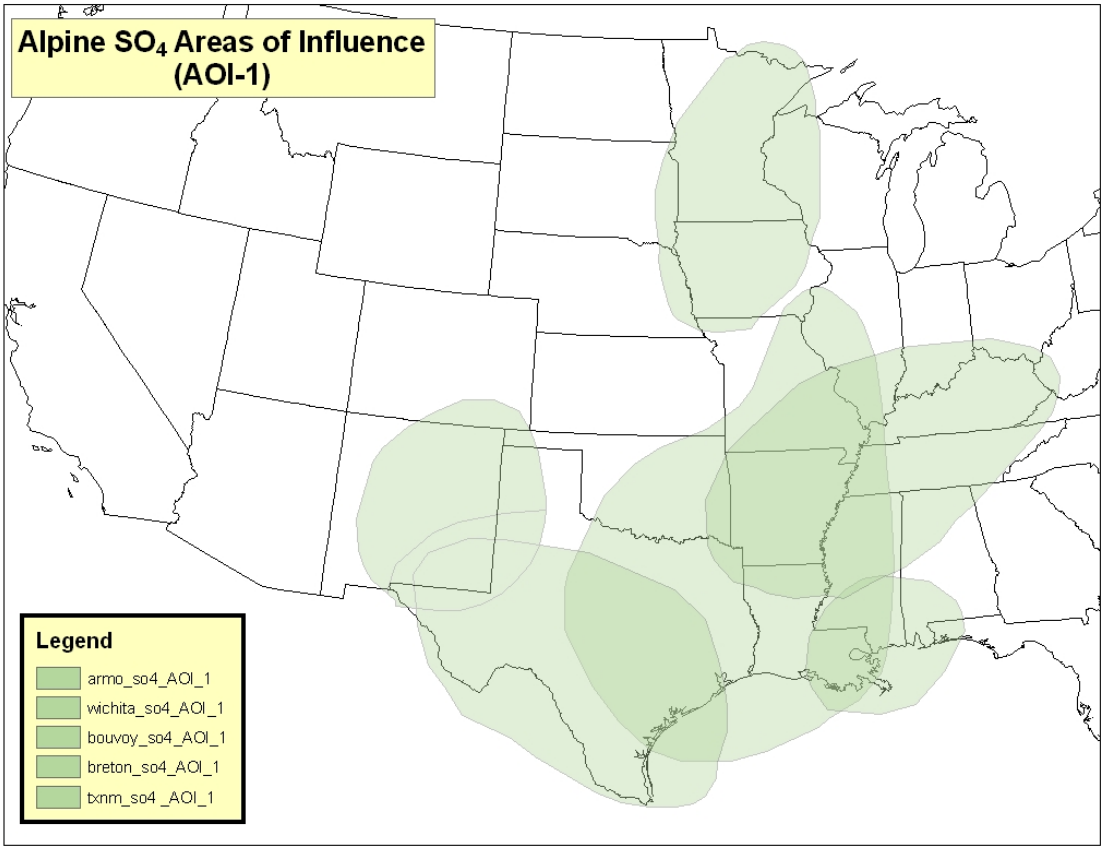
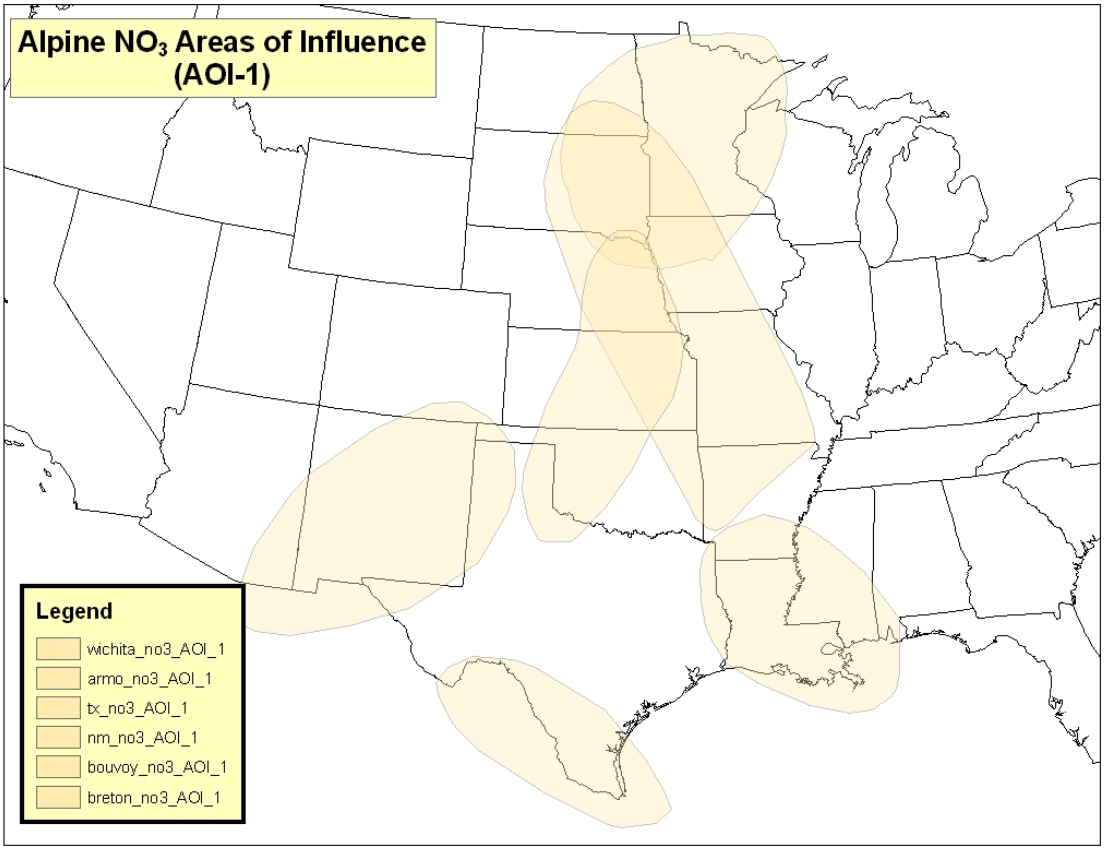
Sensitivity Run Specifications for CENRAP Consultation

