Technical Support Document (TSD) for the Cross State Air Pollution Rule Supplemental Rulemaking

Docket ID No. EPA-HQ-OAR-2009-0491

Determination of State Budgets for the Final Ozone Supplemental of the Transport Rule

U.S Environmental Protection Agency

Office of Air and Radiation

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EPA finalized the Transport Rule in July of 2011[1]. At the same time, EPA also issued a Supplemental Notice of Proposed Rulemaking (SNPR) proposing to bring six states into the Transport Rule ozone-season NO_X program. In this final rulemaking, EPA is finalizing FIPs to address significant contribution to nonattainment and interference with maintenance in Iowa, Michigan, Missouri, Oklahoma, and Wisconsin. For two of these states (Iowa and Missouri), the state budgets in this final rule are unchanged from those budgets as quantified at proposal. For three of these states (Michigan, Oklahoma, and Wisconsin), EPA is finalizing state budgets that reflect adjustments in certain unit-level assumptions that result in changes from the budgets presented for these states in the proposal. See Section III.E of the preamble for an explanation of these adjustments. This technical support document (TSD) shows the underlying data and calculations used to determine the amount by which each of these three states have their budget adjusted from proposal. The first section below summarizes final budgets for all of the states for which EPA is finalizing a FIP under this rule. The second section identifies each specific unit-level adjustment and quantifies its impact on the relevant state budget and the number of allowances put into the relevant new unit set-aside (NUSA),[2] as well as the impact to the relevant assurance level[3] for that state, using the methodologies described in the final Transport Rule.

Section A: Summary of State Emission Budgets

EPA is finalizing FIPs to control ozone-season NO_X emissions from five states. The state budgets determined for these states maintain a consistent application of the methodology described in the final Transport Rule to quantify and eliminate emissions that significantly contribute to nonattainment and interfere with maintenance of the NAAQS assessed in that rulemaking. EPA's regulatory impacts analysis (RIA) of the July 2011 final Transport Rule included coverage of these states for ozone-season NO_X reductions using their state budgets as quantified in the proposal of this supplemental rulemaking. As shown in further detail below, the final ozone-season NO_X budgets for these states in 2014 (the year of analysis in that RIA) vary collectively by less than 3,500 tons from the budgets as originally modeled.[4]

Final Ozone-Season NO_X Budgets (thousand tons)

		Final Budget	
State		2012	2014
Michigan		28.041	27.016

[1] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals (76 FR 48208).
[2] The "Total NUSAs" presented for each state in section B of this document include allowances under both the State NUSA and the Indian Country NUSA (where the latter exists in the given state).
[3] EPA has also proposed in a separate action to amend the effective date of the assurance provisions in all states to start in 2014 instead of in 2012. Please see 76 FR 63860 for more information on that proposal.
[4] For more information, please see the final Transport Rule Regulatory Impact Analysis in the docket for this rulemaking (EPA-HQ-OAR-2009-0491-4409).

Oklahoma		36.567	21.835[5]
Wisconsin		14.784	14.296
Iowa		16.532	16.207
Missouri		22.762	21.073

Section B: Quantification of State Emission Budgets, Assurance Levels, and NUSAs Affected by Unit-Level Adjustments

1) Michigan

As described in the preamble, EPA is finalizing Michigan's 2012 and 2014 ozone-season (OS) NO_X budget with an adjustment to account for no SCR being installed at Monroe Unit 2. This results in a 2,289 ton increase to the state's ozone-season NO_X budgets in 2012 and 2014.

Table 1.a: Calculation to Determine Michigan Ozone Season Budget Increase Assuming No SCR at Monroe Unit # 2

		A	B	C	D	E	F
Plant	Unit	Emissions from TR_Remedy Final_2012 (1000 tons)	HI from TR_Remedy_Final_2012 (Tbtu)	Remedy Emission Rate from from TR_Remedy_Final_2012 (lbs/mmBtu)	Adjusted Emission Rate (lbs/mmBtu)	Adjusted Emissions	Budget Adjustment (1000 tons)
Calculation				A/B		D x B	E - A
Monroe	2	0.675	19.46356305	0.07	0.3046	2.964300653	2.289

