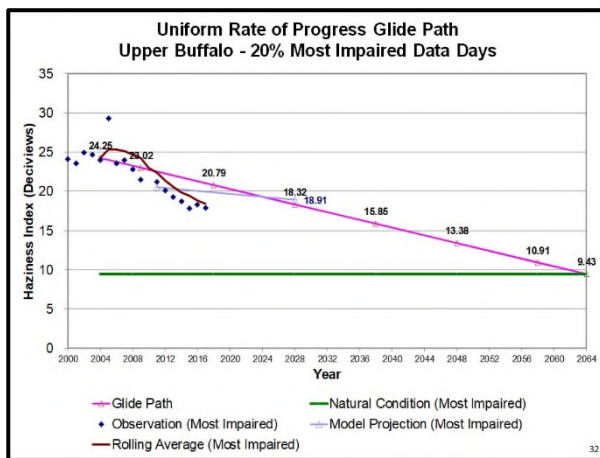
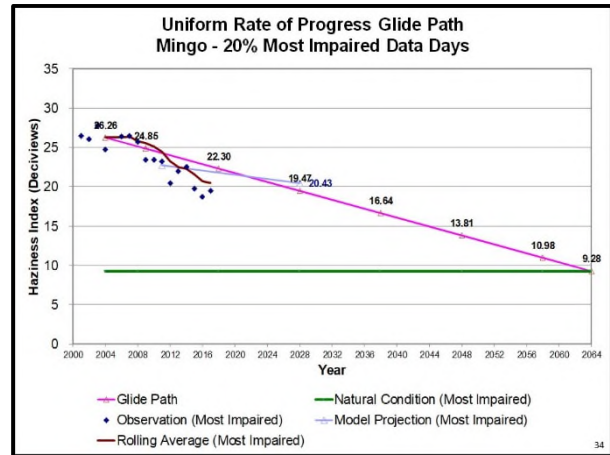
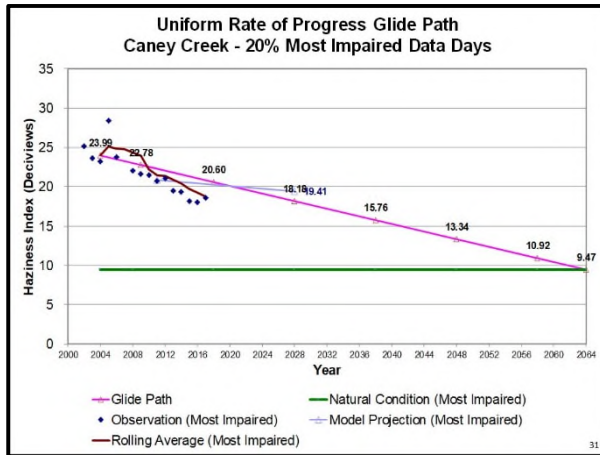
15



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Remaining Work Schedule

Task	Schedule
Best and final 2028 run?	Necessity uncertain
Final reports and documentation	February 2020
Website updates and postings	Ongoing task
Regional Haze SIPs Due to EPA	July 31, 2021

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- Phone: 404-361-4000



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VISTAS Source Selection and 4-Factor Analyses



Jim Boylan (GA DNR), Randy Strait (NC DAQ), and
John Hornback (Metro 4/SESARM)

2019 National Regional Haze Meeting
St. Louis, MO - October 29, 2019

Area of Influence (AOI) Analysis

- Evaluates 2028 emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d) * EWRT$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the 4-factor analysis

4

Outline

- AOI Analysis
- PSAT Analysis
- Next Steps



2

HYSPLIT Trajectories

- Trajectories were run using NAM-12 meteorology for the 20% most impaired days in 2011-2016 at 44 Class I areas.
 - Trajectories were run with starting heights of 100, 500, 1,000, and 1,500 meters.
 - Trajectories were run 72 hours backwards in time for each height at each location.
 - Trajectories were run with start times of 12AM (midnight of the start of the day), 6AM, 12PM, 6PM, and 12AM (midnight at the end of the day) local time.
- 44 Class I areas x 6 years x 24 days/year x 4 heights x 5 start times = **126,720 trajectories**

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AOI ANALYSIS

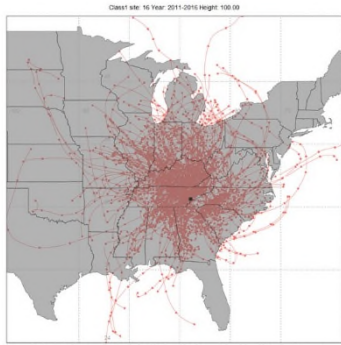
3

Class I Areas Analyzed



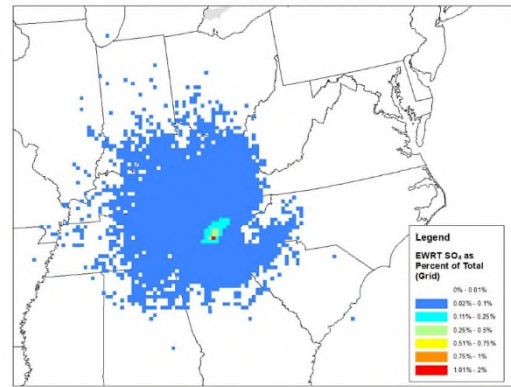
6

100 Meter Trajectories at GRSM



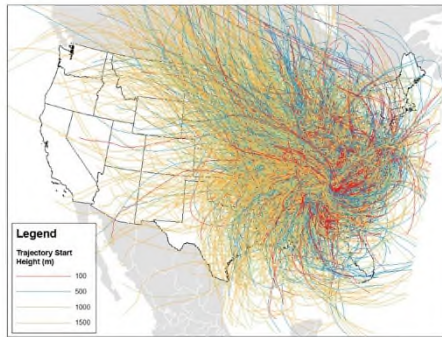
7

Sulfate EWRT at GRSM



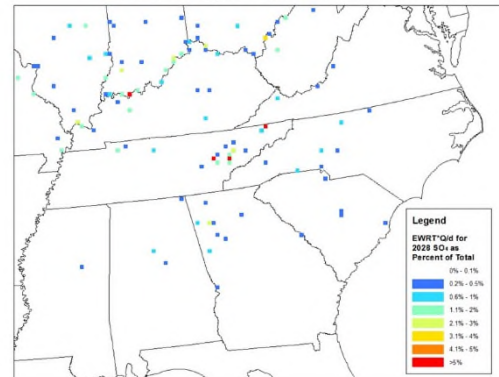
10

All Trajectories at GRSM



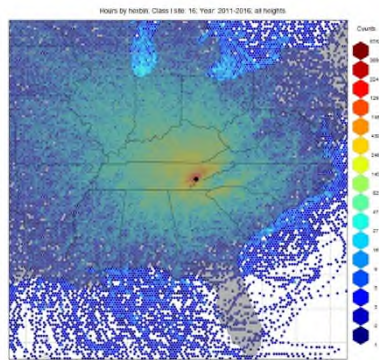
8

Sulfate Q/d*EWRT at GRSM



11

Residence Time for GRSM



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AOI Point Contributions for GRSM

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
TN	TVA KINGSTON FOSSIL PLANT	60.0	1,687.4	1,886.1	0.71%	0.71%
TN	EASTMAN CHEMICAL COMPANY	160.1	6,900.3	6,420.2	0.19%	0.19%
IN	INDIANA MICHIGAN POWER COA AEP ROCKPORT	375.5	8,806.8	30,536.3	0.21%	4.66%
TN	McClellan Tyson	19.7	594.7	78.6	0.01%	0.01%
OH	General James M. Gavin Power Plant (6627010056)	400.5	8,122.5	41,595.8	0.04%	2.25%
GA	Gas Power Company - Plant Bowen	189.7	6,643.3	10,453.4	0.04%	2.00%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (4413090154)	360.0	7,150.0	22,133.9	0.09%	1.84%
TN	Campbell-Knoxville Plant	44.3	711.5	121.5	0.00%	1.71%
IL	Jopka Steam	474.4	4,706.3	20,509.3	0.04%	1.62%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	368.7	6,188.5	9,038.1	0.13%	1.60%
IN	INDIANA POLS POWER & LIGHT - PETERSBURG	835.6	10,660.3	18,141.9	0.12%	1.48%
KY	KY Utilities Co - Ghent Station	359.2	7,919.8	10,169.3	0.09%	1.43%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	7,007.3	19,504.7	0.02%	1.34%
IN	Gibson	556.3	12,280.3	23,117.2	0.07%	1.25%
TN	TATE & LYLE, Loudon	36.1	252.5	110.2	0.00%	1.22%
KY	Big Rivers Electric Corp. - Wilson Station	345.8	1,151.9	6,934.2	0.03%	1.17%
KY	Century Aluminum of KY LLC	346.5	197.7	9,044.2	0.00%	1.07%
WV	MIDMONTING AREA POWER CO-PLEASANTS POWER STA.	475.9	5,497.4	15,817.4	0.02%	1.06%
WV	APPALACHIAN POWER COMPANY-JOHN E AMOS PLANT	367.1	4,878.1	10,984.2	0.01%	1.05%
MO	AMEREN MISSOURI-RUSH ISLAND PLANT	628.2	3,349.3	20,151.5	0.00%	0.90%

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AOI Source Categories for GRSM

SOURCE CATEGORY	NOx	SO ₂	TOTAL
NONPOINT	8.5%	10.7%	19.2%
NONROAD_MAR	3.1%	0.1%	3.2%
NONROAD_OTHER	4.7%	0.3%	5.0%
ONROAD	11.6%	1.5%	13.1%
POINT	7.0%	49.9%	56.8%
PT_FIRES_PRESCRIBED	0.3%	2.3%	2.6%
TOTAL	35.2%	64.8%	100.0%

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AOI Source Categories for OKEF

SOURCE CATEGORY	NOx	SO ₂	TOTAL
NONPOINT	1.7%	2.0%	3.7%
NONROAD_MAR	6.0%	0.6%	6.6%
NONROAD_OTHER	1.7%	0.1%	1.9%
ONROAD	4.5%	0.5%	5.0%
POINT	5.9%	62.9%	68.8%
PT_FIRES_PRESCRIBED	2.6%	11.4%	13.9%
TOTAL	22.4%	77.6%	100.0%

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AOI Source Categories for COHU

SOURCE CATEGORY	NOx	SO ₂	TOTAL
NONPOINT	3.2%	5.1%	8.3%
NONROAD_MAR	3.4%	0.1%	3.5%
NONROAD_OTHER	2.5%	0.2%	2.7%
ONROAD	6.6%	0.6%	7.2%
POINT	8.1%	67.0%	75.1%
PT_FIRES_PRESCRIBED	0.5%	2.6%	3.2%
TOTAL	24.3%	75.7%	100.0%

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AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	112.4	2,745.0	0.03%	11.1%
FL	ROCK TENN CO. LLC	64.8	2,316.8	2,606.7	0.88%	12.1%
FL	SEA	65.6	651.8	2,094.5	0.19%	8.4%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	5.25%
FL	IFF CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	0.90%	2.82%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	0.08%	2.81%
FL	BULKHEAD FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	WENDESENZ LLC	59.8	66.3	569.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	0.06%	1.40%
AL	Sanders Lead Co	384.6	121.7	7,951.1	0.00%	1.11%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.01%	1.09%
GA	Gsa Power Company - Plant Bowen	456.1	6,643.3	10,459.4	0.05%	1.02%
GA	Brownsville Cellulose Inc.	75.1	1,514.3	294.2	0.34%	1.01%
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	PCA Valdosta Mill	112.7	1,032.6	485.7	0.09%	0.85%
SC	SANTEE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.05%	0.85%
FL	CITY OF GAINESVILLE GRU	111.7	410.0	881.4	0.03%	0.79%
SC	KAPSTONE CHARLESTON RAFT LLC	314.9	2,155.8	1,861.7	0.06%	0.65%
GA	Gsa Power Company - Plant Wansley	403.7	2,052.5	4,856.0	0.02%	0.65%

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AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	Gsa Power Company - Plant Bowen	78.0	6,643.3	10,459.4	1.15%	18.9%
IN	INDIANA MICHIGAN POWER COBA AEP - ROCKPORT	410.1	8,806.8	30,536.3	0.13%	4.68%
GA	International Paper - Rome	87.4	1,773.4	1,791.0	0.18%	4.66%
IN	Gibson	487.1	12,780.3	23,117.2	0.10%	2.31%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	10,665.3	18,141.9	0.16%	2.18%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	0.07%	2.18%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	0.13%	2.27%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	0.02%	1.71%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KY	Big Rivers Electric Corp. - Wilson Station	369.0	1,151.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,150.0	22,133.9	0.06%	1.05%
GA	Gsa Power Company - Plant Wansley	156.8	2,052.5	4,856.0	0.04%	1.05%
KY	KY Utilities Co. - Ghent Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Jopka Steam	466.9	4,706.3	20,509.3	0.02%	1.04%
GA	Mohawk Industries Inc.	32.0	66.5	77.1	0.07%	1.02%
TN	EASTMAN CHEMICAL COMPANY	269.8	6,990.3	6,420.2	0.09%	0.99%
MO	AMEREN MISSOURI-LABADRE PLANT	695.4	9,685.5	41,740.3	0.01%	0.96%
IL	Newport	564.0	1,934.5	10,631.6	0.03%	0.91%
GA	Chemical Products Corporation	71.9	15.5	513.8	0.00%	0.89%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.76%

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AOI Source Categories for WOLF

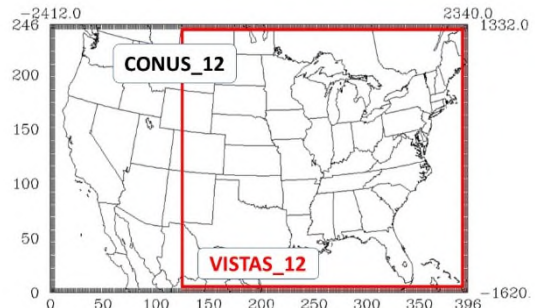
SOURCE CATEGORY	NOx	SO ₂	TOTAL
NONPOINT	1.7%	2.8%	4.4%
NONROAD_MAR	2.9%	1.5%	4.4%
NONROAD_OTHER	3.3%	0.3%	3.6%
ONROAD	5.7%	0.7%	6.4%
POINT	7.3%	67.9%	75.2%
PT_FIRES_PRESCRIBED	0.9%	5.1%	6.0%
TOTAL	21.8%	78.2%	100.0%

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AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO ₂ _2028 (tons/year)	NOx Contribution	SO ₂ Contribution
GA	Brunswick Cellulose Inc.	27.9	1,554.5	294.2	2.34%	1.94%
FL	ROCK TENN CO, LLC	74.0	2,316.8	2,606.7	0.39%	6.41%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	1.94%
FL	JEA	105.1	651.8	2,094.5	0.09%	4.43%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.03%	2.65%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	3,327.1	562.0	0.38%	1.79%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	0.02%	1.71%
SC	SANTEC COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	0.09%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	997.1	0.00%	1.55%
FL	JFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	438.1	6,648.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.9	521.6	562.0	0.08%	1.06%
SC	INTERNATIONAL PAPER EASTOVER	288.7	2,780.3	3,112.9	0.05%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENCON NE MGMT CO/KEYSTONE STA	1,048.6	6,578.5	56,939.2	0.01%	0.84%

VISTAS Modeling Domains



PSAT ANALYSIS

PSAT SO₂ and NOx Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ and NOx for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

Source Apportionment Modeling

- Particulate Matter Source Apportionment Technology (PSAT) tags applied to "VISTAS_12" 2028 model projections (2011 meteorology)
- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- Both NOx and SO₂ tagging
- Refines information on AOI contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

VISTAS Round 1 Facility Tags

Facility State	Facility BPO	FACILITY_ID_SHORT	FACILITY_NAME_SHORT	NOx Tag	SO ₂ Tag
AL	VISTAS	01053-740211	Escambia Operating Company LLC	1	1
AL	VISTAS	01053-985111	Escambia Operating Company LLC	1	1
AL	VISTAS	01073-101871	DRUMMOND COMPANY, INC.	1	1
AL	VISTAS	01097-1056111	Ala Power - Barry	1	1
AL	VISTAS	01097-1064611	Union Oil of California - Chunchula Gas Plant	1	1
AL	VISTAS	01097-949811	Alco Nobel Chemicals Inc.	1	1
AL	VISTAS	01103-100011	Nucor Steel Decatur LLC	1	1
AL	VISTAS	01109-985711	Sanders Lead Co	1	1
FL	VISTAS	12005-535411	ROCKTENN CP LLC	1	1
FL	VISTAS	12017-640011	DUKE ENERGY FLORIDA, INC. (DEF)	1	1
FL	VISTAS	12031-640211	JEA	1	1
FL	VISTAS	12033-752711	GULF POWER - Crist	1	1
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	1	1
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	1	1
FL	VISTAS	12097-710411	MOSAIC FERTILIZER, LLC	1	1
FL	VISTAS	12089-753711	ROCK TENN CP, LLC	1	1
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	1	1
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC	1	1
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC	1	1
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1	1

VISTAS Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
GA	VISTAS	13015-2813011	Ga Power Company - Plant Bowen	1	
GA	VISTAS	13015-3679811	International Paper - Savannah	1	
GA	VISTAS	13127-3721011	Brennswick Cellulose Inc.	1	
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC	1	
KY	VISTAS	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1	
KY	VISTAS	21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant	1	
KY	VISTAS	21183-5561611	Big Rivers Electric Corp. - Wilson Station	1	
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	1	
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill	1	
SC	VISTAS	45015-4834911	ALUMAX OF SOUTH CAROLINA	1	
SC	VISTAS	45019-4978611	KAPSTONE CHARLESTON KRAFT LLC	1	
SC	VISTAS	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	1	
TN	VISTAS	47001-6196011	TVA BULL RUN FOSSIL PLANT	1	
TN	VISTAS	47093-4979911	Cemex - Knoxville Plant	1	
TN	VISTAS	47105-4119211	FATE & LYLE, Loudon	1	
TN	VISTAS	47145-4979111	TVA KINGSTON FOSSIL PLANT	1	
TN	VISTAS	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	1	
TN	VISTAS	47163-3982311	EASTMAN CHEMICAL COMPANY	1	

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Non-VISTAS Round 2 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AR	CENRAP	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT		1
MO	CENRAP	29143-5363811	NEW MADRID POWER PLANT-MARSTON		1
MD	MANE-VU	24001-7763811	Luke Paper Company	1	1
PA	MANE-VU	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1	1
PA	MANE-VU	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	1	1
PA	MANE-VU	42063-3005111	WNG WHOLESALE GEN/SEWARD GEN STA	1	1
IL	LADCO	17127-7808911	Jopco Steam		1
IN	LADCO	18173-8183111	Alcoa Warrick Power Pk Agc Div of AL		1
IN	LADCO	18051-7363111	Gibson		1
IN	LADCO	18147-9017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1	1
IN	LADCO	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG		1
IN	LADCO	18129-8166111	Digeco AB Brown South Indiana Gas & Ele		1
OH	LADCO	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	1	1
OH	LADCO	39031-8010811	Conesville Power Plant (0616000000)	1	1
OH	LADCO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	1	1
OH	LADCO	39053-8148511	General James M. Gavin Power Plant (06270300056)	1	1
OH	LADCO	39053-7983011	Ohio Valley Electric Corp., Ryger Creek Station (0627000003)	1	1

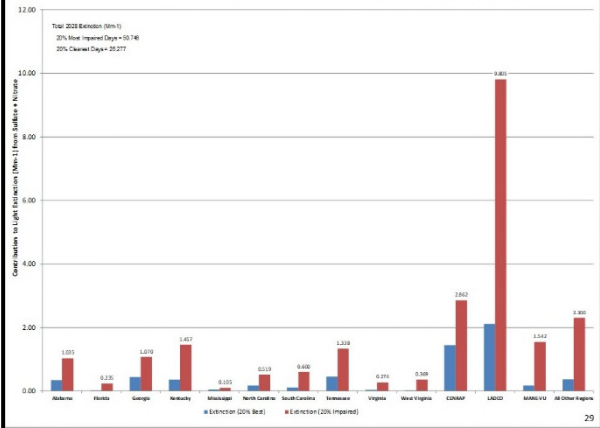
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VISTAS Round 1 Facility Tags

Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
VA	VISTAS	51023-5039811	Roadnote Cement Company		
VA	VISTAS	51027-4034811	Jevell Cole Company LLP	1	
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group	1	
WV	VISTAS	54023-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	1	1
WV	VISTAS	54033-6271711	ALLEGHENY ENERGY SUPPLY CO. LLC-HARRISON	1	1
WV	VISTAS	54041-6900311	EQUITRANS - COPELY RUN CS 70	1	1
WV	VISTAS	54049-4864511	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	1	1
WV	VISTAS	54051-6902311	MITCHELL PLANT	1	1
WV	VISTAS	54061-1652011	LONGVIEW POWER	1	1
WV	VISTAS	54063-6778611	MONONGAHELA POWER CO. - FORT MARTIN POWER	1	1
WV	VISTAS	54061-6773811	MORGANTOWN ENERGY ASSOCIATES	1	1
WV	VISTAS	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	1	1
WV	VISTAS	54079-6789111	APPALACHIAN POWER COMPANY - JOHN F AMOS PLANT	1	1
WV	VISTAS	54083-6790511	GLADY 6C4350	1	1
WV	VISTAS	54083-6790711	FILES CREEK 6C4340	1	1
WV	VISTAS	54093-6327811	KINGSFORD MANUFACTURING COMPANY	1	1

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2028 Contribution of All Anthro + Natural Sources to Cohutta Wilderness, GA from Sulfate + Nitrate (Mm-1)



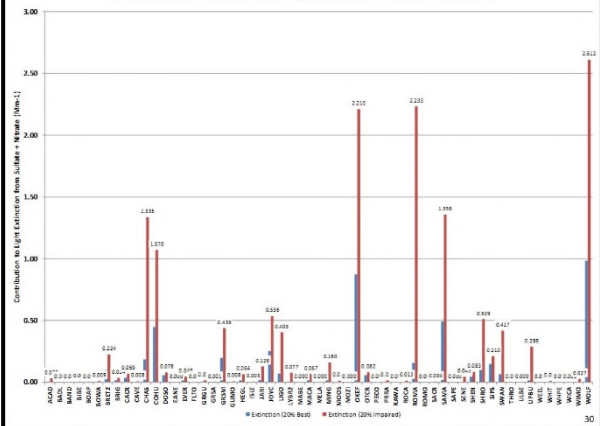
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VISTAS Round 2 Facility Tags

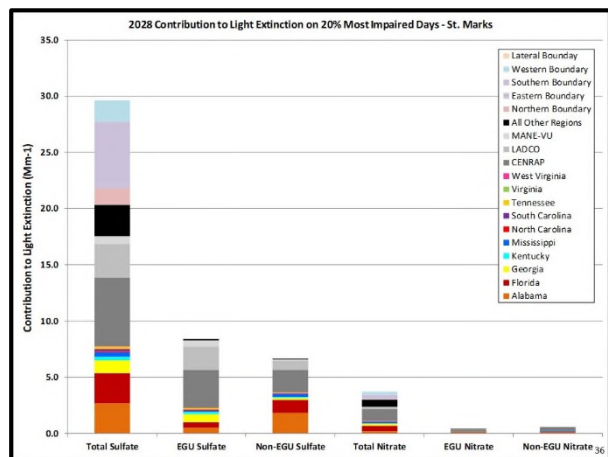
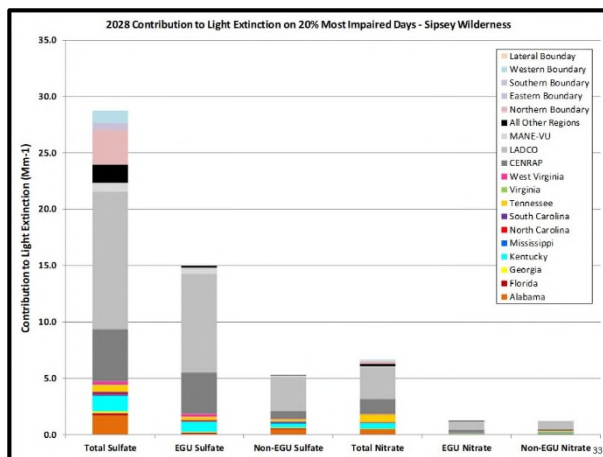
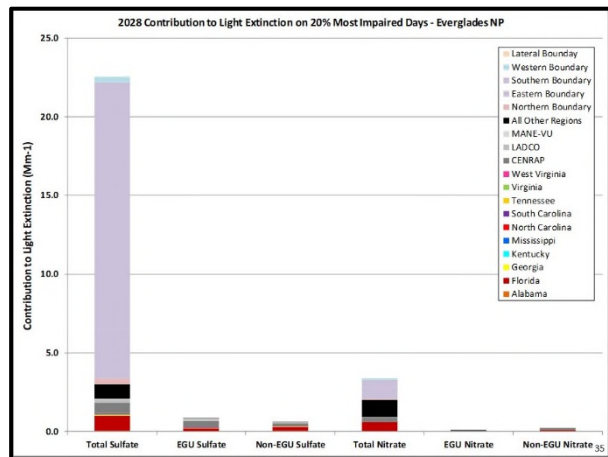
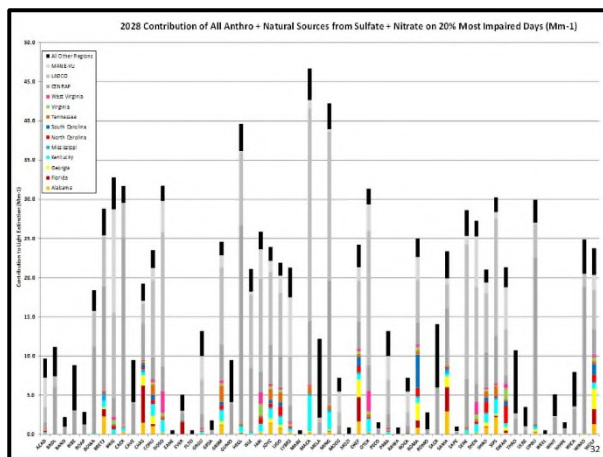
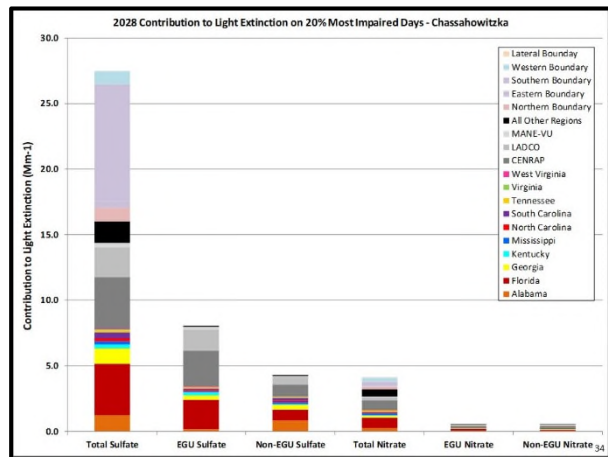
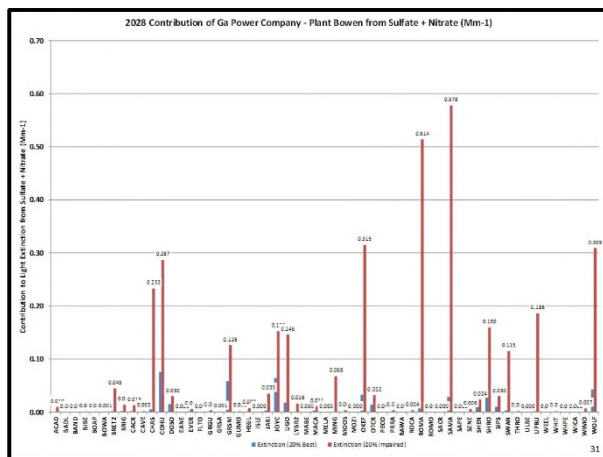
Facility State	Facility RPO	FACILITY_ID_STD	FACILITY_NAME_STD	NOx Tag	SO2 Tag
AL	VISTAS	01129-1012911	American Midstream Chatham, LLC		1
FL	VISTAS	12123-752411	BUCKEYE FLORIDA LIMITED PARTNERSHIP	1	
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC.	1	
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (PTL)	1	
FL	VISTAS	12086-3532711	HOMESTEAD CITY UTILITIES	1	
FL	VISTAS	12129-2731711	TALLAHASSEE CITY PURDOM GENERATING STA.	1	
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	1	
GA	VISTAS	13127-3721011	Brennswick Cellulose Inc	1	
GA	VISTAS	13103-5363111	Georgia-Pacific Consumer Products LP (Savannah River Mill)		1
GA	VISTAS	13115-5393111	International Paper - Rome	1	
MS	VISTAS	28059-8384311	Chevron Products Company, Pascagoula Refinery	1	1
MS	VISTAS	28059-6251011	Mississippi Power Company, Plant Victor J Daniel	1	
NC	VISTAS	37087-7920511	Blue Ridge Paper Products - Canton Mill	1	
NC	VISTAS	37171-8049911	Dorland Paper Company, LLC	1	1
NC	VISTAS	37035-8370411	Duke Energy Carolinas, LLC - Marshall Steam Station	1	1
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	1	
NC	VISTAS	37023-8513011	SGL Carbon LLC	1	
SC	VISTAS	45015-4120411	SANTER COOPER CROSS GENERATING STATION	1	
SC	VISTAS	45043-8652811	SANTER COOPER WINNIEH GENERATING STATION	1	
SC	VISTAS	45015-8306711	SCE& WILLIAMS	1	
VA	VISTAS	51027-4034811	Jevell Cole Company LLP	1	
VA	VISTAS	51580-5798711	Meadwestvaco Packaging Resource Group	1	
VA	VISTAS	51023-5039811	Roadnote Cement Company	1	

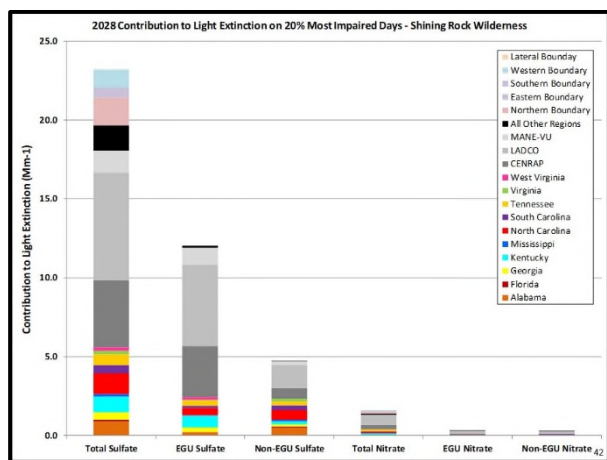
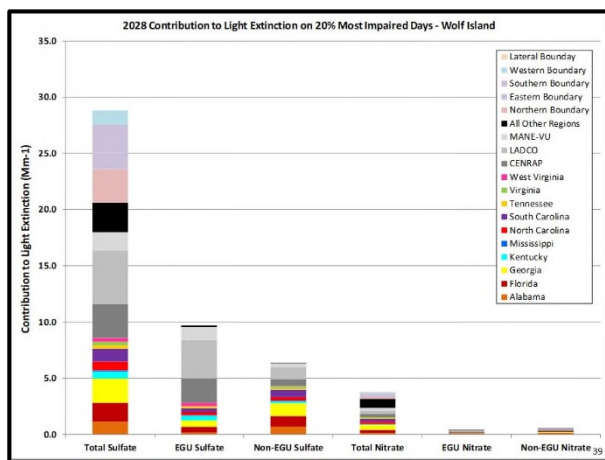
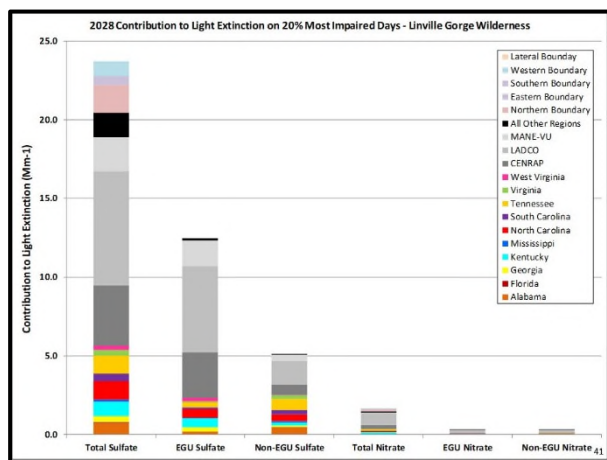
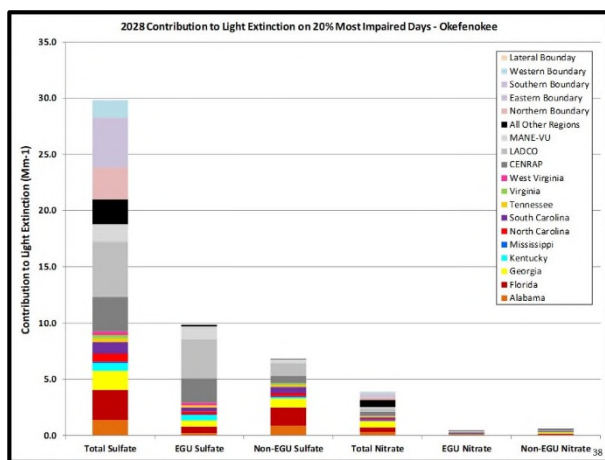
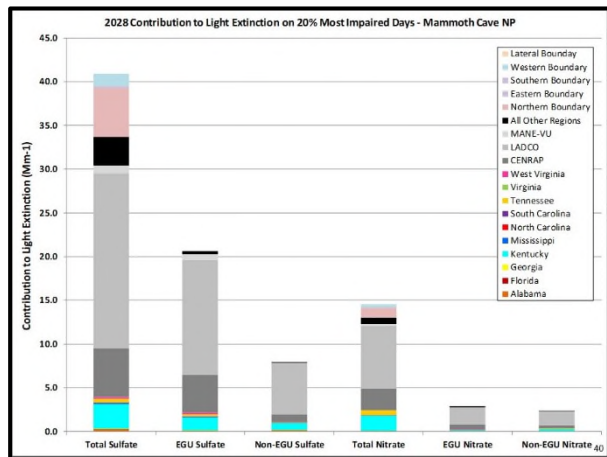
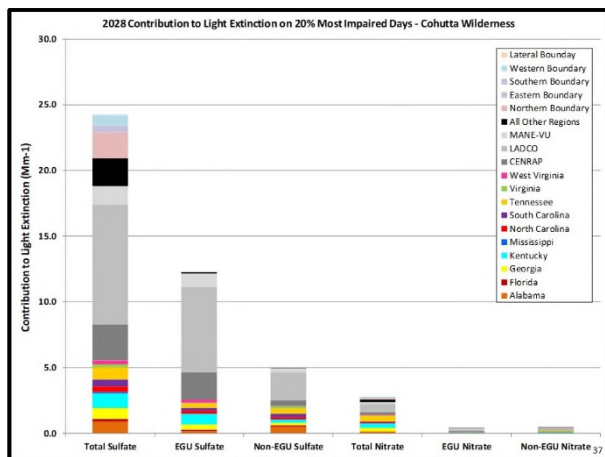
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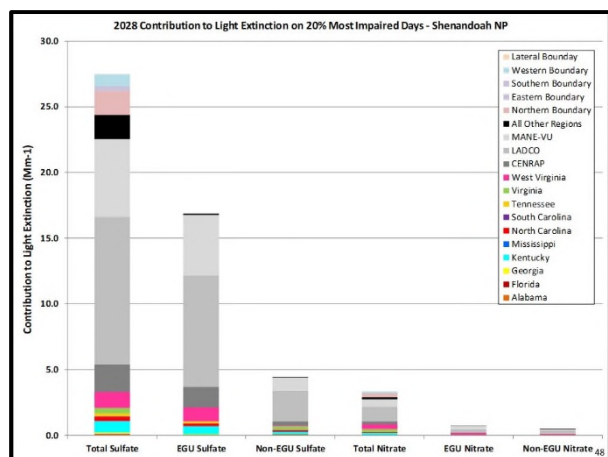
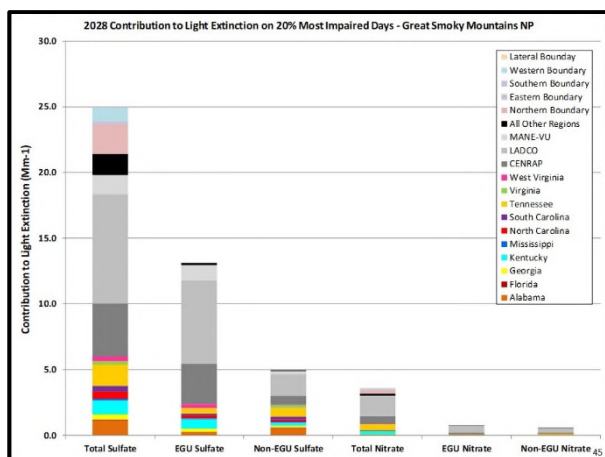
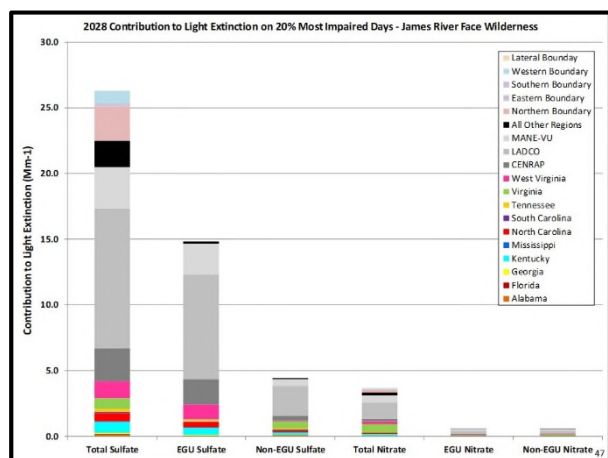
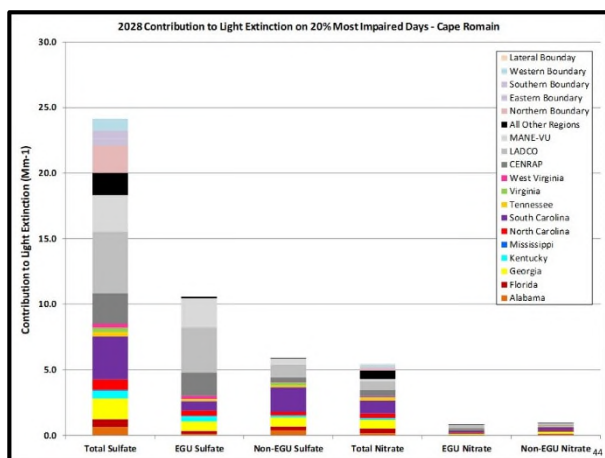
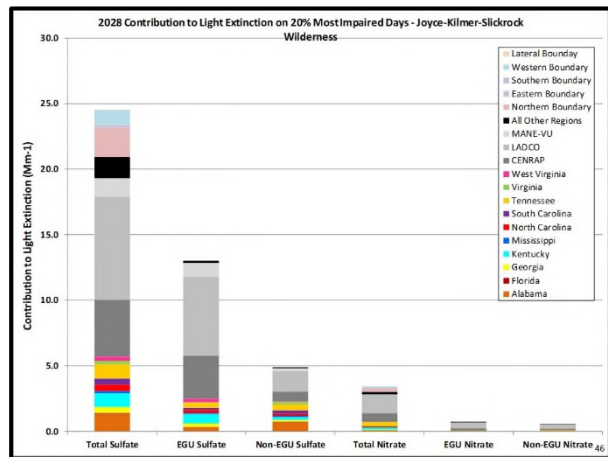
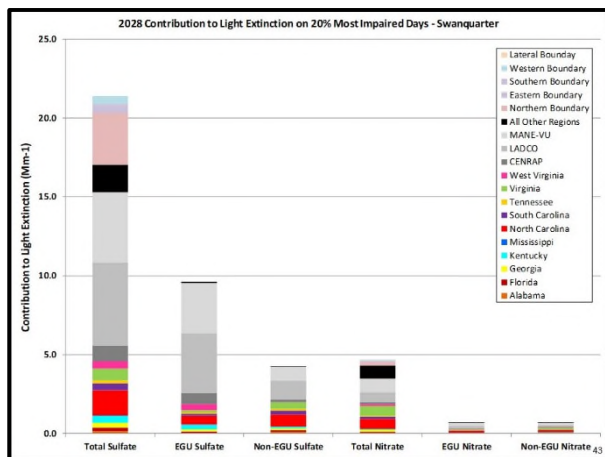
2028 Contribution of All Anthro + Natural Sources in Georgia from Sulfate + Nitrate (Mm-1)

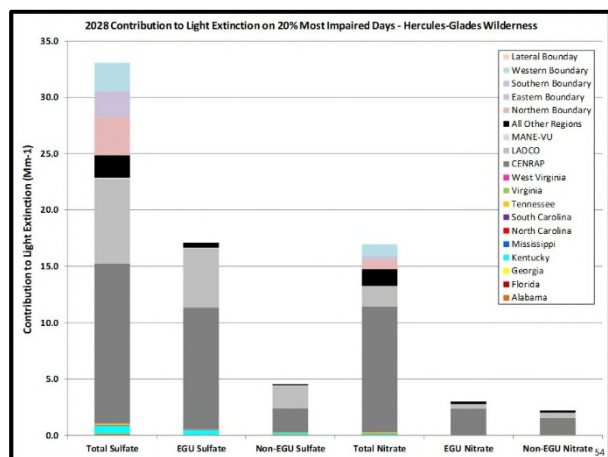
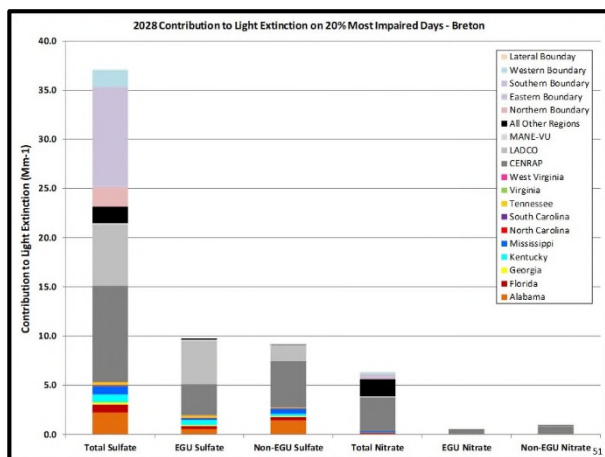
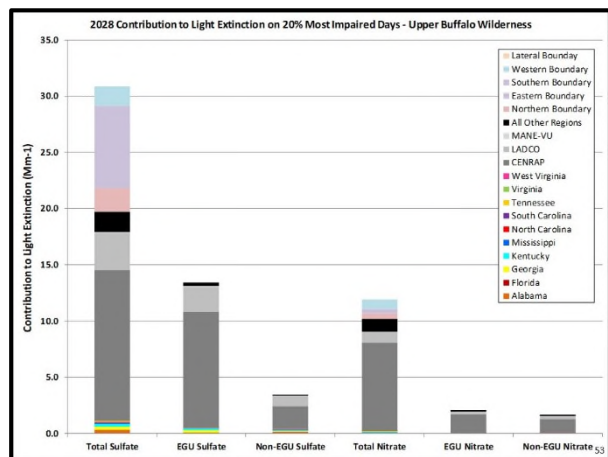
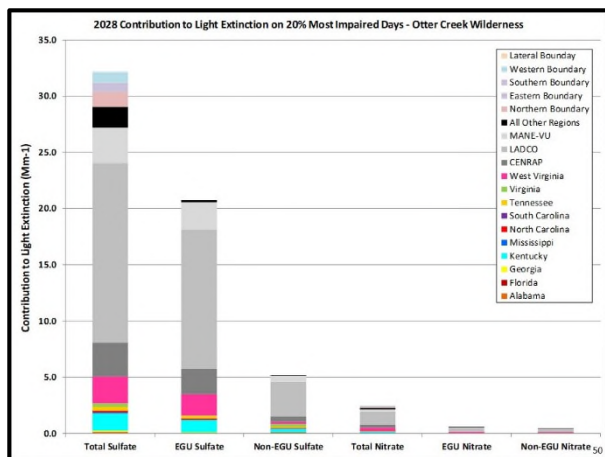
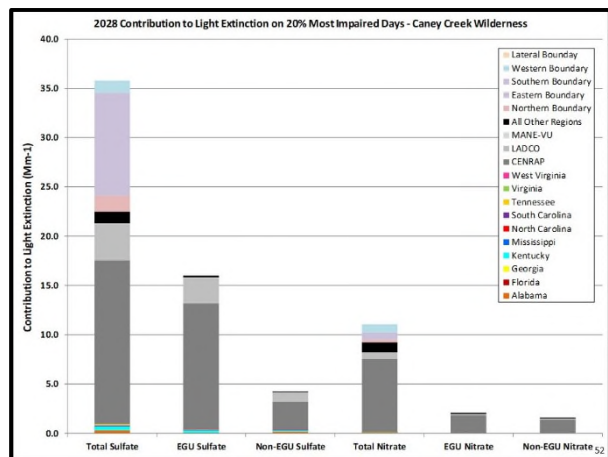
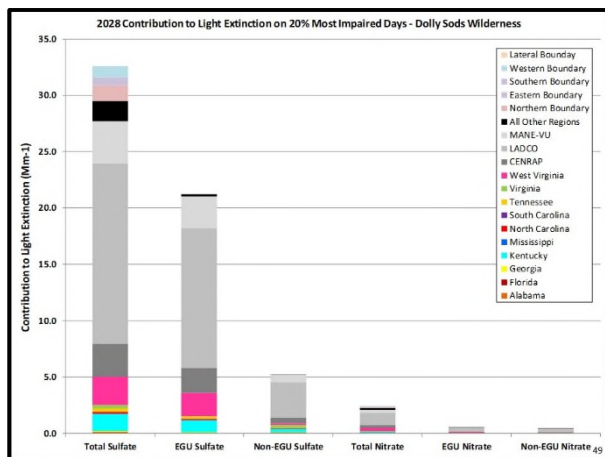


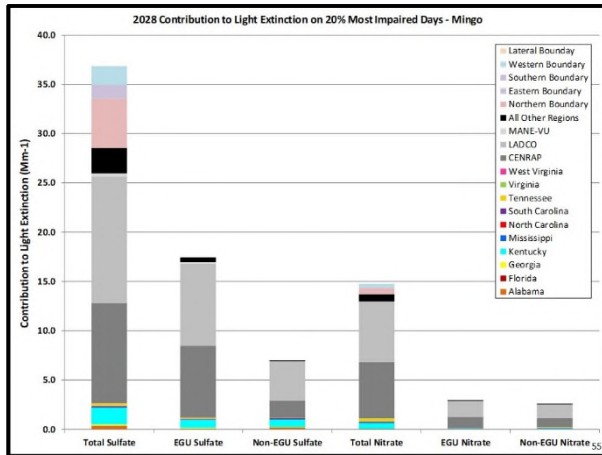
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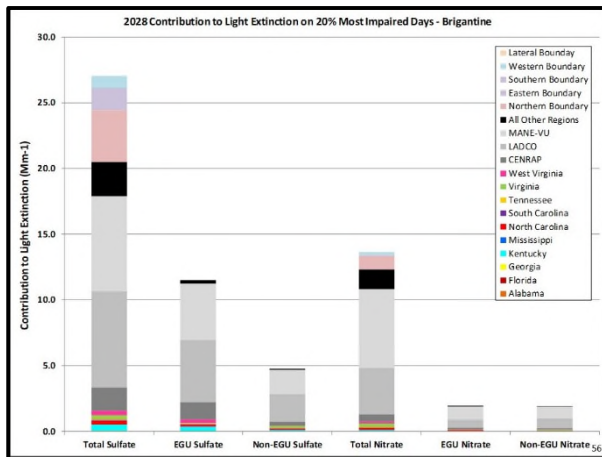




Screening for 4-Factor Analysis

- States are in the process of selecting sources for the reasonable progress 4-factor analysis
- State need to make decisions on screening thresholds:
 - Most states will likely use a screening threshold based on a facility's percent contribution to point source contributions
 - Likely range is between 2% to 5%
 - Sulfate and nitrate separately vs. combination
 - AOI contributions, PSAT contributions, or combination
 - In some cases, the AOI contributions are significantly different than the PSAT contributions

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4-Factor Analysis

- States will evaluate certain sources and emissions to determine if reasonable controls are in place or available
- Considers four important factors
 - Potential costs of compliance
 - \$/ton and \$/Mm⁻¹
 - Time necessary for compliance
 - Energy and non-air quality environmental impacts of compliance
 - Remaining useful life of sources subject to this analysis

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NEXT STEPS

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Remaining Work Schedule

Task	Schedule
Additional PSAT tagging runs?	Necessity uncertain
Final reports and documentation	February 2020
Website updates and postings	Ongoing task
Regional Haze SIPs Due to EPA	July 31, 2021

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west virginia department of environmental protection

Appendix F-3h

VISTAS Regional Haze Project Update April 2, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS Regional Haze Project Update



FLM and EPA Conference Call
April 2, 2020

Old ERTAC (2.7opt) vs. New ERTAC (16.0)

SO ₂	16.0 2028	2.7opt 2028	Δ SO ₂	Δ SO ₂
CENSARA	367,683.7	760,828.2	-393,144.5	-51.67%
LADCO	266,047.0	379,577.5	-113,530.5	-29.91%
MANE-VU	78,657.0	196,672.6	-118,015.6	-60.01%
VISTAS	161,502.5	273,582.1	-112,079.6	-40.97%
TOTAL	976,471.2	1,783,376.5	-806,905.3	-45.25%

NO _x	16.0 2028	2.7opt 2028	Δ NO _x	Δ NO _x
CENSARA	244,499.3	354,795.1	-110,295.8	-31.09%
LADCO	166,429.4	198,966.9	-32,537.4	-16.35%
MANE-VU	56,315.3	83,432.5	-27,117.2	-32.50%
VISTAS	200,791.1	270,615.7	-69,824.6	-25.80%
TOTAL	840,973.6	1,166,663.1	-325,689.5	-27.92%

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Outline

- Background Information
- 2028 Emissions Updates
- Revised 2028 PSAT Stacked Bar Charts
- Four Factor Analysis
- Next Steps & Schedule



2

VISTAS CC/TAWG Conclusions

- 2028 emission updates are necessary
 - **VISTAS States** – States will:
 - Update 2028 major source emissions projections (SO₂, NO_x, PM_{2.5}, PM₁₀, NH₃, CO) at the facility and unit level
 - Add any new sources of significance
 - **LADCO States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.1 based on LADCO input
 - **All Other States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.0
 - Verify accuracy of large SO₂ and NO_x source emissions projections via contact with surrounding states/RPOs and update emissions as needed
- Additional 2028 air quality modeling is needed

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VISTAS vs. EPA Emission Projections

- The table below compares the 2028 point emissions used by VISTAS vs. the latest 2028fh emissions used by EPA (projected from 2016). The emissions below are extracted from the VISTAS 12 modeling domain which covers the Eastern U.S.

Pollutant	VISTAS 2028 (tpy)	New EPA 2028 (tpy)	Change (tpy)	Change (%)
NO _x	2,641,463.83	2,108,115.50	533,348.33	20.19%
SO ₂	2,574,542.02	1,400,287.10	1,174,254.92	45.61%

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Additional Modeling-Related Tasks

- Emissions processing
- Updated 2028 CAMx modeling
- Updated 2028 visibility projections
- Documentation

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Updated 2028 Point Emissions

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Revised 2028 PSAT Stacked Bar Charts (Original and Adjusted)

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2028 SO₂ Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	87,111.28	59,056.98	-32.2%	15,480.96	8,365.96	-46.0%	71,630.32	50,691.02	-29.2%
FL	63,501.23	52,982.68	-16.6%	28,547.41	24,004.67	-15.9%	34,953.82	28,978.01	-17.1%
GA	37,065.83	36,166.09	-2.4%	18,473.28	17,573.54	-4.9%	18,592.55	18,592.55	0.0%
KY	75,140.26	65,636.83	-12.6%	56,262.06	49,585.95	-11.9%	18,878.20	16,050.88	-15.0%
MS	21,234.31	8,405.06	-60.4%	6,984.57	3,226.28	-53.7%	14,249.74	5,168.78	-63.7%
NC	35,232.88	24,347.18	-30.9%	19,734.80	9,571.47	-51.5%	15,498.08	14,775.71	-4.7%
SC	29,600.85	29,601.25	0.0%	10,693.79	10,695.34	0.0%	18,907.05	18,905.91	-0.0%
TN	23,447.58	21,057.17	-10.2%	12,114.30	10,030.04	-17.2%	11,333.28	11,027.13	-2.7%
VA	19,839.18	18,551.32	-6.5%	3,264.09	1,976.23	-39.5%	16,575.09	16,575.09	0.0%
WV	63,404.07	53,715.79	-15.3%	57,828.67	47,744.49	-17.4%	5,575.41	5,971.30	7.1%
CENSARA	1,012,946.59	621,321.29	-38.7%	773,625.13	382,000.54	-50.6%	239,321.46	239,320.75	-0.0%
LADCO	660,186.42	498,171.62	-24.5%	444,506.99	282,492.18	-36.4%	215,679.44	215,679.44	0.0%
MANEVE	270,810.83	149,439.76	-44.8%	203,661.43	95,074.20	-53.3%	67,149.39	54,365.55	-19.0%
WRAP	182,121.89	135,483.18	-25.6%	136,955.17	90,316.46	-34.1%	45,166.72	45,166.73	0.0%
TOTAL	2,581,643.20	1,773,936.20	-31.3%	1,788,132.63	1,032,667.35	-42.2%	793,510.56	741,268.85	-6.6%

8

PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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2028 NOx Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	80,389.97	70,824.72	-11.9%	26,895.35	20,008.14	-25.6%	53,494.61	50,816.58	-5.0%
FL	68,006.19	70,010.40	2.9%	26,250.73	25,049.90	-4.6%	41,755.45	44,960.50	7.7%
GA	67,197.50	65,885.55	-2.0%	25,899.67	24,587.73	-5.1%	41,297.83	41,297.83	0.0%
KY	66,240.03	62,130.83	-6.2%	36,781.77	32,695.94	-11.1%	29,458.31	29,434.89	-0.1%
MS	52,159.32	46,853.62	-10.2%	18,279.53	12,208.89	-33.2%	33,879.79	34,644.73	2.3%
NC	65,863.97	58,933.80	-10.5%	27,842.23	20,977.65	-24.7%	38,021.74	37,956.15	-0.2%
SC	36,051.31	36,170.87	0.3%	10,522.78	10,707.42	1.8%	25,528.53	25,463.44	-0.3%
TN	45,879.07	42,954.25	-6.4%	10,086.01	7,814.13	-22.5%	35,793.06	35,140.12	-1.8%
VA	43,210.19	41,671.99	-3.6%	11,973.97	10,435.77	-12.8%	31,236.22	31,236.22	0.0%
WV	65,054.07	68,200.77	4.8%	46,721.77	49,874.15	6.7%	18,332.30	18,326.62	-0.0%
CENSARA	903,979.85	791,397.50	-12.5%	382,706.66	270,182.46	-29.4%	521,273.19	521,215.14	-0.0%
LADCO	548,866.74	491,345.00	-10.5%	244,035.26	186,513.52	-23.6%	304,831.49	304,831.49	0.0%
MANEVE	244,280.15	222,991.41	-9.7%	103,465.15	82,176.41	-20.6%	140,815.00	140,815.00	0.0%
WRAP	362,819.80	301,433.41	-16.9%	187,944.97	126,558.55	-32.7%	174,874.83	174,874.86	0.0%
TOTAL	2,649,998.14	2,370,804.22	-10.5%	1,159,405.80	879,790.66	-24.1%	1,490,592.35	1,491,013.55	0.0%

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PSAT SO₂ and NOx Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

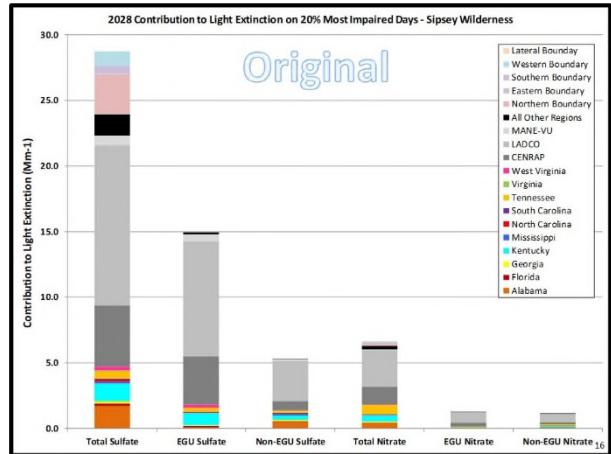
- Non-EGU point SO₂ for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ and NOx for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

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PSAT Adjustment Ratios

State/RPO	SO ₂ EGU Ratio	SO ₂ NEGU Ratio	NO _x EGU Ratio	NO _x NEGU Ratio
AL	0.540	0.708	0.744	0.950
FL	0.841	0.829	0.954	1.077
GA	0.951	1.000	0.949	1.000
KY	0.881	0.850	0.889	0.999
MS	0.463	0.363	0.668	1.023
NC	0.485	0.953	0.753	0.998
SC	1.000	1.000	1.018	0.997
TN	0.828	0.973	0.775	0.982
VA	0.605	1.000	0.872	1.000
WV	0.826	1.071	1.067	1.000
CENSARA	0.494	1.000	0.706	1.000
LADCO	0.636	1.000	0.764	1.000
MANE-VE	0.467	0.810	0.794	1.000

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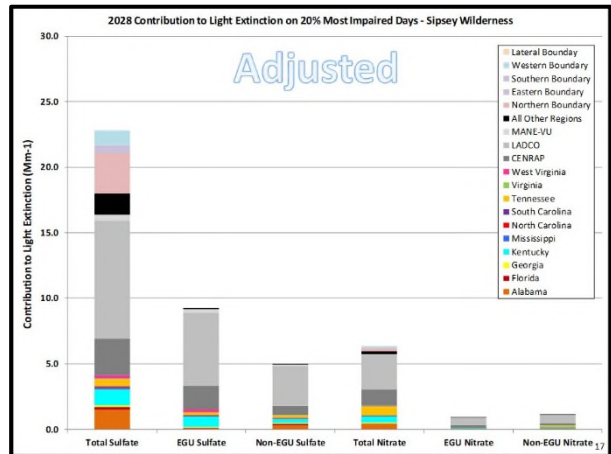
Revised State/RPO PSAT Results

- Revised EGU Sulfate PSAT Results**
 = Original EGU Sulfate PSAT Results * SO₂ EGU Ratio

$$\text{where, SO}_2 \text{ EGU Ratio} = \frac{(\text{Revised EGU SO}_2 \text{ emissions})}{(\text{Original EGU SO}_2 \text{ emissions})}$$
- Revised NEGU Sulfate PSAT Results**
 = Original NEGU Sulfate PSAT Results * SO₂ NEGU Ratio

$$\text{where, SO}_2 \text{ NEGU Ratio} = \frac{(\text{Revised EGU SO}_2 \text{ emissions})}{(\text{Original EGU SO}_2 \text{ emissions})}$$

14



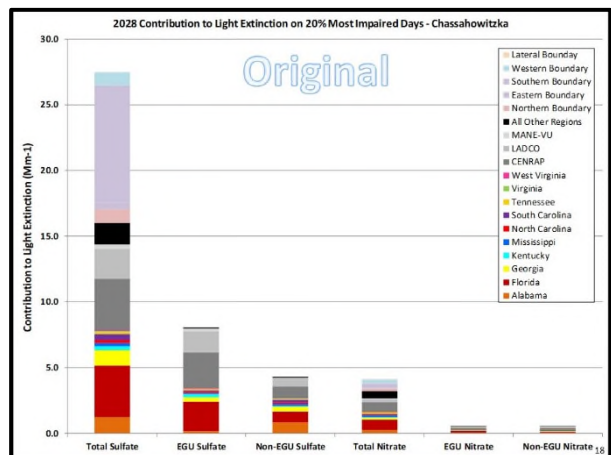
Revised State/RPO PSAT Results

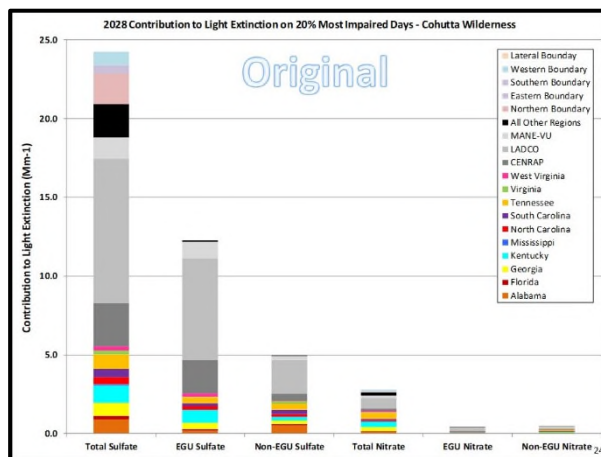
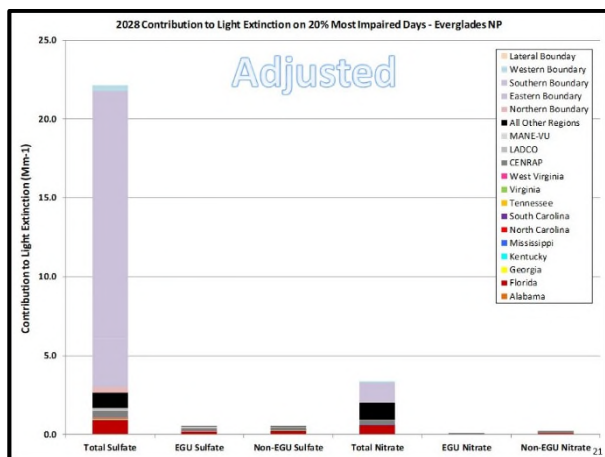
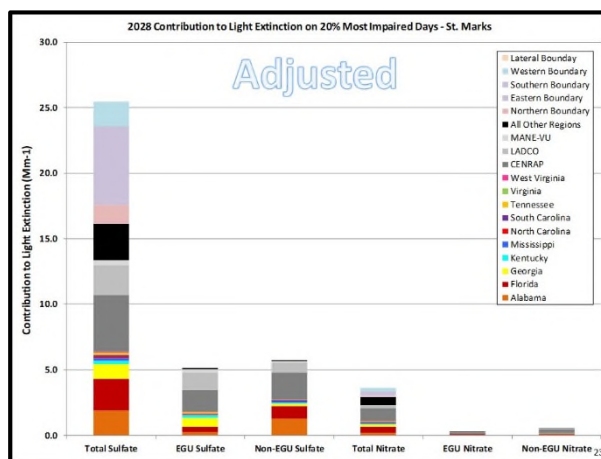
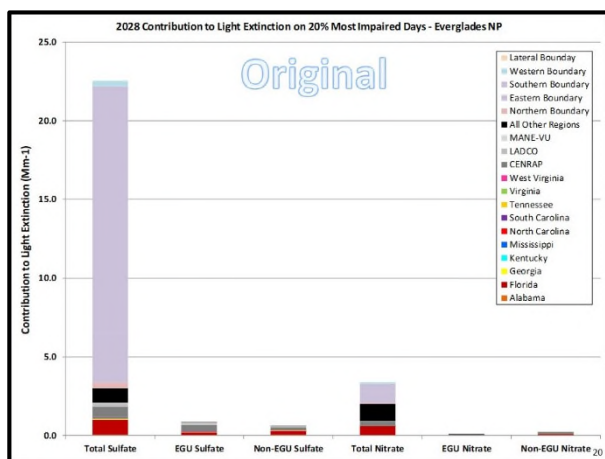
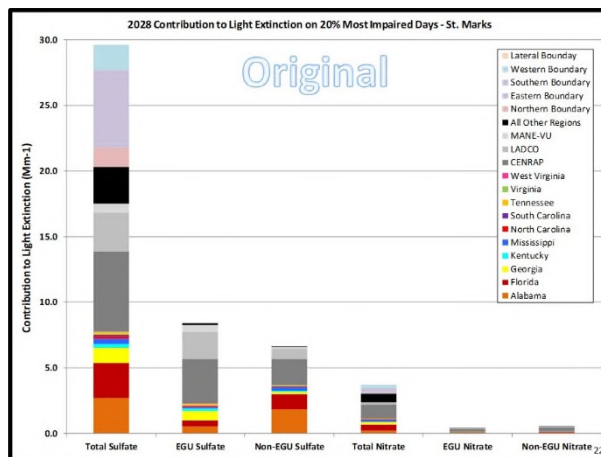
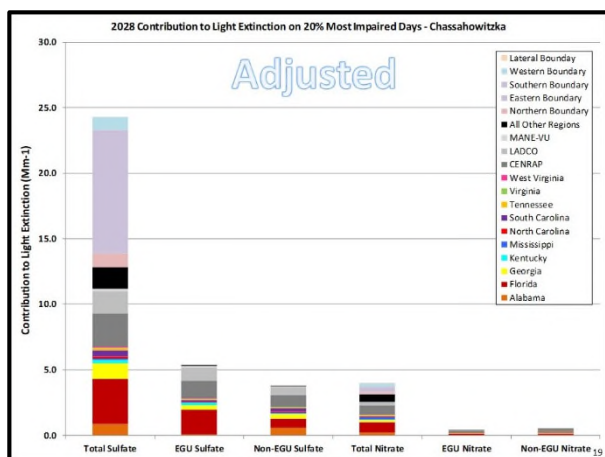
- Revised EGU Nitrate PSAT Results**
 = Original EGU Nitrate PSAT Results * NO_x EGU Ratio

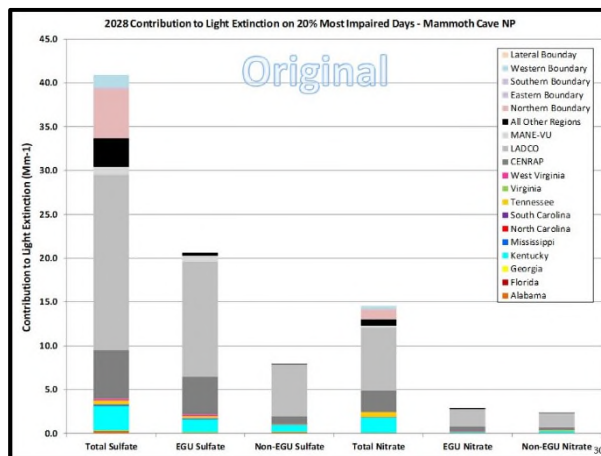
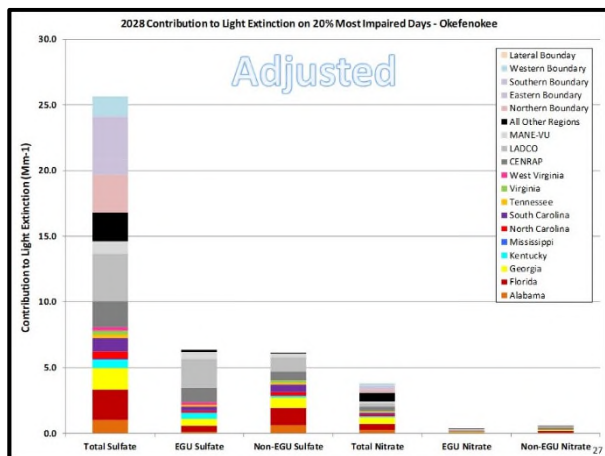
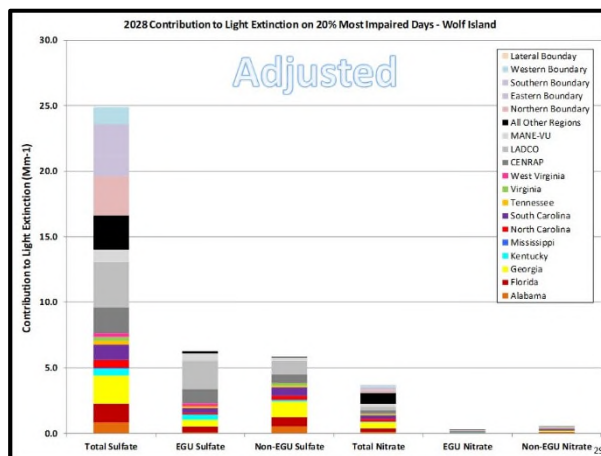
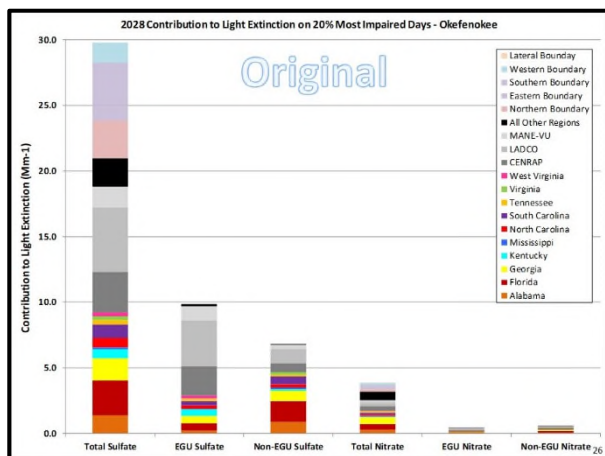
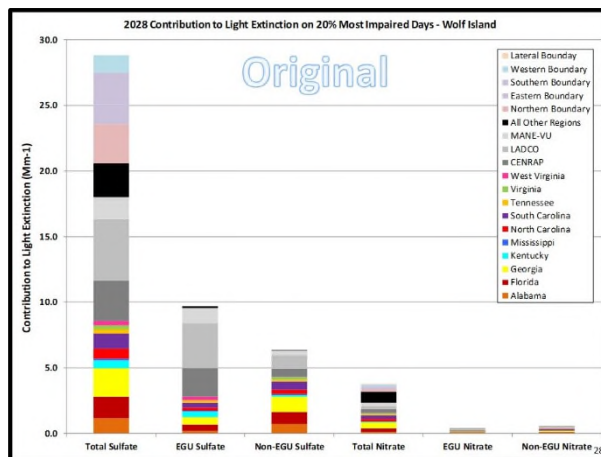
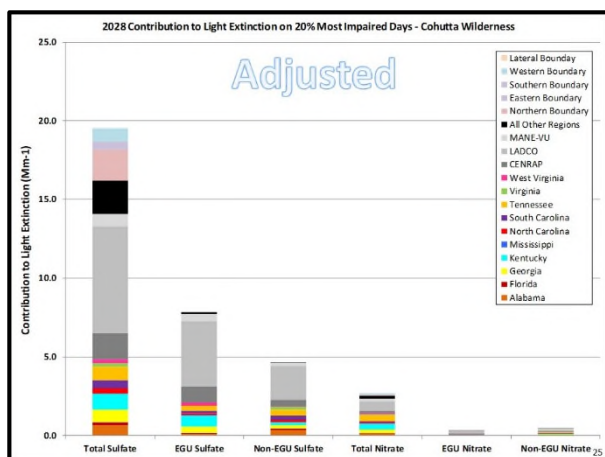
$$\text{where, NO}_x \text{ EGU Ratio} = \frac{(\text{Revised EGU NO}_x \text{ emissions})}{(\text{Original EGU NO}_x \text{ emissions})}$$
- Revised NEGU Nitrate PSAT Results**
 = Original NEGU Nitrate PSAT Results * NO_x NEGU Ratio

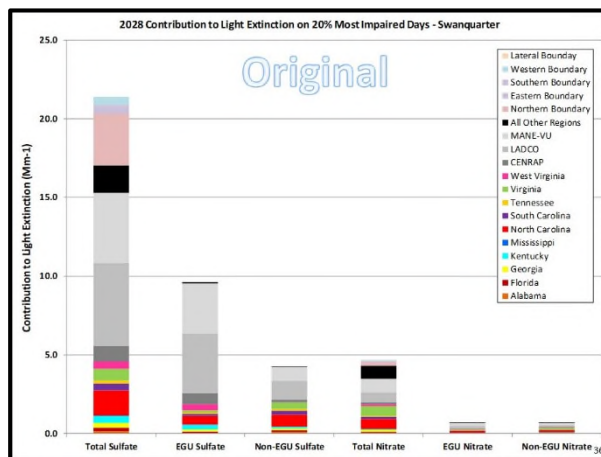
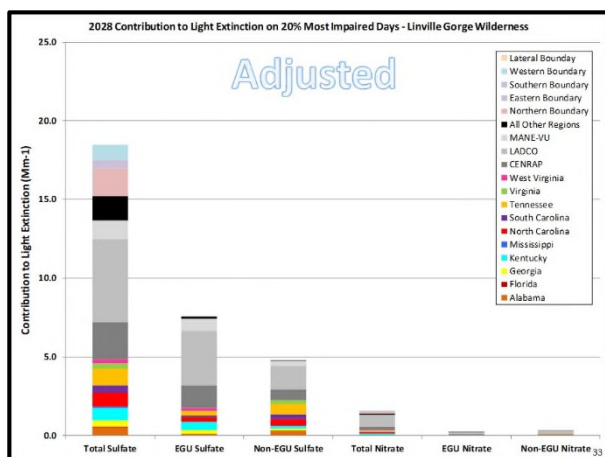
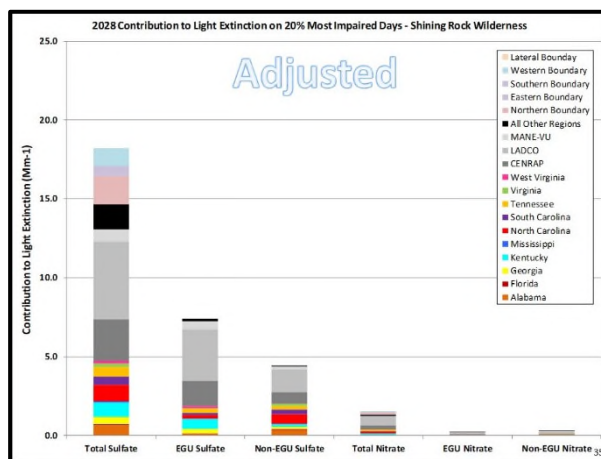
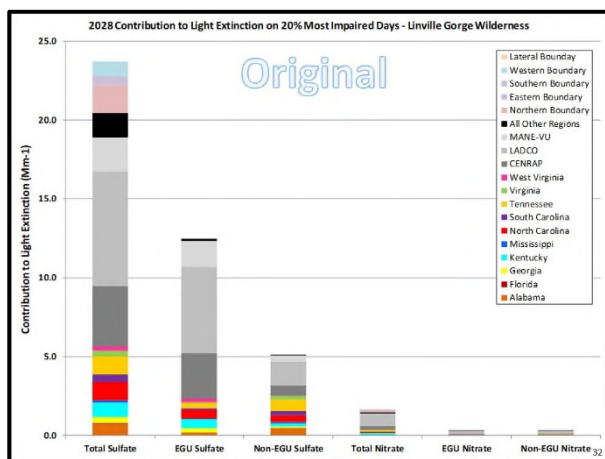
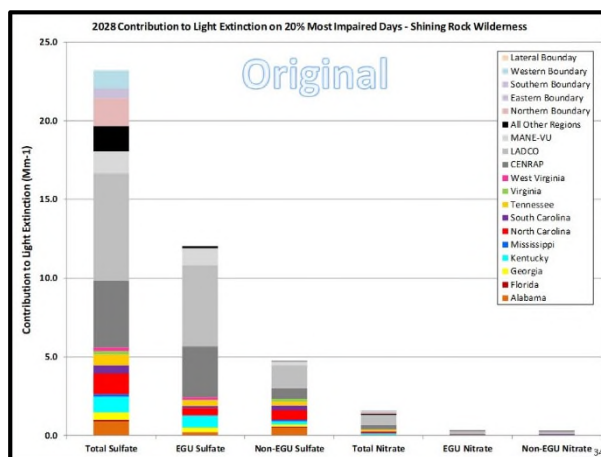
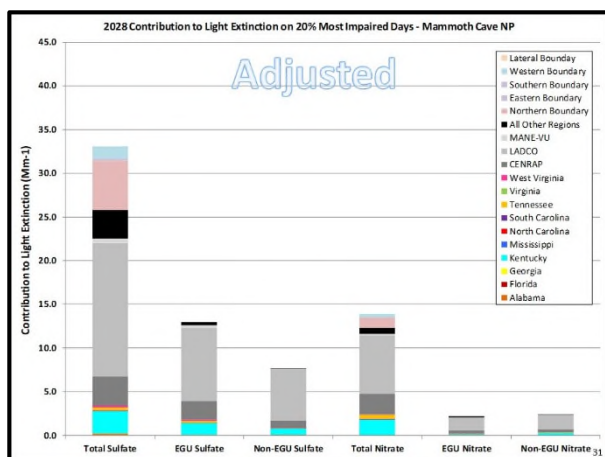
$$\text{where, NO}_x \text{ NEGU Ratio} = \frac{(\text{Revised EGU NO}_x \text{ emissions})}{(\text{Original EGU NO}_x \text{ emissions})}$$

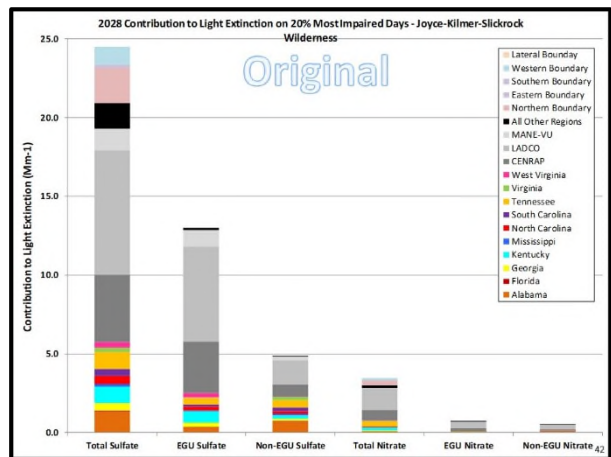
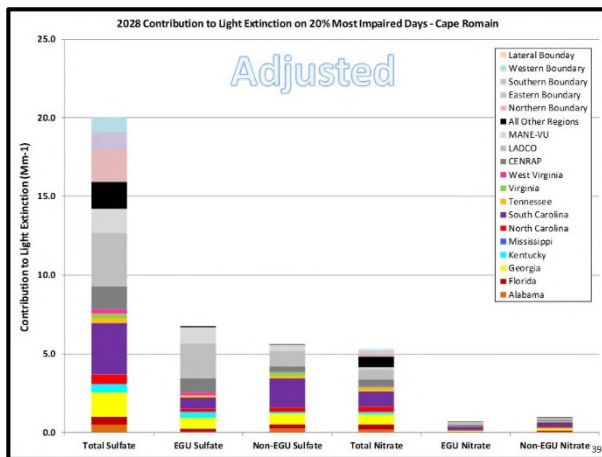
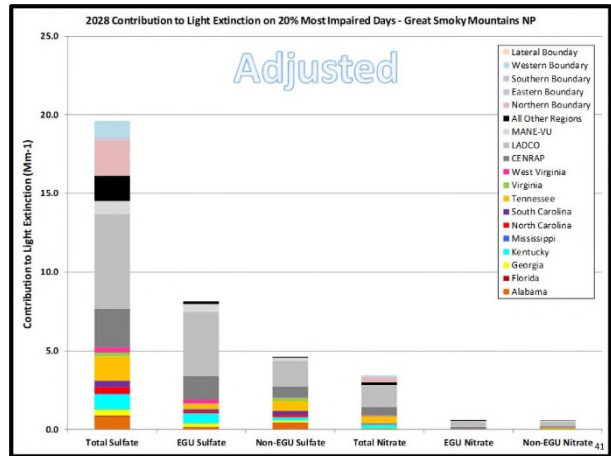
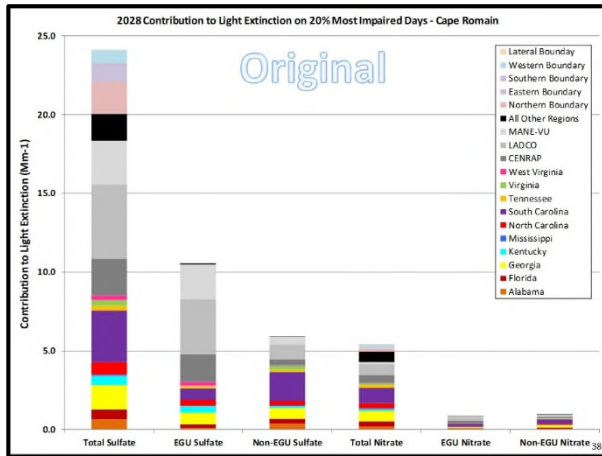
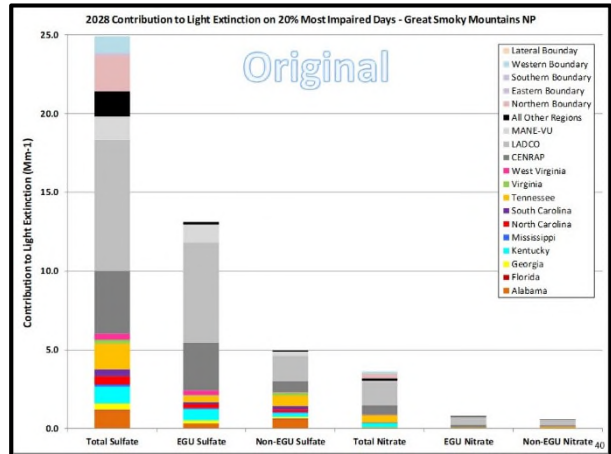
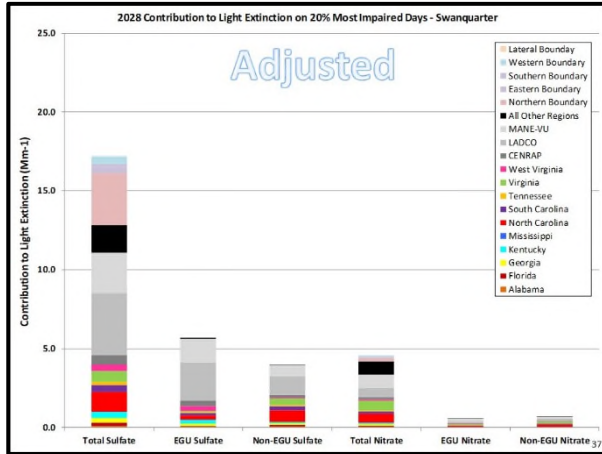
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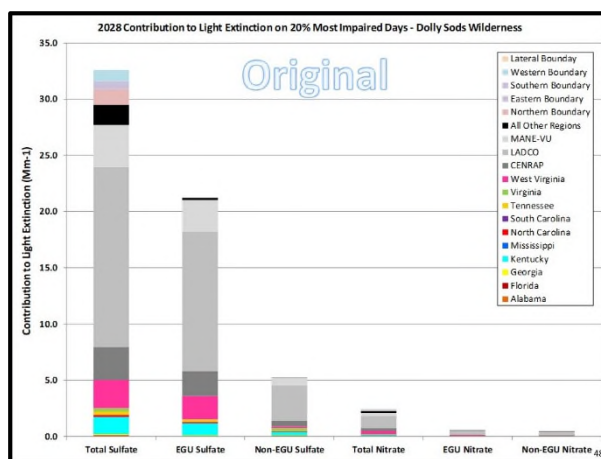
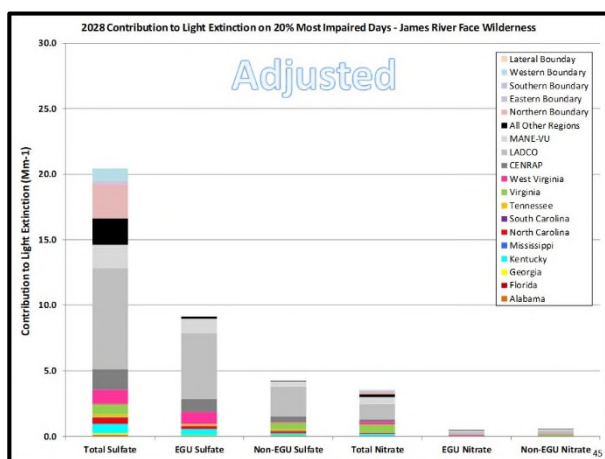
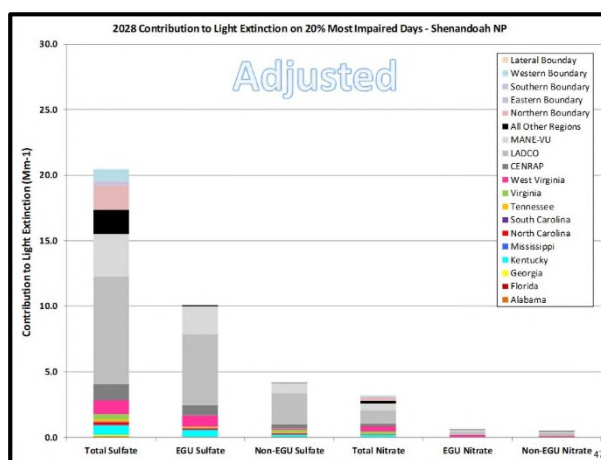
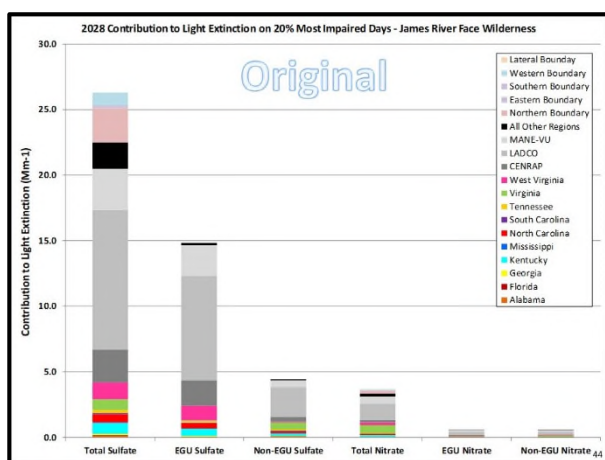
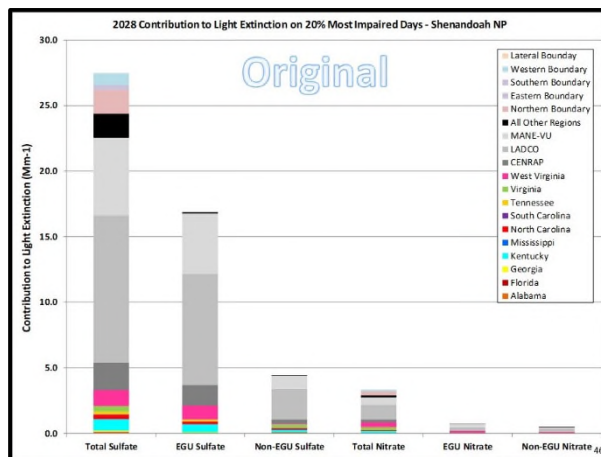
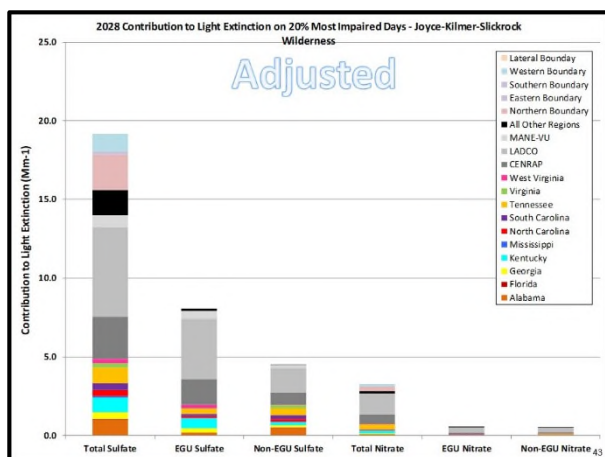


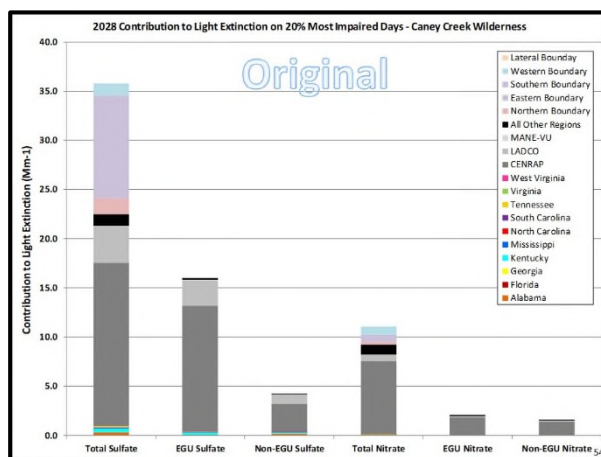
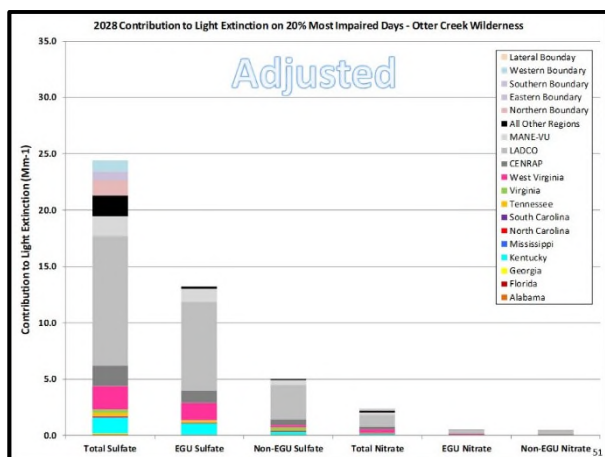
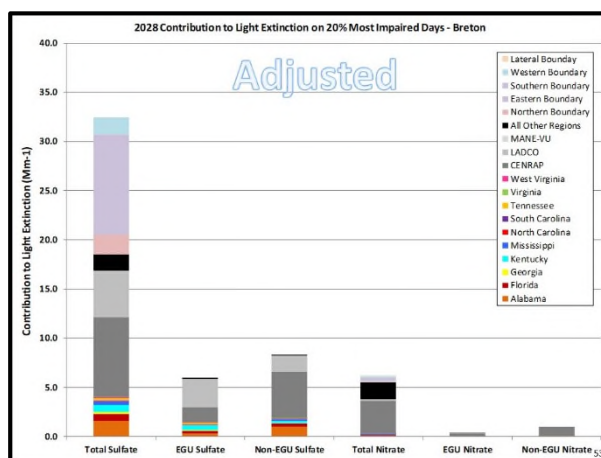
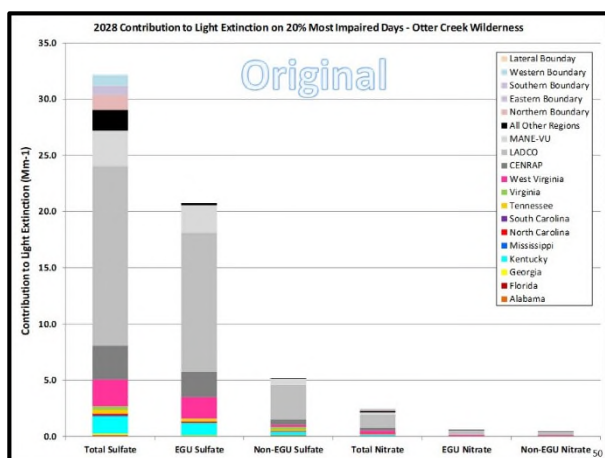
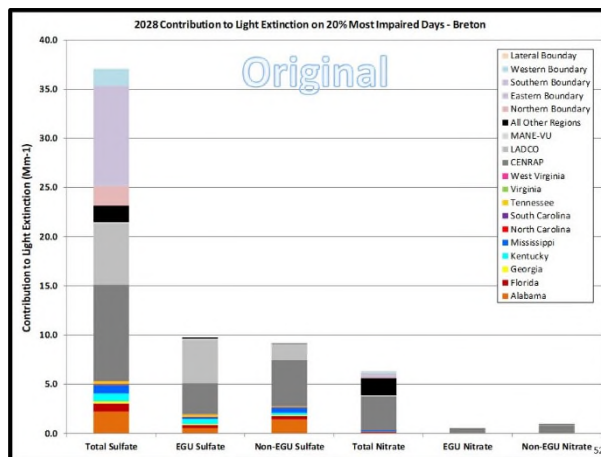
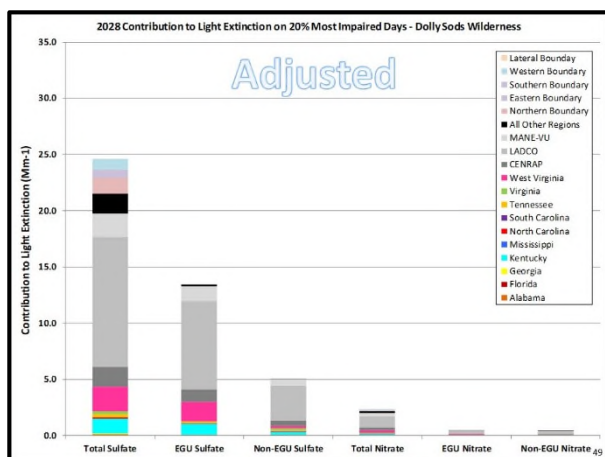


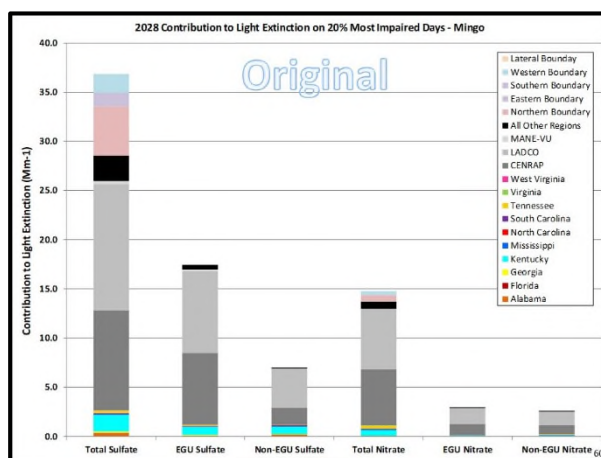
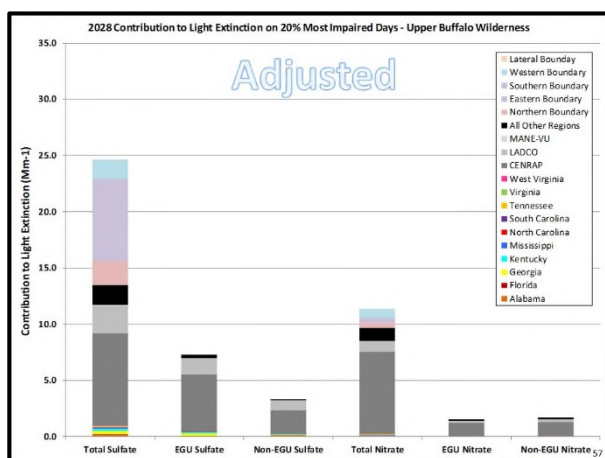
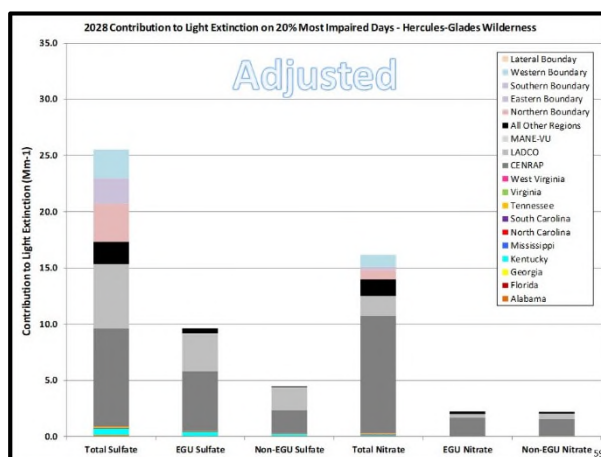
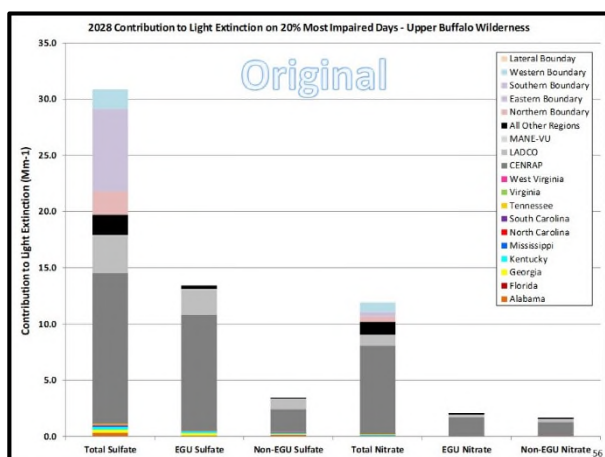
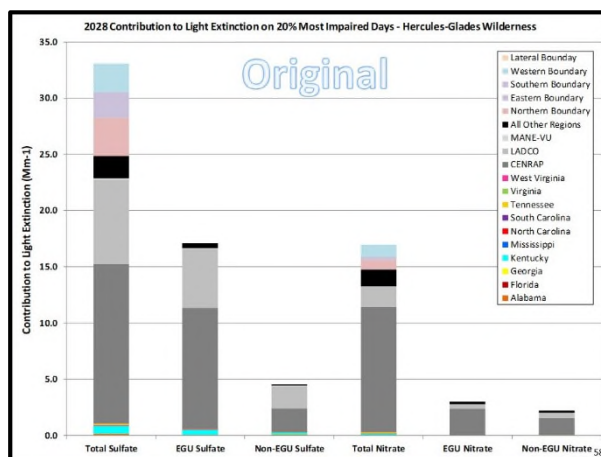
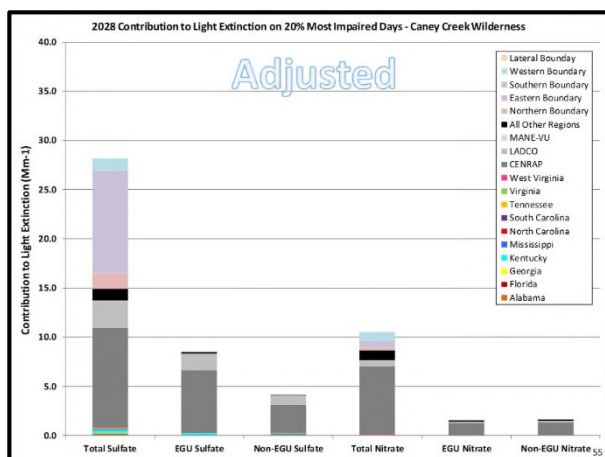


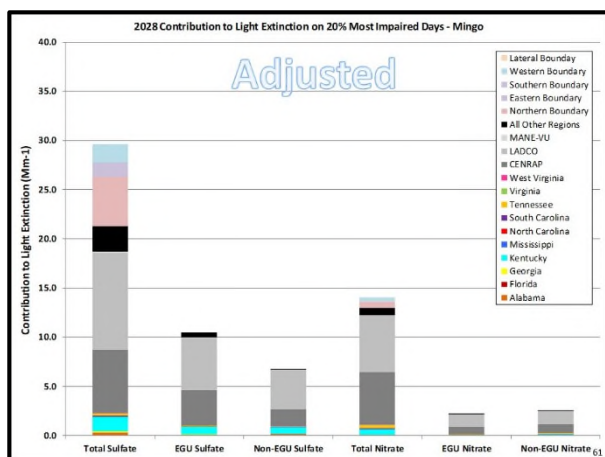






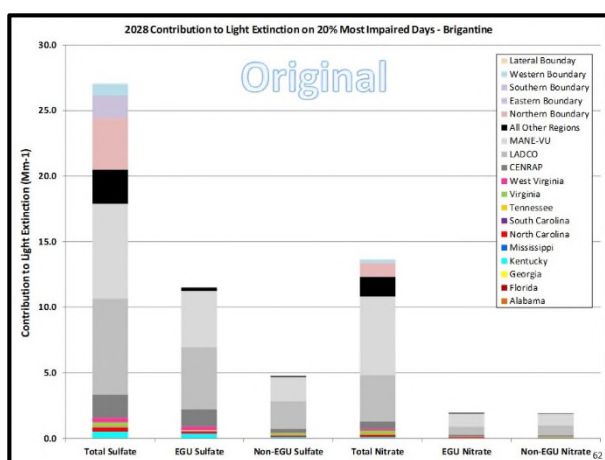






Four Factor Analysis

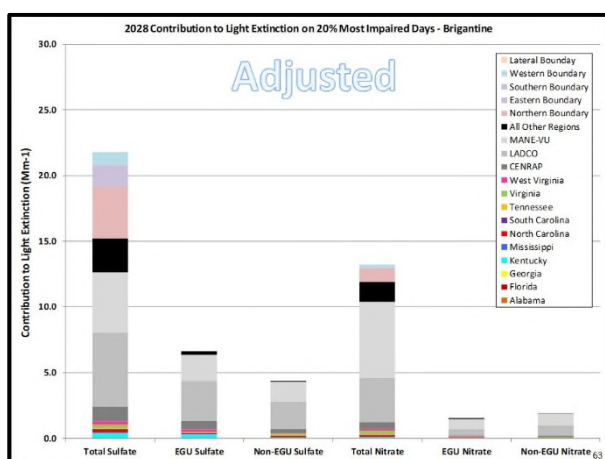
64



Four-Factor Analysis Screening Approach

1. The VISTAS four-factor analysis approach is based on an initial AOI screening ($Q/d \times EWRT$) to rank facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the nitrate and sulfate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate or facility nitrate impacts divided by the total impact of sulfate + nitrate from all point sources to determine which sources will need to be considered for a four-factor analysis.
 - If sulfate contribution $\geq 1\%$ \rightarrow SO_2 Four-Factor Analysis
 - If nitrate contribution $\geq 1\%$ \rightarrow NO_x Four-Factor Analysis

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Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
 - We are using the AOI/PSAT approach and a 1% threshold based on a Facility basis. This will pull in more facilities compared to a Unit basis.
- The CSAPR interstate transport rules use a 1% contribution threshold for determining significant contributions to nonattainment and maintenance areas.
 - The use of a 1% significance threshold would be consistent with the CSAPR approach.