Direction from the POG in March was to refine the cost basis of the control run specifications and to evaluate the differences between areas controlled under the Class I area Areas of Influence (AOI). The initial direction on the cost refinement was to look at the basis for the CAIR control cost assumptions and use those numbers for a lower bound. The general cost assumptions for BACT within the region were to serve as the upper bound. However, BACT costs can vary by pollutant and industry. Therefore a variation on the proposed methodology was employed.

CAIR documentation refers to a $1,500 cost per ton level in the generation of CAIR control assumptions for SO2. The same information was not as readily apparent for NOx and therefore the $1,500 cost per ton assumption was used as a lower bound for both pollutants.

A concern was expressed in the March meeting that limiting our strategies to the level 1 AOIs for each Class I area would drop substantial portions of the CENRAP region from consideration. While these areas were not found to be the primary contributors to visibility impairment at the Class I areas in the original Alpine study they do nonetheless contribute. The following graphics illustrate the coverage area for the level 1 AOIs for sulfate and nitrate.

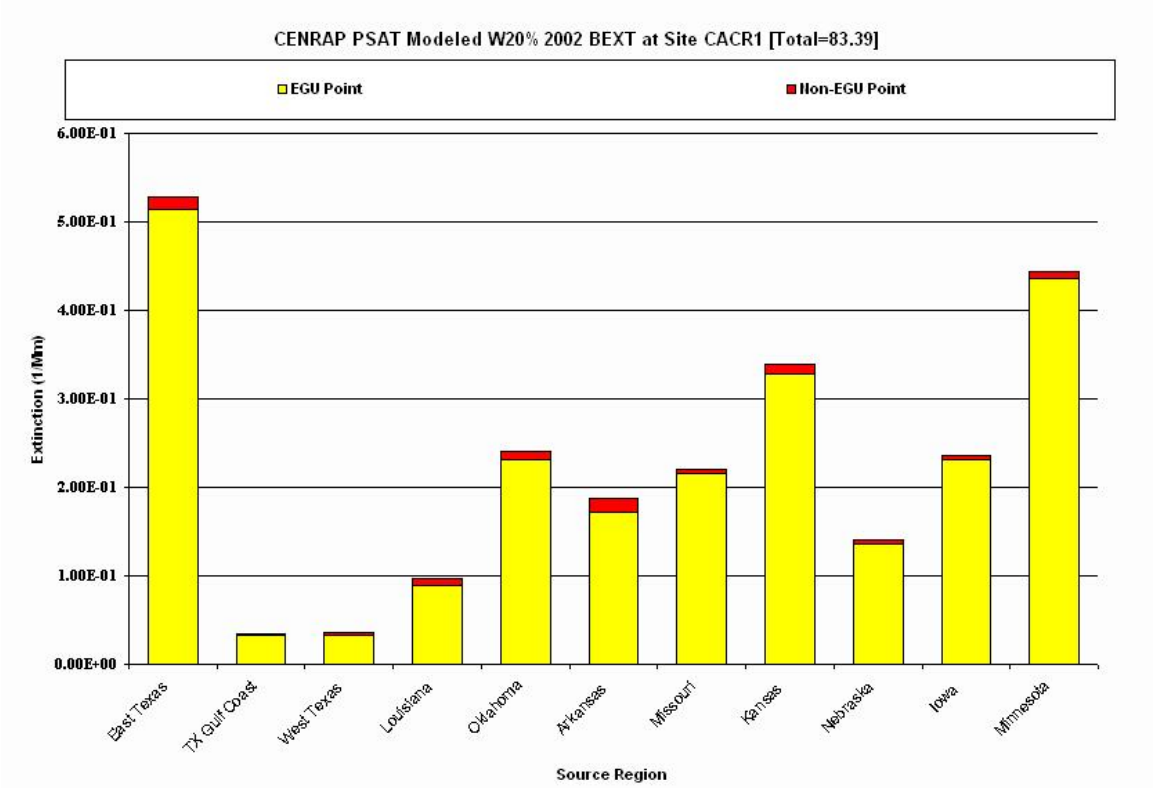




Given the coverage area gaps in the level 1 AOIs the cost refinement evaluation was performed over the entire CENRAP region without respect to AOIs.

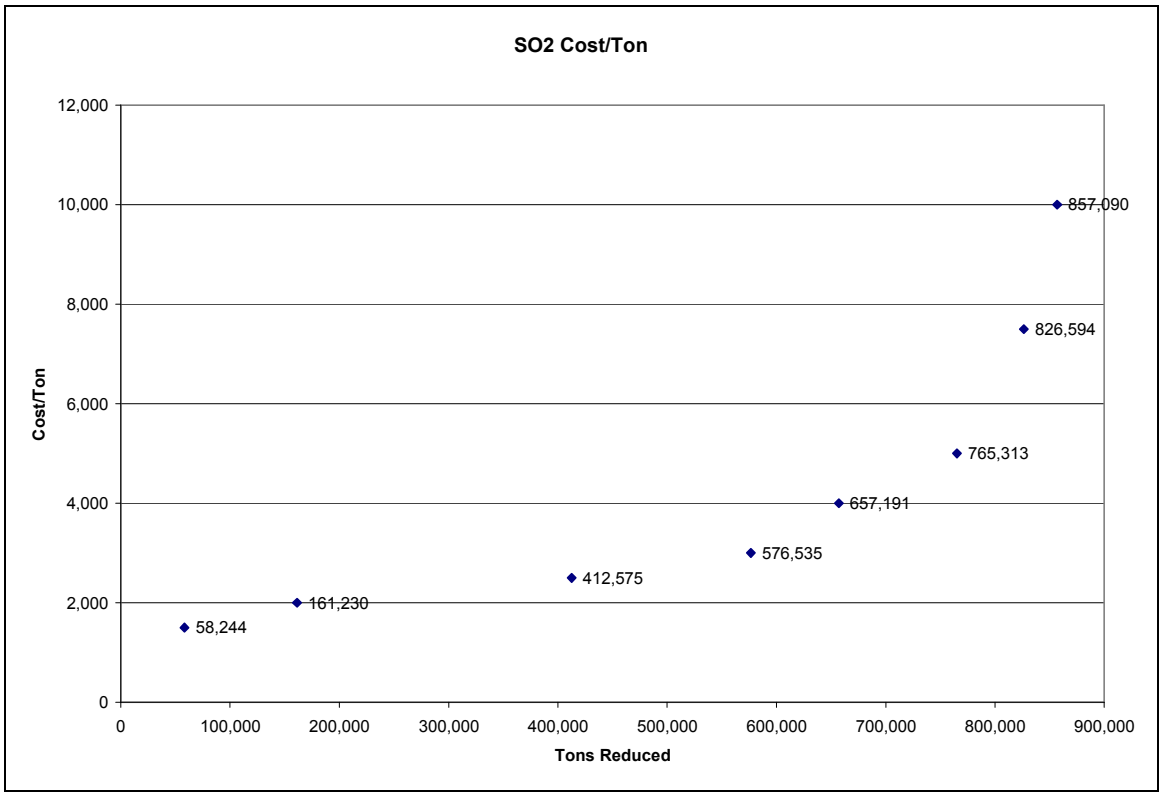
The following bar chart was generated with the latest version of the Environ PSAT tool. The chart was generated for EGU and Non-EGU nitrate apportionment from CENRAP states. Note that, while outside the level 1 AOI, Northeast Texas is modeled to be a significant contributor, relative to the other States, to the worst 20% visibility days in the Caney Creek Class I area. The same can be found, though to a lesser degree about Kansas and Nebraska sulfate impacts on neighboring Class I areas, though both States fall outside the bounds of level 1 AOIs for Missouri, Arkansas, and Minnesota.