Columns A, B, and C show the OS NO_X emissions, heat input, and emission rate from the TR_Remedy_Final_2012 modeling when an SCR is assumed to be present at Monroe Unit 2. Because no SCR is present, EPA modified the emission rate to reflect the "controlled NO_X policy rate" in the NEEDS version from the September 1, 2010 TR Notice of Data Availability (NODA) (column D).[6] This value reflects the NO_X emission rate assumed in EPA's modeling of the Transport Rule as originally proposed, when EPA did not assume an SCR to be present at the unit. This value approximates the emission rate expected at the unit at a cost threshold of $500/ton when no SCR is present at the unit. EPA multiplied this NO_X rate (shown in column D) by the remedy heat input shown in column B to obtain a revised emission projection for the unit (column E). The difference between this revised emission

[5] Budget effective in 2013 and thereafter.
[6] See National Electric Energy Data System (NEEDS) v4.10 available at http://www.epa.gov/airmarkets/progsregs/epa-ipm/BaseCasev410.html

projection (no SCR assumed) and the final Transport Rule remedy analysis emission projection (SCR assumed) determines the amount of the adjustment to the state's ozone-season NO_X budget as compared to the budget presented at proposal (column F).

The final values for the state's ozone-season NO_X budget, assurance level, and new unit set-asides are given in the preamble.

2) Oklahoma

As explained in the preamble section III of the final supplemental rule, EPA has recalculated Oklahoma's state budget for the 2012 ozone season such that it does not reflect the installation or upgrade of any new combustion controls (see Appendix). This recalculation demonstrates that ozone-season NOX emissions would be 9,522 tons higher in the 2012 ozone season without the new and upgraded combustion controls previously assumed; EPA has adjusted the final state budget for the 2012 ozone season only to reflect these emissions. The table below shows the values and calculations used to derive the 9,522 figure.

Table 2a. Oklahoma Ozone Season NO_X Budget Adjustment for the 2012 Ozone Season Reflecting No Combustion Control Upgrade or Installation (1000 tons)

A	B	C	D	E	F	G	H	I
Plant Name	ORIS Plant Code	Unit ID	2012 OS NO_X Remedy Emissions (1000 tons)	2012 Heat Input (Tbtu)	Emission Rate with LNB Upgrade	Base Emission Rate (lbs/mmBtu)	Adjusted Emissions (1,000 tons)	Adjustment Amount (1,000 tons)
Muskogee	2952	6	1.036	14.216	0.146	0.347	2.466710049	1.430
Muskogee	2952	4	1.045	14.613	0.143	0.321	2.343145371	1.298
Sooner	6095	1	1.071	14.939	0.143	0.319	2.386135045	1.315
Muskogee	2952	5	1.042	14.647	0.142	0.314	2.301435722	1.260
Sooner	6095	2	1.111	15.580	0.143	0.314	2.445420837	1.334
GRDA	165	1	1.465	14.507	0.202	0.349	2.528559526	1.063
Northeastern	2963	3314	1.704	13.160	0.259	0.394	2.594200981	0.890
Northeastern	2963	3313	1.649	13.137	0.251	0.382	2.511937905	0.863
Hugo	6772	1	1.269	14.103	0.180	0.190	1.336456463	0.067
Total								**9.522**

Columns A, B, and C provide unit level information about the facility. Columns D, E, and F provide projected emissions, heat input and ozone season NO_X emission rates from EPA's 2012 TR_Remedy_Final modeling. The emission rate in column F, which formed the basis for the column D expected emissions, was based on the assumption that the facilities would make certain upgrades or installations with respect to combustion controls. Column G

reflects the ozone-season NO_X emission rate at these facilities assuming no combustion control upgrades or installation. That is, column G reflects emission rates that are typical to that unit's historic operations. This value is obtained from "controlled NO_X Base rate" in the NEEDS v.410 used for the Final Transport Rule . Column H reflects the emission values expected for each unit when the projected heat input (column E) is multiplied by the historic emission rate (column G). The difference between column H and column D (when summed) reflects the total amount by which the Oklahoma ozone-season NOx budget is adjusted as compared to the budget presented at proposal.

Also, as explained in preamble section III, EPA is finalizing an Oklahoma state budget specifically for the 2012 ozone season that reflects revised projected emissions at oil/gas steam generators consistent with an immediate-term dispatch pattern that maintains the firm power supply arrangements already in place to serve local electricity demand. The table below illustrates the calculations used to derive the adjustment to the Oklahoma state budget for the 2012 ozone season assuming a dispatch pattern of oil/gas steam generation in 2012 consistent with recently observed operational data at those units.