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Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d)*EWRT$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the 4-factor analysis
- Georgia Example:
 - Sources in Georgia, used $\geq 2\%$ threshold
 - Sources outside Georgia, used $\geq 4\%$ threshold

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AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
GA	Brunswick Cellulose Inc.	27.9	1,554.3	294.2	0.94%	0.84%
FL	ROCK TENN CP, LLC	74.9	2,316.8	2,606.7	0.39%	0.56%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	0.73%
FL	JEA	105.1	651.8	2,094.5	0.09%	0.43%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.04%	0.65%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	112.4	2,745.0	0.01%	1.57%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	0.02%	1.71%
SC	Santee Cooper Cross Generating Station	273.0	3,273.5	4,281.2	0.09%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	897.1	0.00%	1.55%
FL	IFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	408.1	6,648.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.9	921.6	582.0	0.00%	1.06%
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.05%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	IGENON NE MGMT. CO/KEYSTONE STA	1,048.6	6,578.5	56,939.2	0.01%	0.84%

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AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,648.3	10,453.4	1.15%	19.51%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	8,806.9	30,536.3	0.13%	4.66%
GA	International Paper - Rome	87.4	1,779.4	1,791.0	0.18%	4.66%
IN	Johnson	487.1	12,780.3	23,117.2	0.10%	2.31%
IN	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	10,665.3	18,141.9	0.16%	2.18%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	0.07%	2.18%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,595.8	0.02%	1.71%
TN	TVA/CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KY	Big Rivers Electric Corp. - Wilson Station	369.0	1,151.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	7,110.0	22,133.9	0.06%	1.05%
GA	Ga Power Company - Plant Wansley	156.9	2,052.5	4,856.0	0.04%	1.03%
KY	KY Utilities Co. - Ghent Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Joppa Steam	466.9	4,706.3	20,509.3	0.02%	1.04%
GA	Mohawk Industries Inc.	32.0	66.5	77.1	0.07%	1.02%
TN	EASTMAN CHEMICAL COMPANY	259.8	6,900.3	6,420.2	0.09%	0.99%
MO	JAMAREN MISSOURI LABADIE PLANT	695.4	9,685.5	41,740.3	0.01%	0.96%
IL	Newport	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	Chemical Products Corporation	71.9	19.5	513.8	0.00%	0.89%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.76%

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Georgia Tagging for PSAT

- Sources in Georgia ($\geq 2\%$ threshold)**
 - Ga Power Company - Plant Bowen
 - International Paper - Rome (aka TEMPLE INLAND)
 - International Paper - Savannah
 - Brunswick Cellulose Inc
 - Georgia-Pacific Consumer Products LP (Savannah River Mill)
- Sources outside Georgia ($\geq 4\%$ threshold)**
 - INDIANA MICHIGAN POWER DBA AEP ROCKPORT (IN)
 - ROCK TENN CP, LLC (FL)
 - JEA (FL)

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AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	112.4	2,745.0	0.03%	14.63%
FL	ROCK TENN CP, LLC	64.8	2,316.8	2,606.7	0.88%	12.82%
FL	JEA	65.6	651.8	2,094.5	0.18%	6.60%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.55%
FL	IFF CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	0.90%	2.82%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	0.08%	2.81%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	RENESENCE LLC	59.8	66.3	560.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	0.06%	1.40%
AL	Sanders Lead Co	384.6	121.7	7,951.1	0.00%	1.11%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.01%	1.05%
GA	Ga Power Company - Plant Bowen	408.1	6,648.3	10,453.4	0.05%	1.02%
GA	Brunswick Cellulose Inc.	73.3	1,554.3	294.2	0.34%	1.01%
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	JCA Valdosta Mill	112.7	1,032.6	485.7	0.09%	0.85%
SC	Santee Cooper Cross Generating Station	348.1	3,273.5	4,281.2	0.05%	0.83%
FL	CITY OF GAINESVILLE, ORU	111.7	410.0	881.4	0.03%	0.79%
SC	KAPSTONE CHARLESTON KRAFT LLC	314.5	2,355.8	1,863.7	0.06%	0.62%
GA	Ga Power Company - Plant Wansley	403.7	2,052.5	4,856.0	0.02%	0.65%

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AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2%	Sulfate or nitrate

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PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NO_x and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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Facility Tags (KY, MS, NC, SC, TN, VA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO ₂ (TPY)	NO _x (TPY)
KY	VISTAS	21183-586111	Ingrown Electric Corp. - Wilson Station	5,034.16	1,151.75
KY	VISTAS	21091-732411	Century Aluminum of KY LLC	5,044.16	1,151.75
KY	VISTAS	21177-510671	Tennessee Valley Authority - Paradise Fossil Plant	3,011.01	3,114.52
KY	VISTAS	21145-403701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	19,104.75	7,007.34
MS	VISTAS	28059-838811	Chevron Products Company - Pascagoula Refinery	741.60	1,534.12
MS	VISTAS	28059-625101	Mississippi Power Company, Plant Victor J. Daniel	731.50	3,829.72
NC	VISTAS	37087-792011	Blue Ridge Paper Products - Canton Mill	1,127.07	2,992.37
NC	VISTAS	37117-804911	Dominar Paper Company, LLC	627.45	1,796.48
NC	VISTAS	37035-837811	Duke Energy Carolinas, LLC - Marshall Steam Station	4,139.21	7,511.31
NC	VISTAS	37013-847931	PCS Phosphate Company, Inc. - Aurora	4,845.30	495.58
NC	VISTAS	37023-851801	SGL Carbon - LLC	261.64	21.69
SC	VISTAS	45015-483811	ALUMAX OF SOUTH CAROLINA	3,751.49	108.08
SC	VISTAS	45043-569811	INTERNATIONAL PAPER GEORGETOWN MILL	2,767.52	2,031.26
SC	VISTAS	45019-497811	KAPSTONE CHARLESTON KRAFT LLC	1,863.65	2,355.82
SC	VISTAS	45019-417811	SANTIL COOPER LUMBER GENERATING STATION	4,281.17	3,273.41
SC	VISTAS	45043-665211	SANTIL COOPER WINNAP GENERATING STATION	2,348.86	1,772.53
SC	VISTAS	45015-830671	SCE&G WILLIAMS	392.48	992.73
TN	VISTAS	47093-407911	Cemex - Knoxville Plant	1,211.47	711.30
TN	VISTAS	47163-798211	EASTMAN CHEMICAL COMPANY	6,420.16	6,900.13
TN	VISTAS	47105-412921	TATE & LYLE, Loudon	477.76	883.25
TN	VISTAS	47001-619601	TVA BULL RUN FOSSIL PLANT	622.54	964.16
TN	VISTAS	47163-407911	TVA CUMBERLAND FOSSIL PLANT	8,427.23	4,916.52
TN	VISTAS	47145-497911	TVA KINGSTON FOSSIL PLANT	1,588.09	1,687.38
VA	VISTAS	51027-403481	Jewell Coke Company LP	5,090.95	520.17
VA	VISTAS	51280-578711	Meadwestvaco Packaging Resource Group	2,115.11	1,985.69
VA	VISTAS	51023-503811	Roanoke Cement Company	2,250.17	1,572.97

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PSAT SO₂ and NO_x Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- Total NO_x tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- EGU point NO_x tags for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NO_x tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 MJOs = 13 tags
- Non-EGU point NO_x for 10 individual VISTAS states + 3 MJOs = 13 tags
- SO₂ and NO_x for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NO_x tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NO_x tags for individual non-VISTAS facilities = 10 tags

→ 87 Total Facility Tags (both SO₂ and NO_x)

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Facility Tags (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO ₂ (TPY)	NO _x (TPY)
WV	VISTAS	54013-627711	ALLEGHENY ENERGY SUPPLY CO. LLC-HARRISON	10,082.34	11,830.88
WV	VISTAS	54059-896611	AMERICAN BUTTUMANS POWER GRANT TOWN PLT	2,139.25	2,285.10
WV	VISTAS	54079-678911	APPALACHIAN POWER COMPANY - JOHN F. AMOS PLANT	10,584.24	4,878.10
WV	VISTAS	54023-625701	Domination Resources, Inc. - MOUNT STORM POWER STATION	2,123.64	1,984.14
WV	VISTAS	54041-690611	EQUITRANS - COLONY RUN CO. 76	0.10	511.06
WV	VISTAS	54083-679071	FILES CREEK 6C4340	0.15	643.35
WV	VISTAS	54083-679051	GLADY 6C4350	0.11	343.29
WV	VISTAS	54059-632711	KINGSFORD MANUFACTURING COMPANY	16.56	140.88
WV	VISTAS	54061-683011	LINCOLN POWER	2,113.77	1,556.57
WV	VISTAS	54051-690231	MITCHELL PLANT	5,372.40	2,719.62
WV	VISTAS	54061-677811	MONONGAHELA POWER CO. - FORT MARTIN POWER	4,881.87	13,743.32
WV	VISTAS	54079-478211	MONONGAHELA POWER CO. PLEASANTS POWER STA	16,817.40	5,497.37
WV	VISTAS	54061-677811	MORGANTOWN ENERGY ASSOCIATES	628.64	655.58
AR	CENRAP	05063-108341	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	32,050.48	14,133.10
MO	CENRAP	29143-536311	NEW MADRID POWER PLANT-MADISON	18,781.71	4,394.10
MD	MANE-VU	24051-778311	Lux Paper Company	22,619.86	1,607.03
PA	MANE-VU	42005-386611	GENON NE MGMT CO/KEYSTONE STA	56,939.25	6,578.47
PA	MANE-VU	42083-300521	HOMER CITY GEN LP/ CENTER TWP	11,885.70	5,215.06
PA	MANE-VU	42083-300521	NIS WHOLESALE GEN/SEWARD GEN STA	8,880.28	2,254.64
IL	Midwest BPO	17127-780891	Joplin Steam	20,509.28	4,706.35
IN	Midwest BPO	18173-818311	Alcoa Warrick Power Pk Age Div of AL	5,071.28	11,158.55
IN	Midwest BPO	18031-783111	Gibson	23,117.23	12,280.34
IN	Midwest BPO	18147-801711	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	30,536.35	8,896.77
IN	Midwest BPO	18125-796241	INDIANAPOLIS POWER & LIGHT PETERSBURG	18,141.86	10,665.27
IN	Midwest BPO	18129-816611	Sigeco AB Brown South Indiana Gas & Ele	7,644.70	1,578.59
OH	Midwest BPO	39083-811711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	7,450.78	2,467.31
OH	Midwest BPO	39031-801081	Cornwall Power Plant (0616000000)	6,356.23	9,957.87
OH	Midwest BPO	39025-829431	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	22,133.90	7,149.97
OH	Midwest BPO	39053-814851	General James M. Gavin Power Plant (0627030000)	41,295.81	8,122.51
OH	Midwest BPO	39033-798311	Ohio Valley Electric Corp. - Sugar Creek Station (0627000003)	3,450.14	9,143.84

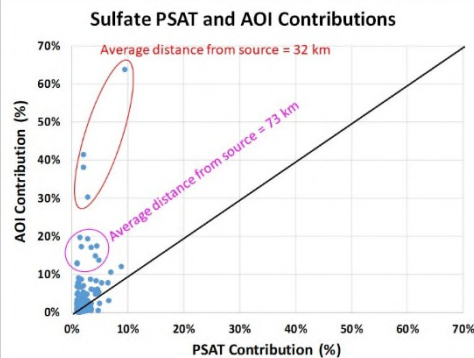
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Facility Tags (AL, FL, GA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO ₂ (TPY)	NO _x (TPY)
AL	VISTAS	01097-549811	Akzo Nobel Chemical Inc	3,151.72	20.72
AL	VISTAS	01097-105611	Ala Power - Barry	6,033.12	2,275.76
AL	VISTAS	01129-102871	American Midstream Chatham, LLC	3,106.38	425.87
AL	VISTAS	01073-101871	BIRMINGHAM COMPANY, INC	2,561.17	1,238.50
AL	VISTAS	01053-744021	Escambia Operating Company LLC	18,974.39	349.32
AL	VISTAS	01053-985111	Escambia Operating Company LLC	8,589.60	149.64
AL	VISTAS	01103-100011	Nucor Steel Decatur LLC	170.21	331.24
AL	VISTAS	01109-985711	Sanders Lead Co	7,951.06	121.72
AL	VISTAS	01097-106161	Union Oil of California - Churchula Gas Plant	2,579.15	349.23
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1,520.42	1,830.75
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC	29.51	910.36
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	5,306.41	2,489.85
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (FPL)	13.09	170.61
FL	VISTAS	12083-752711	GOV POWER - COSE	2,615.53	2,998.58
FL	VISTAS	12086-933271	HOMESTEAD CITY UTILITIES	0.00	97.09
FL	VISTAS	12031-640211	IEA	2,094.48	651.79
FL	VISTAS	12103-717711	MOSAIC FERTILIZER, LLC	7,900.67	310.42
FL	VISTAS	12057-714411	MOSAIC FERTILIZER, LLC	3,014.06	139.71
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC	4,425.56	141.62
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	561.97	2,327.10
FL	VISTAS	12089-753711	ROCK TOWN CP, LLC	2,868.72	2,316.77
FL	VISTAS	12005-533411	ROCKTOWN CP, LLC	2,550.88	1,404.89
FL	VISTAS	12129-273171	TALLAHASSEE CITY PURDOM GENERATING STA.	2.86	121.46
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	6,084.90	2,665.03
FL	VISTAS	12086-899911	TAMMAC AMERICA LLC	8.98	879.10
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	3,197.77	112.41
GA	VISTAS	13117-372101	Brunswick Cellulose Inc	294.20	1,554.51
GA	VISTAS	13015-261201	Ex Power Company, Plant Bremen	10,423.42	6,843.32
GA	VISTAS	13103-538311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1,860.18	351.52
GA	VISTAS	13051-367811	International Paper - Savannah	3,945.38	1,560.73
GA	VISTAS	13115-539311	TEMPLE INLAND	1,791.00	1,773.33

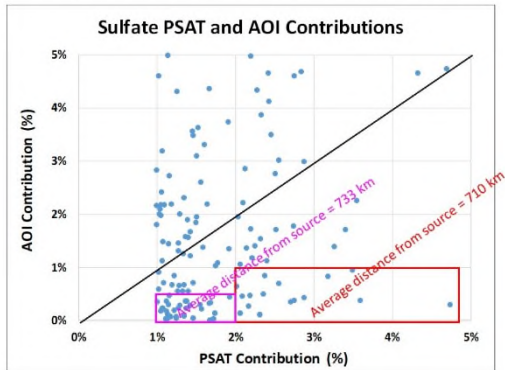
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Sulfate AOI vs. Sulfate PSAT (≥ 1%)



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Sulfate AOI vs. Sulfate PSAT ($\geq 1\%$)



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Four-Factor Analysis Screening Approach

- Due to the amount of resources already invested in the AOI and PSAT analysis, **VISTAS plans to continue with our original approach** for determining which sources will require a four-factor analysis.
- In cases where emissions decreased or increased at individual facilities being considered for a four-factor analysis, the facility contributions will be adjusted to be consistent with the lower/higher facility emissions before comparing to the PSAT contribution threshold.
- **EPA verbally stated this should be okay 2/6/2020.**

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AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area.
- AOI tends to underestimate impacts for facilities far away from the Class I area.
 - AOI uses 72-hour back trajectories, sulfate can last for weeks and travel hundreds to thousands of km.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

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Revised Facility PSAT Results

- **Revised Facility Sulfate PSAT Results**
= Original Facility Sulfate PSAT Results * SO_2 Ratio

$$\text{where, } SO_2 \text{ Ratio} = \frac{(\text{Revised facility } SO_2 \text{ emissions})}{(\text{Original facility } SO_2 \text{ emissions})}$$

- **Revised Facility Nitrate PSAT Results**
= Original Facility Sulfate PSAT Results * NO_x Ratio

$$\text{where, } NO_x \text{ Ratio} = \frac{(\text{Revised facility } NO_x \text{ emissions})}{(\text{Original facility } NO_x \text{ emissions})}$$

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Four-Factor Analysis Screening Approach

- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate impacts** from all sources at each Class I area since the SO_2 and NO_x emissions have decreased.
- However, the **individual sulfate and total nitrate impacts** from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO_2 and/or NO_x emissions.
- Therefore, the percent contribution (facility sulfate impact/total impact of all point sources of sulfate + nitrate) will increase since the denominator will decrease; however, the order of the rankings from largest impact to smallest impact should not change unless one of those facilities reduced or increased emissions.

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PSAT Adjustments (AL, FL, GA)

Facility State	Facility ID	FACILITY ID STD	FACILITY NAME STD	SO_2 Ratio	NO_x Ratio
AL	VISTAS	01092-106111	Ala Power - Barry	1.000	1.000
AL	VISTAS	01129-102671	American Midstream Chatham, LLC	0.000	0.000
AL	VISTAS	01073-101871	EPUMMORD COMPANY, INC.	1.000	1.000
AL	VISTAS	01053-144021	Escambia Operating Company LLC	0.000	1.000
AL	VISTAS	01053-985111	Escambia Operating Company LLC	0.000	0.000
AL	VISTAS	01103-100001	Nucor Steel Decatur LLC	1.000	1.000
AL	VISTAS	01109-98571	Banders Lead Co	1.000	1.000
AL	VISTAS	01097-106761	Union Oil of California - Churchill Gas Plant	0.000	0.000
FL	VISTAS	12123-72411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1.000	1.000
FL	VISTAS	12086-900111	CEMENT CONSTRUCTION MATERIALS FL, LLC	1.000	1.000
FL	VISTAS	12017-940811	Duke Energy Florida, Inc. (DEF)	0.000	0.000
FL	VISTAS	12086-900911	FLORIDA POWER & LIGHT (FPL)	1.000	1.000
FL	VISTAS	12033-752711	GULF POWER - Crest	0.000	0.000
FL	VISTAS	12086-912711	HOMESTEAD CITY UTILITIES	1.000	1.000
FL	VISTAS	12013-940211	UGA	0.000	0.000
FL	VISTAS	12105-717711	MORGAN FERTILIZER LLC	0.000	1.000
FL	VISTAS	12057-716411	MORGAN FERTILIZER, LLC	0.000	1.000
FL	VISTAS	12105-919811	MORGAN FERTILIZER, LLC	0.000	1.000
FL	VISTAS	12085-845811	RAYONIER PERFORMANCE FIBERS LLC	1.000	1.000
FL	VISTAS	12089-753711	ROCK TOWN CP, LLC	1.000	1.000
FL	VISTAS	12055-539411	ROCK TOWN CP, LLC	1.000	1.000
FL	VISTAS	12129-273711	TALLAHASSEE CITY PURDUM GENERATING STA.	1.000	1.000
FL	VISTAS	12057-539811	TAMPA ELECTRIC COMPANY (TEC)	1.000	1.000
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	1.000	1.000
FL	VISTAS	12047-789711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	0.000	0.000
GA	VISTAS	13127-372101	Brusnick Cellulose Inc	1.000	1.000
GA	VISTAS	13015-281301	Sea Power Company - Plant Bowen	1.000	1.000
GA	VISTAS	13103-539311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1.000	1.000
GA	VISTAS	13014-907811	International Paper - Savannah	1.000	1.000
GA	VISTAS	13113-339311	TEMPLE INLAND	1.000	1.000

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PSAT Adjustments (KY, MS, NC, SC, TN, VA)

Facility State	Facility ID	Facility Name	SO ₂ Ratio	NH ₃ Ratio
KY	VISTAS 21133-541611	Ingrown Energy Corp. - Ashton Station	1.000	1.000
KY	VISTAS 21093-752411	Century Aluminum of KY LLC	0.993	1.000
KY	VISTAS 21177-5196711	Tennessee Valley Authority - Paradise Fossil Plant	0.996	0.978
KY	VISTAS 21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1.000	1.000
MS	VISTAS 28059-8384111	Chescon Products Company, Passaicola Refinery	1.000	1.000
MS	VISTAS 28059-6251011	Mississippi Power Company, Plant Victor / Daniel	1.000	1.000
NC	VISTAS 37087-792011	Blue Ridge Paper Products - Canton Mill	0.939	0.976
NC	VISTAS 37117-8049111	Dowlat Paper Company, LLC	1.000	1.000
NC	VISTAS 37055-8174111	Puka Energy Services, LLC - Marshall Steam Station	0.921	0.971
NC	VISTAS 37015-8479111	PCS Phosphate Company, Inc. - Aurora	1.000	1.000
NC	VISTAS 37023-8513011	ISL Carbon LLC	1.000	1.000
SC	VISTAS 45013-4683111	ALLUMAS OF SOUTH CAROLINA	1.000	1.000
SC	VISTAS 45013-5698111	INTERNATIONAL PAPER GEORGETOWN MILL	1.000	1.000
SC	VISTAS 45013-4979111	KAPSTONE CHARLESTON KRAFT LLC	1.000	1.000
SC	VISTAS 45013-4170411	BARTER COOPER CROSS-GENERATING STATION	1.000	1.000
SC	VISTAS 45013-4602811	BARTER COOPER WYMAN GENERATING STATION	1.000	1.000
SC	VISTAS 45013-8300711	CE&G WILLIAMS	1.000	1.000
TN	VISTAS 47053-4979111	Cemex - Knoxville Plant	1.000	1.000
TN	VISTAS 47103-7982111	BAXTIAN CHEMICAL COMPANY	1.000	1.000
TN	VISTAS 47105-4129111	TATE & LYLE, Loudon	0.943	0.955
TN	VISTAS 47001-6196011	TVA BULL RUN FOSSIL PLANT	0.920	0.900
TN	VISTAS 47103-4979111	TVA CUMBERLAND FOSSIL PLANT	1.000	1.000
TN	VISTAS 47105-4979111	TVA KINGSTON FOSSIL PLANT	0.922	0.925
VA	VISTAS 51027-4034811	Jewell Coke Company LLP	1.000	1.000
VA	VISTAS 51280-578711	Meadwestvaco Packaging Resource Group	1.000	1.000
VA	VISTAS 51033-5039111	Roanoke Cement Company	1.000	1.000

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Chassahowitzka Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
FL	12057-540811	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	63.62%	9.55%	4.71%	1.95%	0.40%	0.17%	0.17%
GA	13015-2813011	Ga Power Company - Plant Bowen	637.2	0.03%	1.72%	1.72%	0.00%	0.02%	0.02%	0.02%
Facilities Who Dropped Off After REVISION										
AR	05063-1083411	ENERGY ARKANSAS INC-INDEPENDENCE PLANT	1,133.4	0.05%	1.47%	0.62%	0.00%	0.09%	0.03%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,099.6	0.09%	1.13%	0.40%	0.00%	0.04%	0.04%	0.04%
AL	02053-7440211	Escambia Operating Company LLC	380.7	0.21%	3.67%	0.23%	0.00%	0.02%	0.02%	0.02%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	106.8	4.73%	0.96%	0.96%	0.24%	0.05%	0.05%	0.05%

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PSAT Adjustments (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility ID	Facility Name	SO ₂ Ratio	NH ₃ Ratio
WV	VISTAS 54013-6271711	ALLIANT ENERGY SUPPLY CO. LLC-HARRISON	0.975	0.975
WV	VISTAS 54019-4845111	AMERICAN BITUMINOUS POWER GRANT TOWN PLE	0.975	0.975
WV	VISTAS 54079-4789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	0.937	0.937
WV	VISTAS 54023-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	0.941	0.941
WV	VISTAS 54043-6900111	EQUITRANS - COLEY RUN CS 70	1.000	1.000
WV	VISTAS 54043-6767111	FULL CREEK FCB&B	1.000	1.000
WV	VISTAS 54083-6762111	GLADY #64358	1.000	1.000
WV	VISTAS 54083-6327811	KINGSFORD MANUFACTURING COMPANY	1.000	1.000
WV	VISTAS 54091-1930111	LONGBOW POWER	0.999	0.999
WV	VISTAS 54023-4962111	MITCHELL PLANT	0.937	0.937
WV	VISTAS 54063-6773611	MONONGAHELA POWER CO. - FORT MARTIN POWER	0.920	0.920
WV	VISTAS 54079-4782111	MONONGAHELA POWER CO PLEASANTS POWER STA	0.920	0.920
WV	VISTAS 54043-6778211	MONONGAHELA POWER ASSOCIATES	0.920	0.920
AR	CENRAP 05063-1083411	ENERGY ARKANSAS INC-INDEPENDENCE PLANT	0.410	0.217
MO	CENRAP 29143-5363811	NEW MADRID POWER PLANT-MADISON	0.940	0.940
MD	MAINE-VU 33013-7108111	Lake Paper Company	0.975	1.000
PA	MAINE-VU 42005-3866211	GENON NE MGMT CO/KEYSTONE STA	0.410	0.975
PA	MAINE-VU 42063-3005211	HOMER CITY GEN PL/ CENTER TWP	0.960	0.960
PA	MAINE-VU 42063-3005111	NRG WHOLESALE GEN/NEWARD-GEN STA	0.975	0.975
IL	Midwest RPO 17127-7608011	Joppa Steam	0.975	0.975
IN	Midwest RPO 18173-8183111	Alicea Warwick Power Pnt Agc Div of AL	0.980	0.975
IN	Midwest RPO 18053-7363111	Gibson	0.960	0.975
IN	Midwest RPO 18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	0.991	0.991
IN	Midwest RPO 18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	0.911	0.920
IN	Midwest RPO 18128-8166111	Bigeco AB Brown South Indiana Gas & Ele	0.409	0.975
OH	Midwest RPO 35081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	0.995	0.995
OH	Midwest RPO 35011-8010811	Cornwall Tower Plant (0618000000)	0.995	0.995
OH	Midwest RPO 35025-8294311	Duke Energy Ohio, Wm. N. Zimmer Station (1413090154)	0.981	0.981
OH	Midwest RPO 35033-8148111	General James M. Gavin Power Plant (0627010056)	0.975	0.975
OH	Midwest RPO 35033-7983011	Ohio Valley Electric Corp., Upper Creek Station (0627000031)	0.975	0.975

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Everglades NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Sulfate PSAT %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	3.02%	2.56%	2.56%	0.08%	0.00%	0.00%	0.00%
FL	12105-515811	MOSAIC FERTILIZER, LLC	304.7	2.21%	2.09%	2.03%	0.01%	0.00%	0.00%	0.00%
FL	12105-717711	MOSAIC FERTILIZER, LLC	308.3	2.26%	3.55%	2.02%	0.02%	0.00%	0.00%	0.00%
FL	12086-899911	TARMAC AMERICA LLC	61.7	0.16%	0.17%	0.17%	2.02%	0.76%	2.04%	2.04%

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Sipsey Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	557.7	3.81%	1.61%	1.61%	0.57%	0.04%	0.04%
OH	39053-8148111	General James M. Gavin Power Plant (0627010056)	690.9	0.38%	2.75%	1.44%	0.01%	0.09%	0.09%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	5.72%	4.09%	1.44%	0.31%	0.23%	0.22%
IN	18051-7363111	Gibson	448.7	2.85%	2.12%	1.19%	0.27%	0.13%	0.13%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	464.4	1.72%	2.19%	1.14%	0.23%	0.03%	0.03%
TN	47161-4979111	TVA CUMBERLAND FOSSIL PLANT	228.9	3.18%	1.07%	2.07%	0.48%	0.12%	0.12%
Facilities Who Dropped Off After REVISION									
MO	29143-5363811	NEW MADRID POWER PLANT-MADISON	314.5	3.48%	1.46%	0.97%	0.20%	0.06%	0.05%
IL	17127-7608011	Joppa Steam	346.5	2.94%	2.51%	0.59%	0.25%	0.03%	0.01%
IN	18173-8183111	ALCOA - WARRICK POWER PLT AGC DIV OF AL	396.3	0.91%	1.02%	0.29%	0.62%	0.52%	0.14%
Additional sources (if use Sulfate + Nitrate > 1%)									
MO	29143-5363811	NEW MADRID POWER PLANT-MADISON	314.5	3.48%	1.46%	0.97%	0.20%	0.06%	0.05%

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St Marks Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
GA	13015-2813011	Ga Power Company - Plant Bowen	452.9	0.38%	3.59%	3.59%	0.01%	0.03%	0.03%
FL	12005-5154111	ROCKTECH CP LLC	140.8	8.54%	3.38%	3.38%	0.24%	0.09%	0.09%
Facilities Who Dropped Off After REVISION									
AL	01097-1058111	Ala Power - Barry	383.3	1.67%	1.43%	0.71%	0.03%	0.00%	0.00%
AL	02053-7440211	Escambia Operating Company LLC	325.6	5.95%	3.53%	0.70%	0.01%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	908.4	0.33%	1.67%	0.50%	0.00%	0.01%	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,251.0	0.29%	1.29%	0.48%	0.01%	0.00%	0.00%
AL	02053-985111	Escambia Operating Company LLC	315.0	0.00%	1.68%	0.02%	0.00%	0.00%	0.00%

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Cohutta Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	512.0	1.71%	3.41%	1.79%	0.02%	0.05%	0.05%
GA	13015-2813011	Ge Power Company - Plant Bowen	78.0	19.58%	1.56%	1.56%	1.15%	0.03%	0.03%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	2.18%	1.05%	1.03%	0.07%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	4.68%	2.84%	1.00%	0.13%	0.03%	0.03%
Facilities Who Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	1.05%	2.06%	0.96%	0.06%	0.03%	0.03%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	801.1	0.14%	2.06%	0.76%	0.00%	0.01%	0.01%
IN	18051-7363111	Gibson	487.1	2.11%	1.35%	0.76%	0.10%	0.02%	0.01%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	2.18%	1.19%	0.62%	0.16%	0.03%	0.02%
TN	47145-4579111	TVA KINGSTON FOSSIL PLANT	124.0	2.17%	1.10%	0.25%	0.13%	0.06%	0.01%

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Mammoth Cave NP

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	16.88%	5.97%	1.26%	1.60%	0.26%	0.29%
IN	18051-7363111	Gibson	198.2	5.21%	2.16%	1.22%	1.20%	0.35%	0.25%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	89.9	6.22%	1.07%	1.07%	0.37%	0.06%	0.06%
Facilities Who Dropped Off After REVISION									
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	312.7	0.66%	1.29%	0.86%	0.04%	0.07%	0.07%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	182.9	3.09%	1.50%	0.78%	0.96%	0.40%	0.20%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	256.1	1.21%	1.43%	0.67%	0.14%	0.11%	0.09%
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	406.5	1.45%	1.15%	0.60%	0.04%	0.02%	0.02%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	498.6	0.30%	1.15%	0.49%	0.04%	0.05%	0.02%
IN	18179-8183111	ALCOA WARRICK POWER PLANT DIV OF AL	136.1	2.00%	1.03%	0.30%	1.74%	0.82%	0.22%
IN	18129-8165111	Bigco AB Brown South Indiana Gas & Ele	162.9	2.73%	1.16%	0.00%	0.27%	0.06%	0.00%
Additional sources (f use Sulfate + Nitrate ≥ 1%)									
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	1.60%	0.96%	0.64%	0.15%	0.14%	0.14%

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Okefenokee Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
FL	12047-7697111	WHITE SPRINGS AGRICULTURAL CHEMICALS INC	71.5	14.63%	4.32%	2.10%	0.03%	0.01%	0.01%
GA	13015-2813011	Ge Power Company - Plant Bowen	458.1	1.02%	1.74%	0.74%	0.05%	0.04%	0.04%
FL	12123-7524111	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	2.18%	1.64%	1.64%	0.14%	0.11%	0.11%
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.46%	2.19%	1.15%	0.01%	0.01%	0.01%
FL	12089-7537111	ROCK TETIN CP LLC	64.8	12.92%	1.00%	1.00%	0.88%	0.11%	0.11%
Facilities Who Dropped Off After REVISION									
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,129.0	0.46%	2.09%	0.77%	0.01%	0.01%	0.01%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	921.9	0.09%	1.34%	0.63%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	915.7	0.55%	1.40%	0.49%	0.01%	0.02%	0.02%

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Linville Gorge Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
TN	47145-4579111	EASTMAN CHEMICAL COMPANY	81.9	19.21%	2.87%	2.87%	0.68%	0.07%	0.07%
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	329.2	5.90%	4.67%	2.45%	0.04%	0.01%	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	567.5	0.94%	3.49%	1.29%	0.00%	0.00%	0.00%
Facilities Who Dropped Off After REVISION									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	1.18%	2.22%	0.78%	0.01%	0.07%	0.06%
IN	18051-7363111	Gibson	582.3	0.67%	1.35%	0.76%	0.01%	0.07%	0.05%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	688.6	0.03%	1.11%	0.74%	0.00%	0.00%	0.00%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	856.4	0.29%	1.43%	0.61%	0.00%	0.01%	0.00%
MO	24001-7763811	Luke Paper Company	463.8	0.23%	1.37%	0.60%	0.00%	0.00%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	550.5	0.36%	1.12%	0.58%	0.01%	0.07%	0.04%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	380.3	2.82%	1.00%	0.47%	0.03%	0.02%	0.02%

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Wolf Island Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
FL	12089-7537111	ROCK TETIN CP LLC	74.9	8.56%	1.79%	1.79%	0.39%	0.11%	0.11%
GA	13015-2813011	Ge Power Company - Plant Bowen	458.1	1.08%	1.78%	1.78%	0.03%	0.04%	0.04%
GA	13127-3721011	Brunswick Cellulose Inc	27.9	8.84%	1.34%	1.34%	2.94%	0.10%	0.10%
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	845.3	1.71%	2.51%	1.32%	0.02%	0.02%	0.02%
GA	13051-9679811	International Paper - Savannah	85.9	7.53%	1.18%	1.18%	0.24%	0.07%	0.07%
Facilities Who Dropped Off After REVISION									
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,048.6	0.84%	2.37%	0.88%	0.01%	0.01%	0.01%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	876.1	0.07%	1.25%	0.58%	0.00%	0.02%	0.01%
FL	12047-7697111	WHITE SPRINGS AGRICULTURAL CHEMICALS INC	173.6	1.97%	1.05%	0.51%	0.01%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	899.0	0.37%	1.38%	0.49%	0.00%	0.02%	0.02%
Additional sources (f use Sulfate + Nitrate ≥ 1%)									
SC	45015-4120411	Santee Cooper Cross Generating Station	251.0	1.39%	0.95%	0.95%	0.09%	0.06%	0.06%
FL	12031-6402111	JEK	105.1	4.43%	0.96%	0.99%	0.09%	0.03%	0.03%

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Shining Rock Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39058-8148511	General James M. Gavin Power Plant (0627010056)	397.8	1.89%	5.26%	1.71%	0.01%	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	573.4	0.47%	1.16%	1.16%	0.01%	0.02%	0.02%
Facilities Who Dropped Off After REVISION									
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	625.2	0.36%	1.37%	0.91%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	473.3	0.70%	2.55%	0.90%	0.01%	0.07%	0.07%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	657.6	0.49%	2.36%	0.87%	0.00%	0.00%	0.00%
IN	18051-7363111	Gibson	554.2	0.29%	1.55%	0.87%	0.01%	0.07%	0.05%
NC	17087-7920511	Blue Ridge Paper Products - Canton Mill	16.9	41.29%	2.14%	0.77%	6.63%	0.07%	0.07%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	1.37%	1.59%	0.74%	0.03%	0.01%	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.1	0.13%	1.74%	0.74%	0.00%	0.01%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	529.0	0.18%	1.12%	0.58%	0.01%	0.11%	0.05%
IL	17127-7808911	Joppa Steam	582.4	0.23%	1.07%	0.42%	0.00%	0.01%	0.00%

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Swanquarter Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	640.2	3.00%	6.66%	2.46%	0.08%	0.08%	0.06%
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	52.5	37.89%	2.16%	2.16%	0.57%	0.09%	0.03%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	651.5	1.77%	2.74%	1.44%	0.06%	0.03%	0.03%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.35%	1.00%	1.33%	0.02%	0.03%	0.04%
MD	24001-7768811	Luke Paper Company	512.5	0.43%	2.88%	1.25%	0.02%	0.09%	0.05%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	568.6	0.67%	1.19%	1.22%	0.08%	0.10%	0.08%
Facilities Who Dropped Off After REVISION									
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	620.1	0.55%	1.27%	0.99%	0.05%	0.05%	0.05%
WV	54073-4782811	MOHONGAHELA POWER CO-PLEASANTS POWER STA	625.7	0.84%	1.22%	0.84%	0.07%	0.03%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,005.3	0.34%	1.69%	0.60%	0.02%	0.03%	0.03%
Additional sources if use Sulfate + Nitrate ≥ 1%									
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	620.1	0.55%	1.27%	0.99%	0.05%	0.05%	0.05%

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Joyce Kilmer-Slickrock Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	425.1	4.73%	4.89%	2.46%	0.09%	0.01%	0.01%
Facilities Who Dropped Off After REVISION									
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	711.0	0.27%	2.17%	0.80%	0.00%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	4.33%	2.27%	0.80%	0.14%	0.16%	0.16%
IN	18051-7363111	Gibson	471.7	2.00%	1.29%	0.73%	0.11%	0.21%	0.15%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	3.63%	1.53%	0.71%	0.00%	0.01%	0.01%
AR	05063-1083411	ENERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	1.58%	1.36%	0.58%	0.05%	0.02%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	453.0	2.16%	1.00%	0.52%	0.14%	0.23%	0.12%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	73.7	7.66%	1.24%	0.38%	0.57%	0.10%	0.03%
Additional sources if use Sulfate + Nitrate ≥ 1%									
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.84%	0.99%	0.99%	0.05%	0.07%	0.07%

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Cape Romain Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
SC	45015-4873611	KEPSTONE CHARLESTON WRAFT LLC	29.9	30.18%	2.80%	2.80%	2.74%	0.23%	0.25%
GA	13015-3813611	Ga Power Company - Plant Seven	506.2	0.36%	2.71%	2.71%	0.03%	0.10%	0.10%
SC	45015-4894511	ALUMAX OF SOUTH CAROLINA	39.1	17.07%	1.75%	1.75%	0.03%	0.02%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	857.1	0.30%	4.74%	1.75%	0.00%	0.01%	0.01%
SC	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	69.8	6.57%	1.78%	1.78%	0.45%	0.21%	0.21%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	701.0	0.84%	3.18%	1.67%	0.00%	0.03%	0.03%
SC	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	4.31%	1.26%	1.26%	0.35%	0.11%	0.11%
SC	45043-6652811	SANTEE COOPER WINYAH GENERATING	51.4	4.60%	1.02%	1.02%	0.38%	0.13%	0.13%
Facilities Who Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.11%	1.4%	0.53%	0.00%	0.04%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	868.3	0.06%	1.18%	0.42%	0.00%	0.07%	0.06%
Additional sources if use Sulfate + Nitrate ≥ 1%									
GA	13051-3679811	International Paper - Savannah	166.1	1.76%	0.95%	0.95%	0.04%	0.05%	0.05%

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James River Face Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	7.66%	5.44%	2.86%	0.14%	0.08%	0.08%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	2.76%	2.51%	2.38%	0.36%	0.12%	0.10%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	1.35%	1.92%	2.35%	0.04%	0.02%	0.04%
WV	54073-4782811	MOHONGAHELA POWER CO-PLEASANTS POWER STA	248.0	3.87%	2.33%	1.59%	0.15%	0.03%	0.04%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E JAMOS PLANT	223.5	3.50%	2.46%	1.36%	0.13%	0.05%	0.08%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	337.1	2.98%	2.88%	1.07%	0.06%	0.03%	0.03%
VA	51580-5798711	Meadwestvaco Packaging Resource Group	46.5	12.64%	1.02%	1.02%	1.14%	0.15%	0.15%
Facilities Who Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	435.2	1.89%	1.39%	0.65%	0.05%	0.05%	0.04%
IN	18051-7363111	Gibson	729.4	0.59%	1.02%	0.58%	0.02%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	663.5	0.56%	1.33%	0.47%	0.03%	0.01%	0.01%

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Great Smoky Mountains NP

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	2.25%	5.10%	2.62%	0.04%	0.02%	0.02%
Facilities Who Dropped Off After REVISION									
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	688.2	0.12%	2.31%	0.86%	0.00%	0.02%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	0.85%	0.21%	0.19%	0.18%
IN	18051-7363111	Gibson	456.3	1.25%	1.34%	0.75%	0.07%	0.27%	0.19%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	1.84%	1.50%	0.70%	0.09%	0.02%	0.01%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	435.6	1.48%	1.08%	0.56%	0.12%	0.29%	0.14%
AR	05063-1083411	ENERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.19%	1.22%	0.52%	0.02%	0.01%	0.00%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	69.0	7.38%	1.23%	0.38%	0.71%	0.08%	0.02%
Additional sources if use Sulfate + Nitrate ≥ 1%									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	0.85%	0.21%	0.19%	0.18%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	1.34%	0.94%	0.94%	0.02%	0.06%	0.06%

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Shenandoah NP

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	249.8	11.81%	1.89%	1.20%	0.10%	0.05%	0.04%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	1.53%	2.32%	3.08%	0.06%	0.05%	0.08%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	180.7	4.60%	2.75%	2.84%	0.99%	0.17%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	5.25%	4.88%	2.56%	0.14%	0.10%	0.10%
WV	54073-4782811	MOHONGAHELA POWER CO-PLEASANTS POWER STA	265.0	4.97%	2.20%	1.50%	0.34%	0.18%	0.19%
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	210.4	2.60%	1.56%	1.27%	0.13%	0.04%	0.04%
Facilities Who Dropped Off After REVISION									
MD	24001-7768811	Luke Paper Company	118.4	8.90%	2.20%	0.98%	0.21%	0.09%	0.09%
PA	42061-3005111	WING WHOLESALE GEN/SEWARD GEN STA	215.5	1.80%	1.00%	0.78%	0.04%	0.02%	0.01%
WV	54061-6779611	MOHONGAHELA POWER CO - FORT MARTIN POWER	184.4	2.41%	1.06%	0.60%	1.27%	0.47%	0.41%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	505.4	1.31%	1.28%	0.60%	0.11%	0.05%	0.04%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E JAMOS PLANT	295.6	2.09%	2.04%	0.52%	0.09%	0.08%	0.23%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	750.8	0.71%	2.40%	0.32%	0.80%	0.02%	0.02%
Additional sources if use Sulfate + Nitrate ≥ 1%									
MD	24001-7768811	Luke Paper Company	118.4	8.90%	2.20%	0.98%	0.21%	0.09%	0.09%
WV	54061-6779611	MOHONGAHELA POWER CO - FORT MARTIN POWER	184.4	2.41%	1.06%	0.60%	1.27%	0.47%	0.41%

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Dolly Sods Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	89.6	13.98%	4.94%	5.07%	1.36%	0.26%	0.22%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	233.8	7.62%	6.56%	3.45%	0.10%	0.03%	0.03%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	4.64%	4.32%	2.96%	0.16%	0.07%	0.07%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	1.36%	2.14%	2.84%	0.08%	0.01%	0.02%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	1.40%	2.25%	1.05%	0.02%	0.04%	0.04%
WV	54051-6902311	MITCHELL PLANT	144.2	1.45%	1.28%	1.01%	0.07%	0.02%	0.03%
Facilities Who Dropped Off After Revision									
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	172.8	4.12%	2.43%	0.90%	0.01%	0.00%	0.00%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	219.9	3.56%	1.85%	0.81%	0.11%	0.01%	0.02%
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	79.8	6.53%	1.77%	0.79%	1.07%	0.18%	0.16%
IN	18051-7363111	Gibson	729.5	0.04%	0.24%	0.70%	0.02%	0.04%	0.03%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	676.3	0.44%	1.93%	0.68%	0.01%	0.00%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	682.6	0.18%	1.05%	0.54%	0.02%	0.04%	0.02%
OH	39031-8010811	Conesville Power Plant (0616000000)	242.3	0.71%	1.05%	0.00%	0.12%	0.08%	0.00%

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VISTAS Facilities ≥ 1%

Facility State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
FL	12123-752411	BUCKEYE FLORIDA LIMITED PARTNERSHIP	OKEF
FL	12017-640611	DUKE ENERGY FLORIDA, INC. (DEP)	CHAS
FL	12105-717711	MODAC FERTILIZER LLC	EVER
FL	12105-919811	MODAC FERTILIZER, LLC	EVER
FL	12089-753711	ROCK TERN CO LLC	OKEF, WOLF
FL	12005-535411	ROCKTENN CP LLC	SAMA
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	EVER
FL	12086-899911	TARMAC AMERICA LLC	EVER
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	OKEF
GA	13127-3721011	Brunswick Cellulose Inc.	WOLF
GA	13015-2813011	Ga Power Company - Plant Bowen	CHAS, COHU, OKEF, ROMA, SAMA, WOLF
GA	13051-3679811	International Paper - Savannah	WOLF
KY	21181-5551611	Big Rivers Electric Corp - Wilson Station	MACA
KY	21145-6017011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	COHEL, HEG, MING, SHRO, SIPS
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	SWAN
SC	45015-4834911	ALUMAX OF SOUTH CAROLINA	ROMA
SC	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	ROMA
SC	45019-4971611	KAPSTONE CHARLESTON KRAFT LLC	ROMA
SC	45015-4120411	Santee Cooper Cross Generating Station	ROMA
SC	45043-6652811	Santee Cooper Winwah Generating Station	ROMA
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	LIGO
TN	47164-4979211	TVA CUMBERLAND FOSSIL PLANT	SIPS
VA	51346-6789111	Meadowbush Packaging Resource Group	JARI
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	DOSO, JARI, OTCR, SHEN, SWAN
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	JARI
WV	54051-6902311	MITCHELL PLANT	DOSO, OTCR
WV	54073-4781811	MONONGAHELA POWER CO-PLEASANTS POWER STA	DOSO, JARI, OTCR, SHEN

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Otter Creek Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	Revised Nitrate PSAT %
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	72.8	17.37%	4.49%	4.61%	1.83%	0.26%	0.22%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	10.46%	7.08%	3.72%	0.18%	0.04%	0.04%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	8.19%	4.93%	3.00%	0.30%	0.08%	0.09%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	1.94%	2.03%	2.70%	0.05%	0.02%	0.03%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	1.12%	2.40%	1.12%	0.02%	0.06%	0.05%
WV	54051-6902311	MITCHELL PLANT	136.8	1.56%	1.40%	1.10%	0.06%	0.03%	0.04%
Facilities Who Dropped Off After Revision									
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	4.36%	1.67%	0.93%	0.12%	0.02%	0.03%
IN	18051-7363111	Gibson	709.7	0.24%	1.27%	0.72%	0.01%	0.05%	0.03%
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	82.7	4.98%	1.14%	0.71%	0.92%	0.20%	0.17%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	656.7	0.64%	2.01%	0.71%	0.01%	0.03%	0.03%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	186.5	3.73%	1.91%	0.71%	0.03%	0.00%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	681.0	0.23%	1.07%	0.56%	0.01%	0.04%	0.02%
OH	39031-8010811	Conesville Power Plant (0616000000)	232.8	1.12%	1.07%	0.00%	0.17%	0.08%	0.00%

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Non-VISTAS Facilities ≥ 1%

Facility State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
IN	18051-7363111	Gibson	MACA, SIPS
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	COHU, MACA, SIPS
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	SIPS
MD	24001-7761811	Luke Paper Company	SWAN
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	DOSO, JARI, OTCR, SHEN, SWAN
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	DOSO, OTCR
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	COHU, DOSO, GRSM, JARI, KSR, LIGO, OKEF, OTCR, ROMA, SHEN, SHRO, SIPS, SWAN, WOLF
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	JARI, LIGO, ROMA, SHEN, SWAN
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	SHEN

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Non-VISTAS Class I Areas

- Only one VISTAS facility has a contribution ≥ 1% at any non-VISTAS Class I Area
- Tennessee Valley Authority (TVA) - Shawnee Fossil Plant**
 - Hercules-Glades Wilderness Area (1.35% sulfate)
 - Mingo Wilderness Area (1.08% sulfate)

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Effective Emission Control Technology

- For the purpose of SO₂ control measures, an EGU that has add-on flue gas desulfurization (FGD) and that meets the applicable alternative SO₂ emission limit of the 2012 Mercury Air Toxics Standards (MATS) rule for power plants. The two limits in the rule (0.2 lb/MMBtu for coal-fired EGUs or 0.3 lb/MMBtu for EGUs fired with oil-derived solid fuel) are low enough that it is unlikely that an analysis of control measures for a source already equipped with a scrubber and meeting one of these limits would conclude that even more stringent control of SO₂ is necessary to make reasonable progress.
- For the purposes of SO₂ and NO_x control measures, a combustion source (e.g., an EGU or industrial boiler or process heater) that, during the first implementation period, installed a FGD system that operates year-round with an effectiveness of at least 90 percent or by the installation of a selective catalytic reduction system that operates year-round with an overall effectiveness of at least 90 percent (in both cases calculating the effectiveness as the total for the system, including any bypassed flue gas), on a pollutant-specific basis.

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Additional Considerations

- The final list of four-factor analysis sources will be determined in consultation with the FLMS, EPA, other states, and stakeholders.
- Some states may perform additional four-factor analyses for sources not listed on Slide 106.
- Some states may allow their facilities to take a permit limit that will result in adjusted PSAT impacts below the 1% threshold in lieu of performing a four-factor analysis.
- The large number of coal-fired EGU retirements and fuel switching from coal to natural gas needs to be considered along with the sources selected for the four-factor analysis. States should not be penalized for early action.

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Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
- For general, contract, and funding questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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Next Steps and Schedule

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Remaining VISTAS Work Schedule

Task	Schedule
2028 Point Emissions Updates	Completed
2028 Emissions Processing	Late April, 2020
2028 CAMx Modeling	Late June, 2020
2028 Visibility Projections	Mid-July, 2020
2028 Deposition Projections	Mid-July, 2020
Final reports and documentation	Late July, 2020
Website updates and postings	Late July, 2020
End of Contract	September 30, 2020
Regional Haze SIPs Due to EPA	July 31, 2021

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west virginia department of environmental protection

Appendix F-3i

VISTAS Presentation to MJOs April 21, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS Regional Haze Project Update



Regional Planning Organization Briefing
April 21, 2020

Initial VISTAS Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's Initial 2028 projection year emissions
 - EGU and major non-EGU sources
 - Removed Clean Power Plan assumptions
 - VISTAS – Adjusted for changes in fuels and facility operating plans
 - Non-VISTAS – Used ERTAC 2.7opt



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Outline

- Background Information
- 2028 Emissions Updates
- Revised 2028 PSAT Stacked Bar Charts
- Four Factor Analysis
- Next Steps & Schedule



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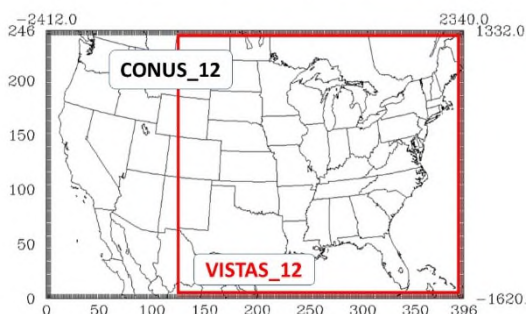
VISTAS vs. EPA Updated 2028 Emission Projections

- The table below compares the 2028 point emissions used by VISTAS vs. the latest 2028fh emissions used by EPA (projected from 2016). The emissions below are extracted from the VISTAS 12 modeling domain which covers the Eastern U.S.

Pollutant	VISTAS 2028 (tpy)	New EPA 2028 (tpy)	Change (tpy)	Change (%)
NOx	2,641,463.83	2,108,115.50	533,348.33	20.19%
SO2	2,574,542.02	1,400,287.10	1,174,254.92	45.61%

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VISTAS Modeling Domains



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Old ERTAC (2.7opt) vs. New ERTAC (16.0)

SO2	16.0_2028	2.7opt_2028	Δ SO2	Δ SO2
CENSARA	367,683.7	760,828.2	-393,144.5	-51.67%
LADCO	266,047.0	379,577.5	-113,530.5	-29.91%
MANE-VU	78,657.0	196,672.6	-118,015.6	-60.01%
VISTAS	161,502.5	273,582.1	-112,079.6	-40.97%
TOTAL	976,471.2	1,783,376.5	-806,905.3	-45.25%

NOx	16.0_2028	2.7opt_2028	Δ NOx	Δ NOx
CENSARA	244,499.3	354,795.1	-110,295.8	-31.09%
LADCO	166,429.4	198,966.9	-32,537.4	-16.35%
MANE-VU	56,315.3	83,432.5	-27,117.2	-32.50%
VISTAS	200,791.1	270,615.7	-69,824.6	-25.80%
TOTAL	840,973.6	1,166,663.1	-325,689.5	-27.92%

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VISTAS CC/TAWG Conclusions

1. 2028 emission updates are necessary

- **VISTAS States** – States will:
 - Update 2028 major source emissions projections (SO₂, NO_x, PM_{2.5}, PM₁₀, NH₃, CO) at the facility and unit level
 - Add any new sources of significance
- **LADCO States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.1 based on LADCO input
- **All Other States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.0
 - Verify accuracy of large SO₂ and NO_x source emissions projections via contact with surrounding states/RPOs and update emissions as needed

2. Additional 2028 air quality modeling is needed

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2028 SO₂ Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	87,111.28	59,056.98	-32.2%	15,480.96	8,365.96	-46.0%	71,630.32	50,691.02	-29.2%
FL	63,501.23	52,982.68	-16.6%	28,547.41	24,004.67	-15.9%	34,953.82	28,978.01	-17.1%
GA	37,065.83	36,166.09	-2.4%	18,473.28	17,573.54	-4.9%	18,592.55	18,592.55	0.0%
KY	75,140.26	65,636.83	-12.6%	56,262.06	49,585.95	-11.9%	18,878.20	16,050.88	-15.0%
MS	21,234.31	8,405.06	-60.4%	6,964.27	3,236.28	-53.7%	14,269.74	5,168.78	-63.7%
NC	35,232.88	24,347.18	-30.9%	19,734.80	9,571.47	-51.5%	15,498.08	14,775.71	-4.7%
SC	29,600.85	29,601.25	0.0%	10,693.79	10,695.34	0.0%	18,907.05	18,905.91	0.0%
TN	23,447.58	21,057.17	-10.2%	12,114.30	10,030.04	-17.2%	11,333.28	11,027.13	-2.7%
VA	19,839.18	18,551.32	-6.5%	3,264.09	1,976.23	-39.5%	16,575.09	16,575.09	0.0%
WV	63,404.07	53,715.79	-15.3%	37,828.67	47,744.49	-17.4%	5,575.41	5,971.30	7.1%
CENSARA	1,012,946.59	621,321.29	-38.7%	775,625.13	382,000.54	-50.6%	239,321.46	239,320.75	0.0%
LADCO	460,186.42	498,171.62	8.4%	444,596.99	282,492.18	-36.4%	215,679.44	215,679.44	0.0%
MANE-VU	270,810.83	149,439.76	-44.8%	203,661.43	95,074.20	-53.3%	67,145.39	54,365.55	-19.0%
WRAP	182,121.89	135,483.18	-25.6%	136,955.17	90,316.46	-34.1%	45,166.72	45,166.73	0.0%
TOTAL	2,581,643.20	1,773,936.20	-31.3%	1,788,132.63	1,032,667.35	-42.2%	793,510.56	741,268.85	-6.6%

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Additional Modeling-Related Tasks

- Emissions processing
- Updated 2028 CAMx modeling (VISTAS_12)
- Updated 2028 visibility projections
- Documentation

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2028 NO_x Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	80,389.97	70,824.72	-11.0%	26,895.35	20,008.14	-25.6%	53,494.61	50,816.58	-5.0%
FL	68,006.19	70,010.40	2.9%	26,250.73	25,049.90	-4.6%	41,755.45	44,960.50	7.7%
GA	67,197.50	65,885.55	-1.9%	25,899.67	24,587.73	-5.1%	41,297.83	41,297.83	0.0%
KY	66,240.03	62,130.83	-6.2%	36,781.72	32,695.94	-11.1%	29,458.31	29,434.89	-0.1%
MS	52,159.32	46,853.62	-10.2%	18,279.53	12,208.89	-33.2%	33,879.79	34,644.73	2.3%
NC	65,863.97	58,933.80	-10.5%	27,842.23	20,977.65	-24.7%	38,021.74	37,956.15	-0.2%
SC	36,051.31	36,170.87	0.3%	10,522.78	10,707.42	1.8%	25,528.53	25,463.44	-0.3%
TN	45,879.07	42,954.25	-6.4%	10,086.01	7,814.13	-22.5%	35,793.06	35,140.12	-1.8%
VA	43,210.19	41,671.99	-3.6%	11,973.97	10,435.77	-12.8%	31,236.22	31,236.22	0.0%
WV	65,054.07	68,200.77	4.8%	46,721.77	49,874.15	6.7%	18,332.30	18,326.62	0.0%
CENSARA	903,979.85	791,397.59	-12.5%	382,706.66	270,182.46	-29.4%	521,273.19	521,215.14	0.0%
LADCO	548,866.74	491,345.00	-10.5%	244,035.26	186,513.52	-23.6%	304,831.49	304,831.49	0.0%
MANE-VU	244,280.15	222,991.41	-8.7%	103,465.15	82,176.41	-20.6%	140,815.00	140,815.00	0.0%
WRAP	362,819.80	301,433.41	-16.9%	187,944.97	126,558.55	-32.7%	174,874.83	174,874.86	0.0%
TOTAL	2,649,998.14	2,370,804.22	-10.5%	1,159,405.80	879,790.66	-24.1%	1,490,592.35	1,491,013.55	0.0%

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Updated 2028
Point Emissions

9

Revised 2028 PSAT
Stacked Bar Charts
(Original and Adjusted)

12

PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NO_x and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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Revised State/RPO PSAT Results

Revised EGU Sulfate PSAT Results

$$= \text{Original EGU Sulfate PSAT Results} * \text{SO}_2 \text{ EGU Ratio}$$

$$\text{where, SO}_2 \text{ EGU Ratio} = \frac{(\text{Revised EGU SO}_2 \text{ emissions})}{(\text{Original EGU SO}_2 \text{ emissions})}$$

Revised NEGU Sulfate PSAT Results

$$= \text{Original NEGU Sulfate PSAT Results} * \text{SO}_2 \text{ NEGU Ratio}$$

$$\text{where, SO}_2 \text{ NEGU Ratio} = \frac{(\text{Revised NEGU SO}_2 \text{ emissions})}{(\text{Original NEGU SO}_2 \text{ emissions})}$$

16

PSAT SO₂ and NO_x Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- Total NO_x tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point NO_x tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NO_x tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 RPOs = 13 tags
- Non-EGU point NO_x for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ and NO_x for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NO_x tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NO_x tags for individual non-VISTAS facilities = 10 tags

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Revised State/RPO PSAT Results

Revised EGU Nitrate PSAT Results

$$= \text{Original EGU Nitrate PSAT Results} * \text{NO}_x \text{ EGU Ratio}$$

$$\text{where, NO}_x \text{ EGU Ratio} = \frac{(\text{Revised EGU NO}_x \text{ emissions})}{(\text{Original EGU NO}_x \text{ emissions})}$$

Revised NEGU Nitrate PSAT Results

$$= \text{Original NEGU Nitrate PSAT Results} * \text{NO}_x \text{ NEGU Ratio}$$

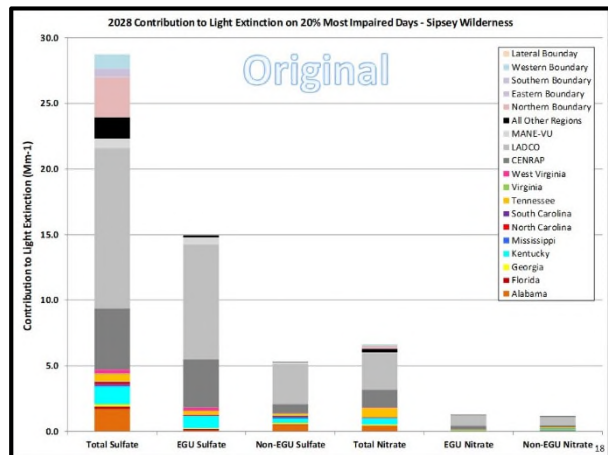
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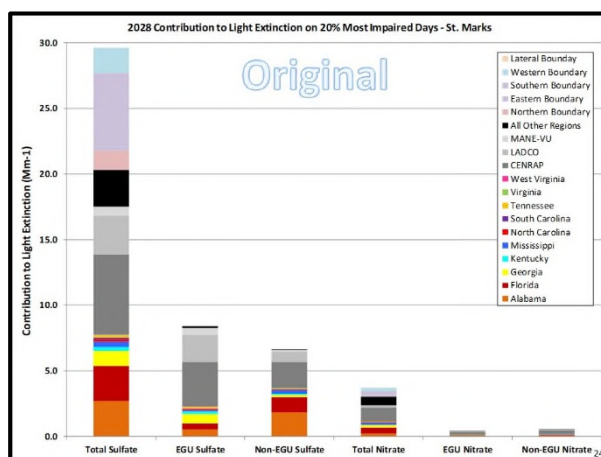
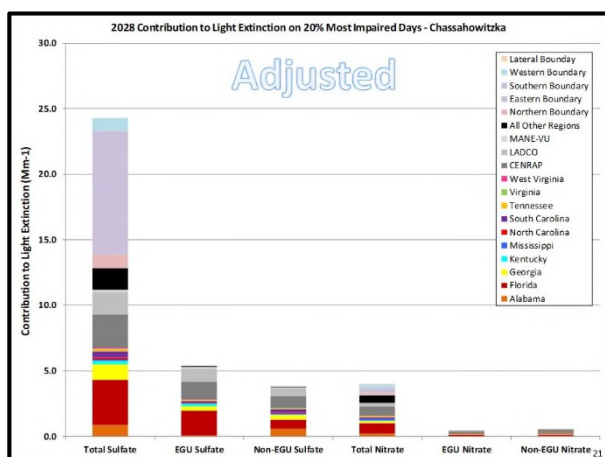
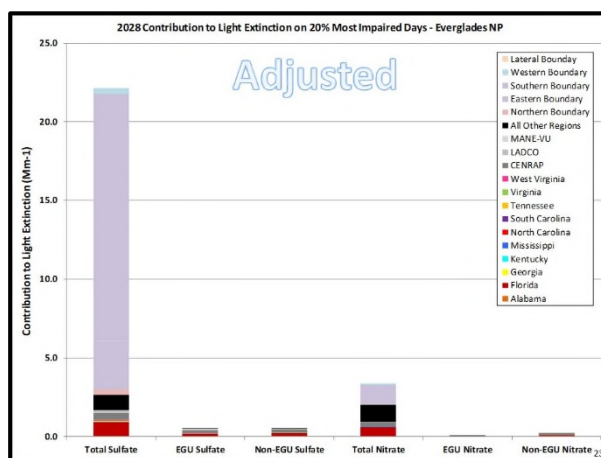
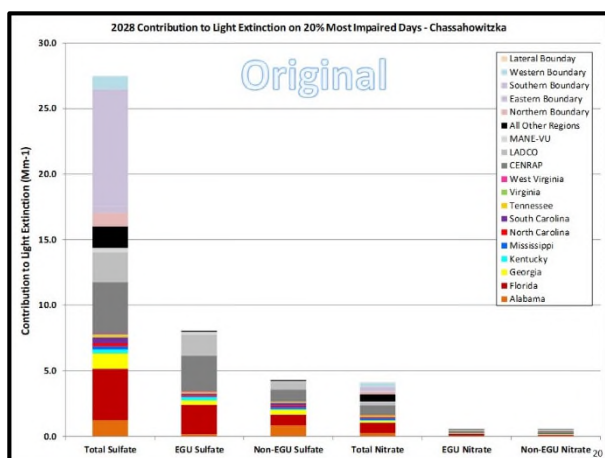
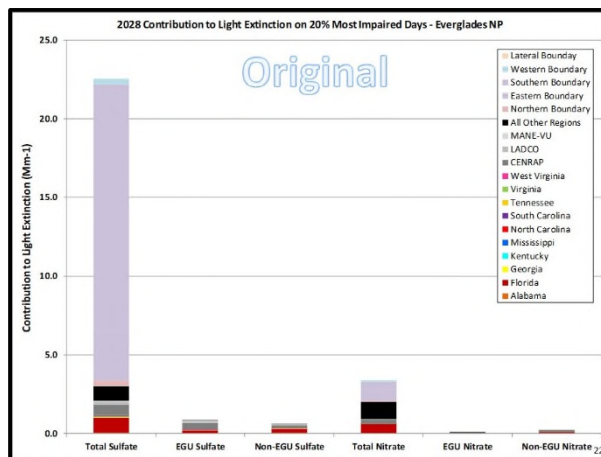
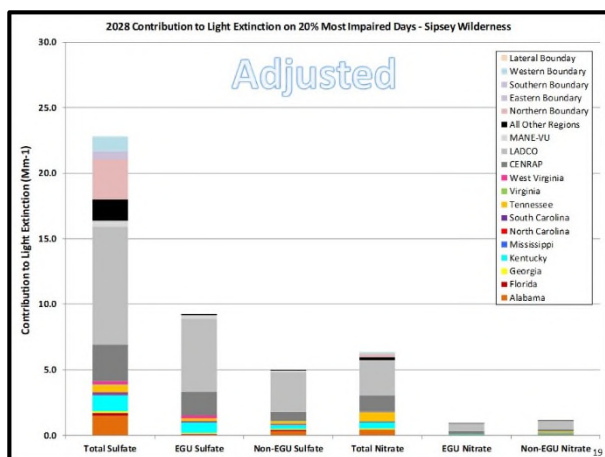
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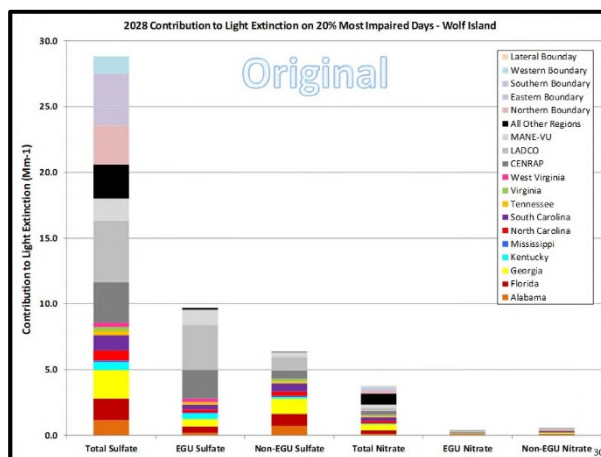
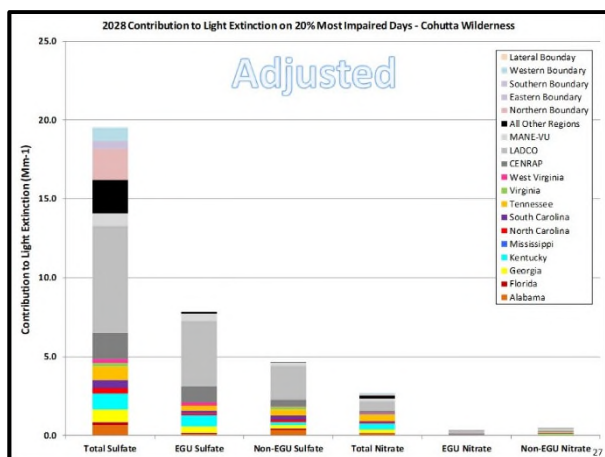
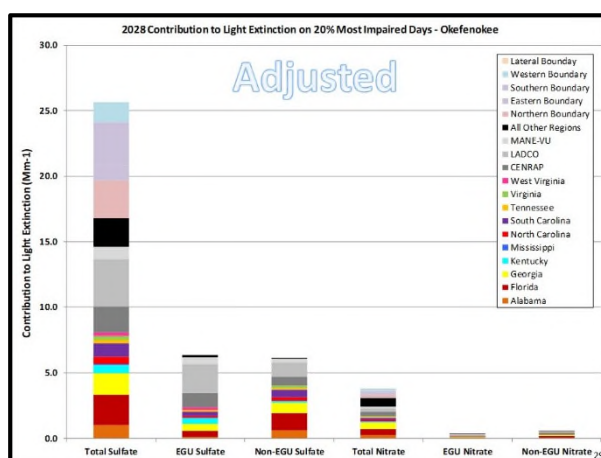
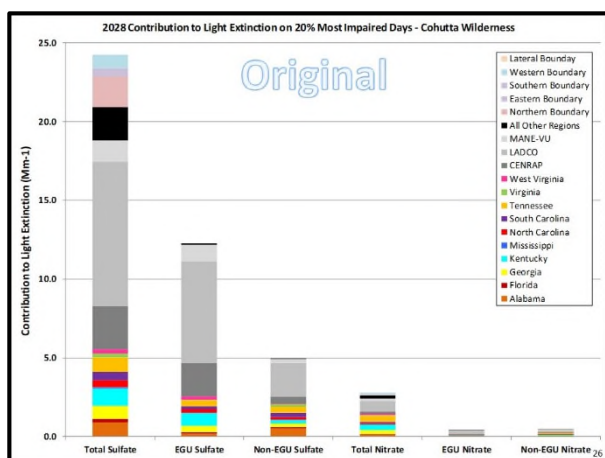
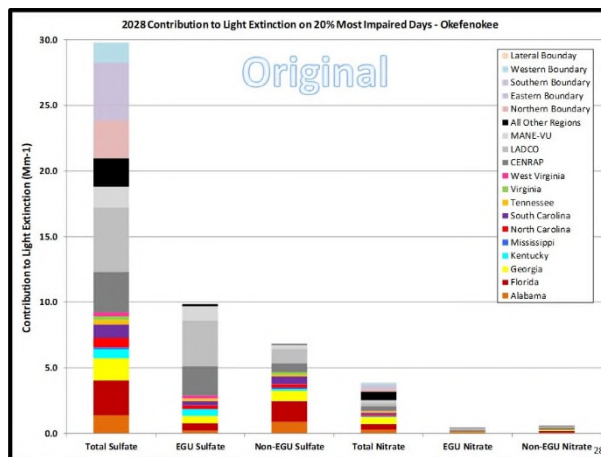
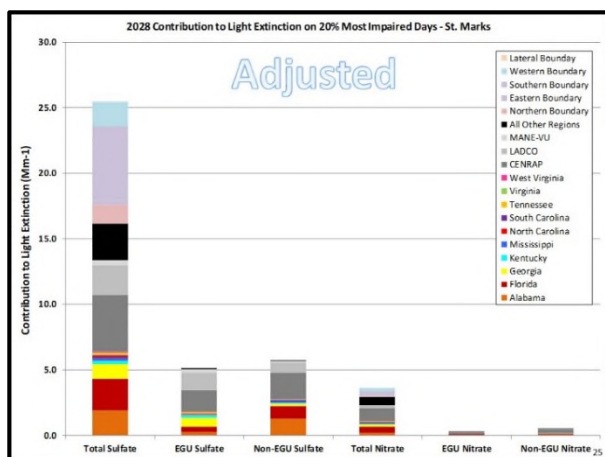
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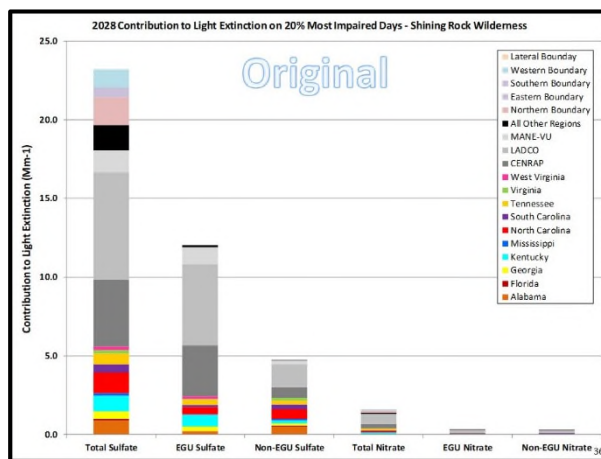
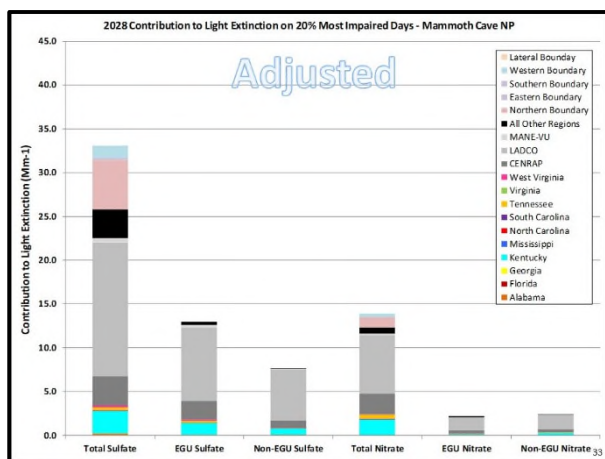
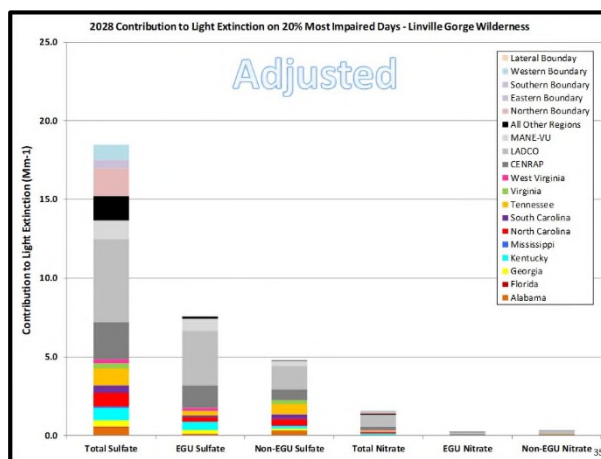
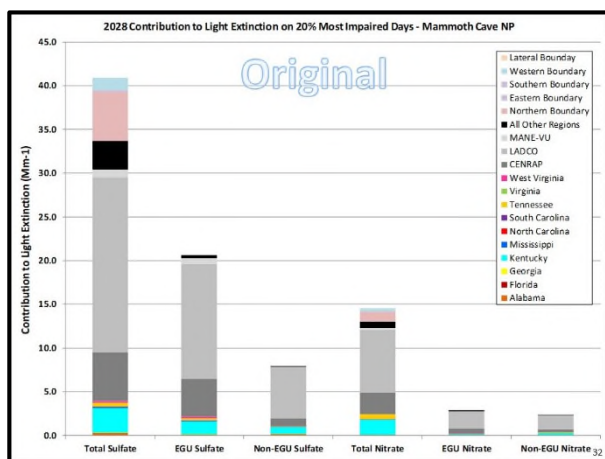
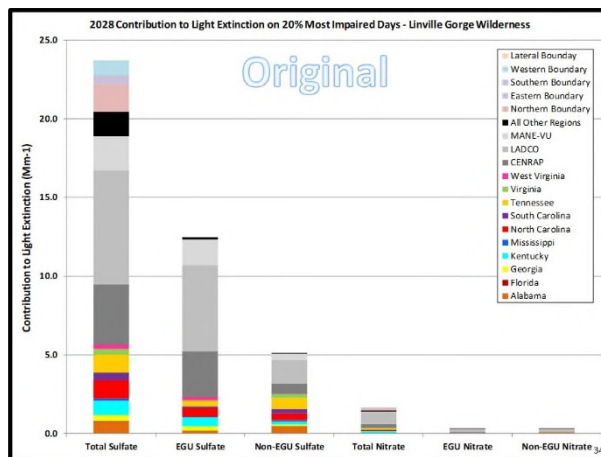
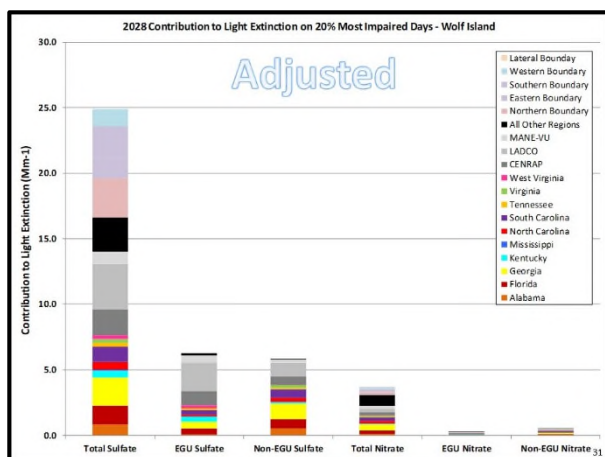
State/RPO	SO ₂ EGU Ratio	SO ₂ NEGU Ratio	NO _x EGU Ratio	NO _x NEGU Ratio
AL	0.540	0.708	0.744	0.950
FL	0.841	0.829	0.954	1.077
GA	0.951	1.000	0.949	1.000
KY	0.881	0.850	0.889	0.999
MS	0.463	0.363	0.668	1.023
NC	0.485	0.953	0.753	0.998
SC	1.000	1.000	1.018	0.997
TN	0.828	0.973	0.775	0.982
VA	0.605	1.000	0.872	1.000
WV	0.826	1.071	1.067	1.000
CENSARA	0.494	1.000	0.706	1.000
LADCO	0.636	1.000	0.764	1.000
MANE-VU	0.467	0.810	0.794	1.000

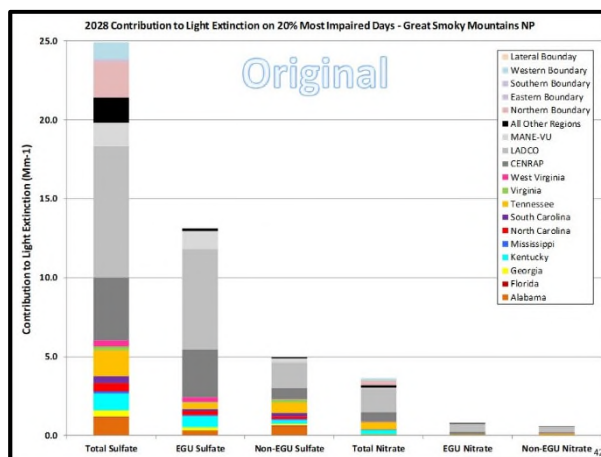
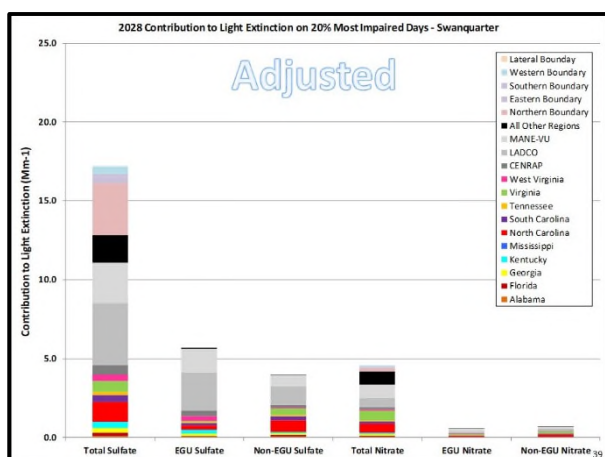
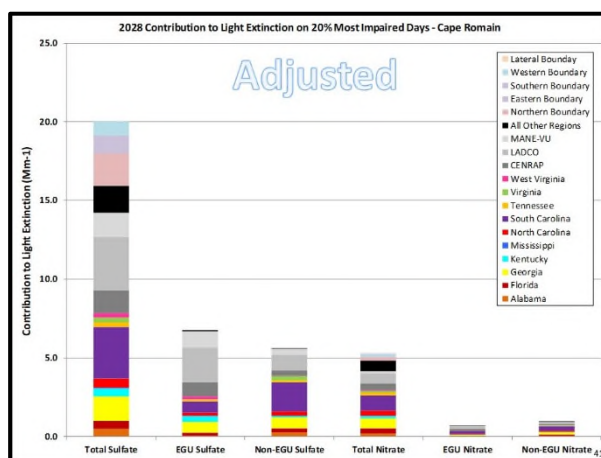
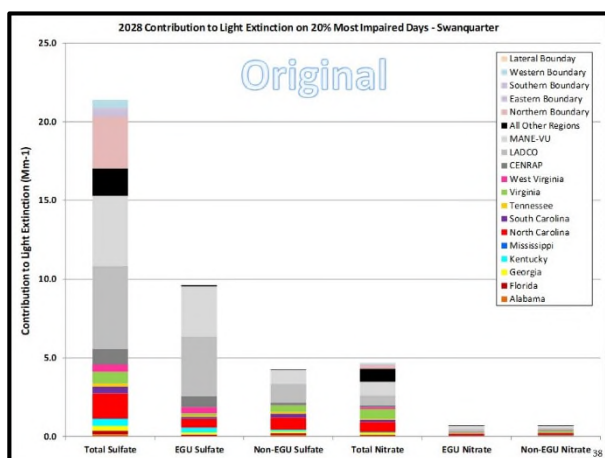
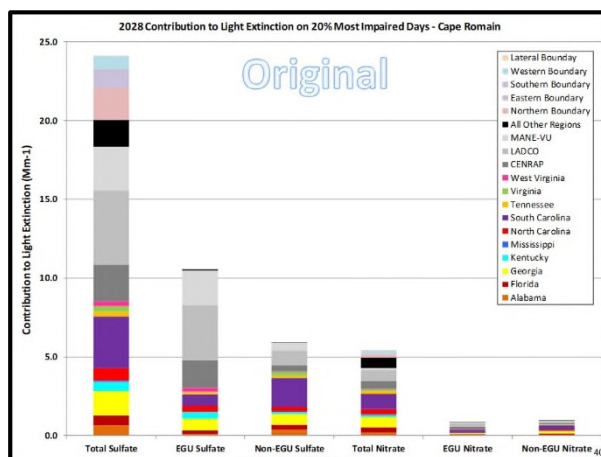
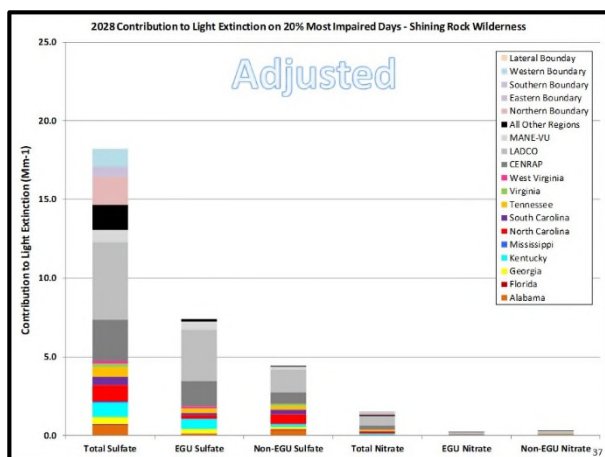
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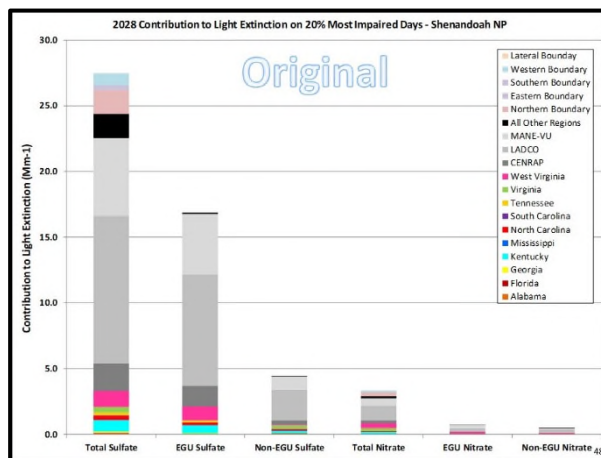
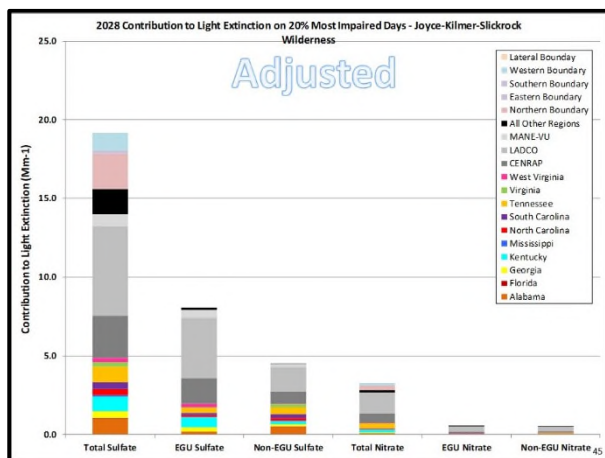
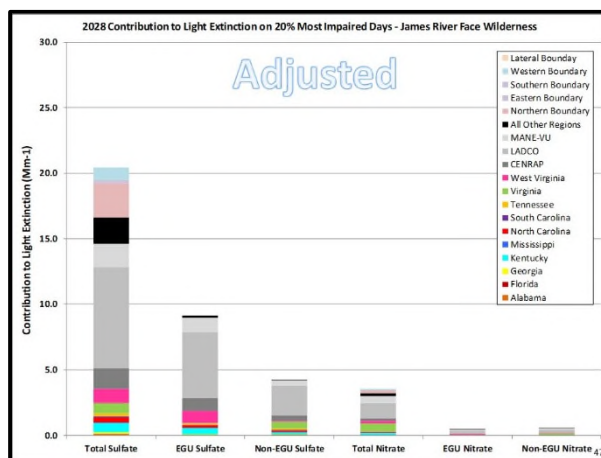
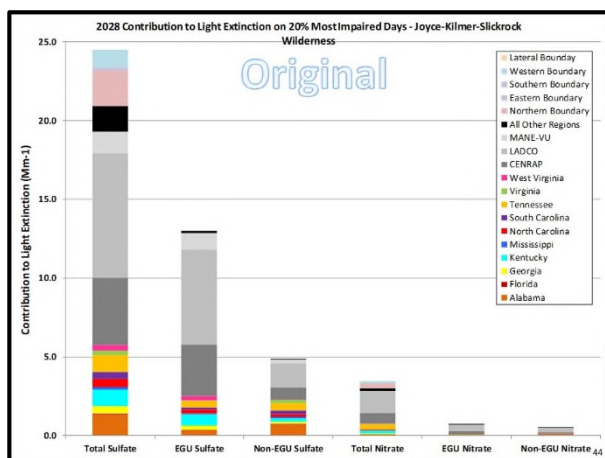
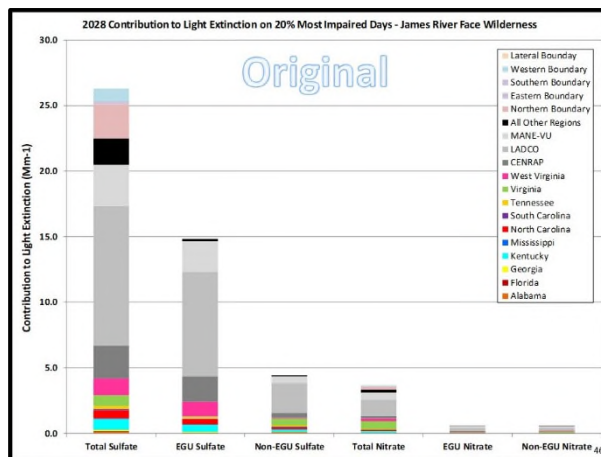
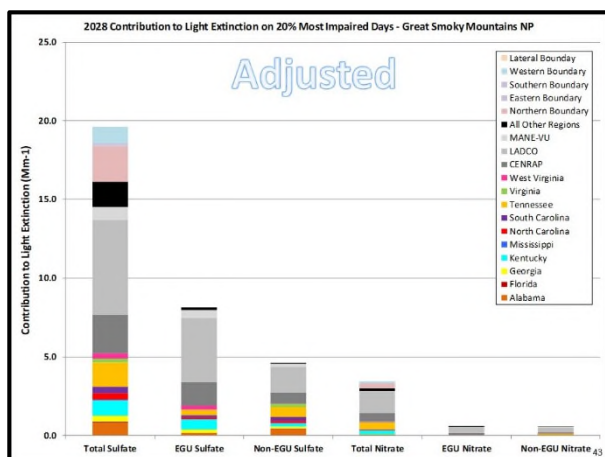


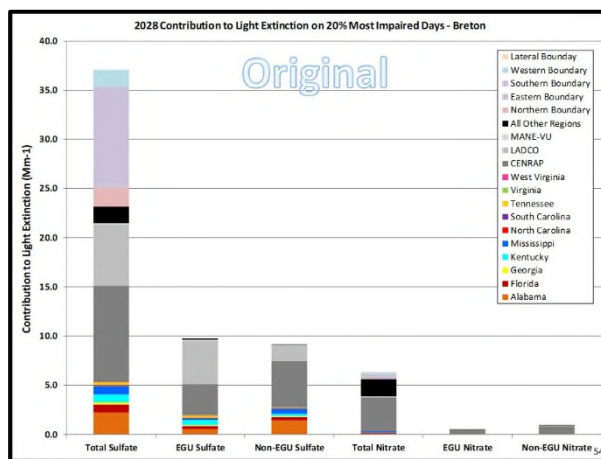
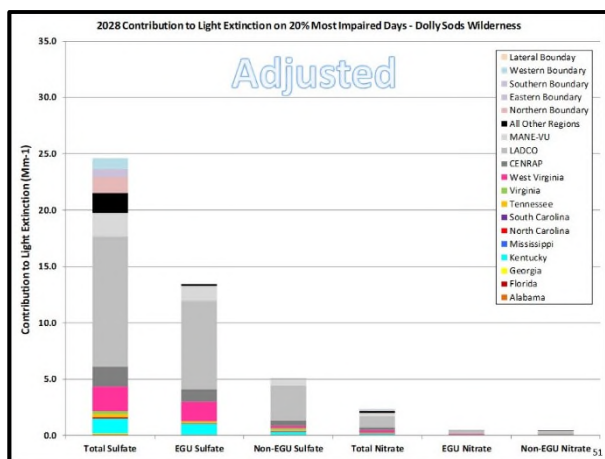
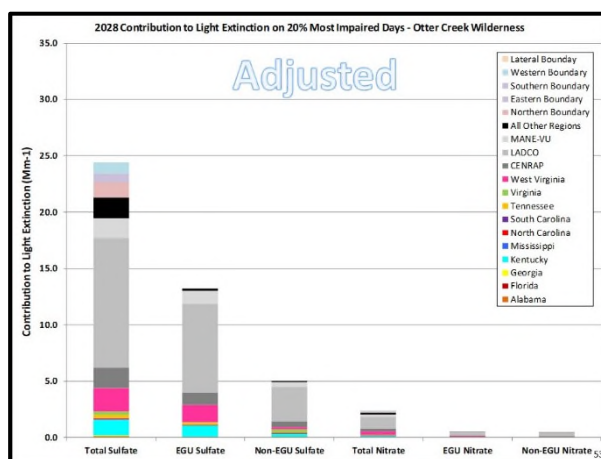
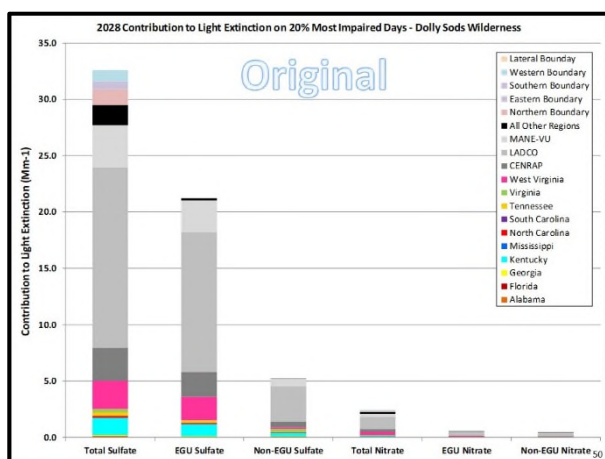
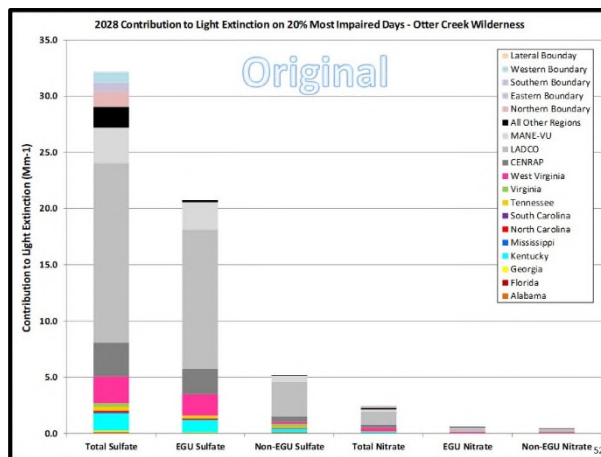
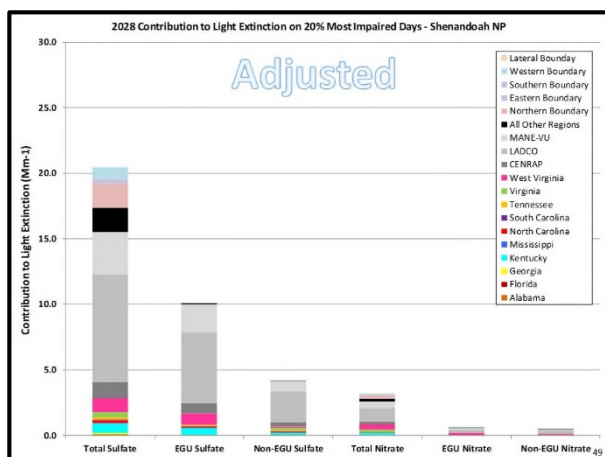


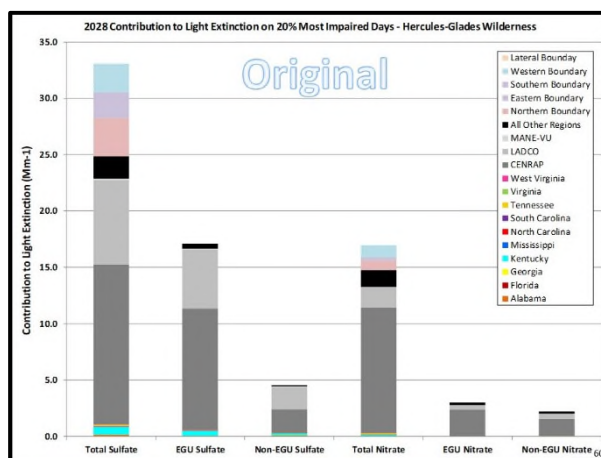
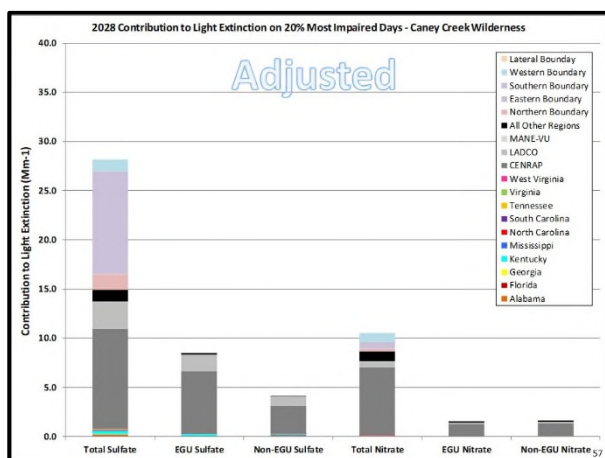
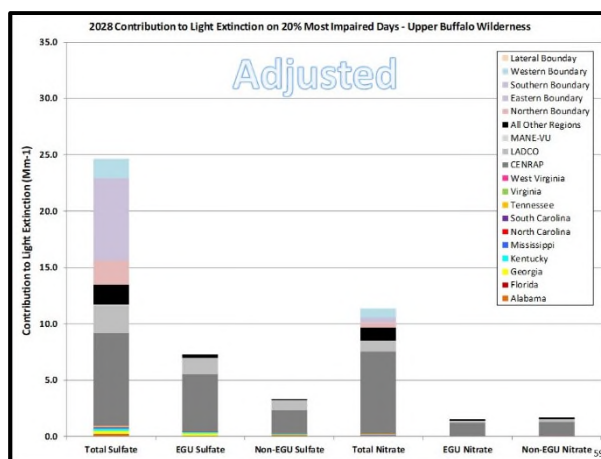
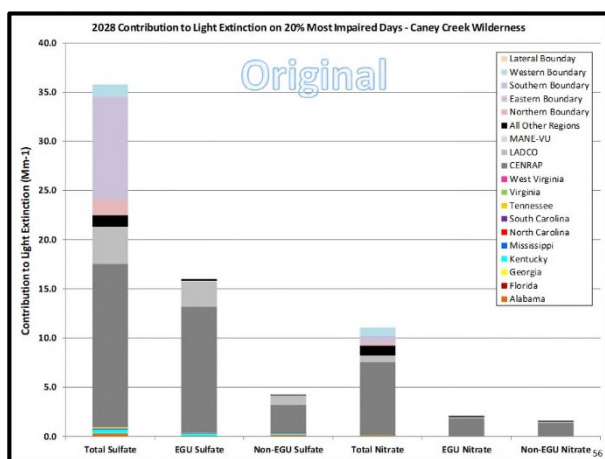
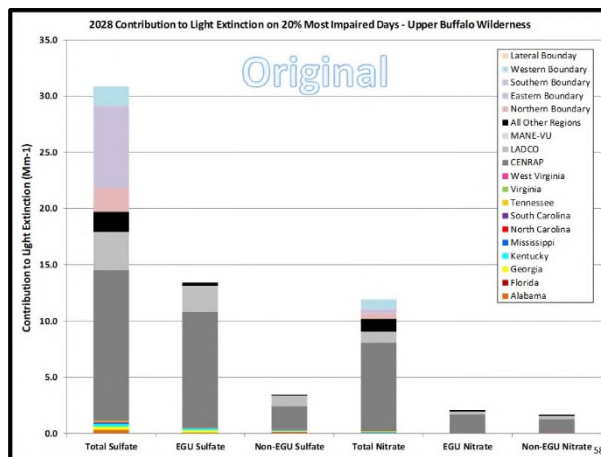
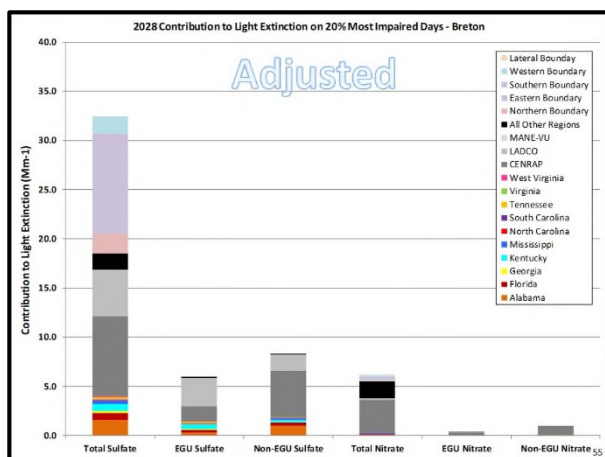


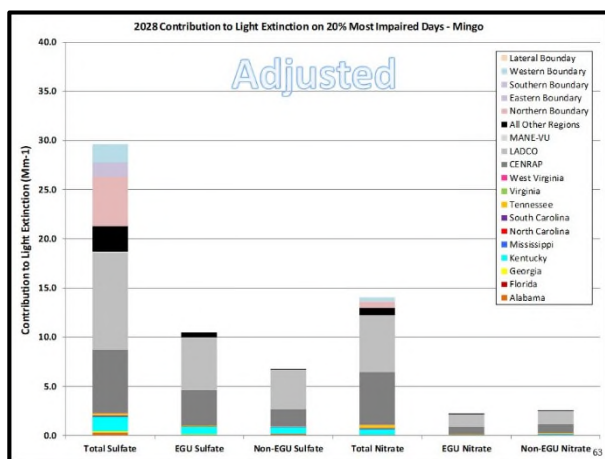
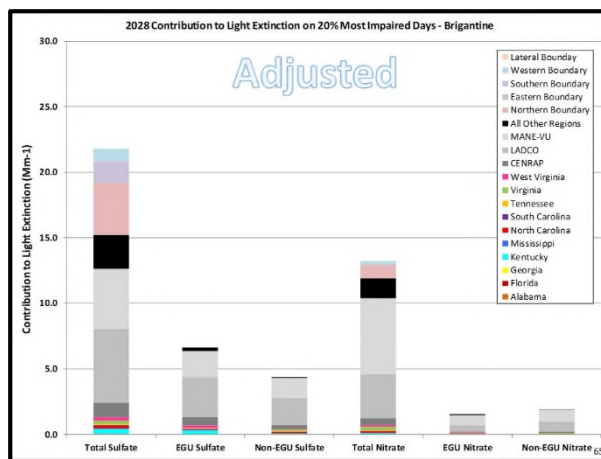
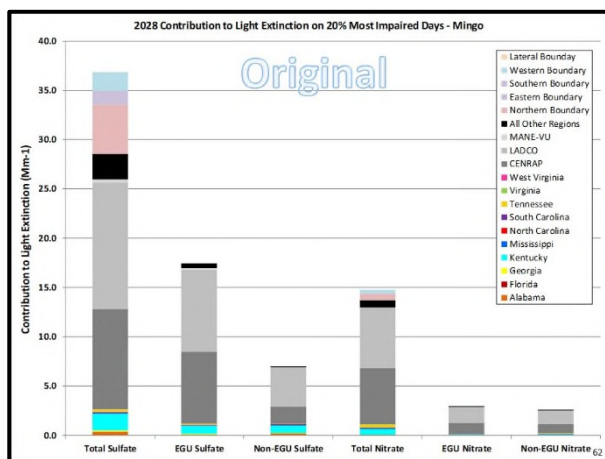
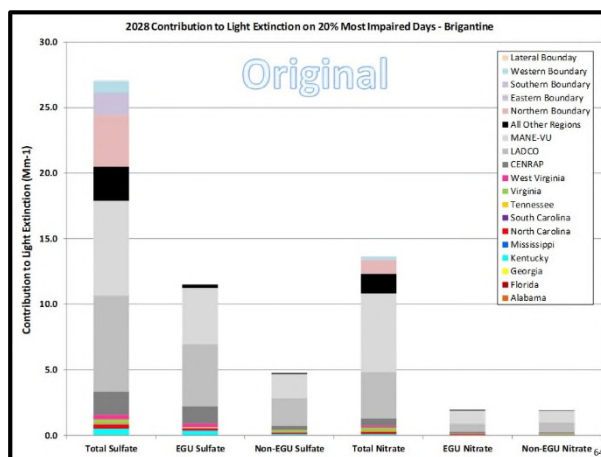
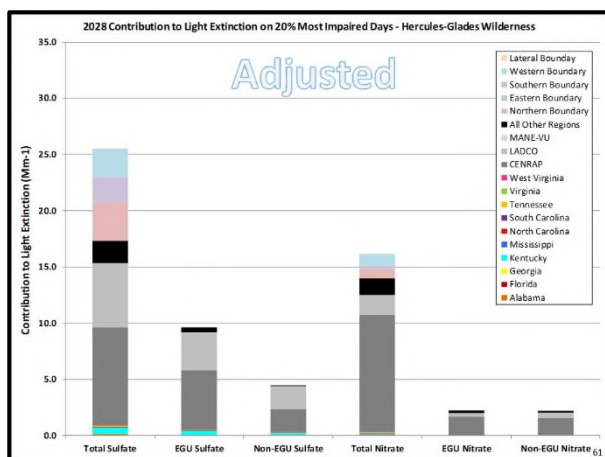












Four Factor Analysis

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Four-Factor Analysis Screening Approach

1. The VISTAS four-factor analysis approach is based on an initial AOI screening ($Q/d * EWRT$) to rank facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the nitrate and sulfate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate and facility nitrate impacts (separately, not combined) divided by the total impact of sulfate + nitrate from all point sources to determine which sources may need to be considered for a four-factor analysis.
 - If sulfate contribution $\geq 1.00\% \rightarrow SO_2$ Four-Factor Analysis
 - If nitrate contribution $\geq 1.00\% \rightarrow NO_x$ Four-Factor Analysis

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Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d)*EWRT$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the 4-factor analysis
- Georgia Example:
 - Sources in Georgia, used $\geq 2\%$ threshold
 - Sources outside Georgia, used $\geq 4\%$ threshold

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Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
 - We are using the AOI/PSAT approach and a $\geq 1.00\%$ PSAT threshold based on a Facility basis.
 - This will pull in more facilities compared to a Unit basis.
- This approach results in a reasonable number of sources that can be evaluated with limited state resources and focuses on the sources with the largest impacts.

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AOI Point Contributions for COHU

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,643.3	10,453.4	1.13%	15.58%
IN	INDIANA MICHIGAN POWER CO. AEP - ROCKPORT	410.1	8,806.8	30,536.3	0.13%	4.68%
GA	International Paper - Rome	87.4	1,773.4	1,791.0	0.18%	4.66%
IN	Gibson	487.1	12,280.3	23,117.2	0.10%	2.51%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	10,655.3	18,141.9	0.16%	2.18%
KY	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	7,007.3	19,504.7	0.07%	2.18%
TN	TVA KINGSTON FOSSIL PLANT	124.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (662/7010056)	512.0	8,122.5	41,595.8	0.02%	1.71%
TN	TVA CUMBERLAND FOSSIL PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KY	Big Rivers Electric Corp. - Wilson Station	369.0	1,111.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (2413090134)	454.6	7,150.0	22,133.9	0.06%	1.05%
GA	Ga Power Company - Plant Wansley	156.8	2,052.5	4,856.0	0.04%	1.05%
KY	KY Utilities Co. - Ghent Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Poppe Steam	466.9	4,706.3	20,509.3	0.02%	1.04%
GA	Mohawk Industries Inc.	12.0	46.5	77.1	0.07%	1.02%
TN	EASTMAN CHEMICAL COMPANY	269.8	6,900.3	6,420.2	0.05%	0.99%
MO	JAMEREN MISSOURI-LASODIE PLANT	695.4	9,685.5	41,740.3	0.01%	0.96%
IL	Newton	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	Chemical Products Corporation	71.9	15.5	513.8	0.00%	0.89%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	9,188.5	9,038.1	0.04%	0.76%

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HYSPLIT Trajectories

- Trajectories were run using NAM-12 meteorology for the 20% most impaired days in 2011-2016 at 44 Class I areas.
 - Trajectories were run with starting heights of 100, 500, 1,000, and 1,500 meters.
 - Trajectories were run 72 hours backwards in time for each height at each location.
 - Trajectories were run with start times of 12AM (midnight of the start of the day), 6AM, 12PM, 6PM, and 12AM (midnight at the end of the day) local time.
- 44 Class I areas x 6 years x 24 days/year x 4 heights x 5 start times = **126,720 trajectories**

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AOI Point Contributions for OKEF

State	FACILITY NAME	DISTANCE (km)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	112.4	2,745.9	0.03%	14.63%
FL	ROCK TENN. CO. LLC	64.8	2,316.8	2,606.7	0.88%	12.82%
FL	IEA	65.6	651.8	2,094.5	0.18%	6.60%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.25%
FL	RTT CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	63.4	2,327.1	562.0	0.90%	2.82%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	0.08%	2.81%
FL	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	RENESSENZ LLC	59.8	66.3	569.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	205.0	2,489.8	5,306.4	0.06%	1.40%
AL	Sanitary Land Co.	384.6	121.7	7,951.1	0.00%	1.11%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.01%	1.05%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.05%	1.02%
GA	Brunswick Cellulose Inc.	75.3	1,554.5	294.2	0.34%	1.01%
SC	ALLUMAX OF SOUTH CAROLINA	322.7	106.1	3,751.7	0.00%	0.97%
GA	PCA Vaidosta Mill	112.7	1,032.6	489.7	0.09%	0.85%
SC	SANTEE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.05%	0.85%
FL	CITY OF GAINESVILLE, GRU	111.7	410.0	881.4	0.03%	0.79%
SC	KAPSTONE CHARLESTON KRAFT LLC	314.9	2,355.8	1,863.7	0.06%	0.65%
GA	Ga Power Company - Plant Wansley	403.7	2,052.5	4,856.0	0.02%	0.65%

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AOI Point Contributions for WOLF

State	FACILITY NAME	DISTANCE (km)	NOx_2028 (tons/year)	SO ₂ _2028 (tons/year)	NOx Contribution	SO ₂ Contribution
GA	Brunswick Cellulose Inc.	27.9	1,554.5	294.2	2.34%	8.84%
FL	ROCK TENN CP, LLC	74.0	2,316.8	2,606.7	0.39%	8.56%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	7.55%
FL	JEA	105.1	651.8	2,094.5	0.09%	4.43%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.03%	2.65%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	SEMINOLE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.3	8,122.5	41,595.8	0.02%	1.71%
SC	SANTEE COOPER CROSS GENERATING STATION	231.0	3,273.5	4,281.2	0.05%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	997.1	0.00%	1.55%
FL	JFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEF)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.9	521.9	562.0	0.08%	1.06%
SC	INTERNATIONAL PAPER EASTOVER	288.7	2,780.3	3,212.9	0.03%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENCON NE MGMT CO/KEYSTONE STA	1,048.6	6,578.5	56,939.2	0.01%	0.84%

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PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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Georgia Tagging for PSAT

- Sources in Georgia (≥ 2% threshold)**
 - Ga Power Company – Plant Bowen
 - International Paper – Rome (aka TEMPLE INLAND)
 - International Paper – Savannah
 - Brunswick Cellulose Inc
 - Georgia-Pacific Consumer Products LP (Savannah River Mill)
- Sources outside Georgia (≥ 4% threshold)**
 - INDIANA MICHIGAN POWER DBA AEP ROCKPORT (IN)
 - ROCK TENN CP, LLC (FL)
 - JEA (FL)

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PSAT SO₂ and NOx Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 RPOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ and NOx for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

→ 87 Total Facility Tags (both SO₂ and NOx)

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AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2%	Sulfate or nitrate

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Facility Tags (AL, FL, GA)

Facility State	Facility RPO	FACILITY ID STD	FACILITY NAME STD	SO ₂ (TPY)	NOx (TPY)
AL	VISTAS	01097-849811	Alzo Nobel Chemicals Inc	3,135.72	20.73
AL	VISTAS	01097-105611	Ala Power - Barry	6,033.17	2,275.76
AL	VISTAS	01179-108711	American Midstream Chattahoochee, LLC	3,105.39	425.87
AL	VISTAS	01073-101811	DRUMMOND COMPANY, INC.	2,562.17	1,228.55
AL	VISTAS	01053-744021	Escambia Operating Company LLC	18,574.39	349.32
AL	VISTAS	01053-885111	Escambia Operating Company LLC	8,589.80	149.64
AL	VISTAS	01103-100011	Puroler Steel Converter LLC	170.23	331.24
AL	VISTAS	01109-885711	Sanders Lead Co	7,551.06	121.71
AL	VISTAS	01097-106161	Union Oil of California - Chunchula Gas Plant	2,573.15	349.23
FL	VISTAS	12125-72411	BUCKEYE FLORIDA LIMITED PARTNERSHIP	1,320.44	1,830.72
FL	VISTAS	12086-900111	CHENIER CONSTRUCTION MATERIALS FL, LLC	29.51	910.30
FL	VISTAS	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	5,306.43	2,489.83
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (PTF)	13.05	170.61
FL	VISTAS	12033-752711	GULF POWER - Crist	2,631.69	2,998.36
FL	VISTAS	12086-352721	HOMESTEAD CITY UTILITIES	0.00	97.09
FL	VISTAS	12031-640211	JEA	2,094.48	651.79
FL	VISTAS	12105-717711	MOSAIC FERTILIZER, LLC	7,960.67	310.44
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC	3,034.06	159.70
FL	VISTAS	12105-919811	MOSAIC FERTILIZER, LLC	4,425.36	141.02
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	961.97	2,327.10
FL	VISTAS	12089-753711	ROCK TENN CP, LLC	2,608.72	2,316.77
FL	VISTAS	12005-535411	ROCK TENN CP LLC	2,590.88	1,404.89
FL	VISTAS	12129-273171	TALLAHASSEE CITY PURDOM GENERATING STA.	2.86	121.46
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	6,084.30	2,865.03
FL	VISTAS	12086-899911	TARIMAC AMERICA LLC	9.38	879.70
FL	VISTAS	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	3,187.77	112.41
GA	VISTAS	13127-372101	Brunswick Cellulose Inc	294.20	1,554.51
GA	VISTAS	13015-261011	Ga Power Company - Plant Bowen	80,412.42	6,643.32
GA	VISTAS	13103-536311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1,860.18	351.52
GA	VISTAS	13031-3679811	International Paper - Savannah	3,945.38	1,560.78
GA	VISTAS	13115-539311	TEMPLE INLAND	1,791.05	1,779.33

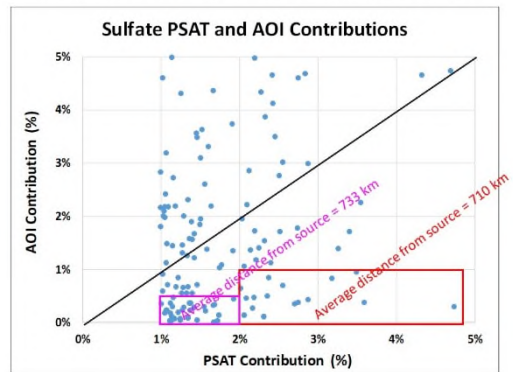
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Facility Tags (KY, MS, NC, SC, TN, VA)

Facility State	Facility RPO	FACILITY_ID STD	FACILITY_NAME STD	SO ₂ (TPY)	NO _x (TPY)
KY	VISTAS	2113-546111	Ingrown Electric Corp. - Wilson Station	5,934.16	1,151.55
KY	VISTAS	2109-752411	Century Aluminum of KY LLC	5,044.16	337.66
KY	VISTAS	2117-5196711	Tennessee Valley Authority - Paradise Fossil Plant	3,011.01	3,114.52
KY	VISTAS	2114-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	15,504.75	7,007.34
MS	VISTAS	2809-838411	Chemron Products Company, Passaicville Refinery	741.69	1,534.12
MS	VISTAS	2809-625011	Mississippi Power Company, Plant Victor I (Daniel)	231.92	3,829.72
NC	VISTAS	3708-792011	Blue Ridge Paper Products - Canton Mill	1,127.07	2,992.37
NC	VISTAS	3711-804911	Dow Paper Company, LLC	687.45	1,796.49
NC	VISTAS	3705-837411	Pulse Energy Services, LLC - Marshall Steam Station	4,159.21	7,511.31
NC	VISTAS	3701-847911	PCS Phosphate Company, Inc. - Aurora	4,843.90	495.58
NC	VISTAS	3703-8513011	SGS Carbon LLC	261.64	21.69
SC	VISTAS	4501-463411	ALLIANCE OF SOUTH CAROLINA	3,791.69	108.06
SC	VISTAS	4503-569811	INTERNATIONAL PAPER GEORGETOWN MILL	2,767.52	2,031.26
SC	VISTAS	4501-497311	KAPSTONE CHARLESTON KRAFT LLC	1,863.65	2,355.82
SC	VISTAS	4501-4120411	LANTEE COOPER CROSS-HEATING STATION	4,281.17	3,779.47
SC	VISTAS	4503-665211	LANTEE COOPER WINYAM GENERATING STATION	2,286.86	1,722.33
SC	VISTAS	4501-8306711	CE&G WILLIAMS	392.48	992.73
TN	VISTAS	4703-497911	Cemex - Knoxville Plant	121.47	711.50
TN	VISTAS	4713-398211	EASTMAN CHEMICAL COMPANY	6,420.18	6,900.11
TN	VISTAS	4710-4129211	TATE & LYLE, Loudon	477.78	883.25
TN	VISTAS	4700-6196011	TVA BULL RUN FOSSIL PLANT	627.54	964.16
TN	VISTAS	4713-497911	TVA CUMBERLAND FOSSIL PLANT	6,427.31	4,916.52
TN	VISTAS	4714-497911	TVA KINGSTON FOSSIL PLANT	1,886.09	1,867.58
VA	VISTAS	5102-403411	Jewell Coke Company LLP	5,090.95	520.17
VA	VISTAS	5103-578711	Meadwestvaco Packaging Resource Group	2,115.32	1,955.69
VA	VISTAS	5103-503911	Roanoke Cement Company	2,290.17	1,372.57

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Sulfate AOI vs. Sulfate PSAT (≥ 1.00%)



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Facility Tags (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility RPO	FACILITY_ID STD	FACILITY_NAME STD	SO ₂ (TPY)	NO _x (TPY)
WV	VISTAS	5403-6271711	ALLEGHENY ENERGY SUPPLY CO. LLC-HARRISON	10,082.54	11,830.88
WV	VISTAS	5403-4864311	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	2,220.25	1,245.10
WV	VISTAS	5401-7269111	ARPAI ALUMINUM POWER COMPANY - JOHN AMOS PLANT	18,984.24	4,878.10
WV	VISTAS	5403-6257011	Dominion Resources, Inc. - MOUNT STORM POWER STATION	2,113.64	1,984.14
WV	VISTAS	5401-6900311	EQUITRANS - COPELY RUN CS 76	0.10	511.06
WV	VISTAS	5403-6790711	FILES CREEK SC4340	0.15	643.35
WV	VISTAS	5403-6790511	ELIOT KACASO	0.11	343.27
WV	VISTAS	5409-6327811	KINGSFORD MANUFACTURING COMPANY	16.96	140.68
WV	VISTAS	5401-1832011	LONGVIEW POWER	2,313.73	1,556.57
WV	VISTAS	5401-4992311	MITCHELL PLANT	5,572.46	2,729.62
WV	VISTAS	5401-6778611	MONONGAHELA POWER CO. - FORT MARTIN POWER	4,881.87	15,743.52
WV	VISTAS	5403-4782811	MONONGAHELA POWER CO. - PLEASANTS POWER STA	16,817.43	5,497.37
WV	VISTAS	5401-6778811	MONONGAHELA POWER ASSOCIATES	828.64	655.58
AR	CENRAP	0503-108411	ENTERGY ARKANSAS INC. INDEPENDENCE PLANT	21,090.48	14,133.10
MO	CENRAP	2914-536311	NEW MADRID POWER PLANT-MARSTON	16,781.71	4,394.10
MD	MANE-VU	2801-7763811	Luke Paper Company	22,659.84	1,607.03
PA	MANE-VU	4203-3866111	SEPHON NE MONT. CO. KEYSTONE STA	26,939.23	6,578.47
PA	MANE-VU	4203-3005211	HOMER CITY GEN LP/ CENTER TWP	11,865.70	5,215.96
PA	MANE-VU	4203-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	8,880.26	2,254.64
IL	Midwest RPO	1712-786911	Joplin Steam	20,509.38	4,706.35
IN	Midwest RPO	1817-818311	Alcoa Warma Power PR Agr Div of AL	5,071.28	11,156.95
IN	Midwest RPO	1803-736311	Gibson	23,117.23	12,280.34
IN	Midwest RPO	1814-8017211	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	30,536.33	8,806.77
IN	Midwest RPO	1815-7362411	INDIANA POWER & LIGHT - PETERSBURG	18,141.38	10,465.27
IN	Midwest RPO	1812-8166311	Bigeco AB Brown South Indiana Gas & Ele	7,644.70	1,578.59
OH	Midwest RPO	3901-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	7,460.79	2,467.31
OH	Midwest RPO	3901-8010811	Cornellville Power Plant (0616000000)	6,154.23	9,957.87
OH	Midwest RPO	3901-8046111	Duke Energy Ohio, Vm. N. Zimmer Station (1413990154)	22,131.90	7,149.67
OH	Midwest RPO	3903-8148511	General James M. Gavin Power Plant (0627010056)	41,595.81	8,122.51
OH	Midwest RPO	3903-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000001)	3,405.14	9,143.84

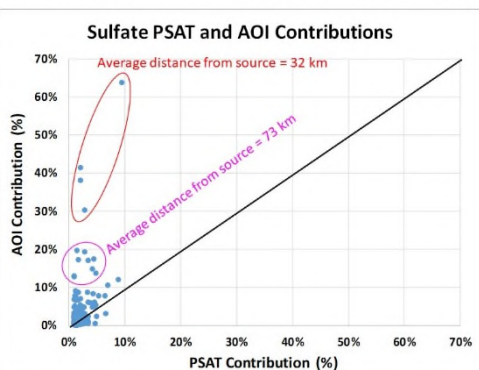
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AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area.
- AOI tends to underestimate impacts for facilities far away from the Class I area.
- AOI uses 72-hour back trajectories, sulfate can last for weeks and travel hundreds to thousands of km.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

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Sulfate AOI vs. Sulfate PSAT (≥ 1.00%)



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Four-Factor Analysis Screening Approach

- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate impacts** from all sources at each Class I area since the SO₂ and NO_x emissions have decreased.
- However, the **individual sulfate and total nitrate impacts** from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO₂ and/or NO_x emissions.
- Therefore, the percent contribution (facility sulfate impact/total impact of all point sources of sulfate + nitrate) will increase since the denominator will decrease; however, the order of the rankings from largest impact to smallest impact should not change unless one of those facilities reduced or increased emissions.

