

DRAFT

Technical Support Document
and
Budget Demonstration
for
Nitrogen Oxides (NO_x) Emissions
From
Large Non-Electric Generating Units
and
Repeal of NO_x Budget
and
Clean Air Interstate Rule (CAIR) Ozone Season
Trading Programs

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A. BACKGROUND

Nitrogen Oxide (NO_x) State Implementation Plan (SIP) Call Rule

The Ozone Transport NO_x SIP Call rule was promulgated by the United States Environmental Protection Agency (U.S. EPA) in 1998. The rulemaking, commonly referred to as the NO_x SIP Call, required eastern states to submit SIPs that set statewide NO_x budgets for the ozone season. NO_x is a major precursor to the formation of ozone and the ozone season is the warm summer months in each year when ground-level ozone concentrations are highest. The NO_x Budget Trading Program (NBP) was an allowance trading program the U.S. EPA provided in the rule as an option for States to use to meet NO_x SIP Call obligations. A model rule was included in the NO_x SIP Call rule and can be found in 40 CFR 96.

Indiana's NBP was adopted in 2001 and can be found in the Indiana Administrative Code (IAC) at 326 IAC 10-4. The rulemaking generally applies to large electric generating units (EGUs), which includes, boilers, turbines, and combined cycle units used to generate electricity for sale. However, Indiana is one of the states that included large non-EGUs as part of the Indiana NBP. States were allowed to include these units as part of the NBP. Examples of these units are boilers and turbines at heavy manufacturing facilities, such as aluminum smelters, petroleum refineries, and iron and steel production facilities. These units also include steam plants at institutional settings, such as large universities.

Clean Air Interstate Rule (CAIR)

In 2005, U.S. EPA issued the Clean Air Interstate Rule to address interstate transport of ozone and fine particulate matter pollution. CAIR required certain states to limit annual emissions of NO_x and sulfur dioxide (SO₂), which contribute to the formation of ozone and PM_{2.5}. The rule also included limits on ozone season NO_x emissions. In 2006, U.S. EPA published CAIR Federal Implementation Plans (FIPs) for states covered by CAIR to ensure the required emission reductions were achieved on schedule. As the control strategy for the FIPs, U.S. EPA adopted the model SO₂ and NO_x cap-and-trade programs for fossil-fuel-fired power plants. CAIR established three separate cap-and-trade programs that most States used to achieve required reductions in developing state SIPs.

The CAIR NO_x annual trading program applied to EGUs used to generate electricity for sale. The CAIR NO_x ozone season trading program also applied to EGUs but some states also included large industrial units that produce electricity or steam primarily for internal use carried over from the NBP. Indiana adopted its CAIR SO₂ and NO_x Annual Trading Programs and CAIR NO_x Ozone Season Trading Program rules in 2007 at 326 IAC 24 in accordance with the requirements of the federal CAIR program. The large non-EGUs included in Indiana's NBP at 326 IAC 10-4 were moved as a group to the Indiana CAIR NO_x Ozone Season Trading Program rules at 326 IAC 24-3. CAIR referred to the non-EGUs as large affected units with the overall non-EGU budget being covered by the following set-asides in 326 IAC 3-8; 8,727 allowances for existing large affected units, 400 allowances for new large affected units, 500 allowances for energy efficiency, and 150 allowances for hardship. The Indiana CAIR NO_x Ozone Season Trading Program had a large non-EGU budget of 9,777 tons of NO_x emissions per ozone season.

In 2008, the U. S. Court of Appeals for the DC Circuit issued a ruling vacating CAIR in its entirety. After U.S. EPA and other parties requested a hearing, the court revised its decision and remanded CAIR to U.S. EPA without vacatur. This ruling left CAIR and the CAIR FIPS, including the trading programs, in place until U.S. EPA issued a new rule to replace it.