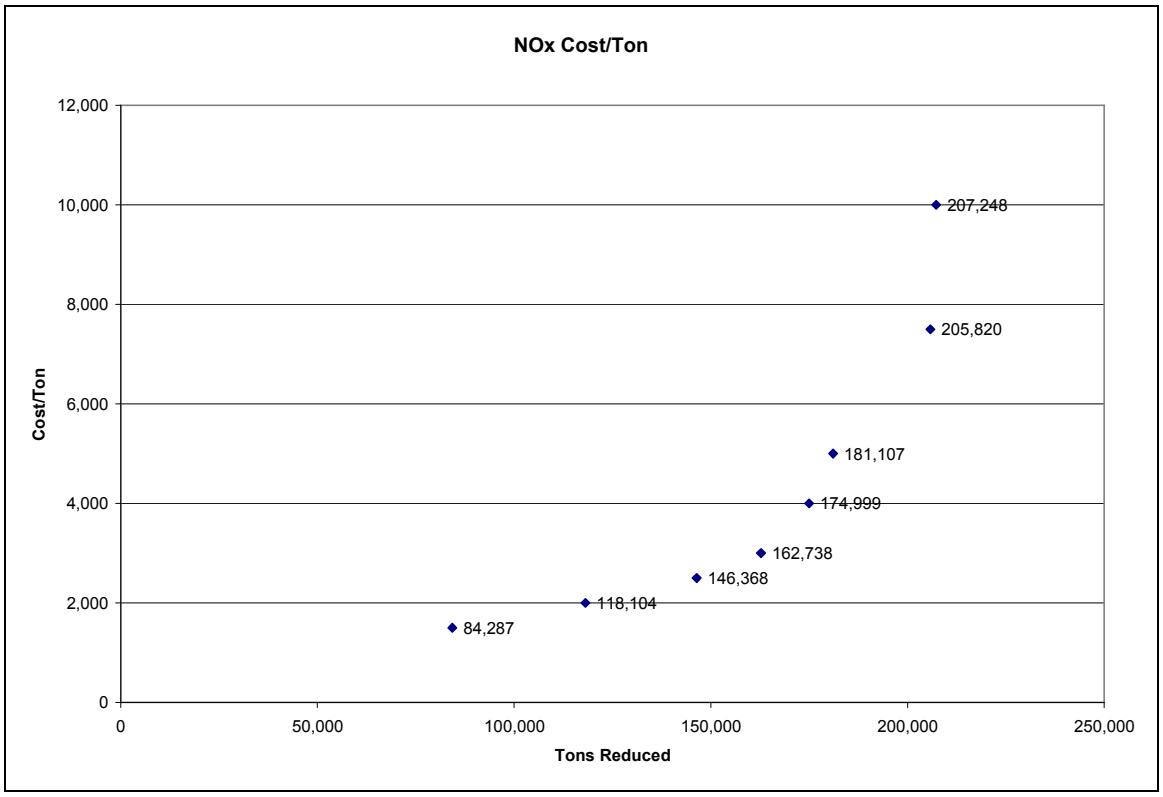
As the control run is intended to assist with the consultation process and provide more information on the effectiveness of reasonably achievable levels of controls, limiting controls to only the areas covered by level 1 AOIs may not provide the intended information.