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Four-Factor Analysis Screening Approach

- Due to the amount of resources already invested in the AOI and PSAT analysis, **VISTAS plans to continue with our original approach** for determining which sources will require a four-factor analysis.
- In cases where emissions decreased or increased at individual facilities being considered for a four-factor analysis, the facility contributions will be adjusted to be consistent with the lower/higher facility emissions before comparing to the PSAT contribution threshold.
- EPA verbally stated this should be okay 2/6/2020.**

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Revised Facility Nitrate PSAT Results

- Revised Facility Nitrate PSAT Results**
= **Original Facility Nitrate PSAT Results**
* **NOx Ratio_Facility * Ratio_Class_I_Area**

$$\text{where, NOx Ratio_Facility} = \frac{\text{(Revised facility NOx emissions)}}{\text{(Original facility NOx emissions)}}$$

$$\text{where, Ratio_Class_I_Area} = \frac{\text{(Original sulfate + nitrate point contribution)}}{\text{(Revised sulfate + nitrate point contribution)}}$$

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Original Facility PSAT Contributions

- Original Facility Sulfate PSAT Contributions (%)**
Facility Sulfate PSAT Contributions (Mm⁻¹)
= **Total Sulfate + Nitrate Point Contribution (Mm⁻¹)**
- Original Facility Nitrate PSAT Contributions (%)**
Facility Nitrate PSAT Contributions (Mm⁻¹)
= **Total Sulfate + Nitrate Point Contribution (Mm⁻¹)**

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Facility Ratios (AL, FL, GA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 Ratio	NOx Ratio
AL	VISTAS	01072-740611	Alco Steel Chemicals Inc.	1.000	1.000
AL	VISTAS	01097-105611	Ala Power - Barry	0.999	1.000
AL	VISTAS	01129-102871	American Midstream Chatham, LLC	0.000	0.000
AL	VISTAS	01072-101871	ENHANCED COMPANY, INC.	1.000	1.000
AL	VISTAS	01053-740021	Escambia Operating Company LLC	0.999	1.000
AL	VISTAS	01053-885111	Escambia Operating Company LLC	0.999	0.000
AL	VISTAS	01103-100001	Nucor Steel Operator LLC	1.000	1.000
AL	VISTAS	01109-885711	Smelter Lead Co	1.000	1.000
AL	VISTAS	01097-106161	Union Oil of California - Chunchula Gas Plant	0.000	0.000
FL	VISTAS	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1.000	1.000
FL	VISTAS	12086-900111	CEMENT CONSTRUCTION MATERIALS FL, LLC	1.000	1.000
FL	VISTAS	12017-940011	DUKE ENERGY FLORIDA, INC. (DEF)	0.999	0.999
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (FPL)	1.000	1.000
FL	VISTAS	12033-752711	GULF POWER - Crist	0.999	0.999
FL	VISTAS	12086-932711	HOMESTEAD CITY UTILITIES	1.000	1.000
FL	VISTAS	12033-640011	JEA	0.999	1.000
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC	0.999	1.000
FL	VISTAS	12052-716411	MOSAIC FERTILIZER, LLC	0.999	1.000
FL	VISTAS	12105-919611	MOSAIC FERTILIZER, LLC	0.999	1.000
FL	VISTAS	12088-845811	RAYONIER PERFORMANCE FIBERS LLC	1.000	1.000
FL	VISTAS	12089-791711	ROCK TENN CP, LLC	1.000	1.000
FL	VISTAS	12003-539411	ROCK TANN CP LLC	1.000	1.000
FL	VISTAS	12126-273171	TALLAHASSEE CITY PURDOM GENERATING STA.	1.000	1.000
FL	VISTAS	12052-538611	TAMPA ELECTRIC COMPANY (TEC)	1.000	1.000
FL	VISTAS	12086-899911	TAMPA ELECTRIC COMPANY (TEC)	1.000	1.000
FL	VISTAS	12047-789711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	0.999	0.999
GA	VISTAS	13117-372101	Brunswick Cellulose Inc	1.000	1.000
GA	VISTAS	13015-261301	Ga Power Company - Plant Bowen	1.000	1.000
GA	VISTAS	13103-539311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1.000	1.000
GA	VISTAS	13013-367981	International Paper - Savannah	1.000	1.000
GA	VISTAS	13115-539311	TEMPLE INLAND	1.000	1.000

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Revised Facility Sulfate PSAT Results

- Revised Facility Sulfate PSAT Results**
= **Original Facility Sulfate PSAT Results**
* **SO₂ Ratio_Facility * Ratio_Class_I_Area**

$$\text{where, SO}_2 \text{ Ratio_Facility} = \frac{\text{(Revised facility SO}_2 \text{ emissions)}}{\text{(Original facility SO}_2 \text{ emissions)}}$$

$$\text{where, Ratio_Class_I_Area} = \frac{\text{(Original sulfate + nitrate point contribution)}}{\text{(Revised sulfate + nitrate point contribution)}}$$

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Facility Ratios (KY, MS, NC, SC, TN, VA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 Ratio	NOx Ratio
KY	VISTAS	21113-550311	Big Town Electric Corp. - Wilton Station	1.000	1.000
KY	VISTAS	21091-752411	Cambium Aluminum of KY LLC	0.999	1.000
KY	VISTAS	21177-510671	Tennessee Valley Authority - Paradise Fossil Plant	0.999	0.999
KY	VISTAS	21145-661201	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1.000	1.000
MS	VISTAS	28059-938411	Chemur Products Company - Pascagoula Refinery	1.000	1.000
MS	VISTAS	28059-625101	Mississippi Power Company - Plant Victor J. Daniel	1.000	1.000
NC	VISTAS	37087-792011	Blue Ridge Paper Products - Canton Mill	0.999	0.999
NC	VISTAS	37017-804911	Durham Paper Company, LLC	1.000	1.000
NC	VISTAS	37015-837041	Duke Energy Carolinas, LLC - Marshall Steam Station	0.999	0.999
NC	VISTAS	37013-847931	PCS Phosphate Company, Inc. - Aurora	1.000	1.000
NC	VISTAS	37023-851301	SGI Carbon LLC	1.000	1.000
SC	VISTAS	45015-484811	ALLIANCE OF SOUTH CAROLINA	1.000	1.000
SC	VISTAS	45043-569661	INTERNATIONAL PAPER GEORGETOWN MILL	1.000	1.000
SC	VISTAS	45019-497861	KAPSTONE CHARLESTON KRAFT LLC	1.000	1.000
SC	VISTAS	45013-417041	SANTER COOPER LUDOWS GENERATING STATION	1.000	1.000
SC	VISTAS	45043-665281	SANTER COOPER WILKINSON GENERATING STATION	1.000	1.000
SC	VISTAS	45015-830671	SC&W WILLIAMS	1.000	1.000
TN	VISTAS	47093-407991	Cemex - Knoxville Plant	1.000	1.000
TN	VISTAS	47143-198211	EASTMAN CHEMICAL COMPANY	1.000	1.000
TN	VISTAS	47105-412921	TATE & LYLE, Loudon	0.999	0.999
TN	VISTAS	47001-619601	TVA BULL RUN FOSSIL PLANT	0.000	0.000
TN	VISTAS	47181-497911	TVA CUMBERLAND FOSSIL PLANT	1.000	1.000
TN	VISTAS	47145-497911	TVA KINGSTON FOSSIL PLANT	0.999	0.999
VA	VISTAS	51027-403481	Jewell Coke Company LP	1.000	1.000
VA	VISTAS	51280-578671	Meadwestvaco Packaging Resource Group	1.000	1.000
VA	VISTAS	51023-503811	Pennwoods Cement Company	1.000	1.000

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Facility Ratios (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility ID	FACILITY ID STD	FACILITY NAME STD	SO ₂ Ratio	NO _x Ratio
WV	VISTAS	54013-4071113	ALLIANCE ENERGY SUPPLY CO. LLC-HARRISON	0.57	0.51
WV	VISTAS	54049-484511	AMERICANBITUMINOUS POWER-GRANT TOWN PLT	0.57	0.51
WV	VISTAS	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	0.53	0.50
WV	VISTAS	54023-6207113	Dominion Resources, Inc. - MOUNT STORM POWER STATION	0.49	0.48
WV	VISTAS	54043-6903111	ECOUTRANS - COLEY RUN CS 70	1.00	1.00
WV	VISTAS	54083-6790711	PILES CREEK RC4340	1.00	1.00
WV	VISTAS	54083-6790511	SLADY RC4338	1.00	1.00
WV	VISTAS	54089-6827611	KINGSFORD MANUFACTURING COMPANY	1.00	1.00
WV	VISTAS	54081-18320111	LONGVIEW POWER	1.00	1.00
WV	VISTAS	54031-6902311	MITCHELL PLANT	0.56	0.51
WV	VISTAS	54081-6773611	MONONGAHELA POWER CO. - FORT MARTIN POWER	0.52	0.51
WV	VISTAS	54079-4782111	MONONGAHELA POWER CO. PLEASANTS POWER STA.	0.49	0.48
WV	VISTAS	54083-6773811	MORGANTOWN ENERGY ASSOCIATES	0.49	0.50
AR	CENRAP	05063-1083411	ENTERGY ARKANSAS INC. INDEPENDENCE PLANT	0.43	0.41
MO	CENRAP	29143-5308111	NEW MADRID POWER PLANT-MARSTON	0.48	0.48
MD	MANE-VUJ	33003-7103811	Luke Paper Company	0.49	1.00
PA	MANE-VUJ	42009-3860311	SENON NE MGMT. CO/KEYSTONE STA.	0.47	0.71
PA	MANE-VUJ	42063-3003111	HOMER CITY GEN LV/ CENTER TWP	0.75	0.81
PA	MANE-VUJ	42063-3003111	WING WILCOX/SAFE GEN/SEWARD/GEN STA.	0.75	0.71
IL	Midwest RPO	17127-7808111	Jopka Steam	0.52	0.54
IN	Midwest RPO	18173-8183111	Alcoa Warlick Power Pk Agc Div of AL	0.48	0.70
IN	Midwest RPO	18125-7362411	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	0.43	0.46
IN	Midwest RPO	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	0.43	0.50
IN	Midwest RPO	18125-7362411	INGECO AB Brown South Indiana Gas & Ele	0.48	0.70
OH	Midwest RPO	39033-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	0.48	0.50
OH	Midwest RPO	39031-8010811	Cornellville Power Plant (0615000000)	0.48	0.50
OH	Midwest RPO	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	0.46	0.49
OH	Midwest RPO	39033-8115711	General James M. Gavin Power Plant (0627010050)	0.48	0.50
OH	Midwest RPO	39033-7383111	Juno Valley Electric Corp. Upper Creek Station (0627000003)	0.48	0.50

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Sipsey Wilderness Area

State	Facility ID	Facility Name	DISTANCE, km	Sulfate AOI %	Sulfate PSAT %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	3.31%	1.61%	2.22%	0.97%	0.04%	0.04%	0.05%
OH	39053-8148511	General James M. Gavin Power Plant	690.9	0.38%	2.75%	1.99%	0.01%	0.09%	0.13%	
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	5.72%	4.09%	1.99%	0.31%	0.23%	0.31%	
IN	18051-7363111	Gibson	448.7	2.85%	2.12%	1.65%	0.27%	0.19%	0.18%	
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	444.4	1.72%	2.19%	1.57%	0.23%	0.23%	0.14%	
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	228.8	3.18%	1.07%	1.48%	0.48%	0.12%	0.17%	
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	314.5	3.48%	1.46%	1.34%	0.26%	0.06%	0.07%	
KY	21183-5561611	Big Rivers Electric Corp - Wilcox Station	945.5	1.99%	0.99%	1.28%	0.07%	0.04%	0.05%	
Facilities That Dropped Off After REVISION										
IL	17127-7808111	Jopka Steam	346.5	1.94%	1.51%	0.82%	0.25%	0.03%	0.02%	
IN	18173-8183111	ALCOA WARRICK POWER PLT AGC DIV OF AL	396.3	0.91%	1.02%	0.43%	0.62%	0.52%	0.19%	

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Class I Area Ratios

State	Class I Area	Ratio, Class I Area
AL	Sipsey Wilderness Area	1.382
FL	Chassahowitzka Wilderness Area	1.325
FL	Peeverglades NP	1.290
FL	St Marks Wilderness Area	1.363
GA	Cohutta Wilderness Area	1.363
GA	Dixie/Fenlee Wilderness Area	1.317
CA	Noll Island Wilderness	1.311
KY	Mammoth Cave NP	1.337
NC	Linnville Gorge Wilderness Area	1.411
NC	Shining Rock Wilderness Area	1.410
NC	Swainquarter Wilderness Area	1.398
SC	Cape Romain Wilderness	1.302
TN	Great Smoky Mountains NP	1.394
TN	Joyce Kilmer-Slickrock Wilderness	1.401
VA	James River-Face Wilderness	1.416
VA	Shenandoah NP	1.463
WV	Dolly Sods Wilderness	1.417
WV	Otter Creek Wilderness	1.412
AR	Caney Creek Wilderness Area	1.490
AR	Upper Buffalo Wilderness Area	1.490
LA	Breton Wilderness	1.306
ME	Acadia National Park	1.402
ME	Moosehorn Wilderness EDM	1.417
MI	Seney Wilderness Area	1.266
MO	Hercules-Glades Wilderness Area	1.450
MO	Mingo Wilderness Area	1.360
NH	Great Gulf Wilderness Area	1.463
NH	Presidential Range-Dry River Wilderness	1.463
NJ	Brigantine Wilderness Area	1.391
VT	Ice Brook Wilderness	1.471

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Chassahowitzka Wilderness Area

State	Facility ID	Facility Name	DISTANCE, km	Sulfate AOI %	Sulfate PSAT %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12017-6406111	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	63.62%	0.95%	6.24%	1.95%	0.40%	0.23%	
GA	13015-2811811	Ed Power Company - Plant Bowen	637.2	0.03%	1.72%	2.28%	0.00%	0.02%	0.03%	
FL	12057-5186111	TAMPA ELECTRIC COMPANY (TEC)	106.8	4.73%	0.96%	1.28%	0.24%	0.05%	0.07%	
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,098.0	0.03%	0.76%	1.01%	0.00%	0.04%	0.05%	
AL	01109-0887111	Standard Laid Co	471.3	0.15%	0.76%	1.00%	0.00%	0.01%	0.01%	
Facilities That Dropped Off After REVISION										
AR	05063-1083411	ENTERGY ARKANSAS INC. INDEPENDENCE PLANT	1,133.4	0.05%	1.47%	0.82%	0.00%	0.09%	0.04%	
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,099.6	0.03%	1.13%	0.53%	0.00%	0.04%	0.06%	
AL	01053-7440211	Escambia Operating Company LLC	530.7	0.21%	1.57%	0.41%	0.00%	0.01%	0.01%	

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EXAMPLE: New Madrid Power at SIPS

- Revised Facility Sulfate PSAT Results
= Original Facility Sulfate PSAT Results
* SO₂ Ratio_Facility * Ratio_Class_I_Area
- Original Facility Sulfate PSAT Results = 1.46%
- Revised Facility Sulfate PSAT Results
= 1.46% * 0.665 (slide 91) * 1.382 (slide 92)
= 1.34% (slide 94)

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Everglades NP

State	Facility ID	Facility Name	DISTANCE, km	Sulfate AOI %	Sulfate PSAT %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12057-5186111	TAMPA ELECTRIC COMPANY (TEC)	916.6	3.02%	2.56%	3.30%	0.08%	0.00%	0.00%	
FL	12105-5186111	MOSAIC FERTILIZER, LLC	304.7	2.21%	2.08%	2.62%	0.01%	0.00%	0.00%	
FL	12105-7177111	MOSAIC FERTILIZER, LLC	808.3	2.26%	3.55%	2.60%	0.02%	0.00%	0.00%	
FL	12086-8999111	TARMAC AMERICA LLC	61.7	0.16%	0.17%	0.23%	2.02%	0.76%	2.63%	

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St Marks Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
GA	13015-2813011	Ge Power Company - Plant Bowen	452.9	0.38%	3.59%	4.89%	0.01%	0.03%	0.03%
FL	12005-535411	ROCKTENN CP LLC	140.8	8.54%	3.38%	4.60%	0.24%	0.09%	0.13%
AL	01109-885711	Sanders Lead Co	235.9	3.08%	0.82%	1.12%	0.00%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
AL	03097-3056121	Whe Power - Barry	353.1	1.67%	1.43%	0.97%	0.01%	0.02%	0.03%
AL	03053-7440211	Exxonmoba Operating Company LLC	325.6	5.95%	3.53%	0.96%	0.01%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	908.4	0.33%	1.67%	0.80%	0.00%	0.01%	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,251.0	0.29%	1.29%	0.65%	0.01%	0.00%	0.00%
AL	01053-985111	Exxonmoba Operating Company LLC	315.0	0.00%	1.68%	0.02%	0.00%	0.00%	0.00%

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Wolf Island Wilderness

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12089-733711	ROCK TENN CP, LLC	74.9	8.56%	1.79%	2.33%	0.39%	0.11%	0.14%
GA	13015-2813011	Ge Power Company - Plant Bowen	458.1	1.08%	1.78%	2.33%	0.63%	0.04%	0.05%
GA	13127-8721011	Brunswick Cellulose Inc	27.9	8.84%	1.94%	1.76%	2.54%	0.10%	0.13%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	845.3	1.71%	2.51%	1.72%	0.02%	0.02%	0.02%
GA	13051-3679811	International Paper - Savannah	85.9	7.53%	1.18%	1.54%	0.04%	0.07%	0.09%
SC	45015-4120411	Santee Cooper Cross Generating Station	251.0	1.59%	0.99%	1.80%	0.09%	0.06%	0.08%
FL	12081-440211	JEK Plant	105.1	4.43%	0.96%	1.25%	0.09%	0.03%	0.06%
SC	45015-4834911	ALUMAK OF SOUTH CAROLINA	223.0	1.84%	0.95%	1.23%	0.00%	0.03%	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,048.6	0.84%	2.37%	1.15%	0.01%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	876.1	0.07%	1.25%	0.76%	0.00%	0.02%	0.02%
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	173.6	1.97%	1.05%	0.67%	0.01%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	899.0	0.37%	1.38%	0.64%	0.00%	0.02%	0.03%

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Cohutta Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant	512.0	1.71%	3.41%	2.44%	0.02%	0.05%	0.07%
GA	13015-2813011	Ge Power Company - Plant Bowen	78.0	19.58%	1.96%	2.13%	1.13%	0.88%	0.04%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	497.2	2.18%	1.05%	1.44%	0.67%	0.81%	0.02%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	4.68%	2.84%	1.37%	0.13%	0.03%	0.04%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	1.05%	2.06%	1.31%	0.06%	0.03%	0.04%
TN	47183-3982311	EASTMAN CHEMICAL COMPANY	268.8	0.99%	0.93%	1.23%	0.09%	0.07%	0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	801.1	0.14%	2.06%	1.03%	0.00%	0.01%	0.01%
IN	18051-7363111	Gibson	487.1	2.31%	1.35%	1.03%	0.10%	0.02%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	477.0	2.18%	1.19%	0.84%	0.16%	0.03%	0.02%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	124.0	2.17%	1.10%	0.94%	0.13%	0.06%	0.02%

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Mammoth Cave NP

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	16.88%	3.57%	1.68%	2.60%	0.26%	0.33%
IN	18051-7363111	Gibson	198.2	5.21%	2.16%	1.63%	1.20%	0.35%	0.33%
KY	21145-6037011	Big Rivers Electric Corp - Wilson Station	89.9	6.72%	1.07%	1.42%	0.37%	0.06%	0.08%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	1.60%	0.96%	1.13%	0.15%	0.14%	0.19%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	312.7	0.66%	1.29%	1.14%	0.04%	0.07%	0.09%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	182.9	3.09%	1.50%	1.03%	0.56%	0.40%	0.27%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	256.1	1.21%	1.43%	0.89%	0.14%	0.11%	0.12%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	406.5	1.45%	1.15%	0.81%	0.04%	0.02%	0.02%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	498.6	0.30%	1.15%	0.65%	0.04%	0.05%	0.02%
IN	18173-8183111	ALCOA WARRICK POWER PLT AGC DIV OF AL	136.1	2.00%	1.03%	0.40%	1.74%	0.82%	0.30%
IN	18129-8166111	Sigeco AB Brown South Indiana Gas & Ele	162.9	2.73%	1.16%	0.00%	0.27%	0.06%	0.00%

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Okefenokee Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS,INC	71.5	14.63%	4.32%	2.77%	0.89%	0.82%	0.01%
GA	13015-2813011	Ge Power Company - Plant Bowen	458.1	1.02%	1.74%	2.80%	0.05%	0.04%	0.05%
FL	12123-732411	BUCKEYE FLORIDA, UNITED PARTNERSHIP	133.5	2.18%	1.64%	2.16%	0.14%	0.11%	0.14%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.46%	2.19%	1.51%	0.01%	0.01%	0.01%
FL	12089-733711	ROCK TENN CP, LLC	64.8	12.82%	1.00%	1.31%	0.88%	0.11%	0.15%
SC	45015-4120411	Santee Cooper Cross Generating Station	348.1	0.85%	0.89%	1.18%	0.09%	0.08%	0.04%
GA	13051-3679811	International Paper - Savannah	178.9	2.81%	0.75%	1.04%	0.08%	0.09%	0.06%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	939.4	0.23%	0.78%	1.03%	0.00%	0.03%	0.04%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,129.0	0.46%	2.09%	1.02%	0.01%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	921.9	0.09%	1.34%	0.83%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	915.7	0.55%	1.40%	0.65%	0.01%	0.02%	0.03%

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Linville Gorge Wilderness Area

State	Facility ID	Facility Name	DISTANCE_km	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
TN	47183-3982311	EASTMAN CHEMICAL COMPANY	81.9	19.21%	1.87%	4.05%	0.68%	0.07%	0.10%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	329.2	5.90%	4.67%	3.46%	0.04%	0.01%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	567.5	0.94%	3.49%	1.82%	0.00%	0.00%	0.00%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.28%	0.95%	1.34%	0.00%	0.01%	0.02%
TN	47181-4979311	TVA CUMBERLAND FOSSIL PLANT	516.6	0.11%	0.85%	1.20%	0.00%	0.01%	0.01%
GA	13015-2813011	Ge Power Company - Plant Bowen	340.9	0.53%	0.80%	1.13%	0.62%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	1.18%	2.22%	1.10%	0.01%	0.07%	0.09%
IN	18051-7363111	Gibson	582.3	0.67%	1.35%	1.07%	0.01%	0.07%	0.07%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	688.6	0.03%	1.11%	1.04%	0.00%	0.00%	0.00%
VA	51073-4034811	Jenell Coke Company LLP	140.4	5.84%	0.73%	1.05%	0.03%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	856.4	0.29%	1.43%	0.86%	0.00%	0.01%	0.00%
MD	24002-7763611	Luke Paper Company	453.0	0.23%	1.37%	0.82%	0.00%	0.00%	0.00%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	550.5	0.36%	1.12%	0.82%	0.01%	0.07%	0.05%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	380.3	2.82%	1.00%	0.66%	0.03%	0.02%	0.03%

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Shining Rock Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	397.3	1.39%	3.26%	2.41%	0.01%	0.01%	0.01%
KY	21145-6097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	578.4	0.47%	1.16%	1.63%	0.01%	0.02%	0.02%
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	454.1	0.54%	0.93%	1.32%	0.02%	0.01%	0.02%
GA	13015-2813011	Ga Power Company - Plant Bowen	241.6	1.70%	0.92%	1.29%	0.07%	0.01%	0.01%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	625.2	0.36%	1.37%	1.28%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	473.3	0.70%	2.55%	1.27%	0.01%	0.07%	0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	657.6	0.49%	2.36%	1.23%	0.00%	0.00%	0.00%
IN	18051-7363111	Gibson	554.2	0.29%	1.55%	1.23%	0.01%	0.07%	0.07%
NC	37087-7920911	Blue Ridge Paper Products - Canton Mill	16.9	41.23%	2.14%	3.08%	6.45%	0.87%	0.10%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	1.37%	1.59%	1.05%	0.03%	0.01%	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.13%	1.74%	1.04%	0.00%	0.01%	0.01%
TN	47161-4979311	EASTMAN CHEMICAL COMPANY	136.9	4.43%	0.74%	2.04%	0.40%	0.82%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	529.0	0.18%	1.12%	0.82%	0.01%	0.11%	0.08%
IL	17227-7808911	Joppe Steam	582.4	0.23%	1.07%	0.59%	0.00%	0.01%	0.00%

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Great Smoky Mountains NP

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	2.25%	5.10%	3.72%	0.04%	0.02%	0.02%
KY	21145-6097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.8	1.34%	0.94%	1.32%	0.02%	0.06%	0.08%
TN	47161-4979311	EASTMAN CHEMICAL COMPANY	160.1	6.01%	0.88%	1.22%	0.19%	0.04%	0.05%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	688.2	0.11%	2.31%	1.19%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	1.19%	0.21%	0.19%	0.25%
IN	18051-7363111	Gibson	456.3	1.25%	1.34%	1.05%	0.07%	0.27%	0.27%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	1.84%	1.50%	0.98%	0.09%	0.02%	0.02%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	435.6	1.48%	1.08%	0.78%	0.12%	0.29%	0.20%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.19%	1.22%	0.72%	0.02%	0.01%	0.00%
TN	47161-4979311	TVA KINGSTON FOSSIL PLANT	60.0	7.38%	1.23%	0.38%	0.71%	0.08%	0.03%

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Swanquarter Wilderness Area

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	640.2	3.00%	6.66%	3.44%	0.08%	0.08%	0.09%
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	52.5	97.89%	2.16%	3.62%	0.57%	0.89%	0.06%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	651.5	1.77%	2.74%	2.01%	0.06%	0.09%	0.06%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.35%	1.00%	1.86%	0.02%	0.03%	0.06%
MD	24001-7763811	Luke Paper Company	512.5	0.43%	2.88%	1.75%	0.02%	0.05%	0.06%
WV	54039-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	368.8	0.67%	1.19%	1.71%	0.08%	0.10%	0.12%
PA	42063-3005211	POWER CITY GEN LP/ CENTER TWP	620.1	0.55%	1.27%	1.38%	0.05%	0.05%	0.07%
WV	54078-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	623.7	0.84%	1.22%	1.17%	0.07%	0.08%	0.09%
GA	13015-2813011	Ga Power Company - Plant Bowen	810.6	0.15%	0.74%	1.03%	0.00%	0.82%	0.03%
NC	37117-8049311	Dominar Paper Company, LLC	69.0	2.17%	0.72%	1.00%	1.02%	0.14%	0.20%
Facilities That Dropped Off After REVISION									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,005.3	0.34%	1.69%	0.83%	0.02%	0.09%	0.04%

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Joyce Kilmer-Slickrock Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	425.1	4.73%	4.69%	3.45%	0.05%	0.01%	0.01%
KY	21145-6097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.84%	0.99%	1.38%	0.09%	0.07%	0.10%
TN	47161-4979311	EASTMAN CHEMICAL COMPANY	179.2	9.88%	0.93%	1.30%	0.18%	0.82%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	711.0	0.27%	2.17%	1.12%	0.00%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	4.33%	2.27%	1.12%	0.14%	0.16%	0.22%
GA	13015-2813011	Ga Power Company - Plant Bowen	166.2	3.61%	0.79%	1.11%	0.10%	0.01%	0.01%
IN	18051-7363111	Gibson	471.7	2.00%	1.29%	1.02%	0.11%	0.21%	0.21%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	3.63%	1.53%	1.00%	0.06%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	1.58%	1.36%	0.81%	0.05%	0.02%	0.01%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	453.0	2.16%	1.00%	0.72%	0.14%	0.23%	0.16%
TN	47161-4979311	TVA KINGSTON FOSSIL PLANT	73.7	7.86%	1.24%	0.39%	0.57%	0.10%	0.03%

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Cape Romain Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
SC	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	29.3	30.18%	2.86%	2.73%	2.74%	0.23%	0.33%
GA	13015-2813011	Ga Power Company - Plant Bowen	506.2	0.36%	2.71%	2.53%	0.01%	0.10%	0.14%
SC	45013-4834611	ALUMAX OF SOUTH CAROLINA	39.1	17.07%	1.79%	2.33%	0.08%	0.82%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	857.1	0.30%	4.74%	2.26%	0.00%	0.01%	0.01%
SC	45013-4120411	SANTEE COOPER CROSS GENERATING STATION	63.8	6.37%	1.73%	2.23%	0.43%	0.21%	0.27%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	701.0	0.84%	3.18%	2.17%	0.00%	0.03%	0.04%
SC	45048-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	37.4	4.31%	1.26%	1.64%	0.35%	0.11%	0.13%
SC	45048-6652811	SANTEE COOPER WYNNAH GENERATING STATION	51.4	4.60%	1.02%	1.33%	0.38%	0.13%	0.17%
GA	13015-2813011	International Paper - Savannah	164.1	1.76%	0.99%	1.28%	0.64%	0.89%	0.06%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.11%	1.14%	0.69%	0.00%	0.04%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	868.3	0.06%	1.18%	0.54%	0.00%	0.07%	0.08%

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James River Face Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	7.66%	5.44%	4.04%	0.14%	0.08%	0.11%
WV	54039-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	2.76%	2.51%	3.65%	0.38%	0.12%	0.14%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	1.35%	1.92%	3.61%	0.04%	0.02%	0.06%
WV	54078-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	3.87%	2.38%	2.26%	0.13%	0.03%	0.09%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	223.5	3.50%	2.46%	1.93%	0.13%	0.09%	0.11%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	317.1	2.38%	2.88%	1.51%	0.06%	0.03%	0.04%
VA	51580-5798711	Meacham Packaging Resource Group (0627000003)	66.5	12.64%	1.02%	1.43%	1.14%	0.15%	0.22%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	270.0	0.63%	0.66%	1.18%	0.16%	0.04%	0.04%
WV	54051-6902811	MITCHELL PLANT	269.6	0.68%	0.97%	1.05%	0.83%	0.02%	0.04%
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	435.2	1.89%	1.39%	0.52%	0.05%	0.05%	0.06%
IN	18051-7363111	Gibson	729.4	0.59%	1.02%	0.82%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	663.5	0.56%	1.33%	0.66%	0.03%	0.01%	0.02%

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Shenandoah NP

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	249.8	11.83%	8.89%	4.81%	0.10%	0.05%	0.06%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	1.53%	2.32%	4.50%	0.06%	0.05%	0.12%
WV	54093-6271711	MONONGAHELA POWER CO-PLEASANTS POWER STA	189.7	4.60%	2.75%	4.14%	0.99%	0.37%	0.46%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	5.25%	4.88%	3.75%	0.14%	0.10%	0.14%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	4.97%	2.20%	2.20%	0.24%	0.18%	0.23%
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	230.4	2.60%	1.56%	1.78%	0.13%	0.04%	0.06%
MD	24001-7763811	Luke Paper Company	118.4	6.90%	2.20%	1.41%	0.23%	0.09%	0.14%
PA	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	215.5	1.80%	1.00%	1.12%	0.04%	0.02%	0.02%
WV	54093-6902811	MITCHELL PLANT	281.4	1.44%	0.86%	1.01%	0.13%	0.08%	0.14%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	324.1	0.43%	0.55%	1.01%	0.16%	0.06%	0.06%
Facilities That Dropped Off After REVISION									
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	184.4	2.41%	1.06%	0.97%	1.27%	0.47%	0.60%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	505.4	1.11%	1.28%	0.87%	0.21%	0.05%	0.06%
WV	54079-6789211	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	295.6	2.09%	1.04%	0.84%	0.09%	0.09%	0.13%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	755.8	0.71%	1.46%	0.76%	0.03%	0.02%	0.03%

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Non-VISTAS Class I Areas

- Only two VISTAS facilities have a contribution $\geq 1.00\%$ at any non-VISTAS Class I Area
- ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON (WV)**
 - Moosehorn Wilderness EDM (1.06% sulfate)
- Tennessee Valley Authority (TVA) - Shawnee Fossil Plant (KY)**
 - Caney Creek Wilderness Area (1.09% sulfate)
 - Hercules-Glades Wilderness Area (1.95% sulfate)
 - Mingo Wilderness Area (1.47% sulfate)
 - Great Gulf Wilderness Area (1.03% sulfate)
 - Presidential Range-Dry River Wilderness (1.03% sulfate)

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Dolly Sods Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
WV	54093-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	89.6	13.98%	4.94%	7.18%	1.86%	0.26%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	233.8	7.62%	6.56%	4.88%	0.10%	0.03%	0.05%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	4.64%	4.32%	4.19%	0.16%	0.07%	0.10%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	1.36%	2.14%	4.02%	0.03%	0.01%	0.03%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	1.40%	2.25%	1.40%	0.02%	0.04%	0.05%
WV	54093-6902811	MITCHELL PLANT	144.2	1.45%	1.28%	1.42%	0.07%	0.02%	0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	172.8	4.12%	2.43%	1.27%	0.03%	0.00%	0.00%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	234.9	0.62%	0.66%	1.18%	0.11%	0.02%	0.02%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	219.8	3.56%	1.45%	1.14%	0.11%	0.01%	0.08%
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	79.8	6.39%	1.27%	1.13%	1.07%	0.18%	0.23%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	847.6	0.32%	0.74%	1.05%	0.00%	0.03%	0.02%
Facilities That Dropped Off After REVISION									
IN	18015-7658112	Gibson	729.5	0.04%	1.24%	0.99%	0.02%	0.04%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	676.3	0.44%	1.93%	0.97%	0.01%	0.00%	0.03%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	682.6	0.58%	1.00%	0.77%	0.02%	0.04%	0.07%
OH	39012-8010811	Conneville Power Plant (0616000001)	242.3	0.71%	1.09%	0.00%	0.12%	0.08%	0.07%

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VISTAS Facilities $\geq 1.00\%$

State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
IL	01109-801711	Bardonia Lead Co	CHAS, SAMO
FL	12123-752411	BUCKEYE FLORIDA LIMITED PARTNERSHIP	OKEF
FL	12017-440611	DUKE ENERGY FLORIDA, INC. (DEF)	CHAS
FL	12011-440211	JEA	WOLF
FL	12105-717711	MOSAIC FERTILIZER LLC	EVER
FL	12105-419811	MOSAIC FERTILIZER, LLC	EVER
FL	12089-751711	ROCK TWIN CO. LLC	OKEF, WOLF
FL	12005-535411	ROCKTOWN CP LLC	SAMA
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	CHAS, EVER
FL	12086-809911	TANIMAC AMERICA LLC	EVER
FL	12047-789711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	OKEF
GA	13127-3721011	Brunswick Cellulose Inc.	WOLF
GA	13015-2613011	Ex Power Company - Plant Bowen	CHAS, COHU, JKSR, LUGO, OKEF, ROMA, SAMA, SHRO, SWAN, WOLF
GA	13051-8679611	International Paper - Savannah	OKEF, ROMA, WOLF
KY	21183-5561611	Big Rivers Electric Corp. - Wilson Station	MACA, SIPS
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	CACR, CHAS, COHU, DOSO, GRSM, GRMA, HELL, JKSR, LUGO, MACA, MINGO, OKEF, OTCR, PRED, SHRO, SIPS
NC	37087-7920511	Blue Ridge Paper Products - Canton Mill	SHRO
NC	37117-8049111	Dorland Paper Company, LLC	SWAN
NC	37011-8479111	PCL Phosphate Company, Inc. - Aurora	SWAN
SC	45015-4834911	ALUMAX OF SOUTH CAROLINA	ROMA, WOLF
SC	45043-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	ROMA
SC	45013-4978611	KAYSTONE CHARLESTON GRAPT LLC	ROMA
SC	45013-4120411	SANTEE COOPER CROSS GENERATING STATION	OKEF, ROMA, WOLF
SC	45043-6652811	SANTEE COOPER WINNAP GENERATING STATION	ROMA
TN	47169-2962111	EASTMAN CHEMICAL COMPANY	COHU, GRSM, JKSR, LUGO, SHRO
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	LUGO, SHRO, SIPS
VA	51027-4034811	Jewell Coke Company LLP	SHRO
VA	51040-5786711	ResidentTwo Packaging Resources Group	JARI
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	DOSO, JARI, MOOS, OTCR, SHEN, SWAN
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	DOSO, JARI, OTCR
WV	54011-4902111	MITCHELL PLANT	DOSO, JARI, OTCR, SHEN
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	DOSO, OTCR
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	DOSO, JARI, OTCR, SHEN, SWAN

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Otter Creek Wilderness

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
WV	54093-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	17.37%	4.49%	6.91%	1.81%	0.28%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	10.46%	7.08%	5.25%	0.18%	0.04%	0.06%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	8.19%	4.95%	4.24%	0.30%	0.08%	0.12%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	1.94%	2.03%	2.81%	0.05%	0.02%	0.04%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	1.12%	2.40%	1.58%	0.02%	0.06%	0.06%
WV	54093-6902811	MITCHELL PLANT	136.8	1.56%	1.40%	1.56%	0.06%	0.08%	0.09%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	4.36%	1.67%	1.31%	0.12%	0.02%	0.04%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	215.3	0.85%	0.71%	1.27%	0.20%	0.02%	0.02%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	826.5	0.18%	0.77%	1.09%	0.00%	0.01%	0.02%
IN	18015-7658112	Gibson	709.7	0.24%	1.27%	1.01%	0.01%	0.05%	0.05%
WV	54061-6773611	MONONGAHELA POWER CO- FORT MARTIN POWER	82.7	4.98%	1.14%	2.00%	0.92%	0.20%	0.24%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	655.7	0.64%	2.01%	1.00%	0.01%	0.03%	0.04%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	186.5	3.73%	1.91%	1.00%	0.03%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	663.0	0.23%	1.07%	0.79%	0.02%	0.04%	0.07%
OH	39012-8010811	Conneville Power Plant (0616000001)	232.8	1.12%	1.07%	0.00%	0.17%	0.08%	0.07%

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Non-VISTAS Facilities $\geq 1.00\%$

State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
AR	05063-1084111	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	SHRO
IN	18051-7363111	Gibson	COHU, GRSM, JKSR, LUGO, MACA, OTCR, SHRO, SIPS
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	COHU, GRSM, JKSR, LUGO, MACA, OTCR, SHRO, SIPS
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	MACA, SIPS
MD	24001-7763811	Luke Paper Company	SHEN, SWAN
MO	29543-3638311	NEW MADRID POWER PLANT-MARSTON	LUGO, MACA, SHRO, SIPS
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	DOSO, JARI, OTCR, SHEN, SWAN
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	COHU, DOSO, JKSR, OTCR, SHRO
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	COHU, DOSO, GRSM, JARI, JKSR, LUGO, OKEF, OTCR, ROMA, SHEN, SHRO, SIPS, SWAN, WOLF
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	DOSO, JARI, OTCR, SHEN
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	COHU, DOSO, GRSM, JARI, JKSR, LUGO, OKEF, OTCR, ROMA, SHEN, SHRO, SWAN, WOLF
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	SHEN, SWAN
PA	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	SHEN

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EPA Guidance (August 20, 2019)

- Many facilities already have effective emission control technologies in place. States will consider control options for these facilities on a case-by-case basis.
 - “For the purpose of SO₂ control measures, an EGU that has add-on flue gas desulfurization (FGD) and that meets the applicable alternative SO₂ emission limit of the 2012 Mercury Air Toxics Standards (MATS) rule for power plants. The two limits in the rule (0.2 lb/MMBtu for coal-fired EGUs or 0.3 lb/MMBtu for EGUs fired with oil-derived solid fuel) are low enough that it is unlikely that an analysis of control measures for a source already equipped with a scrubber and meeting one of these limits would conclude that even more stringent control of SO₂ is necessary to make reasonable progress.”
 - “For the purposes of SO₂ and NO_x control measures, a combustion source (e.g., an EGU or industrial boiler or process heater) that, during the first implementation period, installed a FGD system that operates year-round with an effectiveness of at least 90 percent or by the installation of a selective catalytic reduction system that operates year-round with an overall effectiveness of at least 90 percent (in both cases calculating the effectiveness as the total for the system, including any bypassed flue gas), on a pollutant-specific basis.”

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Remaining VISTAS Work Schedule

Task	Schedule
2028 Point Emissions Updates	Completed
2028 Emissions Processing	Late April, 2020
2028 CAMx Modeling	Late June, 2020
2028 Visibility Projections	Mid-July, 2020
2028 Deposition Projections	Mid-July, 2020
Final Reports and Documentation	Late July, 2020
Website Updates and Postings	Late July, 2020
End of Contract	September 30, 2020
Regional Haze SIPs Due to EPA	July 31, 2021

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Additional Considerations

- The final list of four-factor analysis sources will be determined in consultation with the FLMS, EPA, other states, and stakeholders.
- Some VISTAS states may perform additional four-factor analyses for sources not listed on Slide 113.
- States will verify projected SO₂ and NO_x emissions with facilities. PSAT results can be adjusted to match.
- Some states may allow their facilities to take a permit limit that will result in adjusted PSAT impacts below the 1.00% threshold in lieu of performing a four-factor analysis.
- The large number of coal-fired EGU retirements and fuel switching from coal to natural gas needs to be considered along with the sources selected for the four-factor analysis. States should not be penalized for early action.

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Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
- For general, contract, and funding questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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Next Steps and Schedule

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west virginia department of environmental protection

Appendix F-3j

VISTAS Regional Haze Project Update to FLMs, EPA OAQPS, Region 3, Region 4, MJOs May 11, 2020

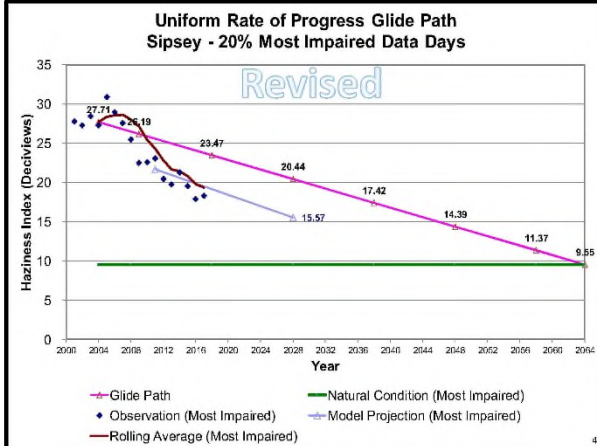
West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

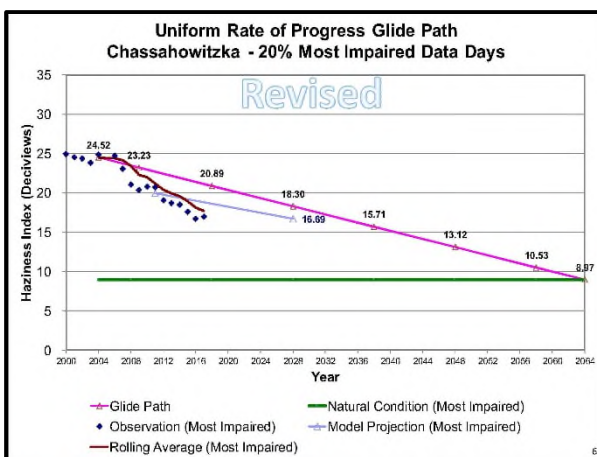
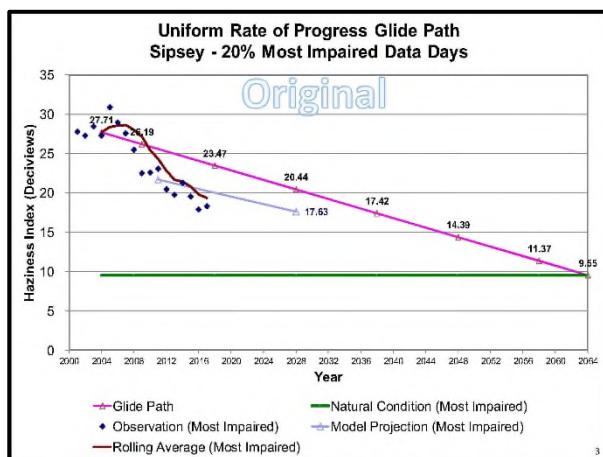
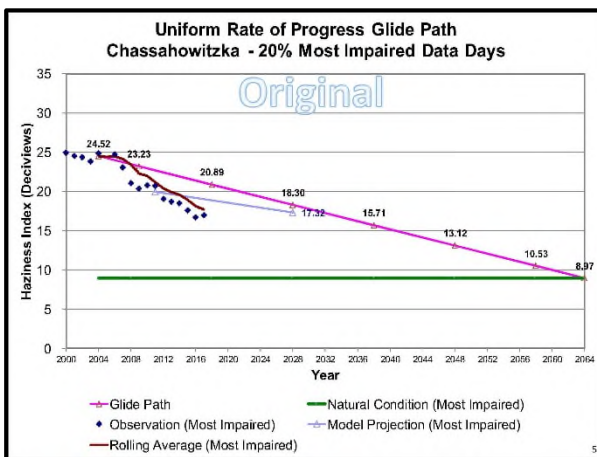
VISTAS Regional Haze Project Update, Part 1 URP Glide Path Adjustments

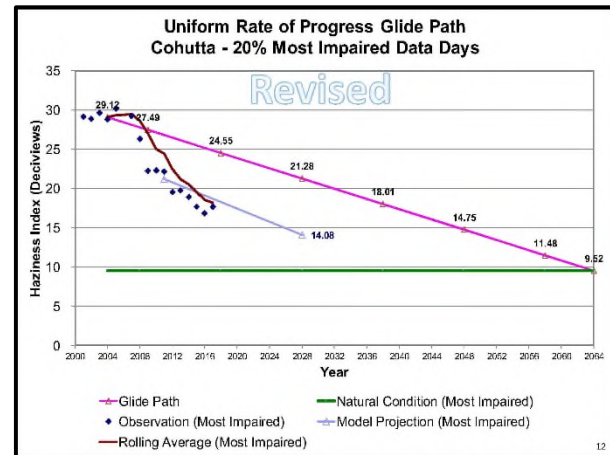
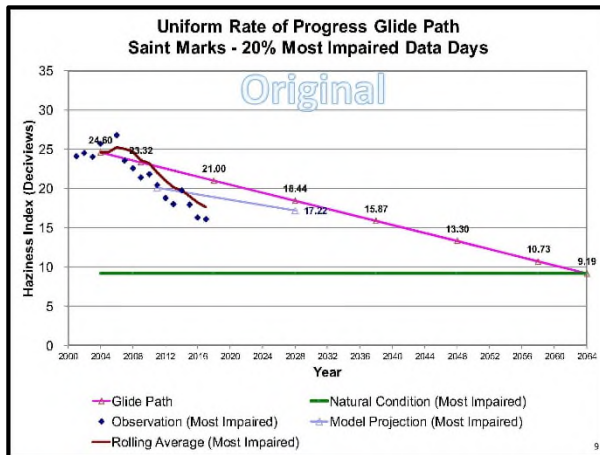
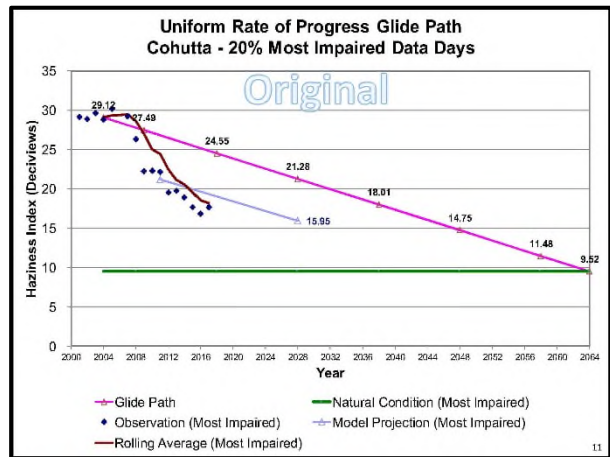
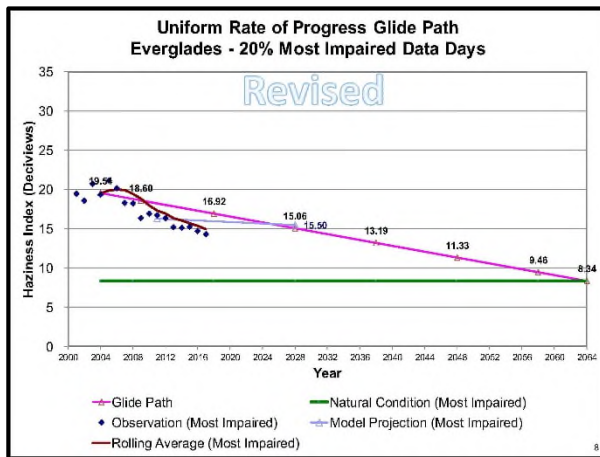
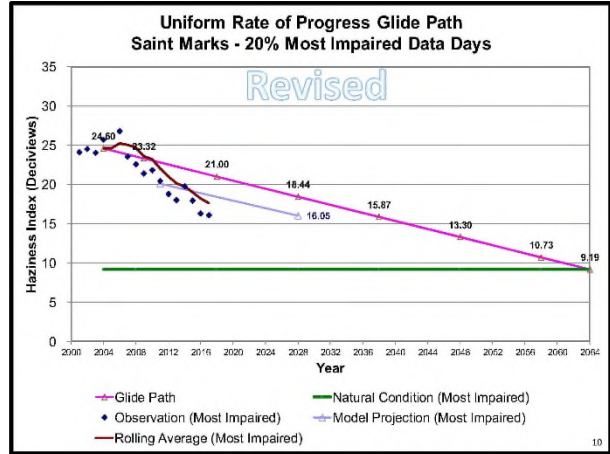
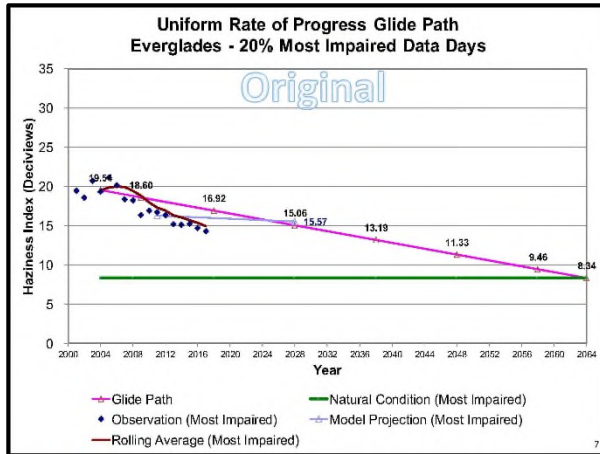


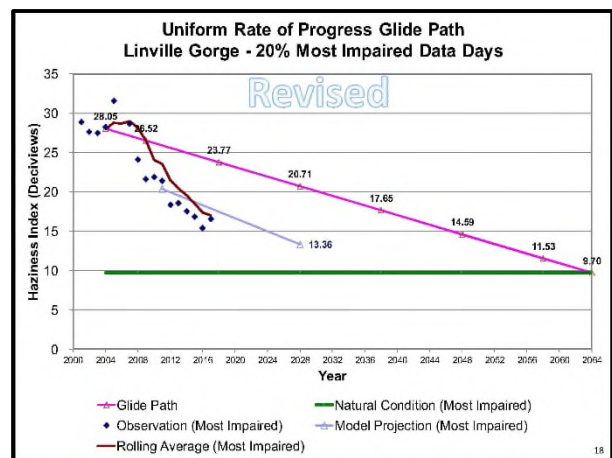
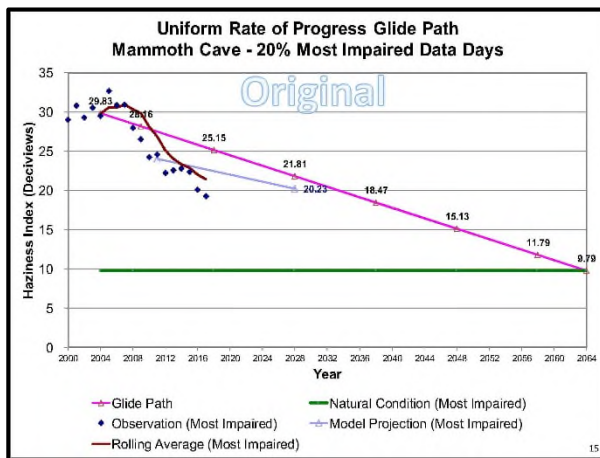
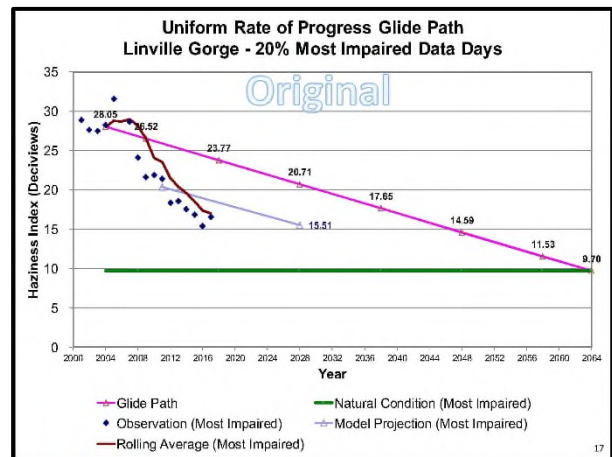
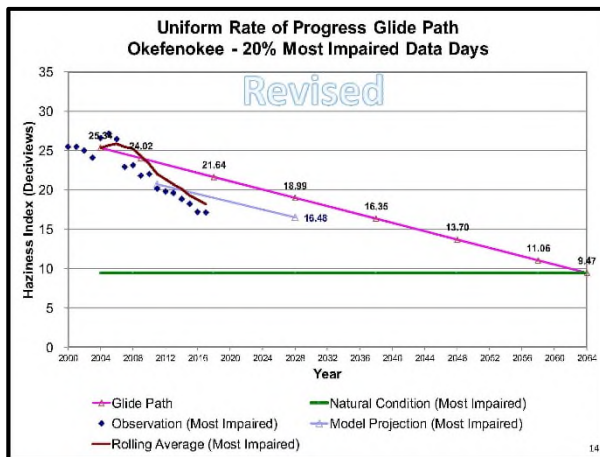
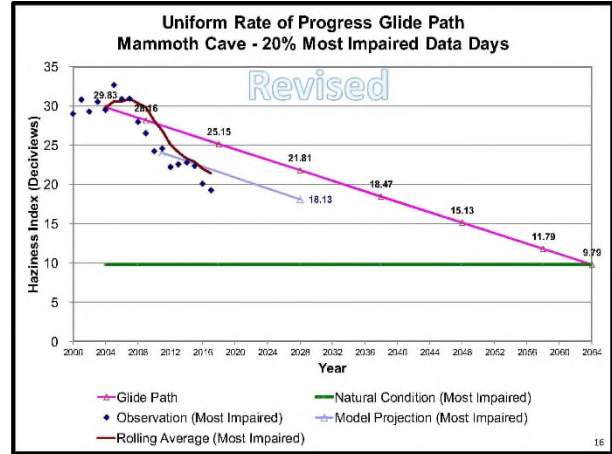
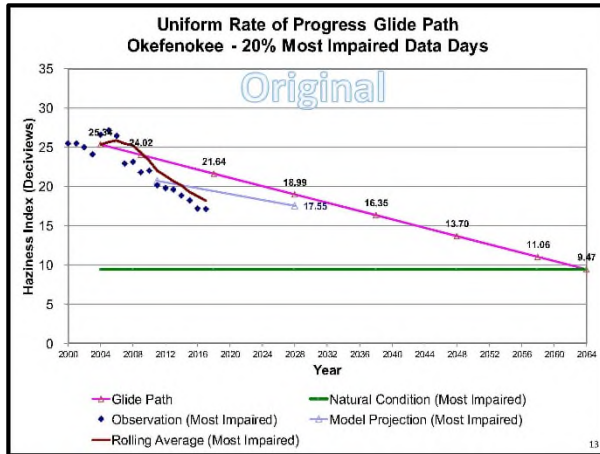
FLM/EPA Briefing
Jim Boylan
May 11, 2020

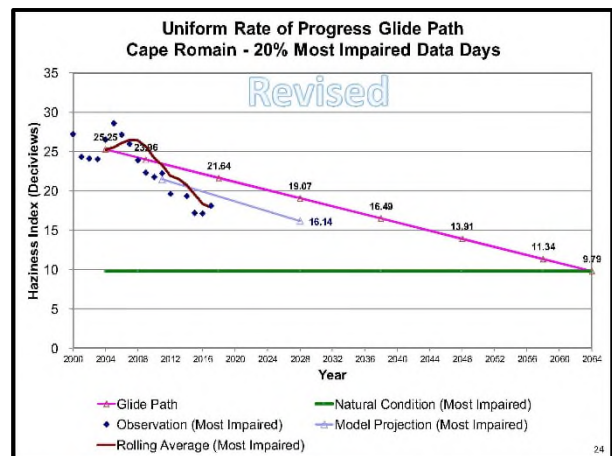
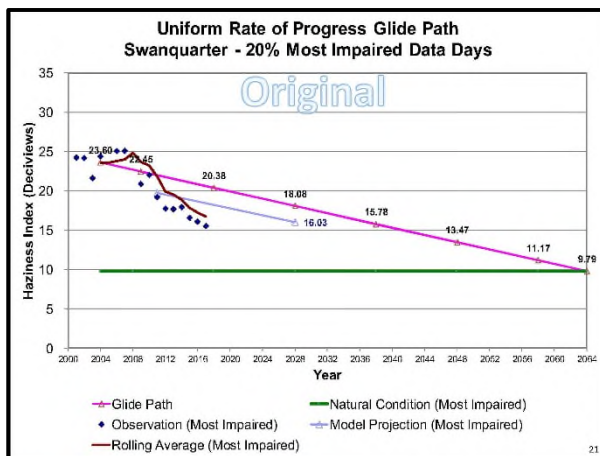
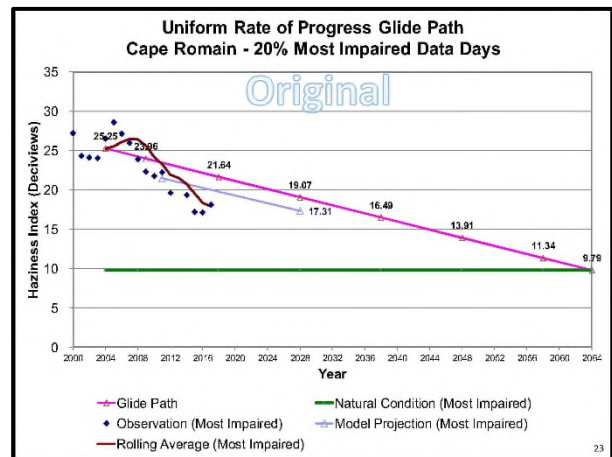
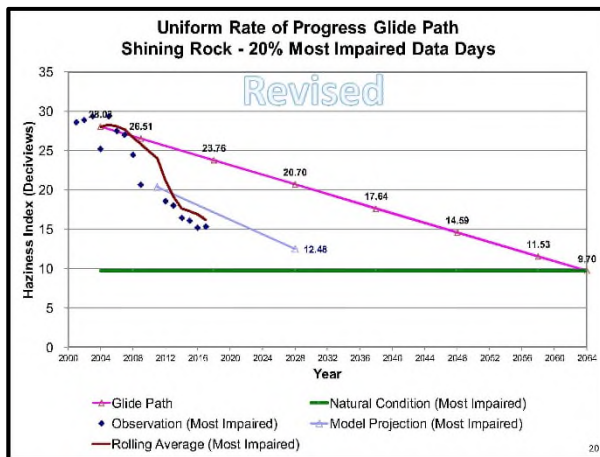
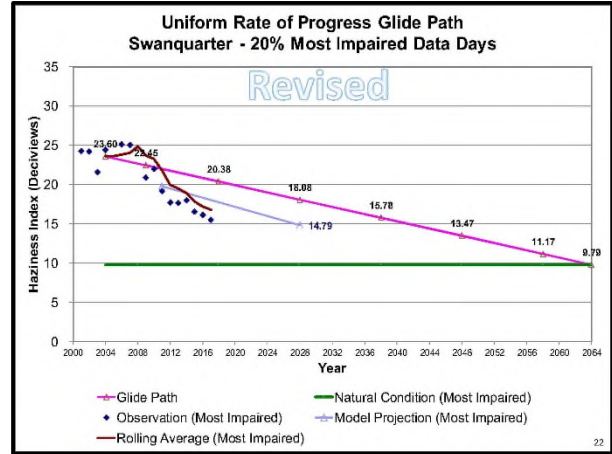
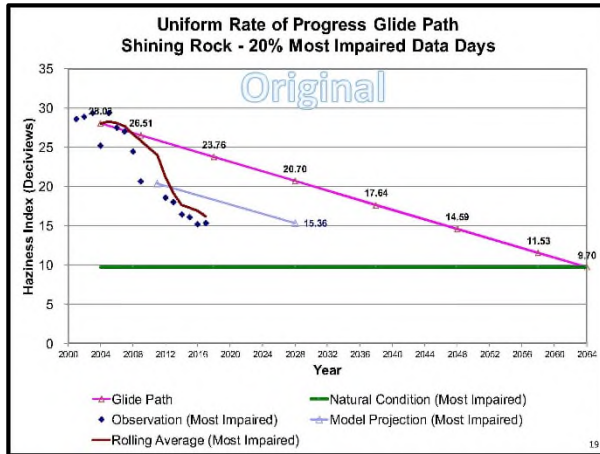


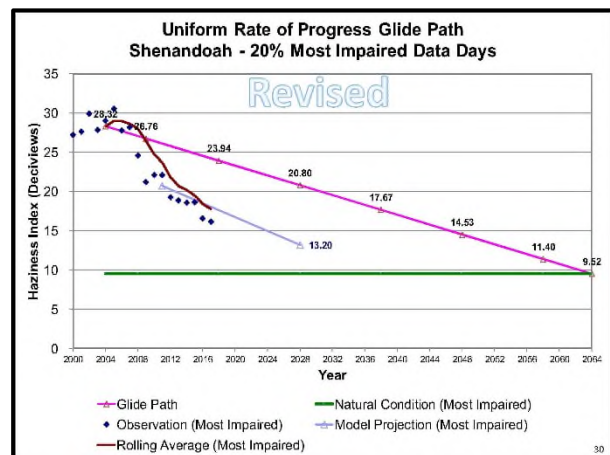
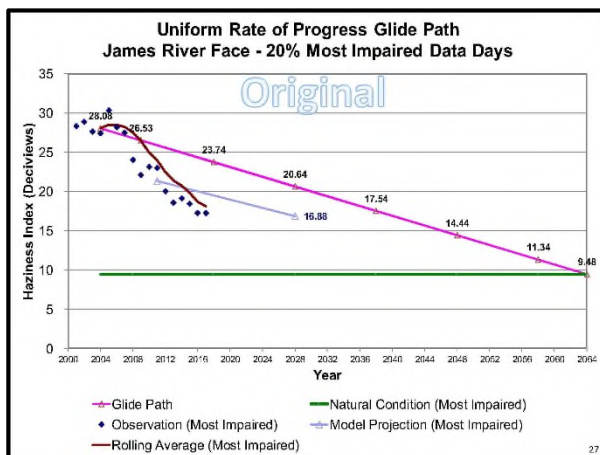
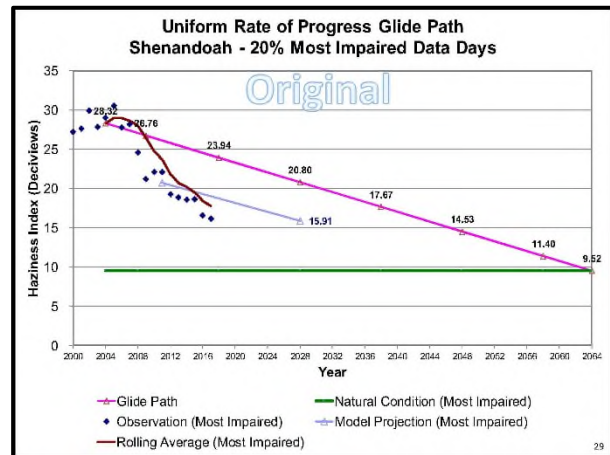
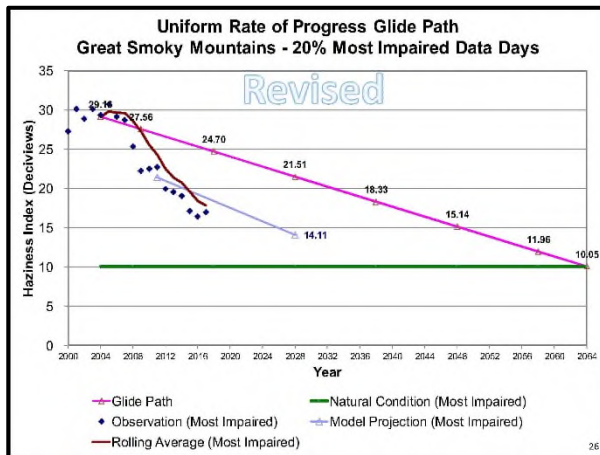
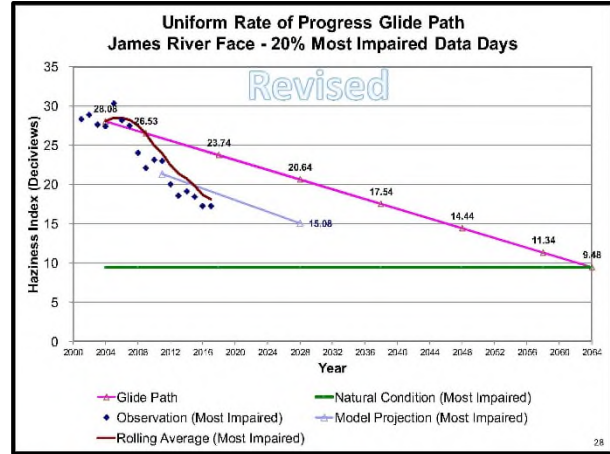
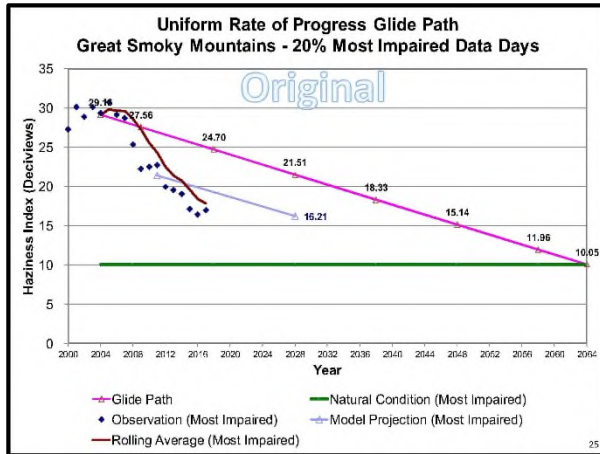
ORIGINAL AND REVISED 2028 MODEL PROJECTIONS

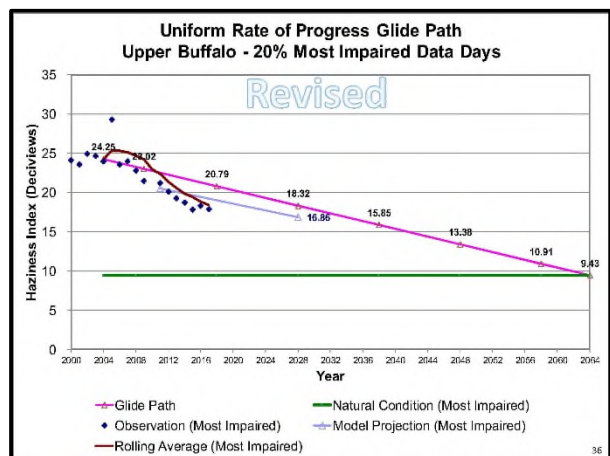
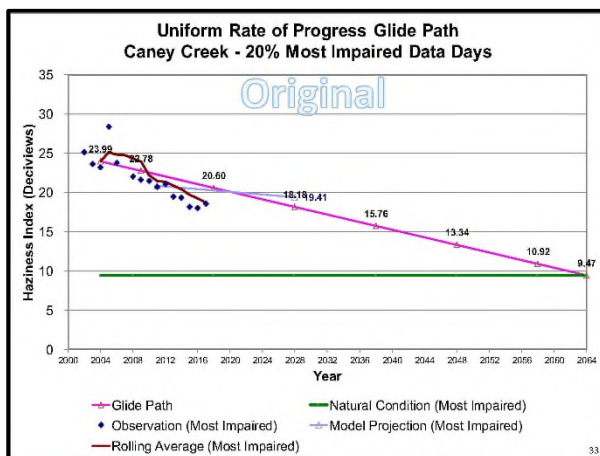
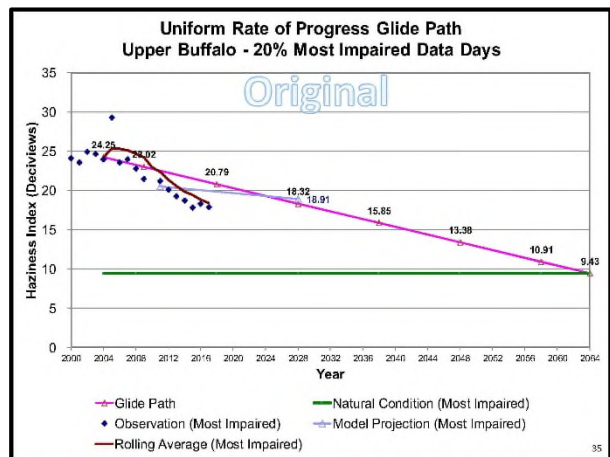
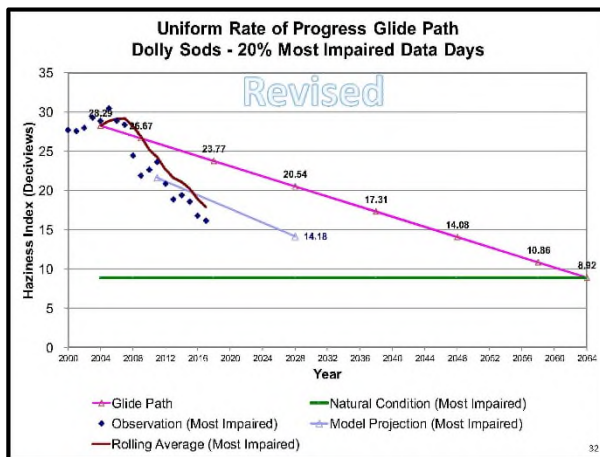
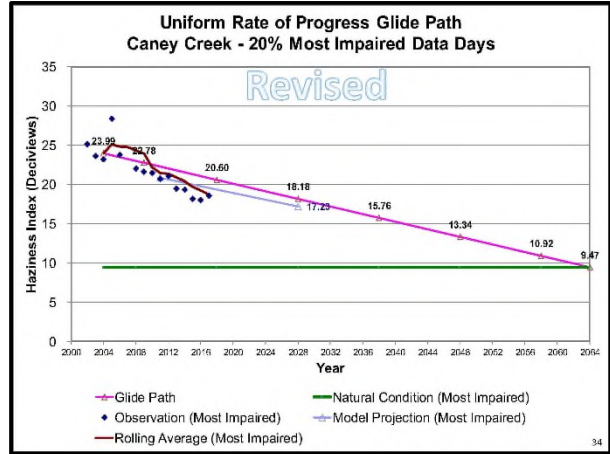
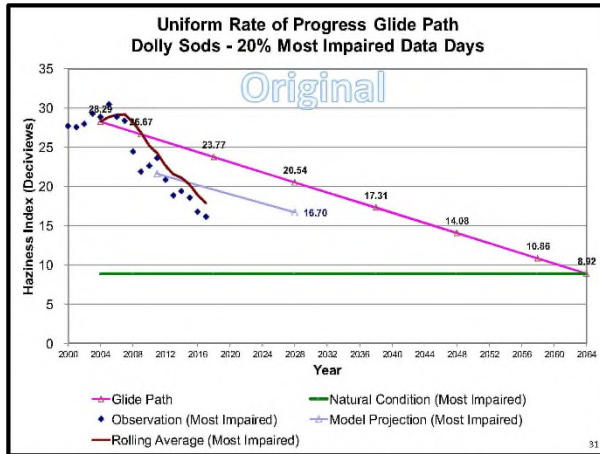


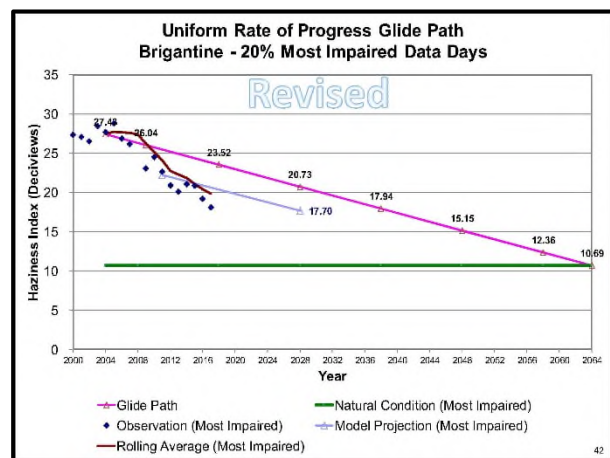
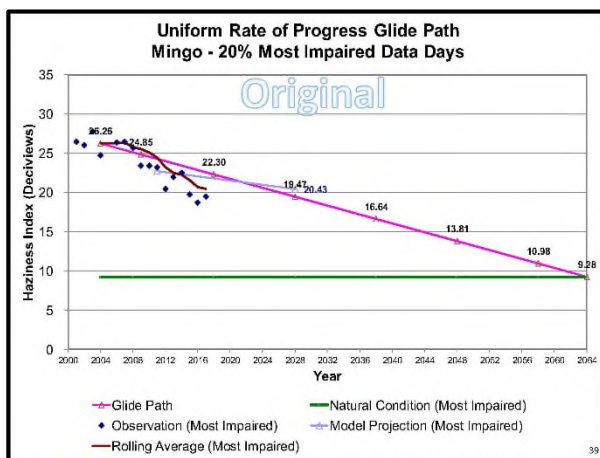
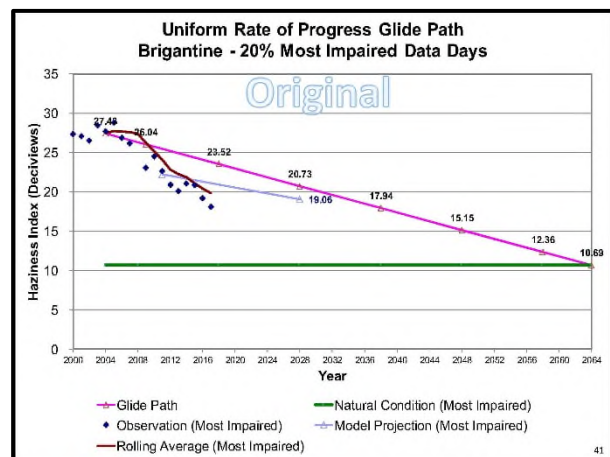
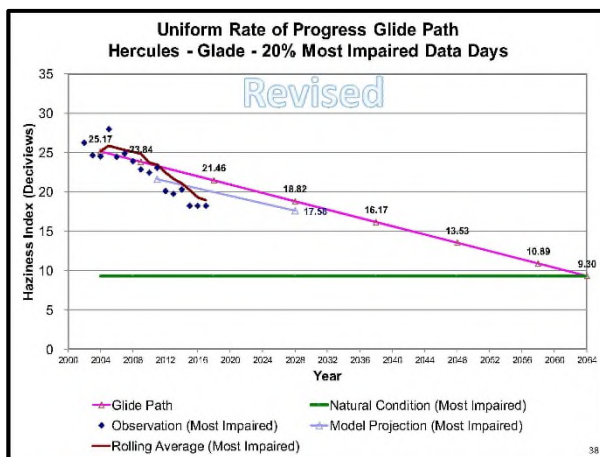
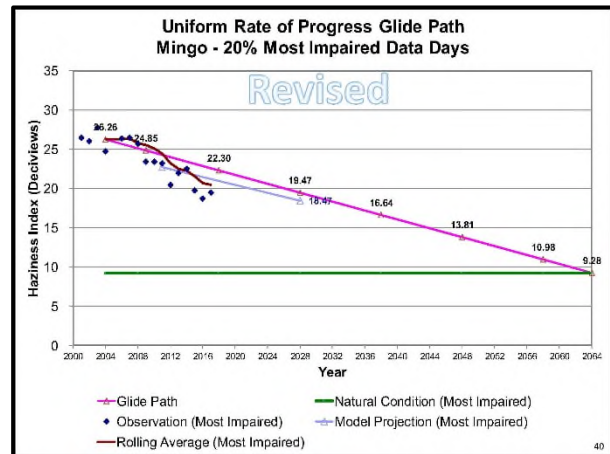
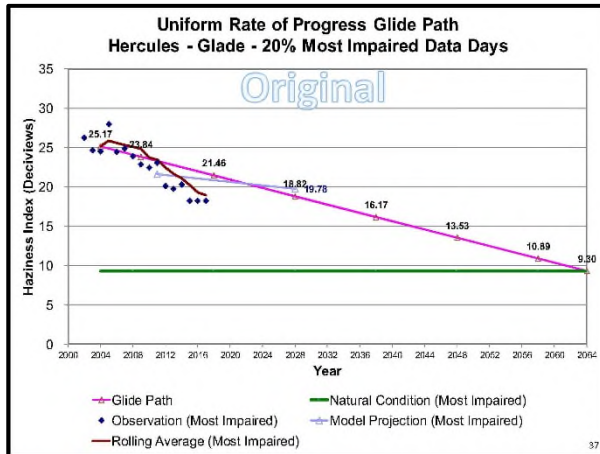












Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
- For project and contract management questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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VISTAS Regional Haze Project Update – Part 2



FLM/EPA Briefing
Jim Boylan
May 11, 2020

VISTAS Class I Areas

VISTAS FEDERAL CLASS I AREAS	
AL – Sipsey Wilderness Area (SIPS)	USDA Forest Service
FL – Chassahowitzka Wilderness Area (CHAS)	USDI Fish and Wildlife Service
FL – Everglades National Park (EVER)	USDI National Park Service
FL – Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA – Cohutta Wilderness Area (COHU)	USDA Forest Service
GA – Okefenokee Wilderness Area (OKEF)	USDI Fish and Wildlife Service
GA – Wolf Island Wilderness Area (WOLF)*	USDI Fish and Wildlife Service
KY – Mammoth Cave National Park (MACA)	USDI National Park Service
NC – Linville Gorge Wilderness Area (LUGO)	USDA Forest Service
NC – Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC – Swamquarter Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC – Cape Romain Wilderness Area (BIOMA)	USDI Fish and Wildlife Service
TN/NC – Great Smoky Mountains National Park (GRSM)	USDI National Park Service
TN/NC – Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	USDA Forest Service
VA – James River Face Wilderness Area (JARI)	USDA Forest Service
VA – Shenandoah National Park (SHEN)	USDI National Park Service
WV – Dolly Sods Wilderness Area (DOSO)	USDA Forest Service
WV – Otter Creek Wilderness Area (OTCR)*	USDA Forest Service

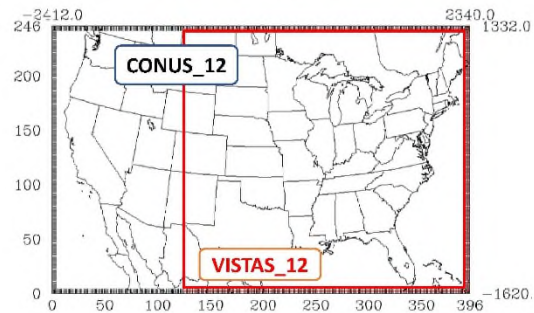
*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

Outline

- Background Information
- 2028 Emissions Updates
- Revised 2028 PSAT Stacked Bar Charts
- Reasonable Progress Analysis
- Next Steps & Schedule



VISTAS Modeling Domains



Class I Areas of Interest to VISTAS States



Initial VISTAS Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's Initial 2028 projection year emissions
 - EGU and major non-EGU sources
 - Removed Clean Power Plan assumptions
 - VISTAS – Adjusted for changes in fuels and facility operating plans
 - Non-VISTAS – Used ERTAC 2.7opt



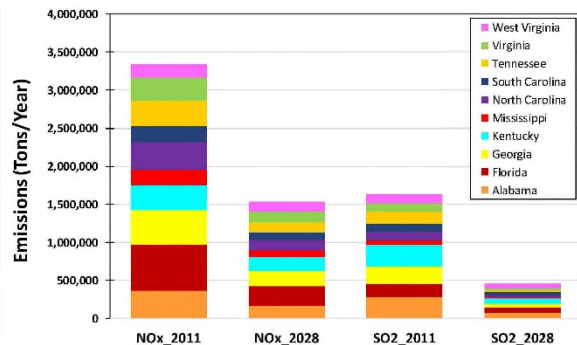
VISTAS vs. EPA Updated 2028 Emission Projections

- The table below compares the 2028 point emissions used by VISTAS vs. the latest 2028fh emissions used by EPA (projected from 2016). The emissions below are extracted from the VISTAS 12 modeling domain which covers the Eastern U.S.

Pollutant	VISTAS 2028 (tpy)	New EPA 2028 (tpy)	Change (tpy)	Change (%)
NOx	2,641,463.83	2,108,115.50	-533,348.33	-20.19%
SO2	2,574,542.02	1,400,287.10	-1,174,254.92	-45.61%

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VISTAS States Emissions: 2011 vs. 2028



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Old ERTAC (2.7opt) vs. New ERTAC (16.0)

SO2	16.0_2028	2.7opt_2028	Δ SO2	Δ SO2
CENSARA	367,683.7	760,828.2	-393,144.5	-51.67%
LADCO	266,047.0	379,577.5	-113,530.5	-29.91%
MANE-VU	78,657.0	196,672.6	-118,015.6	-60.01%
VISTAS	161,502.5	273,582.1	-112,079.6	-40.97%
TOTAL	976,471.2	1,783,376.5	-806,905.3	-45.25%

NOx	16.0_2028	2.7opt_2028	Δ NOx	Δ NOx
CENSARA	244,499.3	354,795.1	-110,295.8	-31.09%
LADCO	166,429.4	198,966.9	-32,537.4	-16.35%
MANE-VU	56,315.3	83,432.5	-27,117.2	-32.50%
VISTAS	200,791.1	270,615.7	-69,824.6	-25.80%
TOTAL	840,973.6	1,166,663.1	-325,689.5	-27.92%

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Additional Modeling-Related Tasks

- Emissions processing
- Updated 2028 CAMx modeling (VISTAS_12)
- Updated 2028 visibility projections
- Documentation

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VISTAS CC/TAWG Conclusions

- 2028 emission updates are necessary
 - VISTAS States** – States will:
 - Update 2028 major source emissions projections (SO₂, NOx, PM_{2.5}, PM₁₀, NH₃, CO) at the facility and unit level
 - Add any new sources of significance
 - LADCO States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.1 based on LADCO input
 - All Other States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.0
 - Verify accuracy of large SO₂ and NOx source emissions projections via contact with surrounding states/RPOs and update emissions as needed
- Additional 2028 air quality modeling is needed

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Updated 2028 Point Emissions

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2028 SO₂ Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	87,111.28	59,056.98	-32.2%	15,480.96	8,365.96	-46.0%	71,630.32	50,691.02	-29.2%
FL	63,501.23	52,982.68	-16.6%	28,547.41	24,004.67	-15.9%	34,953.82	28,978.01	-17.1%
GA	37,065.83	36,166.09	-2.4%	18,473.28	17,573.54	-4.9%	18,592.55	18,592.55	0.0%
KY	75,140.26	65,636.83	-12.6%	56,262.06	49,585.95	-11.9%	18,878.20	16,050.88	-15.0%
MS	21,234.31	8,405.06	-60.4%	6,984.57	3,236.28	-53.7%	14,249.74	5,168.78	-63.7%
NC	35,231.86	24,347.18	-30.9%	18,734.80	9,571.47	-51.5%	15,498.08	14,775.71	-4.7%
SC	29,670.85	29,671.25	0.0%	10,673.79	10,695.34	0.0%	18,997.05	18,995.91	-0.0%
TN	23,447.58	21,057.17	-10.2%	12,114.30	10,030.04	-17.2%	11,333.28	11,027.13	-2.7%
VA	19,839.18	18,551.32	-6.5%	3,264.09	1,976.23	-39.5%	16,575.09	16,575.09	0.0%
WV	63,404.07	53,715.79	-15.3%	57,828.67	47,744.49	-17.4%	5,575.41	5,971.30	7.1%
CENSARA	1,012,946.59	621,321.29	-38.7%	773,625.13	382,000.54	-50.6%	239,321.46	239,320.75	0.0%
LADCO	660,186.42	498,173.62	-24.5%	444,566.99	282,492.18	-36.4%	215,619.44	215,679.44	0.0%
MANE-VU	270,810.83	149,439.76	-44.8%	203,661.43	95,074.20	-53.7%	67,149.39	54,365.55	-19.0%
WRAP	182,121.83	135,483.18	-25.6%	136,555.17	90,316.46	-34.1%	45,166.72	45,166.73	0.0%
TOTAL	2,581,643.20	1,773,936.20	-31.3%	1,788,132.63	1,032,667.35	-42.2%	793,510.56	741,268.85	-6.6%

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PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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2028 NOx Comparison

State/ RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	80,389.97	70,824.72	-11.9%	26,895.35	20,008.14	-25.6%	53,494.61	50,816.58	-5.0%
FL	68,006.19	70,010.40	2.9%	26,250.73	25,049.90	-4.6%	41,755.45	44,960.50	7.7%
GA	67,197.50	65,885.55	-2.0%	25,899.67	24,587.73	-5.1%	41,297.83	41,297.83	0.0%
KY	66,240.03	62,130.83	-6.2%	36,781.72	32,695.94	-11.1%	29,458.31	29,434.89	-0.1%
MS	52,159.32	46,853.62	-10.2%	18,279.53	12,208.89	-33.2%	33,879.79	34,644.73	2.3%
NC	65,883.97	58,933.80	-10.5%	27,842.23	20,977.65	-24.7%	38,021.74	37,958.15	-0.2%
SC	36,051.31	36,170.87	0.3%	10,522.78	10,707.42	1.8%	25,528.53	25,463.44	-0.3%
TN	45,879.07	42,954.25	-6.4%	10,086.01	7,814.13	-22.5%	35,793.06	35,140.12	-1.8%
VA	43,210.19	41,671.99	-3.6%	11,973.97	10,435.77	-12.8%	31,236.22	31,236.22	0.0%
WV	65,054.07	68,200.77	4.8%	46,721.77	49,874.15	6.7%	18,332.30	18,326.62	-0.0%
CENSARA	903,979.85	791,397.59	-12.5%	382,706.66	270,182.46	-29.4%	521,273.19	521,215.14	-0.0%
LADCO	548,866.74	491,345.00	-10.5%	244,035.26	186,513.52	-23.6%	304,831.49	304,831.49	0.0%
MANE-VU	244,780.15	222,991.41	-9.3%	109,465.15	82,178.41	-24.0%	140,815.00	140,815.00	0.0%
WRAP	362,819.80	301,433.41	-16.9%	187,944.97	126,538.55	-32.7%	174,874.83	174,874.86	0.0%
TOTAL	2,649,998.14	2,370,804.22	-10.5%	1,159,405.80	879,790.66	-24.1%	1,490,592.35	1,491,013.55	0.0%

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PSAT SO₂ and NOx Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 RPOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ and NOx for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

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Revised 2028 PSAT Stacked Bar Charts (Original and Adjusted)

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PSAT Adjustment Ratios

State/RPO	SO ₂ EGU Ratio	SO ₂ NEGU Ratio	NOx EGU Ratio	NOx NEGU Ratio
AL	0.540	0.708	0.744	0.950
FL	0.841	0.829	0.954	1.077
GA	0.951	1.000	0.949	1.000
KY	0.881	0.850	0.889	0.999
MS	0.463	0.353	0.668	1.023
NC	0.485	0.953	0.753	0.998
SC	1.000	1.000	1.018	0.997
TN	0.828	0.973	0.775	0.982
VA	0.605	1.000	0.872	1.000
WV	0.826	1.071	1.067	1.000
CENSARA	0.494	1.000	0.706	1.000
LADCO	0.636	1.000	0.764	1.000
MANE-VU	0.467	0.810	0.794	1.000

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Revised State/RPO PSAT Results

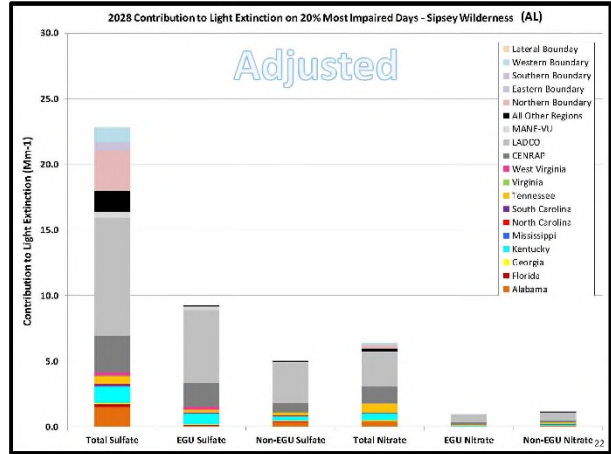
- Revised EGU Sulfate PSAT Results
= Original EGU Sulfate PSAT Results * SO₂ EGU Ratio

$$\text{where, SO}_2 \text{ EGU Ratio} = \frac{(\text{Revised EGU SO}_2 \text{ emissions})}{(\text{Original EGU SO}_2 \text{ emissions})}$$

- Revised NEGU Sulfate PSAT Results
= Original NEGU Sulfate PSAT Results * SO₂ NEGU Ratio

$$\text{where, SO}_2 \text{ NEGU Ratio} = \frac{(\text{Revised NEGU SO}_2 \text{ emissions})}{(\text{Original NEGU SO}_2 \text{ emissions})}$$

19



Revised State/RPO PSAT Results

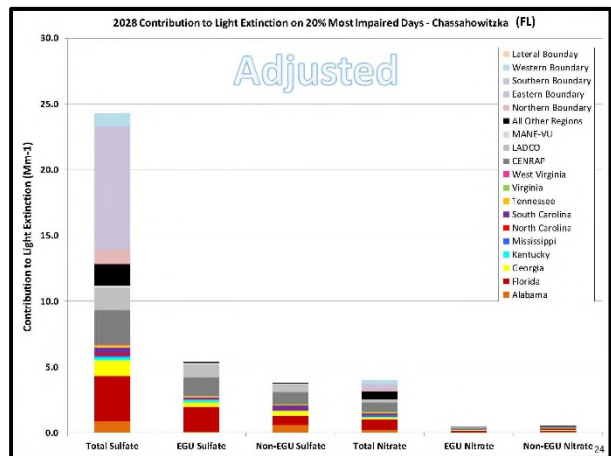
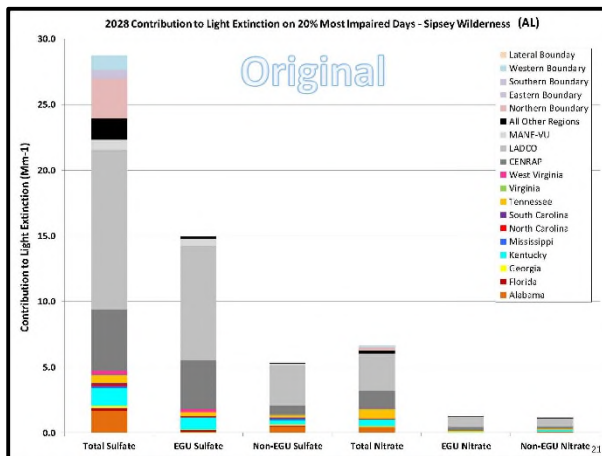
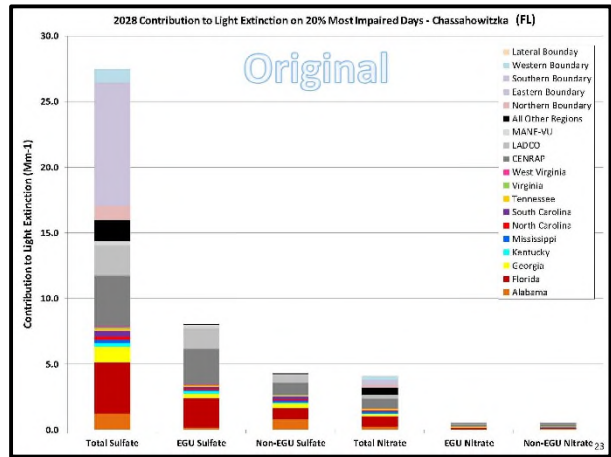
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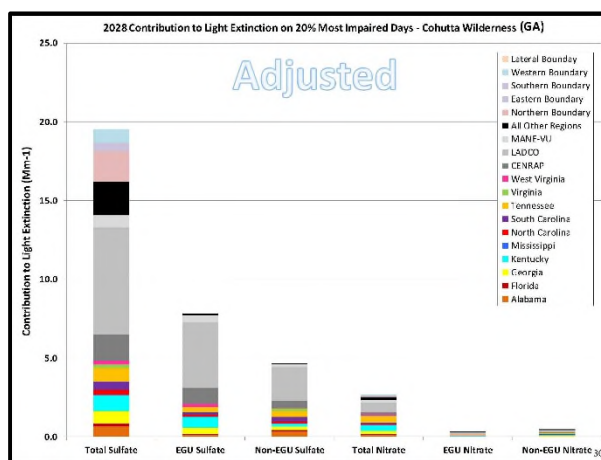
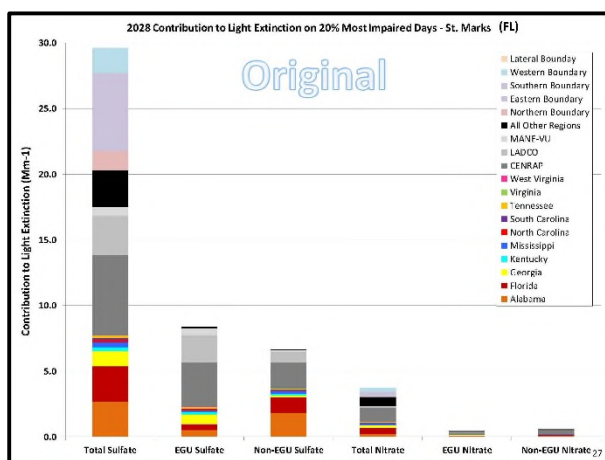
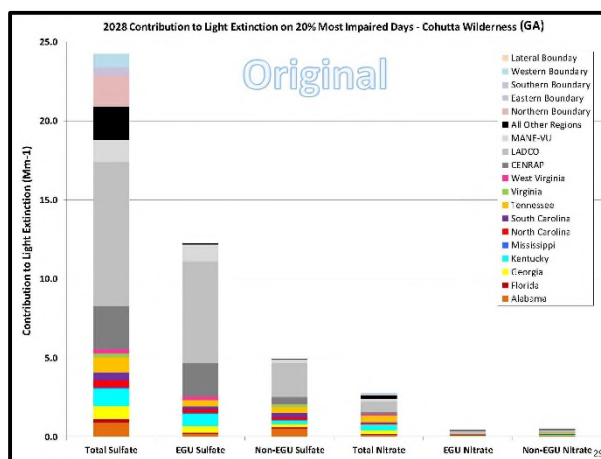
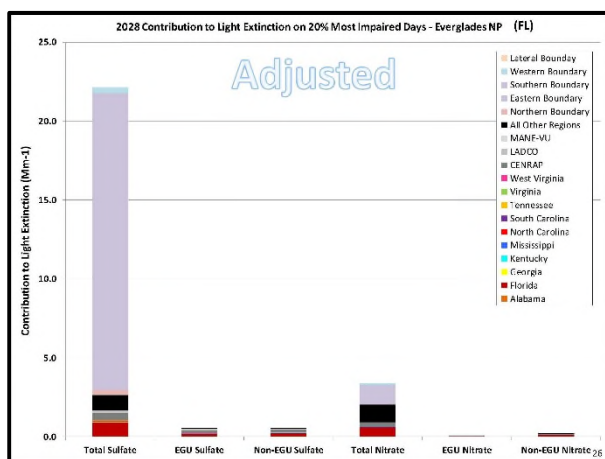
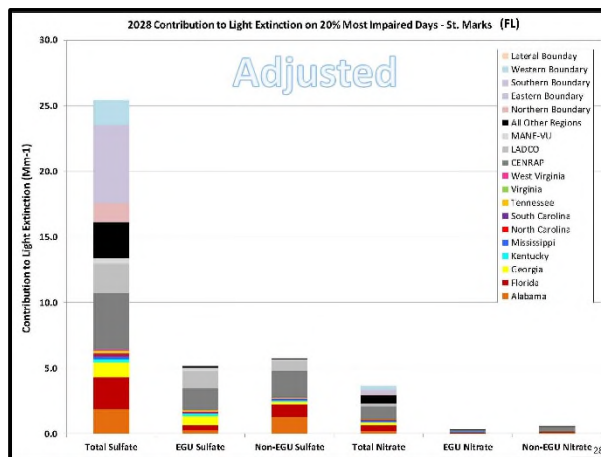
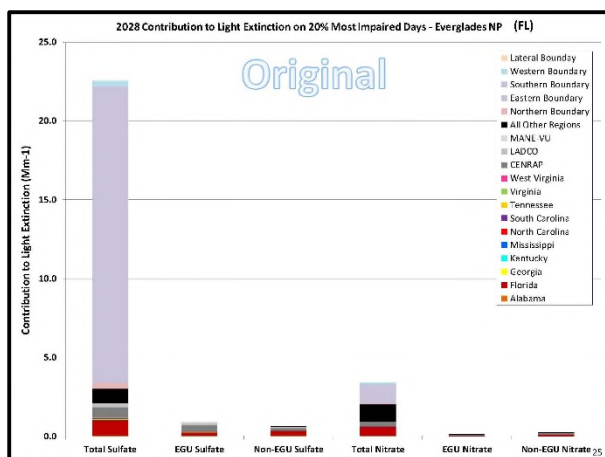
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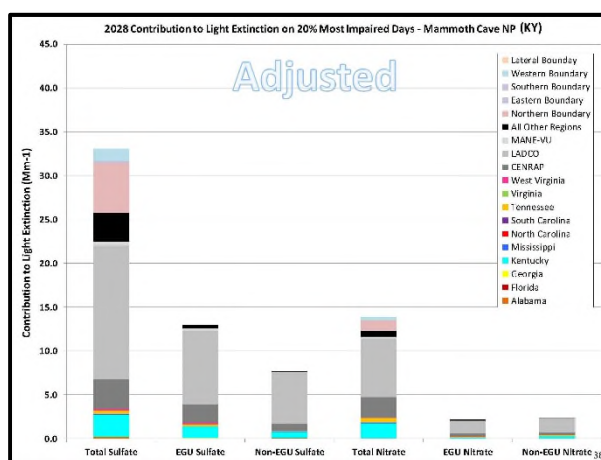
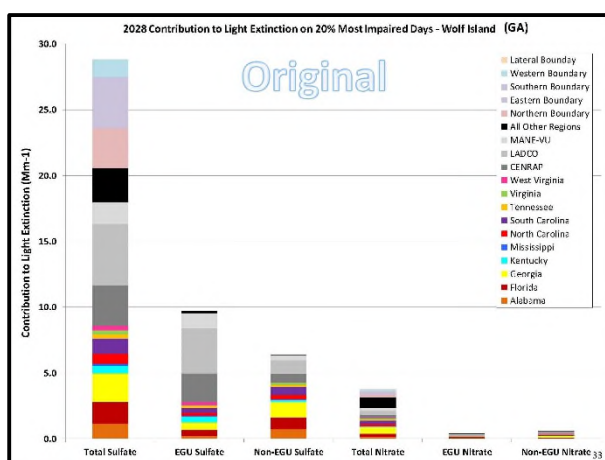
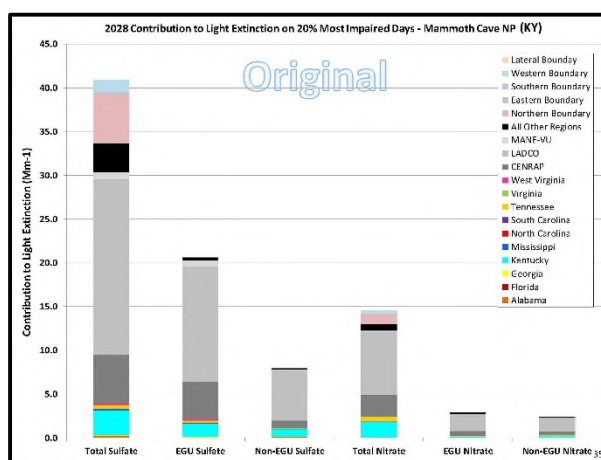
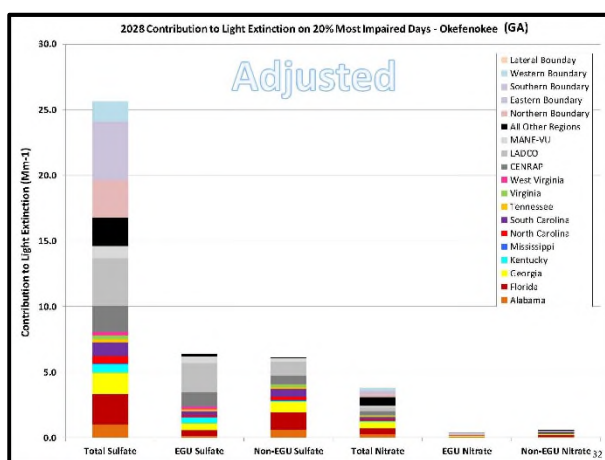
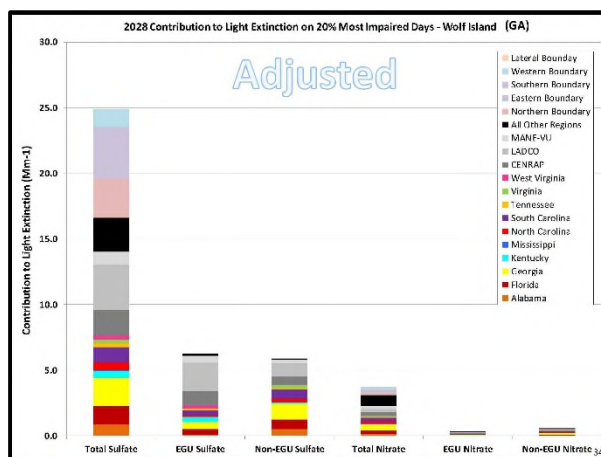
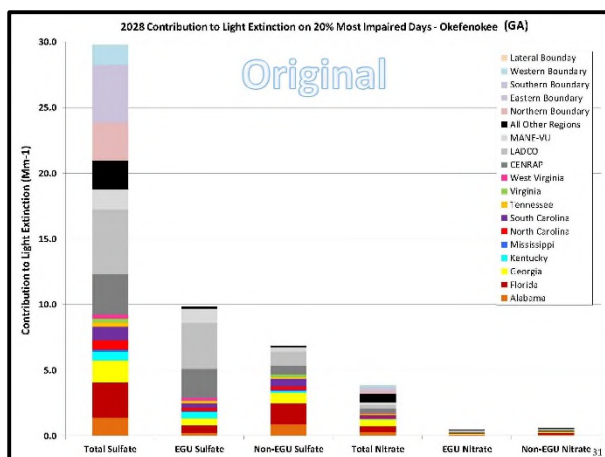
- Revised NEGU Nitrate PSAT Results
= Original NEGU Nitrate PSAT Results * NO_x NEGU Ratio

