

2025 North Dakota Data Requirements Rule Report North Dakota Department of Environmental Quality Division of Air Quality

1. Background and History of the Data Requirements Rule

The Data Requirements Rule (DRR, 80 FR 51052) was promulgated to produce sulfur dioxide (SO₂) concentration data so that informed decisions may be made on designations for the 2010 1-hour SO₂ National Ambient Air Quality Standard (NAAQS). Because of the tendency of SO₂ concentrations to be highest near larger sources of SO₂, the Environmental Protection Agency (EPA) designed the DRR to require the collection of SO₂ data near these sources. The final version of the DRR allowed for States to fulfill their requirements using data based on either ambient monitoring or dispersion modeling. Of the sources required to produce SO₂ data for the DRR in North Dakota, only the Tioga Gas Plant owned and operated by Hess Corporation chose to use data based on ambient monitoring. All other DRR sources chose to produce SO₂ data using dispersion modeling. This annual DRR report addresses requirements for SO₂ sources that utilized data produced through dispersion modeling.

Because of a lawsuit filed by the Sierra Club and the Natural Resources Defense Council, requirements to produce SO_2 data for designations proceeded in stages. The outcome of that lawsuit was a Consent Decree (CD) with the EPA on March 2, 2015, which accelerated the data submission and designation schedule for certain sources. In North Dakota, the SO₂ sources that were required to submit SO₂ data earlier because of the CD were Coyote Station (Coyote), Coal Creek Station (CCS), and Leland Olds Station (LOS).

Modeled Region	Sources Included	Year Span Modeled	Modeled Design Values (µg/m ³)	Percent of 2010 SO ₂ NAAQS	
McLean County /	Coal Creek Station				
Eastern Mercer	Leland Olds Station	2012-2014	167.3	85.4%	
County Area	Stanton Station				
Central Mercer County Area	Coyote Station	2012–2014	115.9	59.1%	
	Coyote Station				
Northern Mercer	Antelope Valley Station	2012 2015	126.6	69.7%	
County Area	Great Plains Synfuels	2013-2013	150.0		
	Plant				
	Coal Creek Station				
	Coyote Station			39.7%	
Oliver County Area	Leland Olds Station	2012 2015	9 77		
Oliver County Alea	Milton R. Young Station	2013-2013	//.0		
	R.M. Heskett Station				
	Stanton Station				
Burleigh County	R.M. Heskett Station	2013 2015	156.3	70 7%	
and Morton County Mandan Refinery		2013-2013	150.5	19.170	

Table 1: Sources Modeled from Each Region in North Dakota, Time Span of Data Modeled forEach Region, Modeled Design Values, and Percent of 2010 NAAQS

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Division of Municipal Facilities 701-328-5211 Division of Waste Management 701-328-5166 Division of Water Quality 701-328-5210 Division of Chemistry 701-328-6140 2635 East Main Ave Bismarck ND 58501 As documented in Table 1, the modeling conducted for the McLean County and Mercer County Area encompassed emissions from 2012 through 2014 and included CCS, LOS, and Stanton Station. Stanton Station permanently ceased operation in 2017. Modeling for the Central Mercer County area encompassed emissions from 2012 through 2014 and included Coyote Station. Modeling for the Northern Mercer County area encompassed emissions from 2013 through 2015 and included the Coyote Station, Antelope Valley Station (AVS), and Great Plains Synfuels Plant (GPSP). Modeling conducted for the Oliver County area encompassed emissions from 2013 through 2015 and included the CCS, Coyote Station, LOS, Milton R. Young Station (MRYS), R.M. Heskett Station (Heskett), and Stanton Station. Heskett Station coal units permanently ceased operation in the first quarter of 2022. The modeling conducted for the Burleigh County and Morton County area encompassed emissions from 2013 through 2015 and included Heskett and the Mandan Refinery.

The required modeling analyses for the sources were submitted to the EPA by the prescribed deadline. The EPA approved the modeling analyses and the SO₂ data. Based on the modeling analyses, the EPA made the decision to designate areas of North Dakota surrounding these sources as "attainment/unclassifiable" for the 1-hour SO₂ NAAQS.

2. Procedure used for the Data Requirements Rule

The scope of the DRR is depicted in Figure 1. Operating electric generating units (EGU) and coal consumers are pinned with a green marker and permanently shut down units are indicated by a red circle with a slash. The North Dakota Department of Environmental Quality's Ambient Air Monitoring sites are pinned in yellow. The three North Dakota State monitoring locations located within the scope of the DRR region are as follows: Beulah North (38-057-0004), Hannover (38-065-0002) and Bismarck (38-015-0003). All three sites are equipped with SO₂ monitoring equipment, which provides 1-hour SO₂ readings 24-hours a day, 365 days a year. All data from the Ambient Air Monitoring Sites are reported to the EPA's AQS (Air Quality System) database.

All the sources addressed in the modeling analyses used actual emissions (Coyote Station, CCS, AVS, GPSP, MRYS, Stanton Station, the Mandan Refinery, and Heskett Station), except for LOS, which used allowable emissions. LOS's owner, Basin Electric Power Cooperative, installed wet scrubbers and a new 600-foot stack in the middle of the modeled 3-year period (2012–2014) and therefore did not have three consecutive years of emissions data using the new wet scrubber, which would be representative of current and future emissions at the facility. Basin Electric used a Best Available Retrofit Technology (BART) permit allowable emission rate in the modeling analysis for LOS.