Cross-State Air Pollution Rule (CSAPR)

In 2011, U.S. EPA finalized the Cross-State Air Pollution Rule to replace CAIR and address power plant emissions that cross state lines and contribute to ozone and fine particle pollution in other states. To speed implementation, U.S. EPA adopted FIPs for each of the states covered by CSAPR in 2015 and encouraged States to submit SIPs. CAIR had included large non-EGU boilers and combustion turbines in the CAIR NO_x Ozone Season Trading Program, however large non-EGU units were not brought into the CSAPR trading program FIP. While the CSAPR FIP applies only to EGUs, U.S. EPA has offered several options for States to show continued compliance with the NO_x SIP Call requirements with regard to large non-EGUs. There are three acceptable approaches to address NO_x SIP Call requirements for these units.

Option 1: Streamlined demonstration. Demonstrate that total ozone-season NO_x emissions from large non-EGU boilers and combustion turbines in the State that were included in the NBP but will not be included in the CSAPR ozone-season trading program could not exceed the large non-EGU budget imposed by the NO_x SIP Call even if these units were to operate every hour of the ozone season.

Option 2: Demonstrate that the NO_x SIP Call reduction obligations for these large non-EGU boilers and combustion turbines are being met through alternative limits on these non-EGUs, in accordance with 40 CFR 51.121(f)(2)(i).

Option 3: Demonstrate that additional ozone season NO_x emission reductions from other sources covered by the NO_x SIP Call have achieved extra reductions, over and above any required for those other sources by the NO_x SIP Call, to the degree that overall reduction requirements of the NO_x SIP Call have been achieved without any reductions from large non-EGUs.

In addition, within the Federal Register (FR) for amendments to the CSAPR rule on October 26, 2016, U.S. EPA provided the option of reducing the EGU budget to allow states to include the large non-EGUs in their CSAPR trading program SIP.

B. BUDGET DEMONSTRATION ANALYSIS

The Indiana Department of Environmental Management (IDEM) has evaluated these options, and based on the emissions data of the large non-EGU sources in Indiana, IDEM has selected the streamlined demonstration option (Option 1), which demonstrates that the total ozone-season NO_x emissions from large non-EGUs (i.e., all large non-EGUs included in the trading program at 326 IAC 24-3, except steel mills) could not exceed the large non-EGU budget imposed by the NO_x SIP Call, even if these units were to operate every hour of the ozone season.

Indiana can demonstrate that the NO_x SIP Call requirements are met using the Option 1 demonstration (see attached document). The demonstration includes the total mass ozone season emission (tons) divided by actual operating hours multiplied by the total number of hours in the ozone season (3,672 hours) for each individual unit. The sum of the resulting NO_x mass emissions for all of these large non-EGUs must be less than the large non-EGU portion of the NO_x SIP Call budget. The demonstration uses data by U.S. EPA's Clean Air Markets Division (CAMD), 2014-2017.

Conservatively, the highest ozone season mass emissions at 3672 hours was chosen for each individual unit from the years 2014 through 2017 and summed to get the total ozone season NO_x emissions. The demonstration shows the total ozone season NO_x emissions without the steel mills' blast furnace gas (BFG) units because these units were not included in the final budget analysis. Reductions from these units were not needed to meet Indiana's NO_x SIP Call obligations, even though some of these units were included in Indiana's NO_x Budget Trading Program. Table 4 in the November 8, 2001 FR¹ for final SIP approval shows zero reductions to be achieved by the blast furnace gas units.

During the development stages of the Indiana NO_x SIP Call rules, all BFG units were included in the trading program. However, IDEM in coordination with U.S. EPA, determined that removing these units from the trading program would have no net effect on the amount of total reductions needed to be achieved by the State, since IDEM was not projecting emission reductions from these units to meet the budget. These units were low NO_x emitters on a lb/MMBtu basis with no viable control options available. BFG boilers use the blast furnace gas by-product from blast furnaces as a fuel, reducing the need for flaring, which reduces the overall emissions from the process. Some units later chose to be included in the trading program and there was a subsequent rule change and SIP approval for moving a portion back into the trading program. The trading budget for the non-EGUs, excluding the blast furnace gas units, is 8,008 tons as specified in the final SIP approval for the NO_x SIP Call (Table 4 in the November 8, 2001 FR). This is the budget that IDEM is using for this current budget demonstration for transitioning sources from the trading program to 326 IAC 10-2.