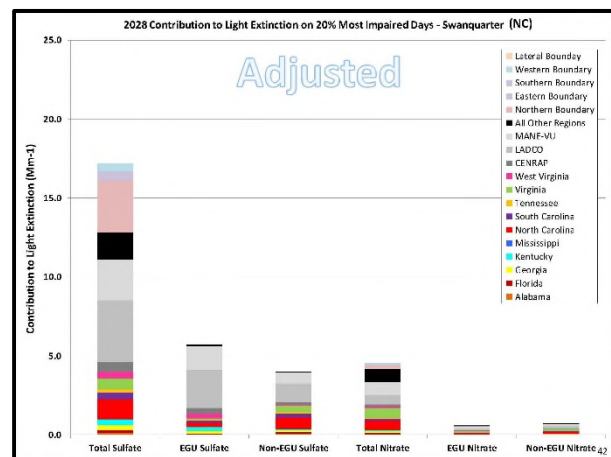
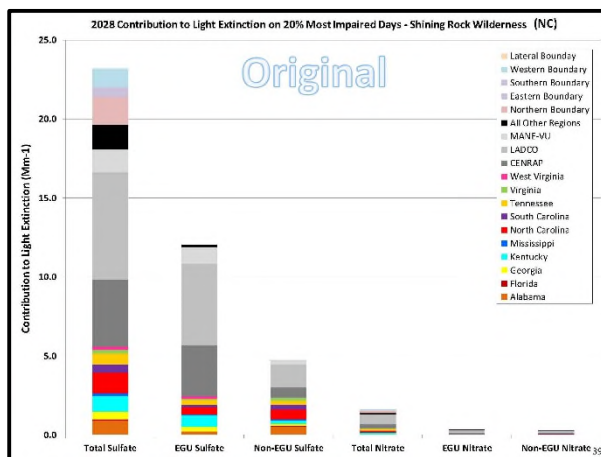
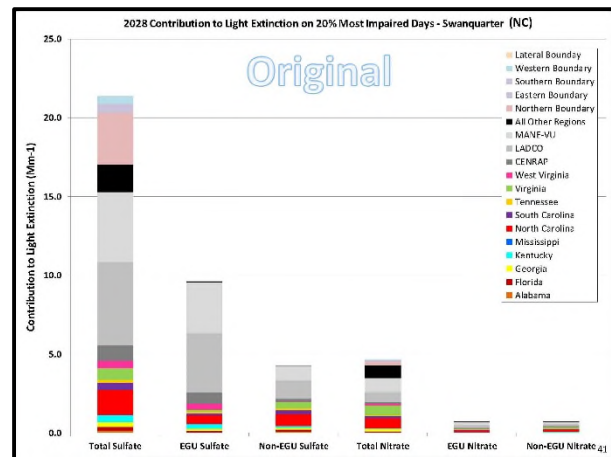
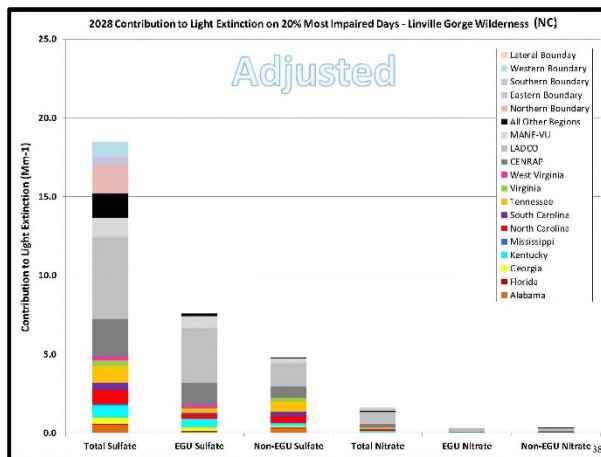
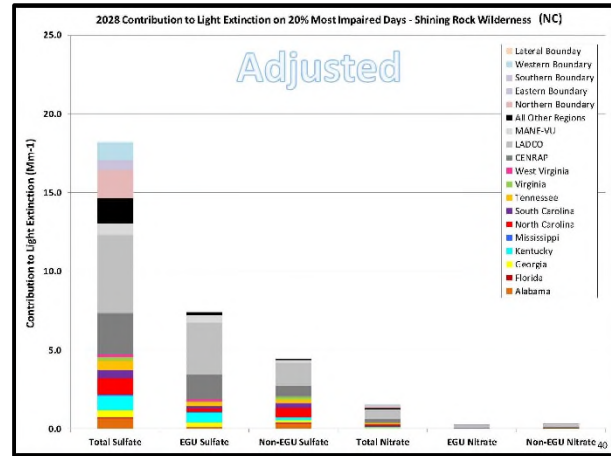
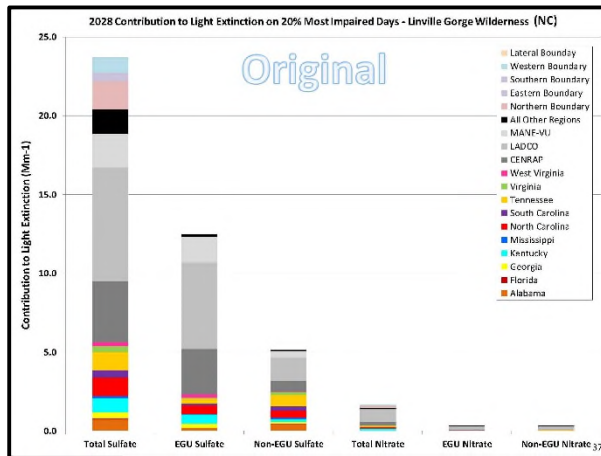
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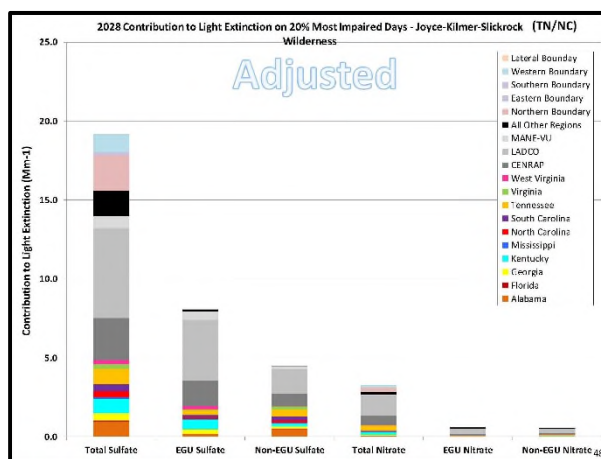
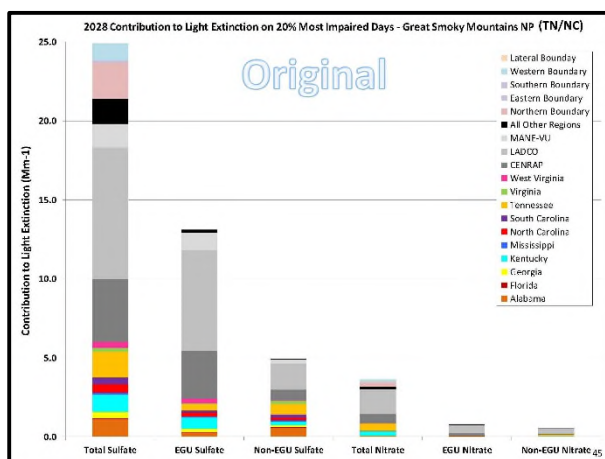
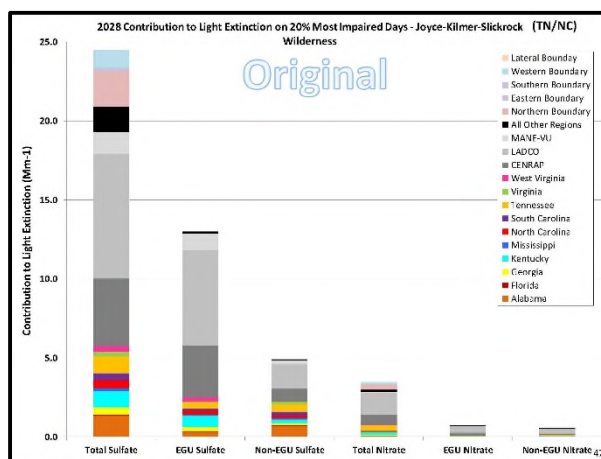
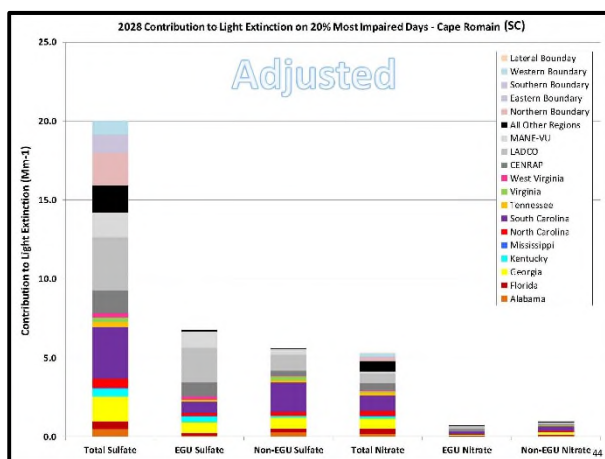
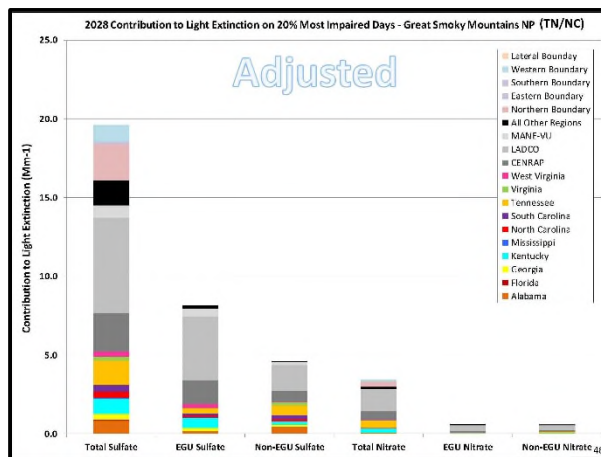
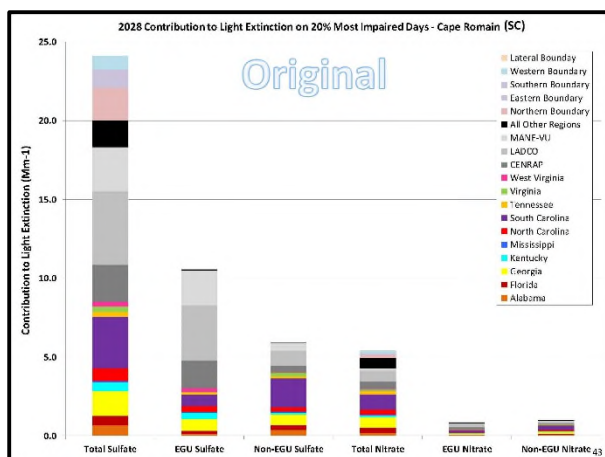
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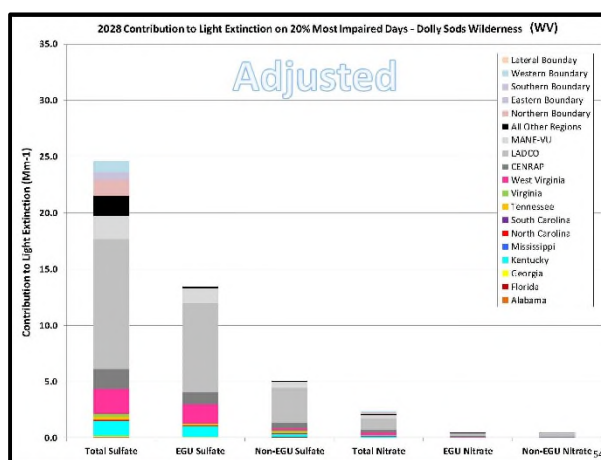
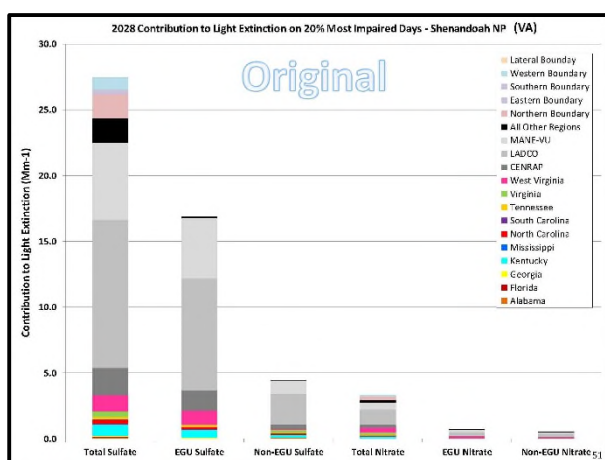
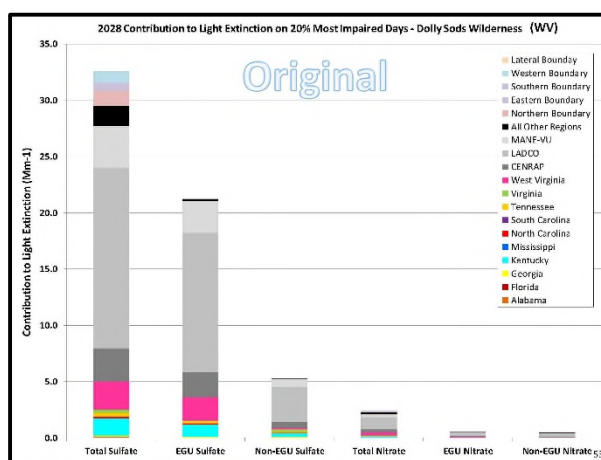
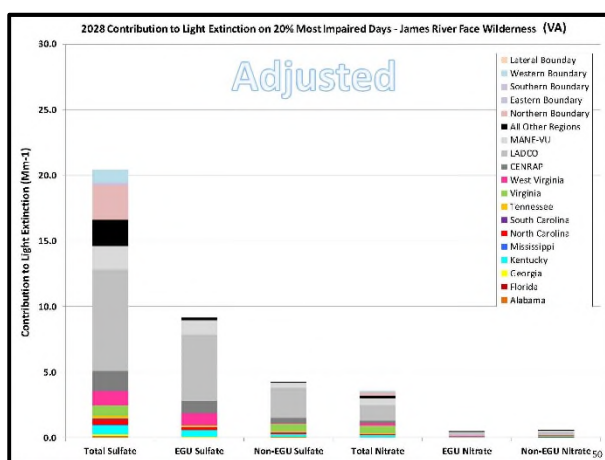
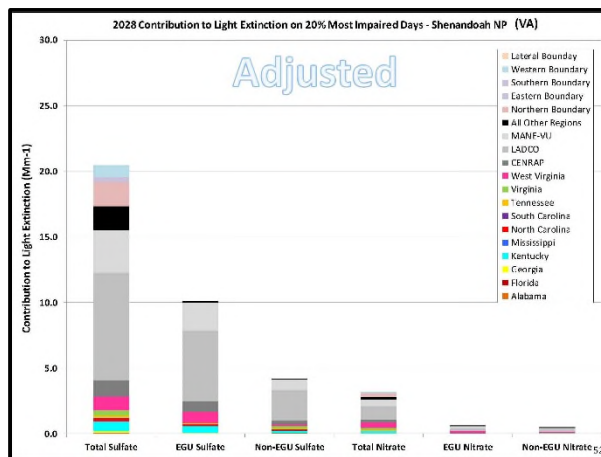
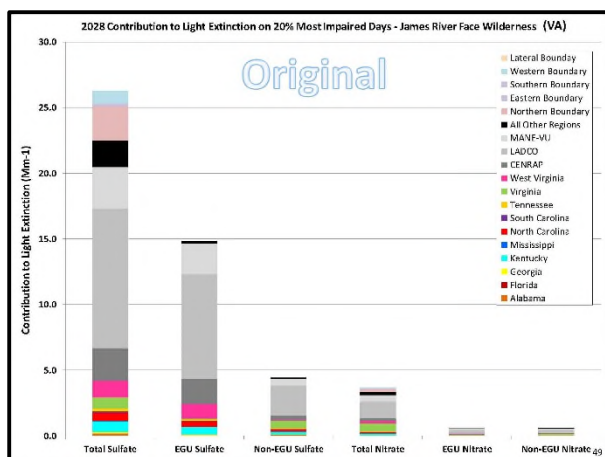


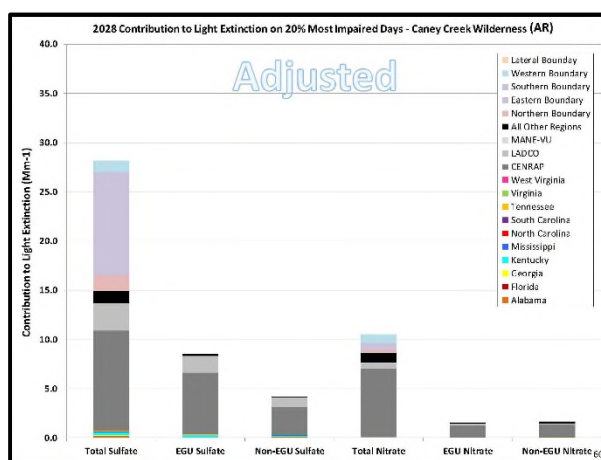
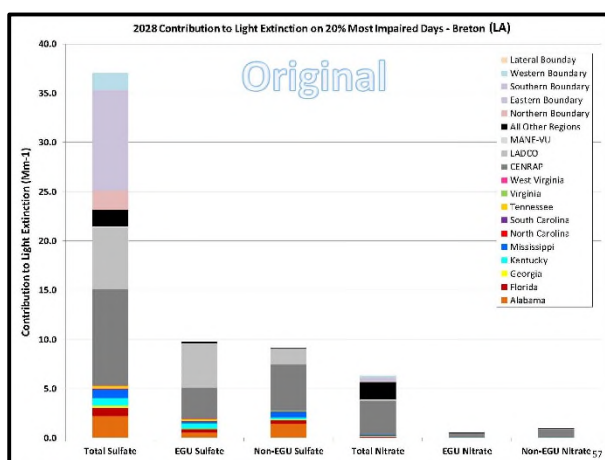
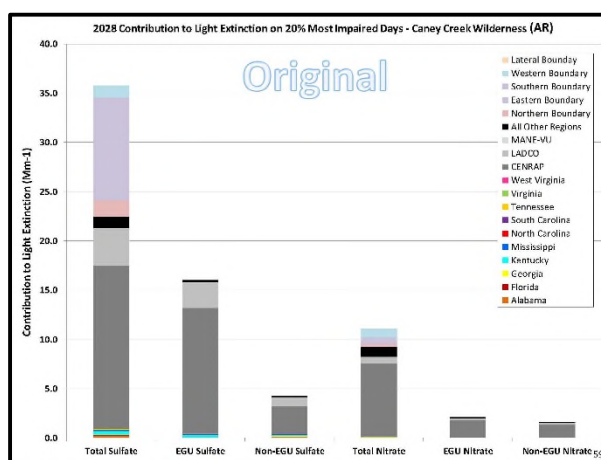
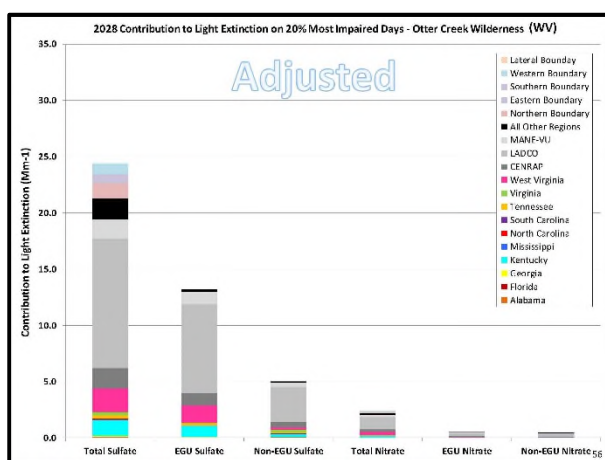
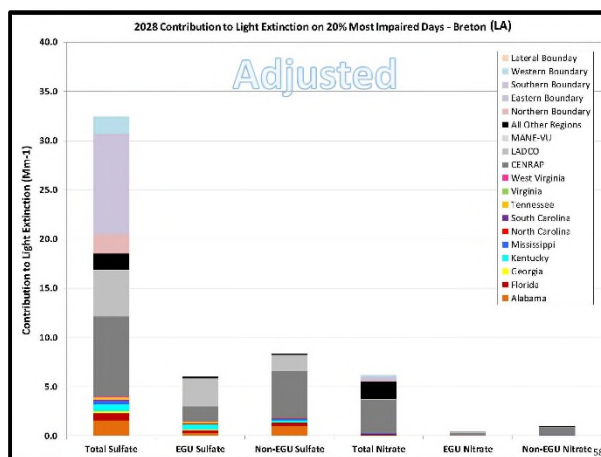
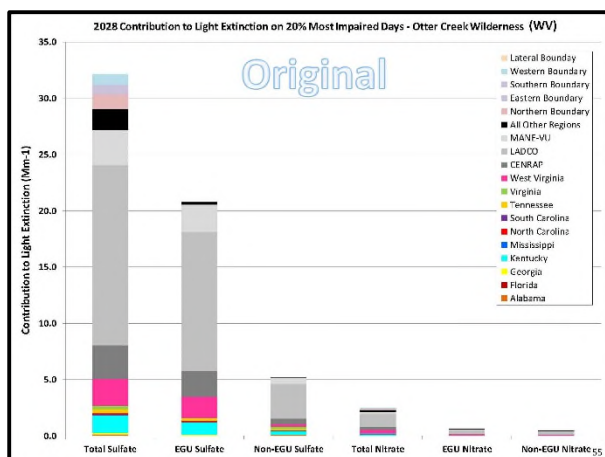


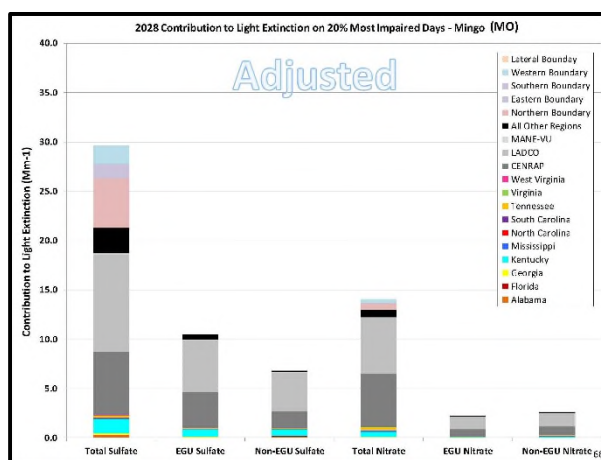
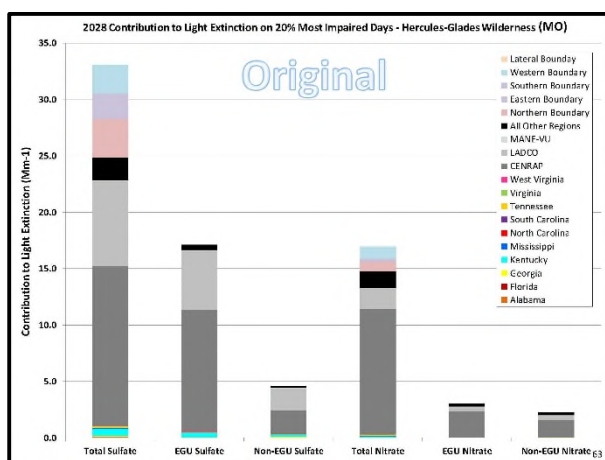
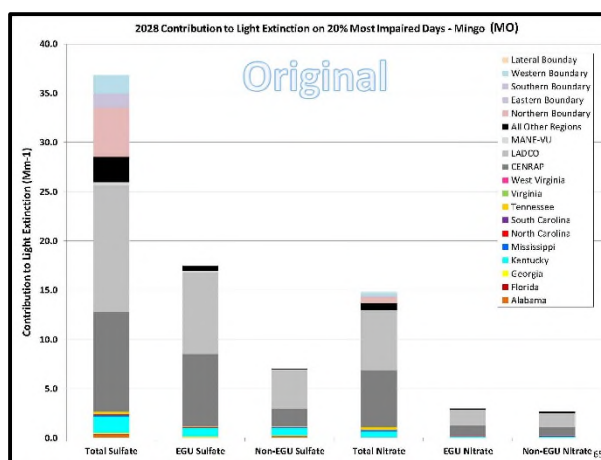
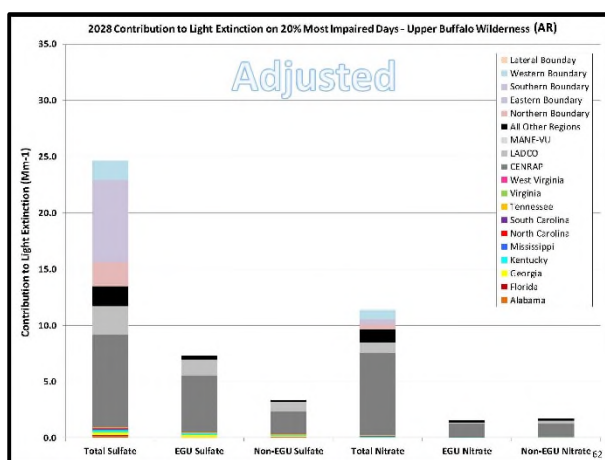
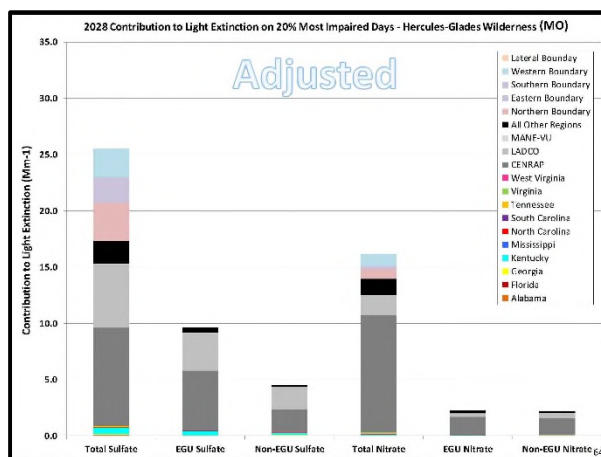
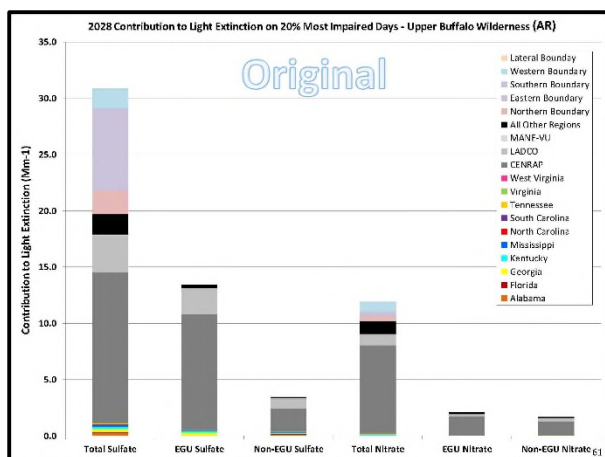


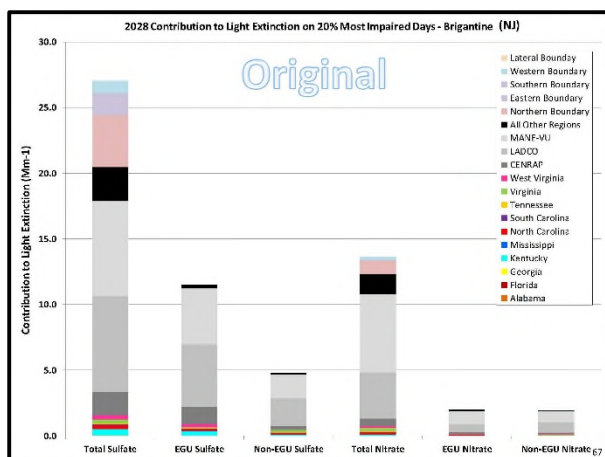








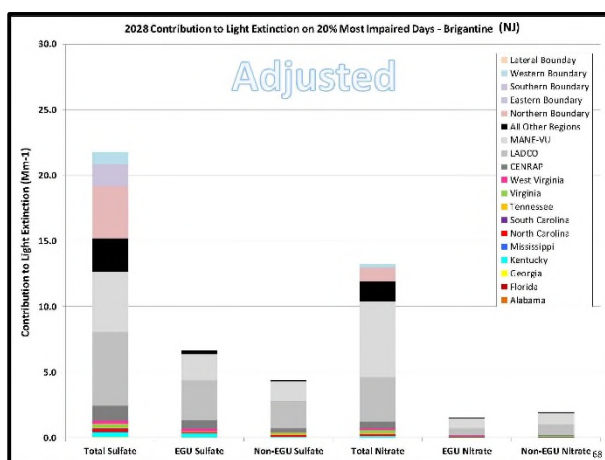




Reasonable Progress Screening Approach

1. The VISTAS reasonable progress work started with AOI screening (Q/d * EWRT) to rank facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the sulfate and nitrate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate and facility nitrate impacts (separately, not combined) divided by the total impact of sulfate + nitrate from all point sources to determine which sources may need to be considered for a four-factor analysis.
 - If sulfate contribution $\geq 1.00\%$ \rightarrow SO₂ Four-Factor Analysis
 - If nitrate contribution $\geq 1.00\%$ \rightarrow NO_x Four-Factor Analysis

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Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
 - Round 2 uses the AOI/PSAT approach and a $\geq 1.00\%$ PSAT threshold based on a Facility basis.
 - This will pull in more facilities compared to a Unit basis.
 - Round 2 uses 2028 emissions (lower than 2018)
 - This will pull in facilities with smaller visibility impacts (in Mm⁻¹) compared to Round 1.
- This approach results in a reasonable number of sources that can be evaluated with limited state resources and focuses on the sources with the largest impacts.

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Reasonable Progress Analysis

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HYSPLIT Trajectories

- Trajectories were run using NAM-12 meteorology for the 20% most impaired days in 2011-2016 at 44 Class I areas.
 - Trajectories were run with starting heights of 100, 500, 1,000, and 1,500 meters.
 - Trajectories were run 72 hours backwards in time for each height at each location.
 - Trajectories were run with start times of 12AM (midnight of the start of the day), 6AM, 12PM, 6PM, and 12AM (midnight at the end of the day) local time.
- 44 Class I areas x 6 years x 24 days/year x 4 heights x 5 start times = **126,720 trajectories**

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Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d)*EWRT$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the four-factor analysis
- Georgia Example:
 - Sources in Georgia, used $\geq 2\%$ threshold
 - Sources outside Georgia, used $\geq 4\%$ threshold

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AOI Point Contributions for Wolf Island

State	FACILITY NAME	DISTANCE (mi)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
GA	Brunswick Cellulose Inc.	27.9	3,554.5	294.2	2.94%	1.54%
FL	ROCK TENN CP, LLC	74.9	2,336.8	2,606.7	0.39%	8.55%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	7.53%
FL	JEA	105.1	651.8	2,094.5	0.09%	4.43%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.03%	2.65%
FL	WHITE SPRINGS AGRICULTURAL-CHEMICALS, INC.	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	223.0	108.1	3,751.7	0.00%	1.84%
FL	RAYO WTR PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	SEVINGUE PAPER COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	845.1	8,122.5	41,505.8	0.07%	1.71%
SC	SANTÉE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	0.09%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	592.1	0.00%	1.55%
FL	ICI CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEFL)	296.6	7,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.9	521.6	582.0	0.08%	1.06%
SC	INTERNATIONAL PAPER EASTOVERS	288.7	1,780.3	3,212.9	0.05%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	NAPSTON CHARLESTON CRAFT LLC	713.6	2,355.8	1,863.7	0.09%	0.89%
PA	ELGIN REFINERY COOPERATION, LLC	1,048.6	6,578.5	56,939.2	0.01%	0.84%

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AOI Point Contributions for Cohutta

State	FACILITY NAME	DISTANCE (mi)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,643.3	10,453.4	1.15%	15.58%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	430.1	8,806.8	30,536.3	0.13%	4.68%
GA	International Paper - Rome	87.4	1,773.4	1,791.0	0.18%	4.66%
IN	Celvolan	487.3	12,280.3	23,117.2	0.10%	2.31%
IN	INDIANA MICHIGAN POWER & LIGHT - INTERSUNG	477.0	10,665.3	18,141.9	0.16%	2.38%
KY	Tennessee Valley Authority (TVA) - Shawnee Fork Plant	457.2	7,007.3	19,504.7	0.07%	2.38%
TN	TVA KINSTON COGEN PLANT	174.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (0627010056)	512.0	8,122.5	41,505.8	0.02%	1.71%
TN	IVN CUMBERLAND CLASS PLANT	327.0	4,936.5	8,427.3	0.09%	1.38%
KY	Roe River Electric Corp. - Wilson Station	380.0	1,151.9	6,934.2	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	454.6	2,150.0	22,133.9	0.06%	1.05%
GA	Ga Power Company - Plant Wansley	356.8	2,052.5	4,856.0	0.04%	1.05%
KY	KY Utilities Co. - Lohr Station	441.5	7,919.9	10,169.3	0.08%	1.05%
GA	Joppa Steam	486.9	4,706.5	20,509.3	0.07%	1.04%
GA	Midwest Industries Inc.	32.9	66.5	77.1	0.07%	1.02%
TN	ALUMAX CHEMICAL COMPANY	289.8	6,300.3	6,420.2	0.09%	0.99%
MO	AMEREN MISSOURI-LABADE PLANT	695.4	9,885.5	41,740.3	0.01%	0.96%
IL	Newcom	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	Chemical Products Corporation	71.9	19.5	513.8	0.00%	0.89%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.78%

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Georgia Tagging for PSAT

- Sources in Georgia ($\geq 2\%$ threshold)**
 - Ga Power Company – Plant Bowen
 - International Paper – Rome (aka TEMPLE INLAND)
 - International Paper – Savannah
 - Brunswick Cellulose Inc
 - Georgia-Pacific Consumer Products LP (Savannah River Mill)
- Sources outside Georgia ($\geq 4\%$ threshold)**
 - INDIANA MICHIGAN POWER DBA AEP ROCKPORT (IN)
 - ROCK TENN CP, LLC (FL)
 - JEA (FL)

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AOI Point Contributions for Okefenokee

State	FACILITY NAME	DISTANCE (mi)	NO _x 2028 (tons/year)	SO ₂ 2028 (tons/year)	NO _x Contribution	SO ₂ Contribution
FL	WHITE SPRINGS AGRICULTURAL-CHEMICALS, INC.	71.5	112.4	2,745.0	0.03%	14.63%
FL	ROCK TENN CP, LLC	84.8	2,336.8	2,606.7	0.88%	12.82%
FL	JEA	85.6	651.8	2,094.5	0.18%	6.60%
FL	SEVINGUE PAPER COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.25%
FL	ICI CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYO WTR PERFORMANCE FIBERS LLC	83.4	2,327.1	562.0	0.90%	2.82%
GA	International Paper - Savannah	178.9	1,560.7	3,945.4	0.96%	2.81%
FL	DUKE ENERGY FLORIDA WHITE PARTNERSHIP	153.5	1,830.7	1,520.4	0.14%	2.80%
FL	KENNESAW LLC	59.8	66.3	569.5	0.02%	1.96%
FL	DUKE ENERGY FLORIDA, INC. (DEFL)	205.0	7,489.8	5,306.4	0.06%	1.40%
AL	Sanders Coal Co.	384.6	121.7	7,951.1	0.00%	1.11%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.01%	1.05%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.03%	1.02%
GA	Brunswick Cellulose Inc.	75.3	1,554.5	294.2	0.34%	1.01%
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	JCA Valdosta Mill	112.7	1,032.6	685.7	0.09%	0.85%
SC	SANTÉE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.09%	0.85%
FL	CITY OF GAINESVILLE GRP	111.7	410.0	881.4	0.01%	0.78%
SC	NAPSTON CHARLESTON CRAFT LLC	314.0	2,355.8	1,863.7	0.06%	0.66%
GA	Ga Power Company - Plant Wansley	403.7	2,052.5	4,856.0	0.02%	0.65%

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AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2%	Sulfate or nitrate

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PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NO_x and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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Facility Tags (KY, MS, NC, SC, TN, VA)

Facility State	Facility RPO	FACILITY ID STD	FACILITY NAME STD	SO ₂ (TPY)	NO _x (TPY)
KY	VISTAS	21189-1381011	Int. Jones Electric Corp. - Wilson Station	5,554.13	1,351.33
KY	VISTAS	21091-7352411	Century Aluminum of KY LLC	5,044.13	107.58
KY	VISTAS	21177-1195711	Tennessee Valley Authority - Paradise Fossil Plant	3,011.01	3,114.72
KY	VISTAS	21145-5031011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	19,024.72	7,007.14
MS	VISTAS	38019-5384311	Chevron Products Company - Pascagoula Refinery	741.24	1,584.12
MS	VISTAS	28059-5251011	Mississippi Power Company - Plant Victor J. Daniel	231.52	3,829.72
NC	VISTAS	37037-7920511	Blue Ridge Paper Products - Cannon Mill	1,127.07	2,982.37
NC	VISTAS	37187-5049311	Dominion Power Company, LLC	597.45	1,785.48
NC	VISTAS	37035-8370411	Duke Energy Carolinas, LLC - Marshall Steam Station	4,139.21	7,511.33
NC	VISTAS	37013-8479311	PCS Phosphate Company, Inc. - Aurora	4,845.93	495.58
NC	VISTAS	37023-8518011	SGL Carbon, LLC	261.44	21.68
NC	VISTAS	45019-4040111	PLUMAS CO. (SOUTH) - CAROLINA	3,011.45	108.98
SC	VISTAS	45043-1508511	INTERNATIONAL PAPER GEORGETOWN M. L.	2,061.54	2,651.24
SC	VISTAS	45018-4973011	KAPSTONE (1) ABILETTON KRAFT, LLC	1,861.54	2,355.82
SC	VISTAS	45015-4130411	SANTIT COOPER EROS (TVA) RAILROAD STATION	4,241.17	3,771.47
SC	VISTAS	45043-5557611	SANTIT COOPER WYVAH GENERATING STATION	2,746.42	3,777.73
SC	VISTAS	45015-8107111	SC ELEC WILLIAMS	392.43	992.72
TN	VISTAS	47033-4979911	Cemex - Knoxville Plant	121.47	111.50
TN	VISTAS	47153-3983111	EASTMAN CHEMICAL COMPANY	6,400.13	6,900.13
TN	VISTAS	47105-4122211	TAI & VLE - London	472.75	883.23
TN	VISTAS	47031-6196011	TVA BULL RUN FOSIL PLANT	622.54	964.18
TN	VISTAS	47153-4079311	TVA CUMBERLAND FOSIL PLANT	8,427.33	4,915.43
TN	VISTAS	47145-4975111	TVA KINGSTON FOSIL PLANT	1,889.05	1,887.18
VA	VISTAS	51027-4034811	Jewell Coker Company L.P.	5,090.05	5,201.1
VA	VISTAS	51580-4798711	Meadowbreeze Packaging Resource Group	2,115.11	1,985.50
VA	VISTAS	51013-5036011	Roanoke Cement Company	2,285.13	1,377.33

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PSAT SO₂ and NO_x Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- Total NO_x tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point NO_x tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NO_x tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 RPOs = 13 tags
- Non-EGU point NO_x for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ and NO_x for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NO_x tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NO_x tags for individual non-VISTAS facilities = 10 tags

→ 87 Total Facility Tags (both SO₂ and NO_x)

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Facility Tags (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility RPO	FACILITY ID STD	FACILITY NAME STD	SO ₂ (TPY)	NO _x (TPY)
WV	VISTAS	14019-4712111	ALUMINUM AND HOT SUPPLY CO. LLC HARBISON	10,060.56	11,499.08
WV	VISTAS	34040-4044111	AMERICAN BITUMINOUS POWDER MONITOR TOWN ALI	2,110.23	3,245.18
WV	VISTAS	34078-0789111	APPALACHIAN POWER COMPANY - JOINT FARMOR PLANT	10,984.24	4,878.18
WV	VISTAS	34073-0757011	Duranton Resources, Inc. - MOUNT STORM POWER STATION	2,173.54	1,984.14
WV	VISTAS	34041-0800111	FOOTBRAIN - COPIER RAILROAD	0.14	511.02
WV	VISTAS	34033-0790711	FILES CREEK COALMID	0.15	643.35
WV	VISTAS	34033-0790511	GLADY COALMID	0.11	343.29
WV	VISTAS	34033-0790311	WINGSCORD MANUFACTURING COMPANY	16.55	140.88
WV	VISTAS	34061-1632011	LONGVIEW POWER	2,313.73	1,555.57
WV	VISTAS	34051-0902311	MITCHELL PLANT	5,372.43	2,713.62
WV	VISTAS	34033-0773611	MONONGAHELA POWER CO. - FORT MARTIN POWER	4,881.87	13,743.24
WV	VISTAS	34024-0780311	MONONGAHELA POWER CO. - FARMOR POWER PLANT	18,811.45	5,407.17
WV	VISTAS	34051-0773811	MONONGAHELA POWER ASSOCIATES	808.54	855.58
AR	CENRAP	05033-1084411	ENERGY Arkansas INC - INDEPENDENCE PLANT	22,050.44	14,133.13
CO	CRABA	29183-1763811	NEW MADRID POWER PLANT - MADRID	16,283.71	4,984.18
MD	VAE-VU	24001-7763811	Luke Paper Company	77,059.44	3,607.08
PA	VAE-VU	42005-1865111	GENCO NEWMONT COALSTON STA	56,939.21	6,575.17
PA	VAE-VU	42013-1005211	HEMLOCK CITY GEN CO CENTER TWO	11,885.25	5,215.94
PA	VAE-VU	42013-1005111	HEMLOCK CITY GEN CO CENTER ONE	8,880.27	2,554.04
IL	Midwest RPO	17127-7808911	Joplin Steam	20,509.24	4,765.33
IN	Midwest RPO	18173-8181111	Alcoa Warrenton Power 7th Age Div of AL	5,071.28	11,558.55
IN	Midwest RPO	18053-7861111	GenCorp	23,117.23	12,380.34
IN	Midwest RPO	18147-8017211	INDIANA MICHIGAN POWER COA AEP - ROCKPORT	10,336.15	8,805.77
IN	Midwest RPO	18125-7362411	INDIANA POLYS POW-4 & 5 - HIGHT PETERSBURG	18,141.88	10,665.72
IN	Midwest RPO	18125-8105111	Sargeant Brown South Indiana Gas & Elec	7,644.21	1,578.83
OH	Midwest RPO	18013-8117211	Central Power Plant (Central Operating Company) (0541050002)	7,460.75	7,467.13
OH	Midwest RPO	19011-8101811	Cummins Power Plant (0515000000)	6,356.23	9,857.67
OH	Midwest RPO	19025-0794311	Duke Energy Ohio, Inc. - Premier Station (1413098114)	27,113.44	7,145.67
OH	Midwest RPO	19025-0794311	Duke Energy Ohio, Inc. - Capital Power Plant (0527010000)	23,117.23	12,380.34
OH	Midwest RPO	19013-7993011	Ohio Valley Electric Corp. - Upper Creek Station (0527000003)	3,400.14	9,143.54

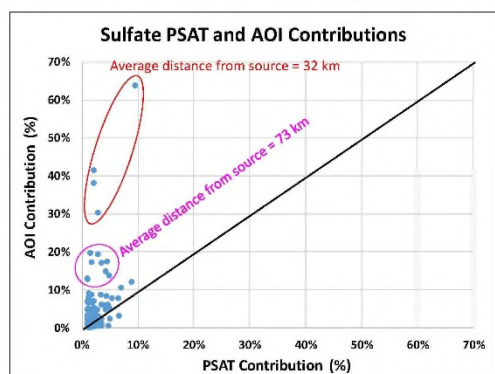
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Facility Tags (AL, FL, GA)

Facility State	Facility RPO	FACILITY ID STD	FACILITY NAME STD	SO ₂ (TPY)	NO _x (TPY)
AL	VISTAS	01057-5498111	Alcoa Nobel Chemicals, Inc.	5,335.72	20.14
AL	VISTAS	01027-1055111	Alta Power - Barry	6,033.14	2,275.78
AL	VISTAS	01178-1028711	American Midstream Chemicals, LLC	3,106.98	471.87
AL	VISTAS	01073-1018111	PRIMACHOC COMPANY, INC.	7,562.13	5,258.52
AL	VISTAS	01073-7440711	Cummins Operating Company, LLC	18,974.95	349.13
AL	VISTAS	01053-8551111	Escambia Operating Company, LLC	8,589.60	149.54
AL	VISTAS	01103-1600011	Fluor Steel Decatur, LLC	170.23	331.24
AL	VISTAS	01029-8557111	Formosa, Ltd. Co.	7,991.05	121.71
AL	VISTAS	01027-1061611	Union Oil of California - Chunchula Gas Plant	2,573.15	349.24
FL	VISTAS	12225-7524111	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1,520.42	1,830.77
FL	VISTAS	12086-8001111	CEMEX CONSTRUCTION MATERIALS FL, LLC	25.51	910.34
FL	VISTAS	12011-8440811	DUCHE ENERGY LICHU, NC, (DUC)	5,308.41	2,489.83
FL	VISTAS	12088-0000111	FLORIDA POWER & LIGHT (FPL)	13.09	1,035.81
FL	VISTAS	12013-7527111	GUJ POWER - GULF	2,615.55	2,998.23
FL	VISTAS	12016-7537711	HOMESTEAD CITY UTILITIES	0.00	87.00
FL	VISTAS	12011-8407111	JTA	7,094.48	651.74
FL	VISTAS	12205-2172111	MOGAS FERTILIZER, LLC	7,900.62	310.44
FL	VISTAS	12057-7161111	MOGAS FERTILIZER, LLC	8,034.02	259.72
FL	VISTAS	12205-9198111	MOGAS FERTILIZER, LLC	4,425.53	141.03
FL	VISTAS	12089-8458111	RAYONIER PERFORMANCE FIBERS, LLC	561.97	2,327.18
FL	VISTAS	12089-7517111	ROCKTENN CO, LLC	2,606.72	2,119.77
FL	VISTAS	12005-5154111	ROCKTENN CO, LLC	2,590.88	1,464.88
FL	VISTAS	12129-2731711	SAIA-HASSIS CITY PURCHASING GENERATING STA.	2.85	121.44
FL	VISTAS	12085-5388111	TAZARA LLC (THE COMPANY) (1-1)	6,084.93	2,665.03
FL	VISTAS	12080-8991111	TAZARA HANOVER, LLC	9.98	879.74
FL	VISTAS	12047-7597111	WILITE SPRINGS AGRICULTURAL CHEMICALS, INC.	3,187.77	112.41
GA	VISTAS	13127-7721011	Branswick Cellulose, Inc.	284.20	1,554.51
GA	VISTAS	13015-2813011	Go Power Company - Plant Tocco	10,453.41	5,641.75
GA	VISTAS	13103-5161111	Georgia-Pacific Consumer Products LP (Savannah River VIII)	3,465.15	351.12
GA	VISTAS	13051-1079811	International Paper - Savannah	3,495.33	1,560.73
GA	VISTAS	13115-1093111	TEWLE INLAND	1,791.00	1,773.33

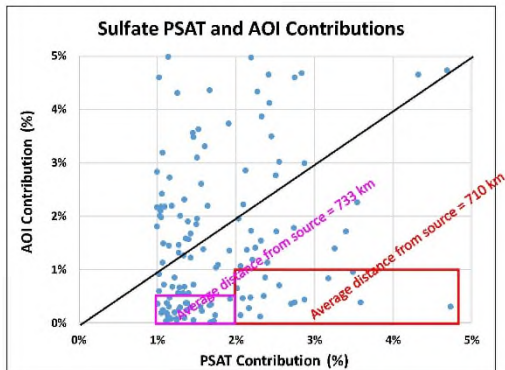
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Sulfate AOI vs. Sulfate PSAT (≥ 1.00%)



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Sulfate AOI vs. Sulfate PSAT ($\geq 1.00\%$)



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Reasonable Progress Screening Approach

- Due to the amount of resources already invested in the AOI and PSAT analysis, **VISTAS plans to continue with our original reasonable progress analysis approach** for determining which sources will require a four-factor analysis.
- In cases where emissions decreased or increased at individual facilities being considered for a four-factor analysis, the facility contributions will be adjusted to be consistent with the lower/higher facility emissions before comparing to the PSAT contribution threshold.
- **EPA verbally stated this should be okay 2/6/2020.**

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AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area.
- AOI tends to underestimate impacts for facilities far away from the Class I area.
 - AOI uses 72-hour back trajectories, sulfate can last for weeks and travel hundreds to thousands of km.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

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Revised Facility Sulfate PSAT Results

- **Revised Facility Sulfate PSAT Results**
 = Original Facility Sulfate PSAT Results
 * $SO_2 \text{ Ratio}_{\text{Facility}} * \text{Ratio}_{\text{Class}_I \text{ Area}}$

$$\text{where, } SO_2 \text{ Ratio}_{\text{Facility}} = \frac{\text{(Revised facility } SO_2 \text{ emissions)}}{\text{(Original facility } SO_2 \text{ emissions)}}$$

$$\text{where, } \text{Ratio}_{\text{Class}_I \text{ Area}} = \frac{\text{(Original sulfate + nitrate point contribution)}}{\text{(Revised sulfate + nitrate point contribution)}}$$

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Reasonable Progress Screening Approach

- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate impacts** from all sources at each Class I area since the SO_2 and NO_x emissions have decreased.
- However, the **individual sulfate and total nitrate impacts** from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO_2 and/or NO_x emissions.
- Therefore, the percent contribution (facility sulfate impact/total impact of all point sources of sulfate + nitrate) will increase since the denominator will decrease; however, the order of the rankings from largest impact to smallest impact should not change unless one of those facilities reduced or increased emissions.

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Revised Facility Nitrate PSAT Results

- **Revised Facility Nitrate PSAT Results**
 = Original Facility Nitrate PSAT Results
 * $NO_x \text{ Ratio}_{\text{Facility}} * \text{Ratio}_{\text{Class}_I \text{ Area}}$

$$\text{where, } NO_x \text{ Ratio}_{\text{Facility}} = \frac{\text{(Revised facility } NO_x \text{ emissions)}}{\text{(Original facility } NO_x \text{ emissions)}}$$

$$\text{where, } \text{Ratio}_{\text{Class}_I \text{ Area}} = \frac{\text{(Original sulfate + nitrate point contribution)}}{\text{(Revised sulfate + nitrate point contribution)}}$$

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Facility Name	Facility RPO	FACILITY ID	FACILITY NAME	502 Ratio	Now Ratio
AL	VFS025	0109-040811	Alto North Chemicals int	1,000	1,000
AL	VFS025	0102-026313	Ala Power - Balfy	1,000	1,000
AL	VFS025	0101-020103	American Oil Refining Company, Chicago, IL	8,000	8,000
AL	VFS025	0107-010117	BURHUMED CO OF PANY, INC.	1,000	1,000
AL	VFS025	0103-043304	Carrollville Express and Logistics L.L.C.	1,000	1,000
AL	VFS025	0103-085111	Examining Station, Birmingham L.L.C.	5,000	5,000
AL	VFS025	01103-010010	Fluor Solvent Dewater L.L.C.	2,000	2,000
AL	VFS025	01309-055101	Frontier Lead Co	1,000	1,000
AL	VFS025	02007-020614	Frontier Oil Refining Company - Chunchuga Gas Plant	1,000	1,000
CA	VFS025	1212-75-2311	BUCKLEY FUEL LIA, LIMITED PARTNERSHIP	1,000	0,000
CA	VFS025	10886-200101	CEMEX CONSTRUCTION MATERIALS FL, LLC	1,000	1,000
CA	VFS025	1203-040811	CHS ENERGY LOGISTICS	1,000	1,000
CA	VFS025	1088-060813	CLIMATE WIND ENERGY, S.E. (RPT) P.L.L.C.	1,000	0,000
CA	VFS025	10831-75-7111	COI - POWELL - CH	1,000	0,000
CA	VFS025	1206-75-7111	COMET STEEL DISTRIBUTION LTD	1,000	1,000
CA	VFS025	13001-640711	CPIA	1,000	1,000
CA	VFS025	12404-71-7111	COSAC FERTILIZERS L.L.C.	1,000	1,000
CA	VFS025	12067-710111	COSAC FERTILIZERS L.L.C.	1,000	1,000
CA	VFS025	12105-910811	COSAC FERTILIZERS L.L.C.	1,000	1,000
CA	VFS025	12089-640611	COWEN CHEM CO-ORMANCE - BEERS L.C.	1,000	0,000
CA	VFS025	12080-75-7111	COX'S TENDRY L.L.C.	1,000	1,000
CA	VFS025	10005-535411	COY-CHEN CO L.L.C.	1,000	1,000
CA	VFS025	12749-270111	CRILA-MODE- CITY PLUM STEEL MANUFACTURING STA.	2,000	2,000
CA	VFS025	14005-030811	CROWN STEEL MANUFACTURING (P.L.L.C.)	1,000	1,000
CA	VFS025	10008-409911	CUMMINS-EMERICK L.L.C.	1,000	1,000
CA	VFS025	12087-709711	DELITE SPRINGERS AND CULTURAL C-ENTRALS L.L.C.	1,000	1,000
CA	VFS025	13117-772111	Deming Oil Refining Co	1,000	1,000
CA	VFS025	13015-281011	EO Power Company - Rural Texas	1,000	1,000
CA	VFS025	13404-516111	Gescon-De-Pro Consumer Products L.L.C. (Hawthorn River VIII)	1,000	0,000
CA	VFS025	13015-162011	Greenwood Energy Services, Fresno	1,000	1,000
CA	VFS025	13115-281111	TEVRIE INC	1,000	0,000

Sipsey Wilderness Area (AL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	0.364	16.370	2.22%	0.005	16.370	0.05%
OH	39053-8148511	General James M. Gavin Power Plant (6227010055)	690.9	0.327	16.370	1.99%	0.021	16.370	0.13%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ASP ROCKPORT	398.4	0.327	16.370	1.99%	0.050	16.370	0.31%
IN	18051-7363111	Silsen	438.7	0.270	16.370	1.65%	0.029	16.370	0.18%
IN	18125-7362111	INDIANA POLIS POWER & LIGHT - PETERSBURG	464.1	0.255	16.370	1.57%	0.026	16.370	0.16%
TN	47161-4879311	TVA CLIMBERLAND FOSAL PLANT	328.9	0.242	16.370	1.45%	0.008	16.370	0.17%
VO	29343-5363831	NLW MADRID POWER PLANT - VARS'ON	314.5	0.220	16.370	1.44%	0.012	16.370	0.07%
KY	21183-5561611	Big Rivers Electric Corp - Wilson Station	343.5	0.211	16.370	1.29%	0.008	16.370	0.05%
Facilities That Dropped Off After REVISION									
IL	17117-7508911	Joppe Station	346.5	0.134	16.370	0.82%	0.003	16.370	0.02%
IN	18173-8181111	ALCOA - WARRICK POWER PLT AGC DIV OF AL	506.3	0.066	16.370	0.41%	0.037	16.370	0.19%

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Everglades NP (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	3.02%	2.56%	3.33%	0.08%	0.00%	0.00%
FL	12105-915811	MOSAIC FERTILIZER, LLC	304.7	2.21%	2.09%	2.62%	0.01%	0.00%	0.00%
FL	12105-717711	MOSAIC FERTILIZER LLC	303.3	2.26%	3.55%	2.69%	0.02%	0.00%	0.00%
FL	12088-899911	TARMAC AMERICA LLC	61.7	0.16%	0.17%	0.23%	2.02%	0.76%	2.63%

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Chassahowitzka Wilderness Area (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
FL	12017-640611	DURE ENERGY FLORIDA, INC. (DEF)	27.4	62.62%	9.55%	6.24%	1.95%	0.40%	0.23%
GA	13015-2813011	Ga Power Company - Plant Bowen	637.2	0.03%	1.72%	2.28%	0.00%	0.02%	0.03%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	108.8	4.73%	0.80%	1.28%	0.24%	0.05%	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,088.0	0.03%	0.76%	1.01%	0.00%	0.04%	0.05%
AL	01109-985711	Sanders Lead Co	471.2	0.15%	0.76%	1.00%	0.00%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	1,133.4	0.05%	1.47%	0.83%	0.00%	0.08%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ASP ROCKPORT	1,099.6	0.03%	1.13%	0.53%	0.00%	0.04%	0.06%
AL	01053-7440211	Escambia Operating Company LLC	530.7	0.21%	1.57%	0.41%	0.00%	0.01%	0.01%

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Everglades NP (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	0.04%	1.33%	3.33%	0.00%	1.33%	0.00%
FL	12105-915811	MOSAIC FERTILIZER, LLC	304.7	0.03%	1.33%	2.62%	0.00%	1.33%	0.00%
FL	12105-717711	MOSAIC FERTILIZER LLC	303.3	0.03%	1.33%	2.69%	0.00%	1.33%	0.00%
FL	12088-899911	TARMAC AMERICA LLC	61.7	0.00%	1.33%	0.23%	0.03%	1.33%	2.63%

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Chassahowitzka Wilderness Area (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
FL	12017-640611	DURE ENERGY FLORIDA, INC. (DEF)	27.4	0.62%	10.092	6.24%	0.023	10.092	0.23%
GA	13015-2813011	Ga Power Company - Plant Bowen	637.2	0.330	10.092	2.28%	0.009	10.092	0.03%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	108.8	0.129	10.092	1.28%	0.007	10.092	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,088.0	0.102	10.092	1.01%	0.005	10.092	0.05%
AL	01109-985711	Sanders Lead Co	471.2	0.101	10.092	1.00%	0.001	10.092	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	1,133.4	0.083	10.092	0.83%	0.004	10.092	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ASP ROCKPORT	1,099.6	0.053	10.092	0.53%	0.006	10.092	0.06%
AL	01053-7440211	Escambia Operating Company LLC	530.7	0.042	10.092	0.41%	0.001	10.092	0.01%

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St Marks Wilderness Area (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Nitrate PSAT MWh	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD MWh	FINAL Revised Sulfate PSAT %
GA	13015-2813011	Ga Power Company - Plant Bowen	452.5	0.38%	3.59%	4.83%	0.01%	0.03%	0.03%
FL	12005-535411	ROCKTENN CP LLC	140.8	8.54%	3.38%	4.60%	0.24%	0.09%	0.13%
AL	01109-985711	Sanders Lead Co	255.9	3.06%	0.82%	1.12%	0.00%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
AL	01057-1056111	Mid-Tennessee Energy	589.1	1.67%	1.43%	0.97%	0.03%	0.02%	0.03%
AL	01053-7440211	Escambia Operating Company LLC	525.6	5.95%	3.53%	0.98%	0.01%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ASP ROCKPORT	908.4	0.13%	1.67%	0.80%	0.00%	0.01%	0.01%
PA	47005-3866111	EPSON NE NIGHT COAST/STONE STA	1,251.0	0.29%	1.70%	0.65%	0.01%	0.00%	0.00%
AL	01053-985111	Escambia Operating Company LLC	315.0	0.00%	1.68%	0.02%	0.00%	0.00%	0.00%

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St Marks Wilderness Area (FL)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
GA	13015-2813011	Ga Power Company - Plant Bowen	452.9	0.574	11.729	0.899	0.004	11.729	0.039
FL	12009-553411	ROCKTECH CP LLC	149.8	0.540	11.729	0.600	0.015	11.729	0.139
AL	01109-985711	Sanders Lead Co	255.9	0.131	11.729	1.129	0.000	11.729	0.000
Facilities That Dropped Off After REVISION									
AL	01097-1056111	Min Power - Berry	363.1	0.114	11.729	0.979	0.009	11.729	0.039
AL	01053-7440711	Escambia Operating Company LLC	325.6	0.112	11.729	0.969	0.000	11.729	0.029
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	808.4	0.094	11.729	0.809	0.001	11.729	0.019
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	1,251.0	0.076	11.729	0.659	0.000	11.729	0.000
AL	01053-985111	Escambia Operating Company LLC	315.0	0.093	11.729	0.029	0.000	11.729	0.000

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Okefenokee Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	14.639	4.329	2.779	0.039	0.019	0.019
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	1.029	1.749	2.939	0.059	0.049	0.059
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	155.5	1.169	1.649	2.169	0.149	0.119	0.149
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.469	2.199	1.519	0.019	0.019	0.019
FL	12089-753711	ROCK TENN CP, LLC	64.8	12.839	1.009	1.319	0.889	0.119	0.159
SC	45015-4120411	Santee Cooper Cross Generating Station	348.1	0.659	0.899	1.199	0.059	0.039	0.049
GA	13051-3679811	International Paper - Savannah	178.9	2.819	0.729	1.049	0.089	0.059	0.069
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	939.4	0.239	0.789	1.939	0.809	0.039	0.049
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	1,120.0	0.469	7.059	1.029	0.019	0.019	0.019
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	971.9	0.099	1.349	0.839	0.009	0.079	0.019
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	915.7	0.559	1.409	0.659	0.019	0.079	0.039

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Cohutta Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	512.0	1.719	3.419	2.419	0.029	0.059	0.079
GA	13015-2813011	Ga Power Company - Plant Bowen	78.0	19.589	1.569	2.139	1.159	0.039	0.049
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	2.189	1.059	1.449	0.079	0.019	0.029
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	410.1	4.689	7.849	1.379	0.139	0.039	0.049
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	1.059	2.069	1.319	0.069	0.039	0.049
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	269.8	0.999	0.929	2.259	0.999	0.029	0.099
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	801.1	0.149	2.069	1.049	0.009	0.019	0.019
IN	18051-7363111	Elkhart	487.1	2.319	1.359	1.039	0.109	0.079	0.079
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	2.189	1.299	0.819	0.169	0.029	0.029
TN	47145-4579111	TVA KINGSTON FOSSIL PLANT	124.0	2.179	1.209	0.349	0.139	0.069	0.029

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Okefenokee Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	0.372	13.400	2.779	0.002	13.400	0.019
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	0.308	13.400	2.939	0.007	13.400	0.059
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	155.5	0.288	13.400	2.169	0.019	13.400	0.149
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.203	13.400	1.519	0.002	13.400	0.019
FL	12089-753711	ROCK TENN CP, LLC	64.8	0.176	13.400	1.319	0.020	13.400	0.159
SC	45015-4120411	Santee Cooper Cross Generating Station	348.1	0.158	13.400	1.199	0.006	13.400	0.049
GA	13051-3679811	International Paper - Savannah	178.9	0.140	13.400	1.049	0.008	13.400	0.069
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	939.4	0.138	13.400	1.939	0.006	13.400	0.049
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	1,120.0	0.137	13.400	1.029	0.002	13.400	0.019
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	971.9	0.111	13.400	0.839	0.002	13.400	0.019
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	915.7	0.087	13.400	0.659	0.004	13.400	0.039

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Cohutta Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	512.0	0.322	13.229	2.419	0.009	13.229	0.079
GA	13015-2813011	Ga Power Company - Plant Bowen	78.0	0.282	13.229	2.139	0.005	13.229	0.049
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	0.190	13.229	1.449	0.900	13.229	0.029
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	410.1	0.181	13.229	1.379	0.005	13.229	0.049
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	0.173	13.229	1.319	0.005	13.229	0.049
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	269.8	0.165	13.229	2.259	0.012	13.229	0.099
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	801.1	0.137	13.229	1.049	0.002	13.229	0.019
IN	18051-7363111	Elkhart	487.1	0.137	13.229	1.039	0.002	13.229	0.079
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	0.111	13.229	0.819	0.003	13.229	0.029
TN	47145-4579111	TVA KINGSTON FOSSIL PLANT	124.0	0.045	13.229	0.349	0.002	13.229	0.029

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Wolf Island Wilderness (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Nitrate PSAT Mm ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NEGU Mm ³	FINAL Revised Sulfate PSAT %
FL	12089-753711	ROCK TENN CP, LLC	74.9	8.569	1.799	2.359	0.339	0.119	0.149
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	1.089	1.789	2.839	0.099	0.049	0.059
GA	13127-9721011	Bramwell Cellulose Inc.	27.9	8.849	1.949	1.769	2.949	0.109	0.139
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	845.3	1.719	2.519	1.719	0.029	0.029	0.029
GA	13051-3679811	International Paper - Savannah	85.9	7.539	1.189	1.549	0.249	0.079	0.099
SC	45015-4120411	Santee Cooper Cross Generating Station	251.0	1.559	0.999	1.109	0.099	0.069	0.089
FL	12051-640211	IFA	109.1	4.439	0.869	1.129	0.099	0.039	0.069
SC	45015-4849411	ALLUMAX OF SOUTH CAROLINA	223.0	1.849	0.959	1.759	0.009	0.019	0.019
PA	42005-3866111	SEVON NF MGMT CO/KEYSTONE STA	1,048.0	0.849	2.979	1.159	0.019	0.019	0.019
Facilities That Dropped Off After REVISION									
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	876.1	0.079	1.259	0.769	0.009	0.029	0.029
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.8	1.979	1.059	0.679	0.019	0.019	0.019
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	899.0	0.379	1.389	0.649	0.009	0.029	0.039

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Wolf Island Wilderness (GA)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
FL	12089-753711	ROCK TERN CP, LLC	74.9	0.304	12.957	2.351	0.018	12.957	0.14%		
GA	13015-2813011	Ria Power Company - Plant Bowen	458.1	0.302	12.957	2.331	0.007	12.957	0.05%		
GA	13127-8721011	Brunswick Cellulose Inc	27.5	0.228	12.957	1.731	0.017	12.957	0.13%		
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	845.3	0.224	12.957	1.711	0.003	12.957	0.02%		
GA	13051-3679811	International Paper - Savannah	85.9	0.200	12.957	1.541	0.012	12.957	0.09%		
SC	45015-4120411	Santee Cooper Cross Generating Station	251.0	0.168	12.957	1.301	0.011	12.957	0.00%		
FL	12011-640711	RA	109.1	0.167	12.957	1.291	0.006	12.957	0.06%		
SC	45015-4819411	ALLMAN OF SOUTH CAROLINA	233.0	0.162	12.957	1.251	0.001	12.957	0.01%		
PA	42003-3866111	GLWON NL V/GW1 CO/KEYSTONE STA	1,048.0	0.149	12.957	1.151	0.002	12.957	0.01%		
Facilities That Dropped Off After REVISION											
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	876.1	0.099	12.957	0.761	0.002	12.957	0.02%		
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	0.087	12.957	0.671	0.001	12.957	0.02%		
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	899.0	0.083	12.957	0.641	0.004	12.957	0.03%		

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Linville Gorge Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	81.9	19.21%	2.87%	4.05%	0.68%	0.07%	0.10%		
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	379.2	5.90%	4.67%	3.46%	0.04%	0.01%	0.07%		
PA	42003-3866111	CFNON NF V/GW1 CO/KEYSTONE STA	567.5	0.94%	3.49%	1.82%	0.00%	0.09%	0.09%		
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.28%	0.95%	1.34%	0.00%	0.01%	0.02%		
TN	47163-4979311	TVA CLUMBERLAND FOSSIL PLANT	516.6	0.11%	0.85%	1.20%	0.00%	0.01%	0.01%		
GA	13015-2813011	Ria Power Company - Plant Bowen	340.9	0.53%	0.80%	1.13%	0.02%	0.00%	0.00%		
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	1.18%	2.22%	1.10%	0.01%	0.07%	0.09%		
IN	18051-7363111	Gibson	582.3	0.67%	1.55%	2.07%	0.01%	0.07%	0.07%		
VO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	688.6	0.03%	1.11%	1.01%	0.00%	0.00%	0.00%		
VA	51027-4034811	Jewell Coke Company LIP	149.4	5.34%	0.33%	1.05%	0.01%	0.00%	0.00%		
Facilities That Dropped Off After REVISION											
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	856.4	0.29%	1.41%	0.86%	0.00%	0.01%	0.09%		
MD	24002-7763812	Luke Paper Company	461.8	0.22%	1.37%	0.84%	0.00%	0.00%	0.00%		
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PLT/CLUBS	550.5	0.36%	2.22%	0.82%	0.01%	0.07%	0.05%		
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	380.2	2.82%	1.00%	0.66%	0.03%	0.02%	0.01%		

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Mammoth Cave NP (KY)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	16.88%	3.57%	1.69%	2.60%	0.26%	0.33%		
IN	18051-7363111	Gibson	198.2	5.21%	2.16%	1.63%	1.26%	0.35%	0.33%		
KY	21183-5561611	Big Rivers Electric Corp. - Wilson Station	89.5	6.72%	1.07%	1.43%	0.37%	0.06%	0.06%		
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	1.60%	0.86%	1.15%	0.15%	0.14%	0.19%		
VO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	312.7	0.65%	1.29%	1.14%	0.04%	0.07%	0.09%		
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PLT/CLUBS	182.9	3.09%	1.50%	1.04%	0.96%	0.40%	0.27%		
Facilities That Dropped Off After REVISION											
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	256.1	1.21%	1.43%	0.89%	0.14%	0.12%	0.12%		
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	406.5	1.45%	1.15%	0.81%	0.04%	0.02%	0.02%		
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	498.6	0.30%	1.15%	0.65%	0.04%	0.05%	0.02%		
IN	18173-8183112	ALCOA WARRICK POWER PLT AGC DIV OF AL	136.1	2.05%	1.03%	0.40%	1.74%	0.82%	0.32%		
IN	18123-8166112	Egeco AB Brown South Indiana Gas & Ele	162.9	2.73%	1.16%	0.00%	0.27%	0.06%	0.00%		

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Linville Gorge Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	81.9	0.52%	12.884	4.05%	0.01%	12.884	0.16%		
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	379.2	0.44%	12.864	3.46%	0.00%	12.864	0.07%		
PA	42003-3866111	CFNON NF V/GW1 CO/KEYSTONE STA	567.5	0.73%	12.854	1.82%	0.00%	12.854	0.09%		
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.17%	12.844	1.34%	0.00%	12.844	0.02%		
TN	47163-4979311	TVA CLUMBERLAND FOSSIL PLANT	516.6	0.15%	12.844	1.20%	0.00%	12.844	0.01%		
GA	13015-2813011	Ria Power Company - Plant Bowen	340.9	0.14%	12.844	1.13%	0.00%	12.844	0.00%		
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	0.14%	12.844	1.10%	0.01%	12.844	0.09%		
IN	18051-7363111	Gibson	582.3	0.13%	12.844	2.07%	0.00%	12.844	0.07%		
VO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	688.6	0.13%	12.844	1.01%	0.00%	12.844	0.00%		
VA	51027-4034811	Jewell Coke Company LIP	149.4	0.13%	12.844	1.05%	0.00%	12.844	0.00%		
Facilities That Dropped Off After REVISION											
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	856.4	0.11%	12.844	0.86%	0.00%	12.844	0.00%		
MD	24002-7763812	Luke Paper Company	461.8	0.10%	12.844	0.84%	0.00%	12.844	0.00%		
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PLT/CLUBS	550.5	0.10%	12.844	0.82%	0.00%	12.844	0.00%		
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	380.2	0.08%	12.844	0.66%	0.00%	12.844	0.01%		

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Mammoth Cave NP (KY)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	0.42%	25.289	1.08%	0.08%	25.289	0.33%		
IN	18051-7363111	Gibson	198.2	0.41%	25.289	1.63%	0.08%	25.289	0.33%		
KY	21183-5561611	Big Rivers Electric Corp. - Wilson Station	89.5	0.36%	25.289	1.43%	0.07%	25.289	0.08%		
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	0.29%	25.289	1.15%	0.04%	25.289	0.19%		
VO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	312.7	0.38%	25.289	1.14%	0.07%	25.289	0.09%		
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PLT/CLUBS	182.9	0.24%	25.289	1.04%	0.06%	25.289	0.27%		
Facilities That Dropped Off After REVISION											
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	256.1	0.22%	25.289	0.89%	0.03%	25.289	0.12%		
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	406.5	0.20%	25.289	0.81%	0.00%	25.289	0.02%		
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	498.6	0.16%	25.289	0.65%	0.00%	25.289	0.02%		
IN	18173-8183112	ALCOA WARRICK POWER PLT AGC DIV OF AL	136.1	0.10%	25.289	0.40%	0.07%	25.289	0.30%		
IN	18123-8166112	Egeco AB Brown South Indiana Gas & Ele	162.9	0.00%	25.289	0.00%	0.00%	25.289	0.00%		

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Shining Rock Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	Original EDU + NEDU MM	Original Nitrate PSAT %	Original Nitrate AO %	FINAL Revised Sulfate PSAT %	FINAL Revised EDU + NEDU MM	FINAL Revised Nitrate PSAT %	FINAL Revised Nitrate AO %
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	379.2	1.39%	7.26%	2.41%	0.01%	0.01%	0.01%		
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	579.8	0.47%	1.16%	1.43%	0.01%	0.02%	0.02%		
TN	47163-4979311	TVA CLUMBERLAND FOSSIL PLANT	464.1	0.54%	0.93%	1.32%	0.02%	0.01%	0.03%		
GA	13015-2813011	Ria Power Company - Plant Bowen	341.6	1.70%	0.85%	1.23%	0.07%	0.01%	0.03%		
VO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	675.2	0.36%	1.57%	1.22%	0.00%	0.01%	0.01%		
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	473.8	0.70%	2.55%	1.27%	0.01%	0.07%	0.09%		
PA	42003-3866111	GLWON NL V/GW1 CO/KEYSTONE STA	617.8	0.49%	2.36%	2.23%	0.00%	0.00%	0.00%		
IN	18051-7363111	Gibson	554.2	0.29%	1.55%	2.23%	0.01%	0.07%	0.07%		
NC	37087-7920511	Blue Ridge Paper Products - Canton Mill	16.9	41.29%	2.14%	1.03%	6.65%	0.07%	0.10%		
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	406.7	1.37%	1.50%	1.05%	0.03%	0.01%	0.01%		
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.13%	1.74%	1.04%	0.00%	0.01%	0.01%		
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	126.9	4.43%	0.74%	1.04%	0.49%	0.02%	0.02%		
Facilities That Dropped Off After REVISION											
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PLT/CLUBS	529.0	0.18%	1.17%	0.87%	0.01%	0.11%	0.06%		
IL	17127-7808912	Yoggo Steam	582.4	0.23%	1.07%	0.59%	0.00%	0.02%	0.02%		

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Shining Rock Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	397.3	0.297	12.313	2.91%	0.003	12.313	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	573.4	0.201	12.313	1.83%	0.009	12.313	0.00%
TN	47161-4879311	TVA CUMBERLAND FOSSIL PLANT	454.1	0.162	12.313	1.52%	0.000	12.313	0.00%
GA	13015-2813011	Ea Power Company - Plant Bowen	241.6	0.159	12.313	1.29%	0.000	12.313	0.01%
VO	29143-5363811	NFW MADRID POWER PLANT-VARSTON	675.2	0.158	12.313	1.28%	0.001	12.313	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	473.3	0.156	12.313	1.27%	0.002	12.313	0.00%
PA	42003-3866111	GLNVON NL N G/V T CO/KEYSTONE STA	657.6	0.151	12.313	1.23%	0.000	12.313	0.00%
IN	18051-7363111	Edison	554.2	0.151	12.313	1.23%	0.008	12.313	0.07%
NC	37087-7920511	Blue Ridge Paper Products - Canton Mills	16.9	0.193	12.313	1.08%	0.002	12.313	0.00%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	0.129	12.313	1.05%	0.007	12.313	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.129	12.313	1.04%	0.003	12.313	0.01%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	326.9	0.128	12.313	1.04%	0.009	12.313	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	529.0	0.101	12.313	0.82%	0.010	12.313	0.08%
IL	17127-7808911	Papco Steam	582.4	0.073	12.313	0.59%	0.000	12.313	0.07%

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Swanquarter Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42003-3866111	GENVON NE N G/V T CO/KEYSTONE STA	640.2	0.375	10.894	3.14%	0.009	10.894	0.03%
NC	37013-4879311	PCS Phosphate Company, Inc. - Aurora	52.5	0.329	10.894	3.02%	0.007	10.894	0.06%
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	651.5	0.219	10.894	2.01%	0.005	10.894	0.05%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.203	10.894	1.86%	0.007	10.894	0.08%
MD	74001-7763811	Juke Paper Company	512.5	0.191	10.894	1.75%	0.008	10.894	0.07%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	568.6	0.186	10.894	1.71%	0.013	10.894	0.12%
PA	42003-3866111	IONMLR CTY GLN LP/ CLNTLR TWP	620.1	0.151	10.894	1.38%	0.008	10.894	0.07%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	625.7	0.127	10.894	1.17%	0.005	10.894	0.05%
GA	13015-2813011	Ea Power Company - Plant Bowen	810.6	0.112	10.894	1.03%	0.009	10.894	0.03%
NC	37117-4804311	Dorstar Paper Company, LLC	89.0	0.109	10.894	1.00%	0.022	10.894	0.20%
Facilities That Dropped Off After REVISION									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	1,005.3	0.097	10.894	0.83%	0.005	10.894	0.04%

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Joyce Kilmer-Slickrock Wilderness Area (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	475.1	4.73%	4.69%	3.45%	0.05%	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.64%	0.93%	1.38%	0.05%	0.07%	0.10%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	179.2	5.88%	0.93%	1.30%	0.16%	0.02%	0.02%
PA	42003-3866111	GLNVON NE N G/V T CO/KEYSTONE STA	711.0	0.27%	2.17%	1.17%	0.00%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	391.2	4.33%	2.27%	1.12%	0.14%	0.10%	0.22%
GA	13015-2813011	Ea Power Company - Plant Bowen	166.2	3.63%	0.79%	1.11%	0.10%	0.01%	0.01%
IN	18051-7363111	Edison	471.7	2.00%	1.29%	1.02%	0.11%	0.21%	0.21%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	3.63%	1.53%	1.00%	0.06%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	1.58%	1.36%	0.81%	0.05%	0.02%	0.01%
TN	47125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	453.0	2.16%	1.00%	0.72%	0.74%	0.23%	0.16%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	73.7	7.86%	2.44%	0.39%	0.57%	0.10%	0.03%

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Cape Romain Wilderness Area (SC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
SC	45018-4879311	KAPSTONE CHARLESTON KRAFT LLC	29.3	30.18%	2.86%	3.73%	2.74%	0.25%	0.33%
GA	13015-2813011	Ea Power Company - Plant Bowen	506.2	0.36%	2.71%	1.53%	0.01%	0.10%	0.14%
SC	45015-4834911	ALUMAK OF SOUTH CAROLINA	39.1	17.07%	1.79%	2.33%	0.03%	0.02%	0.02%
PA	42003-3866111	GLNVON NL N G/V T CO/KEYSTONE STA	837.1	0.30%	4.74%	2.28%	0.00%	0.01%	0.01%
SC	45015-4120411	SANTIE COOPER CROSS GENERATING STATION	61.8	6.57%	1.73%	2.25%	0.45%	0.21%	0.27%
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	701.0	0.84%	3.18%	2.17%	0.00%	0.03%	0.04%
SC	45043-5696611	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	4.31%	1.26%	1.64%	0.35%	0.11%	0.15%
SC	45043-6465211	SANTIE COOPER WINTAH GENERATING STATION	51.4	4.60%	1.02%	1.33%	0.38%	0.13%	0.17%
GA	13051-3479811	International Paper - Savannah	166.1	1.76%	0.99%	1.20%	0.04%	0.05%	0.06%
Facilities That Dropped Off After REVISION									
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.11%	1.14%	0.69%	0.00%	0.04%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	868.3	0.06%	1.18%	0.54%	0.00%	0.07%	0.08%

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Swanquarter Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42003-3866111	GENVON NE N G/V T CO/KEYSTONE STA	640.2	3.00%	6.66%	3.14%	0.08%	0.08%	0.07%
NC	37013-4879311	PCS Phosphate Company, Inc. - Aurora	52.5	17.89%	2.16%	3.02%	0.57%	0.08%	0.06%
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	651.5	1.77%	2.74%	2.01%	0.06%	0.03%	0.05%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.35%	1.00%	1.86%	0.02%	0.03%	0.06%
MD	74001-7763811	Juke Paper Company	512.5	0.43%	2.88%	1.75%	0.07%	0.05%	0.07%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	568.6	0.67%	1.19%	1.71%	0.08%	0.10%	0.12%
PA	42003-3866111	IONMLR CTY GLN LP/ CLNTLR TWP	620.1	0.55%	1.27%	1.38%	0.05%	0.05%	0.07%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	625.7	0.64%	1.22%	1.17%	0.07%	0.03%	0.05%
GA	13015-2813011	Ea Power Company - Plant Bowen	810.6	0.15%	0.74%	1.03%	0.00%	0.02%	0.03%
NC	37117-4804311	Dorstar Paper Company, LLC	89.0	3.23%	0.72%	1.00%	2.03%	0.14%	0.20%
Facilities That Dropped Off After REVISION									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	1,005.3	0.54%	1.69%	0.83%	0.07%	0.03%	0.04%

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Cape Romain Wilderness Area (SC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate ADI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
SC	45018-4879311	KAPSTONE CHARLESTON KRAFT LLC	29.3	0.52%	14.02%	3.73%	0.04%	14.02%	0.33%
GA	13015-2813011	Ea Power Company - Plant Bowen	506.2	0.49%	14.02%	3.53%	0.01%	14.02%	0.14%
SC	45015-4834911	ALUMAK OF SOUTH CAROLINA	39.1	0.327	14.02%	2.33%	0.009	14.02%	0.02%
PA	42003-3866111	GLNVON NL N G/V T CO/KEYSTONE STA	837.1	0.320	14.02%	2.28%	0.002	14.02%	0.01%
SC	45015-4120411	SANTIE COOPER CROSS GENERATING STATION	61.8	0.316	14.02%	2.25%	0.038	14.02%	0.27%
OH	39053-8148511	General James M. Govin Power Plant (0627010056)	701.0	0.305	14.07%	2.17%	0.005	14.07%	0.04%
SC	45043-5696611	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	0.230	14.07%	1.64%	0.021	14.02%	0.15%
SC	45043-6465211	SANTIE COOPER WINTAH GENERATING STATION	51.4	0.187	14.07%	1.33%	0.024	14.02%	0.17%
GA	13051-3479811	International Paper - Savannah	166.1	0.180	14.07%	1.20%	0.009	14.02%	0.06%
Facilities That Dropped Off After REVISION									
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.097	14.02%	0.69%	0.006	14.02%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	868.3	0.076	14.02%	0.54%	0.012	14.02%	0.08%

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Great Smoky Mountains National Park (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	0.570	13.016	5.73%	0.003	13.916	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	0.183	13.916	1.32%	0.011	13.916	0.08%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	160.1	0.178	13.916	1.22%	0.007	13.916	0.05%
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	688.2	0.166	13.916	1.1%	0.001	13.916	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	375.5	0.186	13.916	1.1%	0.035	13.916	0.25%
IN	18051-7863111	Gibson	456.3	0.146	13.916	1.05%	0.017	13.916	0.7%
Facilities That Dropped Off After REVISION									
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	360.0	0.136	13.916	0.98%	0.002	13.916	0.02%
IN	18125-7262412	INDIANAPOLIS POWER & LIGHT - PETERSBURG	435.6	0.109	13.916	0.78%	0.028	13.916	0.20%
AR	05063-1083412	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.100	13.916	0.72%	0.001	13.916	0.00%
TN	47145-4379112	TVA KINGSTON FOSSIL PLANT	60.0	0.054	13.916	0.38%	0.004	13.916	0.03%

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James River Face Wilderness Area (VA)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	7.66%	4.00%	0.18%	0.08%	0.11%	0.07%
WV	54093-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	2.76%	3.65%	0.36%	0.12%	0.14%	0.04%
DH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	1.35%	3.61%	0.04%	0.02%	0.06%	0.00%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	3.87%	2.33%	2.26%	0.13%	0.09%	0.05%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	323.5	3.50%	2.46%	1.33%	0.13%	0.05%	0.11%
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	337.1	2.98%	2.88%	1.51%	0.06%	0.03%	0.04%
VA	51580-5798711	Westwinds Park/Siding Resource Group	46.5	17.64%	1.02%	1.45%	1.14%	0.15%	0.22%
DH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	270.0	0.63%	0.66%	1.18%	0.16%	0.04%	0.04%
WV	54051-6902311	MITCHELL PLANT	269.6	0.68%	0.97%	1.02%	0.03%	0.02%	0.04%
Facilities That Dropped Off After REVISION									
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	435.2	1.89%	1.39%	0.92%	0.05%	0.05%	0.06%
IN	18051-7863111	Gibson	779.4	0.59%	1.07%	0.87%	0.07%	0.07%	0.18%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	663.5	0.56%	1.3%	0.66%	0.03%	0.01%	0.02%

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Great Smoky Mountains National Park (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	7.75%	5.10%	0.73%	0.04%	0.07%	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	1.34%	0.94%	1.32%	0.00%	0.06%	0.08%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	160.1	6.01%	0.89%	1.22%	0.19%	0.04%	0.05%
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	688.2	0.11%	2.31%	1.1%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	375.5	4.66%	2.42%	1.1%	0.21%	0.19%	0.25%
IN	18051-7863111	Gibson	456.3	1.75%	1.34%	1.05%	0.07%	0.77%	0.7%
Facilities That Dropped Off After REVISION									
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	360.0	1.84%	1.50%	0.98%	0.09%	0.02%	0.02%
IN	18125-7262412	INDIANAPOLIS POWER & LIGHT - PETERSBURG	435.6	1.48%	1.08%	0.78%	0.12%	0.23%	0.20%
AR	05063-1083412	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.19%	1.22%	0.72%	0.02%	0.02%	0.00%
TN	47145-4379112	TVA KINGSTON FOSSIL PLANT	60.0	7.38%	1.23%	0.38%	0.71%	0.08%	0.03%

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James River Face Wilderness Area (VA)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	0.582	14.404	4.01%	0.036	14.404	0.11%
WV	54093-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	0.526	14.404	3.65%	0.020	14.404	0.14%
DH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	0.520	14.404	3.61%	0.008	14.404	0.06%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	0.325	14.404	2.26%	0.007	14.404	0.05%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	323.5	0.278	14.404	1.33%	0.016	14.404	0.11%
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	337.1	0.217	14.404	1.51%	0.005	14.404	0.04%
VA	51580-5798711	Westwinds Park/Siding Resource Group	46.5	0.209	14.404	1.45%	0.001	14.404	0.22%
DH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	270.0	0.170	14.404	1.18%	0.006	14.404	0.04%
WV	54051-6902311	MITCHELL PLANT	269.6	0.156	14.404	1.02%	0.006	14.404	0.04%
Facilities That Dropped Off After REVISION									
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	435.2	0.133	14.404	0.92%	0.009	14.404	0.06%
IN	18051-7863111	Gibson	779.4	0.118	14.404	0.87%	0.007	14.404	0.18%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	663.5	0.096	14.404	0.66%	0.003	14.404	0.02%

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Joyce Kilmer-Slickrock Wilderness Area (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	475.1	0.473	13.694	1.45%	0.007	13.694	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.189	13.694	1.30%	0.014	13.694	0.10%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	179.2	0.178	13.694	1.30%	0.009	13.694	0.02%
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	711.0	0.154	13.694	1.12%	0.000	13.694	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	391.2	0.154	13.694	1.12%	0.030	13.694	0.22%
GA	13015-2813011	Ea Power Company - Plant Bowen	166.2	0.152	13.694	1.11%	0.001	13.694	0.01%
IN	18051-7863111	Gibson	471.7	0.139	13.694	1.02%	0.029	13.694	0.21%
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	385.1	0.137	13.694	1.00%	0.002	13.694	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083412	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	0.122	13.694	0.81%	0.001	13.694	0.01%
IN	18125-7262412	INDIANAPOLIS POWER & LIGHT - PETERSBURG	453.0	0.099	13.694	0.72%	0.022	13.694	0.16%
TN	47145-4379112	TVA KINGSTON FOSSIL PLANT	73.7	0.054	13.694	0.39%	0.004	13.694	0.03%

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Shenandoah National Park (VA)

State	Facility ID	Facility Name	DISTANCE_m	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %	Original EGU + NREG PSAT %	FINAL Revised EGU + NREG PSAT %
PA	42003-3866111	GEWON NE V GWT CO/KEYSTONE STA	219.8	11.83%	8.89%	4.81%	0.10%	0.05%	0.06%
DH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	1.53%	7.32%	4.50%	0.06%	0.05%	0.12%
WV	54093-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	189.7	4.60%	2.75%	4.14%	0.99%	0.37%	0.46%
DH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	5.75%	4.88%	3.75%	0.14%	0.10%	0.14%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	4.97%	2.20%	2.29%	0.24%	0.18%	0.28%
PA	42083-3005211	HOMER CITY GEN LP/ CENTER TWP	230.4	2.40%	1.56%	1.78%	0.13%	0.01%	0.06%
MD	24001-7261811	Jube Paper Company	118.4	8.92%	2.70%	1.41%	0.22%	0.09%	0.14%
PA	42003-3866111	WV: WHITFIELD CO/CFM/FWARD CFM STA	715.5	1.89%	1.00%	1.17%	0.04%	0.07%	0.07%
WV	54051-6902311	MITCHELL PLANT	251.8	3.46%	0.88%	1.01%	0.11%	0.08%	0.16%
DH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	324.1	0.43%	0.53%	1.01%	0.16%	0.06%	0.06%
Facilities That Dropped Off After REVISION									
WV	54082-6773612	MONONGAHELA POWER CO - FORT MARTIN POWER	181.4	2.42%	1.06%	0.97%	1.27%	0.47%	0.60%
DH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413080154)	505.4	1.31%	1.28%	0.87%	0.11%	0.05%	0.06%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	395.6	2.09%	1.04%	0.84%	0.09%	0.09%	0.15%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	755.8	0.71%	1.46%	0.76%	0.03%	0.02%	0.03%

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Dolly Sods Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PPM %	FINAL Revised Sulfate PPM %	Nitrate ADI %	Original Nitrate PPM %	FINAL Revised Nitrate PPM %
WV	54033-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	85.6	13.58%	4.84%	7.18%	1.36%	0.26%	0.31%
O-	39013-81480-1	General James M. Gavin Power Plant (06270-0056)	233.8	7.62%	6.56%	4.88%	0.10%	0.03%	0.05%
WV	54073-478281	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	4.64%	4.32%	4.39%	0.16%	0.07%	0.10%
O-	39081-81137-1	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	1.36%	7.18%	4.02%	0.03%	0.03%	0.03%
O-	39025-82943-1	Duke Energy Ohio, Wm. H. Zimmer Station (413080-54)	416.9	1.40%	7.25%	1.97%	0.02%	0.04%	0.05%
WV	54051-690231	MITCHELL PLANT	144.2	1.45%	1.28%	1.47%	0.07%	0.02%	0.05%
PA	42005-18961-1	LITCON NP FACULT CO/LEYSTONE STA	172.8	4.12%	2.43%	1.27%	0.01%	0.00%	0.02%
O-	39023-79830-1	Ohio Valley Electric Corp., Upper Creek Station (0627000003)	234.9	0.67%	0.66%	1.18%	0.11%	0.02%	0.02%
WV	54079-478911	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	215.3	3.56%	1.45%	1.34%	0.11%	0.01%	0.03%
WV	54061-477361	MONONGAHELA POWER CO - FORT MARTIN POWER	75.8	8.53%	1.27%	1.33%	1.07%	0.18%	0.23%
KY	23145-603701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	847.6	0.21%	0.74%	1.05%	0.00%	0.01%	0.04%
Facilities That Dropped Off After REVISION									
IN	18051-780311	Elkhart	729.5	0.04%	1.24%	0.99%	0.02%	0.01%	0.01%
IN	18147-801721	INDIANA MICHIGAN POWER DBA AEP RICKPORT	676.3	0.44%	1.93%	0.97%	0.01%	0.02%	0.03%
IN	18125-798241	INDIANAPOLIS POWER & LIGHT - PETERSBURG	682.6	0.16%	1.05%	0.77%	0.02%	0.04%	0.03%
OH	39031-801081	Kenesville Power Plant (0616000000)	242.3	0.71%	1.00%	0.00%	0.12%	0.08%	0.00%

Otter Creek Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PPM %	FINAL Revised Sulfate PPM %	Nitrate ADI %	Original Nitrate PPM %	FINAL Revised Nitrate PPM %
WV	54033-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	13.57%	4.84%	6.51%	1.81%	0.26%	0.31%
O-	39013-81480-1	General James M. Gavin Power Plant (06270-0056)	214.2	10.46%	7.08%	5.25%	0.18%	0.04%	0.06%
WV	54073-478281	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	6.19%	4.39%	4.24%	0.30%	0.08%	0.12%
O-	39081-81137-1	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	1.94%	7.03%	3.81%	0.05%	0.02%	0.04%
O-	39025-82943-1	Duke Energy Ohio, Wm. H. Zimmer Station (413080-54)	397.8	1.12%	7.40%	1.38%	0.02%	0.06%	0.08%
WV	54051-690231	MITCHELL PLANT	136.8	1.56%	1.40%	1.54%	0.06%	0.03%	0.05%
WV	54079-478911	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	198.0	4.36%	1.67%	1.31%	0.12%	0.02%	0.04%
O-	19013-78030-1	Ohio Valley Electric Corp., Upper Creek Station (0627000003)	215.3	0.85%	0.71%	1.27%	0.30%	0.02%	0.02%
KY	23145-603701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	825.5	0.18%	0.77%	1.03%	0.00%	0.01%	0.02%
IN	18051-780311	Elkhart	709.7	0.24%	1.27%	1.01%	0.01%	0.05%	0.05%
WV	54061-477361	MONONGAHELA POWER CO - FORT MARTIN POWER	82.7	4.86%	1.34%	1.30%	0.92%	0.20%	0.24%
IN	18147-801721	INDIANA MICHIGAN POWER & LIGHT AEP RICKPORT	656.7	0.64%	7.01%	1.03%	0.01%	0.03%	0.04%
PA	42005-18961-1	LITCON NP FACULT CO/LEYSTONE STA	186.5	1.73%	1.91%	1.00%	0.03%	0.03%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-798241	INDIANAPOLIS POWER & LIGHT - PETERSBURG	663.0	0.23%	1.07%	0.79%	0.02%	0.04%	0.03%
OH	39031-801081	Kenesville Power Plant (0616000000)	232.8	1.12%	1.07%	0.00%	0.17%	0.08%	0.00%

Shenandoah National Park (VA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PPM %	FINAL Revised Sulfate PPM %	Nitrate ADI %	Original Nitrate PPM %	FINAL Revised Nitrate PPM %
PA	42005-18961-1	GENCON NE VEGT CONEYSTONE STA	219.9	0.74%	15.37%	4.61%	0.00%	15.37%	0.06%
OH	39081-811571	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	0.69%	15.37%	4.50%	0.01%	15.37%	0.12%
WV	54033-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	185.7	0.63%	15.37%	4.14%	0.07%	15.37%	0.46%
OH	39058-814851	General James M. Gavin Power Plant (0627010056)	873.4	0.57%	15.37%	8.75%	0.07%	15.37%	0.14%
WV	54073-478281	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	0.39%	15.37%	2.20%	0.04%	15.37%	0.28%
PA	42063-800521	HOMER CITY GEN LEY CENTER TWP	230.4	0.27%	15.37%	0.78%	0.01%	15.37%	0.08%
MD	24001-776381	Luke Paper Company	118.4	0.21%	15.37%	1.41%	0.09%	15.37%	0.14%
PA	42083-800511	NRC WHOLESALE GEN/SPWARD GEN STA	215.5	0.17%	15.37%	1.17%	0.00%	15.37%	0.07%
WV	54051-690231	MITCHELL PLANT	251.8	0.15%	15.37%	1.01%	0.05%	15.37%	0.16%
OH	39053-798301	Ohio Valley Electric Corp., Upper Creek Station (0627000003)	324.1	0.15%	15.37%	1.01%	0.09%	15.37%	0.06%
Facilities That Dropped Off After REVISION									
WV	54061-477361	MONONGAHELA POWER CO - FORT MARTIN POWER	149.4	0.14%	15.37%	0.97%	0.09%	15.37%	0.07%
OH	39025-829431	Duke Energy Ohio, Wm. H. Zimmer Station (413080-54)	505.4	0.13%	15.37%	0.87%	0.00%	15.37%	0.07%
WV	54079-478911	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	295.5	0.13%	15.37%	0.84%	0.00%	15.37%	0.19%
IN	18147-801721	INDIANA MICHIGAN POWER DBA AEP RICKPORT	755.8	0.11%	15.37%	0.76%	0.00%	15.37%	0.03%

Otter Creek Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PPM %	FINAL Revised Sulfate PPM %	Nitrate ADI %	Original Nitrate PPM %	FINAL Revised Nitrate PPM %
WV	54033-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	1.24%	19.07%	6.51%	0.95%	19.07%	0.31%
O-	39013-81480-1	General James M. Gavin Power Plant (06270-0056)	214.2	1.00%	19.07%	5.25%	0.01%	19.07%	0.06%
WV	54073-478281	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	0.80%	19.07%	4.24%	0.03%	19.07%	0.12%
O-	39081-81137-1	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	0.77%	19.07%	3.81%	0.00%	19.07%	0.04%
O-	39025-82943-1	Duke Energy Ohio, Wm. H. Zimmer Station (413080-54)	397.8	0.30%	19.07%	1.38%	0.01%	19.07%	0.08%
WV	54051-690231	MITCHELL PLANT	136.8	0.29%	19.07%	1.54%	0.01%	19.07%	0.05%
WV	54079-478911	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	198.0	0.24%	19.07%	1.31%	0.00%	19.07%	0.04%
O-	19013-78030-1	Ohio Valley Electric Corp., Upper Creek Station (0627000003)	215.3	0.24%	19.07%	1.27%	0.00%	19.07%	0.02%
KY	23145-603701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	825.5	0.20%	19.07%	1.03%	0.00%	19.07%	0.02%
IN	18051-780311	Elkhart	709.7	0.19%	19.07%	1.01%	0.00%	19.07%	0.05%
WV	54061-477361	MONONGAHELA POWER CO - FORT MARTIN POWER	82.7	0.19%	19.07%	1.29%	0.04%	19.07%	0.34%
IN	18147-801721	INDIANA MICHIGAN POWER & LIGHT AEP RICKPORT	656.7	0.19%	19.07%	1.00%	0.00%	19.07%	0.04%
PA	42005-18961-1	LITCON NP FACULT CO/LEYSTONE STA	186.5	0.19%	19.07%	1.00%	0.00%	19.07%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-798241	INDIANAPOLIS POWER & LIGHT - PETERSBURG	663.0	0.18%	19.07%	0.79%	0.00%	19.07%	0.03%
OH	39031-801081	Kenesville Power Plant (0616000000)	232.8	0.09%	19.07%	0.00%	0.00%	19.07%	0.00%

Dolly Sods Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate ADI %	Original Sulfate PPM %	FINAL Revised Sulfate PPM %	Nitrate ADI %	Original Nitrate PPM %	FINAL Revised Nitrate PPM %
WV	54033-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	85.6	1.39%	19.34%	7.18%	0.05%	19.34%	0.31%
O-	39013-81480-1	General James M. Gavin Power Plant (06270-0056)	233.8	0.94%	19.34%	4.88%	0.00%	19.34%	0.05%
WV	54073-478281	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	0.81%	19.34%	4.39%	0.02%	19.34%	0.10%
O-	39081-81137-1	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	0.77%	19.34%	4.02%	0.00%	19.34%	0.03%
O-	39025-82943-1	Duke Energy Ohio, Wm. H. Zimmer Station (413080-54)	416.9	0.78%	19.34%	1.97%	0.01%	19.34%	0.05%
WV	54051-690231	MITCHELL PLANT	144.2	0.27%	19.34%	1.47%	0.00%	19.34%	0.05%
PA	42005-18961-1	LITCON NP FACULT CO/LEYSTONE STA	172.8	0.24%	19.34%	1.27%	0.00%	19.34%	0.02%
O-	39023-79830-1	Ohio Valley Electric Corp., Upper Creek Station (0627000003)	234.9	0.22%	19.34%	1.18%	0.00%	19.34%	0.02%
WV	54079-478911	APPALACHIAN POWER COMPANY - JOHN E JAMES PLANT	215.3	0.22%	19.34%	1.34%	0.00%	19.34%	0.03%
WV	54061-477361	MONONGAHELA POWER CO - FORT MARTIN POWER	75.8	0.21%	19.34%	1.33%	0.04%	19.34%	0.23%
KY	23145-603701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	847.6	0.20%	19.34%	1.05%	0.00%	19.34%	0.03%
Facilities That Dropped Off After REVISION									
IN	18051-780311	Elkhart	729.5	0.19%	19.34%	0.99%	0.00%	19.34%	0.01%
IN	18147-801721	INDIANA MICHIGAN POWER DBA AEP RICKPORT	676.3	0.18%	19.34%	0.97%	0.00%	19.34%	0.03%
IN	18125-798241	INDIANAPOLIS POWER & LIGHT - PETERSBURG	682.6	0.19%	19.34%	0.77%	0.00%	19.34%	0.03%
OH	39031-801081	Kenesville Power Plant (0616000000)	242.3	0.09%	19.34%	0.00%	0.00%	19.34%	0.00%

Non-VISTAS Class I Areas

- Only two VISTAS facilities have a contribution $\geq 1.00\%$ at any non-VISTAS Class I Area
- ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON (WV)**
 - Moosehorn Wilderness EDM (1.06% sulfate)
- Tennessee Valley Authority (TVA) - Shawnee Fossil Plant (KY)**
 - Caney Creek Wilderness Area (1.09% sulfate)
 - Hercules-Glades Wilderness Area (1.95% sulfate)
 - Mingo Wilderness Area (1.47% sulfate)
 - Great Gulf Wilderness Area (1.03% sulfate)
 - Presidential Range-Dry River Wilderness (1.03% sulfate)

State	FACILITY_ID	STD	FACILITY_NAME	INDUSTRY	IMPACTED CLASS / AREAS
AR	04562-106141		ENT-REG A KANAWAS INC (DPE)F023836 ALA#1		SHHO
IN	18071-776111		Gibson		COHU, GRSV, JOYC, IG, VIOA, CTCH, SHHO, SPS
IN	18141-801121		NO ANAPUL MICHIGAN POWER 386 AR	CCCCPDI	COHU, GRSV, JOYC, LIGO, VIOA, CTCH, SHHO, SPS
IN	18175-786241		NO ANAPULS POWER & LIGHT PETERSBURG		MAPS, SPS
MD	74003-714711		John Paper Company		SREN, SHAN
MO	23813-556811		WEST KANSAS POWER PLANT MARSTON		COHU, GRSV, JOYC, SPS
OH	24003-514571		Cardinal Power Plant (Cardinal Operating Company) (0610450002)		DOSO JAG, OTCR, SHN, SWAN
OH	24003-523491		Duke Energy Chm. Wm. J. Zimmerman Station (1413090045)		COHU, DOSO, JOYC, OTCR, SHN
OK	71001-814111		General Electric W. Gavin Power Plant (2570100056)		COHU, DOSO, GRSV, JAG, JOYC, LIGO, OHEF, OTCR, ROMA, SREN, SHHO, SHN, SWAN, WOLF
OK	71001-814111		Duke Energy Chm. Wm. J. Zimmerman Station (1413090045)		COHU, DOSO, GRSV, JAG, JOYC, LIGO, OHEF, OTCR, ROMA, SREN, SHHO, SHN, SWAN, WOLF
PA	47003-300311		IGMFC CITY OF BIRM. P/C/E WADP G'S TA		S/EN
PA	47003-300311		WRC W-101341 P/C/E WADP G'S TA		S/EN

[illegible]

Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
- For project and contract management questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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Overview

This document describes the cobalt-emerald and both the data streaming algorithms for extractable (plus) and (minus) analysis. The second set of results are data stream based on the second AGS, SA, and MS point estimates. Identify the AGS, SA and MS, G, H, H, H, and MS point estimates. Identify a new AGS - estimate, the integral AGS, and a new set of results. Consider the new AGS results have been added to reflect, integrate, and AGS analysis.

¹2020 Emission Inventory Comparison Spreadsheet - April 2020
 EPA's 2020 emissions inventory comparing 2014/15 and 2019/20

- 3

[*All Data Summary](#)

This Brief Executive Summary of the facility information and AEC calculations from the "NORM" program can be found in "Federal NORM Class I Area Results" and "Federal Non-VISTAS Class I Area Results". Only facilities contributing more than 0.01% to the total of sulfate + nitrate (Column 45) are included in this summary for each Class I area.

Individual VBTAS Class 1 Area Results and *Individual Non-VBTAS Class 1 Area Results*
(e.g., AL - Sigsey Wilderness Area, etc.) and (AR - Conroy Creek Wilderness Area, etc.)

- [illegible]

The "CHOCOLATE" method is not suitable for ALL DIFFERENTIAL EQUATIONS.

2

PSAT Source Apportionment Results Summary - April 2002

[illegible]

- This table is used to adjust the total percent contribution of each Class, and is "PSAT Percent Contribution Revisions - April 2020". The cell at row shows is Scientific Content II.

1

^aDEAF Parent Contribution: \$100,000 - April 2022*

The "AD" and "PAT" fields were linked together with AD information from "Technical VITAS Class A Results" and "Individual New VITAS Class A Test Results" with PAT information from "PAT Score Application Test Results Summary - April 2020". There was no longer included formulas used to adjust the PAT results.

Ordering #170 are the original SAT results.

Original Facility Sectors PSAT Contributions (a) = Facility Sectors PSAT Contributions (b) (c)
 Crystal Lenses + Mirrors + Beam Combinators (b)

Original - only minute PSAT Coefficient (p) (-se its minute PSAT Coefficient (q))
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

Calculus BP and SC₁ mirror the (1) P(ϵ_i | $\text{adm} = \text{with}$, $\mu = 0$) to \mathcal{D}_1 to $\text{B}(x_i = \text{with}$, $\sigma^2 = 1$) for $\text{adm} = \text{with}$.

on various aspects of the Chinese market, such as the Chinese government's policies, the Chinese market's size, the Chinese market's growth, the Chinese market's competition, the Chinese market's risks, and the Chinese market's opportunities. The Chinese market is a vast and growing market, and it offers many opportunities for foreign investors. However, there are also risks associated with investing in the Chinese market, such as political risk, currency risk, and market risk. Therefore, it is important for foreign investors to conduct thorough research and analysis before investing in the Chinese market.

Second Family: $\text{ZnF}_2 \rightarrow \text{PbF}_2$ (with $\frac{1}{2}\text{O}_2 \rightarrow \text{CO(g)}$) and $\text{ZnF}_2 \rightarrow \text{PbF}_2$ Basides (9.5 $\times 10^3$ Btu/lb. Fuel
+ 10.0 $\times 10^3$ Btu/lb. Fuel)

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where, $N_{\text{CR}} = \text{No. of CRs}$, $N_{\text{CR}} = 1$ for CRs with no associated Original Facility, $N_{\text{CR}} = 2$ for CRs with

Revised Facility Defects PSAT Results (Mm %) – Original Facility Defects PSAT Results (Mm %)
= 100.00% Facility Defects

where, $S_{\text{eff}} = \text{floor}(\text{Severance} / \text{VLI} \text{ earnings})$, $S_{\text{eff}} = 0$ if the S_{eff} is negative.