Table 2b. Oklahoma Ozone Season NO_X Budget Adjustment Reflecting No Major Curtailment of O/G Steam Generating Units

A	B	C	D	E	F	G	H	I	J
Plant Name	Plant Type	ORIS Code	Unit ID	2012 OS NO_X Remedy Heat Input (mmBtu)	2012 OS NO_X Remedy Emissions (1,000 tons)	2010 Heat Input (mmBtu)	NEEDS Controlled NO_X Base Rate (lbs/mmBtu)	Emissions Assuming 2010 Heat Input (1,000 tons)	Emission Adjustment for 2012 (1,000 tons)
Anadarko Plant	O/G Steam	3006	3	0	0	1,917	0.22	0.000	0.000
Horseshoe Lake	O/G Steam	2951	6	0	0	3,022,970	0.28	0.427	0.427
Horseshoe Lake	O/G Steam	2951	8	0	0	5,904,903	0.14	0.405	0.405
Mooreland	O/G Steam	3008	1	0	0	52,018	0.34	0.009	0.009
Mustang	O/G Steam	2953	1	0	0	648,384	0.20	0.066	0.066
Mustang	O/G Steam	2953	2	0	0	636,546	0.15	0.048	0.048
Mustang	O/G Steam	2953	3	0	0	1,700,657	0.24	0.200	0.200
Mustang	O/G Steam	2953	4	0	0	1,884,097	0.35	0.325	0.325
Northeastern	O/G Steam	2963	3302	0	0	8,298,493	0.40	1.644	1.644
Ponca	O/G Steam	762	2	0	0	1,895	0.19	0.000	0.000
Riverside	O/G Steam	4940	1502	0	0	6,559,178	0.23	0.742	0.742
Southwestern	O/G Steam	2964	8002	0	0	457,715	0.33	0.075	0.075
Southwestern	O/G Steam	2964	8003	0	0	4,603,800	0.44	1.005	1.005

Southwestern	O/G Steam	2964	801N	0	0	244,030	0.25	0.031	0.031
Southwestern	O/G Steam	2964	801S	0	0	244,058	0.21	0.025	0.025
Tulsa	O/G Steam	2965	1402	0	0	1,029,085	0.18	0.094	0.094
Tulsa	O/G Steam	2965	1403	0	0	112,296	0.28	0.015	0.015
Tulsa	O/G Steam	2965	1404	0	0	1,058,014	0.19	0.099	0.099
Total				**0**	**0**	**36,460,055**		**5.210**	**5.210**

Columns A, B, C and D provide unit level information about the facility. Columns E, and F provide projected ozone season heat input and emissions from EPA's 2012 TR_Remedy_Final modeling. The heat input in column E, which formed the basis for the column E expected emissions, was based on the assumption that the facilities would reduce uneconomic generation from these less efficient sources under the Transport Rule market incentives. Column G reflects the 2010 ozone-season NO_X heat input at these facilities. Column H reflects emission rates that are typical to that unit's historic operations and assumed as the "controlled NO_X Base rate" in the NEEDS IPM version 4.10 used for the final Transport Rule. Column I reflects the emission values expected for each unit when the 2010 heat input (column E) is multiplied by the emission rate (column H). The difference between column I and column F (when summed) reflects the total amount by which the Oklahoma ozone-season NO_X budget is adjusted as compared to the budget presented at proposal.

The final values for the state's ozone-season NO_X budget, assurance level, and new unit set-asides are given in the preamble.

3) Wisconsin

As explained in the preamble section III.E of the final supplemental rule, EPA has recalculated Wisconsin's 2012 and 2014 ozone-season budget such that it does not reflect the installation of SCR control technology at J P Madgett. This results in a 1,080 ton increase to the state's ozone-season NO_X budget relative to what was proposed in the SNPR. The table below details the values and calculations used to arrive at that amount.