No emissions were reported to CAMD for the cogeneration unit at SABIC and two boilers at Grain Processing Corporation during the four year time frame evaluated. The cogeneration unit at SABIC is a new unit, starting operation in late 2017. The two boilers at Grain Processing Corporation did operate during this timeframe, however the data has not been reported to CAMD. Grain Processing Corporation is aware that this reporting requirement has not been met and is working on correcting the issue. Nonetheless, to provide the most conservative estimate to demonstrate emissions added from these units do not exceed the Indiana NO_x SIP Call Budget, the potential to emit (PTE) NO_x emissions from these units were used for this budget demonstration. The ozone season mass emissions shown in the last column (Highest 2014-2017) of the demonstration for the cogeneration unit at SABIC was calculated using the annual potential to emit at 8,760 hours converted to the ozone season PTE at 3,672 hours for the combustion turbine and auxiliary boiler combined. PTE calculations were obtained from SABIC's Title V Operating permit number 129-36775-00002. The ozone season mass emissions shown in the budget demonstration for the two boilers at Grain Processing Corporation were

¹ Federal Register, Volume 66, Issue 217 (November 8, 2001), Page 56469

calculated using the PTE NO_x emissions from Title V Operating permit number 027-37916-00046.

The total ozone season mass emissions compared to Indiana’s large non-EGU NO_x SIP Call budget of 8,008 tons shows that Indiana can demonstrate that the NO_x SIP Call requirements are met using the Option 1 demonstration. The totals are summarized below:

NON-EGU BUDGET DEMONSTRATION SUMMARY TABLE

Ozone Season Mass at 3672 hours				
2017	2016	2015	2014	Highest 2014-2017
2,821.0 tons	2,714.1 tons	4,038.2 tons	4,605.8 tons	4,720.3 tons
2017 Indiana NO _x SIP Call Budget (excluding BFG units)				8,008.0 tons
Indiana CAIR NO _x Ozone Season Trading Program Budget				9,777.0 tons

IDEM will submit this demonstration in support of the “NO_x Emissions from Large Affected Units and Repeal of NO_x Budget Trading Program” rulemaking to U.S. EPA for SIP approval as a revision to Indiana’s Nitrogen Oxide Rules in Article 10. The SIP revision does not interfere with progress towards any area in the state achieving compliance with the NAAQS under 110(l). This rulemaking incorporates NO_x emission requirements for large non-EGUs (referred to as large affected units in the rule) in 326 IAC 10-2 that were covered by CAIR but not covered by CSAPR and repeals the NO_x Budget Trading Program in 326 IAC 10-4 and CAIR Ozone Season Trading Program in 326 IAC 24-3. It also revises 326 IAC 10-3 to expand applicability to blast furnace gas units that are no longer part of a trading program so that all blast furnace gas units are subject to the NO_x emission limit of 0.17 lbs/MMBtu.

This rulemaking was preliminarily adopted by the Indiana Environmental Rules Board on January 10, 2018. IDEM has already adopted the CSAPR rulemaking, which revised 326 IAC 24 to incorporate CSAPR requirements and repeal the ozone season trading program portions of CAIR. It also revised 326 IAC 26 to replace references to CAIR with CSAPR in the BART rule.

C. COMPLIANCE

U.S. EPA is not requiring enforceable caps on either individual large non-EGUs or all of the large non-EGUs as a group. When new large non-EGUs are permitted by the state, IDEM will need to update the demonstration to show that the units as a group are still below the budget. IDEM is also proposing to add a new rule at 326 IAC 10-2 to adopt NO_x monitoring requirements for large non-EGUs, based on the NO_x monitoring requirements previously required in the NO_x budget trading rules at 326 IAC 10-4 and subsequently the CAIR rules at 326 IAC 24-3. NO_x monitoring will be conducted in accordance with 40 CFR 75, Subpart H, often referred to as “Part 75 monitoring requirements”. IDEM will use data collected from the NO_x monitoring rule at 326 IAC 10-2 to update this demonstration on an annual basis.