Queries of the Alpine Geophysics control data set were generated to provide control assumptions for all sources that fell within a range of Q/5D of any CENRAP Class I area. The queries were generated for a range of maximum dollars per ton, starting at $1,500 up through $10,000 per ton. The following graphs illustrate the cost effectiveness curves for both pollutants.

The SO2 curve indicates that given the constraints on the data set, the effectiveness of increasing control cost begins to diminish after a maximum of approximately four-thousand dollars per ton. The NOx curve indicates that again, given the constraints on the data set, effectiveness of increasing control costs begins to diminish beyond the range of three to four thousand dollars per ton.


SO2 Cost/Ton
Cost/Ton
12,000
10,000
8,000
6,000
4,000
2,000
0
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
Tons Reduced
857,090
826,594
765,313
657,191
576,535
412,575
161,230
58,244


NOx Cost/Ton
Cost/Ton
12,000
10,000
8,000
6,000
4,000
2,000
0
0
50,000
100,000
150,000
200,000
250,000
Tons Reduced
207,248
205,820
181,107
174,999
162,738
146,368
118,104
84,287

The State summary tables below assume a maximum cost of four thousand dollars per ton with and without level one AOIs for those sources that fall within 5D of any CENRAP Class I area.

Q/5D

NOx ($4,000/Ton with no restriction on AOI)

State	Tons	Tons Reduced	Total Cost (2005 $)	Average Cost/Ton
Arkansas Total	29,840	10,939	$16,063,479	1,468
Iowa Total	15,229	9,638	$21,152,980	2,195
Kansas Total	45,492	17,694	$28,654,098	1,619
Louisiana Total	37,285	30,617	$61,113,051	1,996
Minnesota Total	22,258	8,192	$17,530,083	2,140
Missouri Total	41,489	20,312	$29,217,934	1,438
Nebraska Total	27,751	13,159	$11,014,418	837
Oklahoma Total	49,127	24,423	$47,342,251	1,938
Texas Total	110,421	40,025	$72,892,326	1,821
Grand Total	378,892	174,999	$304,980,620	1,743

NOx ($4,000/Ton with AOI =1)

State	Tons	Tons Reduced	Total Cost (2005 $)	Average Cost/Ton
Arkansas Total	29,840	10,939	$16,063,479	1,468
Iowa Total	15,229	9,638	$21,152,980	2,195
Kansas Total	45,492	17,694	$28,654,098	1,619
Louisiana Total	37,285	30,617	$61,113,051	1,996
Minnesota Total	22,258	8,192	$17,530,083	2,140
Missouri Total	30,663	13,492	$13,835,584	1,025
Nebraska Total	21,414	10,811	$7,760,719	718
Oklahoma Total	44,140	20,825	$39,511,338	1,897
Texas Total	43,545	16,725	$29,774,281	1,780
Grand Total	289,867	138,934	$235,395,613	1,694

SO2 ($4,000/Ton with no restriction on AOI)

State	Tons	Tons Reduced	Annualized Cost ($2005)	AVERAGE COST/TON
Arkansas Total	64,543	58,088	$141,702,592	2,439
Iowa Total	123,996	111,596	$297,860,477	2,669
Kansas Total	19,078	17,170	$50,742,099	2,955
Louisiana Total	66,364	59,165	$106,975,459	1,808
Minnesota Total	8,950	8,033	$24,035,119	2,992
Missouri Total	181,493	161,624	$385,099,041	2,383
Nebraska Total	16,229	14,606	$10,605,556	726
Oklahoma Total	46,638	36,542	$93,684,930	2,564
Texas Total	212,005	190,366	$418,329,434	2,197
Grand Total	739,295	657,191	$1,529,034,707	2,327