Table 3.a: Calculation to Determine Wisconsin Ozone Season NO_X Budget Adjustment Assuming No SCR at J P Madgett

		A	*B*	*C*	*D*	*E*	*F*
Plant Name	Unit ID	Emissions from TR_Remedy Final_2012 (1000 tons)	Heat Input from TR_Remedy_Final_2012 (Tbtu)	Remedy Emission Rate fromTR_Remedy_Final_2012 (lbs/mmbtu)	Revised Emission Rate (lbs/mmbtu)	Revised Emissions (1000 tons)	Net Budget Adjustment (1000 tons)
Calculation				*A/B*		*D x B/2*	*E - A*
J P Madgett	B1	.257068143	10.28272555	.05	.26	1.337	1.080

Columns A, B, and C show the emissions, heat input, and emission rate from the 2012 remedy modeling for the J P Madgett unit. However, the emission rate in column C reflects the existence of a SCR. Because no SCR is present, EPA calculates the source's expected emissions using the emission rate shown for this unit in the EPA's analysis of the base case for the final Transport Rule, as found in the TR_Base_Case_Final for 2012 (column D) of 0.26 lbs/mmBtu. This ozone-season NO_X emission rate reflects generation at this unit without the operation of the assumed SCR, which did not operate in the final Transport Rule base case because it was modeled as a "dispatchable" control that was not found to be economic to operate in that scenario.[7] Moreover, this emission rate reflects one typically observed at past operation of the facility when no SCR was present. The J P Madgett emission rate without operating an SCR (column D) multiplied by the remedy heat input (column B) yields the projected emissions from the unit if no SCR were assumed to be in place. The difference between the projected emissions when no SCR is in place (column E) and the projected emissions when an SCR is assumed (column A) determines the amount of the adjustment to the state's 2012 and 2014 ozone-season NO_X budgets as compared to the budget presented at proposal (column F).

The final values for the state's ozone-season NO_X budget, assurance level, and new unit set-aside are given in the preamble.

[7] See **"WebReady_ParsedFile_TR_Base_Case_Final_2012"** in the Transport Rule docket or on EPA's CSAPR website

APPENDIX

Assessment of Resource Adequacy for the 2012 Ozone Season in Oklahoma

EPA is setting the Oklahoma state budget for the 2012 ozone season at a level that does not necessitate the installation of new low-NO_X burners. See preamble section III for further discussion. At proposal, EPA quantified Oklahoma's 2012 ozone-season NO_X state budget assuming that a number of units representing 4,452 MW of capacity would install new low-NO_X burners (LNB) before the 2012 ozone season. See Table 1 for a list of those units showing each unit's net summer dependable capacity.

Table 1. Oklahoma Units Projected to Install Low NO_X Burners under the Transport Rule

Plant Name	Unit ID	County	Capacity (MW)
GRDA	1	Mayes	490
Muskogee	4	Muskogee	511
Muskogee	5	Muskogee	522
Muskogee	6	Muskogee	515
Northeastern	3313	Rogers	450
Northeastern	3314	Rogers	450
Sooner	1	Noble	535
Sooner	2	Noble	540
Hugo	1	Choctaw	440
Total			4452

As explained in preamble section III, EPA assessed the relationship of the capacity identified in Table 1 to the relevant region's total available capacity that is taken into account in resource adequacy determinations. This assessment shows that if the capacity identified in Table 1 were to be unavailable due to the installation of low-NO_X burners during the 2012 ozone season, the ozone-season planning reserve margin in the IPM region containing Oklahoma (SPPS) would fall below the target planning reserve margin of 13.6% (see Table 2).

Table 2. IPM 2012 Ozone-Season Reserve Margin Projections for SPPS

	Including All Plants in IPM	With Table 1 Capacity Removed
Capacity (MW)	39,093	34,641
Ozone-Season Peak Load (MW)	31,785	31,785
Margin (MW)	7,308	2,856
Reserve Margin†	23.0%	9.0%
Target Planning Reserve Margin	13.6%	13.6%

† The reserve margin is calculated as the margin (third row) divided by the available peak load (second row)

The potential unavailability of this capacity would only frustrate the region's target planning reserve margin during the ozone season, because the ozone season period represents the highest projected load (electricity demand). Even without this capacity available, the regional reserve margin would remain higher than the target planning reserve margin during the remainder of the year, as shown in Table 3. Because these units would be able to complete LNB installation without impairing the region's ability to meet its target planning reserve margin after the 2012 ozone season, EPA is not adjusting Oklahoma's state budgets for years subsequent to 2012 from the budget as quantified at proposal.

Table 3. IPM 2012 Non-Ozone-Season Reserve Margin Projections for SPPS

	Including All Plants in IPM	With Table 1 Capacity Removed
Capacity (MW)	39,093	34,641
Non-Ozone-Season Peak Load (MW)	24,025	24,025
Margin (MW)	15,068	10,616
Reserve Margin†	62%	44%
Target Planning Reserve Margin	13.6%	13.6%

† The reserve margin is calculated as the margin (third row) divided by the peak load (second row)