Attachment

Ozone Season Nox Emissions Information for Non-EGUs

Facility Name	ORIS Code	Unit ID	Ozone Season NOx Mass (tons)				Ozone Season Sum Operating Time (hours)				Ozone Season Mass at 3672 hours				
			2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014	Highest 2014-2017
Alcoa	6705	1	362.2	387.9	967.6	1027	2731.6	2378.1	3618.7	3475.8	486.9	598.9	981.8	1085.1	981.8
Alcoa	6705	2	422.7	355.1	1060	1074	3112.7	2131.6	3556.5	3488.8	498.6	611.7	1094.0	1130.0	1094.0
Alcoa	6705	3	119.4	385.2	997.2	1056	864.77	2017.8	3374.6	3421	506.8	701.1	1085.1	1133.0	1085.1
BP Whiting Business Unit	52130	1SPS13													Retired
BP Whiting Business Unit	52130	1SPS14													Retired
BP Whiting Business Unit	52130	1SPS15													Retired
BP Whiting Business Unit	52130	1SPS16													Retired
BP Whiting Business Unit	52130	1SPS17													Retired
BP Whiting Business Unit	52130	3SPS31	11.2	11.07	12.27	12.69	3672	3672	3672	3308.8	11.2	11.1	12.3	14.1	12.3
BP Whiting Business Unit	52130	3SPS32	12.35	5.755	9.557	13.72	3672	1709	2583	3672	12.4	12.4	13.6	13.7	13.6
BP Whiting Business Unit	52130	3SPS33	6.929	11.61	6.555	14.08	2159.9	3360.6	2607.7	2723.6	11.8	12.7	9.2	19.0	12.7
BP Whiting Business Unit	52130	3SPS34	7.847	13.37	14.74	13.33	3670.2	3671	3672	3561.5	7.9	13.4	14.7	13.7	14.7
BP Whiting Business Unit	52130	3SPS36	29.39	12.4	12.77	15.58	3672	3523	3672	3672	29.4	12.9	12.8	15.6	29.4
C. C. Perry K Steam Plant	992	11	60.85	58.8	48.35	33.32	2710.4	2921.1	2761.6	1946.4	82.4	73.9	64.3	62.8	82.4
C. C. Perry K Steam Plant	992	12	30.41	34.22	25.9	28.51	3392	3666.6	3336.9	3114.2	32.9	34.3	28.5	33.6	34.3
C. C. Perry K Steam Plant	992	13	7.199	4.769	11.55	8.518	858.37	573.49	1167.2	990.8	30.8	30.5	36.3	31.6	36.3
C. C. Perry K Steam Plant	992	14	10.24	11.47	7.176	7.091	713.4	980	634.69	571.79	52.7	43.0	41.5	45.5	52.7
C. C. Perry K Steam Plant	992	15				77.2				1533.2				184.9	184.9
C. C. Perry K Steam Plant	992	16	0.174	0.243	2.74	4.807	24.89	60.14	233.16	270.42	25.7	14.8	43.2	65.3	65.3
Wentz Steel USA Indiana Harbor East	10474	211													Retired
Wentz Steel USA Indiana Harbor East	10474	212													Retired
Wentz Steel USA Indiana Harbor East	10474	213													Retired
Wentz Steel USA Indiana Harbor East	10474	401													Retired
Wentz Steel USA Indiana Harbor East	10474	402													Retired
Wentz Steel USA Indiana Harbor East	10474	403													Retired
Wentz Steel USA Indiana Harbor East	10474	404													Retired
Wentz Steel USA Indiana Harbor East	10474	405													Retired
Wentz Steel USA Indiana Harbor East	10474	501	229.6	64.63	34.88	20.17	3360.8	3665	3671.1	2479.1	250.8	64.8	34.9	29.9	250.8
Wentz Steel USA Indiana Harbor East	10474	502	251.4	57.34	35.83	24.04	3671.2	3385.3	3555.4	3218.8	251.5	62.2	37.0	27.4	251.5
Wentz Steel USA Indiana Harbor East	10474	503	90.63	68.14	33.85	22.35	3670	3660.6	3671.1	3055.5	90.7	68.3	33.9	26.9	90.7
Wentz Steel USA Indiana Harbor East	10474	504	107.3	97.79	66.96	38.75	3341.2	3366.2	3334.9	2181.9	117.9	106.7		65.2	117.9