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the 20 and 201.5 = 1295' with 500' margins on each side of the 'National Grid Gate'

rockiness, except all boulders have been replaced with sand.

mean \pm SEM (n = 10) are shown. **P* < 0.05, compared with control.

The "AO" and "SCAT" data (SCAT: 10% withheld) include a summary of all "PAA" results ≥ 1.000 in original data (Column D), based on the (Column E), original errors (Column G), or values in (Column C). The "line estimate" data are listed in the "line estimate" and "line estimate error" columns.

Column EQ and Column ET, respectively.

Table 1 includes an estimated 20- and 30-year mortality rates for 10,877 individuals in the POG area. Green indicates confidence intervals, red indicates confidence intervals, and yellow indicates no confidence change.

File Name	File Size	File Type	File Description	File Location
1	1.0 MB	Image	1.0 MB	1.0 MB
2	1.0 MB	Image	1.0 MB	1.0 MB
3	1.0 MB	Image	1.0 MB	1.0 MB
4	1.0 MB	Image	1.0 MB	1.0 MB
5	1.0 MB	Image	1.0 MB	1.0 MB
6	1.0 MB	Image	1.0 MB	1.0 MB
7	1.0 MB	Image	1.0 MB	1.0 MB
8	1.0 MB	Image	1.0 MB	1.0 MB
9	1.0 MB	Image	1.0 MB	1.0 MB
10	1.0 MB	Image	1.0 MB	1.0 MB
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41	1.0 MB	Image	1.0 MB	1.0 MB
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44	1.0 MB	Image	1.0 MB	1.0 MB
45	1.0 MB	Image	1.0 MB	1.0 MB
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1



west virginia department of environmental protection

Appendix F-3k

VISTAS Regional Haze Project Update Stakeholder Briefing May 20, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS Regional Haze Project Update



Stakeholder Briefing
Jim Boylan
May 20, 2020

VISTAS Organization

- State and Tribal Air Directors (STAD)
 - Policy Decisions
 - Michelle Walker Owenby (TN), Chair
- Coordinating Committee (CC)
 - Planning Recommendations
 - Jim Boylan (GA), Chair
- Technical Analysis Work Group (TAWG)
 - Technical Recommendations
 - Randy Strait (NC), Chair
- Project Manager
 - John Hornback (SESARM)

Outline

- Background Information
- 2028 Emissions Updates
- 2028 Model Projections
- Adjusted 2028 PSAT Stacked Bar Charts
- Reasonable Progress Screening Analysis
- Next Steps & Schedule



Class I Areas of Interest to VISTAS States



Regional Haze Background Information

- Initial round of regional haze SIPs were due December 17, 2007
- Regional haze SIPs for second planning period due July 31, 2021
- EPA revised regional haze regulations
 - 40 CFR Part 51 and 40 CFR Part 52
 - Revisions effective January 10, 2017
- Current EPA regional haze guidance
 - December 20, 2018 – Tracking Visibility Progress
 - August 20, 2019 – Regional Haze SIPs for the Second Planning Period

VISTAS Class I Areas

VISTAS FEDERAL CLASS I AREAS	
AL – Sipsey Wilderness Area (SIPS)	USDA Forest Service
FL – Chassahowitzka Wilderness Area (CHAS)	USDI Fish and Wildlife Service
FL – Everglades National Park (EVER)	USDI National Park Service
FL – Saint Marks Wilderness Area (SAMA)	USDI Fish and Wildlife Service
GA – Cohutta Wilderness Area (COHU)	USDA Forest Service
GA – Okefenokee Wilderness Area (ONEF)	USDI Fish and Wildlife Service
GA – Wolf Island Wilderness Area (WOLF)*	USDI Fish and Wildlife Service
KY – Mammoth Cave National Park (MACA)	USDI National Park Service
NC – Linville Gorge Wilderness Area (LIGO)	USDA Forest Service
NC – Shining Rock Wilderness Area (SHRO)	USDA Forest Service
NC – Swainquarter Wilderness Area (SWAN)	USDI Fish and Wildlife Service
SC – Cape Romain Wilderness Area (ROMA)	USDI Fish and Wildlife Service
TN/NC – Great Smoky Mountains National Park (GRSM)	USDI National Park Service
TN/NC – Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	USDA Forest Service
VA – James River Face Wilderness Area (JARI)	USDA Forest Service
VA – Shenandoah National Park (SHEN)	USDI National Park Service
WV – Dolly Sods Wilderness Area (DOSO)	USDA Forest Service
WV – Otter Creek Wilderness Area (OTCR)*	USDA Forest Service

*This Class I Area does not have an IMPROVE monitor and will be represented by measurement data from a nearby Class I Area with an IMPROVE monitor.

VISTAS Air Quality Model

- Started with EPA's 2011/2028 modeling platform
 - Version 6.3el
 - CAMx v6.32
- Replaced CAMx v6.32 with CAMx v6.40
- Used 2011 meteorology
- Reasons for using EPA platform
 - Time limited
 - Budget limited
 - Most source sectors acceptably represented in EPA platform

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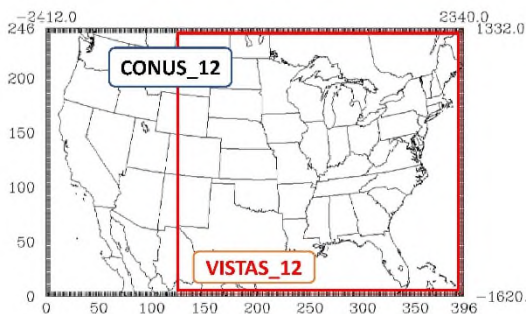
Initial VISTAS vs. Updated EPA 2028 Emissions

- The table below compares the 2028 point emissions used by VISTAS vs. the latest 2028fh emissions used by EPA (projected from 2016). The emissions below are extracted from the VISTAS 12 modeling domain which covers the Eastern U.S.

Pollutant	VISTAS 2028 (tpy)	New EPA 2028 (tpy)	Change (tpy)	Change (%)
NOx	2,641,463.83	2,108,115.50	-533,348.33	-20.19%
SO2	2,574,542.02	1,400,287.10	-1,174,254.92	-45.61%

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VISTAS Modeling Domains



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Old ERTAC (2.7opt) vs. New ERTAC (16.0)

SO2	2.7opt 2028	16.0 2028	Δ SO2	Δ SO2
CENSARA	760,828.2	367,683.7	-393,144.5	-51.67%
LADCO	379,577.5	266,047.0	-113,530.5	-29.91%
MANE-VU	196,672.6	78,657.0	-118,015.6	-60.01%
VISTAS	273,582.1	161,502.5	-112,079.6	-40.97%
TOTAL	1,783,376.5	976,471.2	-806,905.3	-45.25%

NOx	2.7opt 2028	16.0 2028	Δ NOx	Δ NOx
CENSARA	354,795.1	244,499.3	-110,295.8	-31.09%
LADCO	198,966.9	166,429.4	-32,537.4	-16.35%
MANE-VU	83,432.5	56,315.3	-27,117.2	-32.50%
VISTAS	270,615.7	200,791.1	-69,824.6	-25.80%
TOTAL	1,166,663.1	840,973.6	-325,689.5	-27.92%

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Initial VISTAS Emissions Updates

- Used EPA's 2011 base year emissions without change
- Updated EPA's Initial 2028 projection year emissions
 - EGU and major non-EGU sources
 - Removed Clean Power Plan assumptions
 - VISTAS – Adjusted for changes in fuels and facility operating plans
 - Non-VISTAS – Used ERTAC 2.7opt



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VISTAS CC/TAWG Conclusions (January 2020)

- 2028 emission updates are necessary
 - **VISTAS States** – States will:
 - Update 2028 major source emissions projections (SO₂, NO_x, PM_{2.5}, PM₁₀, NH₃, CO) at the facility and unit level
 - Add any new sources of significance
 - **LADCO States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.1 based on LADCO input
 - **All Other States** – SESARM will:
 - Replace ERTAC_2.7 with ERTAC_16.0
 - Verify accuracy of large SO₂ and NO_x source emissions projections via contact with surrounding states/RPOs and update emissions as needed
- Additional 2028 air quality modeling is needed

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Additional Modeling-Related Tasks

- Emissions processing
- Updated 2028 CAMx modeling (VISTAS_12)
- Updated 2028 visibility projections
- Documentation

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2028 EGU & NEGU NOx Comparison

State	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	80,389.57	70,824.72	-11.9%	26,895.35	20,004.14	-25.6%	53,494.61	50,816.58	-5.0%
FL	68,006.19	70,010.40	2.9%	26,250.73	25,049.90	-4.6%	41,755.45	44,960.50	7.7%
GA	67,157.50	65,885.55	-2.0%	25,895.67	24,587.73	-5.1%	41,297.83	41,297.83	0.0%
KY	66,240.03	62,130.83	-6.2%	36,781.72	32,695.94	-11.1%	29,458.31	29,434.89	-0.1%
MS	52,159.32	46,853.62	-10.2%	18,279.53	12,208.89	-33.2%	33,879.79	34,644.73	2.3%
NC	85,863.97	58,933.80	-31.5%	27,842.23	20,977.65	-24.7%	58,021.74	37,956.15	-34.6%
SC	36,051.31	36,170.87	0.3%	10,522.78	10,707.42	1.8%	25,528.53	25,463.44	-0.3%
TN	45,879.07	42,954.25	-6.4%	10,086.01	7,814.13	-22.5%	35,793.06	35,140.12	-1.8%
VA	43,210.19	41,671.99	-3.6%	11,973.97	10,435.77	-12.8%	31,236.22	31,236.22	0.0%
WV	65,054.07	68,200.77	4.8%	48,721.77	49,874.15	2.3%	16,332.30	18,326.62	12.2%
VISTAS	590,051.60	563,636.80	-4.5%	241,253.76	214,359.73	-11.1%	348,797.84	349,277.07	0.1%

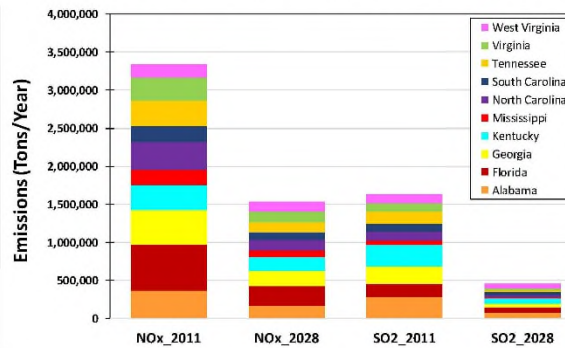
RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
VISTAS	590,051.60	563,636.80	-4.5%	241,253.76	214,359.73	-11.1%	348,797.84	349,277.07	0.1%
CENSARA	903,979.85	791,397.58	-12.5%	382,706.66	270,182.46	-29.4%	521,273.19	521,215.14	-0.0%
LADCO	548,866.74	491,345.00	-10.5%	244,035.26	186,513.52	-23.6%	304,831.49	304,831.49	0.0%
MANE VU	244,280.15	222,991.41	-9.1%	103,465.15	82,176.41	-20.6%	140,815.00	140,815.00	0.0%
WRAP	362,819.80	301,433.41	-16.9%	187,044.97	126,558.55	-32.7%	174,874.83	174,874.86	0.0%
TOTAL	2,649,998.14	2,370,804.22	-10.5%	1,159,405.80	879,790.66	-24.1%	1,490,592.35	1,491,013.55	0.0%

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Recent 2028 Emissions Updates

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VISTAS States Emissions: 2011 vs. 2028



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2028 EGU & NEGU SO₂ Comparison

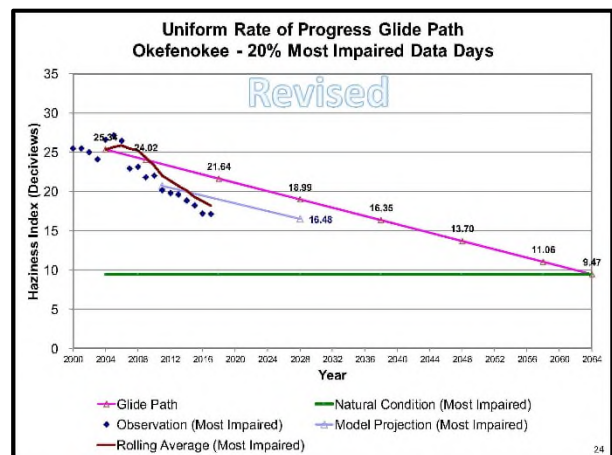
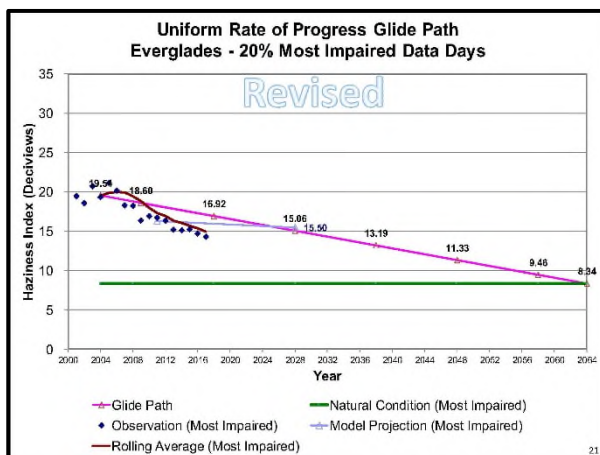
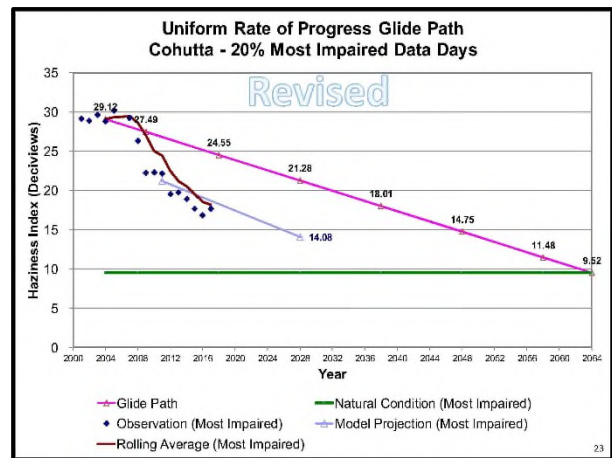
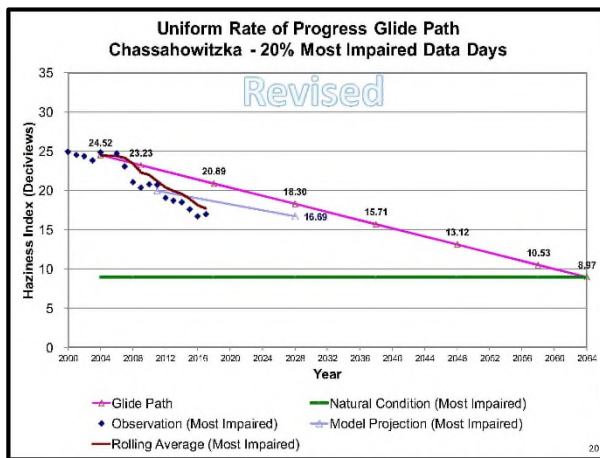
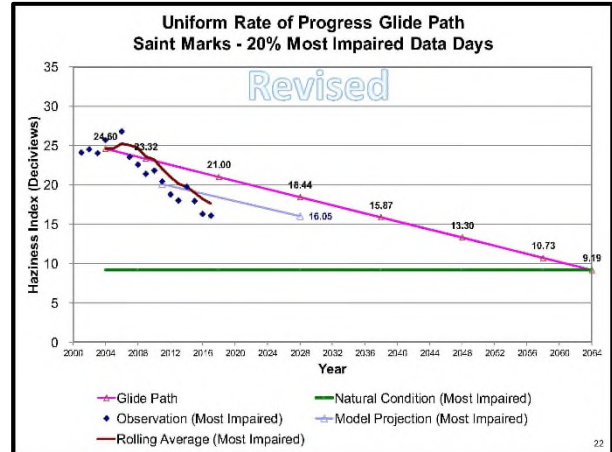
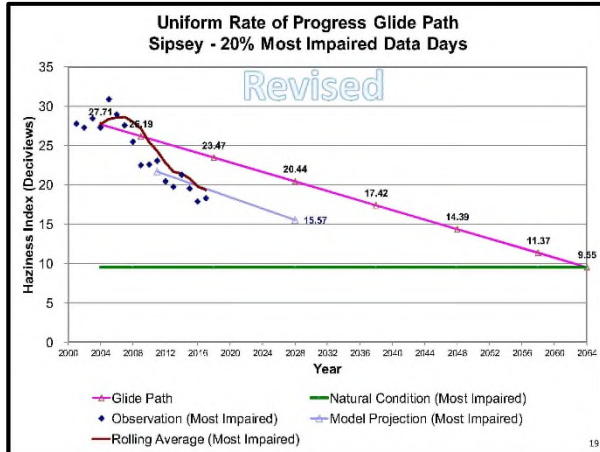
State	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
AL	87,111.28	59,056.98	-32.2%	15,480.96	8,365.96	-46.0%	71,630.32	50,691.02	-29.2%
FL	63,501.23	52,982.68	-16.0%	28,547.41	24,004.67	-15.9%	34,953.82	28,978.01	-17.1%
GA	37,065.83	36,166.09	-2.4%	18,473.28	17,573.54	-4.9%	18,592.55	18,592.55	0.0%
KY	75,140.26	65,846.83	-11.6%	56,267.06	49,585.95	-11.9%	18,872.20	16,260.88	-13.8%
MS	21,234.31	8,405.06	-60.4%	5,984.57	3,236.28	-45.7%	14,249.74	5,164.78	-63.7%
NC	35,232.88	28,347.18	-19.5%	19,724.80	9,571.47	-51.5%	15,498.08	14,775.71	-4.7%
SC	29,600.85	29,601.25	0.0%	10,693.79	10,695.34	0.0%	18,907.05	18,905.91	-0.0%
TN	23,447.58	21,057.17	-10.2%	12,114.30	10,030.04	-17.2%	11,333.28	11,027.13	-2.7%
VA	19,839.18	18,551.32	-6.5%	3,264.09	1,976.23	-39.5%	16,575.09	16,575.09	0.0%
WV	63,404.07	53,715.79	-15.3%	57,826.67	47,744.49	-17.4%	5,575.41	5,971.30	7.1%
VISTAS	455,577.46	369,320.35	-18.9%	229,383.91	182,783.96	-20.3%	226,193.55	186,736.39	-17.4%

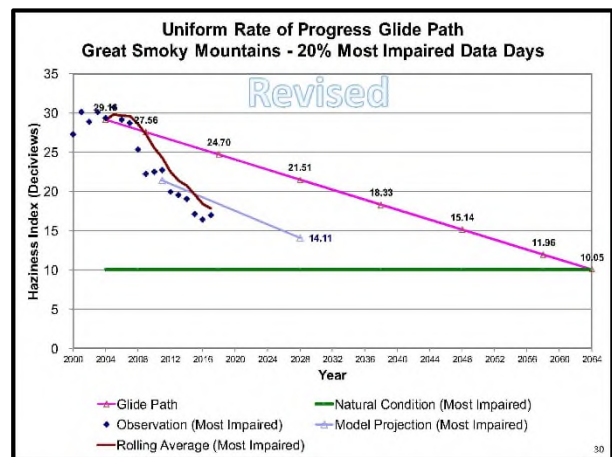
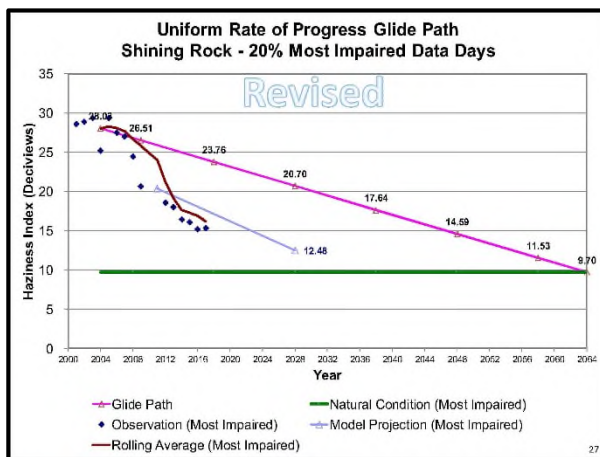
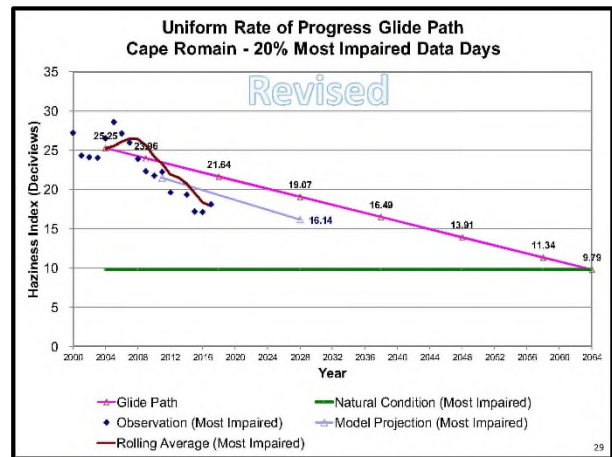
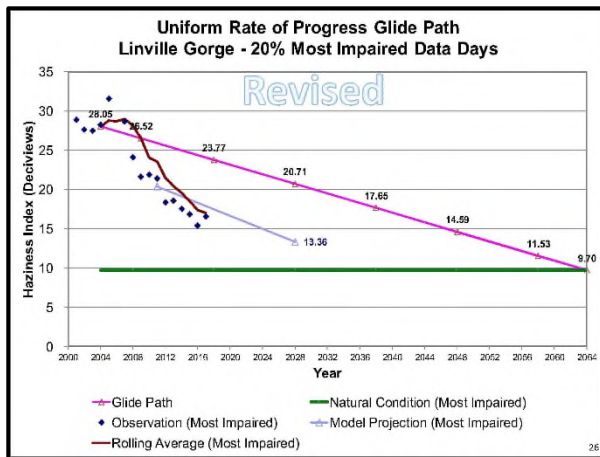
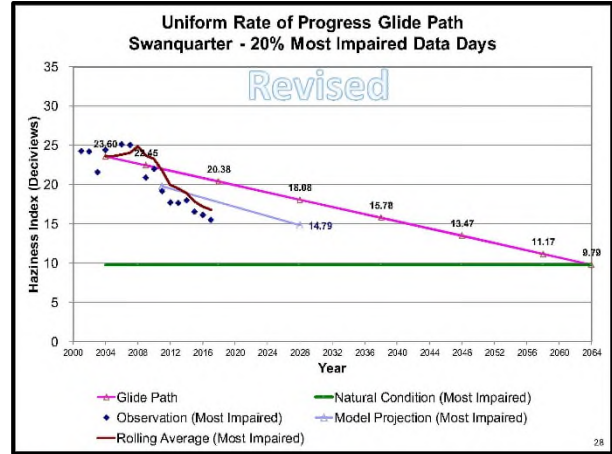
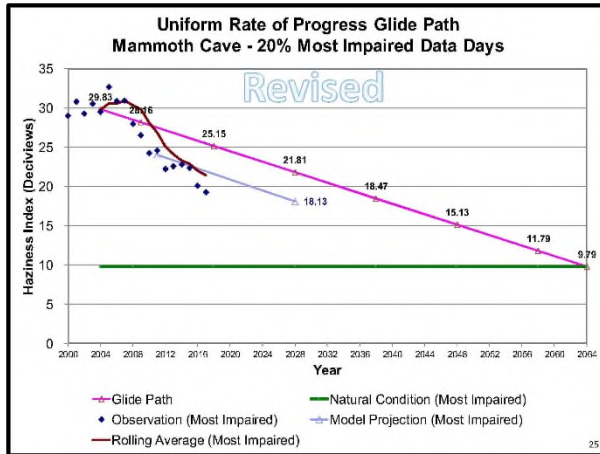
RPO	Point_OLD (tpy)	Point_NEW (tpy)	Delta (%)	EGU_OLD (tpy)	EGU_NEW (tpy)	Delta (%)	NEGU_OLD (tpy)	NEGU_NEW (tpy)	Delta (%)
VISTAS	455,577.46	369,320.35	-18.9%	229,383.91	182,783.96	-20.3%	226,193.55	186,736.39	-17.4%
CENSARA	1,012,944.59	621,221.29	-38.7%	775,625.13	382,000.54	-50.6%	239,321.46	239,320.75	-0.0%
LADCO	650,186.42	498,171.62	-24.5%	444,506.99	282,492.18	-36.4%	215,679.44	215,679.44	0.0%
MANE VU	270,810.83	149,438.76	-44.8%	203,681.43	95,074.20	-53.3%	67,149.39	54,365.55	-19.0%
WRAP	182,121.89	135,483.18	-25.6%	136,955.17	90,316.46	-34.1%	45,166.72	45,166.73	0.0%
TOTAL	2,581,643.20	1,773,936.20	-31.3%	1,788,132.63	1,032,657.35	-42.2%	793,510.56	741,268.85	-6.6%

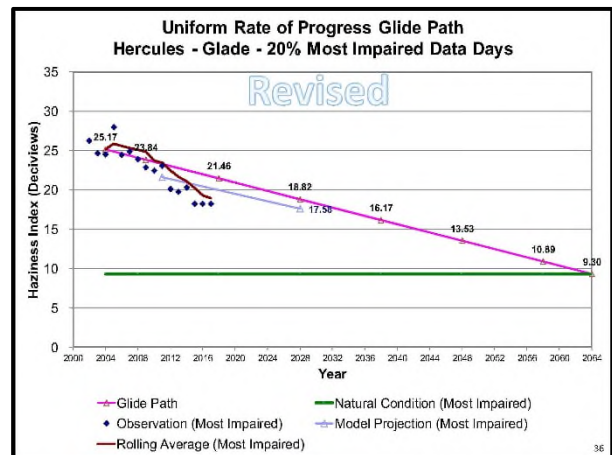
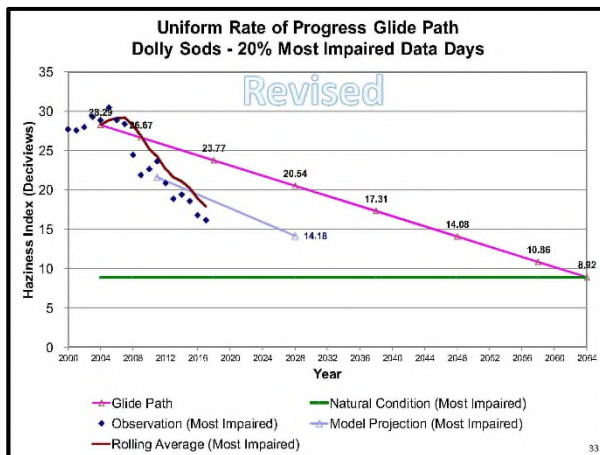
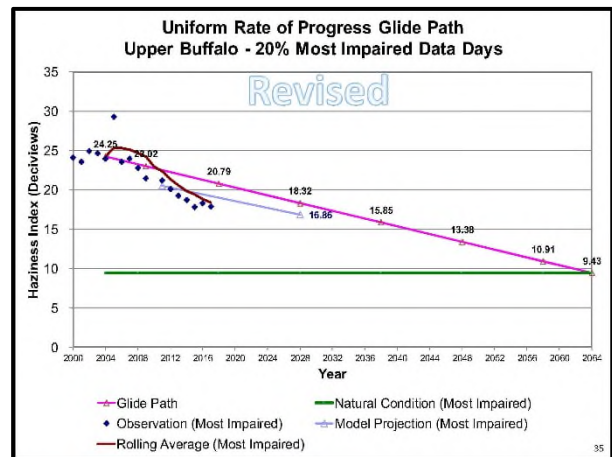
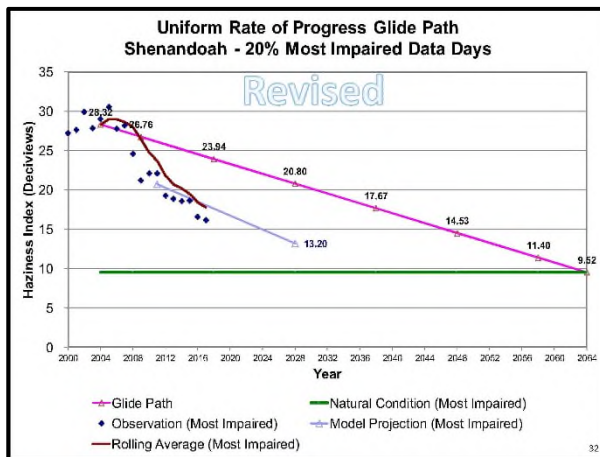
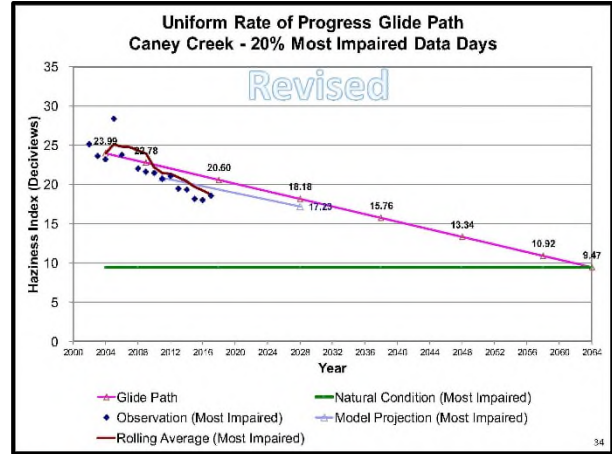
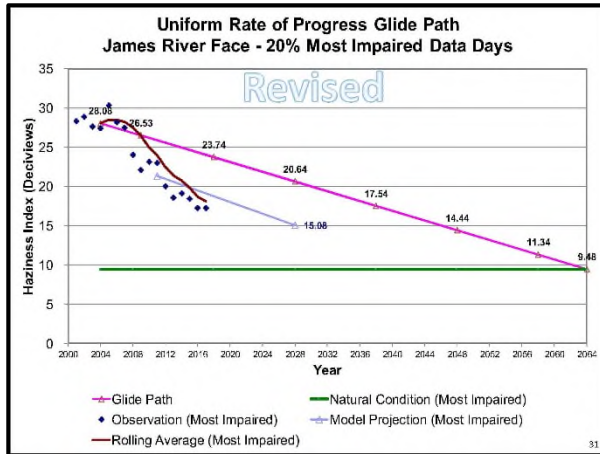
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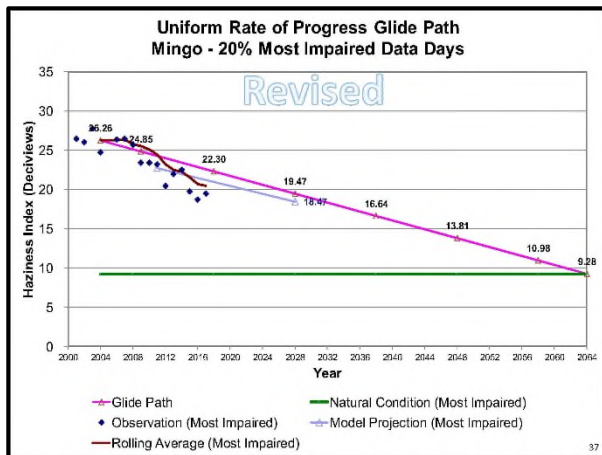
2028 Model Projections

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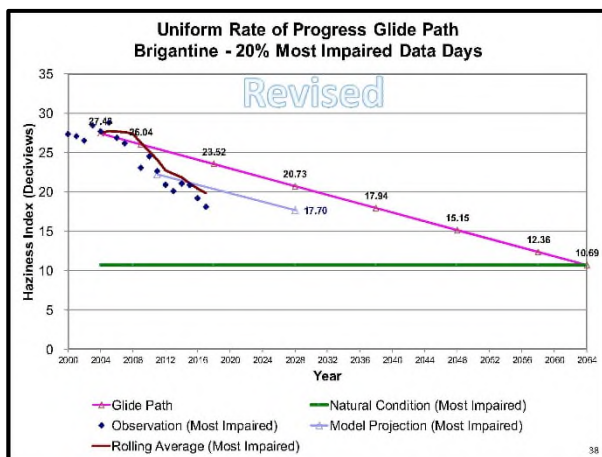




PSAT Source Apportionment Modeling

- PSAT = Particulate Matter Source Apportionment Technology
- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

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PSAT SO₂ and NOx Tags (209)

Round 1 (122 tags)

- Total SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- Total NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point SO₂ tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- EGU point NOx tags for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ tags for individual VISTAS facilities = 50 tags
- NOx tags for individual VISTAS facilities = 20 tags

Round 2 (87 tags)

- Non-EGU point SO₂ for 10 individual VISTAS states + 3 RPOs = 13 tags
- Non-EGU point NOx for 10 individual VISTAS states + 3 RPOs = 13 tags
- SO₂ and NOx for N/S/W/E boundaries = 8 tags
- SO₂ tags for individual VISTAS facilities = 10 tags
- NOx tags for individual VISTAS facilities = 16 tags
- SO₂ tags for individual non-VISTAS facilities = 17 tags
- NOx tags for individual non-VISTAS facilities = 10 tags

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Adjusted 2028 PSAT Stacked Bar Charts

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Revised State/RPO PSAT Results

• Revised EGU Sulfate PSAT Results

$$= \text{Original EGU Sulfate PSAT Results} * \text{SO}_2 \text{ EGU Ratio}$$

$$\text{where, SO}_2 \text{ EGU Ratio} = \frac{(\text{Revised EGU SO}_2 \text{ emissions})}{(\text{Original EGU SO}_2 \text{ emissions})}$$

• Revised NEGU Sulfate PSAT Results

$$= \text{Original NEGU Sulfate PSAT Results} * \text{SO}_2 \text{ NEGU Ratio}$$

$$\text{where, SO}_2 \text{ NEGU Ratio} = \frac{(\text{Revised NEGU SO}_2 \text{ emissions})}{(\text{Original NEGU SO}_2 \text{ emissions})}$$

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Revised State/RPO PSAT Results

• Revised EGU Nitrate PSAT Results

= Original EGU Nitrate PSAT Results * NOx EGU Ratio

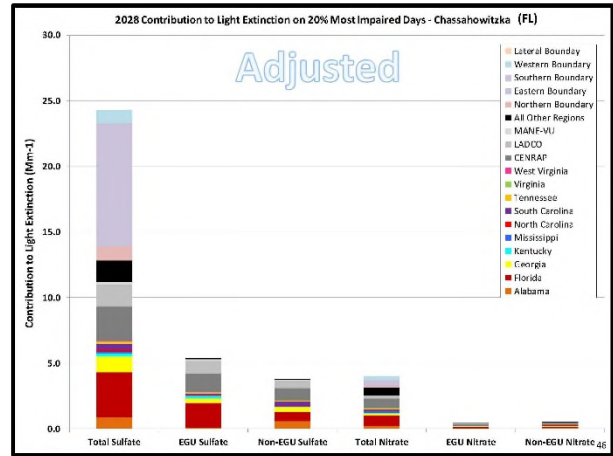
$$\text{where, NOx EGU Ratio} = \frac{(\text{Revised EGU NOx emissions})}{(\text{Original EGU NOx emissions})}$$

• Revised NEGU Nitrate PSAT Results

= Original NEGU Nitrate PSAT Results * NOx NEGU Ratio

$$\text{where, NOx NEGU Ratio} = \frac{(\text{Revised NEGU NOx emissions})}{(\text{Original NEGU NOx emissions})}$$

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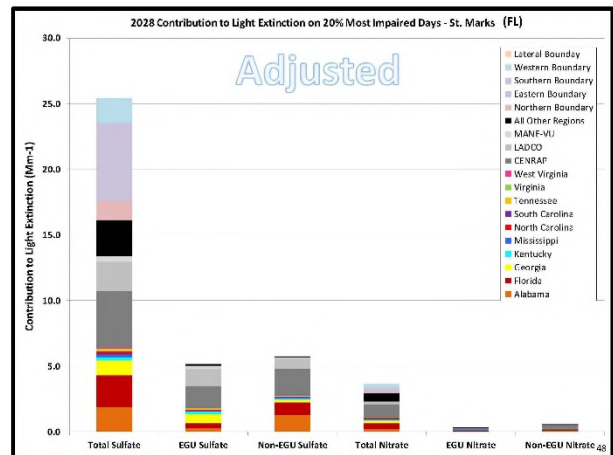
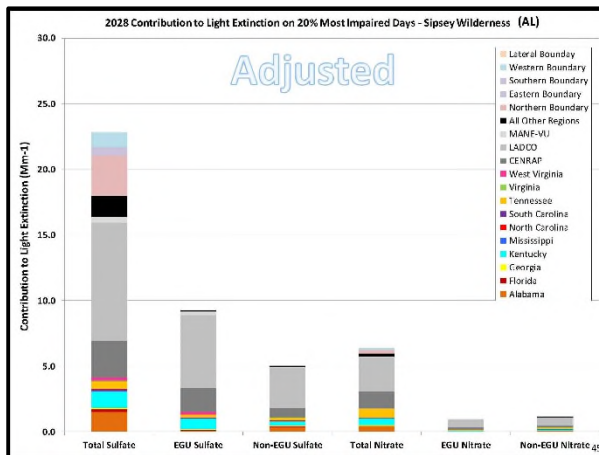
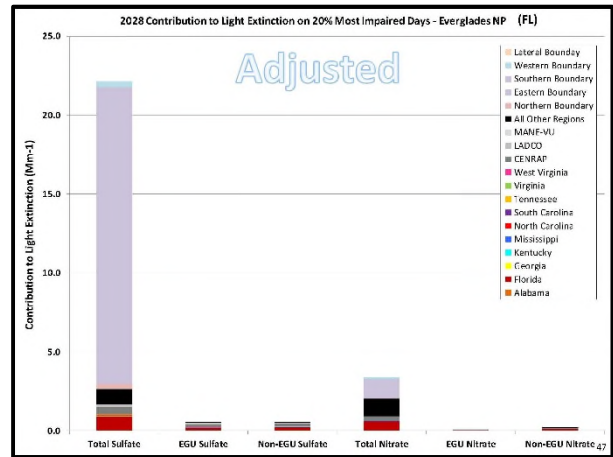
PSAT Adjustment Ratios

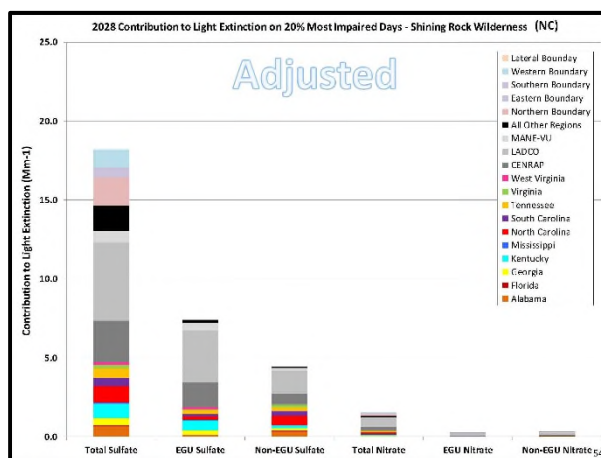
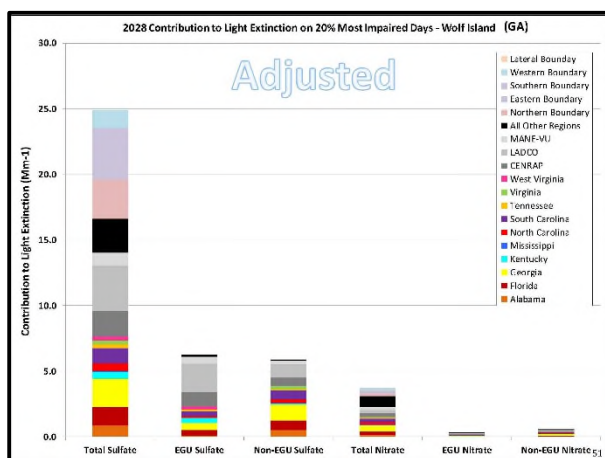
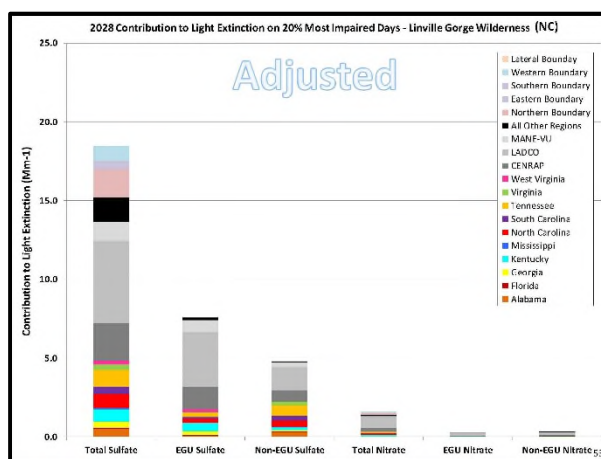
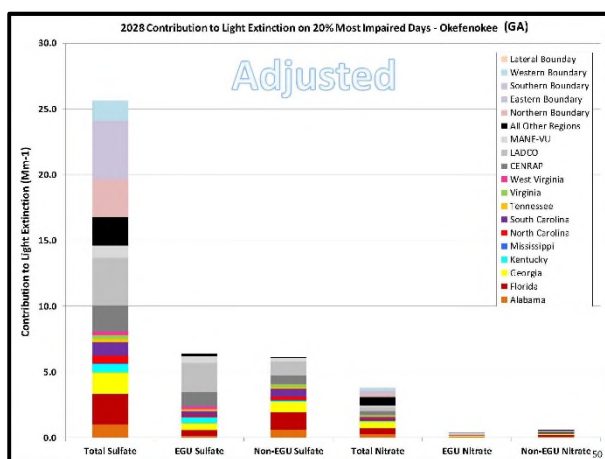
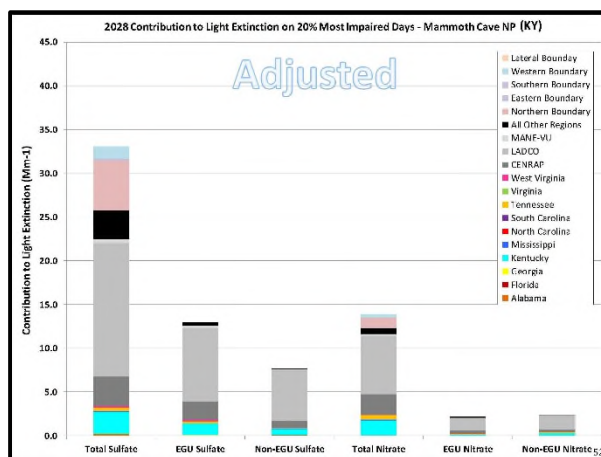
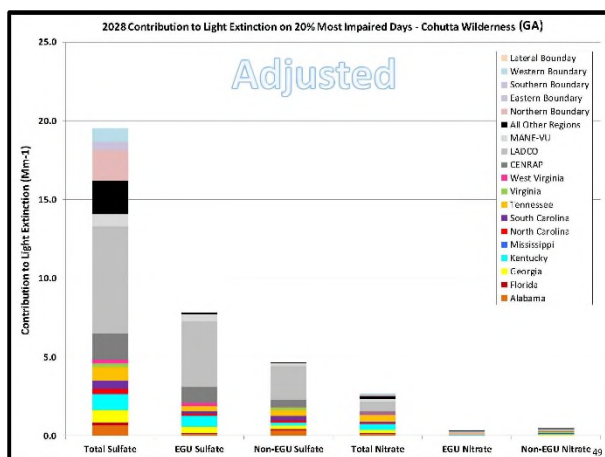
State/RPO	SO ₂ EGU Ratio	SO ₂ NEGU Ratio	NOx EGU Ratio	NOx NEGU Ratio
AL	0.540	0.708	0.744	0.950
FL	0.841	0.829	0.954	1.077
GA	0.951	1.000	0.949	1.000
KY	0.881	0.850	0.889	0.999
MS	0.463	0.363	0.668	1.023
NC	0.485	0.953	0.753	0.998
SC	1.000	1.000	1.018	0.997
TN	0.828	0.973	0.775	0.982
VA	0.605	1.000	0.872	1.000
WV	0.826	1.071	1.067	1.000
CENSARA	0.494	1.000	0.706	1.000
LADCO	0.636	1.000	0.764	1.000
MANE-VU	0.467	0.810	0.794	1.000

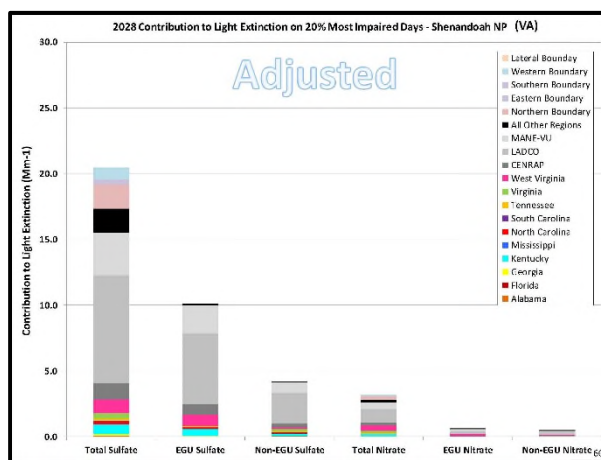
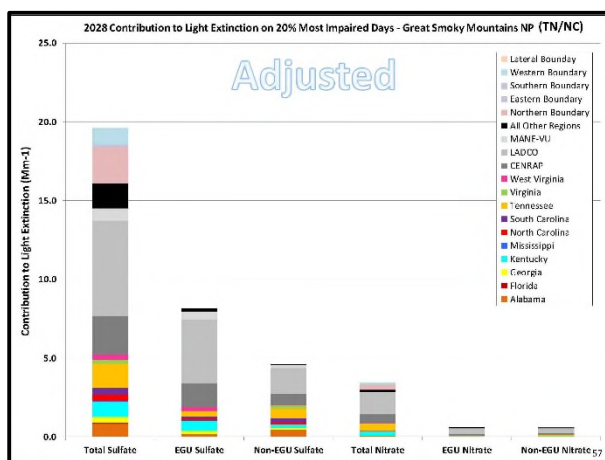
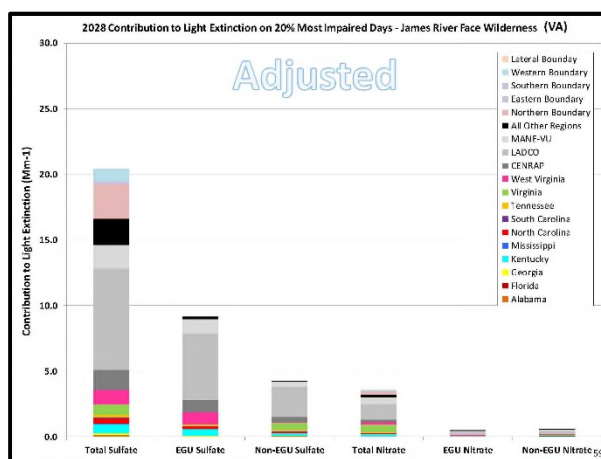
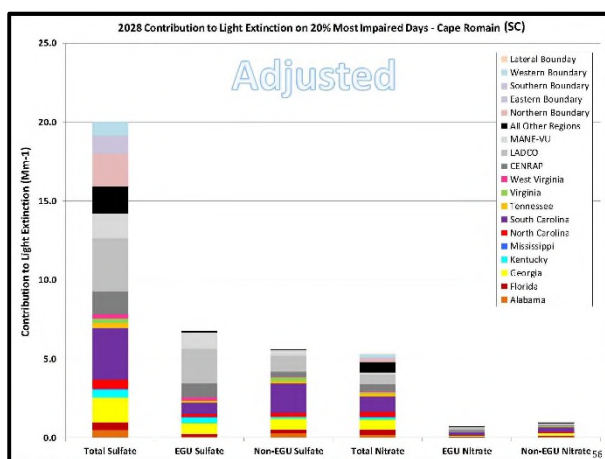
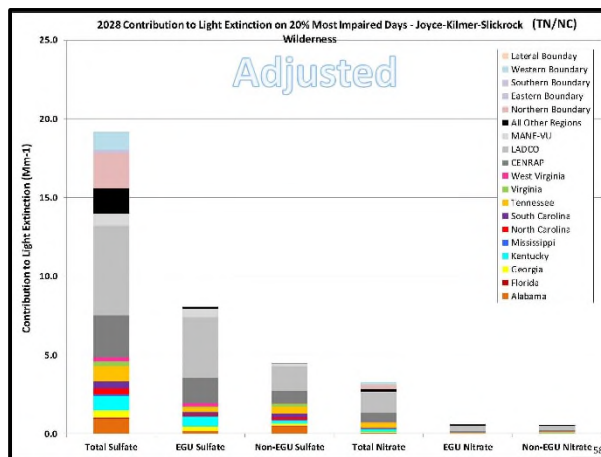
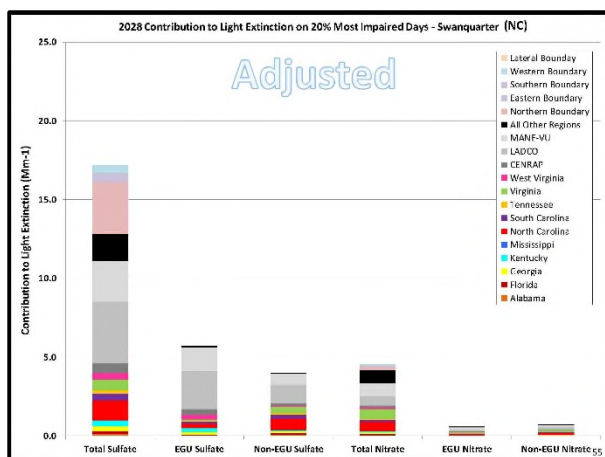
For detailed calculations, see [Handout - Roadmap](#) located at:

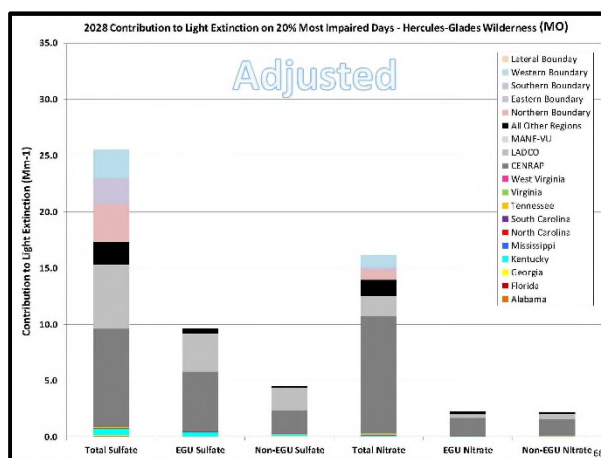
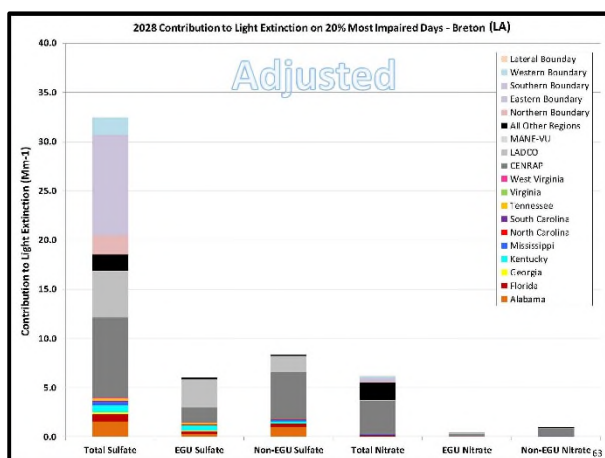
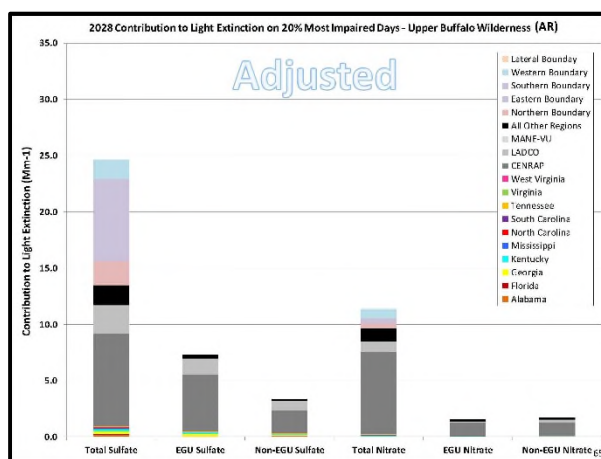
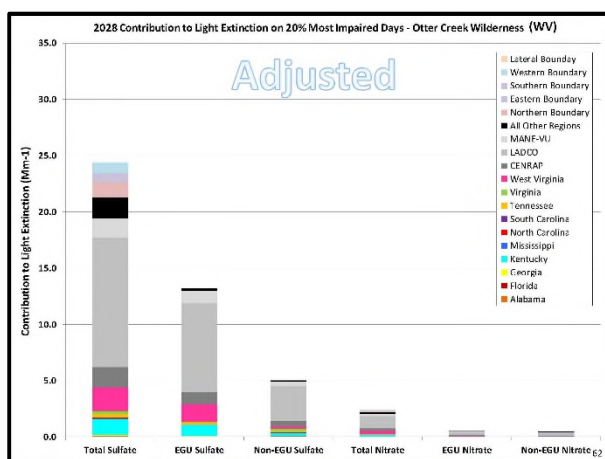
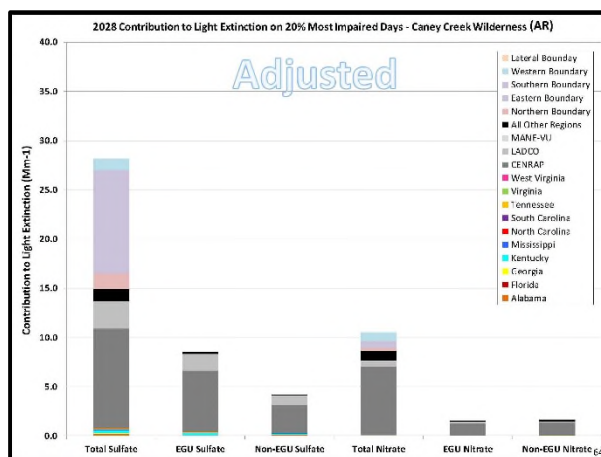
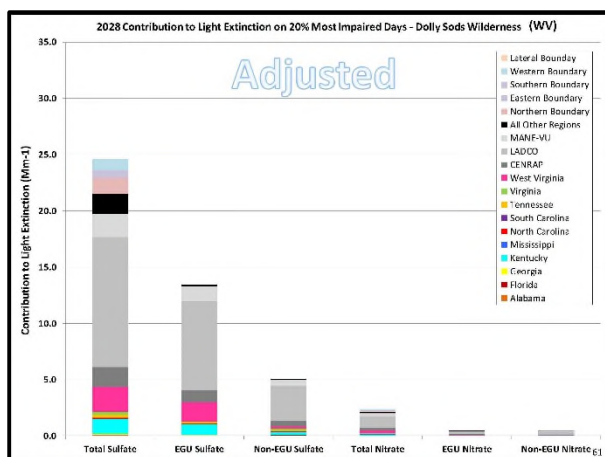
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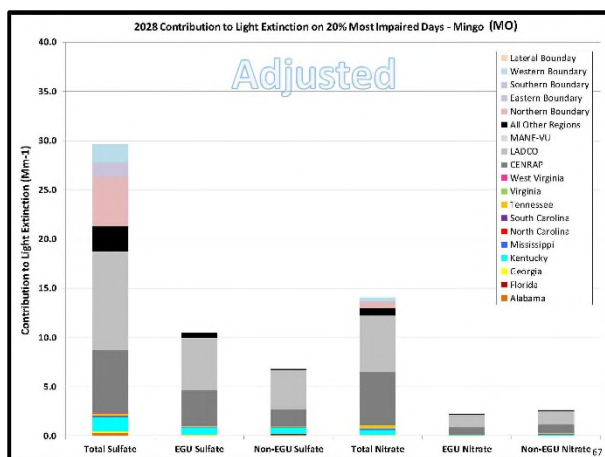
44







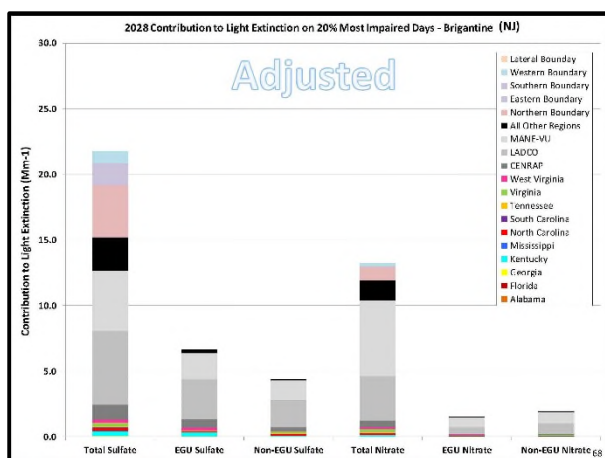




Reasonable Progress Screening Approach

1. The VISTAS reasonable progress work started with AOI screening ($Q/d * EWRT$) to rank facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the sulfate and nitrate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate and facility nitrate impacts (separately, not combined) divided by the total impact of sulfate + nitrate from all point sources to determine which sources may need to be considered for a four-factor analysis.
 - If sulfate contribution $\geq 1.00\%$ \rightarrow SO₂ Four-Factor Analysis
 - If nitrate contribution $\geq 1.00\%$ \rightarrow NO_x Four-Factor Analysis

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Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
 - Round 2 uses the AOI/PSAT approach and a $\geq 1.00\%$ PSAT threshold based on a Facility basis.
 - This will pull in more facilities compared to a Unit basis.
 - Round 2 uses 2028 emissions (lower than 2018)
 - This will pull in facilities with smaller visibility impacts (in Mm⁻¹) compared to Round 1.
- This approach results in a reasonable number of sources that can be evaluated with limited state resources and focuses on the sources with the largest impacts.

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Reasonable Progress Screening Analysis

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Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d) * EWRT$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the four-factor analysis

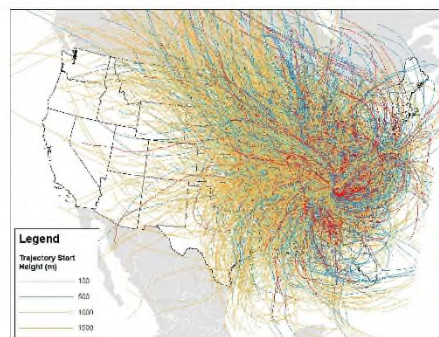
72

HYSPLIT Trajectories

- Trajectories were run using NAM-12 meteorology for the 20% most impaired days in 2011-2016 at 44 Class I areas.
- Trajectories were run with starting heights of 100, 500, 1,000, and 1,500 meters.
- Trajectories were run 72 hours backwards in time for each height at each location.
- Trajectories were run with start times of 12AM (midnight of the start of the day), 6AM, 12PM, 6PM, and 12AM (midnight at the end of the day) local time.
- 44 Class I areas x 6 years x 24 days/year x 4 heights x 5 start times = **126,720 trajectories**

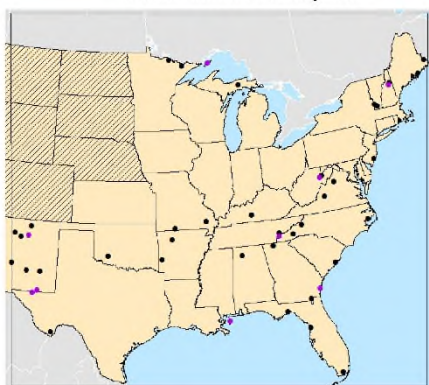
73

All Trajectories at GRSM



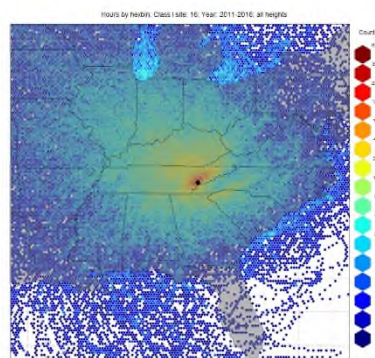
76

Class I Areas Analyzed



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Residence Time for GRSM



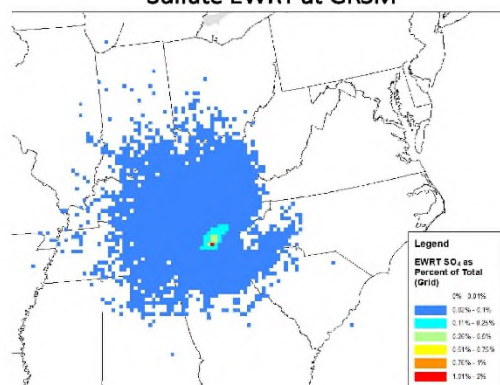
77

100 Meter Trajectories at GRSM



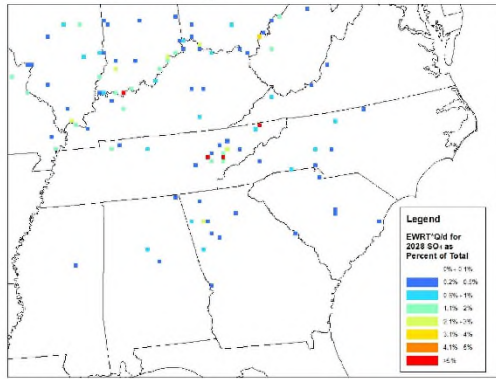
75

Sulfate EWRT at GRSM



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Sulfate Q/d*EWRT at GRSM



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AOI Point Contributions for Wolf Island

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	Brunswick Cellulose Inc.	27.9	3,554.5	294.2	2.24%	8.54%
FL	ROCK TENN CP, LLC	74.9	2,336.8	2,606.7	0.39%	8.55%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	7.53%
FL	JEA	105.1	651.8	2,091.5	0.09%	6.43%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.03%	2.65%
FL	WHITE SPRINGS AGRICULTURAL-CHEMICALS INC.	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	238.0	108.1	3,751.7	0.00%	1.48%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.1	2,327.1	562.0	0.38%	1.79%
FL	SEVINGUE ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (682701005G)	845.1	8,122.5	41,505.8	0.07%	1.71%
SC	SANTÉE COOPER CROSS GENERATING STATION	251.0	3,273.5	4,281.2	0.09%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	592.1	0.00%	1.55%
FL	EL CHEMICAL HOLDINGS, INC.	118.5	37.7	898.9	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEFL)	296.6	7,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.9	521.6	582.0	0.08%	1.06%
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.1	3,212.9	0.05%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	KAPSTONE CHARLESTON RAFT LLC	713.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENCON NEW YORK COASTAL STATION	1,048.6	6,578.5	56,939.2	0.01%	0.84%

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AOI Point Contributions for Cohutta

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
GA	Ga Power Company - Plant Bowen	78.0	6,643.3	10,453.4	1.15%	19.58%
IN	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	430.1	9,895.8	30,535.3	0.12%	4.88%
GA	International Paper - Rome	87.4	1,773.4	1,791.0	0.18%	4.66%
IN	Chickasaw	487.1	12,280.3	23,117.2	0.10%	2.31%
IN	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	10,605.3	18,141.9	0.16%	2.38%
KY	Tompkins Valley Authority (TVA) - Shawnee Tossil Plant	457.2	7,007.3	19,304.7	0.07%	2.18%
TN	DAKOTA ELECTRIC POWER PLANT	124.0	1,687.4	1,886.1	0.13%	2.17%
OH	General James M. Gavin Power Plant (682701005G)	512.0	8,122.5	41,505.8	0.02%	1.71%
TN	INVA COALBURNING - OXLEY PLANT	327.0	4,916.5	8,427.3	0.09%	1.38%
KV	Sta Rivers Electric Corp - Wilson Station	389.0	1,151.9	6,934.7	0.01%	1.07%
OH	Duke Energy Ohio, Wm. H. Hammer Station (441080154)	454.6	7,150.0	22,133.9	0.06%	1.05%
GA	Ga Power Company - Plant Wansley	156.8	2,052.5	4,856.0	0.04%	1.05%
KY	CV Uniflex Co. - Lohm Station	441.5	7,939.9	10,169.3	0.08%	1.05%
IL	Joplin Steam	486.9	4,706.3	20,509.3	0.07%	1.04%
GA	Mohawk Industries Inc.	32.0	66.5	77.1	0.07%	1.02%
TN	JASIMAN CHEMICAL COMPANY	289.8	6,900.3	6,420.2	0.09%	0.99%
MO	ANTHONY MISSOURI-LABADE PLANT	692.4	9,182.5	41,740.3	0.01%	0.98%
IL	Newport	564.0	1,934.9	10,631.6	0.01%	0.91%
GA	Chemical Products Corporation	71.9	19.5	513.8	0.00%	0.89%
IN	INDIANA KENTUCKY ELECTRIC CORPORATION	444.4	6,188.5	9,038.1	0.04%	0.78%

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Georgia Tagging for PSAT

- Sources in Georgia (≥ 2% threshold)
 - Ga Power Company – Plant Bowen
 - International Paper – Rome (aka TEMPLE INLAND)
 - International Paper – Savannah
 - Brunswick Cellulose Inc
 - Georgia-Pacific Consumer Products LP (Savannah River Mill)
- Sources outside Georgia (≥ 4% threshold)
 - INDIANA MICHIGAN POWER DBA AEP ROCKPORT (IN)
 - ROCK TENN CP, LLC (FL)
 - JEA (FL)

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AOI Point Contributions for Okefenokee

State	FACILITY NAME	DISTANCE (mi)	NOx_2028 (tons/year)	SO2_2028 (tons/year)	NOx Contribution	SO2 Contribution
FL	WHITE SPRINGS AGRICULTURAL-CHEMICALS INC.	71.5	112.4	2,745.0	0.03%	14.63%
FL	ROCK TENN CP, LLC	64.8	2,336.8	2,606.7	0.88%	12.92%
FL	JEA	61.6	651.8	2,091.5	0.18%	6.60%
FL	SEVINGUE ELECTRIC COOPERATIVE, INC.	121.4	917.8	3,713.4	0.07%	3.25%
FL	EL CHEMICAL HOLDINGS, INC.	56.8	37.7	898.9	0.01%	3.25%
FL	RAYONIER PERFORMANCE FIBERS LLC	83.4	2,327.1	562.0	0.50%	2.82%
GA	International Paper - Savannah	178.5	1,560.7	3,945.4	0.09%	2.61%
FL	RAYONIER PERFORMANCE FIBERS LLC	153.5	1,830.7	1,520.4	0.14%	2.18%
FL	SEVINGUE ELECTRIC COOPERATIVE, INC.	59.8	66.3	569.5	0.02%	1.95%
FL	DUKE ENERGY FLORIDA, INC. (DEFL)	205.0	7,489.8	5,306.4	0.06%	1.40%
AL	Sanders Road Co.	384.6	121.7	7,951.1	0.00%	1.11%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	197.2	351.5	1,860.2	0.01%	1.05%
GA	Ga Power Company - Plant Bowen	458.1	6,643.3	10,453.4	0.05%	1.02%
GA	Brunswick Cellulose Inc.	75.3	3,554.5	294.2	0.34%	1.01%
SC	ALUMAX OF SOUTH CAROLINA	322.7	108.1	3,751.7	0.00%	0.97%
GA	JEA Valdesia Mill	112.7	1,032.6	485.7	0.09%	0.85%
SC	SANTÉE COOPER CROSS GENERATING STATION	348.1	3,273.5	4,281.2	0.05%	0.85%
FL	CITY OF GAINESVILLE GUY	111.7	410.0	881.4	0.01%	0.79%
SC	KAPSTONE CHARLESTON RAFT LLC	314.0	2,355.8	1,863.7	0.06%	0.65%
GA	Ga Power Company - Plant Wansley	403.7	2,052.5	4,856.0	0.02%	0.65%

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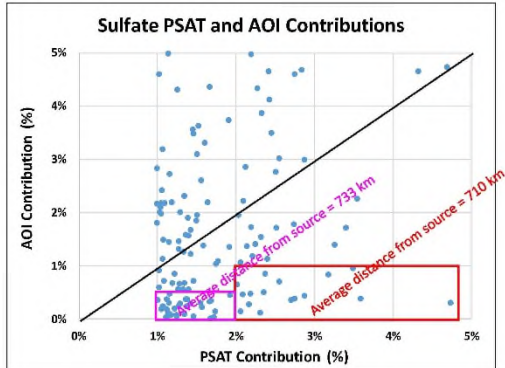
AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2%	Sulfate or nitrate

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- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

Sulfate AOI vs. Sulfate PSAT ($\geq 1.00\%$)



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PSAT Reasonable Progress Screening

- Due to the amount of resources already invested in the AOI and PSAT analysis, **VISTAS does not plan to redo the original AOI or PSAT analyses.**
- In cases where emissions decreased or increased at individual facilities being considered for a four-factor analysis, the facility contributions will be adjusted to be consistent with the lower/higher facility emissions before comparing to the PSAT contribution threshold.
- **EPA verbally stated this should be okay 2/6/2020.**

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AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area.
- AOI tends to underestimate impacts for facilities far away from the Class I area.
 - AOI uses 72-hour back trajectories, sulfate can last for weeks and travel hundreds to thousands of km.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

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Original Facility PSAT Contributions

- **Original Facility Sulfate PSAT Contributions (%)**

$$= \frac{\text{Facility Sulfate PSAT Contributions (Mm}^{-1}\text{)}}{\text{Total Sulfate + Nitrate Point Contribution (Mm}^{-1}\text{)}}$$
- **Original Facility Nitrate PSAT Contributions (%)**

$$= \frac{\text{Facility Nitrate PSAT Contributions (Mm}^{-1}\text{)}}{\text{Total Sulfate + Nitrate Point Contribution (Mm}^{-1}\text{)}}$$

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PSAT Reasonable Progress Screening

- The **facility sulfate and nitrate contributions (Mm⁻¹)** from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO₂ and/or NO_x emissions.
- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate contribution** from point sources at each Class I area since the SO₂ and NO_x emissions have decreased.
 - The facility percent contribution will increase even if the facility emissions do not change since the denominator will decrease

Facility Sulfate Contribution (%) =

$$\frac{\text{Facility Sulfate Impact (Mm}^{-1}\text{)} \downarrow \uparrow}{\text{Total Impact of All Point Sources of Sulfate + Nitrate (Mm}^{-1}\text{)} \downarrow}$$

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Revised Facility Sulfate PSAT Results

- **Revised Facility Sulfate PSAT Results**

$$= \text{Original Facility Sulfate PSAT Results} \times \text{SO}_2 \text{ Ratio}_{\text{Facility}} \times \text{Ratio}_{\text{Class I Area}}$$

$$\text{where, } \text{SO}_2 \text{ Ratio}_{\text{Facility}} = \frac{(\text{Revised facility SO}_2 \text{ emissions})}{(\text{Original facility SO}_2 \text{ emissions})}$$

$$\text{where, } \text{Ratio}_{\text{Class I Area}} = \frac{(\text{Original sulfate + nitrate point contribution})}{(\text{Revised sulfate + nitrate point contribution})}$$

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- Revised Facility Nitrate PSAT Results
 = Original Facility Nitrate PSAT Results
 * NOx Ratio_Facility * Ratio_Class_I_Area

(Revised facility NOx emissions)

where, $NO_x \text{ Ratio_Facility} = \dots\dots\dots$

(Original facility NOx emissions)

(Original sulfate + nitrate point contribution)

where, $\text{Ratio_Class_I_Area} = \frac{\text{Area of Class I}}{\text{Total Area}}$

(Revised sulfate + nitrate point contribution)

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Facility Ratios (WV, AR, MO, MD, PA, IL, IN, OH)

[illegible]

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Facility Ratios (AL, FL, GA)

Facility State	Facility RST	FACILITY ID_570	FACILITY NAME_570	FACILITY ID_570	SQZ Ratio	New Ratio
VA	VST45	V1017-240811	Alzo Nobel Chemicals int	1	1,000	1,000
VA	VST45	V1027-105511	Alkermes - Barty	1	1,000	1,000
VA	VST45	V1218-105711	American Air Liquide, Chemicals, LLC	8	8,000	8,000
VA	VST45	V1013-101111	Asahi Kasei Kasei Co. of PAW, Inc.	1	1,000	1,000
VA	VST45	V1013-124011	Asahi Kasei Chemicals Corp. of PAW, Inc.	1	1,000	1,000
VA	VST45	V1013-101111	Asahi Kasei Chemicals Corp. of PAW, Inc.	1	1,000	1,000
VA	VST45	V1013-100011	Musor Steel Swearth	1	2,000	2,000
VA	VST45	V1009-885711	Barndale Lead Co	1	1,000	1,000
VA	VST45	V0027-306411	Union of California - Chuchalla Gas Plant	1	1,000	1,000
VA	VST45	V1222-752011	BUCKEYE FLOUDA, LIMITED PARTNERSHIP	1	2,000	2,000
VA	VST45	V1208-900011	CEMEX CONSTRUCTION MATERIALS LLC	1	1,000	1,000
VA	VST45	V1001-448011	CLARK PROPERTY LLC, (DPS)	1	1,000	1,000
VA	VST45	V1008-900011	CLIOUDA POWER & LIGHT (DPS)	1	1,000	1,000
VA	VST45	V1023-752111	CLIO POWER - CH	1	1,000	1,000
VA	VST45	V1036-352111	CLIO POWER CITY UTILITIES	1	1,000	1,000
VA	VST45	V1001-640111	COA	1	1,000	1,000
VA	VST45	V1205-217711	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1057-710111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1205-910111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-645611	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1219-272111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-510111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1212-772111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1001-640111	COA	1	1,000	1,000
VA	VST45	V1205-217711	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1057-710111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1205-910111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-645611	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1219-272111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-510111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1212-772111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1001-640111	COA	1	1,000	1,000
VA	VST45	V1205-217711	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1057-710111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1205-910111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-645611	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1219-272111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-510111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1005-515411	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1208-701111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1212-772111	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1001-640111	COA	1	1,000	1,000
VA	VST45	V1205-217711	COASAC PETRT, LLC	1	1,000	1,000
VA	VST45	V1057-710111	COASAC PETRT, LLC	1	1,000	1,000

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Class I Area Ratios

State	Class 1 Area	Ratio	Class 1 Area
AI	Sippah Wilderness Area (SIPS)	1.582	
FL	Chascomuto Wilderness Area (CHAS)	1.326	
IL	Loveland NF (LCLN)	1.298	
FL	St Marks Wilderness Area (SAMA)	1.355	
CA	Cochuta Wilderness Area (COHU)	1.363	
CA	Thiefhollow Wilderness Area (THFF)	1.317	
GA	Wolf Island Wilderness (WOLF)	1.311	
GA	Morming Cave NF (MCAV)	1.337	
CA	Uvinle Grove Wilderness Area (UGOV)	1.331	
NC	Shining Rock Wilderness Area (SROK)	1.310	
NC	Swanquarter Wilderness Area (SWAN)	1.358	
NC	Cape Roman Wilderness (CROM)	1.392	
TN/NC	Jack Smoky Mountains NF (JSMV)	1.354	
TN/NC	Joyce Kilmer-Slickhorn Wilderness (DJCK)	1.401	
VA	James River State Wilderness (AJRI)	1.416	
VA	Pleurodon NF (PLEU)	1.463	
WV	Polly South Wilderness (POSO)	1.417	
WV	Otter Creek Wilderness (OTCR)	1.418	
AR	Caneey Creek Wilderness Area (ACBK)	1.312	
AR	Upper Buffalo Wilderness Area (UPBU)	1.400	
VA	Briston Wilderness (BRIL)	1.406	
VA	Acacia National Park (ACAD)	1.397	
VF	Muskegon Wilderness FOM (VOMU)	1.467	
MI	Seney Wilderness Area (SENF)	1.283	
MO	Floradale Glades Wilderness Area (FLOGL)	1.456	
MO	Mingo Wilderness Area (MNG)	1.380	
NH	Croft Gulch Wilderness Area (BREG)	1.460	
NH	Presidential Range-Dry River Wilderness (PRDR)	1.461	
NH	Bridgewater Wilderness Area (BRIS)	1.393	
NH	Brook Meadows Wilderness Area (BMEW)	1.427	

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Facility Ratios (KY, MS, NC, SC, TN, VA)

[illegible]

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EXAMPLE: New Madrid Power at SIPS

- **Revised Facility Sulfate PSAT Results**

$$= \text{Original Facility Sulfate PSAT Results} \times \text{SO}_2 \text{ Ratio}_{\text{Facility}} \times \text{Ratio}_{\text{Class}_1 \text{ Area}}$$
- **Original Facility Sulfate PSAT Results = 1.46%**
- **Revised Facility Sulfate PSAT Results**

$$= 1.46\% \times 0.665 \text{ (Slide 100)} \times 1.382 \text{ (Slide 101)}$$

$$= 1.34\% \text{ (Slide 103)}$$

For detailed calculations, see [Handout - Roadmap](https://www.metro4-sesarm.org/content/vistas-regional-haze-program) located at:
<https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

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Sipsey Wilderness Area (AL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	0.364	16.370	2.22%	0.005	16.370	0.05%
OH	39053-8148511	General James M. Gavin Power Plant (0827010056)	690.9	0.327	16.370	1.99%	0.021	16.370	0.13%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	398.4	0.327	16.370	1.99%	0.050	16.370	0.31%
IN	18051-7363111	Gibson	438.7	0.270	16.370	1.65%	0.029	16.370	0.18%
IN	18125-7362111	INDIANA VAPOUR POWER & LIGHT - PETERSBURG	464.1	0.255	16.370	1.57%	0.026	16.370	0.16%
TN	47161-4879311	TVA CLIMBERLAND FOSSIL PLANT	328.9	0.242	16.370	1.46%	0.026	16.370	0.17%
VO	29343-5363831	NLW MADRID POWER PLANT - VARS'ON	314.5	0.220	16.370	1.44%	0.012	16.370	0.07%
KY	21183-5561611	Big Rivers Electric Corp - Wilson Station	345.5	0.211	16.370	1.29%	0.008	16.370	0.05%

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St Marks Wilderness Area (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
GA	13015-2813011	Ea Power Company - Plant Bowen	452.9	0.574	11.729	4.89%	0.004	11.729	0.03%
FL	12005-535411	ROCKTECH CP LLC	140.8	0.540	11.729	4.60%	0.015	11.729	0.13%
AL	01109-985711	Randers Lead Co	255.9	0.131	11.729	1.12%	0.000	11.729	0.00%

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Chassahowitzka Wilderness Area (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
FL	12017-640611	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	0.629	10.092	6.24%	0.023	10.092	0.23%
GA	13015-2813011	Ea Power Company - Plant Bowen	637.2	0.230	10.092	2.23%	0.003	10.092	0.03%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	106.8	0.129	10.092	1.28%	0.007	10.092	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,068.0	0.102	10.092	1.01%	0.005	10.092	0.05%
AL	01109-985711	Randers Lead Co	471.2	0.101	10.092	1.00%	0.001	10.092	0.01%

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Cohutta Wilderness Area (GA)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0827010056)	512.0	0.322	13.229	2.44%	0.009	13.229	0.07%
GA	13015-2813011	Ea Power Company - Plant Bowen	78.0	0.282	13.229	2.13%	0.005	13.229	0.04%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	0.190	13.229	1.44%	0.002	13.229	0.02%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AFP ROCKPORT	410.1	0.181	13.229	1.37%	0.005	13.229	0.04%
OH	39023-8294811	Duke Energy Ohio, Wm. H. Zimmer Station (1413020154)	454.6	0.173	13.229	1.31%	0.005	13.229	0.04%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	269.8	0.165	13.229	1.25%	0.012	13.229	0.09%
PA	47003-3868111	SENON NF M/GWTCO/KEYSTONE STA	801.1	0.137	13.229	1.04%	0.003	13.229	0.01%
IN	18051-7363111	Gibson	487.1	0.137	13.229	1.03%	0.003	13.229	0.03%

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Everglades NP (FL)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	0.044	3.333	3.30%	0.000	3.333	0.00%
FL	12105-915811	MOSAC FERTILIZER, LLC	304.7	0.035	3.333	2.62%	0.000	3.333	0.00%
FL	12105-717711	MOSAC FERTILIZER LLC	303.3	0.035	3.333	2.60%	0.000	3.333	0.00%
FL	12086-899911	TARMAC AMERICA LLC	61.7	0.003	3.333	0.23%	0.035	3.333	2.63%

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Okefenokee Wilderness Area (GA)									
State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrate PSAT %
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	71.5	0.372	13.400	2.77%	0.002	13.400	0.01%
GA	13015-2813011	Ea Power Company - Plant Bowen	458.1	0.308	13.400	2.33%	0.007	13.400	0.05%
FL	12123-752411	BUCKEYE FLORIDA, UNITED PARTNERSHIP	153.5	0.289	13.400	2.16%	0.019	13.400	0.14%
OH	39053-8148511	General James M. Gavin Power Plant (0827010056)	909.1	0.203	13.400	1.51%	0.002	13.400	0.01%
FL	12089-753711	ROCK TECH CP, LLC	84.8	0.176	13.400	1.31%	0.020	13.400	0.15%
SC	45015-4120411	SANTE COOPER CROSS GENERATING STATION	348.1	0.158	13.400	1.18%	0.006	13.400	0.04%
GA	13051-3679811	International Paper - Savannah	178.5	0.140	13.400	1.04%	0.008	13.400	0.06%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	939.4	0.138	13.400	1.03%	0.006	13.400	0.04%
PA	47003-3866111	SENON NF M/GWTCO/KEYSTONE STA	1,129.6	0.137	13.400	1.02%	0.002	13.400	0.01%

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Wolf Island Wilderness (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
FL	12089-753731	ROCK TENN CP, LLC	74.9	0.304	12.957	2.350	0.018	12.957	0.14%
GA	13015-2813011	Ea Power Company - Plant Bowen	458.1	0.302	12.957	2.330	0.007	12.957	0.05%
GA	13127-8721011	Branswick Cellulose Inc	27.9	0.228	12.957	1.760	0.017	12.957	0.13%
OH	39053-8148511	General James M. Gwin Power Plant (0627010056)	845.3	0.224	12.957	1.734	0.003	12.957	0.02%
GA	13051-3679811	International Paper - Savannah	85.9	0.200	12.957	1.544	0.012	12.957	0.09%
SC	45015-4120411	SANTTEE COOPER CROSS GENERATING STATION	251.0	0.168	12.957	1.300	0.011	12.957	0.08%
FL	12031-640711	RA	109.1	0.167	12.957	1.290	0.008	12.957	0.06%
SC	45015-4814811	ALUMAX OF SOUTH CAROLINA	233.0	0.162	12.957	1.270	0.001	12.957	0.01%
PA	42003-3866111	GLNCON NL MGMT CO/KEYSTONE STA	1,048.6	0.149	12.957	1.150	0.002	12.957	0.01%

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Shining Rock Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
OH	39053-8148511	General James M. Gwin Power Plant (0627010056)	397.3	0.297	12.313	2.414	0.001	12.313	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	573.4	0.201	12.313	1.433	0.009	12.313	0.02%
TN	47161-4979311	TVA CLUMBERLAND FOSSIL PLANT	454.1	0.162	12.313	1.320	0.002	12.313	0.02%
GA	13015-2813011	Ea Power Company - Plant Bowen	741.6	0.159	12.313	1.230	0.001	12.313	0.01%
VO	29143-5363811	NFW MADRID POWER PLANT-VARSTON	625.2	0.158	12.313	1.220	0.001	12.313	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROXFORD	473.3	0.156	12.313	1.274	0.012	12.313	0.09%
PA	42003-3866111	GLNCON NL MGMT CO/KEYSTONE STA	637.8	0.151	12.313	1.233	0.000	12.313	0.00%
IN	18051-7363111	Gibson	524.4	0.151	12.313	1.233	0.008	12.313	0.07%
NC	37087-7929511	Blue Ridge Paper Products - Canton Mill	16.9	0.133	12.313	1.080	0.012	12.313	0.10%
OH	39075-8794311	Duke Energy Ohio, Wm. H. Zimmer Station (1413030154)	406.7	0.129	12.313	1.050	0.007	12.313	0.05%
AR	05063-1083411	ENERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.129	12.313	1.040	0.001	12.313	0.01%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	126.9	0.128	12.313	1.040	0.009	12.313	0.02%

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Mammoth Cave NP (KY)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROXFORD	118.0	0.426	25.289	1.680	0.085	25.289	0.33%
IN	18051-7363111	Gibson	198.2	0.411	25.289	1.630	0.084	25.289	0.33%
KY	21145-6037011	Eg Rivers Electric Corp. - Wilson Station	89.9	0.361	25.289	1.430	0.020	25.289	0.08%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	0.290	25.289	1.150	0.049	25.289	0.19%
VO	29143-5363811	NFW MADRID POWER PLANT-VARSTON	312.7	0.280	25.289	1.140	0.022	25.289	0.09%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	182.9	0.264	25.289	1.040	0.008	25.289	0.27%

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Swanquarter Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
PA	42003-3866111	GENCON NE MGMT CO/KEYSTONE STA	640.2	0.375	10.894	3.444	0.009	10.894	0.03%
NC	37013-8479311	PCS Phosphate Company, Inc. - Aurora	52.5	0.329	10.894	3.024	0.007	10.894	0.06%
OH	39053-8148511	General James M. Gwin Power Plant (0627010056)	651.5	0.219	10.894	2.014	0.005	10.894	0.05%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.203	10.894	1.860	0.007	10.894	0.08%
MD	74001-7763811	Luke Paper Company	512.5	0.191	10.894	1.750	0.008	10.894	0.07%
WV	54003-4271711	RALEIGH ENERGY SUPPLY CO, LLC- MARBION	568.6	0.186	10.894	1.711	0.013	10.894	0.12%
PA	42003-3866111	LOHMEYER CITY GLN LP/CLINTON TWP	620.1	0.151	10.894	1.344	0.008	10.894	0.07%
WV	54073-4782811	MONONGAHELA POWER CO-FUELSANTS POWER STA	625.7	0.127	10.894	1.170	0.005	10.894	0.05%
GA	13015-2813011	Ea Power Company - Plant Bowen	810.4	0.112	10.894	1.030	0.003	10.894	0.03%
NC	37117-8049311	Remstar Paper Company, LLC	69.0	0.109	10.894	1.000	0.022	10.894	0.20%

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Linville Gorge Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	81.9	0.522	12.884	4.050	0.013	12.884	0.10%
OH	39053-8148511	General James M. Gwin Power Plant (0627010056)	379.2	0.446	12.884	3.460	0.007	12.884	0.07%
PA	42003-3866111	GENCON NE MGMT CO/KEYSTONE STA	567.5	0.735	12.884	1.870	0.000	12.884	0.00%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.172	12.884	1.344	0.002	12.884	0.02%
TN	47161-4979311	TVA CLUMBERLAND FOSSIL PLANT	516.6	0.154	12.884	1.200	0.001	12.884	0.01%
GA	13015-2813011	Ea Power Company - Plant Bowen	349.9	0.146	12.884	1.130	0.000	12.884	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROXFORD	503.5	0.142	12.884	1.100	0.012	12.884	0.09%
IN	18051-7363111	Gibson	582.3	0.138	12.884	1.070	0.008	12.884	0.07%
VO	29143-5363811	NFW MADRID POWER PLANT-VARSTON	688.6	0.131	12.884	1.070	0.000	12.884	0.00%
VA	51027-4034811	Brewell Coke Company LLP	149.4	0.132	12.884	1.020	0.000	12.884	0.00%

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Cape Romain Wilderness Area (SC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹	FINAL Revised EGU + NREGD MWh ⁻¹	FINAL Revised Nitrate PSAT MWh ⁻¹	FINAL Revised Sulfate PSAT MWh ⁻¹
SC	45015-4973611	KEYSTONE CHARLESTON KRAFT LLC	29.3	0.523	14.028	3.730	0.046	14.028	0.33%
GA	13015-2813011	Ea Power Company - Plant Bowen	506.2	0.495	14.028	3.530	0.019	14.028	0.14%
SC	45015-4834911	ALUMAX OF SOUTH CAROLINA	39.1	0.327	14.028	2.330	0.009	14.028	0.02%
PA	42003-3866111	GLNCON NL MGMT CO/KEYSTONE STA	857.1	0.320	14.028	2.284	0.002	14.028	0.01%
SC	45015-4120411	SANTTEE COOPER CROSS GENERATING STATION	61.8	0.316	14.028	2.250	0.038	14.028	0.27%
OH	39053-8148511	General James M. Gwin Power Plant (0627010056)	701.0	0.305	14.028	2.170	0.005	14.028	0.04%
SC	45015-5696611	INTERNATIONAL PAPER GEORGETOWN MILL	87.4	0.230	14.028	1.640	0.021	14.028	0.15%
SC	45043-6652811	SANTTEE COOPER WINTAH GENERATING STATION	51.4	0.187	14.028	1.330	0.024	14.028	0.17%
GA	13051-3679811	International Paper - Savannah	166.1	0.180	14.028	1.280	0.009	14.028	0.06%

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Great Smoky Mountains National Park (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD Min Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Sulfate PSAT %	FINAL Revised Nitrates PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Nitrates PSAT %		
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	0.570	13.916	5.73%	0.003	13.916	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	0.183	13.916	1.32%	0.011	13.916	0.08%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	160.1	0.170	13.916	1.22%	0.007	13.916	0.05%
PA	42005-3866111	GEVON NE V G/V T CO/KEYSTONE STA	688.2	0.166	13.916	1.19%	0.001	13.916	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWLR DBA ALP ROCKPORT	375.5	0.166	13.916	1.19%	0.035	13.916	0.25%
IN	18051-7363111	Gibson	456.3	0.146	13.916	1.05%	0.037	13.916	0.27%

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Shenandoah National Park (VA)

			DISTANCE_m	FINAL Revised Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrates PSAT Min ³	FINAL Revised EGU + NREGD Min ³	FINAL Revised Nitrates PSAT %
State	Facility ID	Facility Name							
PA	42005-3866111	GEVON NE V G/V T CO/KEYSTONE STA	249.8	0.740	15.375	4.81%	0.009	15.375	0.06%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	0.692	15.375	4.52%	0.018	15.375	0.12%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	189.7	0.636	15.375	4.14%	0.070	15.375	0.46%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	0.576	15.375	3.75%	0.027	15.375	0.14%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	0.339	15.375	2.20%	0.043	15.375	0.28%
PA	42063-8005211	HOMER CITY GEN LP/ CENTER TWP	230.4	0.274	15.375	1.78%	0.010	15.375	0.06%
MD	74001-7763811	Luke Paper Company	118.4	0.216	15.375	1.41%	0.021	15.375	0.14%
PA	42063-8005111	WHC WHD PSALF GEN/SWARD GEN STA	215.5	0.172	15.375	1.12%	0.003	15.375	0.02%
WV	54053-6902311	MITCHELL PLANT	251.8	0.155	15.375	1.01%	0.025	15.375	0.16%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	324.1	0.155	15.375	1.01%	0.009	15.375	0.06%

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Joyce Kilmer-Slickrock Wilderness Area (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m						
			EGU + NREGD Min Sulfate PSAT Min ³	EGU + NREGD Min ³ Sulfate PSAT %	EGU + NREGD Min ³ Nitrates PSAT Min ³	EGU + NREGD Min ³ Nitrates PSAT %	EGU + NREGD Min ³ Nitrates PSAT Min ³	EGU + NREGD Min ³ Nitrates PSAT %	
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	475.1	0.473	13.694	2.45%	0.007	13.694	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.189	13.694	1.38%	0.014	13.694	0.10%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	179.2	0.178	13.694	1.30%	0.003	13.694	0.02%
PA	42005-3866111	GEVON NE V G/V T CO/KEYSTONE STA	711.0	0.154	13.694	1.12%	0.000	13.694	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWLR DBA ALP ROCKPORT	391.2	0.154	13.694	1.12%	0.030	13.694	0.22%
GA	13015-3813011	Eis Power Company - Plant Bowen	166.2	0.152	13.694	1.11%	0.001	13.694	0.01%
IN	18051-7363111	Gibson	471.7	0.139	13.694	1.02%	0.029	13.694	0.21%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	0.137	13.694	1.00%	0.002	13.694	0.01%

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Dolly Sods Wilderness Area (WV)

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James River Face Wilderness Area (VA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised EGU + NREGD Min Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Sulfate PSAT %	FINAL Revised Nitrates PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Nitrates PSAT %		
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	0.582	14.404	4.04%	0.016	14.404	0.11%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	0.526	14.404	3.65%	0.020	14.404	0.14%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	0.520	14.404	3.61%	0.008	14.404	0.06%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	0.325	14.404	2.26%	0.007	14.404	0.05%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	223.5	0.278	14.404	1.93%	0.016	14.404	0.11%
PA	42005-3866111	GEVON NE V G/V T CO/KEYSTONE STA	337.1	0.217	14.404	1.51%	0.005	14.404	0.04%
VA	51580-5798711	Meadowcroft Packaging Resource Group	46.5	0.209	14.404	1.45%	0.001	14.404	0.02%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	270.0	0.170	14.404	1.19%	0.006	14.404	0.04%
WV	54051-6902311	MITCHELL PLANT	269.6	0.156	14.404	1.08%	0.006	14.404	0.04%

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Otter Creek Wilderness Area (WV)

			DISTANCE_m	FINAL Revised EGU + NREGD Min ³ Sulfate PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Sulfate PSAT %	FINAL Revised Nitrates PSAT Min ³	FINAL Revised EGU + NREGD Min ³ Nitrates PSAT %		
State	Facility ID	Facility Name							
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	1.242	19.077	6.51%	0.959	19.077	0.51%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	1.001	19.077	5.25%	0.011	19.077	0.06%
WV	54073-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	0.808	19.077	4.24%	0.023	19.077	0.12%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	0.777	19.077	4.01%	0.008	19.077	0.04%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	0.302	19.077	1.58%	0.012	19.077	0.06%
WV	54051-6902311	MITCHELL PLANT	136.8	0.297	19.077	1.54%	0.010	19.077	0.05%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	0.249	19.077	1.31%	0.007	19.077	0.04%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	215.8	0.242	19.077	1.27%	0.004	19.077	0.02%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	815.5	0.207	19.077	1.09%	0.003	19.077	0.02%
IN	18051-7363111	Gibson	709.7	0.193	19.077	1.01%	0.009	19.077	0.05%
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARTIN POWER	82.3	0.192	19.077	1.00%	0.046	19.077	0.24%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	656.7	0.191	19.077	1.00%	0.007	19.077	0.04%
PA	42005-3866111	GEVON NE V G/V T CO/KEYSTONE STA	186.5	0.190	19.077	1.00%	0.001	19.077	0.00%

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Non-VISTAS Class I Areas

- Only two VISTAS facilities have a contribution $\geq 1.00\%$ at any non-VISTAS Class I Area
- **ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON (WV)**
 - Moosehorn Wilderness EDM (1.06% sulfate)
- **Tennessee Valley Authority (TVA) - Shawnee Fossil Plant (KY)**
 - Caney Creek Wilderness Area (1.09% sulfate)
 - Hercules-Glades Wilderness Area (1.95% sulfate)
 - Mingo Wilderness Area (1.47% sulfate)
 - Great Gulf Wilderness Area (1.03% sulfate)
 - Presidential Range-Dry River Wilderness (1.03% sulfate)

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EPA Guidance (August 20, 2019)

- Many facilities already have effective emission control technologies in place. States will consider control options for these facilities on a case-by-case basis.
 - “For the purpose of SO₂ control measures, an EGU that has add-on flue gas desulfurization (FGD) and that meets the applicable alternative SO₂ emission limit of the 2012 Mercury Air Toxics Standards (MATS) rule for power plants. The two limits in the rule (0.2 lb/MMBtu for coal-fired EGUs or 0.3 lb/MMBtu for EGUs fired with oil-derived solid fuel) are low enough that it is unlikely that an analysis of control measures for a source already equipped with a scrubber and meeting one of these limits would conclude that even more stringent control of SO₂ is necessary to make reasonable progress.”
 - “For the purposes of SO₂ and NO_x control measures, a combustion source (e.g., an EGU or industrial boiler or process heater) that, during the first implementation period, installed a FGD system that operates year-round with an effectiveness of at least 90 percent or by the installation of a selective catalytic reduction system that operates year-round with an overall effectiveness of at least 90 percent (in both cases calculating the effectiveness as the total for the system, including any bypassed flue gas), on a pollutant-specific basis.”

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Additional Considerations

- The final list of four-factor analysis sources will be determined in consultation with the FLMs, EPA, other states, and stakeholders.
- Some VISTAS states may perform additional four-factor analyses for sources not listed on Slide 122.
- States will verify projected SO₂ and NO_x emissions with facilities. PSAT results can be adjusted to match.
- Some states may allow their facilities to take a permit limit that will result in adjusted PSAT impacts below the 1.00% threshold in lieu of performing a four-factor analysis.
- The large number of coal-fired EGU retirements and fuel switching from coal to natural gas need to be considered along with the sources selected for the four-factor analysis. States should not be penalized for early action.

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State	FACILITY ID / STD	FACILITY NAME / STD	IMPACTED CLASS / AREAS
AR	05052-108411	N-1-ROY A MEMPHIS INC-IND-PEN/JENCE-PLANT	SHRO
IN	18051-736711	Gibson	COHJ, GRSV, JOYE, LUG, VACA, OTCR, SHRO, SIPS
IN	18134 / 801 / 711	IND ANA MICHIGAN POWER JBA AEP / ROCKPORT	COHU, GRSV, JOYE, LUG, VACA, OTCR, SHRO, SIPS
IN	18125-736211	IND ANAPOLIS POWER & LIGHT / PETERSBURG	MACA, SIPS
MD	21001-776311	Lake Paper Company	SIN, SWAN
MO	21043-536311	NEW MADRID POWER PLANT / MARIOTON	UGO, MACA, SHRO, SIPS
OH	31681-811711	Cardinal Power Plant (Cardinal Operating Company) (0841050002)	DOJO, JAR, OTCR, SHEN, SWAN
OH	39025-829411	Duke Energy Ohio, Wm. P. Zimmerman Station (1443360014)	COHU, DOJO, JOYE, OTCR, SHRO
OH	39053-814811	General James W. Gavin Power Plant (B527010056)	COHU, DOJO, GRSV, JAR, JOYE, LUGO, OKEF, OTCR, ROMA, SIPS, SHRO, SIPS, SWAN, WOLF
OH	39053-758701	Ohio Valley Electric Corp., Kuyser Creek Station (B527000003)	DOJO, JAR, OTCR, SIFN
PA	42005-386511	GEN/ON NE MGMT CO/KEYSTONE STA	COHU, DOJO, GRSV, JAR, JOYE, LUGO, OKEF, OTCR, ROMA, SIPS, SHRO, SWAN, WOLF
PA	47003-300971	UTIMEX CITY GEN. PJ / CT VTR TWP	SIFN, SWAN
PA	47003-300951	NRG WILHELM / GEN / N/WARD CO / W STA	SIFN

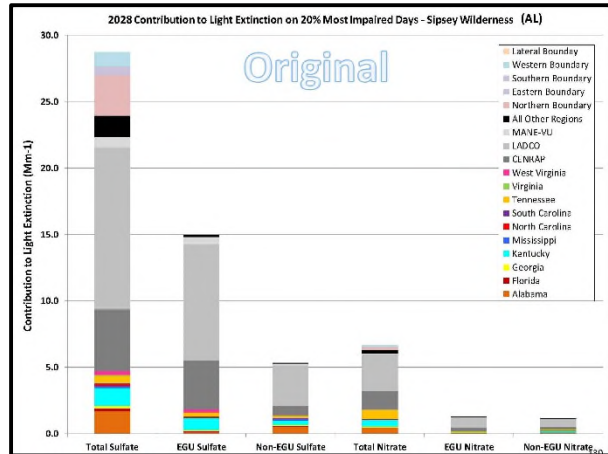
Next Steps and Schedule

Remaining VISTAS Work Schedule

Task	Schedule
2028 Point Emissions Updates	Completed *
2028 Emissions Processing	Completed *
2028 CAMx Modeling	Completed *
2028 Visibility Projections	Completed *
2028 Deposition Projections	Late May/Early June 2020 *
Final Reports and Documentation	Late July 2020
Website Updates and Postings	Late July 2020
End of Contract	September 30, 2020
Regional Haze SIPs Due to EPA	July 31, 2021

* References technical work completion. Draft reports to follow.