SO2 ($4,000/Ton with AOI =1)

State	Tons	Tons Reduced	Annualized Cost ($2005)	AVERAGE COST/TON
Arkansas Total	64,543	58,088	$141,702,592	2,439
Iowa Total	118,082	106,273	$279,767,078	2,633
Louisiana Total	66,364	59,165	$106,975,459	1,808
Minnesota Total	8,012	7,189	$21,791,726	3,031
Missouri Total	143,241	127,464	$309,199,655	2,426
Nebraska Total	16,032	14,429	$10,134,192	702
Oklahoma Total	46,638	36,542	$93,684,930	2,564
Texas Total	165,379	148,403	$282,820,262	1,906
Grand Total	628,290	557,552	$1,246,075,894	2,235

The following State summary tables again assume a maximum cost of four thousand dollars per ton with and without level one AOIs for those sources that fall within 20D of any CENRAP Class I area.

Q/20D

NOx ($4,000/Ton with no restriction on AOI)

State	Tons	Tons Reduced	Total Cost	Average Cost/Ton
Arkansas Total	25,432	7,757	$8,815,243	1,136
Kansas Total	6,647	5,318	$12,271,745	2,308
Louisiana Total	4,687	4,140	$3,064,019	740
Minnesota Total	4,858	806	$1,413,275	1,753
Missouri Total	16,152	7,533	$10,571,431	1,403
Oklahoma Total	24,658	11,872	$18,375,364	1,548
Texas Total	33,200	11,390	$19,121,087	1,679
Grand Total	115,635	48,815	$73,632,164	1,508

NOx ($4,000/Ton with AOI= 1)

State	Tons	Tons Reduced	Total Cost	Average Cost/Ton
Arkansas Total	25,432	7,757	$8,815,243	1,136
Kansas Total	6,647	5,318	$12,271,745	2,308
Louisiana Total	4,687	4,140	$3,064,019	740
Minnesota Total	4,858	806	$1,413,275	1,753
Missouri Total	12,655	5,653	$6,286,970	1,112
Oklahoma Total	20,975	8,926	$11,624,171	1,302
Texas Total	28,648	10,634	$17,628,563	1,658
Grand Total	103,902	43,234	$61,103,986	1,413

SO2 ($4,000/Ton without respect to AOI)

Max Cost/Ton $4,000	Tons	Tons Reduced	Total Cost	Average Cost/Ton
Arkansas Total	64,543	58,088	$141,702,592	2,439
Iowa Total	61,393	55,254	$149,243,419	2,701
Kansas Total	8,999	8,099	$18,131,435	2,239
Louisiana Total	60,290	53,844	$100,467,964	1,866
Missouri Total	168,658	151,792	$359,647,907	2,369
Nebraska Total	16,032	14,429	$10,134,192	702
Oklahoma Total	38,102	28,860	$82,593,436	2,862
Texas Total	183,658	165,292	$385,002,887	2,329
Grand Total	601,675	535,658	$1,246,923,832	2,328

SO2 ($4,000/Ton with AOI=1)

State	Tons	Tons Reduced	Total Cost	Average Cost/Ton
Arkansas Total	64,543	58,088	$141,702,592	2,439
Iowa Total	61,393	55,254	$149,243,419	2,701
Louisiana Total	60,290	53,844	$100,467,964	1,866
Missouri Total	133,596	120,237	$290,804,516	2,419
Nebraska Total	16,032	14,429	$10,134,192	702
Oklahoma Total	38,102	28,860	$82,593,436	2,862
Texas Total	138,992	125,093	$254,181,389	2,032
Grand Total	512,948	455,804	$1,029,127,508	2,258

Separate spread sheets for NOx and SO2 detail the control assumptions for each dollar level. Both the Q/5D and the Q/20D method focus on only the largest emitters. However, for SO2, Q/20D limits controls to primarily EGUs.

In summary, using the $4,000/ton threshold provides maximum reductions without sacrificing cost effectiveness. The Q/5D threshold spreads the burden of control across more contributing industries and provides more information for possible controls for the consultation process.