Ozone Season Nox Emissions Information for Non-EGUs

Facility Name	ORIS Code	Unit ID	Ozone Season NOx Mass (tons)				Ozone Season Sum Operating Time (hours)				Ozone Season Mass at 3672 hours				
			2017	2016	2015	2014	2017	2016	2015	2014	2017	2016	2015	2014	Highest 2014-2017
North Americas South Bend Ethanol	880087	U-4000													Retired
Portside Energy	55096	BLR1	0.8	0.33	0.228	0.09	452.25	221.64	124.04	39.68	6.5	5.5	6.7	8.3	8.3
Portside Energy	55096	BLR2	2.099	1.227	1.561	1.585	3583.8	3564.4	3643.6	3667.9	2.2	1.3	1.6	1.6	2.2
Portside Energy	55096	CT	22.82	23.9	23.71	23.63	3365.5	3587.6	3617.6	3646.2	24.9	24.5	24.1	23.8	24.9
Purdue University	50240	2	19.72	45.81	24.26	16.22	2098.4	3581	2546.7	367.98	34.5	47.0	35.0	161.9	161.9
Purdue University	50240	3	28.75		16.62	22.13	3243.1		2933	3320.5	32.6		20.8	24.5	32.6
Purdue University	50240	5	33.27	54.4	46.94	40.76	2314.5	3385.9	3323.2	2774.9	52.8	59.0	51.9	53.9	59.0
Purdue University	50240	7	9.979	11.55	10.15	10.62	3601	3402.4	3526.9	3575	10.2	12.5	10.6	10.9	12.5
Rockport	6166	AB1	1.105		0.044	0.758	3347.1		1.4	24.41	1.2		115.4	114.0	115.4
Rockport	6166	AB2	1.165		0.054	0.776	3418.8		1.73	25	1.3		114.6	114.0	114.6
US Steel Corp - Gary Works	50733	701B1	20.96	15.42	18.86	12.14	3668.3	3592.7	3321.3	3123	21.0	15.8	20.8	14.3	21.0
US Steel Corp - Gary Works	50733	701B2	19.23	13.72	11.15	11.27	3092.1	3670.2	3163.8	3672	22.8	13.7	12.9	11.3	22.8
US Steel Corp - Gary Works	50733	701B3	16.69	11.6	11.16	8.21	2803.6	3672	3213.1	3256.9	21.9	11.6	12.7	9.3	21.9
US Steel Corp - Gary Works	50733	701B5	7.667	1.603	4.211	5.375	3116.8	1403.2	3670.5	3664.6	9.0	4.2	4.2	5.4	9.0
US Steel Corp - Gary Works	50733	701B6	36.62	22.52	23.76	24.71	3672	3307.4	3539	3669.4	36.6	25.0	24.7	24.7	36.6
US Steel Corp - Gary Works	50733	720B1	5.034	4.394	5.311	5.762	3662.7	3672	2846.6	3672	5.0	4.4	6.9	5.8	6.9
US Steel Corp - Gary Works	50733	720B2	9.784	5.988	15.68	10.62	3671.6	3266.6	3672	3671.6	9.8	6.7	15.7	10.6	15.7
US Steel Corp - Gary Works	50733	720B3	28.46	10.52	16.57	14.26	3666.8	3672	3672	3666.8	28.5	10.5	16.6	14.3	28.5
SABIC*		Cogen**													392.0
Grain Processing Corporation*		Boiler 1													48.8
Grain Processing Corporation*		Boiler 2													48.8

* Emissions not reported to CAMD for four year evaluation period.

Total Ozone Season Mass Emissions: 2821.0 2714.1 4038.2 4605.8 5593.6

**Includes Combustion Turbine and Auxiliary Boiler

KEY (for shaded cells):

Blast Furnace Gas Units (BFG)



Total Ozone Season Mass Emissions (without BFG) 4720.3