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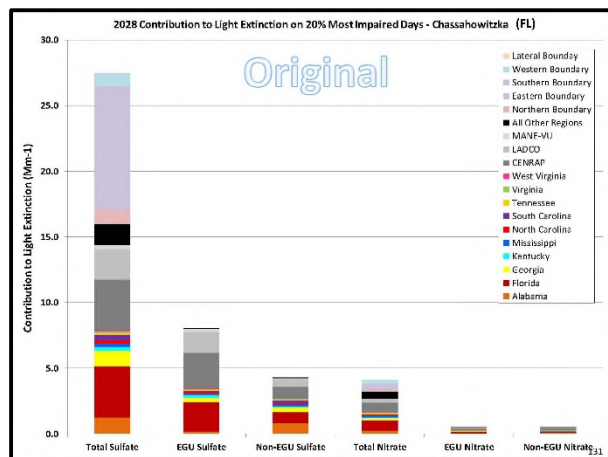


Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
- For project and contract management questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)

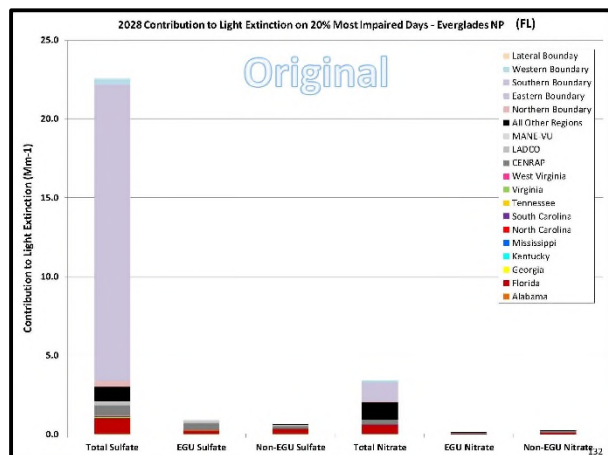


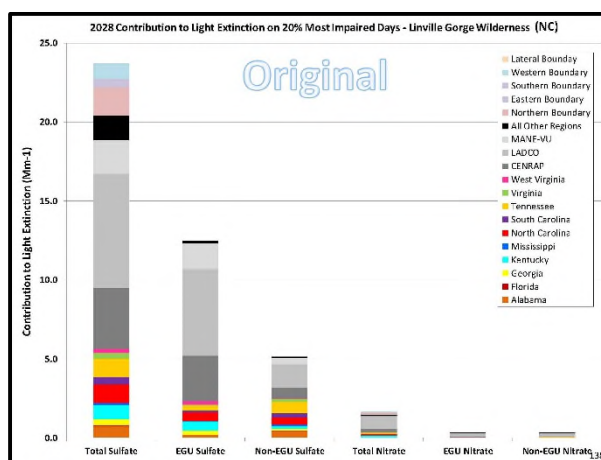
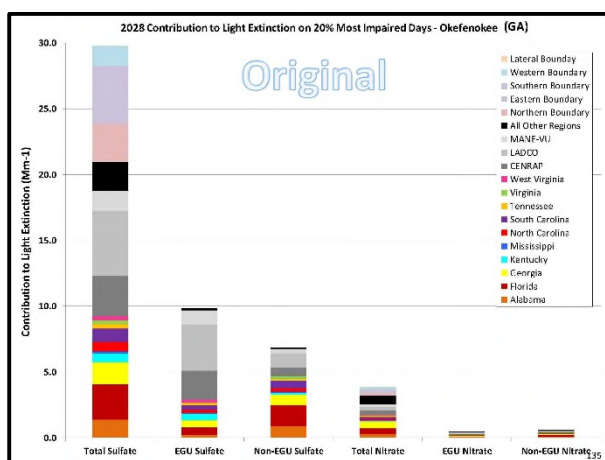
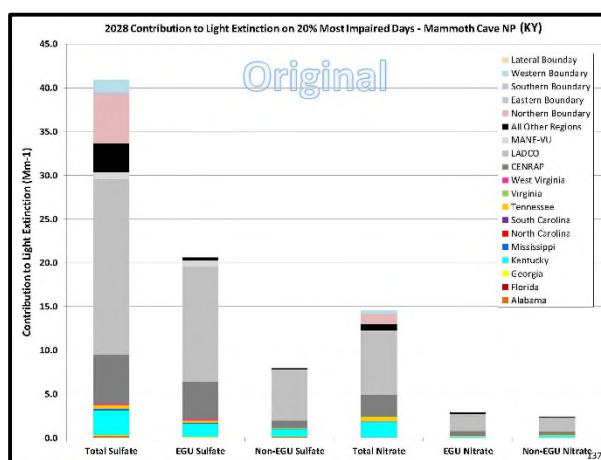
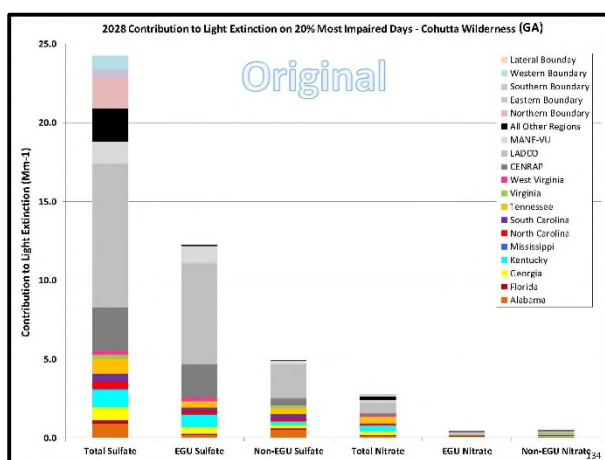
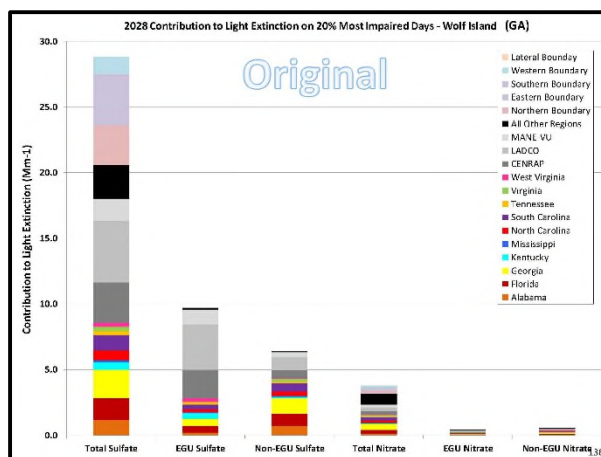
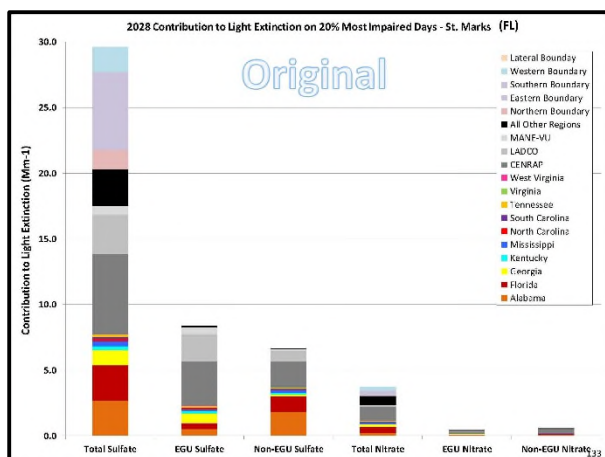
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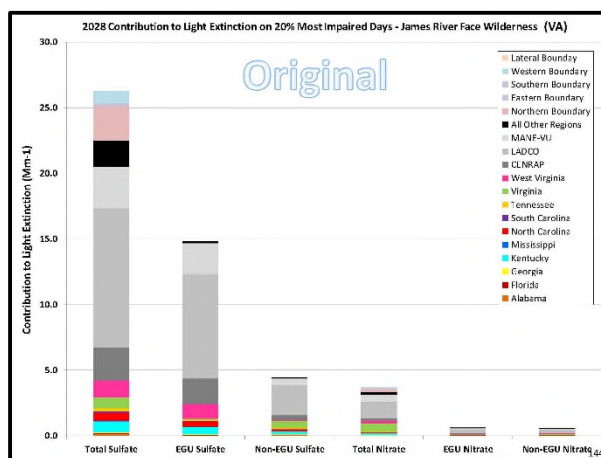
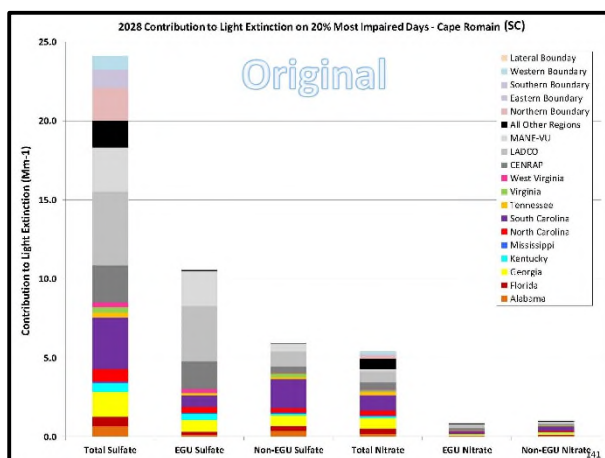
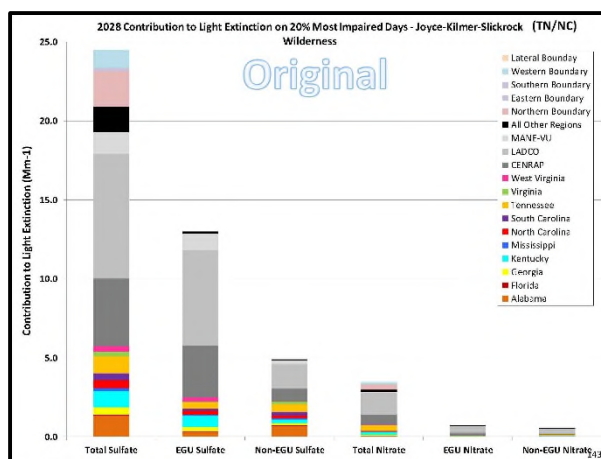
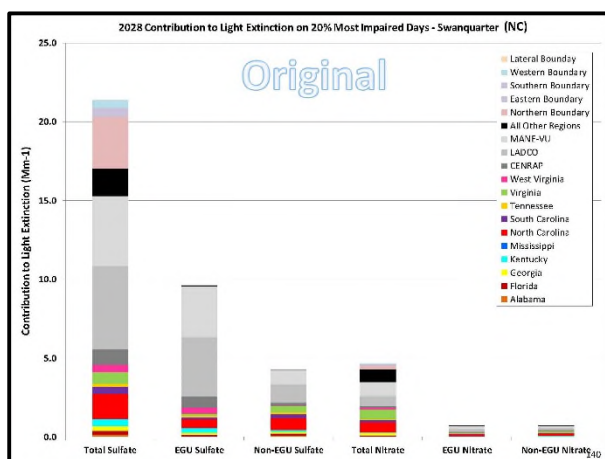
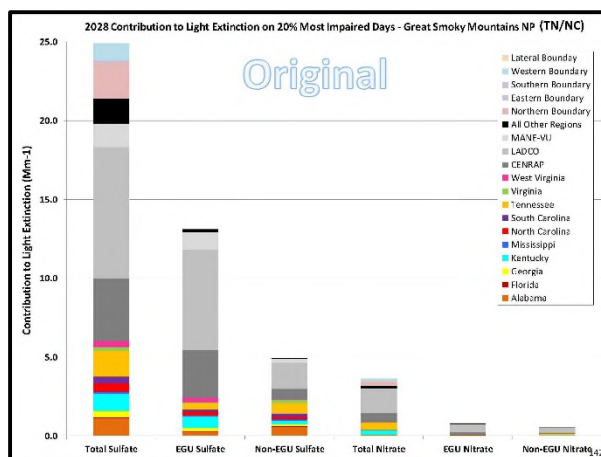
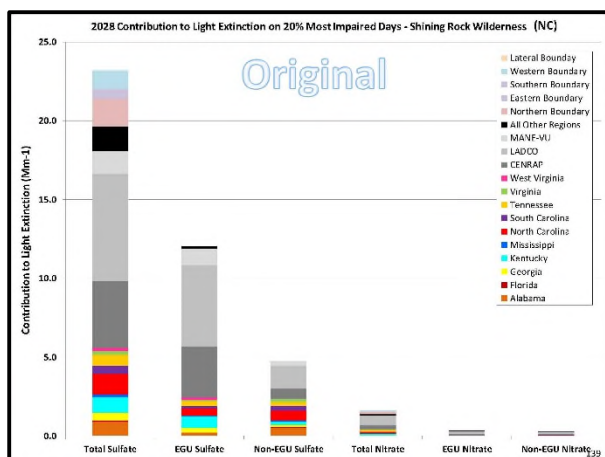


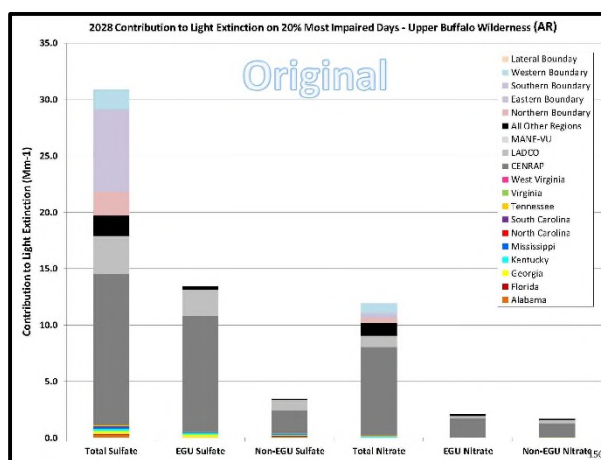
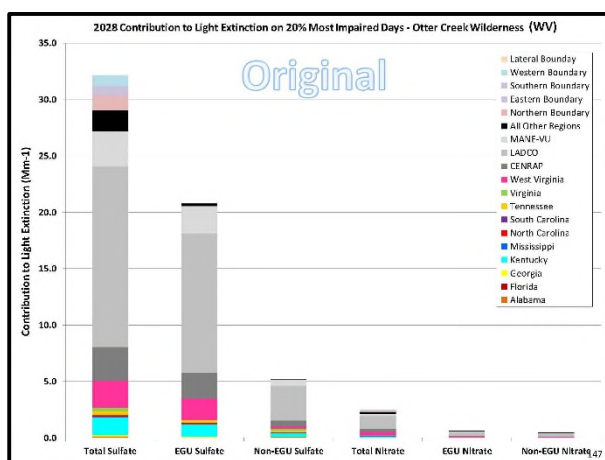
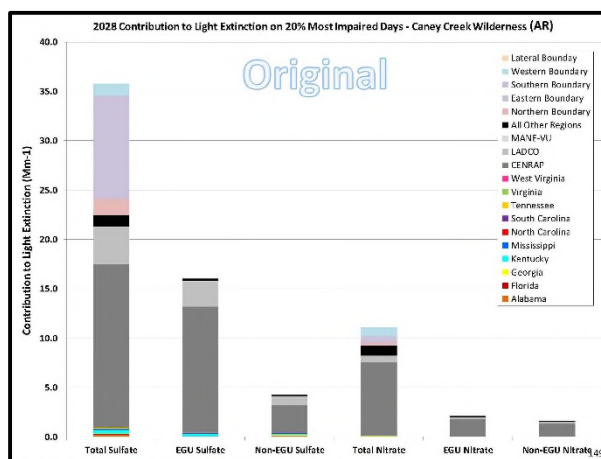
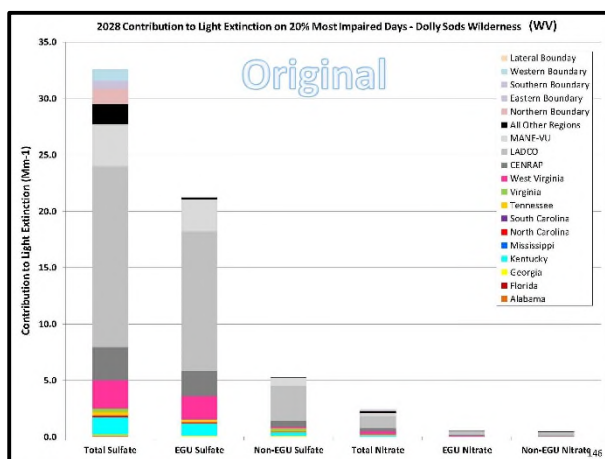
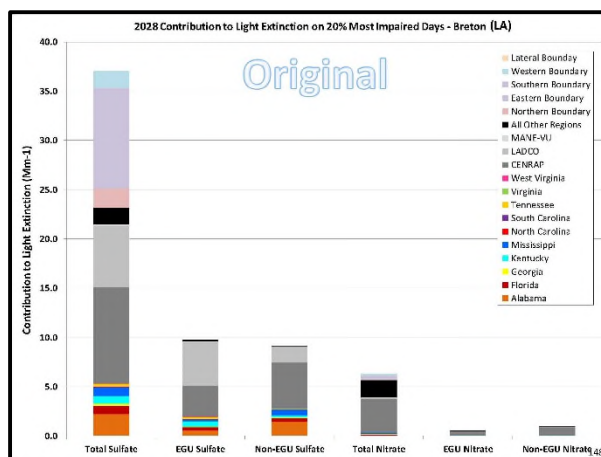
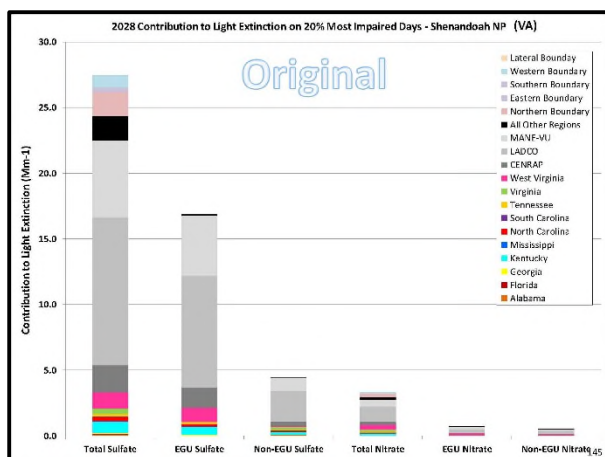
Appendix: Original Analysis (Conducted 2018-2019)

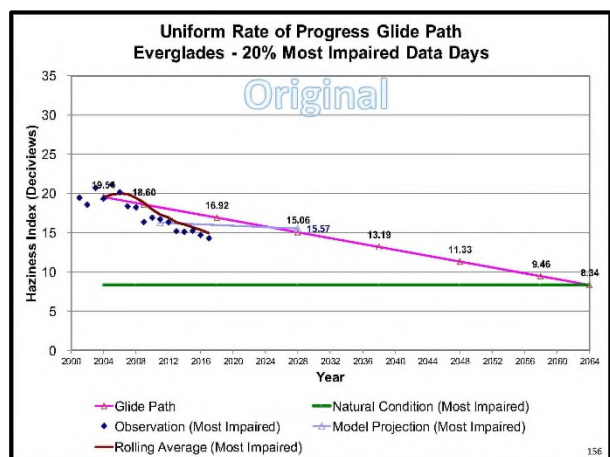
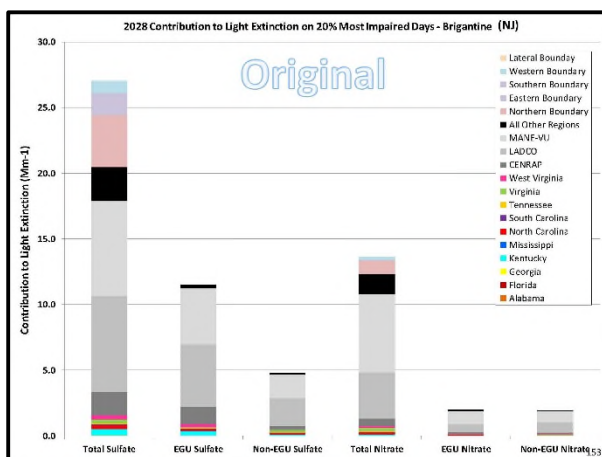
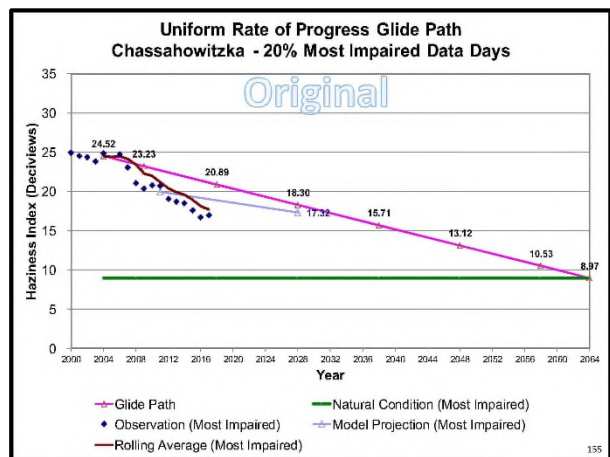
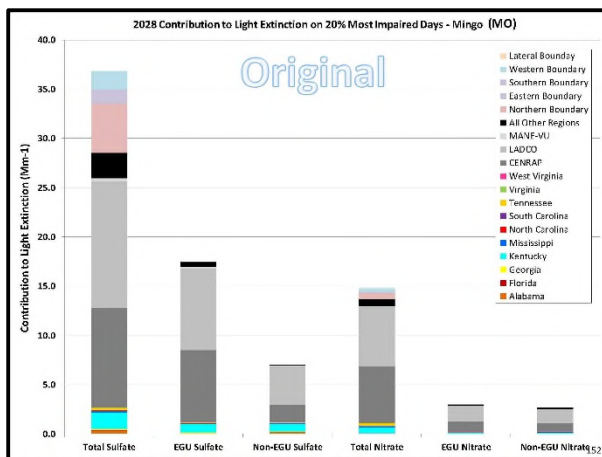
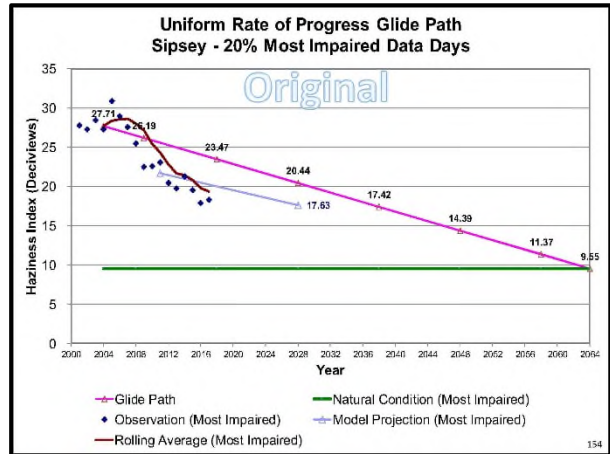
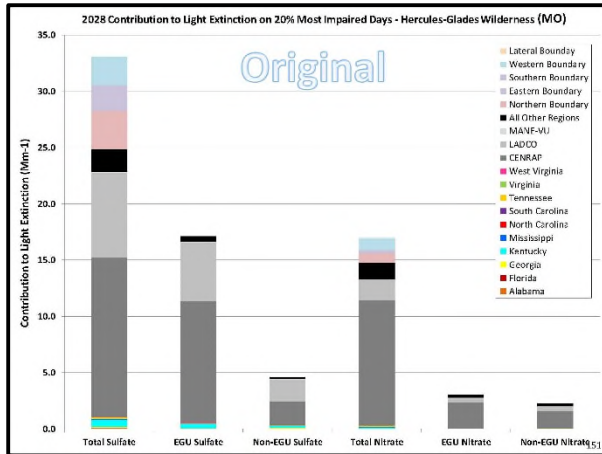
129

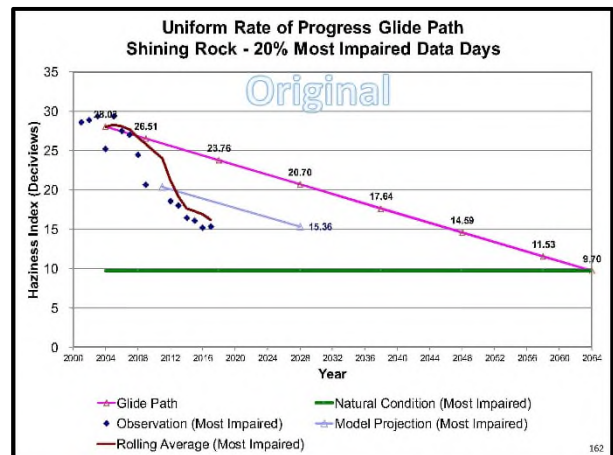
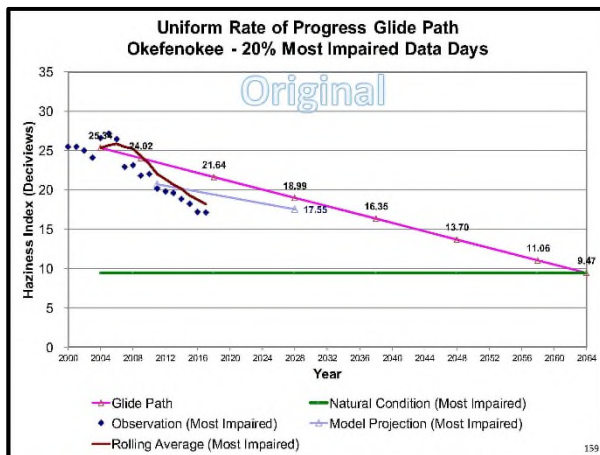
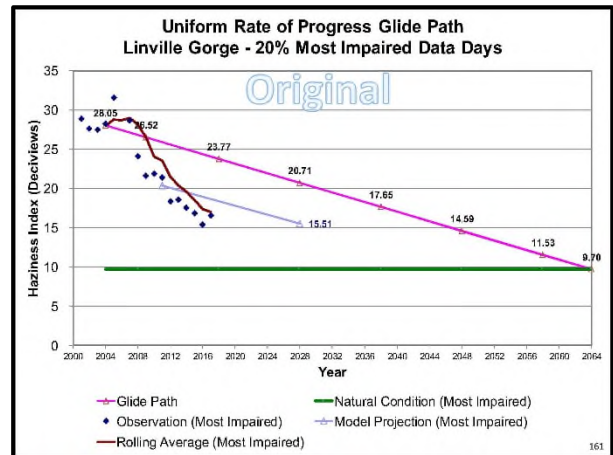
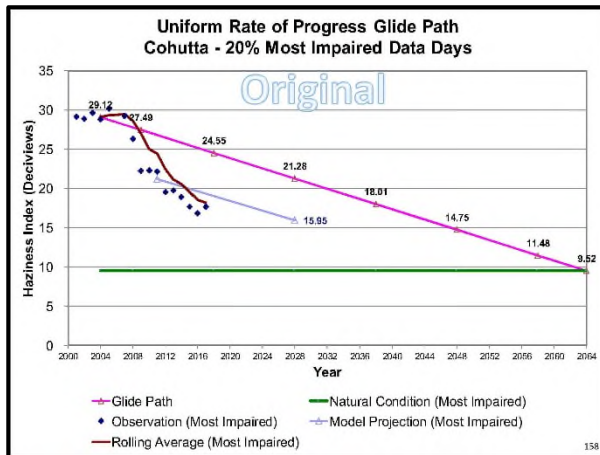
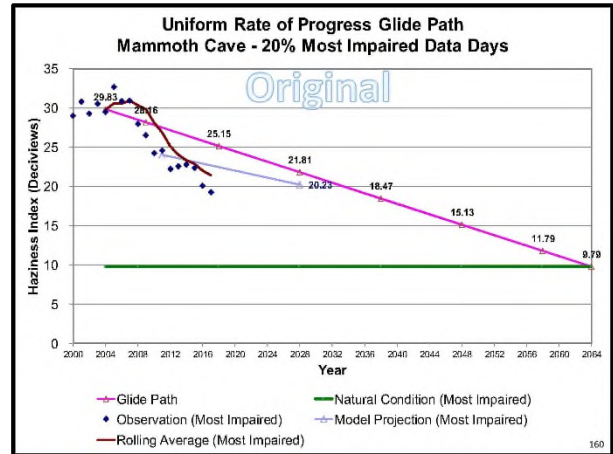
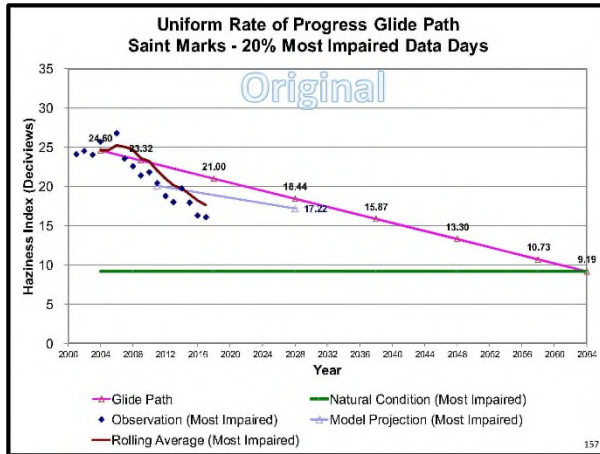


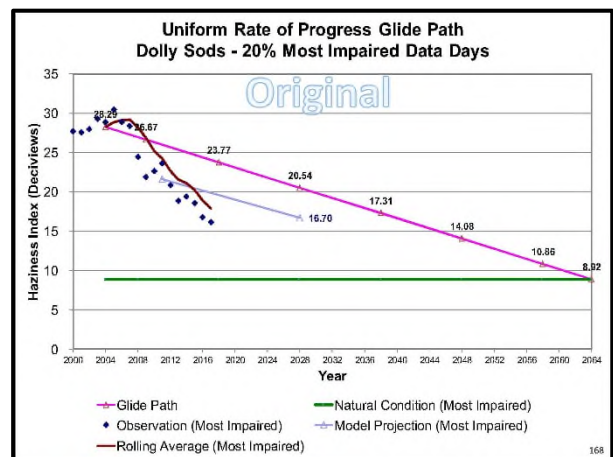
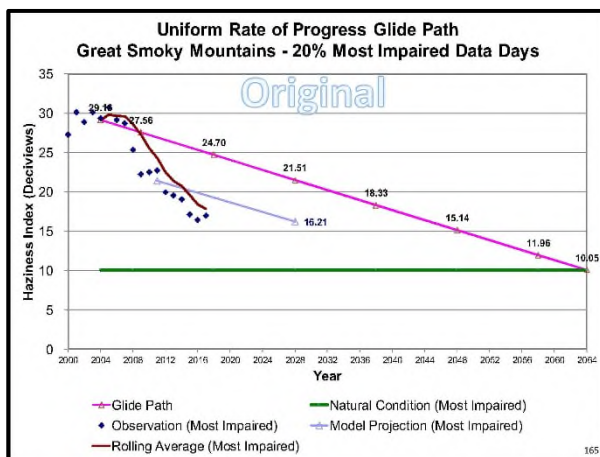
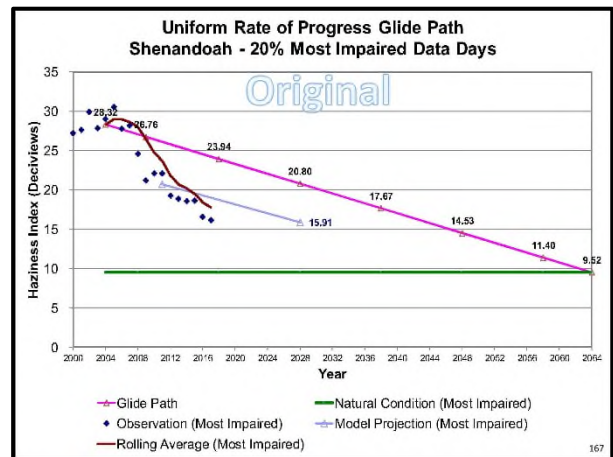
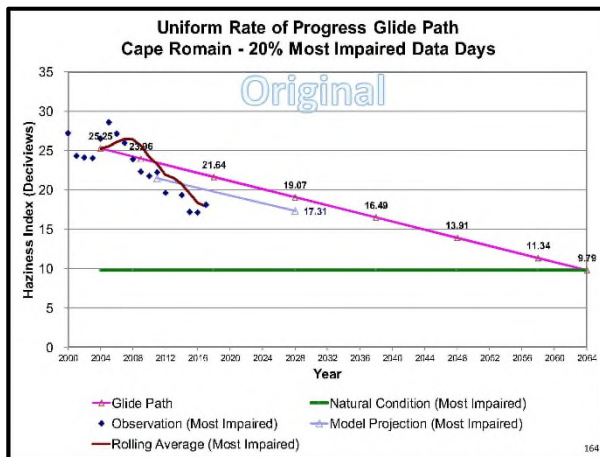
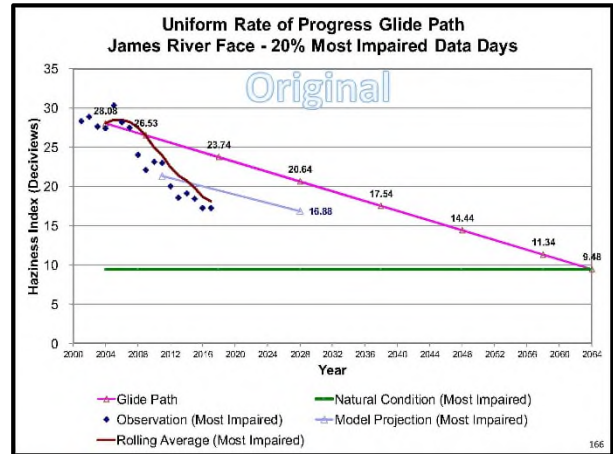
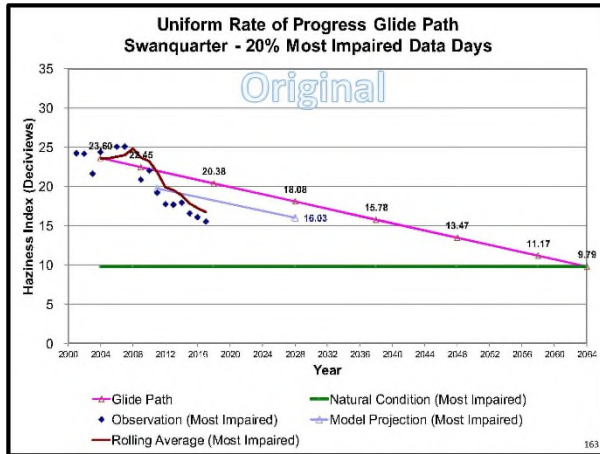


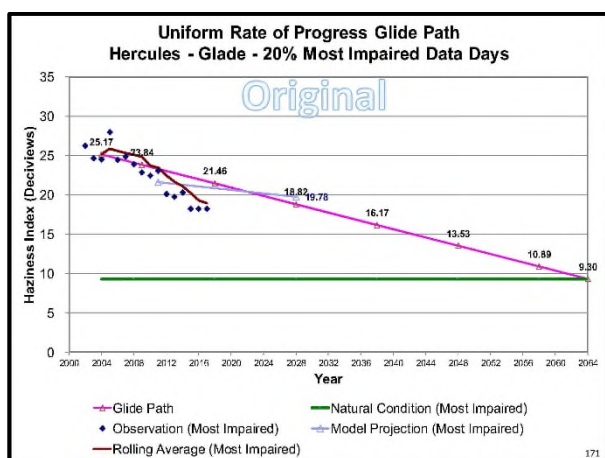
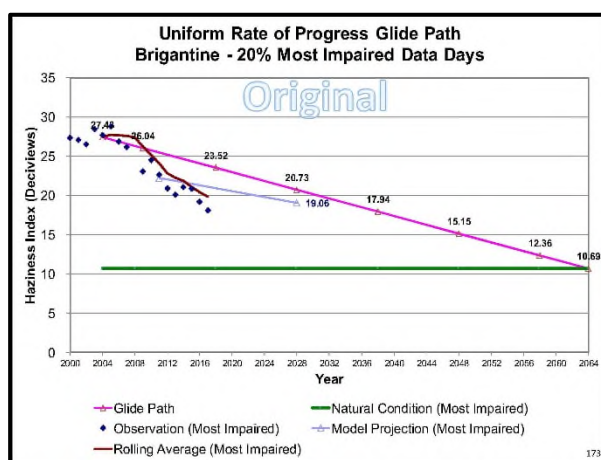
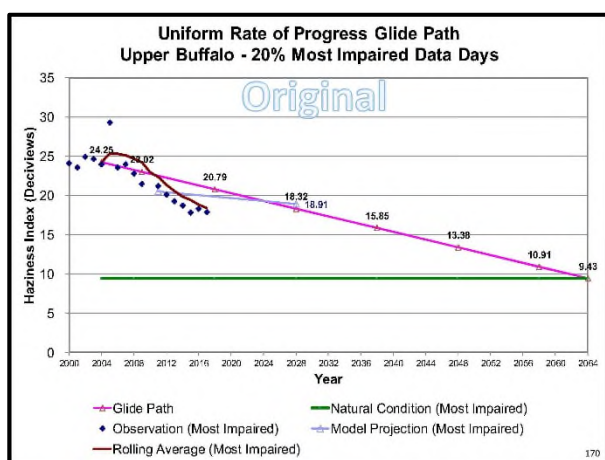
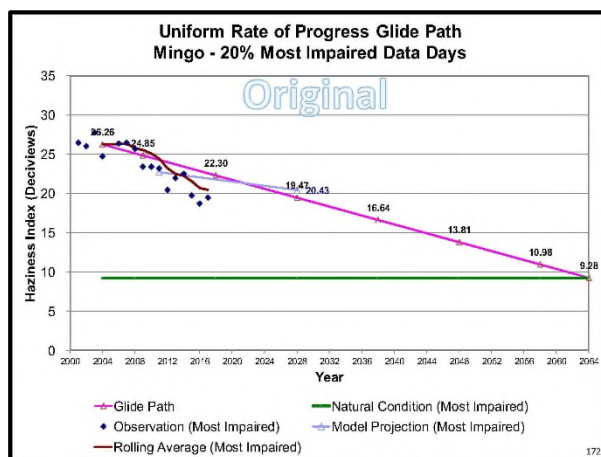
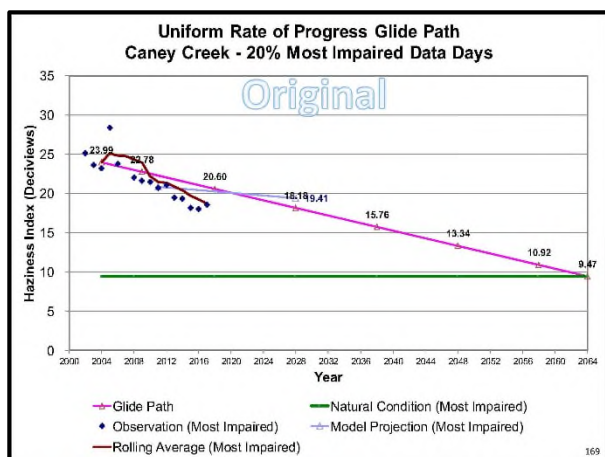












Sipsey Wilderness Area (AL)

State	Facility ID	Facility Name	DISTANCE, km	Sulfate AOI %	Sulfate AOI % Original	Sulfate PSAT %	Nitrate AOI %	Nitrate PSAT %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	3.31%	1.61%	2.22%	0.57%	0.04%	0.05%	
OH	39053-8149511	General James M. Gavin Power Plant (0627010056)	690.9	0.38%	2.75%	1.59%	0.02%	0.09%	0.13%	
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	5.72%	4.09%	3.99%	0.31%	0.23%	0.31%	
IN	18051-7363111	Gibson	448.7	2.85%	2.12%	1.65%	0.27%	0.19%	0.18%	
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT PETERSBURG	464.4	1.72%	2.19%	1.57%	0.23%	0.23%	0.16%	
TN	47161-4979311	TVA CLIMBERLAND FOSIL PLANT	238.9	3.18%	1.07%	1.48%	0.48%	0.12%	0.17%	
VO	25143-5363811	NEW MADRID POWER PLANT VARIOUS	314.5	2.48%	1.46%	1.14%	0.26%	0.08%	0.07%	
KY	21183-5561811	Big Rivers Electric Corp - Wilson Station	343.5	1.99%	0.93%	1.22%	0.07%	0.04%	0.05%	
Facilities That Dropped Off After REVISION										
IL	17122-7808911	Yogio Stepm	346.5	1.94%	1.51%	0.87%	0.75%	0.03%	0.02%	
IN	18178-8181111	ALCOA WARRICK POWER PLT AGC DIV OF AL	396.3	0.91%	1.07%	0.41%	0.62%	0.52%	0.19%	

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Chassahowitzka Wilderness Area (FL)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12017-640611	DURE ENERGY FLORIDA, INC. (DEF)	27.4	63.62%	9.55%	6.24%	1.95%	0.00%	0.23%
GA	13015-2813011	Ea Power Company - Plant Bowen	637.2	0.03%	1.72%	2.28%	0.00%	0.02%	0.03%
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	109.8	4.73%	0.96%	1.28%	0.24%	0.05%	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,098.0	0.03%	0.76%	1.01%	0.00%	0.04%	0.05%
AL	01109-985711	Sanders Lead Co	471.2	0.15%	0.76%	1.00%	0.00%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	1,133.4	0.05%	1.47%	0.83%	0.00%	0.08%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,099.6	0.03%	1.13%	0.53%	0.00%	0.04%	0.06%
AL	01053-7440211	Escambia Operating Company LLC	530.7	0.21%	1.57%	0.41%	0.00%	0.01%	0.01%

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Cohutta Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
DH	39053-8148511	General James M. Govin Power Plant (0627010056)	512.0	1.71%	3.41%	2.44%	0.02%	0.05%	0.07%
GA	13015-2813011	Ea Power Company - Plant Bowen	78.0	10.58%	1.56%	2.13%	1.15%	0.03%	0.04%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	2.18%	1.05%	1.44%	0.07%	0.01%	0.02%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	4.68%	2.84%	1.37%	0.13%	0.03%	0.04%
DH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	1.05%	2.06%	1.31%	0.06%	0.03%	0.04%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	269.8	0.99%	0.92%	1.75%	0.99%	0.07%	0.09%
PA	42003-3866111	GENON NF MGMT CO/KYSTONE STA	801.1	0.14%	2.06%	1.04%	0.00%	0.01%	0.01%
IN	18051-7363111	Cibola	487.1	2.31%	1.35%	1.03%	0.10%	0.02%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-7362111	INDIANAPOLIS POWER & LIGHT - PETERSBURG	477.0	2.18%	1.19%	0.81%	0.16%	0.03%	0.02%
TN	47145-4979111	TVA KINGSTON FOSSIL PLANT	124.0	2.17%	1.10%	0.91%	0.13%	0.06%	0.02%

178

Everglades NP (FL)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	3.02%	2.56%	3.30%	0.08%	0.00%	0.00%
FL	12105-915811	MOSAG FERTILIZER, LLC	304.7	2.21%	2.09%	2.62%	0.01%	0.00%	0.00%
FL	12105-717711	MOSAG FERTILIZER LLC	389.3	2.26%	3.55%	2.60%	0.02%	0.00%	0.00%
FL	12086-899511	TARMAC AMERICA LLC	61.7	0.36%	0.17%	0.23%	2.02%	0.76%	2.63%

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Okefenokee Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	71.5	14.63%	4.32%	2.77%	0.03%	0.01%	0.01%
GA	13015-2813011	Ea Power Company - Plant Bowen	458.1	1.02%	1.74%	2.30%	0.95%	0.04%	0.05%
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	154.5	2.18%	1.64%	2.18%	0.14%	0.11%	0.14%
DH	39053-8148511	General James M. Govin Power Plant (0627010056)	909.1	0.46%	2.19%	1.51%	0.01%	0.01%	0.01%
FL	12089-753711	ROCK TENN CP, LLC	64.8	12.83%	1.00%	1.31%	0.88%	0.11%	0.15%
SC	45015-4120411	SANTE COOPER CROSS GENERATING STATION	348.1	0.85%	0.89%	1.18%	0.95%	0.03%	0.04%
GA	13051-3679811	International Paper - Savannah	178.5	2.83%	0.79%	1.04%	0.08%	0.05%	0.06%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	939.4	0.23%	0.78%	1.03%	0.00%	0.03%	0.04%
PA	42003-3866111	GENON NF MGMT CO/KYSTONE STA	1,129.0	0.46%	2.09%	1.02%	0.03%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
DH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	871.9	0.09%	1.34%	0.83%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	915.7	0.55%	1.40%	0.65%	0.01%	0.02%	0.03%

179

St Marks Wilderness Area (FL)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
GA	13015-2813011	Ea Power Company - Plant Bowen	453.9	0.38%	3.59%	4.80%	0.01%	0.03%	0.03%
FL	12005-535411	ROCKTENN CP LLC	149.8	8.54%	3.38%	4.60%	0.24%	0.09%	0.13%
AL	01109-985711	Sanders Lead Co	255.5	3.06%	0.82%	1.12%	0.00%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
AL	01097-1086111	Ala Power - Berry	382.1	1.67%	2.43%	0.97%	0.03%	0.02%	0.02%
AL	01053-7440211	Escambia Operating Company LLC	325.4	5.98%	5.57%	0.96%	0.01%	0.02%	0.02%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	308.4	0.33%	1.67%	0.80%	0.00%	0.01%	0.01%
PA	42003-3866111	GENON NF MGMT CO/KYSTONE STA	1,251.0	0.29%	1.79%	0.65%	0.01%	0.05%	0.05%
AL	01053-7440211	Escambia Operating Company LLC	313.0	0.02%	1.68%	0.02%	0.00%	0.02%	0.02%

177

Wolf Island Wilderness (GA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
FL	12089-753711	ROCK TENN CP, LLC	74.8	8.56%	1.79%	2.33%	0.99%	0.11%	0.14%
GA	13015-2813011	Ea Power Company - Plant Bowen	458.1	1.08%	1.78%	2.33%	0.99%	0.04%	0.05%
GA	13127-3721011	Brunswick Cellulose Inc.	27.9	8.84%	1.34%	1.70%	2.94%	0.10%	0.13%
DH	39053-8148511	General James M. Govin Power Plant (0627010056)	845.3	1.71%	2.51%	1.73%	0.02%	0.02%	0.02%
SC	45015-4120411	International Paper - Savannah	85.9	7.53%	1.18%	1.54%	0.24%	0.07%	0.09%
FL	12031-440211	IEA	105.1	4.43%	0.96%	1.39%	0.99%	0.03%	0.06%
SC	45015-4849111	ALLIANCE OF SOUTH CAROLINA	233.0	1.84%	0.95%	1.75%	0.00%	0.01%	0.01%
PA	42003-3866111	GENON NF MGMT CO/KYSTONE STA	1,048.6	0.84%	2.97%	1.15%	0.01%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
DH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	876.1	0.07%	1.25%	0.76%	0.00%	0.02%	0.02%
FL	12047-769711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	1.97%	1.05%	0.67%	0.01%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	899.0	0.37%	1.38%	0.64%	0.00%	0.02%	0.03%

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Mammoth Cave NP (KY)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	16.88%	3.57%	2.68%	2.60%	0.26%	0.33%
IN	18051-7363111	Gibson	198.2	5.21%	2.16%	1.63%	1.20%	0.35%	0.33%
KY	21145-6037011	Big River Electric Corp. - Wilson Station	89.8	6.72%	1.07%	1.83%	0.37%	0.66%	0.06%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	233.6	1.46%	0.86%	1.15%	0.15%	0.14%	0.19%
MO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	312.7	0.66%	1.29%	1.14%	0.04%	0.07%	0.09%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PLT/KOSBURG	182.9	3.09%	1.50%	1.04%	0.96%	0.40%	0.27%
Facilities That Dropped Off After REVISION									
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	256.1	4.21%	1.43%	0.89%	0.14%	0.12%	0.12%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	406.5	1.45%	1.15%	0.81%	0.04%	0.02%	0.02%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	498.6	0.30%	1.15%	0.65%	0.04%	0.05%	0.02%
IN	28173-7363112	ALCOA - MARIKICK POWER PLT AGC DIV OF AL	126.1	2.05%	1.03%	0.40%	1.74%	0.82%	0.32%
IN	18125-8294312	Elysee AB Brown South Indiana Gas & Ele	162.9	2.78%	1.16%	0.60%	0.27%	0.06%	0.06%

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Swanquarter Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42003-3866111	GEVON NE MGMT CO/KEYSTONE STA	640.2	3.00%	6.66%	3.44%	0.08%	0.08%	0.03%
NC	37013-8475911	PCS Phosphate Company, Inc. - Aurora	82.5	37.88%	2.16%	3.02%	0.57%	0.05%	0.06%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	651.5	1.77%	2.74%	2.01%	0.06%	0.03%	0.05%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.35%	1.00%	1.86%	0.02%	0.03%	0.08%
MD	24001-7763811	Juke Paper Company	512.5	0.43%	2.88%	1.75%	0.02%	0.05%	0.07%
WV	54003-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	568.6	0.67%	1.19%	1.71%	0.08%	0.10%	0.12%
VA	42083-3005211	IONIER CITY GLN LP/CLINTLER WP	620.1	0.55%	1.27%	1.48%	0.05%	0.05%	0.07%
WV	54073-4782811	MONONGAHELA POWER CO-PUEASANTS POWER STA	625.7	0.84%	1.22%	1.17%	0.87%	0.03%	0.05%
GA	13015-2813011	Ed Power Company - Plant Bowen	810.6	0.15%	0.74%	1.03%	0.00%	0.02%	0.03%
NC	37117-8040311	Dorstar Paper Company, LLC	69.0	2.27%	0.72%	1.00%	1.00%	0.14%	0.20%
Facilities That Dropped Off After REVISION									
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	1,005.3	0.34%	1.69%	0.83%	0.07%	0.03%	0.04%

184

Linville Gorge Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	81.9	19.21%	2.87%	0.05%	0.58%	0.07%	0.10%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	379.2	5.90%	4.67%	3.46%	0.04%	0.01%	0.07%
PA	42003-3866111	GEVON NE MGMT CO/KEYSTONE STA	567.5	0.94%	3.49%	1.82%	0.00%	0.00%	0.00%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.26%	0.95%	1.34%	0.00%	0.61%	0.04%
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	516.6	0.11%	0.85%	1.30%	0.80%	0.61%	0.91%
GA	13015-2813011	Ed Power Company - Plant Bowen	340.9	0.57%	0.80%	0.13%	0.92%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	303.5	1.38%	2.22%	1.10%	0.01%	0.07%	0.09%
IN	18051-7363111	Gibson	382.3	0.67%	1.45%	1.07%	0.01%	0.07%	0.07%
MO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	698.6	0.03%	1.11%	1.01%	0.00%	0.00%	0.00%
VA	51027-4034811	Jewell Coke Company LLP	149.4	5.94%	0.73%	1.02%	0.01%	0.00%	0.00%
Facilities That Dropped Off After REVISION									
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	856.4	0.29%	1.43%	0.86%	0.00%	0.02%	0.00%
MD	24001-7763812	Juke Paper Company	463.8	0.22%	1.37%	0.84%	0.00%	0.00%	0.00%
IN	18125-7362412	INDIANAPOLIS POWER & LIGHT - PLT/KOSBURG	550.5	0.36%	1.12%	0.82%	0.01%	0.07%	0.06%
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	380.3	2.82%	1.00%	0.66%	0.03%	0.02%	0.03%

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Cape Romain Wilderness Area (SC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
SC	45003-4979311	KAPSTONE CHARLESTON KRAFT LLC	29.3	30.18%	2.86%	3.73%	2.74%	0.25%	0.33%
GA	13015-2813011	Ed Power Company - Plant Bowen	506.2	0.36%	2.71%	3.53%	0.01%	0.10%	0.14%
SC	45003-4979311	ALLMAR OF SOUTH CAROLINA	18.1	12.07%	1.79%	2.33%	0.03%	0.02%	0.03%
PA	42003-3866111	GEVON NE MGMT CO/KEYSTONE STA	837.3	0.30%	4.74%	2.28%	0.00%	0.03%	0.03%
SC	45003-4120411	SANTER COOPER CROSS GENERATING STATION	63.8	6.57%	1.73%	2.25%	0.45%	0.21%	0.27%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	701.0	0.84%	3.18%	2.17%	0.00%	0.03%	0.04%
SC	45003-4568611	INTERNATIONAL PAPER GEORGETOWN MILL	57.4	4.31%	1.26%	1.44%	0.35%	0.11%	0.15%
GA	45003-4642811	SANTER COOPER WINYAH GENERATING STATION	51.4	4.60%	1.02%	1.33%	0.38%	0.13%	0.17%
GA	13051-3479811	International Paper - Savannah	166.1	1.76%	0.99%	1.26%	0.04%	0.05%	0.06%
Facilities That Dropped Off After REVISION									
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	776.2	0.11%	1.14%	0.69%	0.00%	0.04%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	868.3	0.06%	1.18%	0.54%	0.00%	0.07%	0.08%

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Shining Rock Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	397.3	1.39%	3.26%	2.41%	0.01%	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	573.4	0.47%	1.10%	1.83%	0.01%	0.02%	0.02%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	454.1	0.54%	0.93%	1.32%	0.02%	0.01%	0.02%
GA	13015-2813011	Ed Power Company - Plant Bowen	241.6	1.70%	0.92%	1.33%	0.07%	0.01%	0.01%
MO	29143-5363811	NEW MADRID POWER PLANT-VARSTON	625.7	0.36%	1.37%	1.26%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	473.3	0.70%	2.55%	1.27%	0.01%	0.07%	0.09%
PA	42003-3866111	GEVON NE MGMT CO/KEYSTONE STA	657.6	0.49%	2.46%	1.23%	0.00%	0.00%	0.00%
IN	18051-7363111	Gibson	544.2	0.29%	1.55%	1.23%	0.01%	0.07%	0.07%
NC	37087-7920511	Blue Ridge Paper Products - Canton Mill	16.9	41.29%	2.14%	1.08%	6.65%	0.67%	0.10%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	1.37%	1.59%	1.05%	0.03%	0.01%	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.13%	1.74%	1.04%	0.00%	0.01%	0.01%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	126.9	4.43%	0.74%	1.04%	0.40%	0.02%	0.02%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PLT/KOSBURG	529.0	0.18%	1.17%	0.82%	0.01%	0.11%	0.08%
IL	27127-7868911	Topco Solum	584.4	0.23%	1.07%	0.59%	0.00%	0.01%	0.00%

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Great Smoky Mountains National Park (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Original Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	2.75%	5.10%	3.73%	0.04%	0.07%	0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	1.34%	0.94%	1.32%	0.02%	0.06%	0.08%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	160.1	6.01%	0.88%	1.22%	0.13%	0.04%	0.05%
PA	42003-3866111	GEVON NE MGMT CO/KEYSTONE STA	688.7	0.11%	2.51%	1.19%	0.00%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	4.66%	2.42%	1.19%	0.21%	0.19%	0.25%
IN	18051-7363111	Gibson	456.3	1.25%	1.94%	1.05%	0.07%	0.27%	0.27%
Facilities That Dropped Off After REVISION									
OH	39025-8294312	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	360.0	1.84%	1.50%	0.98%	0.09%	0.02%	0.02%
IN	18125-7362412	INDIANAPOLIS POWER & LIGHT - PLT/KOSBURG	435.6	1.48%	1.08%	0.78%	0.12%	0.29%	0.20%
AR	05063-1083412	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	675.9	0.19%	1.22%	0.72%	0.02%	0.01%	0.00%
TN	47163-3982311	THE KINGSTON FOSSIL PLANT	80.0	2.88%	1.23%	0.38%	0.71%	0.08%	0.03%

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Joyce Kilmer-Slickrock Wilderness Area (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	475.1	4.73%	4.69%	3.45%	0.05%	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.84%	0.93%	1.38%	0.05%	0.07%	0.10%
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	179.2	5.88%	0.93%	2.30%	0.36%	0.02%	0.02%
PA	42003-3866111	GENCON NE V.G.V.T CO/KEYSTONE STA	711.0	0.27%	2.17%	1.17%	0.00%	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	391.2	4.33%	2.27%	1.12%	0.14%	0.36%	0.21%
GA	13015-3813011	Eis Power Company - Plant Bowen	166.2	3.61%	0.79%	1.11%	0.10%	0.01%	0.01%
IN	18051-7363111	Gibson	471.7	2.00%	1.29%	1.02%	0.11%	0.21%	0.21%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	385.1	3.63%	1.53%	1.00%	0.06%	0.01%	0.01%
Facilities That Dropped Off After REVISION									
AR	05062-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	674.4	1.58%	1.36%	0.81%	0.05%	0.02%	0.01%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	453.0	2.16%	1.00%	0.72%	0.21%	0.23%	0.16%
TN	47145-6379111	EVAN KINSTON FOSSE PLANT	78.7	2.68%	1.24%	0.39%	0.57%	0.10%	0.03%

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Dolly Sods Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
WV	54038-6271731	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	83.6	13.58%	4.94%	7.10%	1.36%	0.26%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	233.8	7.62%	6.56%	4.88%	0.10%	0.03%	0.05%
WV	54073-4782831	MONONGAHELA POWER CO-PLEASANTS POWER STA	163.9	4.64%	4.32%	6.19%	0.16%	0.07%	0.10%
OH	39081-8113711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	1.36%	7.14%	4.02%	0.03%	0.01%	0.03%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	416.9	1.40%	7.25%	1.07%	0.02%	0.04%	0.05%
WV	54051-6902331	MITCHELL PLANT	144.2	1.45%	1.28%	1.47%	0.07%	0.02%	0.05%
PA	42003-3866111	GENCON NE V.G.V.T CO/KEYSTONE STA	172.8	4.12%	2.43%	1.27%	0.01%	0.00%	0.00%
OH	39023-7983011	Duke Valley Electric Corp., Nager Creek Station (0627000003)	234.9	0.62%	0.66%	1.18%	0.11%	0.02%	0.02%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	215.8	3.56%	1.45%	1.14%	0.11%	0.01%	0.03%
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARTIN POWER	79.8	4.33%	1.27%	1.23%	1.07%	0.18%	0.23%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	847.6	0.12%	0.74%	1.05%	0.00%	0.01%	0.02%
Facilities That Dropped Off After REVISION									
IN	18051-7363111	Gibson	729.5	0.04%	1.24%	0.90%	0.02%	0.04%	0.04%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	676.3	0.44%	1.91%	0.97%	0.01%	0.02%	0.03%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	662.6	0.18%	1.05%	0.77%	0.02%	0.04%	0.03%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	242.5	0.71%	1.08%	0.00%	0.17%	0.08%	0.00%

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James River Face Wilderness Area (VA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	7.66%	5.41%	4.04%	0.14%	0.08%	0.11%
WV	54035-6271731	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	207.6	2.76%	2.51%	3.65%	0.36%	0.12%	0.14%
OH	39081-8113711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	1.35%	1.92%	3.01%	0.04%	0.02%	0.06%
WV	54075-4782831	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	3.87%	2.33%	2.26%	0.13%	0.09%	0.09%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	213.5	3.50%	2.46%	1.97%	0.13%	0.05%	0.11%
PA	42003-3866111	GENCON NE V.G.V.T CO/KEYSTONE STA	337.1	2.96%	2.88%	1.51%	0.06%	0.03%	0.04%
VA	51580-5798731	Meadowcroft Packaging Resource Group	46.5	12.64%	1.02%	1.45%	1.14%	0.15%	0.22%
OH	39053-7983011	Duke Valley Electric Corp., Nager Creek Station (0627000003)	270.0	0.63%	0.60%	1.14%	0.16%	0.04%	0.04%
WV	54051-6902331	MITCHELL PLANT	268.6	0.68%	0.97%	1.00%	0.03%	0.02%	0.04%
Facilities That Dropped Off After REVISION									
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	435.2	1.89%	1.89%	0.32%	0.05%	0.06%	0.06%
IN	18051-7363111	Gibson	729.4	0.59%	1.07%	0.82%	0.02%	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	663.5	0.56%	1.33%	0.66%	0.01%	0.01%	0.02%

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Otter Creek Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
WV	54038-6271731	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	17.37%	4.49%	6.51%	1.81%	0.26%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	10.46%	7.08%	5.25%	0.18%	0.04%	0.06%
WV	54073-4782831	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.3	8.19%	4.39%	4.24%	0.30%	0.08%	0.12%
OH	39081-8113711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	167.7	1.94%	7.03%	3.61%	0.05%	0.02%	0.04%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	397.5	1.12%	2.40%	1.38%	0.02%	0.06%	0.06%
WV	54051-6902331	MITCHELL PLANT	136.8	1.56%	1.40%	1.56%	0.06%	0.03%	0.05%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	4.36%	1.67%	1.11%	0.12%	0.02%	0.04%
OH	39053-7983011	Duke Valley Electric Corp., Nager Creek Station (0627000003)	215.3	0.85%	0.71%	1.27%	0.20%	0.02%	0.02%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	816.5	0.18%	0.77%	1.09%	0.00%	0.01%	0.02%
IN	18051-7363111	Gibson	709.7	0.24%	1.27%	2.01%	0.03%	0.05%	0.05%
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARTIN POWER	82.7	4.86%	1.14%	1.00%	0.32%	0.20%	0.24%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	655.7	0.64%	7.01%	1.00%	0.01%	0.03%	0.04%
PA	42003-3866111	GENCON NE V.G.V.T CO/KEYSTONE STA	186.5	3.73%	1.91%	1.00%	0.03%	0.03%	0.03%
Facilities That Dropped Off After REVISION									
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	663.0	0.23%	1.07%	0.79%	0.02%	0.04%	0.03%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	232.8	1.12%	1.07%	0.00%	0.17%	0.08%	0.00%

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Shenandoah National Park (VA)

State	Facility ID	Facility Name	DISTANCE_m	Sulfate AOI %	Original Sulfate PSAT %	FINAL Revised Sulfate PSAT %	Nitrate AOI %	Original Nitrate PSAT %	FINAL Revised Nitrate PSAT %
PA	42003-3866111	GENCON NE V.G.V.T CO/KEYSTONE STA	239.8	11.83%	8.89%	0.81%	0.10%	0.05%	0.08%
OH	39081-8113711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	769.6	1.53%	2.37%	4.50%	0.06%	0.05%	0.13%
WV	54035-6271731	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	188.7	4.60%	2.75%	4.14%	0.90%	0.37%	0.46%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	5.75%	4.88%	3.75%	0.14%	0.10%	0.14%
WV	54073-4782831	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	4.97%	2.20%	2.20%	0.24%	0.18%	0.28%
PA	42083-8005211	HOMER CITY GEN LP CENTER TWP	230.1	7.60%	1.36%	1.78%	0.13%	0.01%	0.06%
MD	24001-7763811	Euler Paper Company	118.4	6.90%	2.20%	1.41%	0.25%	0.09%	0.14%
PA	42083-8005211	NRC WHOLESALE CFB/STWARD CFB STA	215.5	1.80%	1.00%	1.17%	0.04%	0.02%	0.03%
WV	54051-6902331	MITCHELL PLANT	251.8	1.46%	0.89%	1.01%	0.11%	0.08%	0.16%
OH	39053-7983011	Duke Valley Electric Corp., Nager Creek Station (0627000003)	324.1	0.43%	0.53%	1.01%	0.16%	0.06%	0.06%
Facilities That Dropped Off After REVISION									
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARTIN POWER	184.4	2.41%	1.06%	0.97%	1.27%	0.47%	0.60%
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (4133090154)	505.4	1.31%	1.28%	0.87%	0.11%	0.05%	0.09%
WV	54079-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	291.5	2.09%	1.04%	0.84%	0.09%	0.08%	0.19%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA ALP ROCKPORT	755.8	0.71%	1.46%	0.76%	0.03%	0.02%	0.03%

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west virginia department of environmental protection

Appendix F-3I

VISTAS Regional Haze Project Update to EPA Region 3, Region 4, and OAQPS July 30, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS Regional Haze Project Update



EPA Region 4, Region 3, and OAQPS Briefing
Jim Boylan
July 30, 2020

Why 1% Threshold?

- In the Round 1 Regional Haze SIPs, many VISTAS states used the AOI approach and a 1% threshold on a Unit basis.
 - Round 2 uses the AOI/PSAT approach and a $\geq 1.00\%$ PSAT threshold based on a Facility basis.
 - This pulled in more facilities compared to a Unit basis.
 - Round 2 uses 2028 emissions (lower than 2018)
 - This pulled in more facilities with smaller visibility impacts (in Mm^{-1}) compared to Round 1.
- This approach results in a reasonable number of sources that can be evaluated with limited state resources and focuses on the sources and pollutants with the largest impacts.

Outline

- Reasonable Progress Screening Approach
- Area of Influence
- PSAT Results
- Initial List of Sources
- EPA Discussion



Area of Influence (AOI) Analysis

- Evaluates emissions (Q), distance to Class I area (d), and extinction weighted residence time (EWRT) in model grid cells (point) or counties (source categories)
- Formula: $(Q/d) * \text{EWRT}$
- Establishes each county's and each facility's contribution to light extinction at each Class I area on the 20% most impaired days
- Can use contributions to rank and screen facilities for the four-factor analysis

Reasonable Progress Screening Approach

1. The VISTAS reasonable progress work started with AOI screening ($Q/d * \text{EWRT}$) to rank sectors and facilities based on their sulfate and nitrate contributions at each Class I area.
2. These rankings were used to identify 87 individual facilities for PSAT tagging. PSAT tagging was used to determine the sulfate and nitrate contributions from each facility at each Class I area in the VISTAS_12 domain.
3. Each individual VISTAS state will apply a PSAT contribution threshold based on the facility sulfate and facility nitrate impacts (separately, not combined) divided by the total impact of sulfate + nitrate from all point sources to determine which sources may need to be considered for a four-factor analysis.
 - If sulfate contribution $\geq 1.00\% \rightarrow \text{SO}_2$ Four-Factor Analysis
 - If nitrate contribution $\geq 1.00\% \rightarrow \text{NO}_x$ Four-Factor Analysis

AOI Source Categories for WOLF

SOURCE CATEGORY	NO _x	SO ₂	TOTAL
NONPOINT	1.7%	2.8%	4.4%
NONROAD_MAR	2.9%	1.5%	4.4%
NONROAD_OTHER	3.3%	0.3%	3.6%
ONROAD	5.7%	0.7%	6.4%
POINT	7.3%	67.9%	75.2%
PT_FIRES_PRESCRIBED	0.9%	5.1%	6.0%
TOTAL	21.8%	78.2%	100.0%

AOI Screening Summary

State	Threshold	Notes
AL	2%	Sulfate only
FL	5%	Sulfate or nitrate, plus Gulf Crist, Mosaic Bartow, Mosaic New Wales, and Mosaic Riverview
GA	2% - 4%	Sulfate or nitrate, 2% threshold for GA facilities, 4% threshold for facilities outside GA
KY	2%	Sulfate or nitrate
MS	2%	Sulfate or nitrate
NC	3%	Sulfate + nitrate
SC	2% - 5%	2% for sulfate, 5% for nitrate, plus Santee Cooper Winyah, International Paper Georgetown, and SCE&G Williams
TN	3%	Sulfate + nitrate, plus CEMEX
VA	2%	Sulfate + nitrate
WV	0.2% - 2%	Sulfate or nitrate

Each VISTAS state selected their threshold based on their state-specific situation and will document the selection process in their SIP.

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Facility Tags (KY, MS, NC, SC, TN, VA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
KY	VISTAS	21181-506111	Big Town Electric Corp. - Wilson Station	6,334.16	1,151.75
KY	VISTAS	21091-732411	Century Aluminum of KY LLC	5,604.36	197.66
KY	VISTAS	21177-510671	Tennessee Valley Authority - Paradise Fossil Plant	3,011.01	3,114.52
KY	VISTAS	21145-603701	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	19,304.75	7,007.34
MS	VISTAS	28059-838811	Chevron Products Company - Pascagoula Refinery	761.60	1,534.12
MS	VISTAS	28059-625101	Mississippi Power Company - Plant Victor J. Daniel	231.50	3,829.72
NC	VISTAS	37087-732011	Blue Ridge Paper Products - Canton Mill	1,127.07	2,992.37
NC	VISTAS	37117-804911	Durham Paper Company, LLC	647.45	1,796.48
NC	VISTAS	37055-837011	Duke Energy Carolinas, LLC - Marshall Steam Station	4,139.31	7,511.31
NC	VISTAS	37013-847931	PCS Phosphate Company, Inc. - Aurora	4,845.30	495.58
NC	VISTAS	37023-851801	SGL Carbon - LLC	261.64	21.69
SC	VISTAS	45015-484911	ALUMAX OF SOUTH CAROLINA	3,751.49	108.08
SC	VISTAS	45043-569611	INTERNATIONAL PAPER GEORGETOWN MILL	2,767.52	2,031.26
SC	VISTAS	45019-497611	KAPSTONE CHARLESTON KRAFT LLC	1,863.65	2,355.82
SC	VISTAS	45013-417011	KANTIL COOPER WINNAP GENERATING STATION	4,881.17	3,273.41
SC	VISTAS	45043-665211	SANTECOOPER WINNAP GENERATING STATION	2,486.86	1,772.53
SC	VISTAS	45015-830671	SCE&G WILLIAMS	192.48	992.73
TN	VISTAS	47093-407911	Cemex - Knoxville Plant	1,211.47	711.50
TN	VISTAS	47163-198211	EASTMAN CHEMICAL COMPANY	6,439.16	6,900.31
TN	VISTAS	47105-412921	TATE & LYLE, Loudon	477.76	883.25
TN	VISTAS	47001-619611	TVA BULL RUN FOSSIL PLANT	622.54	964.16
TN	VISTAS	47163-407911	TVA CUMBERLAND FOSSIL PLANT	8,427.23	4,916.15
TN	VISTAS	47145-497911	TVA KINGSTON FOSSIL PLANT	1,588.09	1,687.38
VA	VISTAS	51027-403481	Jewell Coke Company LP	5,090.95	520.17
VA	VISTAS	51280-578711	Meadwestvaco Packaging Resource Group	2,115.11	1,985.69
VA	VISTAS	51023-503611	Roundake Cement Company	2,290.17	1,572.97

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AOI Point Contributions for Wolf Island

State	FACILITY NAME	DISTANCE (mi)	NOx_2018 (tons/year)	SO2_2018 (tons/year)	NOx Contribution	SO2 Contribution
GA	Brunswick Cellulose Inc	27.9	1,554.5	294.2	2.84%	8.84%
FL	ROCK TENN CP, LLC	74.0	2,316.8	2,606.7	0.39%	8.50%
GA	International Paper - Savannah	85.9	1,560.7	3,945.4	0.24%	7.55%
FL	J&A	105.1	651.8	2,094.5	0.09%	4.42%
GA	Georgia-Pacific Consumer Products LP (Savannah River Mill)	109.9	351.5	1,860.2	0.03%	2.65%
FL	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	173.6	112.4	2,745.0	0.01%	1.97%
SC	ALUMAX OF SOUTH CAROLINA	213.0	108.1	3,751.7	0.00%	1.84%
FL	RAYONIER PERFORMANCE FIBERS LLC	77.4	2,327.1	562.0	0.38%	1.79%
FL	RESINOIL ELECTRIC COOPERATIVE, INC.	181.4	917.8	3,713.4	0.02%	1.77%
OH	General James M. Gavin Power Plant (0627010056)	865.5	8,122.5	41,595.8	0.02%	1.71%
SC	Santee Cooper Cross Generating Station	251.0	3,273.5	4,281.2	0.03%	1.59%
GA	Southern States Phosphate & Fertilizer	84.1	1.0	597.1	0.00%	1.55%
FL	IFF CHEMICAL HOLDINGS, INC.	118.5	37.7	898.0	0.00%	1.22%
FL	DUKE ENERGY FLORIDA, INC. (DEP)	296.6	2,489.8	5,306.4	0.04%	1.19%
GA	Ga Power Company - Plant Bowen	438.1	6,443.3	10,453.4	0.03%	1.08%
GA	Savannah Sugar Refinery	89.5	521.6	582.0	0.08%	1.06%
SC	INTERNATIONAL PAPER EASTOVER	288.7	1,780.3	3,212.9	0.05%	0.95%
GA	Ga Power Company - Plant McManus	27.1	72.2	30.1	0.14%	0.93%
SC	KAPSTONE CHARLESTON KRAFT LLC	213.6	2,355.8	1,863.7	0.09%	0.89%
PA	GENON NE MGMT CO/KEYSTONE STA	1,048.6	6,578.5	56,335.2	0.01%	0.84%

By setting the AOI threshold at GA's levels, a reasonable number of tags and facilities were identified and 35.0% of the total sulfate + nitrate point contribution was captured.

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Facility Tags (WV, AR, MO, MD, PA, IL, IN, OH)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
WV	VISTAS	54013-627171	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	10,082.94	11,830.88
WV	VISTAS	54049-486451	AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	2,130.25	1,245.10
WV	VISTAS	54079-678911	PAIPALACHAN POWER COMPANY - JOHN AMOS PLANT	10,584.24	4,478.10
WV	VISTAS	54023-625701	Dominion Resources, Inc. - MOUNT STORM POWER STATION	2,123.84	1,984.14
WV	VISTAS	54041-690031	EQUITRANS - COPELY RUN CS 70	0.10	511.06
WV	VISTAS	54083-679071	FILES CREEK 6C340	0.15	643.35
WV	VISTAS	54083-679071	GLADY 6C430	0.11	343.29
WV	VISTAS	54089-632781	KINGSFORD MANUFACTURING COMPANY	16.96	140.88
WV	VISTAS	54061-163011	LONGVIEW POWER	2,133.78	1,556.57
WV	VISTAS	54013-690231	MITCHELL PLANT	5,172.40	2,719.64
WV	VISTAS	54061-677611	MONONGAHELI POWER CO. - FORT MARTIN POWER	4,881.17	13,763.32
WV	VISTAS	54073-478281	MONONGAHELI POWER CO-PLEASANTS POWER STA	16,617.43	5,497.37
WV	VISTAS	54061-677611	MORGANTOWN ENERGY ASSOCIATES	628.64	655.36
AR	CENRAP	05063-108411	ENTERGY ARKANSAS INC INDEPENDENCE PLANT	32,659.48	14,119.10
MO	CENRAP	71913-336381	NEW MADRID POWER PLANT-MAIRTON	16,783.71	4,394.10
MD	MANE-VU	24001-776381	Luke Paper Company	22,659.84	3,607.00
PA	MANE-VU	42003-396411	GRONON NE MGMT CO/KEYSTONE STA	56,335.25	6,578.47
PA	MANE-VU	42003-305231	HOMER CITY GEN LP/ CENTER TWP	11,860.70	5,215.95
PA	MANE-VU	42063-305511	NRG WHOLESALE GEN/SEWARD GEN STA	8,880.26	2,254.64
IL	Midwest BPO	17127-780811	Joplin Steam	20,509.26	4,706.35
IN	Midwest BPO	18173-818111	Alcoa Warrick Power PB Agc Div of AL	5,671.26	11,158.55
IN	Midwest BPO	18051-736311	Gibson	23,117.28	12,280.34
IN	Midwest BPO	18147-801721	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	30,536.33	8,806.77
IN	Midwest BPO	18125-736211	INDIANAPOLIS POWER & LIGHT PETERSBURG	19,641.86	10,665.27
IN	Midwest BPO	18129-816611	Sigeco AB Brown South Indiana Gas & Ele	7,644.70	1,578.59
OH	Midwest BPO	39081-811571	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	7,460.79	2,467.31
OH	Midwest BPO	39011-801081	Cornellville Power Plant (0616000000)	4,154.23	5,957.87
OH	Midwest BPO	39012-829611	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	22,131.80	7,149.57
OH	Midwest BPO	39053-814851	General James M. Gavin Power Plant (0627010056)	41,595.81	8,122.51
OH	Midwest BPO	39053-798301	Ohio Valley Electric Corp. - Sugar Creek Station (0627000003)	3,400.14	9,143.04

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Facility Tags (AL, FL, GA)

Facility State	Facility BPO	FACILITY_ID_STD	FACILITY_NAME_STD	SO2 (TPY)	NOx (TPY)
AL	VISTAS	01097-949811	Akzo Nobel Chemicals Inc	3,135.72	20.71
AL	VISTAS	01097-949811	Ala Power - Barry	6,601.17	2,275.76
AL	VISTAS	01129-102871	American Midstream Chattom, LLC	3,106.38	425.87
AL	VISTAS	01073-101871	DRUMMOND COMPANY, INC.	2,362.17	1,228.55
AL	VISTAS	01053-740211	Esamina Operating Company LLC	18,574.39	349.32
AL	VISTAS	01053-985111	Esamina Operating Company LLC	8,585.80	149.64
AL	VISTAS	01103-100011	Nucor Steel Decatur LLC	170.28	331.24
AL	VISTAS	01109-985711	Sanders Lead Co	7,951.06	121.71
AL	VISTAS	01057-106111	Union Oil of California - Chunchula Gas Plant	2,575.15	349.25
FL	VISTAS	12223-724211	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	1,520.42	1,830.74
FL	VISTAS	12086-900111	CEMEX CONSTRUCTION MATERIALS FL, LLC	29.52	910.36
FL	VISTAS	12105-919811	DUKE ENERGY FLORIDA, INC. (DEP)	5,306.41	2,489.85
FL	VISTAS	12086-900011	FLORIDA POWER & LIGHT (FPL)	11.05	110.62
FL	VISTAS	12033-752711	GULF POWER - Crist	2,615.65	2,998.28
FL	VISTAS	12086-352711	HOMESTEAD CITY UTILITIES	0.00	97.09
FL	VISTAS	12011-640211	J&A	2,094.48	601.77
FL	VISTAS	12105-717711	MOSAIC FERTILIZER LLC	7,900.67	810.42
FL	VISTAS	12057-716411	MOSAIC FERTILIZER, LLC	3,034.06	159.71
FL	VISTAS	12105-919811	MOSENFELT LLC	4,425.56	141.62
FL	VISTAS	12089-845811	RAYONIER PERFORMANCE FIBERS LLC	561.97	2,527.10
FL	VISTAS	12089-753711	ROCK TENN CP, LLC	2,608.72	2,316.77
FL	VISTAS	12005-315411	ROCK TENN CP, LLC	2,190.88	1,404.89
FL	VISTAS	12129-773711	TALLAHASSEE CITY JUDOM GENERATING STA	2.86	121.46
FL	VISTAS	12057-538611	TAMPA ELECTRIC COMPANY (TEC)	6,084.90	2,665.03
FL	VISTAS	12086-899911	TARMAC AMERICA LLC	9.38	879.70
FL	VISTAS	12047-709711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	3,157.77	112.41
GA	VISTAS	13127-372101	Brunswick Cellulose Inc	294.20	1,534.51
GA	VISTAS	13015-281301	Ga Power Company - Plant Bowen	10,453.42	6,643.32
GA	VISTAS	13103-548311	Georgia-Pacific Consumer Products LP (Savannah River Mill)	1,860.18	351.52
GA	VISTAS	13013-507811	International Paper - Savannah	1,565.38	1,560.72
GA	VISTAS	13113-539311	TEMPLE INLAND	1,791.00	1,773.33

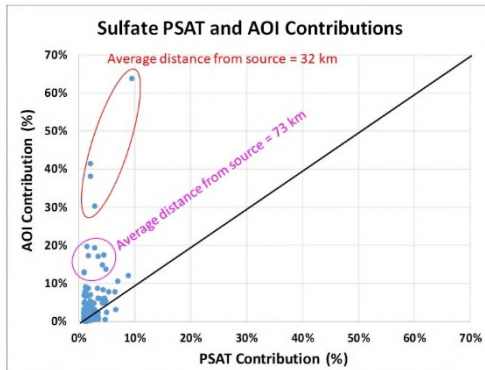
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PSAT Source Apportionment Modeling

- Quantifies visibility impacts from individual point sources, source sectors, and geographic regions
- NOx and SO₂ tagging
- Used for further evaluation of AOI results
- Refines information on contributions to visibility impairment
- Can be used to adjust future year visibility projections to account for additional emission controls
- VISTAS contract with ERG allows for up to 250 tags

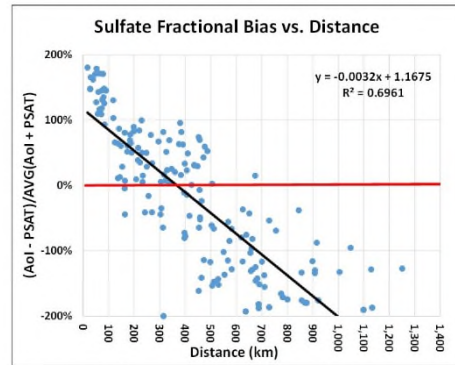
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Sulfate AOI vs. Sulfate PSAT ($\geq 1.00\%$)



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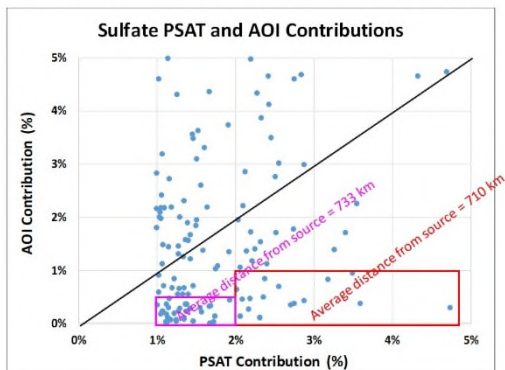
Sulfate Fractional Bias vs. Distance



FB = 100% means that the AOI value is 3x the PSAT value.

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Sulfate AOI vs. Sulfate PSAT ($\geq 1.00\%$)



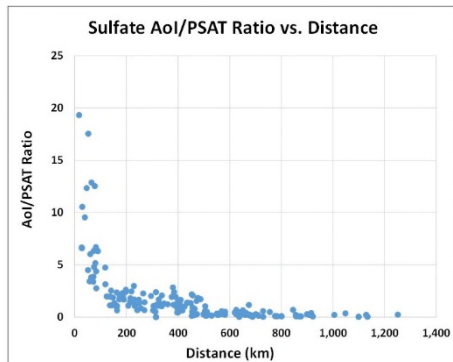
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AOI vs. PSAT Summary

- AOI tends to overestimate impacts for facilities near the Class I area. This brought in more nearby sources.
- AOI tends to underestimate impacts for facilities far away from the Class I area. This may miss some far away sources, but they are likely being captured by other Class I areas that are closer to those sources.
- PSAT is the most reliable modeling tool for tracking facility contributions to visibility impairment at Class I areas.

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Sulfate AOI/PSAT Ratio vs. Distance



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PSAT Reasonable Progress Screening

- The **facility sulfate and nitrate contributions** (Mm^{-1}) from the individual 87 tagged facilities should not change unless a facility has reduced or increased SO_2 and/or NO_x emissions.
- The updated 2028 CAMx modeling will impact the **total sulfate and total nitrate contribution** from point sources at each Class I area since the SO_2 and NO_x emissions have decreased.
 - The facility percent contribution will increase even if the facility emissions do not change since the denominator will decrease

Facility Sulfate Contribution (%) =

$$\frac{\text{Facility Sulfate Impact (Mm}^{-1}\text{)} \downarrow \uparrow}{\text{Total Impact of All Point Sources of Sulfate + Nitrate (Mm}^{-1}\text{)} \downarrow}$$

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Sipsey Wilderness Area (AL)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	337.7	0.364	16.370	2.22%	0.009	16.370 0.03%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	690.9	0.327	16.370	1.99%	0.021	16.370 0.13%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	398.4	0.327	16.370	1.99%	0.050	16.370 0.31%
IN	18051-7363111	Gibson	448.7	0.270	16.370	1.65%	0.029	16.370 0.18%
IN	18125-7562411	INDIANAPOLIS POWER & LIGHT PETERSBURG	464.2	0.258	16.370	1.57%	0.036	16.370 0.16%
TN	47161-4879111	TVA CUMBERLAND FOSSIL PLANT	228.9	0.242	16.370	1.46%	0.028	16.370 0.17%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	314.5	0.220	16.370	1.34%	0.012	16.370 0.07%
KY	21189-5561611	Big Rivers Electric Corp - Wilson Station	845.5	0.211	16.370	1.28%	0.008	16.370 0.05%

8 Facilities Identified for Reasonable Progress Analysis addressing more than 13.5% of the entire sulfate plus nitrate point source visibility impact in 2028.

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St Marks Wilderness Area (FL)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
GA	13015-2813011	Ga Power Company - Plant Bowen	452.9	0.574	11.729	4.89%	0.004	11.729 0.03%
FL	12005-535411	ROCKTECH CP LLC	140.8	0.540	11.729	4.60%	0.015	11.729 0.13%
AL	01109-985711	Sanders Lead Co	255.9	0.131	11.729	1.12%	0.000	11.729 0.00%

3 Facilities Identified for Reasonable Progress Analysis addressing more than 10.6% of the entire sulfate plus nitrate point source visibility impact in 2028.

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Chassahowitzka Wilderness Area (FL)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
FL	12017-540611	DUKE ENERGY FLORIDA, INC. (DEF)	27.4	0.629	10.092	5.24%	0.029	10.092 0.23%
GA	13015-2813011	Ga Power Company - Plant Bowen	637.2	0.230	10.092	2.28%	0.003	10.092 0.03%
FL	12097-538611	TAMPA ELECTRIC COMPANY (TEC)	106.8	0.129	10.092	1.28%	0.007	10.092 0.07%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	1,098.0	0.102	10.092	1.01%	0.005	10.092 0.05%
AL	01109-985711	Sanders Lead Co	471.2	0.101	10.092	1.00%	0.001	10.092 0.01%

5 Facilities Identified for Reasonable Progress Analysis addressing more than 11.8% of the entire sulfate plus nitrate point source visibility impact in 2028.

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Cohutta Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	512.0	0.322	13.229	2.44%	0.009	13.229 0.07%
GA	13015-2813011	Ga Power Company - Plant Bowen	78.0	0.282	13.229	2.13%	0.005	13.229 0.04%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	457.2	0.190	13.229	1.44%	0.002	13.229 0.02%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	410.1	0.181	13.229	1.37%	0.005	13.229 0.04%
OH	39025-8294311	Pulse Energy Ohio, Wm. H. Zimmer Station (1413090154)	454.6	0.173	13.229	1.31%	0.005	13.229 0.04%
TN	47161-4879111	EASTMAN CHEMICAL COMPANY	269.8	0.165	13.229	1.22%	0.012	13.229 0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	801.1	0.137	13.229	1.04%	0.002	13.229 0.01%
IN	18051-7363111	Gibson	487.1	0.137	13.229	1.02%	0.002	13.229 0.02%

8 Facilities Identified for Reasonable Progress Analysis addressing more than 12.0% of the entire sulfate plus nitrate point source visibility impact in 2028.

23

Everglades NP (FL)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
FL	12097-538611	TAMPA ELECTRIC COMPANY (TEC)	316.6	0.044	1.333	3.30%	0.000	1.333 0.00%
FL	12108-919811	MOSAIC FERTILIZER, LLC	304.7	0.035	1.333	2.42%	0.000	1.333 0.00%
FL	12108-717711	MOSAIC FERTILIZER LLC	303.8	0.035	1.333	2.40%	0.000	1.333 0.00%
FL	12086-899911	TARMAC AMERICA LLC	61.7	0.003	1.333	0.23%	0.035	1.333 2.63%

4 Facilities Identified for Reasonable Progress Analysis addressing more than 11.2% of the entire sulfate plus nitrate point source visibility impact in 2028.

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Okefenokee Wilderness Area (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %
FL	12047-749711	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC	71.5	0.372	13.400	2.77%	0.002	13.400 0.01%
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	0.308	13.400	2.30%	0.007	13.400 0.05%
FL	12123-752411	BUCKEYE FLORIDA, LIMITED PARTNERSHIP	133.5	0.289	13.400	2.16%	0.019	13.400 0.14%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	909.1	0.203	13.400	1.51%	0.002	13.400 0.01%
FL	12089-759711	ROCK TECH CP LLC	64.8	0.176	13.400	1.31%	0.020	13.400 0.15%
SC	45015-4120411	SANTEE COOPER CROSS GENERATING STATION	348.1	0.158	13.400	1.18%	0.006	13.400 0.04%
GA	13051-3679811	International Paper - Savannah	178.9	0.140	13.400	1.04%	0.008	13.400 0.06%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	999.4	0.138	13.400	1.03%	0.006	13.400 0.04%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,129.0	0.137	13.400	1.02%	0.002	13.400 0.01%

9 Facilities Identified for Reasonable Progress Analysis addressing more than 14.3% of the entire sulfate plus nitrate point source visibility impact in 2028.

24

Wolf Island Wilderness (GA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
FL	12089-753711	ROCK TENN CP, LLC	74.9	0.304	12.957	2.33%	0.018	12.957	0.14%
GA	13015-2813011	Ga Power Company - Plant Bowen	458.1	0.302	12.957	2.33%	0.007	12.957	0.05%
GA	13127-8721011	Brunswick Cellulose Inc	27.9	0.238	12.957	1.76%	0.017	12.957	0.13%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	845.3	0.224	12.957	1.73%	0.003	12.957	0.02%
GA	13051-3679811	International Paper - Savannah	85.9	0.200	12.957	1.54%	0.012	12.957	0.09%
SC	45015-4120411	Santee Cooper Cross Generating Station	251.0	0.168	12.957	1.30%	0.011	12.957	0.08%
FL	12081-440211	SEA	109.1	0.147	12.957	1.19%	0.008	12.957	0.06%
SC	45015-4894911	ALUMAX OF SOUTH CAROLINA	228.0	0.162	12.957	1.23%	0.001	12.957	0.01%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	1,048.6	0.140	12.957	1.15%	0.002	12.957	0.01%

9 Facilities Identified for Reasonable Progress Analysis addressing more than 14.7% of the entire sulfate plus nitrate point source visibility impact in 2028.

25

Shining Rock Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	397.3	0.297	12.313	2.41%	0.001	12.313	0.01%
NC	21145-4097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	578.4	0.201	12.313	1.63%	0.009	12.313	0.02%
TN	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	484.1	0.162	12.313	1.32%	0.002	12.313	0.02%
GA	13015-2813011	Ga Power Company - Plant Bowen	241.6	0.159	12.313	1.29%	0.001	12.313	0.01%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	625.2	0.158	12.313	1.28%	0.001	12.313	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	473.3	0.156	12.313	1.27%	0.012	12.313	0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	657.6	0.151	12.313	1.23%	0.000	12.313	0.00%
IN	18091-7363111	Kirkison	554.2	0.151	12.313	1.23%	0.008	12.313	0.07%
NC	27087-7520911	Blue Ridge Paper Products - Canton Mill	16.9	0.143	12.313	1.08%	0.012	12.313	0.10%
OH	39025-8294311	Pulse Energy Ohio, Wm. H. Zimmer Station (1413090154)	406.7	0.129	12.313	1.05%	0.002	12.313	0.01%
AR	05063-1083411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	783.3	0.129	12.313	1.04%	0.001	12.313	0.01%
TN	47161-4982311	EASTMAN CHEMICAL COMPANY	126.9	0.126	12.313	1.04%	0.009	12.313	0.02%

12 Facilities Identified for Reasonable Progress Analysis addressing more than 15.9% of the entire sulfate plus nitrate point source visibility impact in 2028.

28

Mammoth Cave NP (KY)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	118.0	0.426	25.289	1.63%	0.085	25.289	0.33%
IN	18051-7263111	Gibson	198.2	0.411	25.289	1.63%	0.084	25.289	0.33%
KY	21183-5561611	Big Rivers Electric Corp. - Wilson Station	89.9	0.361	25.289	1.43%	0.020	25.289	0.08%
KY	21145-4097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	238.6	0.290	25.289	1.13%	0.049	25.289	0.19%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	312.7	0.289	25.289	1.14%	0.022	25.289	0.09%
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	182.9	0.264	25.289	1.05%	0.068	25.289	0.27%

6 Facilities Identified for Reasonable Progress Analysis addressing more than 8.1% of the entire sulfate plus nitrate point source visibility impact in 2028.

26

Swanquarter Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	640.2	0.375	10.894	3.44%	0.009	10.894	0.09%
NC	37015-8479311	PCS Phosphate Company, Inc. - Aurora	52.5	0.329	10.894	3.02%	0.007	10.894	0.06%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	651.5	0.219	10.894	2.01%	0.005	10.894	0.05%
OH	39081-4115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	659.6	0.203	10.894	1.86%	0.007	10.894	0.06%
MD	24001-7763811	Luke Paper Company	512.5	0.191	10.894	1.75%	0.008	10.894	0.07%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	568.6	0.186	10.894	1.71%	0.013	10.894	0.12%
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	620.1	0.151	10.894	1.38%	0.008	10.894	0.07%
WV	54078-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	625.7	0.127	10.894	1.17%	0.005	10.894	0.05%
GA	13015-2813011	Ga Power Company - Plant Bowen	810.6	0.112	10.894	1.03%	0.003	10.894	0.03%
NC	37111-8049311	Domtar Paper Company, LLC	69.0	0.109	10.894	1.00%	0.022	10.894	0.20%

10 Facilities Identified for Reasonable Progress Analysis addressing more than 18.4% of the entire sulfate plus nitrate point source visibility impact in 2028.

29

Linville Gorge Wilderness Area (NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
TN	47161-4979311	EASTMAN CHEMICAL COMPANY	81.9	0.522	12.884	4.03%	0.013	12.884	0.10%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	329.2	0.446	12.884	3.46%	0.002	12.884	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	567.5	0.235	12.884	1.82%	0.000	12.884	0.00%
TN	21145-4097011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	626.3	0.172	12.884	1.34%	0.002	12.884	0.02%
KY	47161-4979311	TVA CUMBERLAND FOSSIL PLANT	516.6	0.154	12.884	1.20%	0.001	12.884	0.01%
GA	13015-2813011	Ga Power Company - Plant Bowen	340.5	0.146	12.884	1.13%	0.000	12.884	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	503.5	0.142	12.884	1.10%	0.012	12.884	0.09%
IN	18091-7363111	Kirkison	582.3	0.138	12.884	1.07%	0.008	12.884	0.07%
MO	29143-5363811	NEW MADRID POWER PLANT-MARSTON	688.6	0.134	12.884	1.05%	0.000	12.884	0.00%
VA	51017-4034811	Jewell Coke Company LLP	140.4	0.132	12.884	1.02%	0.000	12.884	0.00%

10 Facilities Identified for Reasonable Progress Analysis addressing more than 17.2% of the entire sulfate plus nitrate point source visibility impact in 2028.

27

Cape Romain Wilderness Area (SC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PSAT Mm ⁻³	FINAL Revised Nitrate PSAT Mm ⁻³	FINAL Revised EGU + HEGU Mm ⁻³	FINAL Revised Sulfate PSAT %	FINAL Revised Nitrate PSAT %	FINAL Revised EGU + HEGU %
SC	45015-4979311	KAPSTONE CHARLESTON KRAFT LLC	29.3	0.523	14.028	3.72%	0.046	14.028	0.33%
GA	13015-2813011	Ga Power Company - Plant Bowen	506.2	0.495	14.028	3.63%	0.019	14.028	0.14%
SC	45015-4894911	ALUMAX OF SOUTH CAROLINA	19.1	0.327	14.028	2.33%	0.003	14.028	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	857.1	0.320	14.028	2.28%	0.002	14.028	0.01%
SC	45015-4120411	Santee Cooper Cross Generating Station	63.8	0.316	14.028	2.23%	0.008	14.028	0.27%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	701.0	0.305	14.028	2.17%	0.005	14.028	0.04%
SC	45048-5698611	INTERNATIONAL PAPER GEORGETOWN MILL	37.4	0.230	14.028	1.64%	0.021	14.028	0.13%
SC	45048-6652811	Santee Cooper Winyah Generating Station	51.4	0.187	14.028	1.33%	0.024	14.028	0.17%
GA	13051-3679811	International Paper - Savannah	166.1	0.180	14.028	1.28%	0.009	14.028	0.06%

9 Facilities Identified for Reasonable Progress Analysis addressing more than 20.6% of the entire sulfate plus nitrate point source visibility impact in 2028.

30

Great Smoky Mountains National Park (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	400.5	0.520	13.916	0.003	13.916	0.02%	0.02%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	465.3	0.189	13.916	0.011	13.916	0.08%	0.08%
TN	47169-3982311	EASTMAN CHEMICAL COMPANY	160.1	0.170	13.916	0.007	13.916	0.09%	0.09%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	688.2	0.166	13.916	0.001	13.916	0.01%	0.01%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	375.5	0.166	13.916	0.035	13.916	0.25%	0.25%
IN	18051-7363111	Gibson	456.3	0.146	13.916	0.037	13.916	0.27%	0.27%

6 Facilities Identified for Reasonable Progress Analysis addressing more than 9.7% of the entire sulfate plus nitrate point source visibility impact in 2028.

31

Shenandoah National Park (VA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	249.8	0.740	15.375	0.009	15.375	0.06%	0.06%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	269.6	0.692	15.375	0.018	15.375	0.12%	0.12%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	189.7	0.636	15.375	0.070	15.375	0.46%	0.46%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	323.4	0.576	15.375	0.022	15.375	0.14%	0.14%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	265.0	0.339	15.375	0.043	15.375	0.28%	0.28%
PA	42063-3005211	HOMER CITY GEN LP/ CENTER TWP	230.4	0.274	15.375	0.010	15.375	0.06%	0.06%
MD	24001-7763811	Luke Paper Company	118.4	0.216	15.375	0.021	15.375	0.14%	0.14%
PA	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	215.5	0.172	15.375	0.003	15.375	0.02%	0.02%
WV	54001-6902311	MITCHELL PLANT	231.8	0.135	15.375	0.003	15.375	0.02%	0.02%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	324.1	0.155	15.375	0.009	15.375	0.06%	0.06%

10 Facilities Identified for Reasonable Progress Analysis addressing more than 25.7% of the entire sulfate plus nitrate point source visibility impact in 2028.

34

Joyce Kilmer-Slickrock Wilderness Area (TN/NC)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	425.1	0.473	13.694	0.002	13.694	0.01%	0.01%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	472.8	0.189	13.694	0.014	13.694	0.10%	0.10%
TN	47169-3982311	EASTMAN CHEMICAL COMPANY	179.2	0.178	13.694	0.009	13.694	0.02%	0.02%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	711.0	0.154	13.694	0.000	13.694	0.00%	0.00%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	391.2	0.154	13.694	0.030	13.694	0.23%	0.23%
GA	33013-2813011	Sea Power Company - Plant Bowen	166.2	0.152	13.694	0.001	13.694	0.01%	0.01%
IN	18051-7363111	Gibson	471.7	0.139	13.694	0.029	13.694	0.21%	0.21%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	385.1	0.137	13.694	0.002	13.694	0.01%	0.01%

8 Facilities Identified for Reasonable Progress Analysis addressing more than 11.5% of the entire sulfate plus nitrate point source visibility impact in 2028.

32

Dolly Sods Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	83.6	1.350	19.349	0.059	19.349	0.31%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	233.8	0.945	19.349	0.009	19.349	0.05%	0.05%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	169.5	0.810	19.349	0.020	19.349	0.10%	0.10%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	163.9	0.778	19.349	0.007	19.349	0.03%	0.03%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	416.9	0.288	19.349	0.010	19.349	0.05%	0.05%
WV	54001-6902311	MITCHELL PLANT	144.2	0.276	19.349	0.009	19.349	0.05%	0.05%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	172.8	0.246	19.349	0.001	19.349	0.00%	0.00%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	234.9	0.229	19.349	0.003	19.349	0.02%	0.02%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	233.8	0.221	19.349	0.006	19.349	0.03%	0.03%
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARLIN POWER	79.8	0.218	19.349	0.044	19.349	0.23%	0.23%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	847.6	0.204	19.349	0.003	19.349	0.02%	0.02%

11 Facilities Identified for Reasonable Progress Analysis addressing more than 29.0% of the entire sulfate plus nitrate point source visibility impact in 2028.

35

James River Face Wilderness Area (VA)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	270.2	0.582	14.404	0.015	14.404	0.11%	0.11%
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC- HARRISON	207.6	0.526	14.404	0.020	14.404	0.14%	0.14%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	306.4	0.520	14.404	0.008	14.404	0.06%	0.06%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	248.0	0.325	14.404	0.007	14.404	0.05%	0.05%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	223.5	0.278	14.404	0.016	14.404	0.11%	0.11%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	337.1	0.217	14.404	0.005	14.404	0.04%	0.04%
VA	51580-9798711	Meadowcroft Packaging Resources Group	46.5	0.209	14.404	0.001	14.404	0.02%	0.02%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	270.0	0.170	14.404	0.006	14.404	0.04%	0.04%
WV	54031-6902311	MITCHELL PLANT	269.6	0.156	14.404	0.006	14.404	0.04%	0.04%

9 Facilities Identified for Reasonable Progress Analysis addressing more than 20.7% of the entire sulfate plus nitrate point source visibility impact in 2028.

33

Otter Creek Wilderness Area (WV)

State	Facility ID	Facility Name	DISTANCE_m	FINAL Revised Sulfate PM ₁₀ / kg m ⁻³	FINAL Revised EDU + HEDU / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³	FINAL Revised Nitrate PM ₁₀ / kg m ⁻³	FINAL Revised Nitrate PM _{2.5} / kg m ⁻³
WV	54033-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	72.8	1.242	19.077	0.051	19.077	0.31%	0.31%
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	214.2	1.001	19.077	0.011	19.077	0.06%	0.06%
WV	54079-4782811	MONONGAHELA POWER CO-PLEASANTS POWER STA	148.5	0.809	19.077	0.023	19.077	0.12%	0.12%
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	162.7	0.727	19.077	0.008	19.077	0.04%	0.04%
OH	39025-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	397.5	0.302	19.077	0.012	19.077	0.06%	0.06%
WV	54001-6902311	MITCHELL PLANT	136.8	0.297	19.077	0.010	19.077	0.05%	0.05%
WV	54079-4789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	198.0	0.249	19.077	0.007	19.077	0.04%	0.04%
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	215.3	0.242	19.077	0.004	19.077	0.03%	0.03%
KY	21145-6037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	826.5	0.207	19.077	0.003	19.077	0.02%	0.02%
IN	18051-7363111	Gibson	709.7	0.193	19.077	0.009	19.077	0.05%	0.05%
WV	54061-6773611	MONONGAHELA POWER CO - FORT MARLIN POWER	82.7	0.192	19.077	0.046	19.077	0.24%	0.24%
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP ROCKPORT	655.7	0.191	19.077	0.007	19.077	0.04%	0.04%
PA	42005-3866111	GENON NE MGMT CO/KEYSTONE STA	186.5	0.190	19.077	0.001	19.077	0.00%	0.00%

13 Facilities Identified for Reasonable Progress Analysis addressing more than 30.6% of the entire sulfate plus nitrate point source visibility impact in 2028.

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Non-VISTAS Class I Areas

- Only two VISTAS facilities have a contribution $\geq 1.00\%$ at any non-VISTAS Class I Area
- ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON (WV)**
 - Moosehorn Wilderness EDM (1.06% sulfate)
- Tennessee Valley Authority (TVA) - Shawnee Fossil Plant (KY)**
 - Caney Creek Wilderness Area (1.09% sulfate)
 - Hercules-Glades Wilderness Area (1.95% sulfate)
 - Mingo Wilderness Area (1.47% sulfate)
 - Great Gulf Wilderness Area (1.03% sulfate)
 - Presidential Range-Dry River Wilderness (1.03% sulfate)

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Non-VISTAS Facilities $\geq 1.00\%$

State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
AR	05083-1081411	ENTERGY ARKANSAS INC-INDEPENDENCE PLANT	SHRO
IN	18053-7983111	Gibson	COHU, GRSM, JOYC, LIGO, MACA, OTCR, SHRO, SIPS
IN	18147-8017211	INDIANA MICHIGAN POWER DBA AEP - ROCKPORT	COHU, GRSM, JOYC, LIGO, MACA, OTCR, SHRO, SIPS
IN	18125-7362411	INDIANAPOLIS POWER & LIGHT - PETERSBURG	MACA, SIPS
MD	24003-7763811	Luke Paper Company	SHEN, SWAN
MO	26148-5663811	NEW MADRID POWER PLANT-MARSTON	LIGO, MACA, SHRO, SIPS
OH	39081-8115711	Cardinal Power Plant (Cardinal Operating Company) (0641050002)	DOSO, JARI, OTCR, SHEN, SWAN
OH	39023-8294311	Duke Energy Ohio, Wm. H. Zimmer Station (1413090154)	COHU, DOSO, JOYC, OTCR, SHRO
OH	39053-8148511	General James M. Gavin Power Plant (0627010056)	COHU, DOSO, GRSM, JARI, JOYC, LIGO, OKEF, OTCR, ROMA, SHEN, SHRO, SIPS, SWAN, WOLF
OH	39053-7983011	Ohio Valley Electric Corp., Kyger Creek Station (0627000003)	DOSO, JARI, OTCR, SHEN
PA	42005-1886111	GENON NE MGMT CO/KEYSTONE STA	COHU, DOSO, GRSM, JARI, JOYC, LIGO, OKEF, OTCR, ROMA, SHEN, SHRO, SWAN, WOLF
PA	42063-3005211	WOMER CITY GEN LP/CENTER TWP	SHEN, SWAN
PA	42063-3005111	NRG WHOLESALE GEN/SEWARD GEN STA	SHEN

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Summary for VISTAS Class I Areas

VISTAS FEDERAL CLASS I AREAS	Number of Facilities	Percent of Point Sulfate + Nitrate
AL - Sipsey Wilderness Area (SIPS)	8	13.5%
FL - Chassahowitzka Wilderness Area (CHAS)	5	11.8%
FL - Everglades National Park (EVER)	4	11.2%
FL - Saint Marks Wilderness Area (SAMA)	3	10.6%
GA - Cohutta Wilderness Area (COHU)	8	12.0%
GA - Okefenokee Wilderness Area (OKEF)	9	14.3%
GA - Wolf Island Wilderness Area (WOLF)*	9	14.7%
KY - Mammoth Cave National Park (MACA)	6	8.1%
NC - Linville Gorge Wilderness Area (LIGO)	10	17.2%
NC - Shining Rock Wilderness Area (SHRO)	12	15.9%
NC - Swanquarter Wilderness Area (SWAN)	10	18.4%
SC - Cape Romain Wilderness Area (ROMA)	9	20.6%
TN/NC - Great Smoky Mountains National Park (GRSM)	6	9.7%
TN/NC - Joyce Kilmer-Slickrock Wilderness Area (JOYC)*	8	11.5%
VA - James River Face Wilderness Area (JARI)	9	20.7%
VA - Shenandoah National Park (SHEN)	10	25.7%
WV - Dolly Sods Wilderness Area (DOSO)	11	29.0%
WV - Otter Creek Wilderness Area (OTCR)*	13	30.6%
AVERAGE	8.3	16.4%

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Thoughts for Discussion

- VISTAS used a screening approach with Aol (various thresholds) and PSAT (1.00% threshold). This resulted in an average of 8* facilities per Class I area and accounts for an average of 16.4% of the point source sulfate + nitrate contributions. This should be more than adequate especially accounting for all the other recent emission controls that are already built into our 2028 emission projections (next slide).
- The VISTAS focus is on significant emission impacts on Class I areas, not on the number of facilities evaluated in each state.
- Some facilities may be interested in taking permit limits resulting in adjusted PSAT impacts below the 1.00% threshold, thus avoiding the four-factor analysis.
- We are uncertain of the documentation required to apply the four factor analysis off-ramps (e.g., MATS) discussed in the August 2019 guidance.
- We are not aware of the triggers that might require incorporation of permit conditions into the Regional Haze SIPs.

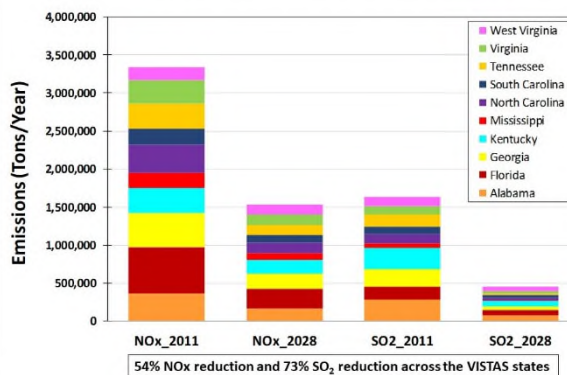
41

VISTAS Facilities $\geq 1.00\%$

State	FACILITY_ID_STD	FACILITY_NAME_STD	IMPACTED CLASS I AREAS
AL	01109-9857111	Sanders Lead Co	CHAS, SAMA
FL	12123-7534211	BUCKEYE FLORIDA LIMITED PARTNERSHIP	OKEF
FL	12031-6400111	DUKE ENERGY FLORIDA, INC. (DEF)	CHAS
FL	12031-6402111	IEA	WOLF
FL	12105-5717711	MOSAIC FERTILIZER LLC	EVER
FL	12105-5138111	MOSAIC FERTILIZER, LLC	EVER
FL	12089-7537111	ROCK TENN CO, LLC	OKEF, WOLF
FL	12085-5354111	ROCKTENN CO, LLC	SAMA
FL	12057-5388111	TAMPA ELECTRIC COMPANY (TEC)	CHAS, EVER
FL	12089-8999111	TARIMAC AMERICA LLC	EVER
FL	12040-7697111	WHITE SPRINGS AGRICULTURAL CHEMICALS, INC.	OKEF
GA	13147-2712011	Brownoka Cellulose, Inc.	WOLF
GA	13015-2813021	Ga Power Company - Plant Bowen	CHAS, COHU, JOYC, LIGO, OKEF, ROMA, SAMA, SHRO, SWAN, WOLF
GA	13021-3679811	International Paper - Savannah	OKEF, ROMA, WOLF
KY	21185-5561811	Peg Rivers Electric Corp. - Wilson Station	MACA, SIPS
KY	21145-4037011	Tennessee Valley Authority (TVA) - Shawnee Fossil Plant	CACR, CHAS, COHU, DOSO, GRGU, GRSM, HESL, JOYC, LIGO, MACA, MING, OKEF, OTCR, PRDR, SHRO, SIPS
NC	37087-7202511	Blue Ridge Paper Products - Canton Mill	SHRO
NC	37117-8049311	Domtar Paper Company, LLC	SWAN
NC	37011-8467911	PCS Phosphate Company, Inc. - Aurora	SWAN
SC	45015-4843411	ALLIANT OF SOUTH CAROLINA	ROMA, WOLF
SC	45043-5698811	INTERNATIONAL PAPER GEORGETOWN MILL	ROMA
SC	45019-4973611	KAPSTONE CHARLESTON KRAFT LLC	ROMA
SC	45015-4120411	SANTEE COOPER CO/CSO GENERATING STATION	OKEF, ROMA, WOLF
SC	45043-6652811	SANTEE COOPER WINYAH GENERATING STATION	ROMA
TN	47163-3982311	EASTMAN CHEMICAL COMPANY	COHU, GRSM, JOYC, LIGO, SHRO
TN	47163-4497911	TVA CAMBERLAND FOSSIL PLANT	LIGO, SHRO, SIPS
VA	51077-4034811	Jewell Coke Company LLP	LIGO
VA	51580-5798711	Meadwestvaco Packaging Resource Group	JARI
WV	54013-6271711	ALLEGHENY ENERGY SUPPLY CO, LLC-HARRISON	DOSO, JARI, MONS, OTCR, SHEN, SWAN
WV	54078-6789111	APPALACHIAN POWER COMPANY - JOHN E AMOS PLANT	DOSO, JARI, OTCR
WV	54051-4902311	MITCHELL PLANT	DOSO, JARI, OTCR, SHEN
WV	54061-6778211	MONONGAHELA POWER CO - FORT MARTIN POWER	DOSO, OTCR
WV	54073-4782811	MONONGAHELA POWER CO/CLATSANTS POWER STA	DOSO, JARI, OTCR, SHEN, SWAN

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VISTAS States Emissions: 2011 vs. 2028



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Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Co-chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - TAWG – Doris McLeod (doris.mcleod@deg.virginia.gov)
 - CC – Jim Boylan (james.boyland@dnr.ga.gov)
 - CC – Jimmy Johnston (james.johnston@tn.gov)
- For project and contract management questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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west virginia department of environmental protection

Appendix F-3m

VISTAS Regional Haze Project Update August 4, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

VISTAS Regional Haze Project Update



EPA, FLM, RPO Briefing
Jim Boylan
August 4, 2020

1

Overview

- During the QA process, an issue was identified with the emissions used in the CAMx modeling that was previously presented on May 20, 2020
- The emissions inventory was correct, but some SO₂ and NOx emissions from EGUs were dropped during the SMOKE processing
- This issues does not impact any of the PSAT modeling or adjustments to the PSAT modeling
- This issue does impact the projected visibility in 2028 for comparison to the URP glide slope

4

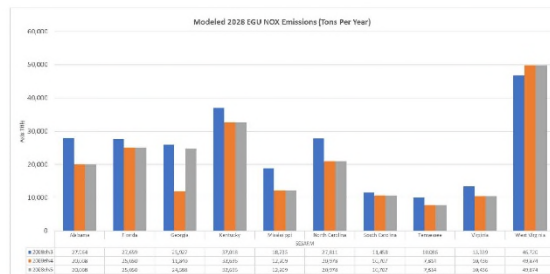
Outline

- Recent Issue with 2028 Modeling
- Updated 2028 Model Projections
- Next Steps & Schedule



2

VISTAS 2028 EGU NOx

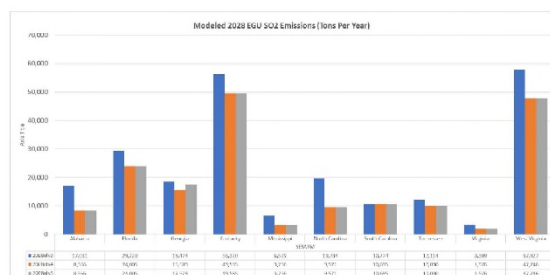


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Recent Issue with 2028 Modeling

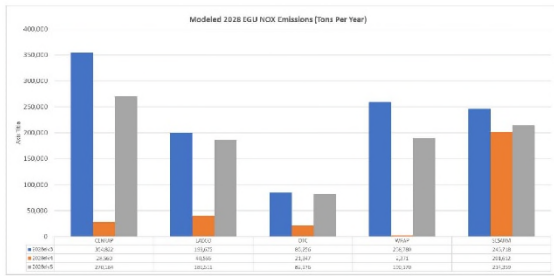
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VISTAS 2028 EGU SO₂



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RPO 2028 EGU NOx

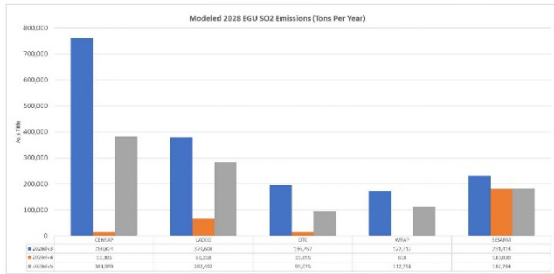


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Updated 2028 Model Projections

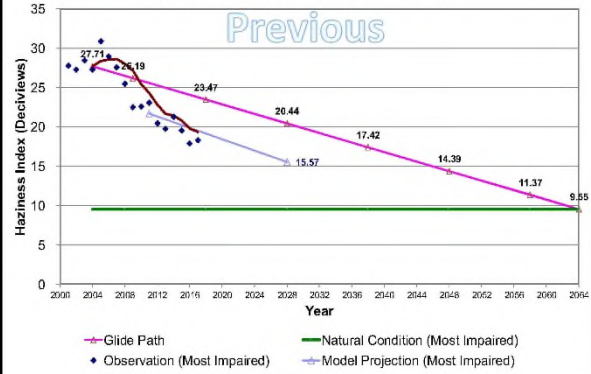
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RPO 2028 EGU SO₂



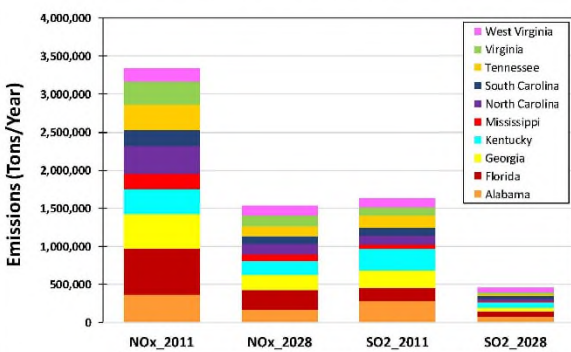
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Uniform Rate of Progress Glide Path Sipsey - 20% Most Impaired Data Days



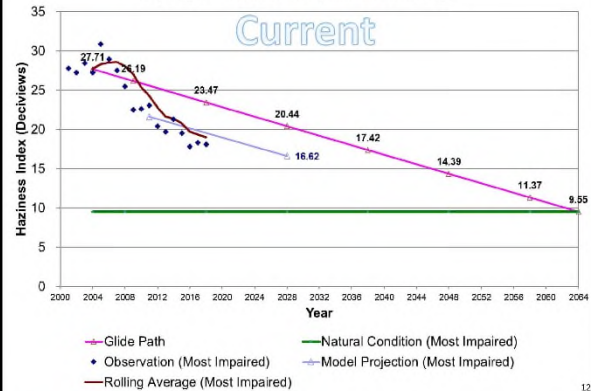
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VISTAS States Emissions: 2011 vs. 2028

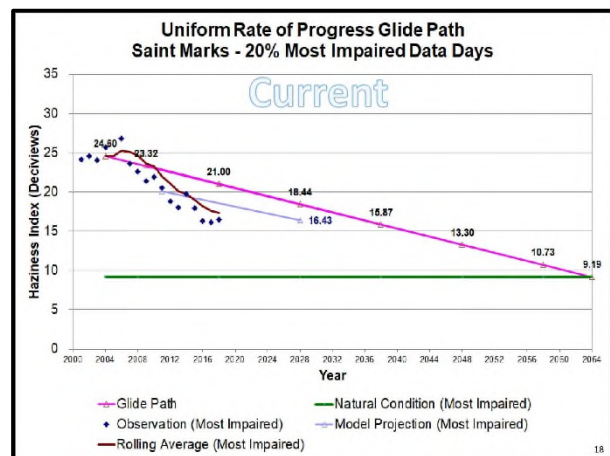
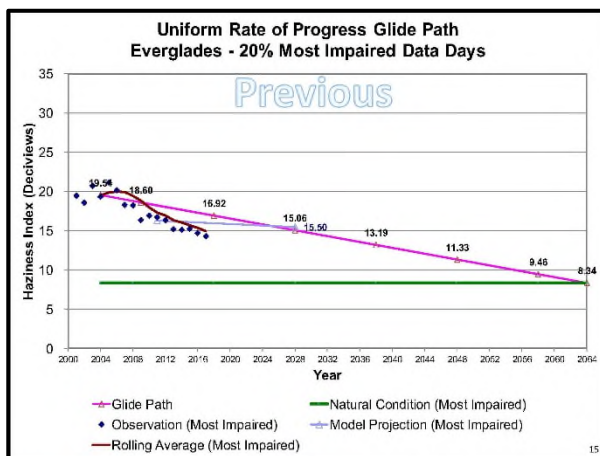
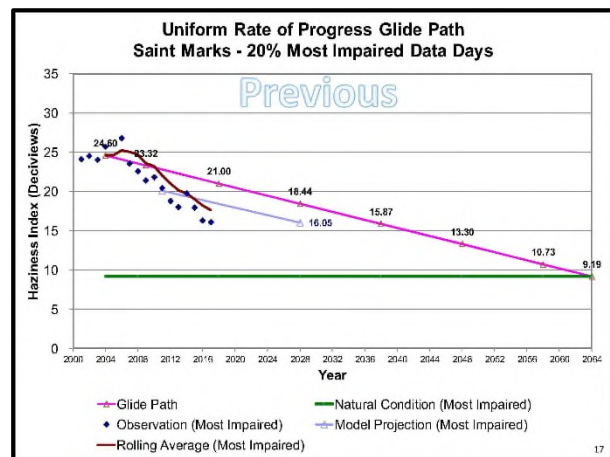
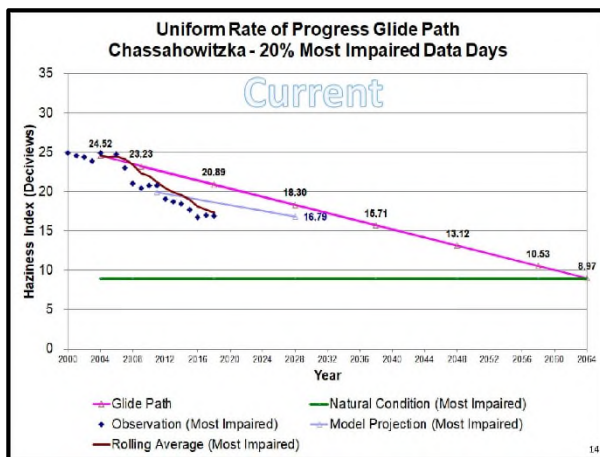
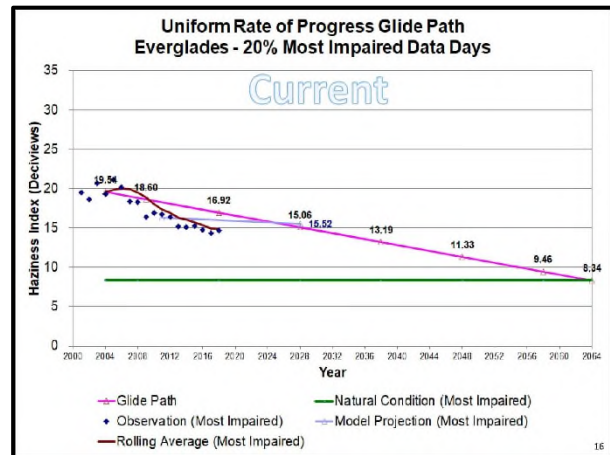
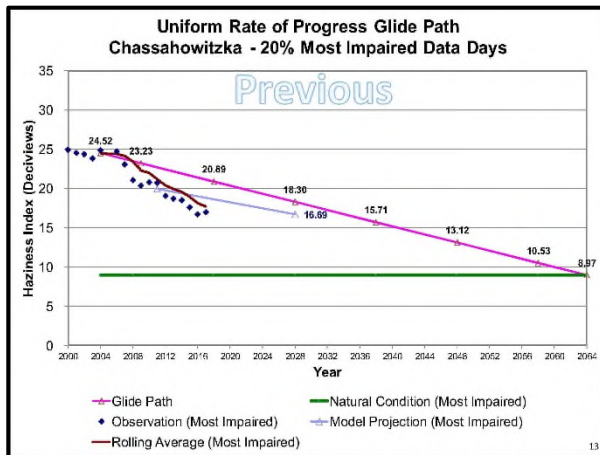


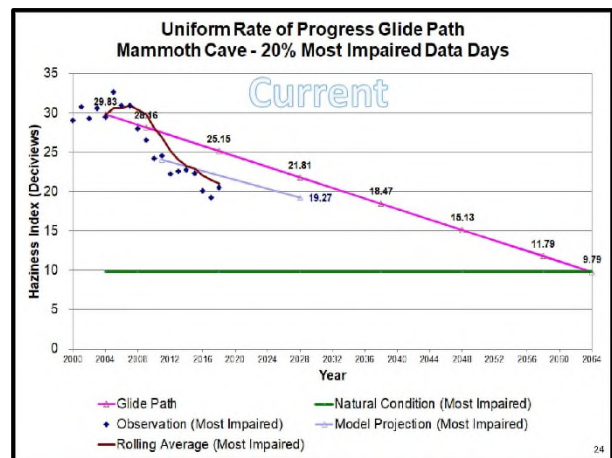
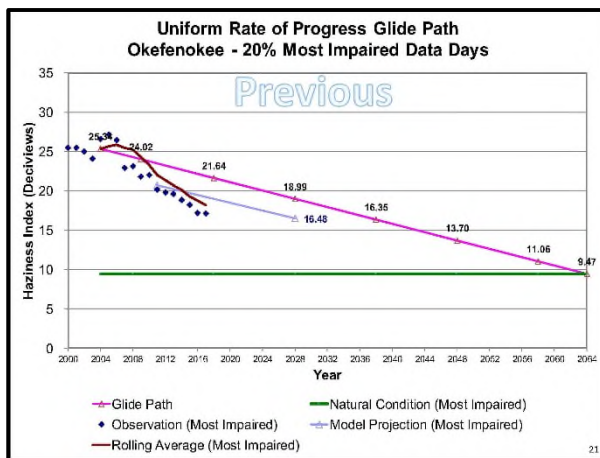
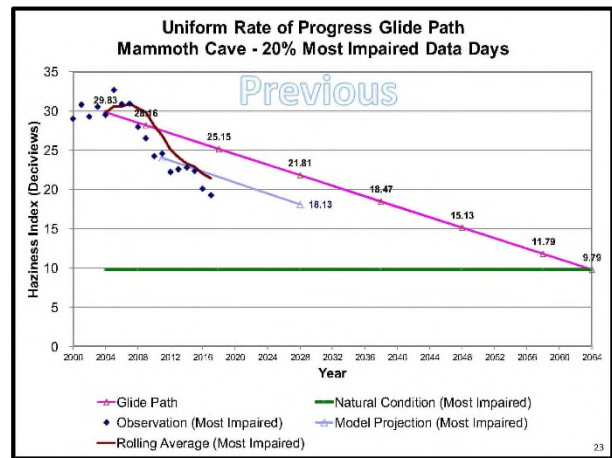
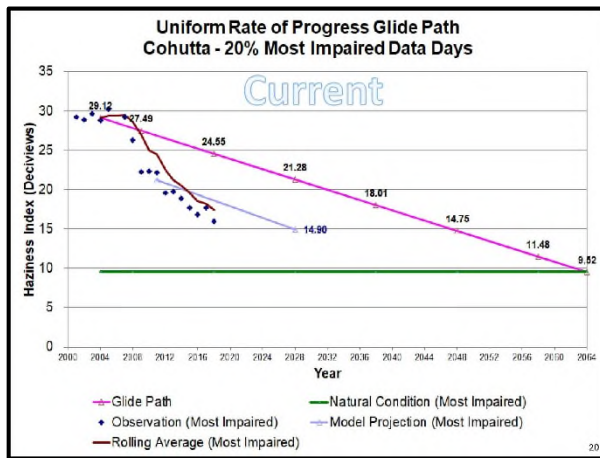
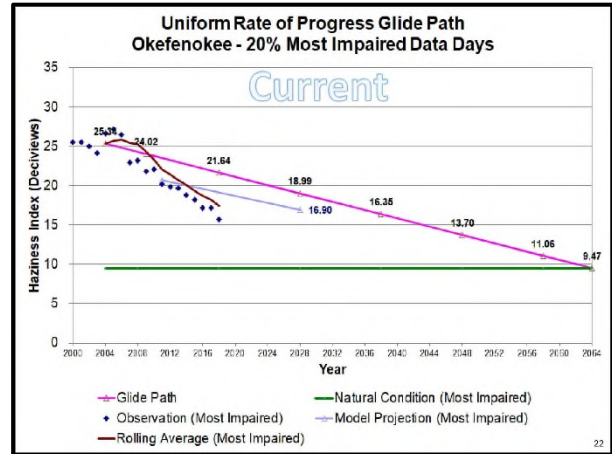
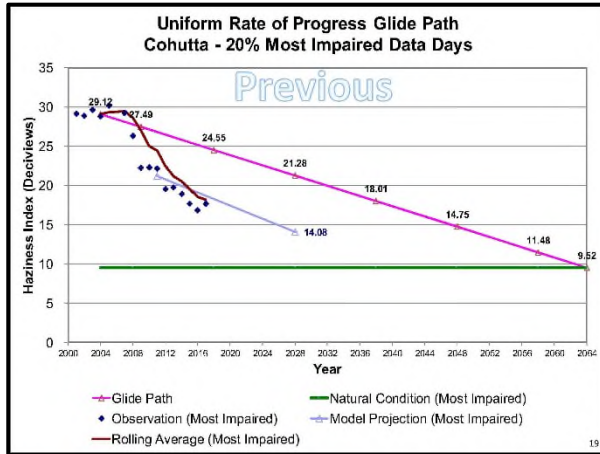
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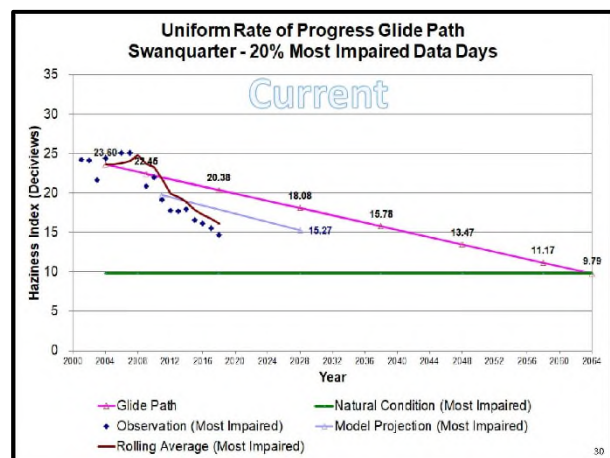
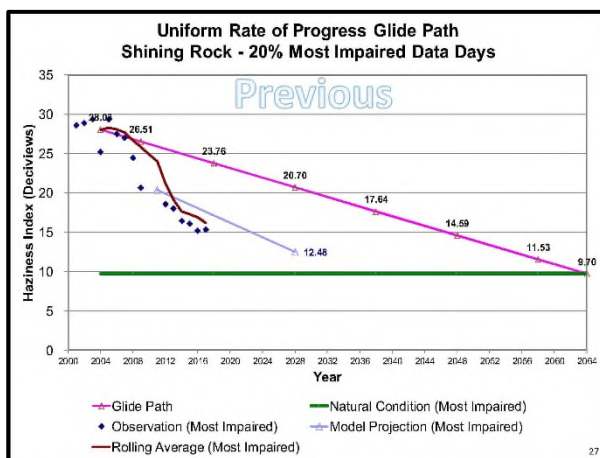
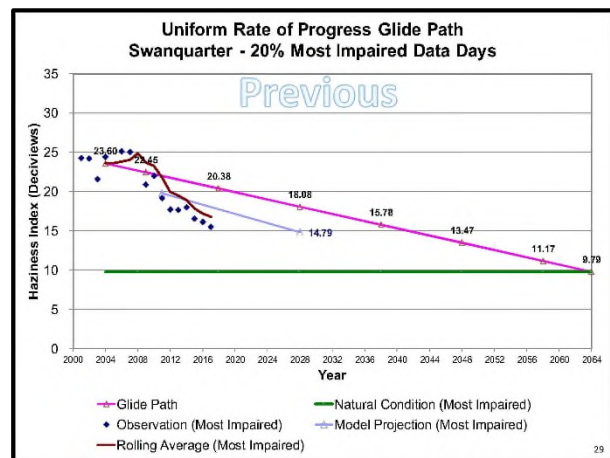
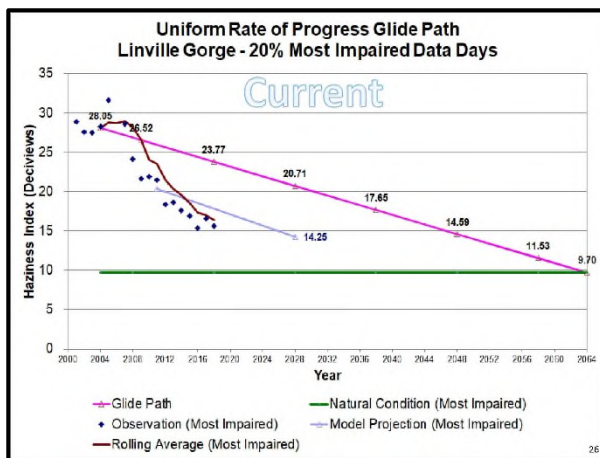
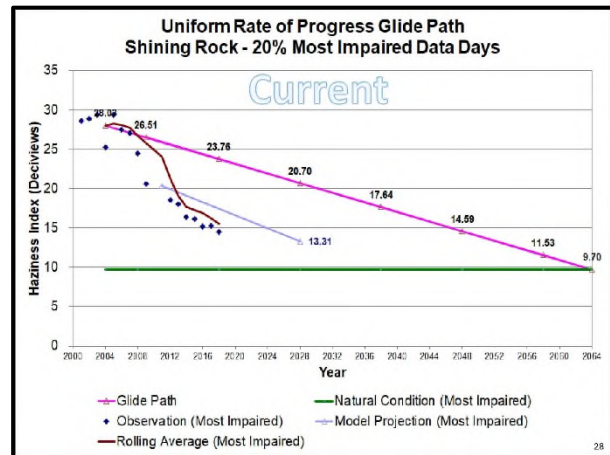
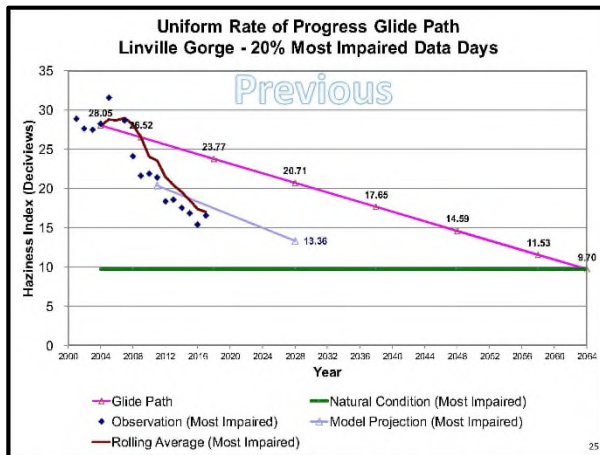
Uniform Rate of Progress Glide Path Sipsey - 20% Most Impaired Data Days

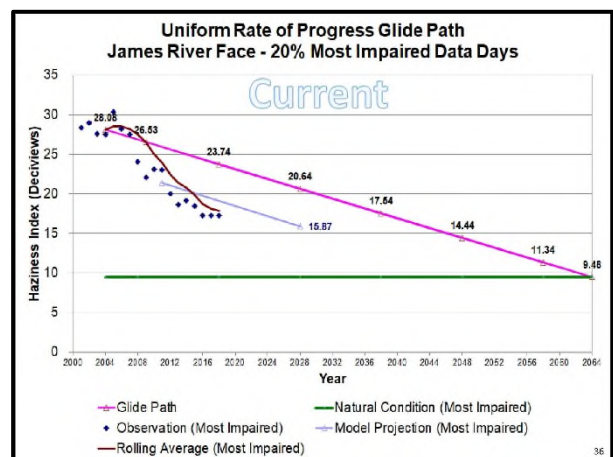
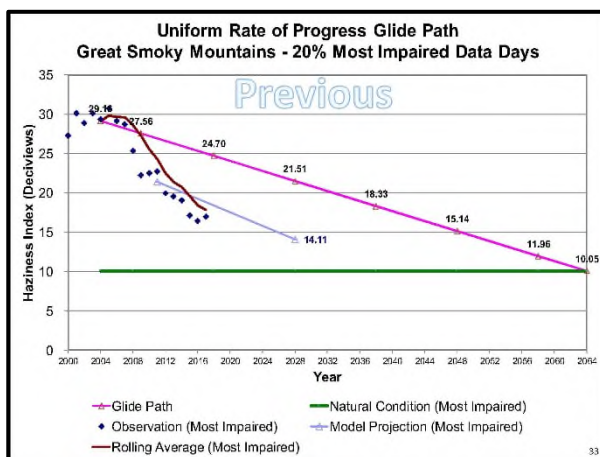
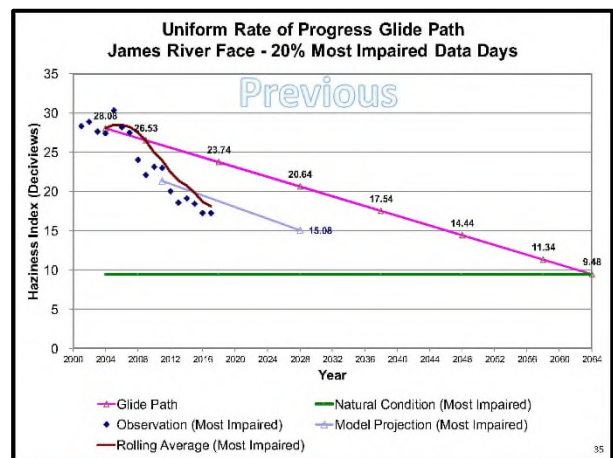
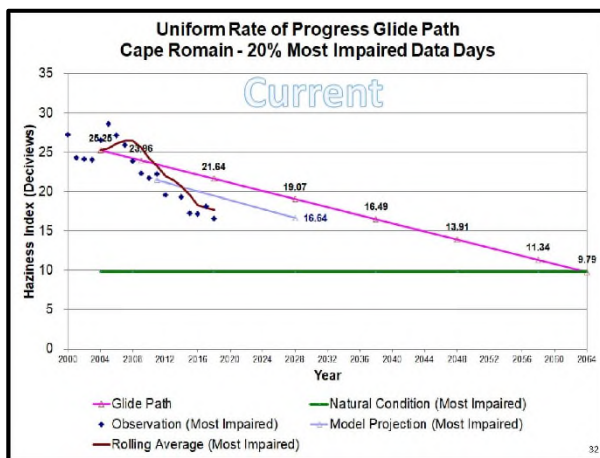
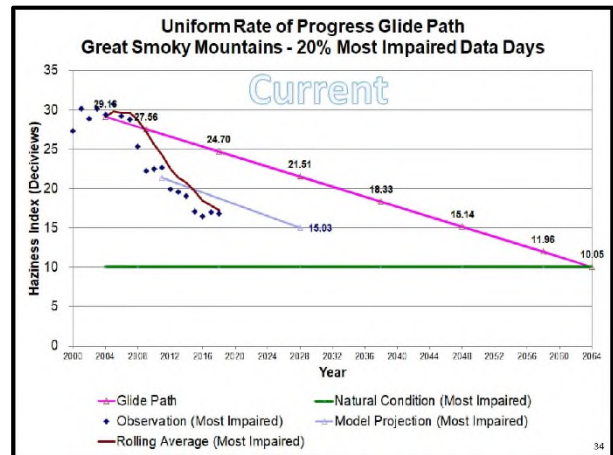
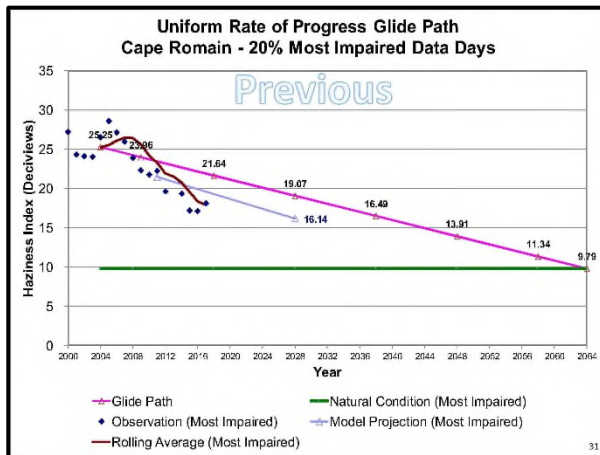


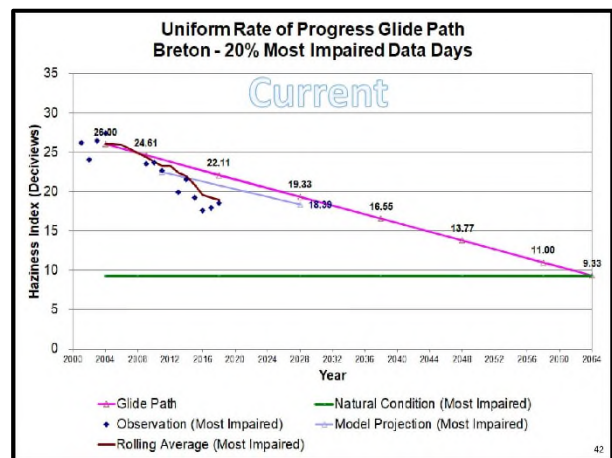
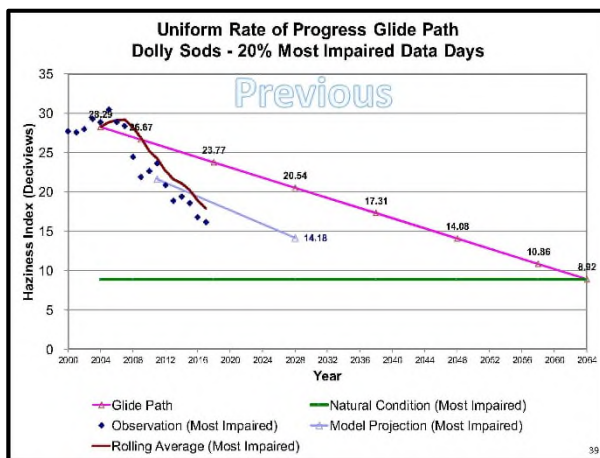
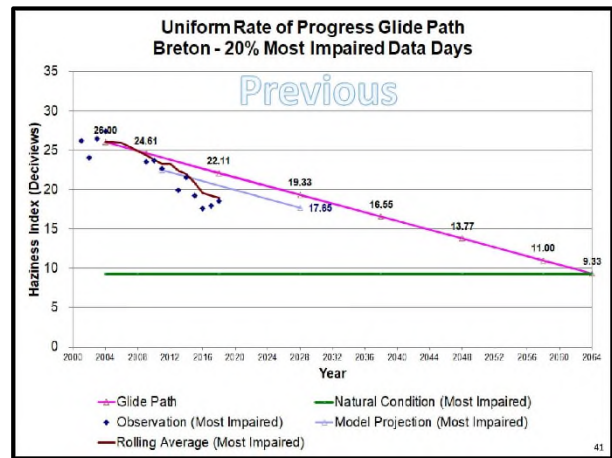
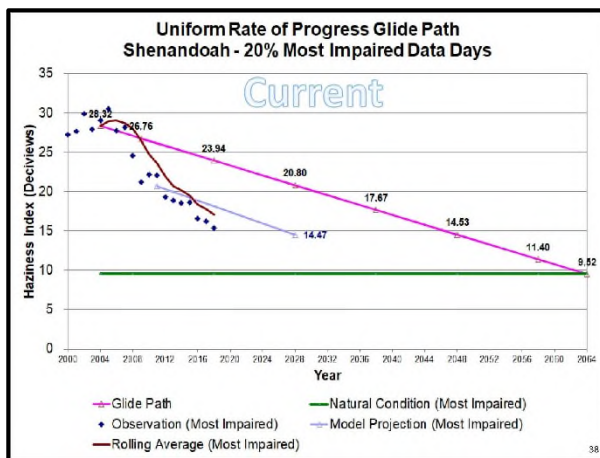
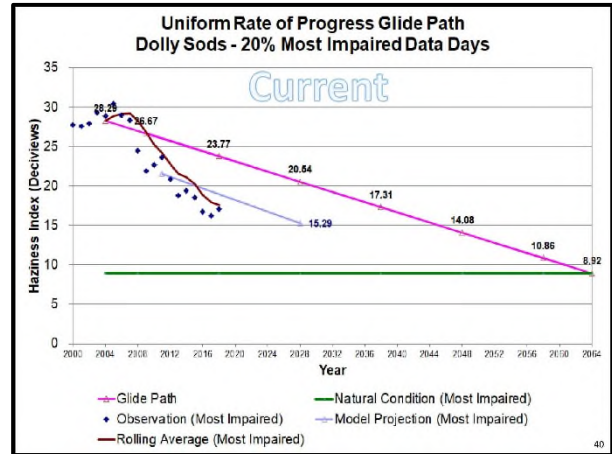
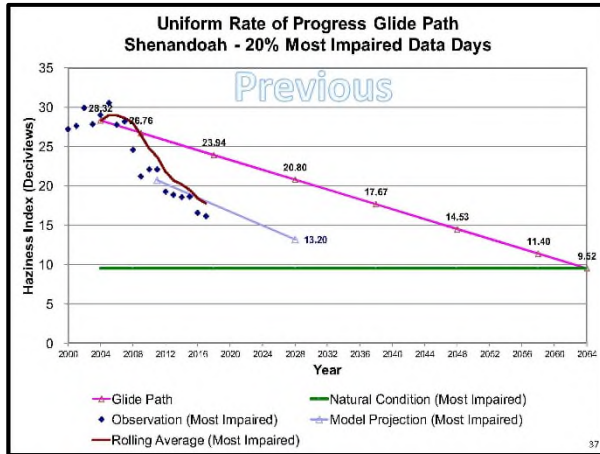
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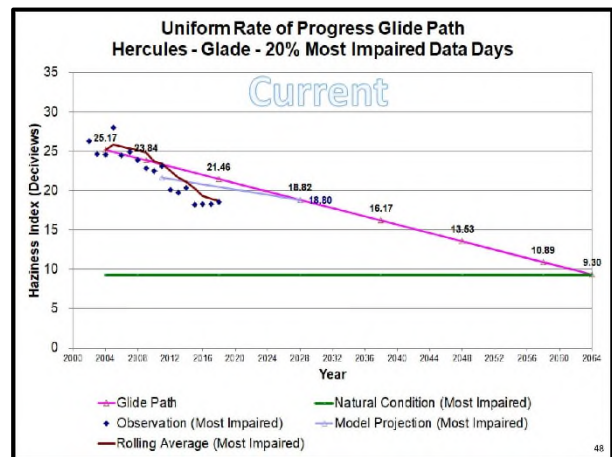
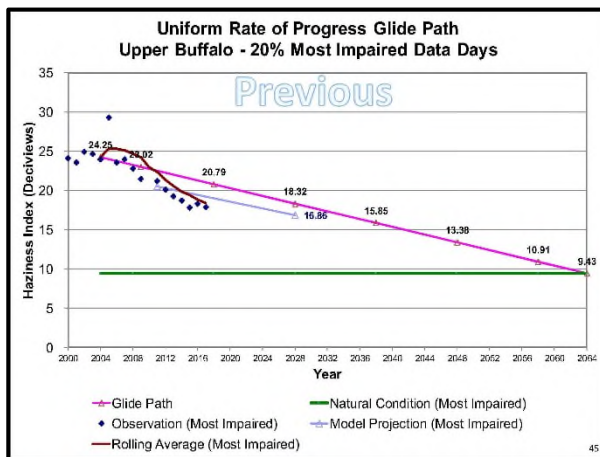
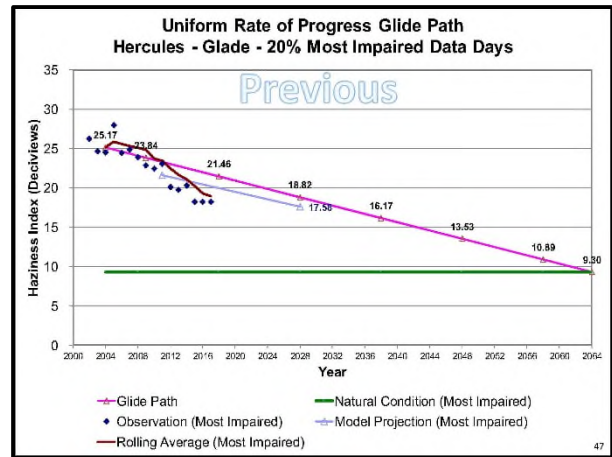
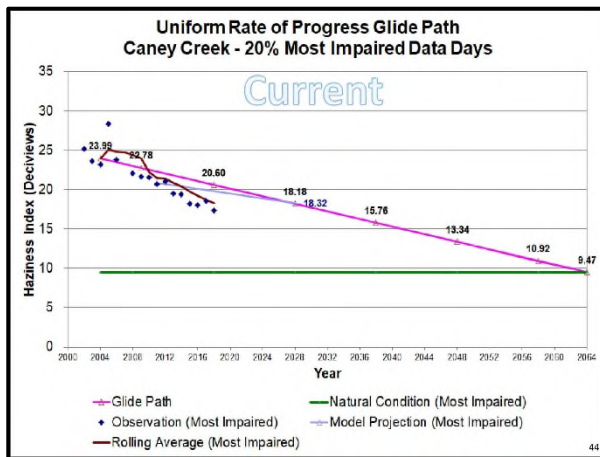
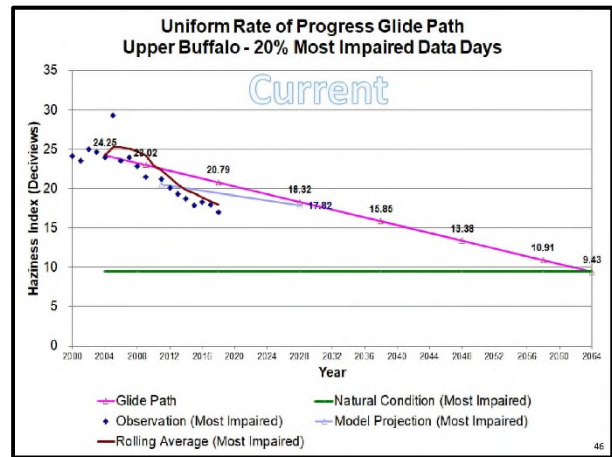
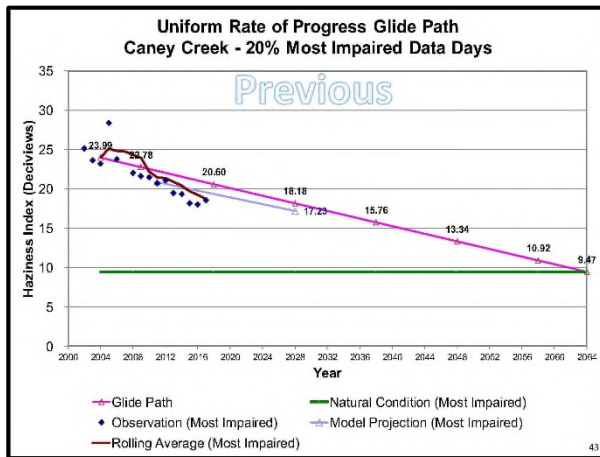


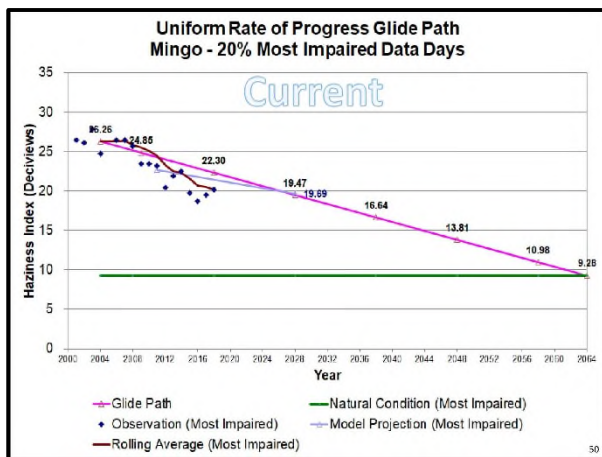
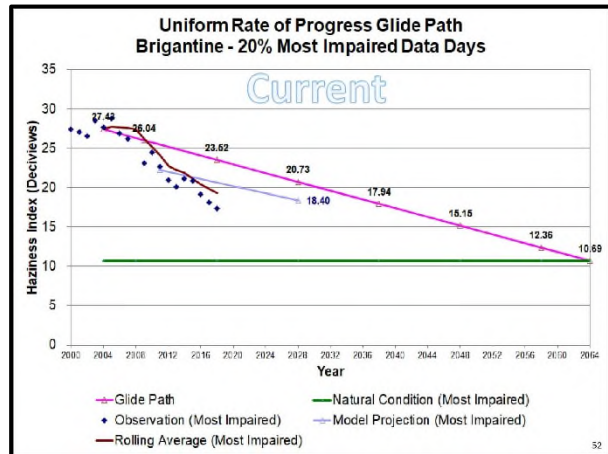
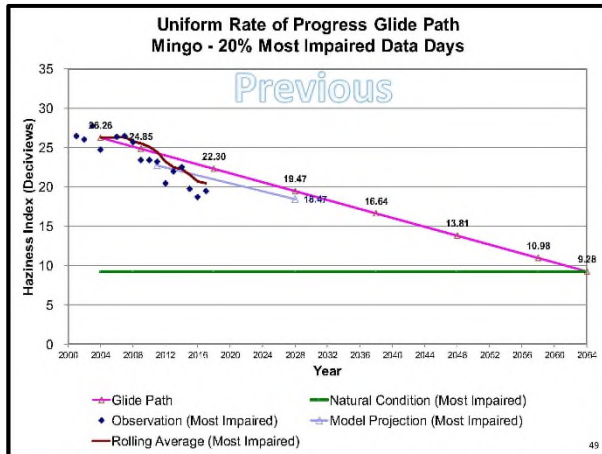






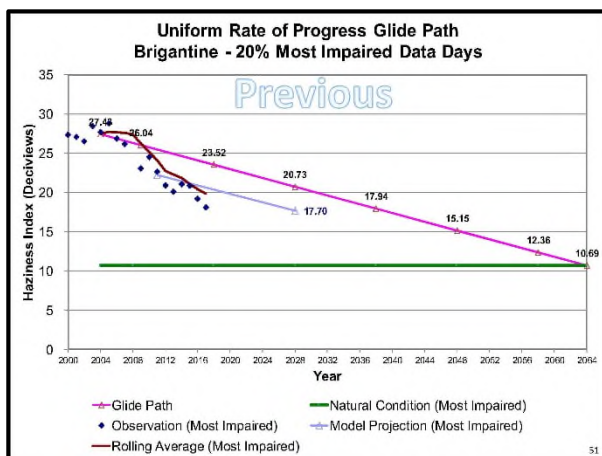






Next Steps and Schedule

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Remaining VISTAS Work Schedule

Task	Schedule
2028 Point Emissions Updates	Completed*
2028 Emissions Processing	Completed*
2028 CAMx Modeling	Completed*
2028 Visibility Projections	Completed*
2028 Deposition Projections	Early August 2020
Final Reports and Documentation	Late August 2020
Website Updates and Postings	Late August 2020
End of Contract	September 30, 2020
Regional Haze SIPs Due to EPA	July 31, 2021

* References technical work completion. Draft reports to follow.

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Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Co-chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - TAWG – Doris McLeod (doris.mcleod@deg.virginia.gov)
 - CC – Jim Boylan (james.boylan@dnr.ga.gov)
 - CC – Jimmy Johnston (james.johnston@tn.gov)
- For project and contract management questions, contact the Project Manager:
 - John Hornback (hornback@metro4-sesarm.org)



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west virginia department of environmental protection

Appendix F-3n

EPA Region 4 Fall 2020 Air Director's Meeting Regional Haze Update October 26, 2020

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

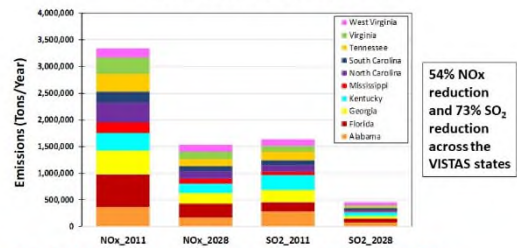
VISTAS II Regional Haze Project Update



Jim Boylan (GA DNR), Randy Strait (NC DAQ), Doris McLeod (VA DEQ), Jimmy Johnston (TN DEC), Chad LaFontaine (Metro 4/SESARM), and John Hornback (Metro 4/SESARM)

EPA Region 4 Fall 2020 Air Director's Meeting
October 26, 2020

Emission Inventories



- "Task 2A Emission Inventory Updates Report (Aol and PSAT)"
- "Task 2B Emission Inventory Updates Report (2028 Visibility Estimates)"
- "Conversion of Task 2A 2028 Point Source Modeling Files for Emissions Processing with SMOKE (Task 3A)"
- "Conversion of the Task 2B 2028 Point Source Remodeling Files for Emissions Processing with SMOKE (Task 3B)"

4

Project Background

- Goal was to provide states with technical information needed to draft their regional haze SIPs
- Project started in December 2017
- Expenses are less than 80% of budget
- Initial tasks: RFP, bids, contractor selection, contract development, work plan, QAPP, and modeling protocol
- Contractor support provided by:



2

Air Quality Modeling

- "2011el and 2028el CAMx Benchmarking Report Task 6 Benchmark Report #1 Covering Benchmark Runs #1 and #2"
- "2011el CAMx Version 6.32 and 6.40 Comparison Report Task 6 Benchmark Report Number #2 Covering Benchmark Run #3"
- "2028 CAMx Version 6.32 and 6.40 Comparison Report Task 6 Benchmark Report #4 Covering Benchmark Run #4"
- "2011el CAMx Version 6.40 12km VISTAS and EPA 12km Continental Grid Comparison Report Benchmark Report Task 6 Benchmark Report #3 Covering Benchmark Run #5"
- "2028elv3 CAMx Version 6.40 12km VISTAS and EPA 12km Continental Grid Comparison Report Benchmark Report Number #6 for Task 6"
- "2028 Emissions Version V3 and V5 Comparison Report Benchmark Report Task 6 Benchmark Report #6 Covering Benchmark Run #7"

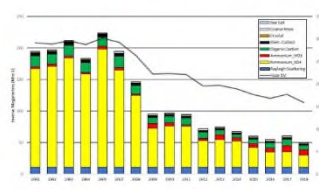
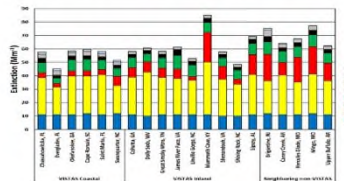


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Data Acquisition and Analysis

- "Task 4 Report"

- IMPROVE
- AQS
- NADP
- CASTNET
- WBAN

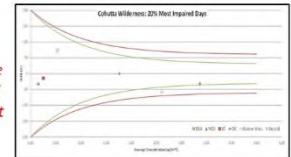
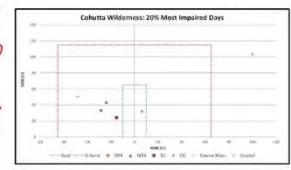


EXAMPLE:
Cohutta Wilderness Area
(2001-2018)

3

Model Performance Evaluation

- "Model Performance Evaluation for Particulate Matter and Regional Haze of the CAMx 6.40 Modeling System and the VISTAS II 2011 Updated Modeling Platform for Task 8.0"
- "Model Performance Evaluation for Ozone of the CAMx 6.40 Modeling System and the VISTAS II 2011 Updated Modeling Platform (Task 8.0)"
- "Deposition Model Performance Evaluation Southeastern VISTAS II Regional Haze Analysis Project (Task 8.1)"



6

Future Year Projections

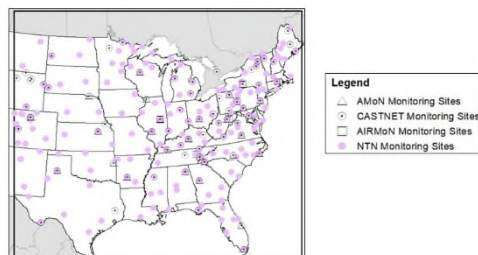
- "Future Year Model Projections Task 9a"



7

Deposition Projections

- Wet and dry deposition projections for SO_2 , SO_4^{2-} , NO_3^- , NH_4^+ , Cl^-

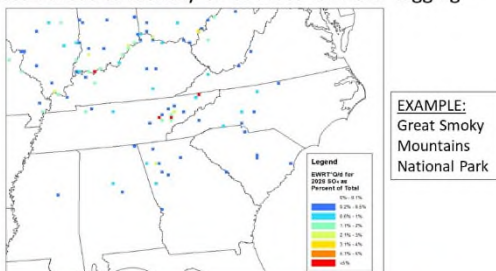


- "Wet and Dry Deposition Calculations Task 9.1"

10

Area of Influence

- States used Aol results for the VISTAS and nearby Class I areas to identify 87 sources for PSAT tagging



- "Area of Influence Analysis Southeastern VISTAS II Regional Haze Analysis Project - Documentation Report for Task 5"

8

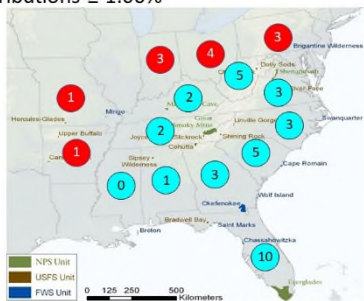
Final Project Report

- Covers everything in previous slides:
 - Task 2 – Emissions Inventories
 - Task 3 – Emissions Processing
 - Task 4 – Data Acquisition and Analysis
 - Task 5 – Area of Influence
 - Task 6 – 2011 and 2028 Photochemical Modeling
 - Task 7 – PSAT Tagging
 - Task 8 – Model Performance Evaluation
 - Task 9 – Visibility and Deposition Projections
- Task 10 – Data Handling Sharing
- Task 11 – Extraction of State-Specific modeling, IC/BC, and meteorology

11

PSAT Tagging

- Identified facilities with sulfate or nitrate point source contributions $\geq 1.00\%$



- "Particulate Source Apportionment Technology Modeling Results Task 7"

9

Consultation & Communication

- FLMs and EPA
 - Multiple VISTAS presentations on technical work
- Non-VISTAS states
 - Multiple VISTAS presentations on technical work
 - Letters to non-VISTAS states from SESARM
- VISTAS states
 - State to state phone calls and e-mails
 - Letters to VISTAS states from other VISTAS states
- Stakeholders
 - One VISTAS presentation on technical work
 - Letters to specific facilities from home states

12

4-Factor Analysis

- States will evaluate certain sources and emissions to determine if reasonable controls are in place or available
- Considers four important factors:
 - Potential costs of compliance (\$/ton, \$/Mm³)
 - Time necessary for compliance
 - Energy and non-air quality environmental impacts of compliance
 - Remaining useful life of sources subject to this analysis

13

FLM Consultation Requirements

40 CFR 51.308(i)(2) (in pertinent part):

...The State must provide the Federal Land Manager with an opportunity for consultation, in person at a point early enough in the State's policy analyses of its long-term strategy emission reduction obligation so that information and recommendations provided by the Federal Land Manager can meaningfully inform the State's decisions on the long-term strategy. The opportunity for consultation will be deemed to have been early enough if the consultation has taken place at least 120 days prior to holding any public hearing or other public comment opportunity on an implementation plan (or plan revision) for regional haze required by this subpart. The opportunity for consultation on an implementation plan (or plan revision) or on a progress report must be provided no less than 60 days prior to said public hearing or public comment opportunity....

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SIP Template Outline

- | | |
|---|--|
| 1. Introduction | 7. 2028 Model Projections |
| 2. Natural Background Conditions and Assessment of Baseline, Modeling Base Period, and Current Conditions | 8. Long-Term Strategy |
| 3. Glidpaths to Natural Conditions in 2064 | 9. Reasonable Progress Goals |
| 4. Types of Emissions Impacting Visibility Impairment | 10. Monitoring Strategy |
| 5. Regional Haze Modeling Methods and Inputs | 11. Consultation Process |
| 6. Model Performance Evaluations | 12. Comprehensive Periodic Implementation Plan Revisions |
| | 13. Determination of the Adequacy of the Existing Plan |
| | 14. Progress Report |
| | APPENDICES |

14

Tentative Timeline*

Dates	Milestone
Week of 11/2/2020	Send redacted template to EPA R4 and R3. Redacted sections to include those dealing with reasonable progress facility selection and four-factor analysis results. Would like to receive feedback on missing analyses or "show stoppers."
11/5/2020 – 12/4/2020	EPA review period
12/7/2020 – 12/15/2020	SIP template workgroup to address EPA's comments
12/15/2020 – 1/15/2021	Develop state-specific draft
1/15/2021 – 1/30/2021	States to address EPA's comments
1/30/2020 – 4/30/2020	Consultation period for FLMs (may vary by state)
4/30/2021 – 5/30/2021	Address FLM comments
5/30/2021 – 6/30/2021	Public comment period
6/30/2021 – 7/31/2021	Address public comment and finalize package for submission
7/31/2021	Regional Haze SIP due to EPA

*Timeline is subject to change due to state-specific resources and issues.

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Current Work Topics

- Cost thresholds for four-factor analyses: workgroup in place to evaluate available information
- Use of off-ramps for four-factor analyses
- Inclusion of various requirements in the SIP as opposed to federally enforceable permits such as construction permits or state operating permits
- NPS and NPCA source listings: some states are in an ongoing dialogue with these groups
- EPA Region 4 source list analysis
- Communications with other states outside of VISTAS for information on facilities impacting VISTAS Class I areas
- How to address face-to-face consultation requirement with FLMs in light of the pandemic? (next slide)

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Contacts for Further Information

- For general, technical, and SIP-related questions, contact the TAWG and CC Co-chairs:
 - TAWG – Randy Strait (randy.strait@ncdenr.gov)
 - TAWG – Doris McLeod (doris.mcleod@deq.virginia.gov)
 - CC – Jim Boylan (james.boylan@dnr.ga.gov)
 - CC – Jimmy Johnston (james.johnston@tn.gov)
- For project and contract management questions, contact the Project Manager:
 - Chad LaFontaine (clafontaine@metro4-sesarm.org)



18



west virginia department of environmental protection

Appendix F-3o

National Park Service Consultation: Presentation on Pre-Draft West Virginia Regional Haze SIP October 19, 2021

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment



10/19/2021 - NPS Formal Consultation Call with West Virginia Department of Environmental Protection (WV DEP) Division of Air Quality on Regional Haze SIP Development.

Attendees:

- National Park Service
 - Holly Salazer, Interior Region 1 – State College, PA
 - Debbie Miller, ARD – Denver, CO
 - Melanie Peters, ARD – Denver, CO
 - Don Shepherd, ARD – Denver, CO
 - Andrea Stacy, ARD – Denver, CO
- West Virginia DEP
 - Todd Shrewsbury
 - Dave Fewell
- Fish & Wildlife Service
 - Tim Allen
- U. S. Forest Service
 - Jeremy Ash
 - Alexia Prosperi
- Environmental Protection Agency (EPA) Region 3
 - Keila Pagain-Incle
 - Adam Yarina
 - Todd Ellsworth
 - Megan Goold
 - Michael Gordon

NPS photos from left to right: Acadia NP, Denali NP, Yellowstone NP, Grand Canyon NP

Agenda

- Welcome & Introductions
- NPS Regional Haze Background
- NPS Class I Areas affected by West Virginia
 - Shenandoah NP
- NPS SIP Feedback for West Virginia
 - Source Selection
 - Four Factor Analysis Feedback
 - Long Term Strategy
- Next Steps

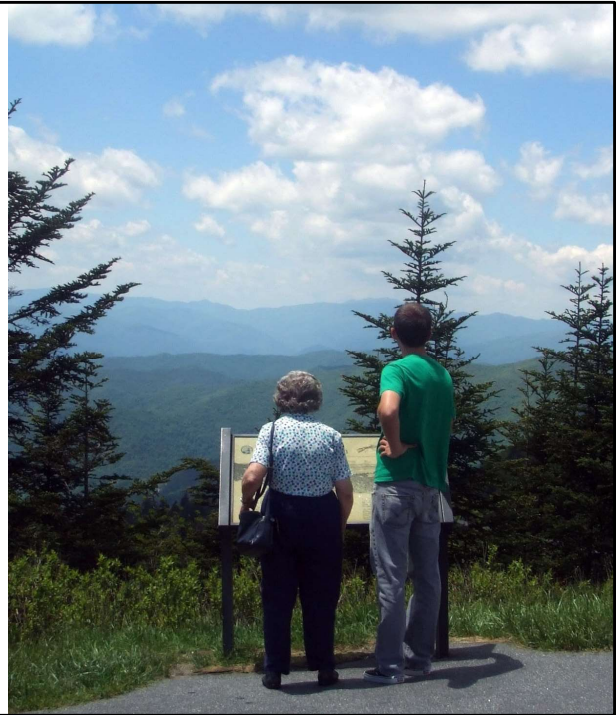


We welcome discussion at any time during this presentation. Please feel free to ask questions or add information along the way.

NPS Photo from Bluestone National Scenic River in West Virginia.

By the Numbers

- **48** Class I areas
- In **24** states
- **90%** of visitors surveyed say that scenic views are ***extremely*** to ***very*** important
- **100%** of visitors surveyed rate clean air in the **top 5** attributes to protect in national parks



List of Class I areas: <https://www.nps.gov/subjects/air/npsclass1.htm>

States with at least one Class I area:

AK, AZ, CA, CO, FL, HI, ID, KY, ME, MI, MN, MT, NC, ND, NM, OR, SD, TN, TX, UT, VA, VI, WA, WY

Statistics citation:

Kulesza C and Others. 2013. National Park Service visitor values & perceptions of clean air, scenic views, & dark night skies; 1988–2011. Natural Resource Report. NPS/NRSS/ARD/NRR—2013/622. National Park Service. Fort Collins, Colorado

NPS photo of Great Smoky Mountains NP, NC & TN

West Virginia National Parks

BY THE NUMBERS

6 National Parks
1,423,432 Visitors to National Parks
\$76,500,000 Economic Benefit from NP Tourism
4 National Heritage Areas
1 Wild & Scenic River Managed by NPS
2 National Trails Administered by NPS
1,070 National Register of Historic Places Listings
16 National Historic Landmarks
16 National Natural Landmarks
5,741,266 Objects in National Park Museum Collections
541 Archeological Sites in National Parks
- nps.gov/state/wv

National Park Units in West Virginia

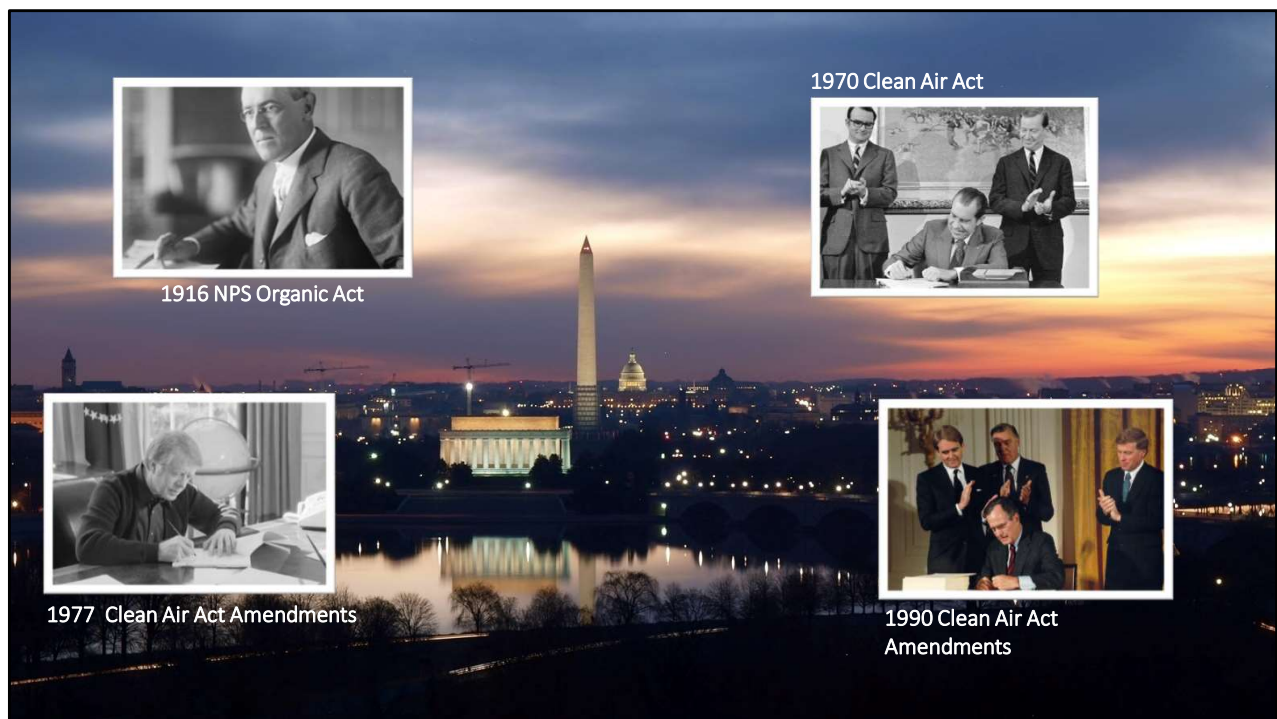
1. [Appalachian](#) National Scenic Trail; Maine to Georgia, CT,GA,MA,MD,ME,NC,NH,NJ,NY,PA,TN,VA,VT,WV
2. [Bluestone](#) National Scenic River; Athens, Pipestem, and Hinton, WV
3. [Chesapeake & Ohio Canal](#) National Historical Park; Potomac River, DC,MD,WV
4. [Gauley River](#) National Recreation Area; Summersville, WV
5. [Harpers Ferry](#) National Historical Park; Harpers Ferry, WV,VA,MD
6. [New River Gorge](#) National Park and Preserve; Hinton, Beckley, Glen Jean, and Fayetteville, WV

Affiliated Areas:

- [Chesapeake Bay](#); Chesapeake Bay Watershed, DC,DE,MD,NY,PA,VA,WV
- [Lewis & Clark](#) National Historical Trail; Sixteen States: IA,ID,IL,IN,KS,KY,MO,MT,NE,ND,OH,OR,PA,SD,WA,WV

<https://www.nps.gov/state/wv/index.htm>

NPS Photo from New River Gorge National Park and Preserve



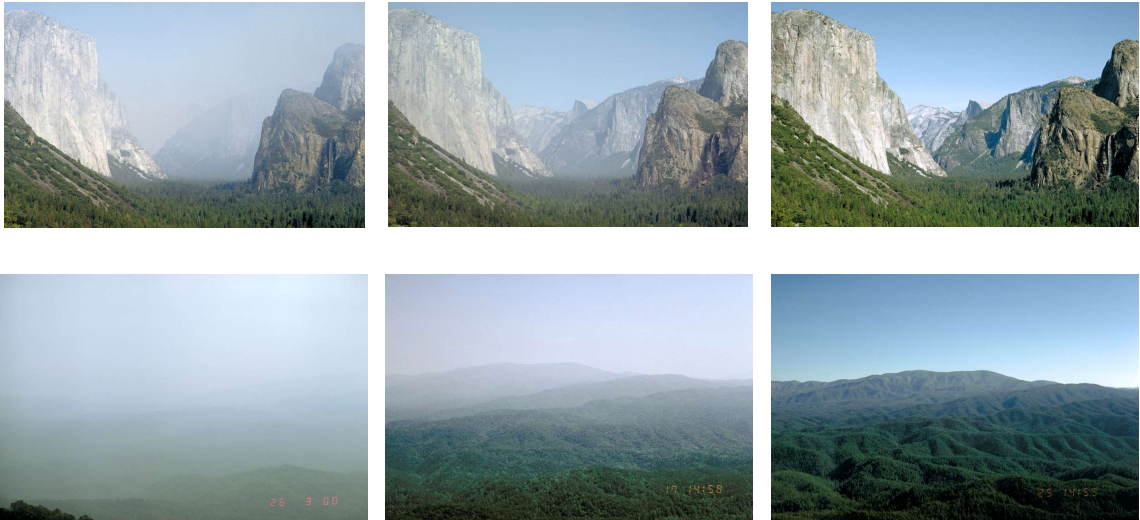
The NPS has an affirmative legal responsibility to protect clean air in national parks.

- 1916 NPS Organic Act: created the agency with the mandate to conserve the scenery, natural and cultural resources, and other values of parks in a way that will leave them unimpaired for the enjoyment of future generations. This statutory responsibility to leave National Park Service units “unimpaired,” requires us to protect all National Park Service units from the harmful effects of air pollution.
- In the 1970 Clean Air Act: authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources. The Act also requires the Environmental Protection Agency to set air quality standards.
- 1977 Clean Air Act Amendments: these amendments to the Clean Air Act provide a framework for federal land managers such as the National Park Service to have a special role in decisions related to new sources of air pollution, and other pollution control programs to protect visibility, or how well you can see distant views. The Act established a national goal to prevent future and remedy existing visibility impairment in national parks larger than 6,000 acres and national wilderness areas larger than 5,000 acres that were in existence when the amendments were enacted.
- 1990 Clean Air Act Amendments: created regulatory programs to address acid rain and expanded the visibility protection and toxic air pollution programs. The acid rain regulations began a series of regional emissions reductions from electric generating facilities and industrial sources that have substantially reduced air pollutant emissions.

NPS photo of Washington DC from our air quality webcam: <https://npgallery.nps.gov/AirWebCams/wash>

Visibility goal:

Restore natural conditions by 2064

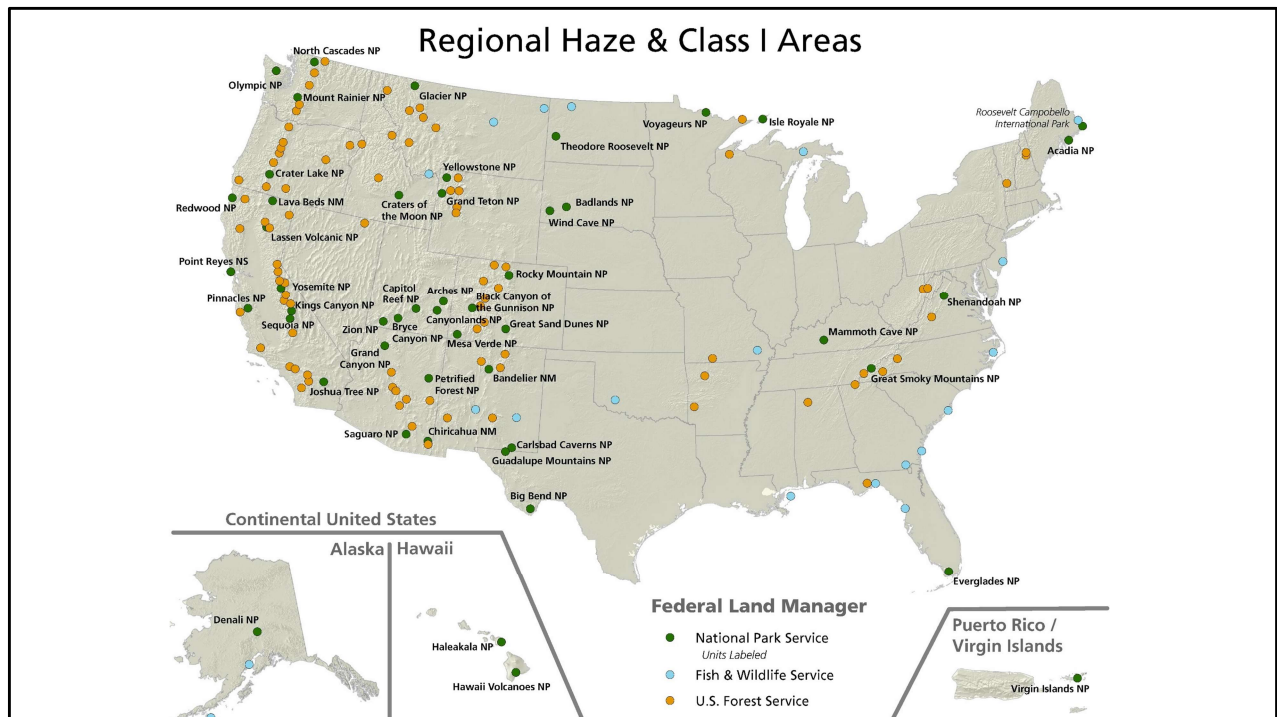


Yosemite NP, California and Great Smoky Mountains NP, Tennessee and North Carolina

Left to right images illustrate hazy to clear conditions.

Haze obscures the color and detail in distant features.

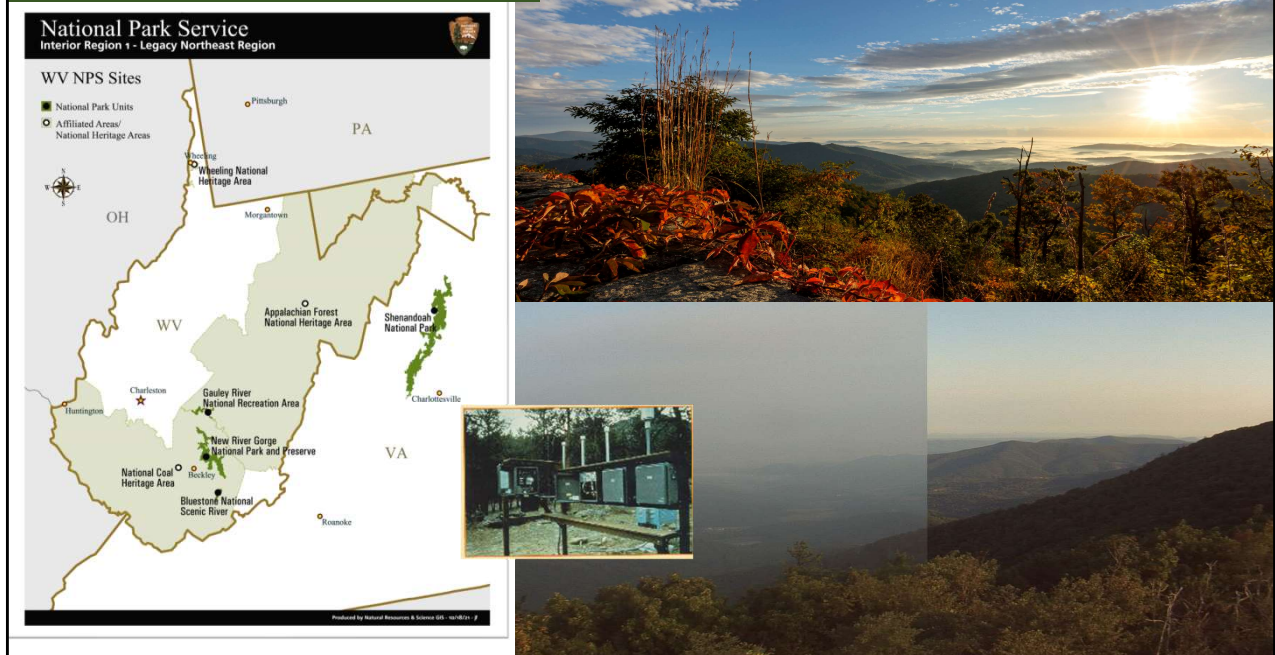
NPS photos



As you know, the NPS is one of three Federal Land Managers (FLMs) with responsibility for the 156 Class I areas nationwide. The NPS manages 48 Class I areas.

The closest NPS Class I area to WV is Shenandoah NP.

Shenandoah National Park

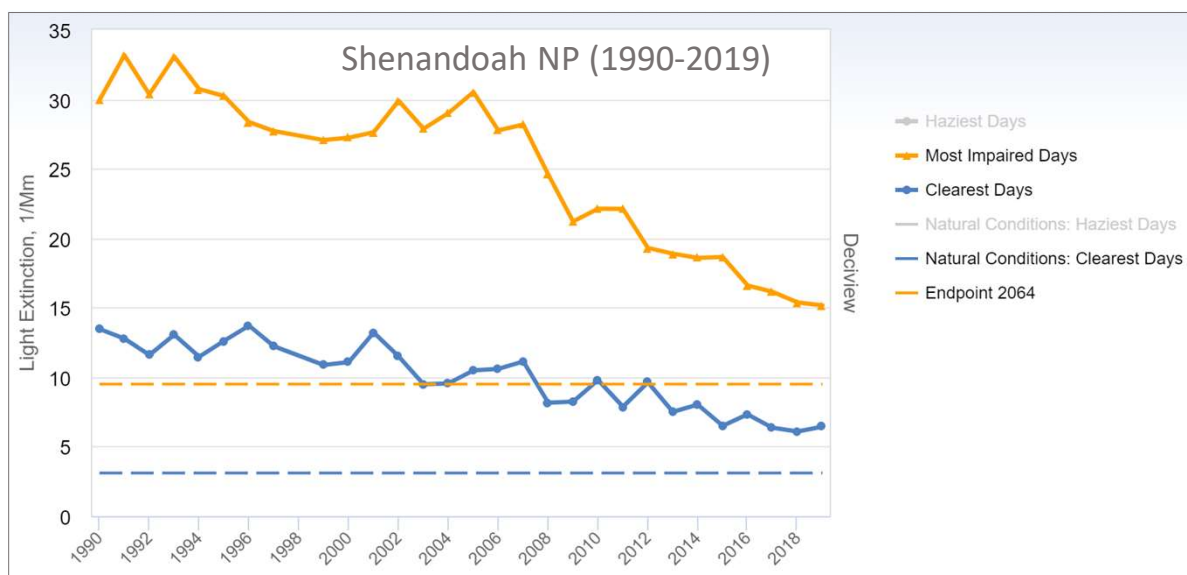


Shenandoah NP is located just 75 miles from Washington, D.C. and is one of the most visited NPs in the east. Many different activities bring visitors to Shenandoah NP, whether it's Skyline Drive or hiking to the rocky peaks of Hawksbill or Old Rag or camping. Visitors can enjoy waterfalls, wildlife, beautiful landscapes and the attraction of fall colors. With over 200,000 acres of protected lands of the Blue Ridge Mountains and beautiful views of the Shenandoah Valley to the west and the Virginia Piedmont to the east, most visitors expect clean air and clear views when visiting the park. Unfortunately, Shenandoah NP experiences some of the highest measured air pollution of any national park in the U.S. As we are all familiar with, the park is downwind of many sources of air pollution from the Mid-Atlantic region and Ohio River Valley. Haze-causing emissions can significantly impact the scenic resources of the park.

NPS photos: Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring at Shenandoah NP and scenic views from Skyline Drive. The spit image shows hazy and clear conditions captured by our webcam: <https://www.nps.gov/subjects/air/webcams.htm?site=shen>.

NPS map

Long-term Visibility Trends



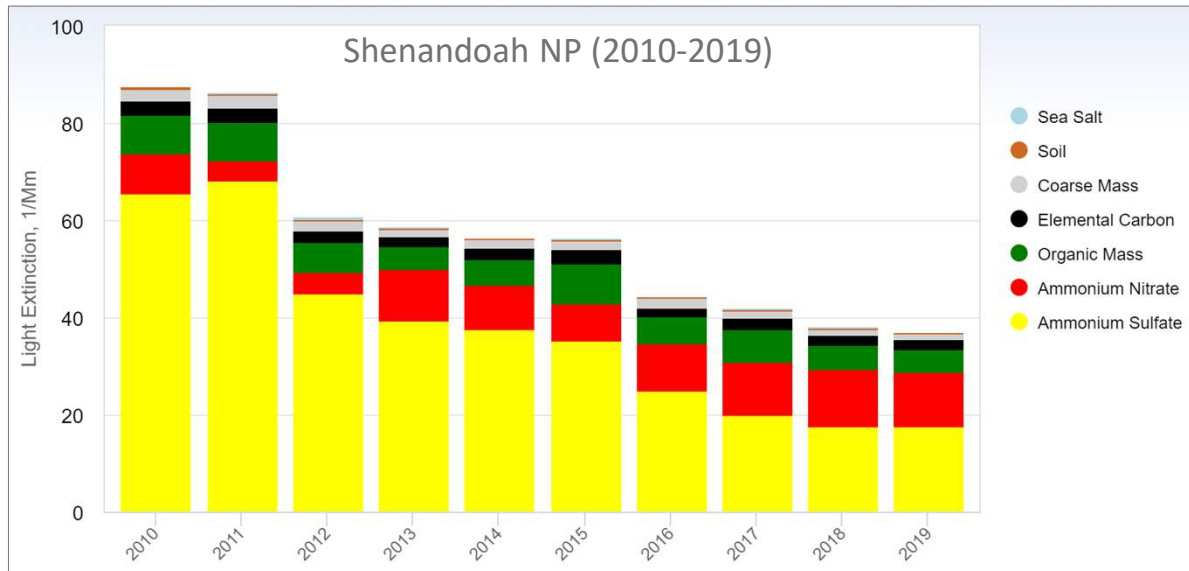
Long history of monitoring at Shenandoah NP, 30+ years!

We are seeing steady progress on both Most Impaired and Clearest days at Shenandoah NP but still not at natural conditions for either.

Progress has been made since first RH planning phase, and we want to continue to make progress over this second planning phase as well!

<http://views.cira.colostate.edu/fed/Express/AqrvTools.aspx>

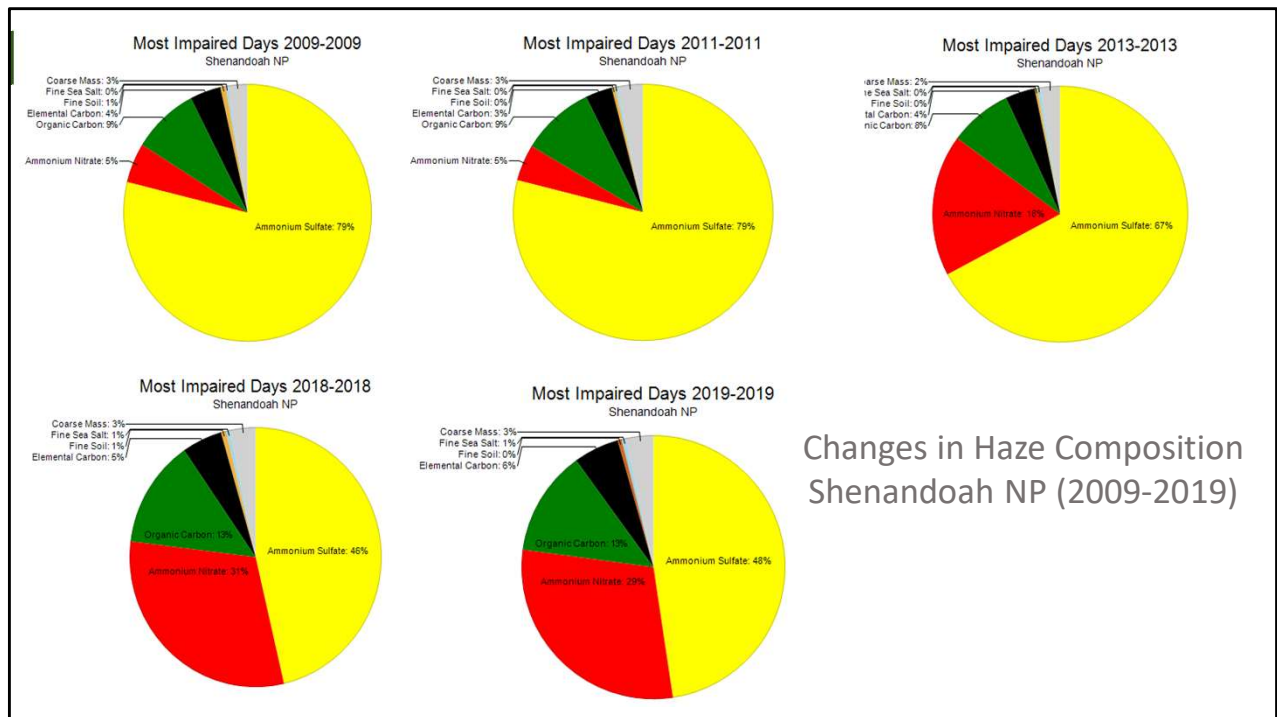
Haze Composition on Most Impaired Days



This annual extinction bar graph shows total haze composition over the past 10 years on most impaired days at Shenandoah NP.

As views improve, haze composition is changing. This bar graph highlights the increasing importance of ammonium nitrate to visibility impacts at Shenandoah NP.

<http://views.cira.colostate.edu/fed/Express/AqrvTools.aspx>

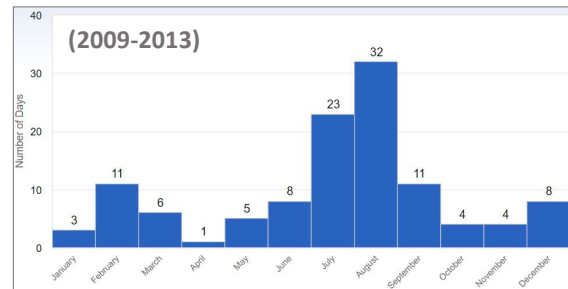
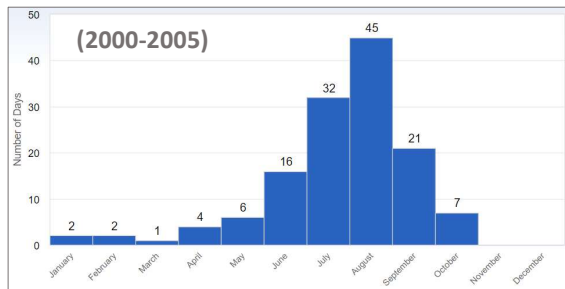


In Shenandoah NP, which is most impacted by West Virginia facilities according to VISTAS modeling, nitrate composition has been increasing, and for the period 2015-2019 nitrate comprises 23% of visibility impairment on the 20% MID. In 2018, data show nitrate hit the greatest fraction in recent years, i.e. up to 31% of total light extinction in 2018 was from nitrate. This is followed by 2019 where nitrate comprised 29% of the total light extinction on the 20% MID in Shenandoah NP.

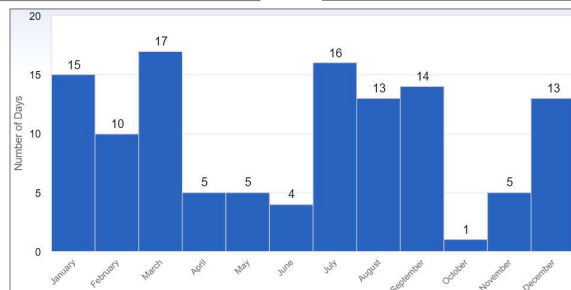
<http://views.cira.colostate.edu/fed/Express/AqrvTools.aspx>

Distribution of Most Impaired Days

Shenandoah NP



(2015-2019)



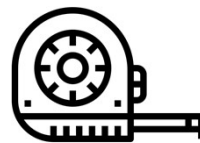
The distribution of Most Impaired Days (MID) is changing – between 2000-2005 monitoring data show that summer is the prominent season for MID. For the period 2009-2013, data show an increase in the number of MID during winter months. Finally, during the most recent five-year period of data, we are just as likely to see MID during the winter as the summer.

<http://views.cira.colostate.edu/fed/Express/AqrVTools.aspx>

National Park Service RHR-R2

- Participating in Regional Planning Organizations (**MANEVU, VISTAS**)
 - NY, NJ, DC, CT, MA, NH, MD
 - FL, NC, TN, WV
- Evaluating facilities for visibility impacts on our NPS Class I areas
- Provided lists of facilities to VISTAS for 4-factor analysis consideration in 2019
- NPS facility-specific requests and recommendations for WV DEP

Q/d



SO₂ & NO_x



During the Second Round of RH Planning, the NPS has participated in all five RPO's. For us in the east, NPS participates in MANE-VU and VISTAS.

During this time, the NPS has evaluated facilities for visibility impacts on our Class I areas.

- We used a NPS Class I centric approach
- For each NPS Class I area, we identified those facilities associated with contributing 80% of visibility impacts, based on EPA's 2016/2018 guidance
- Calculated Q/d for sources within 1,000km of NPS Class I boundaries using SO₂ and NO_x emissions.
- We excluded PM b/c it's well controlled on stationary sources and difficult to control for remaining area sources (including mines)
- We removed rail yards and airports
- Adjusted our results to reflect those facilities that had been controlled, shut down, changed fuels, or that we knew would be controlled before 2028

The NPS provided lists of facilities to states and RPOs in 2018 and 2019.

And during our formal NPS-to-state consultations, we provide our specific facility requests and overall recommendations to individual states.

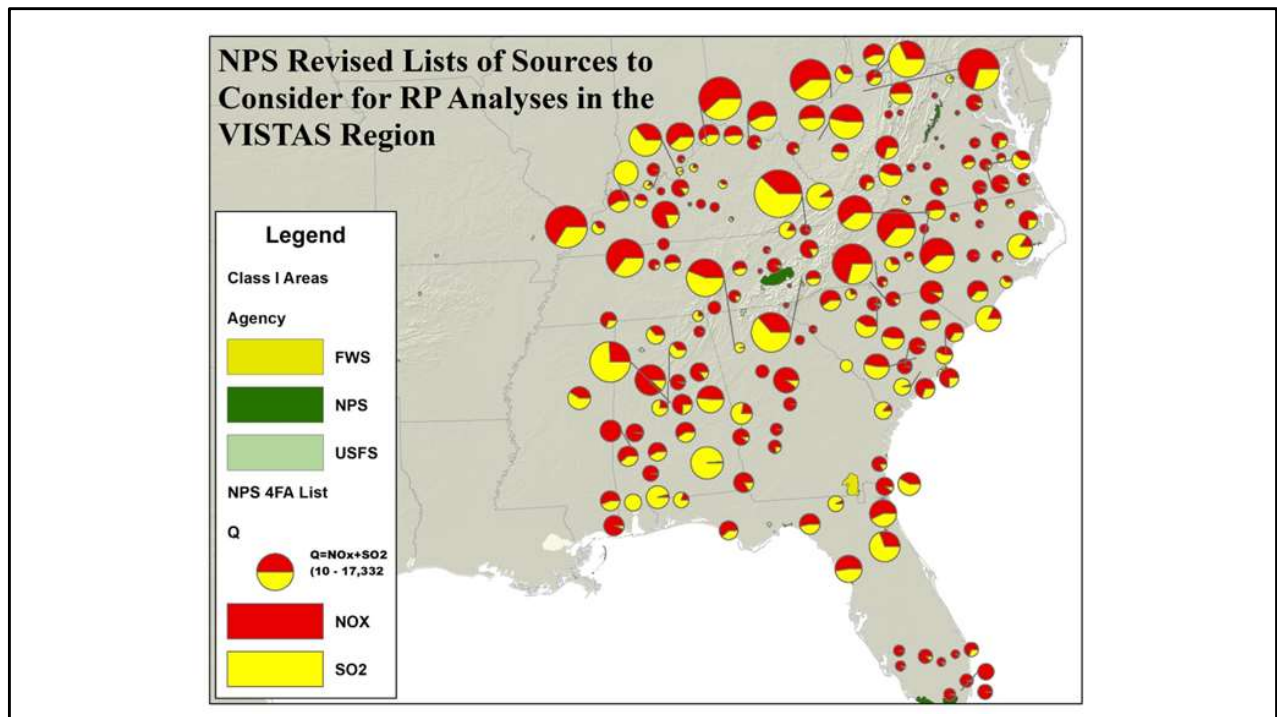
VISTAS Approach Concerns

Exclusion of NO_x/Nitrate from 4FA

- The VISTAS rationale for excluding NO_x emissions from reasonable progress is based on an outdated modeling base year and inaccurate assumptions about the current and future distribution of most-impaired days.
 - The VISTAS analyses justifying exclusion of NO_x do not adequately account for current conditions on the 20% most-impaired days.
 - As SO₂ emissions decline and the seasonality of most-impaired days shifts, Nitrate is increasingly important in many VISTAS Class I areas. These shifts are not captured in the VISTAS modeling analysis.
- NO_x emissions from stationary point sources are not trivial (based on both current and 2028 inventories).
- States should evaluate NO_x and SO₂ control opportunities in this planning period.

As discussed during the consultation call, the NPS is not suggesting that West Virginia needs to re-model using an alternate base year. Instead, we are recommending that the model results be evaluated and considered in light of recent monitoring data.

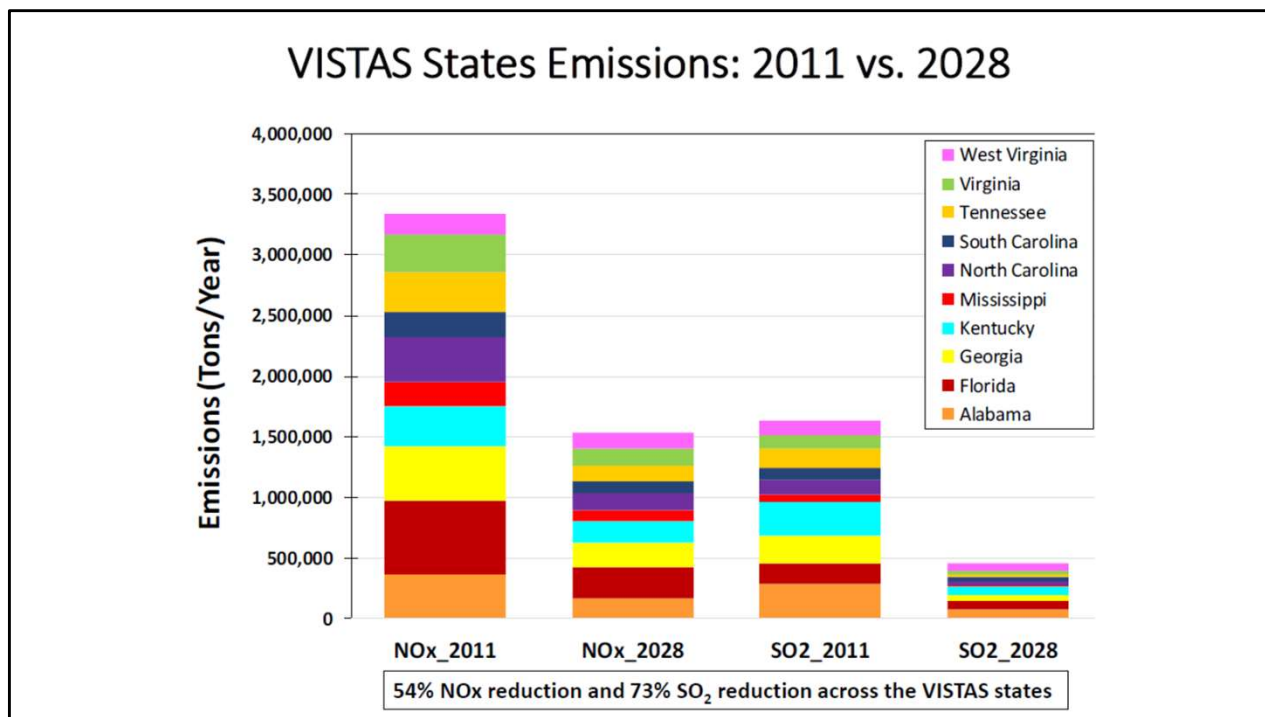
Monitoring information from the past ten years should be used to ground truth modeling results and inform RP analyses and decisions. In doing so, we note that the VISTAS 2011 base-year modeling is dramatically under predicting nitrate. We recommend that West Virginia and other VISTAS states use a weight of evidence approach that incorporates recent monitoring information in their RP decisions. We recommend that West Virginia evaluate NO_x emission reduction opportunities in this round of Regional Haze SIP development.



This map shows the most recent emissions inventory data (2020-CAMD/2017-NEI) for VISTAS sources identified by the earlier (2020) NPS Q/d methodology. Although we are now recommending VISTAS states consider alternate approaches to source selection using the VISTAS EWRT*Q/d results, this map illustrates the current distribution and scale of NO_x and SO_2 stationary sources in the region.

For West Virginia, we observe that the point source emissions are relatively high and for many facilities they are predominantly NO_x .

NPS map, April 2021



VISTAS emissions projections for 2028 show that there will be 1.5 million tons of NO_x (3 times the amount of SO₂) at the end of this planning period. Increasing trends in nitrate haze on most-impaired days will likely continue. We encourage West Virginia to expand focus from SO₂ in reasonable progress determinations and explore opportunities to further reduce NO_x emissions in this planning period.

VISTAS Graphic (Slide 9 from 8/4/2020 EPA, FLM, RPO Briefing presentation: VISTAS_Pres_FLMs_EPA_200804.pdf)

Exclusion of NO_x/Nitrate from 4FA (1)

- EPA acknowledges the importance of nitrate as an anthropogenic source of haze in their recent clarification memorandum, noting that:
 - In “nearly all Class I areas, the largest particulate matter (PM) components of anthropogenic visibility impairment are sulfate and nitrate, caused primarily by PM precursors SO₂ and NO_x, respectively.”
 - Given this, the EPA “generally expects” states to analyze both SO₂ and NO_x when determining control measures.

Ammonium nitrate from NO_x emissions is a significant anthropogenic haze causing pollutant. Over the past 10-years the importance of ammonium nitrate on the 20% most-impaired days has increased for Shenandoah NP. As SO₂ emissions continue to decline and the seasonality of most-impaired days shifts, NO_x emissions are increasingly important for many VISTAS Class I areas.

Again, we agree the modelling methods used the VISTAS states follow EPA guidance and are technically correct. However, the time period selected for the analysis is no longer reflective of current information and this was not factored into the decision-making process. The importance of ammonium nitrate and the distribution of the most-impaired days has changed significantly since the 2011 base year. As a result, 2028 projections based on the 2011 most-impaired days (which were ammonium sulfate dominated and occurred during the summer) miss the importance of nitrogen oxide emissions and ammonium nitrate extinction during the cooler months of the year that are now among the most-impaired days.

Exclusion of NO_x/Nitrate from 4FA (2)

- West Virginia compared the VISTAS modeling (2011 base year) to EPA modeling (2016 base year) to confirm their original conclusions from the VISTAS Model.

Model Predictions vs. Monitoring Data:

- Modeling is useful in determining the relative effectiveness of overall control strategies (i.e., using RRFs to calculate RPGs) in a future year.
- West Virginia & VISTAS used model results alone to determine that nitrate, a major component of anthropogenic impairment, does not warrant consideration in this round. Current visibility data and emission information contradicts this conclusion.

Exclusion of NO_x/Nitrate from 4FA (3)

- NPS recommends that West Virginia address the current and future importance of nitrate for visibility impairment and consider NO_x emission reduction opportunities in this round of RH SIP development.
- Reducing NO_x emissions would have additional regional co-benefits for ozone and nitrogen deposition in downwind Shenandoah National Park.

VISTAS Approach Concerns

Source Selection

- The *individual facility percent-of-total-impact* metrics are arbitrarily high and inherently less protective of the more-impacted Class I areas in the VISTAS region.
- The threshold for selecting an individual facility is **80 times** higher in the most-impacted Class I area than in the least-impacted Class I area in the VISTAS region.
- PSAT Modeling: We do not agree with using the absolute model values to exclude individual facilities from consideration for which reasonable reduction measures may be achieved, particularly when an arbitrarily high impact threshold is used to make this determination.

Source Selection

- Underlying methodology EWRT*Q/d analysis



- Updated NPS lists of facilities
 - 80% of total AOI Impact

We acknowledge that an EWRT*Q/d approach is more robust than a simple Q/d approach because it also considers extinction and meteorology on the 20% MID. Accordingly, we updated our approach using the VISTAS EWRT*Q/d results and evaluated two alternative threshold metrics that could be used in lieu of the VISTAS individual facility percent-of-total-impact thresholds.

- **Clarification Note:** While we agree with using AOI approaches as opposed to a simple Q/d, this is not a wholesale endorsement of the VISTAS methods. We still have technical objections to the reliance on an outdated base year that underpins the AOI & CAMx analyses. Because of this, the outdated MIDs used in the analysis likely underestimate the role of NO₃/NO_x into the future, which contradicts current IMPROVE data. This affects the facility selection process by failing to account for the role of ammonium nitrate on the recent MID and biases the analysis against selecting NO_x sources. Adjusting the selection thresholds does not address this issue. Regardless, we agree that it is more sophisticated than a simple Q/d approach and we used the VISTAS EWRT*Q/d in our revised source screening analyses.

Our first approach, and the one applied to West Virginia used a threshold that captures 80% of the total Class I Area impact (e.g., 80% of the TCI) for sulfate & nitrate, as was recommended in the 2016 draft regional haze guidance. This produced a list of all the facilities that contribute up to 80% of the cumulative AOI impact in NPS VISTAS Class I areas. We are calling these results the “80% cut-off results.”

The second alternative approach applied an absolute value threshold—we are not recommending this approach for West Virginia. For more information see our May 2021 comments on the VISTAS analyses.

Source Selection

- West Virginia selected six sources using the 1% PSAT threshold
 - Pleasants Power Station, Harrison Plant, Fort Martin, John E Amos, Mitchell & Grant Town Plants. (Note: West Virginia did not include results for SHEN in the SIP.)
- Only one of these sources, Pleasant's Power Station, completed a four-factor analysis. All six sources determined that additional SO₂ controls are neither necessary nor feasible, citing the following:
 - Class I areas are well below the URP.
 - Existing controls that meet MATs limits for SO₂ along with other CAA regulations.
- NPS recommends that West Virginia consider the additional emissions sources contributing to 80% of the AOI impact at NPS Class I areas, as recommended in the next slide.

Reminder, our analysis and recommendations only considered NPS Class I areas.

West Virginia Draft SIP Feedback

Source Selection—New NPS List of Sources for West Virginia

- 12 sources identified using the VISTAS AOI data (80% of total AOI impact at NPS Class I areas).
- These 12 facilities were on our original Q/d list sent to West Virginia for consideration. After further review, this list was reduced to the ten sources highlighted in green—the NPS requests additional analysis of these sources.

	Facility	NPS Class I Areas Affected	Pollutants	Selected By WV
1	Monongahela Power Co. Pleasants Power Station	SHEN, GRSM, MACA	SO ₂ , NO _x	✓
2	Allegheny Energy Co. Harrison Plant	SHEN	SO ₂	✓
3	Monongahela Power Co. Fort Martin Power Plant	SHEN, GRSM	SO ₂ , NO _x	✓
4	Appalachian Power Co. John E Amos Plant	SHEN, GRSM	SO ₂ , NO _x	✓
5	Dominion Resources Mount Storm Power Station	SHEN	SO ₂ , NO _x	
6	Mitchell Plant	SHEN	SO ₂ , NO _x	✓
7	American Bituminous Power Grant Town Plant	SHEN	SO ₂ , NO _x	✓
8	Longview Power	SHEN	SO ₂ , NO _x	
9	Appalachian Power Co. Mountaineer Plant	SHEN, GRSM	SO ₂ , NO _x	
10	Dupont Washington Works	SHEN	NA	
11	Morgantown Energy Associates	SHEN	NA	
12	Capitol Cement - Essroc Martinsburg Plant	SHEN	SO ₂ , NO _x	

Using the 80% of total AOI impact to NPS Class I areas identifies 12 West Virginia sources affecting visibility at Shenandoah NP. This final list of 10 removes sources that have converted to natural gas. Note that all of these sources were included on the original list we shared with West Virginia for consideration in 2019.

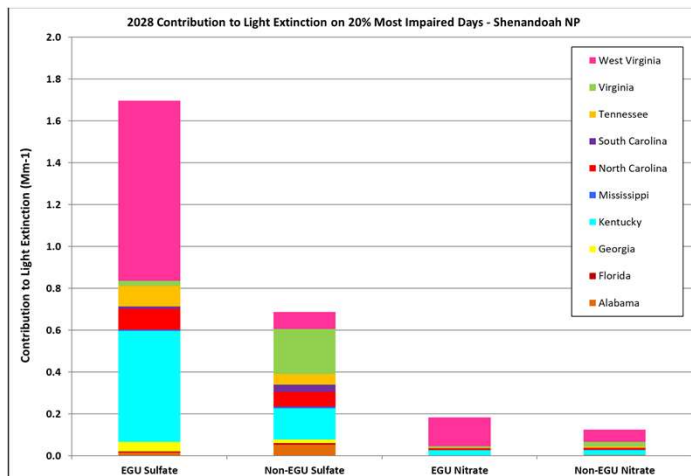
Acronyms:

- GRSM, Great Smoky Mountains NP (North Carolina & Tennessee)
- SHEN, Shenandoah NP (Virginia)
- MACA, Mammoth Cave NP (Kentucky)

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

- Among the Vistas Region States, West Virginia EGUs are the most significant contributors to visibility impairment in Shenandoah NP based on the VISTAS 2028 PSAT modeling.



*Many West Virginia EGUs operate existing controls, but based on historic emissions, limits could be tightened to ensure continued progress.

This graph shows the 2028 modeled contribution to light extinction on 20% most impaired days at Shenandoah NP. The pink color represents emissions from West Virginia which dominate extinction attributed to EGUs for Sulfate and Nitrate. Also, recognize that extinction from nitrate is very likely under predicted since the most impaired set of days was held constant by the modeling and focuses on summertime days.

VISTAS Graphic (from "VISTAS_PSAT_Source_Apport_Results_April_2020.xlsm")

A closer look at West Virginia EGUs

EPA 2021 clarification memo Section 2.3 on Effectively Controlled:

“[States] should further consider information specific to the source, including recent actual and projected emission rates, to determine if the source could reasonably attain a lower rate.”

“It may be difficult for a state to demonstrate that a four-factor analysis is futile for a source just because it has an “effective control” if it has recently operated at a significantly lower emission rate.”

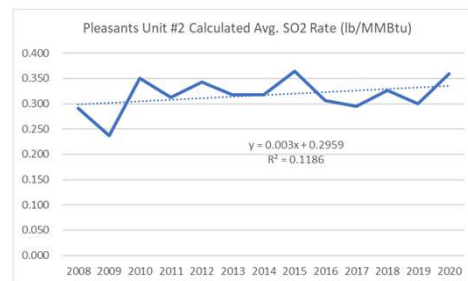
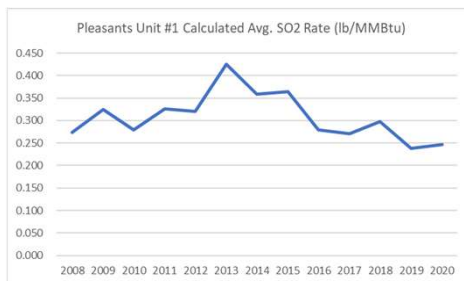
“In that case, a four-factor analysis ***may identify a lower emission rate (e.g., associated with more efficient use of the “effective existing controls”) that may be reasonable and thus necessary for reasonable progress.*** If a source can achieve, or is achieving, a lower emission rate using its existing measures than the rate assumed for the “effective control,” ***a state should further analyze the lower emission rate(s) as a potential control option.***”

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Monongahela Power Co. Pleasants Power Station

- Pollution control equipment on the Pleasants units are not among the top tier performers for SO₂ or NO_x. Out of 494 coal-fired units in the CAMD database in 2020, when ranked best to worst performing:
 - Unit 1 Ranked #356 for its SO₂ emission rate and #370 for its NO_x emission rate.
 - Unit 2 Ranked #394 for its SO₂ emission rate and #379 for its NO_x emission rate.
- Existing Scrubbers were installed in 1979 and upgraded in 2008.



NPS Charts, 2021

A closer look at West Virginia EGUs

Monongahela Power Co. Pleasants Power Station

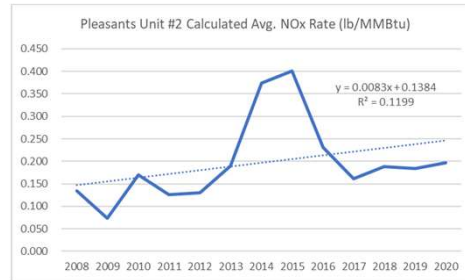
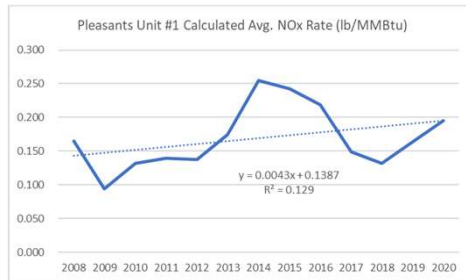
- Monongahela Power completed cost analyses for replacement equipment (but not for scrubber upgrades). They estimated replacement scrubber costs at approx. \$9k-11k/ton.
- The information in the Pleasant's 4FA was incomplete, however, we noted several errors.
- NPS estimated the incremental cost effectiveness of scrubber replacement:
 - Unit 1: \$7,534/ton for an additional 2,525 TPY additional SO₂ reduction
 - Unit 2: \$5,336/ton for an additional 3,579 TPY additional SO₂ reduction
- We recommend that cost-effective scrubber replacements are implemented in this round of RH planning.

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Monongahela Power Co. Pleasants Power Station

- The last 13 years of emissions information demonstrate that lower NO_x emission rates are achievable with the existing LNB + SCR system.
- Evaluate and implement options to ensure consistent low NO_x emissions are achieved with the existing controls (e.g., permit limits, optimization of control efficiency).



NPS Charts, 2021

A closer look at West Virginia EGUs

Monongahela Power Co. Fort Martin Power Plant

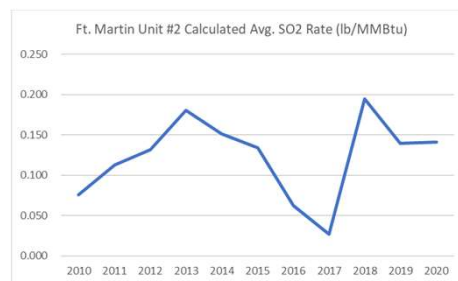
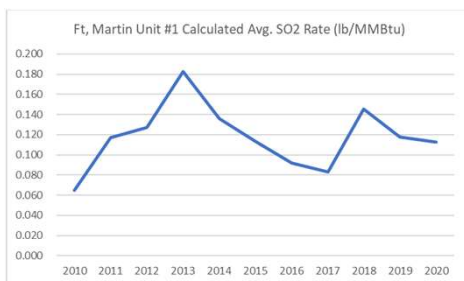
- NO_x emissions are controlled with SNCR. Out of 494 coal-fired units in the CAMD database in 2020, when ranked best to worst performing:
 - Unit 1 Ranked #438 for its NO_x emission rate.
 - Unit 2 Ranked #437 for its NO_x emission rate.
- WV DEP should complete a four-factor analysis to evaluate additional NO_x control options for the Fort Martin units.
- The NPS estimated the incremental cost of replacing the existing SNCRs with SCRs and found:
 - Unit 1: \$3,181/ton for an additional 3,399 TPY additional NO_x reduction
 - Unit 2: \$3,611/ton for an additional 3,003 TPY additional NO_x reduction
- The NPS recommends that the existing SNCR systems be replaced with SCR.

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Monongahela Power Co. Fort Martin Power Plant

- The wet scrubbers were upgraded in 2016. Based on CAMD emission data:
 - Unit #1 is capable of better than 97% control and may have been achieving better than 98% control @ 0.065 lb/mmBtu.
 - Unit #2 is capable of better than 97% control and may have been achieving better than 99.5% control @ 0.027 lb/mmBtu.
 - Both units should be capable of meeting 0.08 lb/mmBtu on an annual average. Permit limits should be established to ensure best operation and maintenance of the SO₂ scrubbers.



NPS Charts, 2021

A closer look at West Virginia EGUs

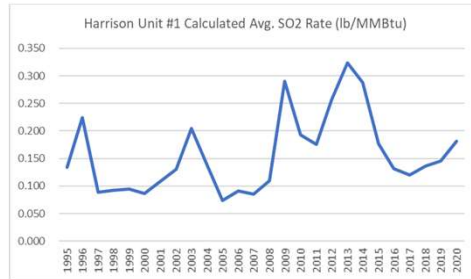
American Bituminous Power Grant Town Plant

- West Virginia determined that a four-factor analysis was not necessary for this facility because:
 - The facility T5 permit limits SO₂ emissions to less than the quantity projected to exceed the 1.00% visibility threshold—Can WV DEP please clarify this?
 - 2036 Retirement Date—We note that this date is near the end of the third planning period and should not be relied on to avoid analysis. If this shutdown date is federally enforceable it may be used to shorten the remaining useful life in a four-factor analysis.
- CAMD Data:
 - From 2015-2019 SO₂ Ranged from 0.311 - 0.57 lb/MMBtu.
 - From 2015-2019 NO_x Ranged from 0.30 - 0.34 lb/MMBtu
 - The Grant Town emission rates are high relative to other well-controlled coal-fired facilities.
 - Please complete a four-factor analysis to evaluate the costs of additional SO₂ and NO_x controls.

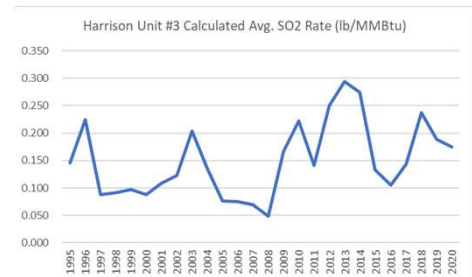
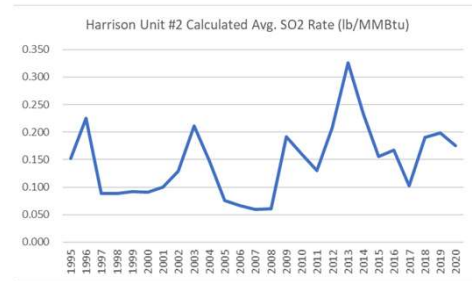
West Virginia Draft SIP Feedback

A closer look at WV EGUs

Allegheny Energy Co. Harrison Plant –Example



- SO₂ emission rates range from 0.048 to 0.326 lb/MMBtu.
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).



NPS Charts, 2021

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Appalachian Power Co. John E Amos Plant—Examples



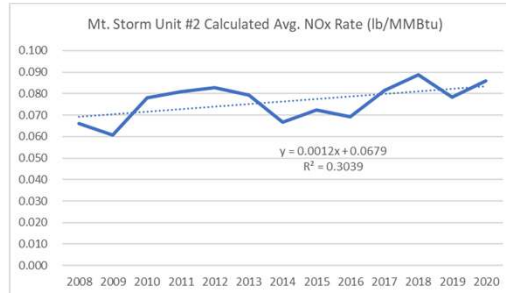
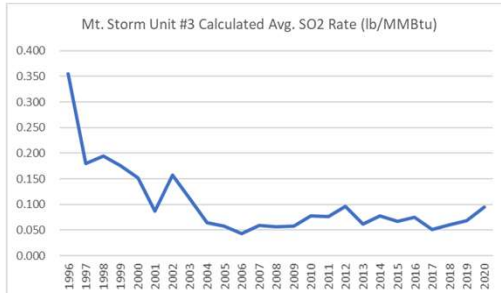
- Annual SO₂ emission rates range from 0.040 to 0.103 lb/MMBtu. Annual NO_x emission rates range from 0.042 to 0.113 lb/MMBtu
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).

NPS Charts, 2021

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Mount Storm Power Station—Example



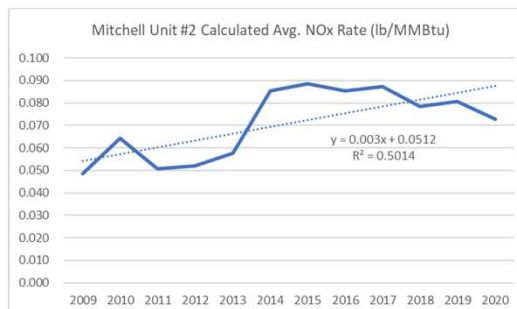
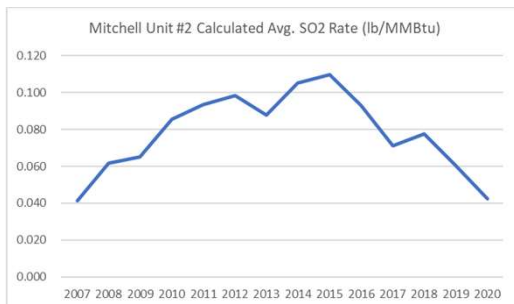
- Annual SO₂ emission rates range from 0.048 to 0.158 lb/MMBtu. Annual NO_x emission rates range from 0.061 to 0.437 lb/MMBtu
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).

NPS Charts, 2021

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Mitchell Plant—Example



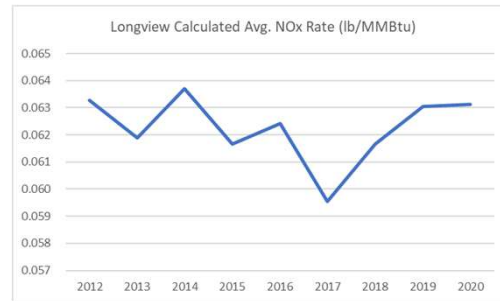
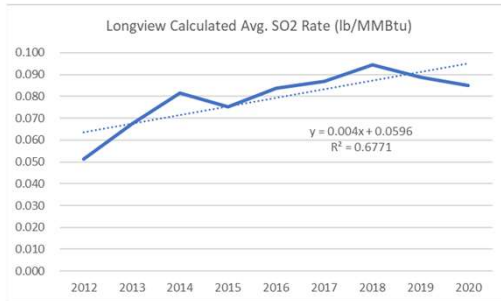
- Annual SO₂ emission rates range from 0.042 to 0.112 lb/MMBtu. Annual NO_x emission rates range from 0.050 to 0.097 lb/MMBtu
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).

NPS Charts, 2021

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Longview Power—Example



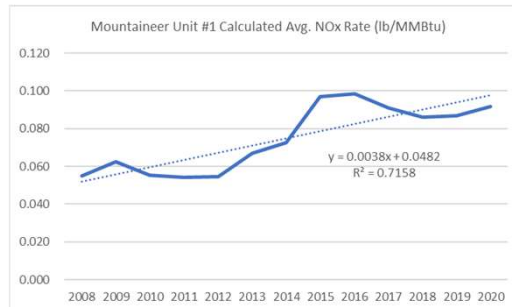
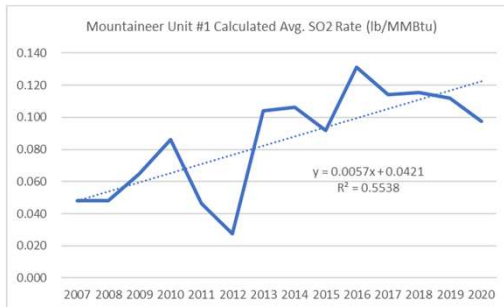
- Annual SO₂ emission rates range from 0.051 to 0.089 lb/MMBtu. Annual NO_x emission rates range from 0.063 to 0.070 lb/MMBtu
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).

NPS Charts, 2021

West Virginia Draft SIP Feedback

A closer look at West Virginia EGUs

Appalachian Power Co. Mountaineer Plant



- Annual SO₂ emission rates range from 0.048 to 0.131 lb/MMBtu. Annual NO_x emission rates range from 0.055 to 0.098 lb/MMBtu
- Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency/scrubber upgrades).

NPS Charts, 2021

West Virginia Draft SIP Feedback

Summary of NPS Requests/Recommendations

- **Pleasants Energy:**
 - SO₂: Consider NPS evaluation of scrubber replacement costs and implement cost-effective options to replace the aging SO₂ controls on the Pleasants units.
 - NO_x: Evaluate and implement options to ensure consistent low NO_x emissions are achieved with the existing LNB + SCR system (e.g., permit limits, optimization of efficiency).
- **Fort Martin:**
 - SO₂: Evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing scrubbers (e.g., permit limits, optimization of efficiency).
 - NO_x: Complete a four-factor analysis for NO_x control option and consider NPS cost estimates for replacement of the existing SNCR with SCR.
- **Grant Town Power Plant:**
 - SO₂: Completed a four-factor analysis to evaluate the costs of post-combustion SO₂ controls.
 - NO_x: Completed a four-factor analysis to evaluate NO_x control options.
- **Remaining EGUs:**
 - Evaluate and implement options to ensure consistent low SO₂ and NO_x emissions are achieved with the existing controls (e.g., permit limits, optimization of efficiency).
- **Capitol Cement - Essroc Martinsburg Plant:**
 - Conduct a four-factor analysis to evaluate SO₂ and NO_x emission reduction opportunities.

National Park Service RHR-R2

- Thank you for meeting with us!
- Please share:
 - Anticipated SIP schedule
 - How you will respond to NPS comments
- Please let us know:
 - When public comment period opens and closes
 - If/when a public hearing will be held
- The NPS will:
 - Email call summary & any additional information
 - Share our comments with EPA Region 3

The NPS will submit an email summary of our October 19, 2021 consultation call along with any final review comments by October 26, 2021.

NPS photo New River Gorge National Park and Preserve

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For any formal notifications of public documents, please include the above list of NPS staff.



west virginia department of environmental protection

Appendix F-3p

National Park Service Consultation: Written Comments on Pre-Draft West Virginia Regional Haze SIP October 26, 2021

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment

ATTACHMENT 1

NATIONAL PARK SERVICE DETAILED COMMENTS ON WEST VIRGINIA’S DRAFT REGIONAL HAZE SIP

October 26, 2021

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1 Introduction and General Comments

We commend West Virginia for developing a well-organized, detailed Regional Haze State Implementation plan (SIP), and for engaging with the National Park Service (NPS) during the FLM consultation period. We also recognize and appreciate the significant SO₂ and NO_x emission reductions and visibility improvements that West Virginia has achieved in the last decade. Still, significant additional progress is necessary before the ultimate visibility goal of no human caused visibility impairment is realized for NPS Class I areas affected by West Virginia emissions. These Class I areas include Shenandoah National Park (NP) in Virginia, Great Smoky Mountains NP in Tennessee and North Carolina, and Mammoth Cave NP in Kentucky.

Under the Clean Air Act (§169A and B) and Federal Regional Haze Rule (40 CFR §51.308), states are required to develop a State Implementation Plan (SIP) and substantively engage with agencies that manage national parks and wildernesses designated as Class I areas. States are also required to update SIPs every 10 years to address haze-causing air pollution and ensure progress is made toward achieving the overall program goal which is “the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.”

It is with this in mind that we provide the following feedback and recommendations, as presented during our consultation call with West Virginia on October 19, 2021. This attachment to our emailed comments documents the topics discussed during that call and provides additional detail to support NPS conclusions and recommendations presented during our consultation call. It is our intention for these recommendations to strengthen West Virginia’s proposed long-term strategy addressing regional haze in NPS Class I areas.

1.1 Facilities recommended for analysis by the NPS

Specifically, we request that WV conduct (or expand and revise) four-factor analyses to evaluate cost-effective SO₂ and NO_x emission reduction opportunities in this planning period for the following facilities:

1. Monongahela Power Co. Pleasants Power Station
2. Allegheny Energy Co. Harrison Plant
3. Monongahela Power Co. Fort Martin Power Plant
4. Appalachian Power Co. John E Amos Plant
5. Dominion Resources Mount Storm Power Station
6. American Electric Power Mitchell Plant
7. American Bituminous Power Grant Town Plant
8. Longview Power
9. Appalachian Power Co. Mountaineer Plant
10. Capitol Cement - Essroc Martinsburg Plant

Our process for identifying facilities for review was described during our consultation call and in our May 14, 2021 comments to the VISTAS region states. We developed our revised list of

facilities using the VISTAS AOI results in response to our concerns regarding the arbitrarily high source selection thresholds used by the VISTAS states. We ranked the facilities according to their AOI impact for each NPS Class I area. We then compiled a list of facilities for each state that comprises 80% of the combined AOI visibility impact from sulfur and nitrogen compounds for NPS Class I areas in the VISTAS region. Only facilities that comprise the top 80% of the AOI impact for any NPS Class I area were included. This resulted in a list of 12 West Virginia facilities affecting visibility at Shenandoah, Great Smoky Mountains, and Mammoth Cave NPs. We narrowed this list to ten by removing two facilities that have converted to natural gas. (See slide 23 of our October 19, 2021 PowerPoint presentation, NPS-WV_RH-ConsultationSlides_10.19.2021.pdf). Each of the ten sources that we are now recommending for four-factor analysis were also included on the original list we shared with West Virginia for consideration in 2019.

The NPS list includes one non-EGU facility, the Capitol Cement-Essroc Martinsburg Plant, as potentially impacting Shenandoah NP. The remaining sources are electric generating units (EGUs). As discussed on slide 24 from our consultation meeting, among the VISTAS Region States, West Virginia EGUs are the most significant contributors to visibility impairment in Shenandoah NP based on the VISTAS 2028 PSAT modeling.

We encourage West Virginia to evaluate and implement any cost-effective emission reduction opportunities. This includes an assessment of existing pollution control equipment at the EGUs to ensure controls are operated efficiently and achieve consistently low SO₂ and NO_x emissions using permit limits, optimization of equipment efficiency, or equipment upgrades. For the Pleasant's Energy and Fort Martin facilities specifically, we request that West Virginia require cost-effective equipment replacement options. We are providing cost analyses that support our recommendation to replace the aging SO₂ scrubbers at the Pleasants Energy facility and replace the SNCR systems with SCR at the Fort Martin facility. Such action would demonstrate WV's commitment to substantively address regional haze requirements and make reasonable progress towards clean air and clear views in this planning period.

1.2 NPS feedback on West Virginia reasonable progress determinations

The RP analyses provided for the EGUs in the WV draft SIP are likely not sufficient to fulfill the regional haze analytical requirements. Under §7491 of the Clean Air Act (CAA), SIPs are required to contain:

“emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal.”

These measures are to be identified using the four statutory factors, which are also listed in §7491:

“the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source.”

A full four-factor analysis was conducted for only one WV source and as described in the source-specific feedback below, there are issues with this cost analysis. However, six WV EGUs exceeded the VISTAS 1% of the total EGU + non-EGU impact at the West Virginia Class I areas and were “selected” for four-factor analysis in the draft WV SIP: (1) Monongahela Power Co. Pleasants Power Station; (2) Allegheny Energy Co. Harrison Plant; (3) Monongahela Power Co. Fort Martin Power Plant; (4) Appalachian Power Co. John E Amos Plant; (5) American Electric Power Mitchell Plant; (6) American Bituminous Power Grant Town Plant.

Based on the information presented in the SIP, West Virginia did not tag WV facilities for impacts to Shenandoah NP. Regardless, each of the six EGUs “selected” by WV is also on the NPS list of sources recommended for four-factor analysis and emissions reductions. As discussed in our presentation and in our May 2021 comments to the VISTAS region states, the percent-of-total-impact thresholds selected by the VISTAS region states were inherently less protective of the most impacted Class I areas. For example, the absolute value of the VISTAS thresholds to identify a source affecting Shenandoah NP is 32 times higher than was needed to identify a source affecting Everglades NP in Florida (the least-visibility-impaired VISTAS Class I area). While the threshold selected by WV to “tag” sources in the first screening step, which was 0.2% of the AOI impact for sulfate or nitrate, was lower than the percent-based threshold selected by any other VISTAS state, it did not result in conducting a greater number of four-factor analyses, nor did it make an appreciable difference in the outcome, as no additional emission reductions were included in the long-term strategy.

Of the six facilities selected, WV DEP pre-determined that a four-factor analysis was not necessary for the American Bituminous Power Grant Town. Four-factor analyses were requested from the remaining five EGUs, but only one, Monongahela Power Co. Pleasants Power Station, provided the requested information. Ultimately, WV determined that additional controls are not necessary for any of the WV EGUs (with or without cost analyses), citing the following justifications for each of the facilities:

- The “rate of progress at the mandatory federal Class I areas identified are well ahead of the uniform rate of progress goals to natural background visibility” and therefore, additional emissions reductions are not necessary.
- These are facilities are already meeting other CAA requirements, including the limits for the Mercury Air Toxics Standards (MATS) rule and the Cross State Air Pollution Rule (CSAPR) and therefore, no additional controls are necessary.

1.3 Below the Uniform Rate of Progress (URP) and reasonable progress determinations

Technically feasible, cost-effective controls identified through four-factor analysis should be implemented in this planning period, regardless of where the state will be relative to the uniform rate of progress (URP) in 2028. EPA addressed this issue at length in the preamble to the 2017 revisions to the Regional Haze Rule. For example, when addressing RP analysis requirements and how this relates to the URP, EPA states:

“Some commenters stated a desire for corresponding rule text dealing with situations where RPGs are equal to (‘on’) or better than (‘below’) the URP or glidepath. Several commenters stated that the URP or glidepath should be a “safe harbor,” opining that states should be permitted to analyze whether projected visibility conditions for the end of the implementation period will be on or below the glidepath based on on-the-books or on-the-way control measures, and that in such cases a four- factor analysis should not be required.

*The CAA requires that each SIP revision contain long-term strategies for making reasonable progress, and that in determining reasonable progress states **must consider the four statutory factors. Treating the URP as a safe harbor would be inconsistent with the statutory requirement** that states assess the potential to make further reasonable progress towards natural visibility goal in every implementation period. Even if a state is currently on or below the URP, there may be sources contributing to visibility impairment for which it would be reasonable to apply additional control measures in light of the four factors. Although it may conversely be the case that no such sources or control measures exist in a particular state with respect to a particular Class I area and implementation period, this should be determined based on a four-factor analysis for a reasonable set of in-state sources that are contributing the most to the visibility impairment that is still occurring at the Class I area. **It would bypass the four statutory factors and undermine the fundamental structure and purpose of the reasonable progress analysis to treat the URP as a safe harbor, or as a rigid requirement¹.**”*
[Emphasis added.]

This point was reiterated at length in Section 5.4 of EPA’s July 2021 Clarification Memorandum:

*“The URP is a planning metric used to gauge the amount of progress made thus far and the amount left to make. **It is not based on consideration of the four statutory factors and, therefore, cannot answer the question of whether the amount of progress made in any particular implementation period is “reasonable progress.”** This concept was explained in the RHR preamble. Therefore, **states must select a reasonable number sources** and evaluate and determine emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors.”*

EPA further emphasized the need to achieve “meaningful reductions” in this round of haze planning in the introduction section of the Clarification Memorandum, again noting that such reductions should be identified through analysis of the four statutory factors listed in the CAA:

“EPA intends the second planning period of the regional haze program to secure meaningful reductions in visibility impairing pollutants that build on the significant progress states have already achieved. There exist many opportunities for states to leverage both ongoing and upcoming emission reductions under other CAA programs;

¹ Protection of Visibility: Amendments to Requirements for State Plans, Final Rule, Vol. 82 Fed. Reg. 3078 (January 10, 2017).

however, we also expect states to undertake rigorous reasonable progress analyses that identify further opportunities to advance the national visibility goal consistent with the statutory and regulatory requirements.” [Emphasis added.]

While we appreciate and recognize the substantial emission reductions that have occurred in West Virginia over the last decade, this does not remove the obligation to consider Reasonable Progress measures based on the four statutory factors. Section 5.2 of the EPA Clarification Memo:

*“However, a state should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas. **More broadly, we do not think a state should rely on these two additional factors to summarily assert that the state has already made sufficient progress and, therefore, no sources need to be selected or no new controls are needed regardless of the outcome of four-factor analyses. Doing so would be similar in principle as relying on URP as a safe harbor, which we have consistently stated does not comport with the RHR, as noted in Section 5.4. We do think states can consider these factors in a more tailored manner, for instance in choosing between multiple control options when all are reasonable based on the four statutory factors.**”*

Given the lack of four-factor analyses to support the WV SIP conclusions and RP determinations, we do not believe the analytical obligations of the CAA have been met. WV should rectify this issue and revise the draft SIP by conducting or expanding and revising the four-factor analyses to evaluate and implement cost-effective SO₂ and NO_x emission reduction opportunities in this planning period.

1.4 General NPS feedback on criteria for determining “effectively controlled”

As described above, WV determined that each of their EGUs is already “effectively controlled” however, an analysis was not performed to verify these determinations. The July 2021 EPA Clarification Memorandum addressed the analytical expectations for these determinations:

“The underlying rationale for the “effective controls” flexibility is that if a source’s emissions are already well controlled, it is unlikely that further cost-effective reductions are available. A state relying on an “effective control” to avoid performing a four-factor analysis for a source should demonstrate why, for that source specifically, a four-factor analysis would not result in new controls and would, therefore, be a futile exercise. States should first assess whether the source in question already operates an “effective control” as described in the August 2019 Guidance. They should further consider information specific to the source, including recent actual and projected emission rates, to determine if the source could reasonably attain a lower rate. It may be difficult for a state to demonstrate that a four-factor analysis is futile for a source just because it has an “effective control” if it has recently operated at a significantly

lower emission rate. In that case, a four-factor analysis may identify a lower emission rate (e.g., associated with more efficient use of the “effective existing controls”) that may be reasonable and thus necessary for reasonable progress. If a source can achieve, or is achieving, a lower emission rate using its existing measures than the rate assumed for the “effective control,” a state should further analyze the lower emission rate(s) as a potential control option.” [Emphasis added.]

In the following sections, we have summarized and documented annual averages of historic operating and emissions data for each of the nine EGUs on the NPS list of sources recommended for analysis. This information suggests that most of these facilities have achieved lower SO₂ or NO_x (or both) emission rates in the past, presenting opportunities to analyze potential upgrades and/or fine-tuning of existing emissions control equipment.

For several of the sources, we note that replacing equipment with newer, higher control efficiency options may be cost-effective. This recommendation is also in line with guidance in the EPA July 2021 Clarification Memorandum, which states:

“Similarly, in some cases, states may be able to achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures. Considering efficiency improvements for an existing control (e.g., using additional reagent to increase the efficiency of an existing scrubber) as a potential measure is generally reasonable since in many cases such improvements may only involve additional operation and maintenance costs. States should generally include efficiency improvements for sources’ existing measures as control options in their four-factor analyses in addition to other types of emission reduction measures.” [Emphasis added.]

As discussed during our October 19, 2021 consultation call and presentation, we have seen several examples of cost analyses for scrubber upgrades, where improvements were found to be very cost-effective.

1.5 West Virginia contributions to visibility impairment in Shenandoah National Park

Among the VISTAS region states, West Virginia point sources have the greatest contribution to both sulfate and nitrate impairment in Shenandoah NP, a point which is not addressed in the WV SIP. (Note, VISTAS did not analyze individual state contributions for states outside of the VISTAS region.) WV emphasizes that “these areas will experience visibility improvements that are significantly better than those on the uniform rate of progress” and that contributions from other regions “are larger than home state contributions.”

In their July 2021 clarification, EPA states that when selecting sources, states should focus primarily on their in-state contributions to haze. Section 2.1 of the EPA Clarification Memo, states:

“In a source-selection process that relies on multi-state rankings of sources, impacts from large out-of-state sources can exceed the contributions from relatively smaller, but still important in-state sources. States should not use that fact to ignore selecting the

largest in-state sources. In applying a source selection methodology, states should focus on the in-state contribution to visibility impairment and not decline to select sources based on the fact that there are larger out-of-state contributors.”

We recommend that the WV SIP address the significance of WV emissions to impairment in Shenandoah NP by including information specific to Shenandoah NP in the SIP and considering emission reduction opportunities for the sources identified by the NPS.

2 Importance of NO_x emissions

During our October 19, 2021 consultation call with West Virginia, the NPS expressed concerns that the West Virginia draft SIP failed to address the increasing importance of ammonium nitrate on the 20% Most-impaired Days (MID) in NPS Class I areas by excluding NO_x emissions from the reasonable progress analyses. The impacted Class I areas in the VISTAS region include Shenandoah, Great Smoky Mountains and Mammoth Cave National Parks. Emission sources in West Virginia primarily impact Shenandoah NP, which is in northern Virginia and downwind from West Virginia.

To address this issue, the NPS recommends that the West Virginia Department of Environmental Protection (WVDEP) complete additional four-factor analyses that evaluates nitrogen oxide (NO_x) reduction opportunities for West Virginia point sources and include any cost-effective measures in their Reasonable Progress determinations. This request was documented in our May 14, 2021 technical feedback to the VISTAS region states.

The WVDEP did not accept these recommendations in their draft SIP for FLM review. Instead, the WV SIP concludes that “ammonium sulfate is the largest contributor to visibility impairment at the West Virginia Class I areas, and reduction of SO₂ emissions would be the most effective means of reducing ammonium sulfate.” With regard to this issue, the WV SIP:

- Recognized that ammonium nitrate contributions have increased for some Class I areas but determined that ammonium sulfate remains the dominant visibility impairment species through 2019. Based on this, it appears WV determined that it is appropriate to defer review of NO_x emissions until the next Regional Haze planning period.
- Concluded that WV EGUs are already “effectively controlled for NO_x” and therefore, it is not reasonable to request four-factor analyses for facilities that are already well-controlled.

We agree that sulfate is the dominant anthropogenic visibility impairing pollutant in Shenandoah and other VISTAS region Class I areas. We also appreciate West Virginia’s acknowledgement that the nitrate contribution to visibility impairment on the 20% most-impaired days has been increasing over the last decade at Shenandoah, Great Smoky Mountains and Mammoth Cave National Parks. However, we reaffirm our position that the nitrate contribution to visibility impairment is significant and should not be ignored. West Virginia should evaluate opportunities to reduce NO_x emissions from stationary sources in this Regional Haze planning period.

In Shenandoah NP, nitrate comprises up to 23% of total light extinction on the 20% Most-impaired (MID) during the most recent five-year period (2015-2019) and up to 31% of total light extinction in 2018, the annual period with the greatest nitrate fraction in recent years. On some days in 2018, nitrate pollution accounted for up to 50%-60% of the haze.

At Great Smoky Mountain NP, which is also impacted by WV facilities, nitrate comprises 17% of total light extinction on the 20% MID during the most recent five-year period (2015-2019) and up to 26% of total light extinction in 2018, the annual period with the greatest nitrate fraction in recent years. On some days in 2018, nitrate pollution accounted for up to 60% of the haze.

At Mammoth Cave NP, this trend is even more apparent, where nitrate comprises 32% of total light extinction on the 20% MID during the most recent five-year period (2015-2019) and up to 45% of total light extinction in 2018, the annual period with the greatest nitrate fraction in recent years. On some days in 2018, nitrate pollution accounted for up to 60% of the haze.

Our analysis of the Interagency Monitoring of Protected Visual Environments (IMPROVE) data and associated recommendation is supported by information in the Environmental Protection Agency's July 8, 2021 Memorandum, *Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period* (EPA Clarification Memo). In Section 2.2, the memo states:

“Consistent with the first planning period, EPA generally expects that each state will analyze sulfur dioxide (SO₂) and nitrogen oxide (NO_x) in selecting sources and determining control measures. In nearly all Class I areas, the largest particulate matter (PM) components of anthropogenic visibility impairment are sulfate and nitrate, caused primarily by PM precursors SO₂ and NO_x, respectively. A state that chooses not to consider at least these two pollutants in the second planning period should show why such consideration would be unreasonable, especially if the state considered both these pollutants in the first planning period. Regional offices are encouraged to work closely with states to ensure the bases for their decisions are sufficiently developed to demonstrate a reasonable analysis.”

WVDEP contends that, based on the monitoring data, as well as the VISTAS PSAT and EPA base year 2016 modeling results, “sulfate continues to be the primary driver of visibility impairment in most mandatory federal VISTAS Class I areas.” As documented in our May 14, 2021 response to VISTAS's states, the VISTAS PSAT modeling does not accurately reflect the recent nitrate contribution to extinction given the recent shift in the seasonal distribution of the 20% MID.² Regardless of this issue, we note that, based on the VISTAS PSAT results, point sources account for roughly one-third of modeled nitrate impact in Shenandoah and Great Smoky Mountains National Parks.³

² ...the 2011 modeling base year is significantly outdated and is no longer representative of current visibility impairment on the 20% MID. Because the subset of days that comprise the 20% MID are held constant between the modeled base year and future year (2028) in the VISTAS analysis, it is critically important to analyze whether the base year appropriately represents the current most impaired days. By selecting 2011, VISTAS states are biasing results toward summer months when sulfate concentrations are generally highest and nitrate concentrations are generally low. For this reason, it not surprising that they have concluded that nitrate will not be a concern in 2028. In fact, using the dates based on MID in 2011 and considering measurements from 2018 would suggest that nitrate was not important in 2018. Monitoring data at Mammoth Cave NP in 2018 show that Ammonium Nitrate was the single biggest contributor to light extinction on the worst visibility days sampled in that year.

³ Data pulled from the information provided in the “Stacked Bar S and N by Area_ADJ” tab of the excel spreadsheet “VISTAS PSAT Source Apportion Results April 2020.xlsm,” available at: <https://www.metro4-sesarm.org/content/task-7-source-apportionment-modelingtagging>. We are interpreting the non-EGU “tag” to include only point sources based on Table 3-3: Round 2 SESARM Defined Regional-Category Combination Tags provided in the VISTAS Task 7 Particulate Source Apportionment Technology Modeling Results Report.

The magnitude of NO_x emissions from stationary sources in West Virginia is significant (based on both current inventory information and 2028 projections). Stationary source NO_x is clearly within the state's purview to control. Reductions in NO_x emissions also result in co-benefits beyond visibility protection/improvement; NO_x emissions are precursors to ozone formation and contribute to deposition.

Again, we want to clarify that we are not recommending that the modeling analysis needs to be redone. Instead, WVDEP should supplement their approach with the current IMPROVE monitoring information described in the updated draft SIP and complete four-factor analyses of sources for potential NO_x controls at the facilities identified by the NPS during our October 19, 2021 consultation meeting. These facilities are listed in the introduction section above and addressed in detail below.

3 Detailed NPS feedback for specific sources

As addressed in Section 1.3 of this document, we recommend that WV conduct a review to determine whether the WV EGUs are “effectively controlled” for both SO₂ and NO_x and evaluate whether existing controls could be optimized based on demonstrated achievable rates or potential cost-effective upgrades. We also recommend that control equipment replacements are considered for the Pleasants Energy and Fort Martin facilities and that a four-factor analysis be completed for the Capitol Cement - Essroc Martinsburg Plant. Our recommendations are consistent with guidance in the July 2021 EPA Clarification Memorandum⁴, as well as our feedback to other VISTAS states, including Tennessee and North Carolina.

The NPS has conducted a preliminary analysis to determine whether the WV EGU facilities are already “effectively controlled” using publicly available information in Clean Air Markets

⁴ “Similarly, in some cases, states may be able to achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures. Considering efficiency improvements for an existing control (e.g., using additional reagent to increase the efficiency of an existing scrubber) as a potential measure is generally reasonable since in many cases such improvements may only involve additional operation and maintenance costs. States should generally include efficiency improvements for sources’ existing measures as control options in their four-factor analyses in addition to other types of emission reduction measures.” (Section 3.2)

“The underlying rationale for the “effective controls” flexibility is that if a source’s emissions are already well controlled, it is unlikely that further cost-effective reductions are available. A state relying on an “effective control” to avoid performing a four-factor analysis for a source should demonstrate why, for that source specifically, a four-factor analysis would not result in new controls and would, therefore, be a futile exercise. States should first assess whether the source in question already operates an “effective control” as described in the August 2019 Guidance. They should further consider information specific to the source, including recent actual and projected emission rates, to determine if the source could reasonably attain a lower rate. It may be difficult for a state to demonstrate that a four-factor analysis is futile for a source just because it has an “effective control” if it has recently operated at a significantly lower emission rate. In that case, a four-factor analysis may identify a lower emission rate (e.g., associated with more efficient use of the “effective existing controls”) that may be reasonable and thus necessary for reasonable progress. If a source can achieve, or is achieving, a lower emission rate using its existing measures than the rate assumed for the “effective control,” a state should further analyze the lower emission rate(s) as a potential control option.” (Section 2.3)

Division (CAMD) database. This analysis is addressed in the subsequent sections for individual facilities.

3.1 Monongahela Power Co. Pleasants Power Station

3.1.1 Pleasants Power station facility background

The Pleasants Power Station is a 1,368 megawatt (MW) bituminous coal-fired power station, formerly owned by Monongahela Power Company and now an asset of Energy Harbor, that consists of two coal-fired EGUs. The Pleasants Power Station is located at Willow Island, West Virginia. Both units at the facility are 657 MW opposed wall-fired boilers; Unit 1 went into service in 1978 and Unit 2 went into service in 1980.

Wet lime FGDs were installed when the facility was constructed and came online in 1979. They were upgraded in 2008 to route 100% of the effluent stream through the scrubbers. According to the company's analysis, the current scrubbing system at the facility achieves an SO₂ control efficiency of 92.5% and that the FGD systems are at maximum capacity. Low NO_x Burners (LNB) were installed in the 1990's and Selective Catalytic Reduction (SCR) was installed on both units in 2003.

Out of 494 coal-fired units in the CAMD database, when 2020 NO_x emission rates are ranked from best to worst performing (#1 = best), Unit 1 ranked #370 and Unit 2 ranked #379. When 2020 SO₂ emission rates are ranked from best to worst performing (#1 = best), Unit 1 ranked #356 and Unit 2 ranked #394. This indicates that the Pleasants units are not among the top ranking well-controlled coal fired EGUs.

Table 1. Pleasants Power Station Emissions Summary & Ranking

Facility Name	Unit ID	SO ₂ (tons)	Avg. SO ₂ Rate (lb/MMBtu)	Avg. SO ₂ Rate (lb/MMBtu) Rank	Avg. NO _x Rate (lb/MMBtu)	Avg. NO _x Rate (lb/MMBtu) Rank	NO _x (tons)
Pleasants Power Station	1	3,390	0.247	#356	0.194	#370	2,676
Pleasants Power Station	2	4,256	0.359	#394	0.1996	#379	2,328

3.1.2 SO₂ Controls at the Pleasants Power Station

As noted previously, Pleasants Power Station is the only WV source for which a four-factor analysis was completed to evaluate SO₂ controls. The analysis completed by Energy Harbor Generation only calculated costs to install new wet limestone scrubbers, similar to the systems currently installed (all options that eliminate gypsum production were not considered in a cost analysis). Energy Harbor estimated that the incremental cost effectiveness of a new wet limestone scrubber is \$11,293/ton for two scrubbers and \$9,932/ton for one scrubber. Based on their analysis, Energy Harbor determined, and WV agreed, that Limestone Scrubbing Forced Oxidation (LFSO) is not economically feasible to install. The company further argued that the

Class I areas that the Pleasants Power station impacts are all well below their respective “URP glide paths, demonstrating already implemented past emissions reductions measures have been and continue to be successful.”

We do not agree that the units at the Pleasants station are effectively controlled for SO₂ based on the current SO₂ emissions rates, the fact that they are only achieving 92.5% control efficiency (modern wet scrubbers can achieve control efficiencies of 98% or better) and the unit’s low performance rankings relative to other coal-fired EGUs. Furthermore, we found numerous errors in Energy Harbor’s cost analysis. These include (but are not limited to):

The analysis did not rely on the most recent version of the acid gas chapter of the Control Cost Manual.

- A 1.3 retrofit factor was assumed without additional justification. Additional supporting documentation should be provided for retrofit factors greater than 1.0.
- The assumed interest rate was not disclosed.
- The assumed equipment life was not disclosed, but based on Table 4.4.1, it appears a 20-year equipment life was assumed. Unless the facility intends to take a federally enforceable shutdown, a 30-year equipment life should be assumed in the cost analysis for the scrubbers. In practice, these systems often operate for 30+ years, as evidenced by the existing scrubbers on the Pleasants units, which have been in operation since 1979.
- The analysis assumed a 95% control efficiency, which is low for a new wet limestone scrubber.
- The analysis assumed a 3% sales tax. Most states do not leverage sales tax on pollution control equipment—is this the case in WV?

Given these issues, we revised cost analyses for the wet scrubbers and estimated the incremental cost effectiveness of scrubber replacement to be:

- Unit 1: \$7,534/ton for an additional 2,525 TPY additional SO₂ reduction
- Unit 2: \$5,336/ton for an additional 3,579 TPY additional SO₂ reduction

The summary results are presented in the Tables below. Detailed analyses are provided in the attached spreadsheets.

Table 2. Scrubber Replacement Cost Analysis for Pleasants Unit 1

Pleasants Power Station Unit #1 Scrubber Replacement		
New	Total Capital Investment (TCI) =	\$ 347,173,500
New	Indirect Annual Cost (IDAC) =	\$ 18,403,463
New	Direct Annual Cost =	\$ 23,908,205
Existing	Direct Annual Cost =	\$ 23,288,153
Incremental	Total Annual Cost (TAC) =	\$ 19,023,515
New	SO ₂ Removed =	85,347
Existing	SO ₂ Removed =	82,822
Incremental	SO ₂ Removed =	2,525
Incremental	Cost Effectiveness =	\$ 7,534

Table 3. Scrubber Replacement Cost Analysis for Pleasants Unit 2

Pleasants Power Station Unit #2 Scrubber Replacement		
New	Total Capital Investment (TCI) =	\$ 343,680,704
New	Indirect Annual Cost (IDAC) =	\$ 18,218,764
New	Direct Annual Cost =	\$ 25,844,191
Existing	Direct Annual Cost =	\$ 24,968,165
Incremental	Total Annual Cost (TAC) =	\$ 19,094,790
New	SO ₂ Removed =	95,187
Existing	SO ₂ Removed =	91,609
Incremental	SO ₂ Removed =	3,579
Incremental	Cost Effectiveness =	\$ 5,336

As noted during our presentation, the estimated incremental costs of scrubber upgrades at the Pleasants Power Station are within the average cost-effectiveness thresholds selected by other states in this round of RH planning⁵. We are seeing proposed average cost-effectiveness thresholds of up to \$10,000/ton (CO and OR), and expect to see most in the \$5,000 - \$7,000/ton range, with a number of states selecting a threshold between \$7,000 and \$10,000/ton. We recommend that West Virginia implement the cost-effective scrubber replacements at the Pleasant's facility in this round of RH planning.

3.1.3 NO_x Controls at the Pleasants Power Station

We conducted a preliminary analysis to determine whether the Pleasants units are already “effectively controlled” for NO_x using publicly available information in Clean Air Markets Division (CAMD) database. The last 13 years of emissions information for the Pleasants units demonstrate that lower NO_x emission rates are achievable with the existing LNB + SCR system. As shown in the graphs below, NO_x emission rates show a significant amount of variability, ranging from 0.094 lb/MMBtu to 0.245 on Unit 1 and from 0.073 lb/MMBtu to 0.401 lb/MMBtu on Unit 2. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.) We recommend that West Virginia evaluate and implement

⁵ Incremental cost-effectiveness thresholds are typically higher than average cost-effectiveness thresholds.

options to ensure consistent low NO_x emissions are achieved with the existing controls (e.g., permit limits, optimization of control efficiency).

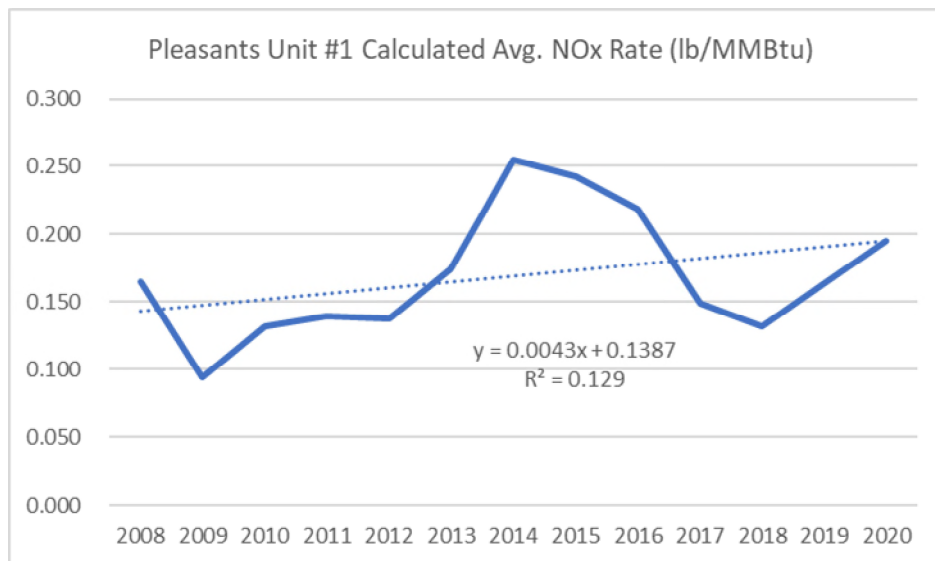


Figure 1. Calculated Average NO_x Rate for Pleasants Unit 1

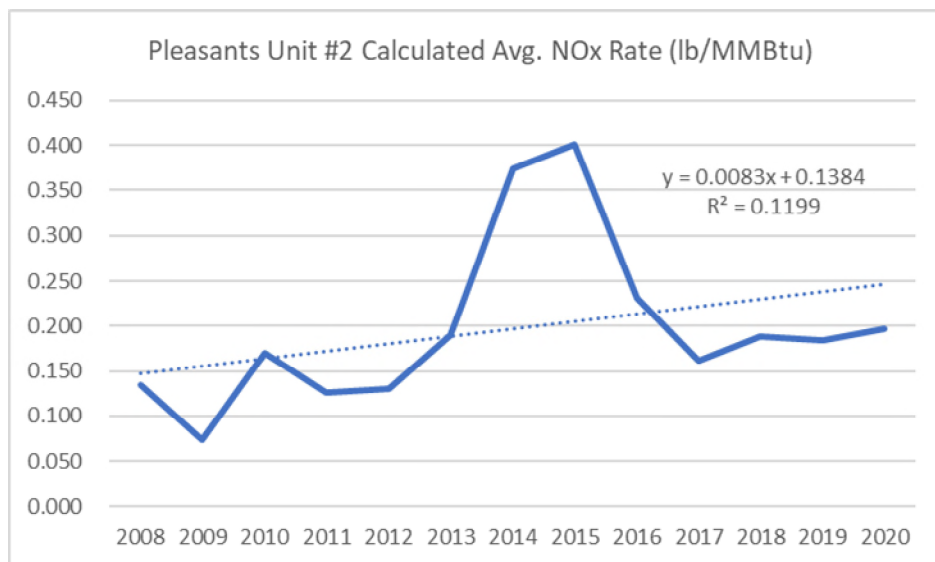


Figure 2. Calculated Average NO_x Rate for Pleasants Unit 2

3.1.4 NPS conclusions and recommendations for the Pleasants Power Plant

- Implement cost effective option to replace the existing aging SO₂ scrubbers with new, more efficient scrubbers.
- Evaluate and implement options to ensure consistent low NO_x emissions are achieved with the existing controls.

3.2 Monongahela Power Co. Fort Martin Power Plant

3.2.1 Fort Martin facility background

The Fort Martin Power Station is a 1,152 megawatt (MW) bituminous coal-fired power station owned and operated by Monongahela Power Company (MonPower), a subsidiary of First Energy through its subsidiary Allegheny Energy. The supercritical boilers are each rated at 576 MW. Unit 1 is a tangentially-fired boiler that went into service in 1967 and Unit 2 is a cell-burner boiler that went into service in 1968.

Selective Non-catalytic Reduction (SNCR) was added in 2000 to control NO_x and wet lime scrubbers came online in 2009. The wet scrubbers were upgraded prior to 2016 to comply with the MATS requirements. Out of 494 coal-fired units in the CAMD database, when 2020 NO_x emission rates are ranked from best to worst performing (#1 = best), Unit 1 at Fort Martin ranked #438 and Unit 2 ranked #437. When SO₂ emission rates are ranked from best to worst performing (#1 = best), Unit 1 ranked #244 and Unit 2 ranked #289.

Table 4. Fort Martin Power Station Emissions Summary & Ranking

Facility Name	Unit ID	SO ₂ (tons)	Avg. SO ₂ Rate (lb/MMBtu)	Avg. SO ₂ Rate (lb/MMBtu) Rank	Avg. NO _x Rate (lb/MMBtu)	Avg. NO _x Rate (lb/MMBtu) Rank	NO _x (tons)
Fort Martin Power Station	1	1,309	0.112	#244	0.2601	#438	3,116
Fort Martin Power Station	2	1,909	0.141	#289	0.2590	#437	3,670

3.2.2 SO₂ analysis for Fort Martin

Monongahela Power concluded, and West Virginia agreed, that neither a SO₂ four-factor analysis nor an SO₂ permit limit were necessary or appropriate for Fort Martin for regional haze purposes for the following reasons:

- VISTAS PSAT modeling predicted 2028 visibility is well below the URP glide paths for VISTAS Class I areas.
- ERTAC model emission predictions overestimate anticipated 2028 emissions from Fort Martin and thus the modeled visibility impacts from the facility are overstated.
- Fort Martin FGD systems demonstrated a 97.5% average removal efficiency for 2017 through 2019, which exceeds the 95% control deemed as BART by EPA.
- Fort Martin averaged 0.11 lb/MMBtu SO₂ emissions from 2015 through 2020. This is in compliance with the 0.2 lb/MMBtu SO₂ emission limit to comply with the MATS rule for coal-fired EGUs.
- Fort Martin is subject to and meets the limits of the CSAPR FIP, and EPA and the courts have previously determined CSAPR is better than BART. As such, additional SO₂ controls would be neither necessary nor economically feasible at Fort Martin.

We agree that the scrubber on unit 1 is capable of better than 97% control. In fact, based upon the chart below, unit 1 may have been achieving better than 98% control at 0.065 lb/mmBtu. We note that this unit should be capable of meeting 0.08 lb/mmBtu on an annual average basis.

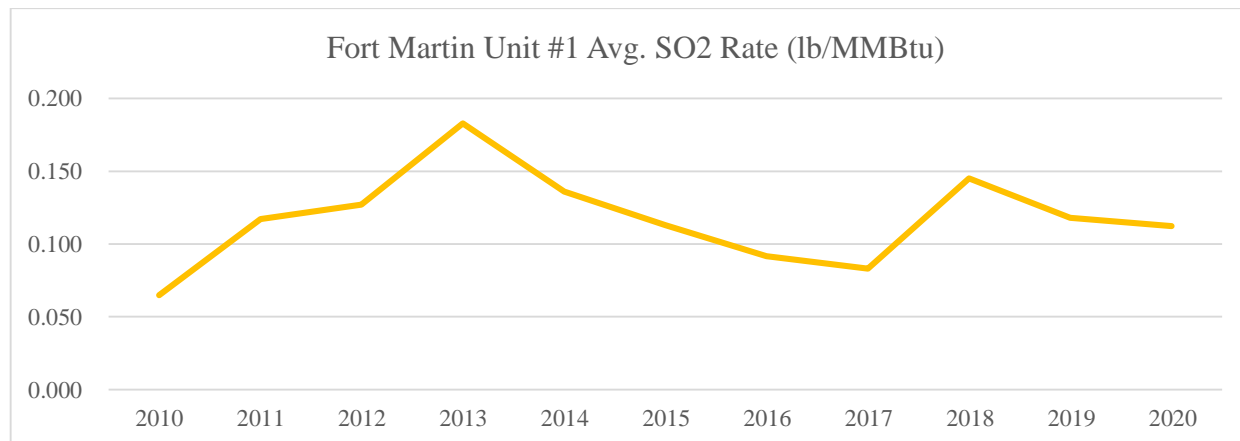


Figure 3. Calculated Average SO₂ Rate for Fort Martin Unit 1

We agree that the scrubber on unit 2 is capable of better than 97% control. In fact, based upon the chart below, unit 2 may have been achieving better than 99.5% control at 0.027 lb/mmBtu. We note that this unit should be capable of meeting 0.08 lb/mBmtu on an annual average basis.

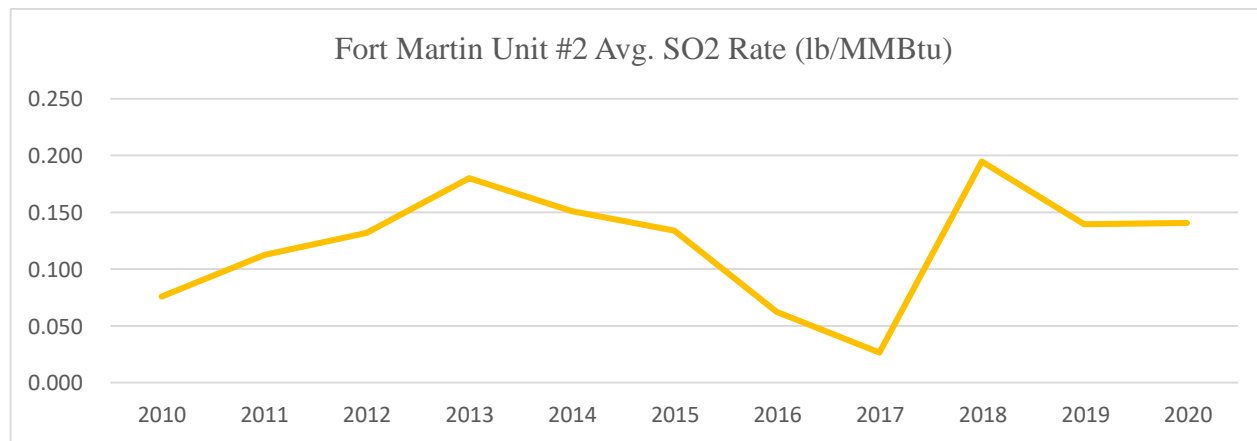


Figure 4. Calculated Average SO₂ Rate for Fort Martin Unit 2

3.2.3 NO_x analysis for Fort Martin

As noted above, West Virginia did not consider NO_x emission controls in their draft SIP, and therefore, there are no conclusions regarding potential NO_x controls or limits. We evaluated the replacement of the 12-year-old SNCR systems with modern Selective Catalytic Reduction (SCR) systems. We applied the CCM SNCR workbook to estimate the Direct Operating Costs that would cease with discontinuation and used the CCM SCR workbook to estimate those costs.

Table 5. NO_x Control Cost Analysis for Fort Martin Unit 1

SCR Indirect Annual Cost	\$ 9,324,882	/yr
SCR Direct Annual Cost	\$ 3,089,819	/yr
SNCR Direct Annual Cost	\$ 1,602,747	/yr
SCR Net Total Annual Cost	\$ 10,811,954	/yr
SCR Tons Removed	8,469	ton/yr
SNCR Tons Removed	5,070	ton/yr
SCR Net Tons Removed	3,399	ton/yr
SCR Cost Effectiveness	\$ 3,181	/ton

Table 6. NO_x Control Cost Analysis for Fort Martin Unit 2

SCR Indirect Annual Cost	\$ 9,462,878	/yr
SCR Direct Annual Cost	\$ 3,673,332	/yr
SNCR Direct Annual Cost	\$ 2,290,149	/yr
SCR Net Total Annual Cost	\$ 10,846,060	/yr
SCR Tons Removed	13,222	ton/yr
SNCR Tons Removed	10,218	ton/yr
SCR Net Tons Removed	3,003	ton/yr
SCR Cost Effectiveness	\$ 3,611	/ton

As shown in the tables above, replacement of the old SNCR systems with modern SCR could reduce NO_x emissions by 6400 tpy for well less than \$4000/ton each.

3.2.4 NPS conclusions and recommendations for Fort Martin

- SO₂ Controls: Permit limits should be established to ensure best operation and maintenance of the SO₂ scrubbers at 0.08 lb/MMBtu.
- NO_x Controls: The existing SNCR systems should be replaced with SCR. The NPS estimated these incremental costs are well within the range of average cost-effectiveness thresholds selected by other states and would reduce NO_x emissions from the Fort Martin facility by an additional 6,400 TPY.

3.3 Allegheny Energy Co. Harrison Plant

We conducted a preliminary analysis to determine whether the three units at the Harrison Plant are already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. Although NO_x emissions are fairly consistent, the last 25 years of emissions information for the Harrison units demonstrate that lower SO₂ emission rates are achievable with the existing wet lime scrubbers. As shown in the graphs below, SO₂ emission rates show a significant amount of variability, ranging from 0.074 lb/MMBtu to 0.324 on Unit 1 and from 0.059 lb/MMBtu to 0.326 lb/MMBtu on Unit 2 and from

0.048 lb/MMBtu to 0.294 lb/MMBtu on Unit 3. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistent low SO₂ emissions are achieved with the existing controls (e.g., permit limits, upgrades or other optimization options).

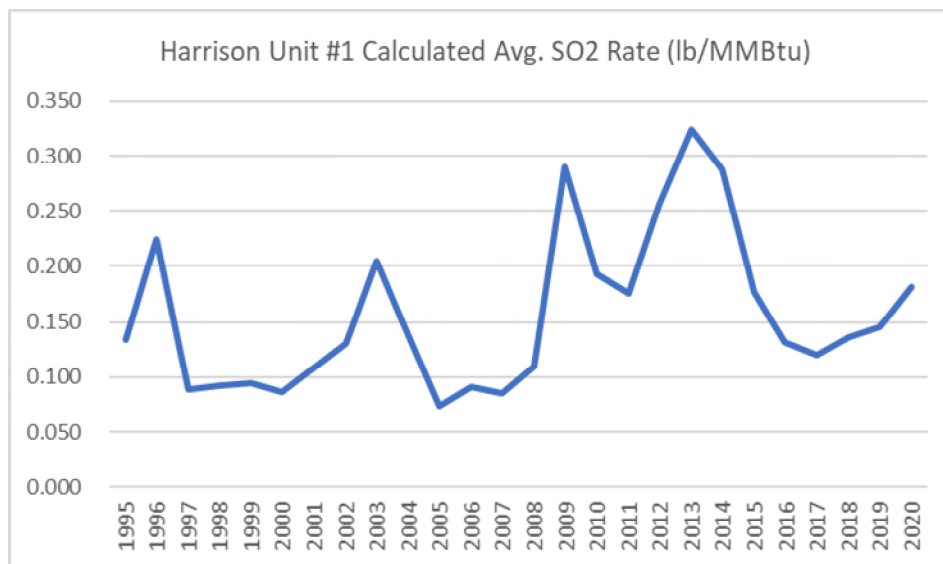


Figure 5. Calculated Average SO₂ Rate for Harrison Unit 1

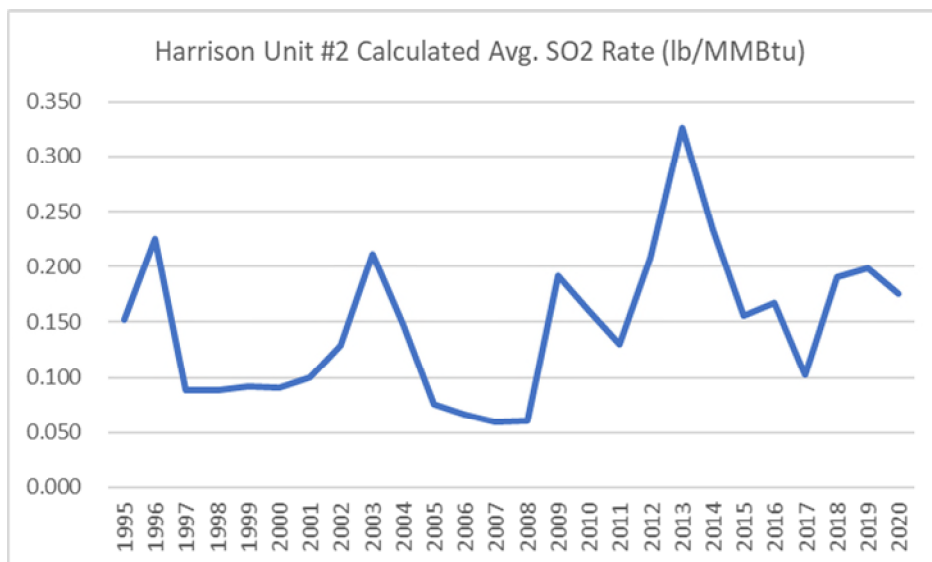


Figure 6. Calculated Average SO₂ Rate for Harrison Unit 2

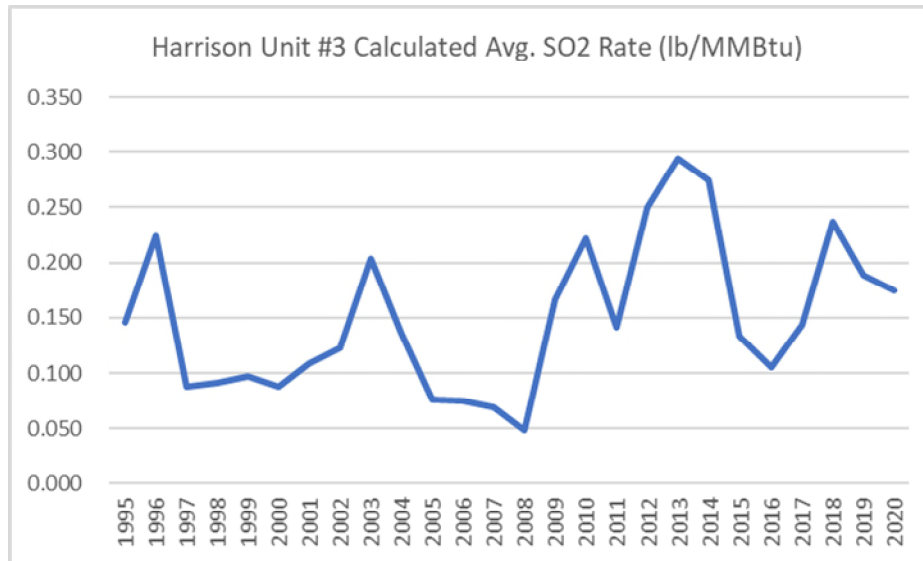


Figure 7. Calculated Average SO₂ Rate for Harrison Unit 3

3.4 Appalachian Power Co. John E Amos Plant

We conducted a preliminary analysis to determine whether the three units at the John E Amos Plant are already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. The last 10 to 12 years of emissions information for the John E Amos units demonstrate that lower SO₂ and NO_x emission rates are achievable with the existing wet limestone scrubbers and LNB+SCR controls, respectively. In fact, this information indicates an upward trend in SO₂ and NO_x emission rates over this time for the John E Amos units.

As shown in the graphs below, SO₂ emission rates show a significant amount of variability, ranging from 0.041 lb/MMBtu to 0.088 on Unit 1 and from 0.040 lb/MMBtu to 0.098 lb/MMBtu on Unit 2 and from 0.058 lb/MMBtu to 0.103 lb/MMBtu on Unit 3. Similar variability is seen in the NO_x emissions, ranging from 0.042 lb/MMBtu to 0.082 on Unit 1 and from 0.046 lb/MMBtu to 0.079 lb/MMBtu on Unit 2 and from 0.055 lb/MMBtu to 0.117 lb/MMBtu on Unit 3. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistently low SO₂ and NO_x emissions are achieved with the existing controls at the John E Amos facility (e.g., permit limits, upgrades or other optimization options).

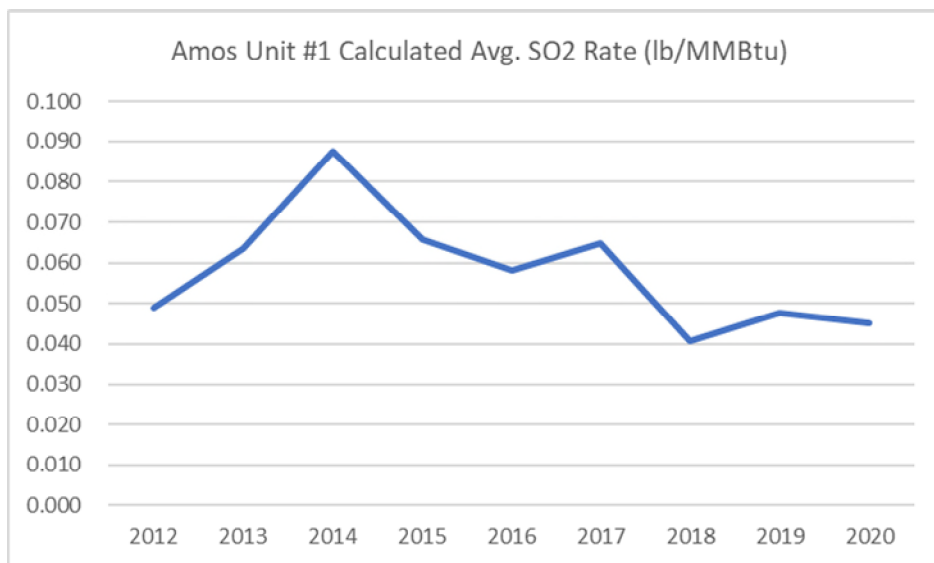


Figure 8. Calculated Average SO₂ Rate for Amos Unit 1

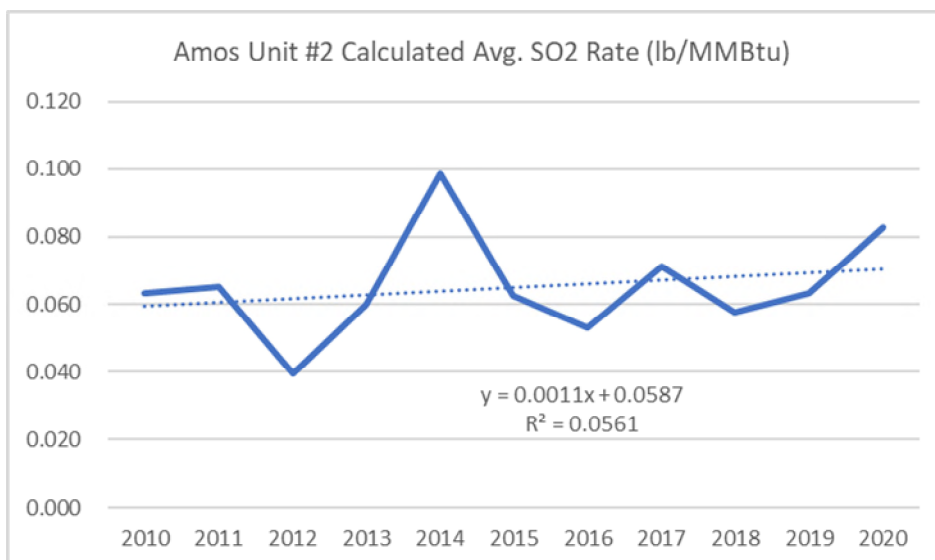


Figure 9. Calculated Average SO₂ Rate for Amos Unit 2

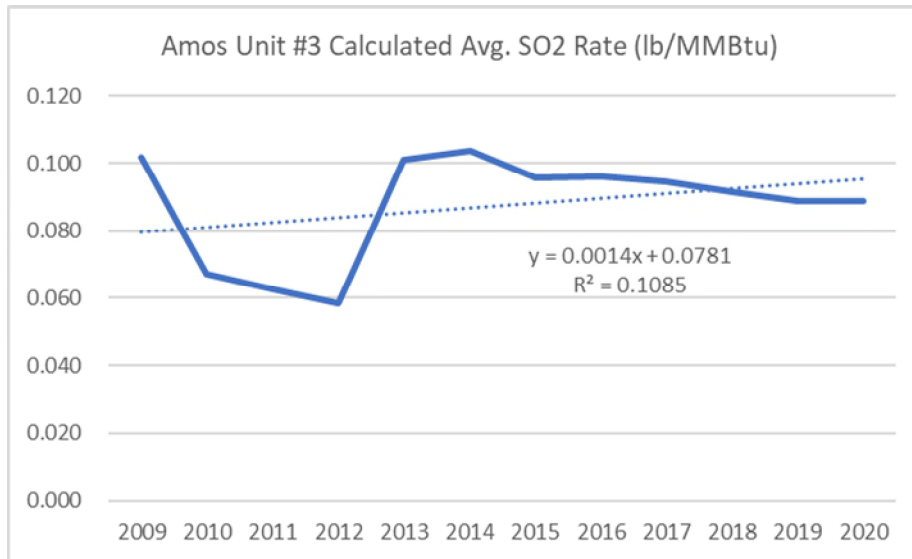


Figure 10. Calculated Average SO₂ Rate for Amos Unit 3

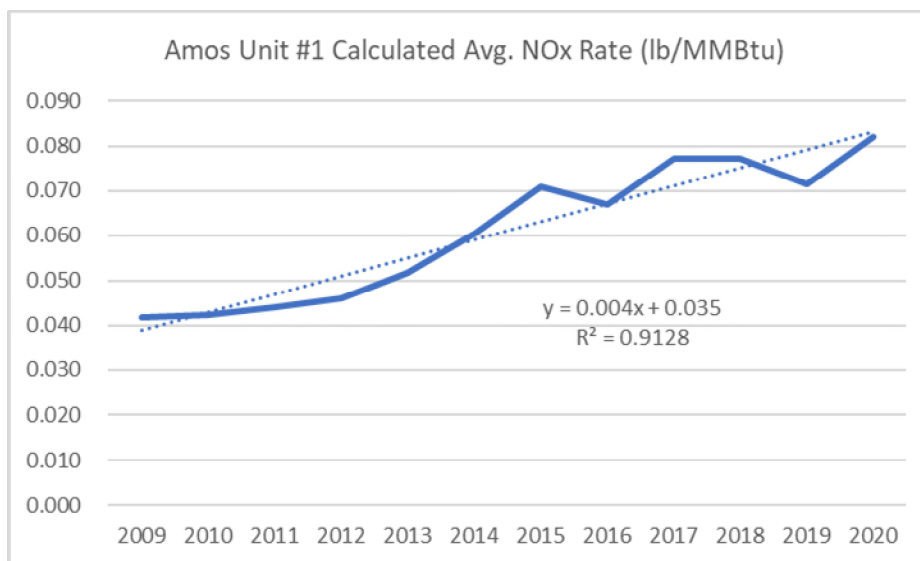


Figure 11. Calculated Average NO_x Rate for Amos Unit 1

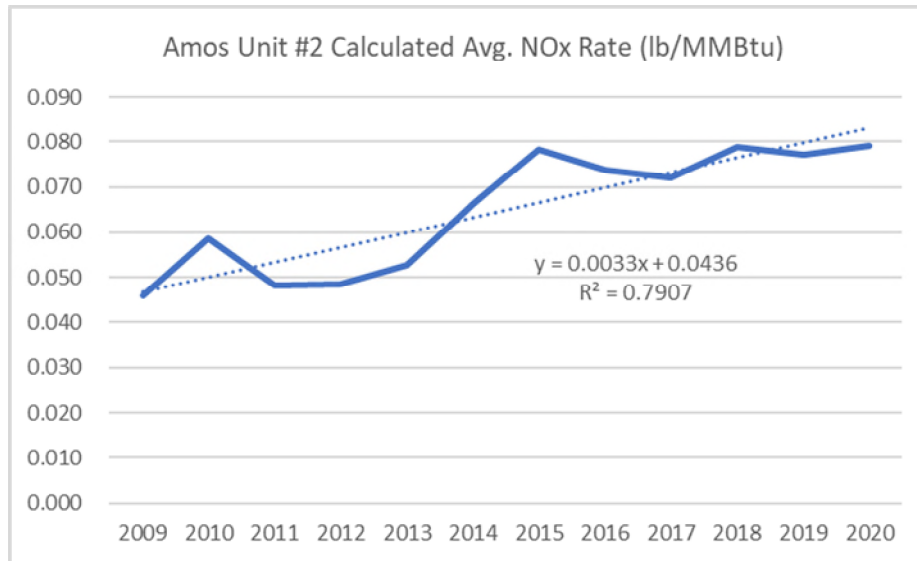


Figure 12. Calculated Average NO_x Rate for Amos Unit 2

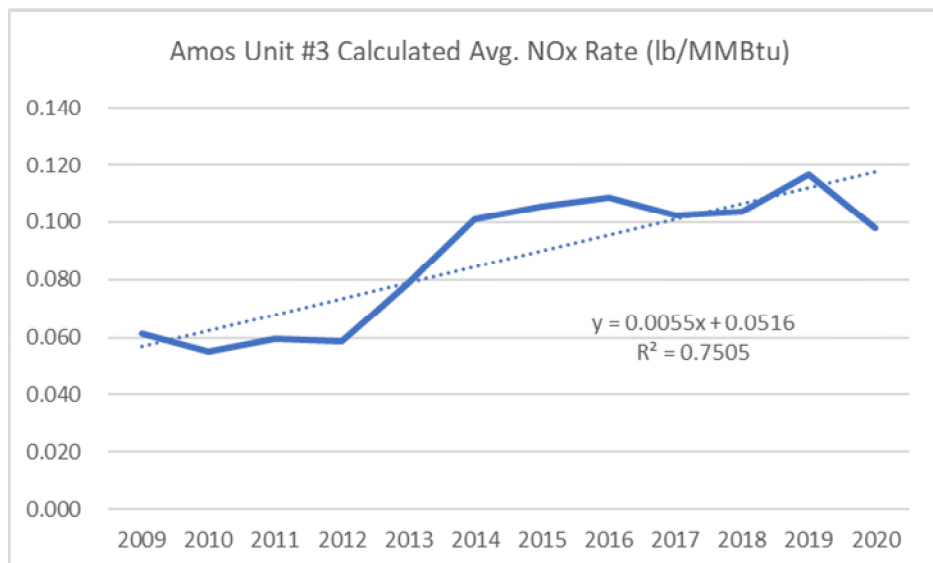


Figure 13. Calculated Average NO_x Rate for Amos Unit 3

3.5 Dominion Resources Mount Storm Power Station

We conducted a preliminary analysis to determine whether the three units at the Mount Storm Power Station are already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. Emissions information for the Mount Storm units demonstrate that lower SO₂ and NO_x emission rates are achievable with the existing wet limestone scrubbers and LNB+SCR controls, respectively. This information indicates there has been significant variability in SO₂ emissions since the scrubbers were installed on the units. There is an upward trend in NO_x emission rates over this time for Unit 2 and similar variability since NO_x controls were installed.

As shown in the graphs below, SO₂ emission rates show a significant amount of variability, ranging from 0.05 lb/MMBtu to 0.14 on Unit 1 and from 0.049 lb/MMBtu to 0.50 lb/MMBtu on Unit 2 and from 0.043 lb/MMBtu to 0.355 lb/MMBtu on Unit 3. Similar variability is seen in the NO_x emissions, ranging from 0.07 lb/MMBtu to 0.36 on Unit 1 and from 0.061 lb/MMBtu to 0.088 lb/MMBtu on Unit 2 and from 0.063 lb/MMBtu to 0.450 lb/MMBtu on Unit 3. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistently low SO₂ and NO_x emissions are achieved with the existing controls at the Mount Storm facility (e.g., permit limits, upgrades or other optimization options).

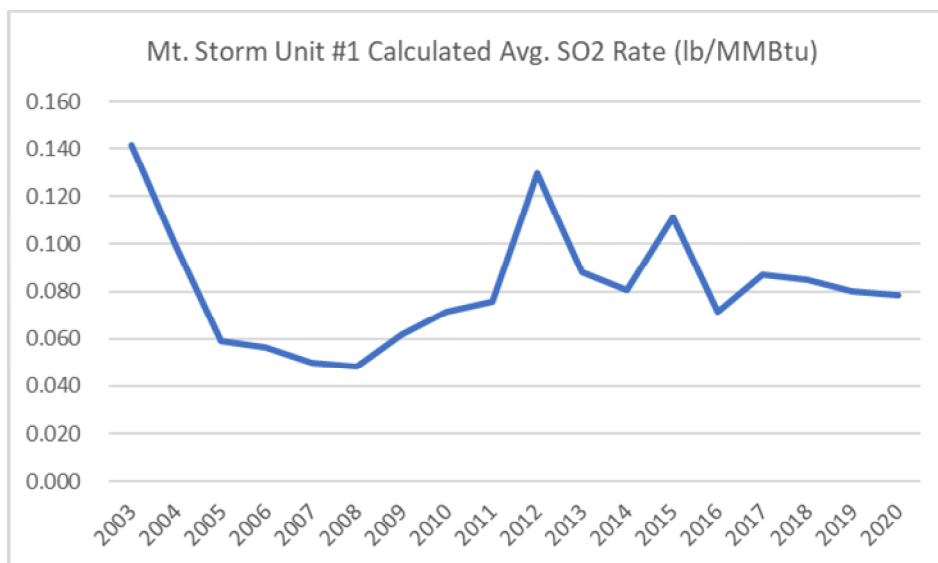


Figure 14. Calculated Average SO₂ Rate for Mt. Storm Unit 1

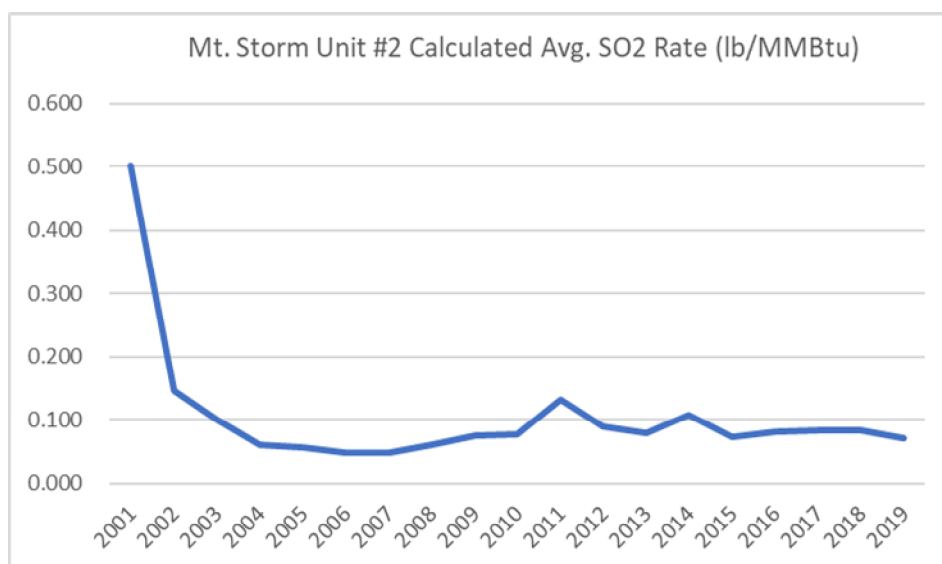


Figure 15. Calculated Average SO₂ Rate for Mt. Storm Unit 2

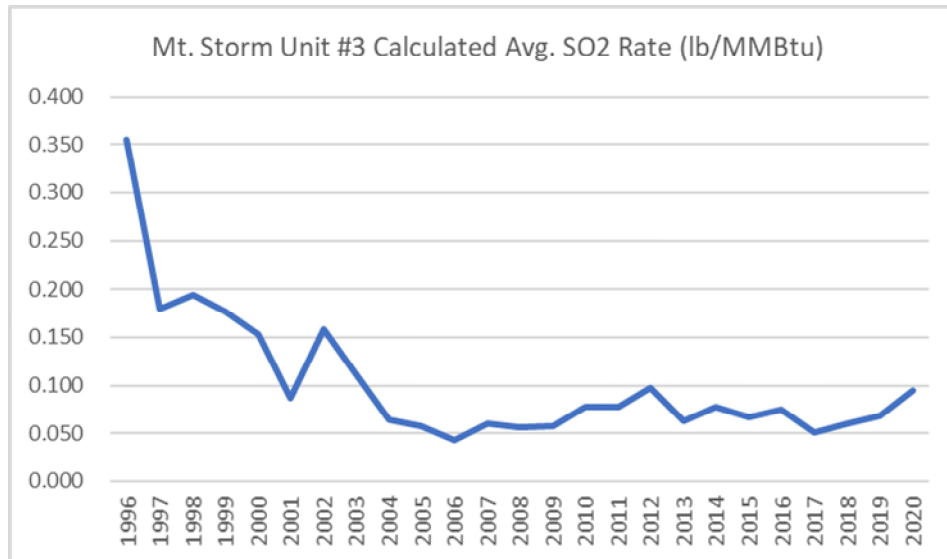


Figure 16. Calculated Average SO₂ Rate for Mt. Storm Unit 3

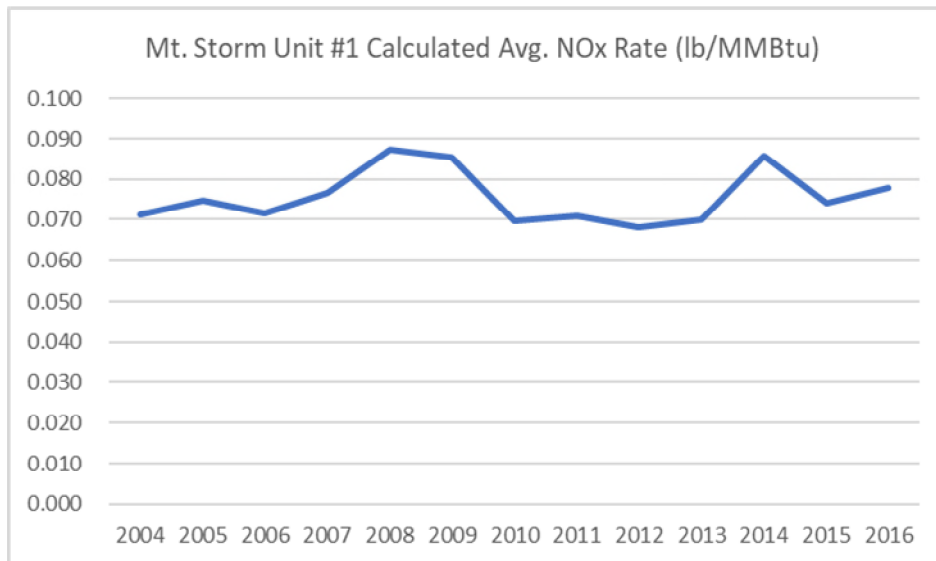


Figure 17. Calculated Average NO_x Rate for Mt. Storm Unit 1

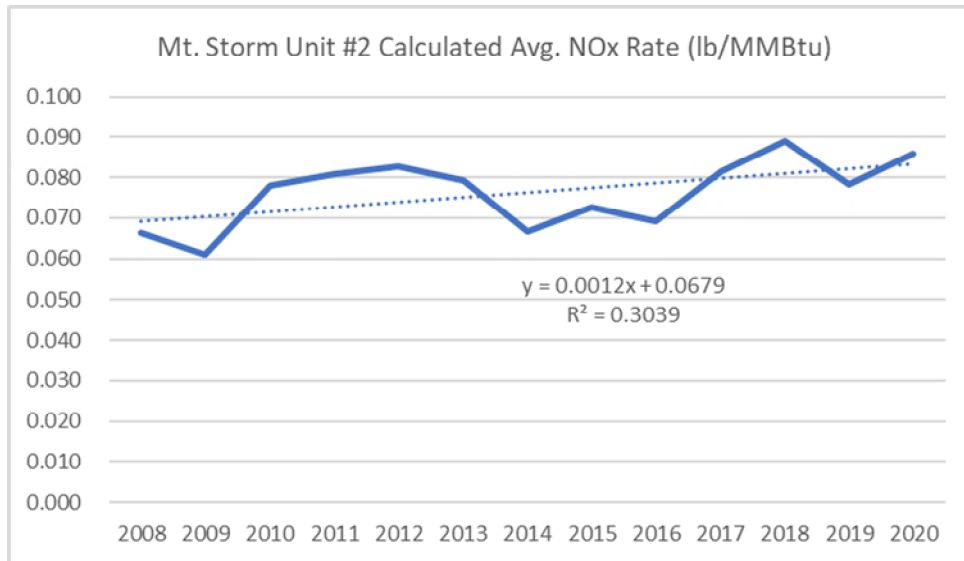


Figure 18. Calculated Average NO_x Rate for Mt. Storm Unit 2

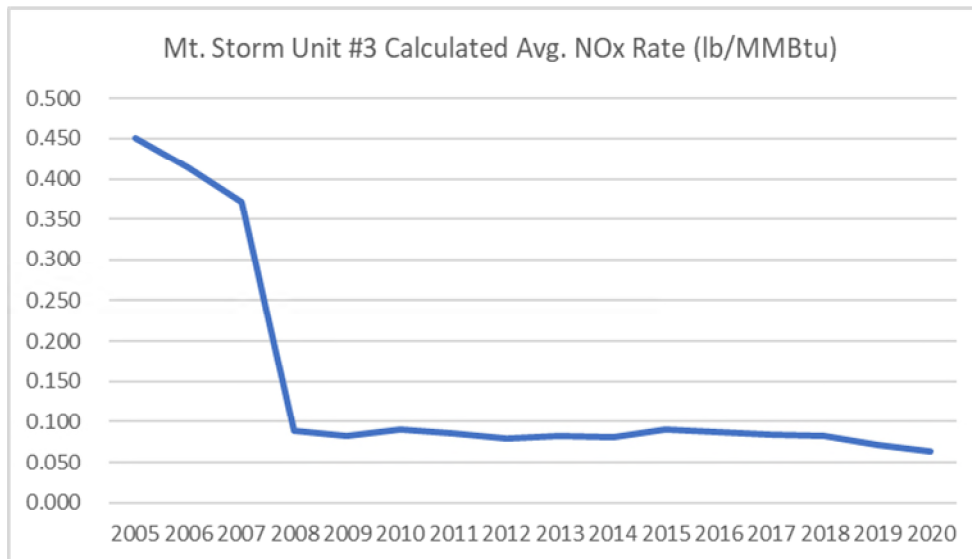


Figure 19. Calculated Average NO_x Rate for Mt. Storm Unit 3

3.6 American Electric Power Mitchell Plant

We conducted a preliminary analysis to determine whether the three units at the AEP Mitchell Plant are already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. Emissions trend information for the two wall-fired Mitchell coal-fired boilers demonstrates that lower SO₂ and NO_x emission rates are achievable with the existing wet limestone scrubbers and LNB+SCR controls, respectively. This information indicates there has been significant variability in SO₂ emissions since the scrubbers were installed on the Units in 2007. SCR was installed during the same time frame. There is an

upward trend in NO_x emission rates over this time for both Units since NO_x controls were installed.

As shown in the graphs below, SO₂ emission rates show a significant amount of variability, ranging from 0.041 lb/MMBtu to 0.118 on Unit 1 and from 0.041 lb/MMBtu to 0.110 lb/MMBtu on Unit 2. Similar variability is seen in the NO_x emissions, ranging from 0.049 lb/MMBtu to 0.088 on Unit 1 and from 0.048 lb/MMBtu to 0.089 lb/MMBtu on Unit 2. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistently low SO₂ and NO_x emissions are achieved with the existing controls at the Mitchell facility (e.g., permit limits, upgrades or other optimization options).

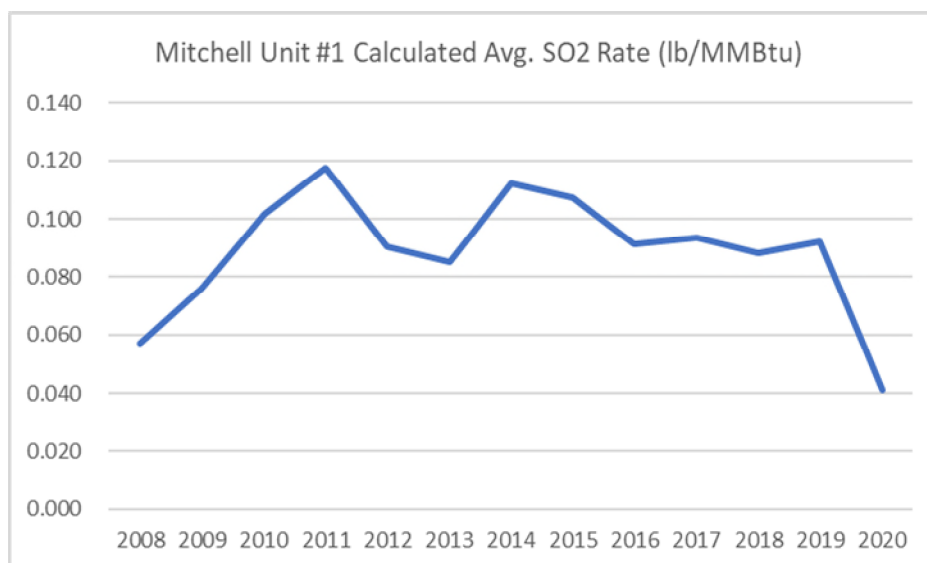


Figure 20. Calculated Average SO₂ Rate for Mitchell Unit 1

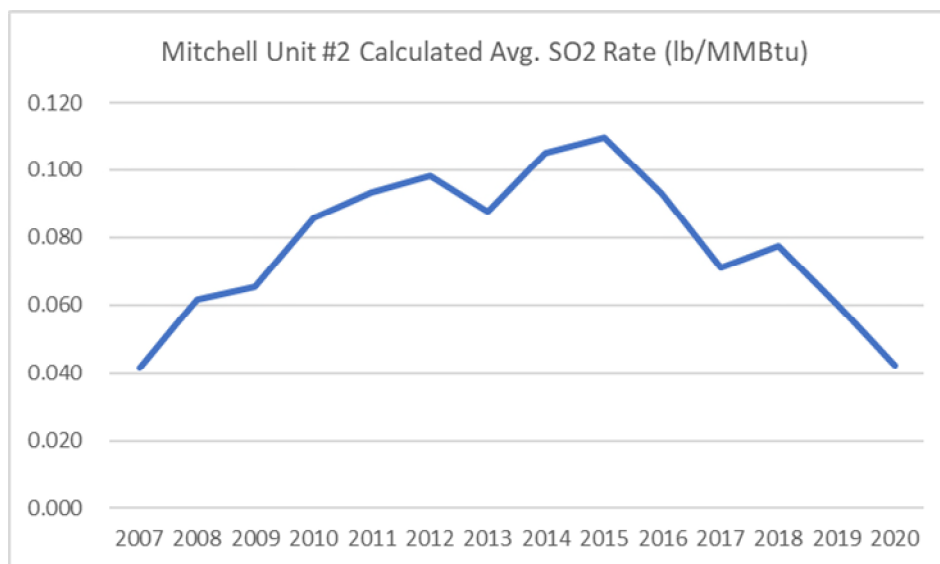


Figure 21. Calculated Average SO₂ Rate for Mitchell Unit 2

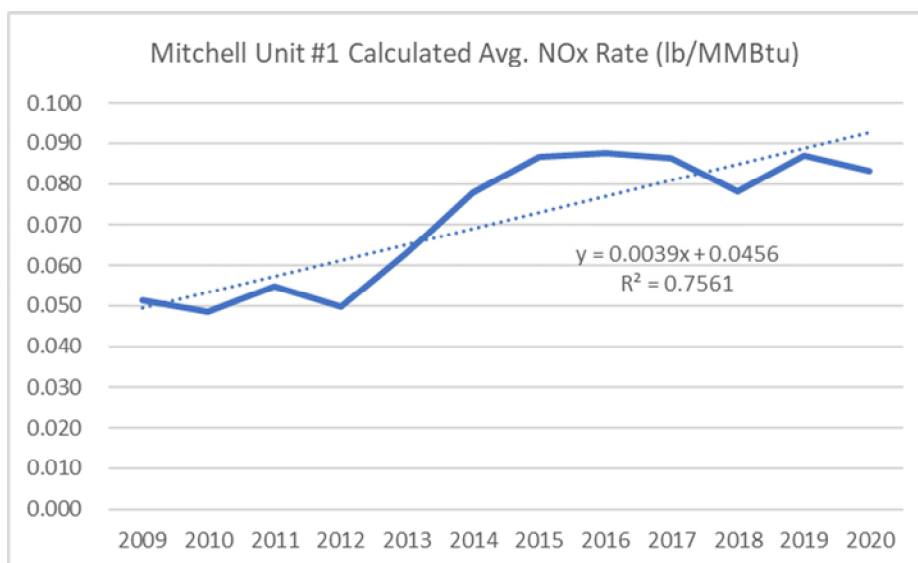


Figure 22. Calculated Average NO_x Rate for Mitchell Unit 1

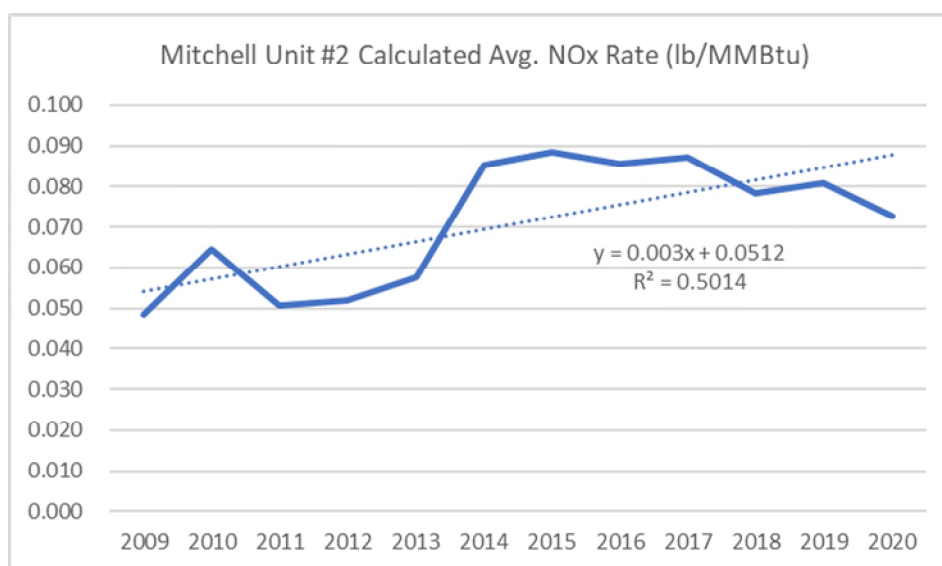


Figure 23. Calculated Average NO_x Rate for Mitchell Unit 2

3.7 American Bituminous Power Grant Town Plant

American Bituminous Power Partners L.P.'s Grant Town Power Plant consists of two (2) 551.9 MMBTU/hr coal refuse-fired circulating fluidized bed (CFB) boilers with a total output of 80 MWe. The boilers are designed to accommodate a variety of fuels, but the primary fuel is eastern bituminous coal refuse (gob) supplemented with pond fines. SO₂ control is achieved by injecting limestone directly into the CFB boilers to capture and remove SO₂. According to CAMD data, NO_x is controlled with a Selective Non-catalytic Reduction (SNCR) system. In the last five years average SO₂ emission rates have ranged from 0.346 lb/MMBtu to 0.481 lb/MMBtu on boiler 1A and 0.352 lb/MMBtu to 0.481 lb/MMBtu on boiler 1B. Average NO_x emission rates have ranged

from 0.303 lb/MMBtu to 0.327 lb/MMBtu on boiler 1A and 0.300 lb/MMBtu to 0.327 lb/MMBtu on boiler 1B. West Virginia did not request a four-factor analysis for this facility for several reasons:

1. The Grant Town Plant is meeting the SO₂ MATS limit (which is higher for refuse coal boilers) of 0.60 lb/MMBtu.
2. To comply with MATs, Grant Town accepted an annual SO₂ emission rate limit of 0.46 lbs/mmBtu or a potential-to-emit of 2,206.5 tons per year in its Title V permit (R30-04900026-2020(SM01)).
3. West Virginia noted that future emissions are likely to be lower. They scaled the PSAT results according to a reduced/scaled AOI and then a calculated AOI to PSAT scaling factor (which is a factor of three) to reduce the PSAT result below the 1% threshold.

We note several issues in WVDEP's analysis for Grant Town. First it is unclear why WVDEP would scale the PSAT results using the AoI to PSAT ratios rather than simply applying a ratio of the emissions reduction to the facility PSAT contribution (in Mm⁻¹).

Second, based on CAMD data, we note that in the last five years, the maximum average SO₂ emission rate was 0.481 lb/MMBtu for both boilers and occurred in 2016. This emission rate is just above the recent 2020 permit limitation accepted by Grant Town of 0.46 lb/MMBtu. Annual facility wide SO₂ emissions in 2016 were 2,370 TPY. If you reduce the 2016 annual emissions by the ratio of the permit limit to the maximum emission rate for 2016 (0.46/0.48), the annual emissions at the facility would be 2,271 TPY SO₂. This is similar to the revised annual limit of 2,207 TPY, indicating that Grant Town may operate up to their newly permitted limits if they continue operate as they have in the recent past. Therefore, it is reasonable to assume that the facility would operate at or just below their revised annual allowable SO₂ limit.

We note that both the revised annual limit (and the approximate ratioed limit) are similar to what was modeled for 2028 in the VISTAS PSAT runs (2,210 TPY). Therefore, notwithstanding our concerns regarding the VISTAS 1% threshold (see Sections 1 and 2 above), we do not think WVDEP's rationale for "screening" the Grant Town Plant is appropriate.

Based on information available in CAMD, emission rates from the Grant Town waste coal-fired combustion facility are high relative to other waste coal-fired boilers. (We note that not all the information necessary to run rough/approximate cost analyses was available in CAMD.)

Table 7. Grant Town Power Station Emissions Summary & Ranking

State	Facility Name	Facility ID (ORISPL)	Unit ID	Year	SO ₂ (tons)	Avg. SO ₂ Rate (lb/MMBtu)	Avg. NO _x Rate (lb/MMBtu)	NO _x (tons)
PA	Scrubgrass Generating Plant	50974	2	2018	463	0.283	0.152	244
PA	Scrubgrass Generating Plant	50974	1	2018	412	0.253	0.146	229
PA	Mt. Carmel Cogeneration	10343	SG-101	2018	456	0.203	0.065	144
PA	St. Nicholas Cogeneration Project	54634	1	2018	1,064	0.191	0.057	305
PA	Gilberton Power Company	10113	31	2018	348	0.174	0.089	180
PA	Gilberton Power Company	10113	32	2018	341	0.174	0.089	177
PA	Northampton Generating Plant	50888	NGC01	2018	125	0.100	0.083	112

We request that WV DEP provide a four-factor analysis of SO₂ and NO_x emission reduction measures for the Grant Town Plant. In addition, we have the following questions we would like WVDEP to address:

- Based on an April 6, 2021 Fact Sheet, Final Significant Modification Permitting Action Under 45CSR30 and Title V of the Clean Air Act, permit number R30-04900026-2020 for the Grant Town Plant, it appears that the company was approved to increase potential SO₂ emissions (PTE) by 211.88 tons/year from 1,994.6 TPY to 2,206.5 TPY. Was a PSD permit required for this significant modification?
- Although the annual limit (in TPY) in the referenced fact sheet matches the annual limit (in TPY) reported in the draft SIP, we cannot find the 0.46 lb/MMBtu limit referenced in the draft SIP in the most recent Title 5 permits available online. Can you please clarify how this limit will be applied and over what averaging period?

3.8 Longview Power

We conducted a preliminary analysis to determine whether the single wall-fired boiler at the Longview Power Plant is already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. SO₂ is controlled with a wet limestone scrubber and NO_x emissions are controlled with LNB+SCR. Emissions trend information for the single wall-fired Longview coal-fired boiler demonstrates that lower SO₂ emission rates are achievable with the existing wet limestone scrubber. This information indicates there has been significant variability in SO₂ emissions since the scrubbers came online with the facility with a general upward trend in SO₂ emissions. NO_x emission rates over this time have remained fairly consistent, between 0.060 and 0.064 lb/MMBtu.

As shown in the graphs below, SO₂ emission rates show a general upward trend, ranging from 0.051 lb/MMBtu to 0.094 lb/MMBtu on the single unit at the Longview facility. NO_x emissions are fairly consistent. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistently low SO₂ are achieved with the existing controls at the Longview facility (e.g., permit limits, upgrades or other optimization options).

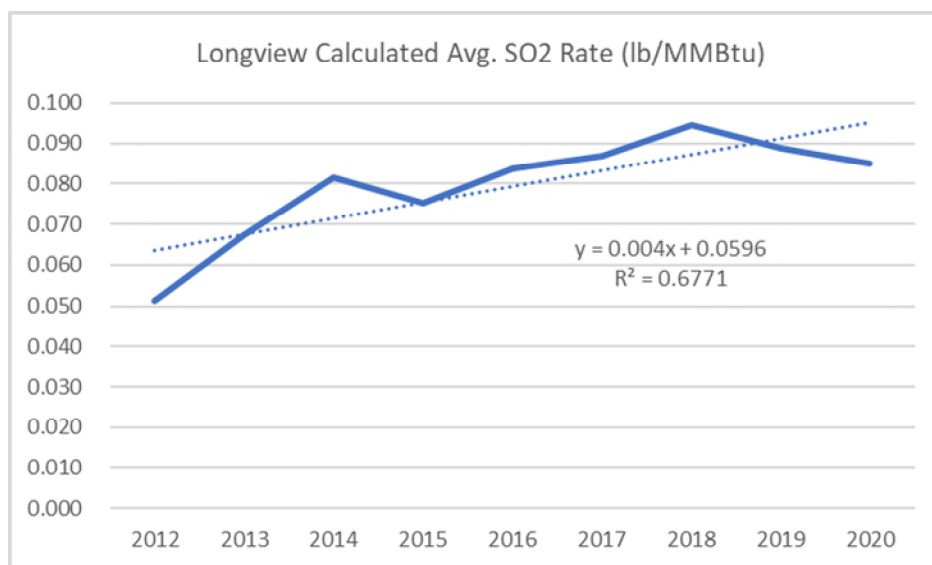


Figure 24. Calculated Average SO₂ Rate for Longview

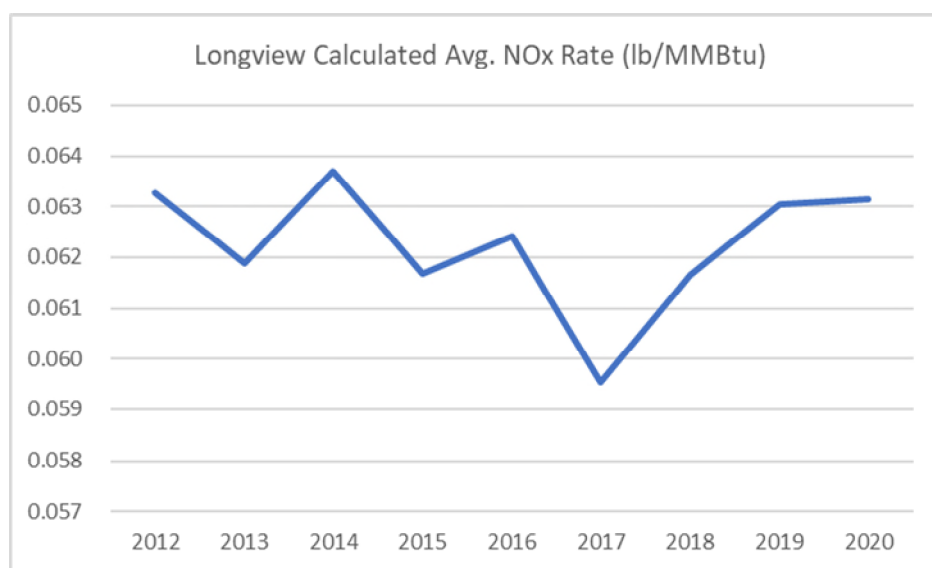


Figure 25. Calculated Average NO_x Rate for Longview

3.9 Appalachian Power Co. Mountaineer Plant

We conducted a preliminary analysis to determine whether the single wall-fired coal boiler at the Mountaineer Power Plant is already “effectively controlled” for SO₂ and NO_x using publicly available information in Clean Air Markets Division (CAMD) database. SO₂ is controlled with a wet limestone scrubber and NO_x emissions are controlled with LNB+SCR. Emissions trend information for the single wall-fired Longview coal-fired boiler demonstrates that lower SO₂ emission rates are achievable with the existing wet limestone scrubber. This information indicates there has been significant variability in SO₂ emissions since the scrubbers came online

with the facility with a general upward trend in SO₂ emissions. NO_x emission rates over this time have remained fairly consistent, between 0.060 and 0.064 lb/MMBtu.

As shown in the graphs below, SO₂ emission rates show a general upward trend, ranging from 0.028 lb/MMBtu to 0.131 lb/MMBtu on the single unit at the Longview facility. NO_x emissions also show a general upward trend, ranging from 0.054 lb/MMBtu to 0.098 lb/MMBtu on the single unit at the Mountaineer facility. (The underlying data and analysis are provided in the attached spreadsheet, WV CAMD_updated_10-19-21.xlsx.)

We recommend that West Virginia evaluate and implement options to ensure consistently low SO₂ and NO_x emissions are achieved with the existing controls at the Mountaineer facility (e.g., permit limits, upgrades or other optimization options).

3.10 Capitol Cement - Essroc Martinsburg Plant

The Argos/Essroc cement manufacturing facility is located approximately 60 km north of Shenandoah NP. The plant is a significant source of NO_x and SO₂ emissions and as such, it has the potential to impact visibility in the Shenandoah. This facility was not tagged in the VISTAS PSAT modeling because WVDEP did not tag facilities for Class I areas outside of West Virginia. The VISTAS AOI inventory assumed future year 2028 emissions of 1,007 TPY NO_x and 537 TPY SO₂, which is significantly lower than the permitted potential to emit (PTE) for this facility. Based on a 2018 minor modification to the Title five permit, PTE limits are as follows:

- 4,042 tpy of NO_x
- 4,518 tpy of SO₂
- 585 tpy of PM₁₀

The primary source of emissions at the facility preheater/precalciner (PH/PC) kiln system, which combusts primarily coal and petcoke, but is also permitted to combust some petroleum contaminated soil. The nominal capacity of the plant is 2,212,890 short tons (tons) per year of clinker. Argos uses approximately 292,110 tons of coal annually and fly ash from electric power plants.

Given both the proximity of this facility to Shenandoah NP, coupled with the current actual emissions and the significant allowable emissions for SO₂ and NO_x, we recommend that a four-factor analysis be completed for this facility for Shenandoah NP. We would like to better understand what emission control units are currently in place and what operating limits/control efficiencies are associated with those controls.



west virginia department of environmental protection

Appendix F-3q

United States Forest Service Consultation: Written Comments on West Virginia Pre-Draft Regional Haze SIP October 26, 2021

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment



File Code: 2580
Date: October 26, 2021

Laura Crowder
Director, Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Dear Laura Crowder:

On August 27, 2021, the State of West Virginia submitted a draft Regional Haze State Implementation Plan describing your proposal to continue improving air quality by reducing regional haze impacts at mandatory Class I areas across the region. We appreciate the opportunity to work closely with your State through the initial evaluation, development, and subsequent review of this plan. Cooperative efforts such as these ensure that, together, we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at our Class I areas.

This letter acknowledges that the U.S. Department of Agriculture, U.S. Forest Service, has received and conducted a substantive review of your proposed Regional Haze State Implementation Plan. This review satisfies your requirements under the federal regulations 40 C.F.R. § 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination about the document's completeness, and therefore, only the EPA has the authority to approve the document.

We have attached comments to this letter based on our review. We look forward to your response required by 40 C.F.R. § 51.308(i)(3). For further information, please contact Jeremy Ash (jeremy.ash@usda.gov) at 828-244-4751.

Again, we appreciate the opportunity to work closely with the State of West Virginia. The Forest Service compliments you on your hard work and dedication to significant improvement in our nation's air quality values and visibility.

Sincerely,

SHAWN COCHRAN
Forest Supervisor

cc: Joby Timm; Shawn Olson; James Gries; Jeremy Ash



West Virginia Draft Regional Haze State Implementation Plan (RH SIP) - Specific Comments

The USDA Forest Service recognizes the significant emission reductions of nitrogen oxides (NO_x) and sulfur dioxide (SO₂) made in West Virginia in the last 15 years due to economic and regulatory drivers. These reductions directly led to measured visibility improvement and numerous other air quality related benefits at Dolly Sods and Otter Creek Wilderness Areas, as well as other nearby USDA Forest Service Class I areas over that time.

Overall, the USDA Forest Service finds that the draft RH SIP is well organized. The Long-Term Strategies for this planning period appear to indicate that Forest Service Class I Areas will continue to show visibility improvements better than the Uniform Rate of Progress (URP) through 2028, and we appreciate the commitment by West Virginia Department of Environmental Protection, Division of Air Quality (WV DAQ) to evaluate progress in meeting the visibility goals during the 5-year progress reports. However, we offer these specific comments on the draft RH SIP for WV DAQ review and consideration.

Source Selection

Section 7.6 of WV's draft RH SIP discusses the methodology that WV DAQ used to determine which sources to consider for reasonable progress analysis. A source was selected for reasonable progress evaluation and potential four-factor analysis if the facility was estimated to have a $\geq 1.00\%$ sulfate or nitrate contribution to visibility impairment in 2028 at Dolly Sods or Otter Creek Wilderness Areas. This process resulted in fifteen facilities for the Dolly Sods Wilderness Area and fourteen facilities for the Otter Creek Wilderness Areas being selected for further evaluation. Of these, six facilities were put forward for reasonable progress evaluation. Forest Service understands and recognizes that EPA has afforded states the flexibility to screen facilities for additional analysis if that screening is based on reasonable methods. For the facilities not brought forward for additional reasonable progress evaluation, we ask that WV DAQ ensures that any emission values used to justify this decision are indeed federally enforceable and reflected in their current permits.

Evaluation of Nitrogen Oxide Emission Sources for Additional Controls

The draft RH SIP only evaluates SO₂ emission sources for four-factor analyses. USDA Forest Service appreciates the discussion within the draft RH SIP regarding nitrate formation in the VISTAS region. We understand that nitrate formation in the VISTAS region is limited by the availability of ammonia (which preferentially reacts with SO₂ and sulfates before reacting with NO_x) and by temperature, with particulate nitrate concentrations highest in the winter months. We also recognize that sulfates have been the main contributor to visibility impairment at Class I Areas within the southern US. However, Table 7-10 and 7-11 in the draft SIP show that the largest percentage of NO_x impacts on visibility at Dolly Sods and Otter Creek Wilderness Areas are from the point sector. Additionally, nitrate contribution to visibility impairment is increasing as sulfur dioxide emissions decrease, and there are still significant NO_x sources within the point sector in WV. IMPROVE monitoring data from Dolly Sods Wilderness Area (also used as a surrogate for nearby Otter Creek Wilderness Area) show that some of the highest rates of light extinction from ammonium nitrate have occurred within the last several years (Figure 1).

Incremental progress towards achieving 2064 goals will be increasingly challenging as the regional haze program progresses and requires a comprehensive evaluation of emission control strategies for both NO_x and SO₂ (see below for comments on lack of four-factor analyses and emissions controls for SO₂). We feel that not including NO_x in the reasonable progress analysis is a missed opportunity to pursue real

progress towards the 2064 goal. We request that WV DAQ consider evaluating NO_x sources, along with SO₂ sources, for reasonable progress during this planning period.

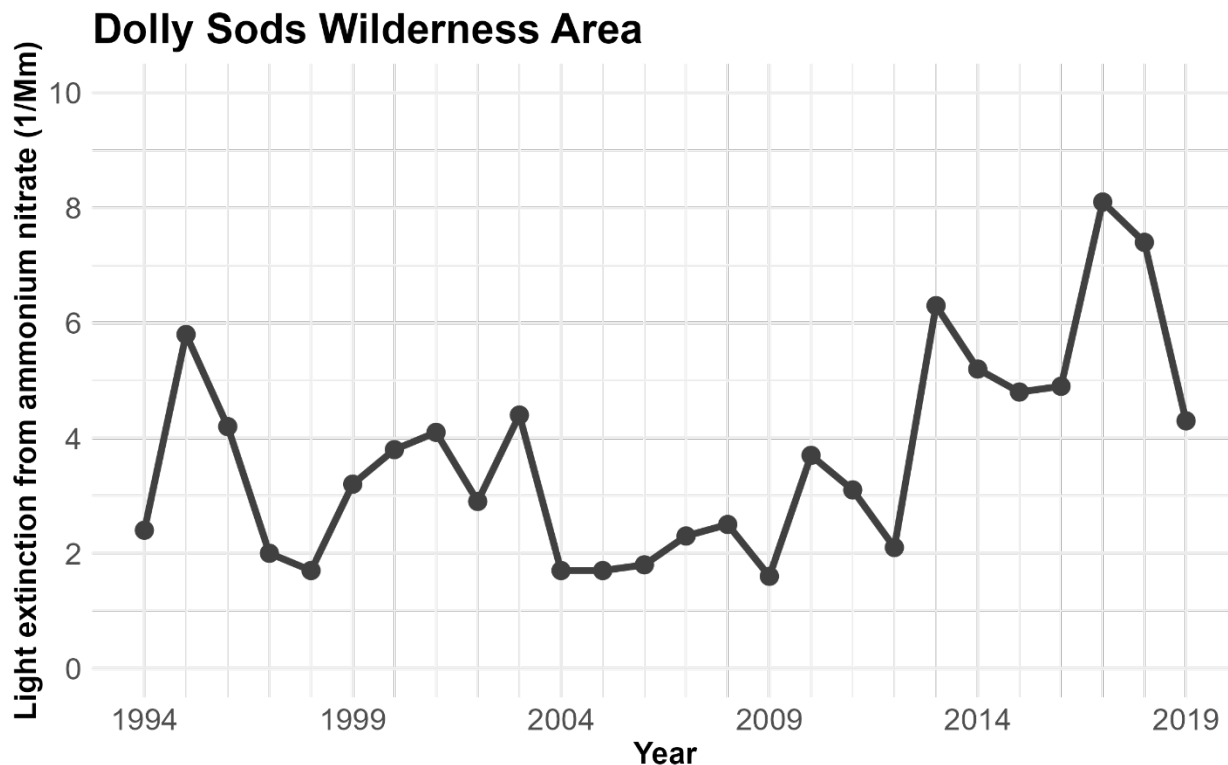


Figure 1. IMPROVE monitoring data from Dolly Sods Wilderness Area showing light extinction from ammonium nitrate (data retrieved from: <https://views.cira.colostate.edu/fed/>).

The Relevance of the Four Factors Versus Other Required Elements of Regional Haze Plans

As discussed above in the *Source Selection* section, six facilities were brought forward in the reasonable progress evaluation, but only one facility submitted a four-factor analysis for possible SO₂ control technology. A variety of reasons were presented for facilities not submitting four-factor analyses, but two consistent rationales used in the draft SIP were WV Class I areas being below the Uniform Rate of Progress (URP) glide path and that SO₂ emissions were already in compliance with other rules (e.g., MATS).

On using the URP as justification to avoid doing a four-factor analysis, we believe this is a misunderstanding of the rule. Potential visibility improvements should not be included as a “fifth factor” in the analyses, as there is no basis for doing so in the Clean Air Act. Reasonable progress goals (RPGs) and the long-term strategy (LTS) are separate plan elements (see 40 CFR Section 51.308 (d)). RPGs are established through the application of the four factors at 40 CFR Section 51.308 (d)(1):

- costs of compliance,

- the time necessary for compliance,
- the energy and non-air quality environmental impacts of compliance, and
- the remaining useful life

The regulation states “The long-term strategy must include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.”¹ In a sense, the LTS is a container for the result of the four-factor analyses that makes them enforceable. It also contains other measures taken by the state to achieve the RPGs. The rule does not allow states to dismiss controls that are otherwise reasonable simply because Class I area visibility is below the uniform rate of progress.

In the preamble to the final EPA Regional Haze Rule², EPA discusses these concepts (emphasis added).

*Under 40 CFR 51.308(f)(ii), states must **develop their long-term strategies by identifying reasonable progress measures using the four factors** and engaging in interstate consultation. Once their strategies have been developed, states with Class I areas must establish RPGs that reflect existing federal and state measures and the reasonable progress measures in the long-term strategy.*

The long-term strategy is the compilation of “enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the [RPGs],” and is the means through which the State ensures that its RPG will be met.

Also, starting on page 3093:

This commenter states that a state should be able to reject “costly” control measures if (1) the RPG for the most impaired days is on or below the [uniform rate of progress] URP line or (2) the RPGs are not “meaningfully” different than current visibility conditions.

*We disagree. **The CAA requires states to determine what emission limitations, compliance schedules and other measures are necessary to make reasonable progress by considering the four factors. The CAA does not provide that states may then reject some control measures already determined to be reasonable if, in the aggregate, the controls are projected to result in too much or too little progress. Rather, the rate of progress that will be achieved by the emission reductions resulting from all reasonable control measures is, by definition, a reasonable rate of progress.***

*What to do if the resulting RPG for the most impaired days is below the URP line? **The URP is not a safe harbor, however, and states may not subsequently reject control measures that they have already determined are reasonable.***

*The commenter’s second suggestion, **that states should be able to reject control measures if***

¹ 40 CFR Section 51.308(d)(2)

² Federal Register, Vol. 82, No. 6, Tuesday, January 10, 2017, pg. 3078-3129

*the RPG for the most impaired days is not “meaningfully” different than current visibility conditions, is counterintuitive and at odds with the purpose of the visibility program. In this situation, the state should take a second look to see whether more effective controls or additional measures are available and reasonable. Whether the state takes this second look or not, it may not abandon the controls it has already determined are reasonable based on the four factors. Regional haze is visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. **At any given Class I area, hundreds or even thousands of individual sources may contribute to regional haze. Thus, it would not be appropriate for a state to reject a control measure (or measures) because its effect on the RPG is subjectively assessed as not “meaningful.”***

*If the State determines that additional progress [beyond the URP] is reasonable based on the statutory factors, the State should adopt that amount of progress as its goal for the first long term strategy.” This approach is consistent with and advances the ultimate goal of section 169A: Remedying existing and preventing future visibility impairment. Congress required the EPA to promulgate regulations requiring reasonable progress toward that goal, **and it would be antithetical to allow states to avoid implementing reasonable measures until and unless that goal is achieved.***

On using emission limits from other rules as a means of showing reasonable progress, we ask that permits issued for these facilities reflect the low emissions presented in the draft SIP. For instance, several facilities noted that they are in compliance with the MATS SO₂ limit and often are well below this value (for instance, see the description of Mitchell Power Plant and John E. Amos Power Plant in section 7.6.4). If this is indeed the case and the low emissions are being used as rationale for not exploring additional control technologies, we would like to see these limits be made federally enforceable. We also extend this concern to assumptions regarding:

- operating scenarios for emission units that represent a reduced capacity, for example a reduced number of operating hours per year, and
- pollution control equipment efficiency used to designate a unit as “effectively controlled”.

Relevance of the Visibility Impact of Individual Sources

EPA’s 2019 Regional Haze Guidance states that “because regional haze results from a multitude of sources over a broad geographic area, a measure may be necessary for reasonable progress even if that measure in isolation does not result in perceptible visibility improvement.” Widespread emissions controls, particularly for SO₂ and NO_x, are essential for making reasonable progress at Class I areas both near to, and more distant from, emissions sources. Further, small visibility improvements, even those that may be imperceptible by themselves, are essential as we continue to make progress towards the national goal of restoring natural conditions at Class I areas by 2064.