The DRR requires that each State must submit an annual report to the EPA for sources that demonstrated compliance with the NAAQS using modeling based on actual emissions. Since all North Dakota sources, except LOS, demonstrated compliance with the 1-hour SO₂ NAAQS using modeling and actual emissions data, the State must submit an annual report to EPA documenting each area's most recent annual emissions. The report must provide an assessment of the reason(s) for any emissions increase and provide a determination of whether air quality modeling would be needed to verify that the area around the source continues to comply with the 1-hour NAAQS.



Figure 1: Scope for the sources reviewed in this report. Image from Google Earth.

The sources were modeled in each respective area, as denoted in Table 1, using hourly emissions from Continuous Emissions Monitoring System (CEMS) data. The most recent three years of data, at the time, were used in the modeling analyses. The DRR specifies that the total annual emissions in tons for the DRR sources should be compared in this report.

3. Results and Summary for the Data Requirements Rule

The Department accessed the Compliance Assurance Monitoring Air Markets Program Data (CAM AMPD) database and evaluated the annual SO₂ emissions. The data on the CAM AMPD include all North Dakota EGUs reporting for a given year, except for Mandan Refinery and GPSP. Data for these sources was taken from Annual Emission Inventory Reports submitted to the Department. Annual SO₂ emissions from individual DRR sources over the last 10 years are included in Table 2.

Table 3 contains SO₂ emissions information for the modeled regions and the individual sources within the modeled regions. Specifically, Table 3 includes each modeled region, the year span modeled for each region, the sources included in the region, the highest emitting round 3 modeled year, 2024 SO₂ emissions, the percent decrease in 2024 compared to the highest emitting round 3 modeled year, the 3-year average emissions of the modeled years, the percent decrease in 2024 compared to the 3-year average of round 3 modeled year emissions, the recent (2022-2024) 3-year average emissions, and the percent decrease from the recent 3-year average compared to the 3-year average of round 3 modeled emissions. The percent decrease calculation results are based on the recommendations of EPA Region 8 from August 13, 2019, and June 1, 2021.

The percentage decreases displayed in Table 3 were calculated using the following equations:

Percent Decrease in 2024 Compared to Highest Emitting Round 3 Modeled Year =

Highest Emitting Round 3 Modeled Year – 2024 Emissions Highest Emitting Round 3 Modeled Year x 100%

And,

Percent Decrease in 2024 Compared to 3-Year Average of Round 3 Modeled Years =

3-Year Average Modeled Years – 2024 Emissions 3-Year Average Modeled Years x 100%

And,

Percent Decrease in "2022-2024 3-Year Average Emissions"

Compared to "3-Year Average of Round 3 Modeled Years" =

"3-Year Average Modeled Years" – "2022-2024 3-Year Average Emissions" x 100% "3-Year Average Modeled Years"

Company	Source	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Basin Electric Power Coop.	AVS 1	6,312	7,254	5,259	5,911	6,045	5,420	4,241	5,949	5,971	4,767
Basin Electric Power Coop.	AVS 2	6,716	5,089	7,603	6,126	4,718	5,896	6,770	5,673	5,149	7,027
Basin Electric Power Coop.	Leland Olds 1 ^A	681	711	554	652	723	484	565	652	466	645
Basin Electric Power Coop.	Leland Olds 2 ^A	1,066	1,217	1,364	1,052	1,314	1,236	910	1,384	1,405	1,202
Minnkota Power Coop.	M.R. Young 1	606	909	905	518	636	504	223	222	194	206
Minnkota Power Coop.	M.R. Young 2	2,129	1,729	2,507	2,258	2,021	2,173	2,099	1,668	1,802	1,944
Ottertail Power Co.	Coyote Station	8,786	11,873	13,444	14,913	10,060	11,975	12,684	11,606	13,753	12,591
Mon. Dak. Utilities	Heskett 1 ^B	1,010	703	642	916	991	962	1,111	175.4	0	0
Mon. Dak. Utilities	Heskett 2 ^B	2,046	1,887	1,485	1,228	1,105	1,384	1,459	155	0	0
Rainbow Energy Center, LLC	Coal Creek 1	7,667	7,643	3,096	3,458	3,555	2,499	3,477	3,340	2,258	3,283
Rainbow Energy Center, LLC	Coal Creek 2	7,776	5,633	3,296	3,400	2,727	2,801	3,354	2,925	3,288	3,059
Great River Energy	Stanton 1 ^B	2,076	2,412	395	0	0	0	0	0	0	0
Great River Energy	Stanton 10 ^B	88	67	28	0	0	0	0	0	0	0
Dakota Gasification	GPSP	3,294	2,825	5,203	2,837	3,033	5,671	3,272	2,808	2,382	3,218
Tesoro Refining and Marketing Co.	Mandan Refinery	250	291	198	135	123	154	206	200	233	164

Table 2: Annual SO₂ Emissions (tons) for Each Individual Source for Recent 10-Years

^A Modeled with allowable emission rates. ^B Permanently shut down and decommissioned.

Modeled Region	Year Span Modeled	Sources Included	Highest Emitting Round 3 Modeled Year	2024 Emissions	Percent Decrease in 2024 Compared to Highest Emitting Round 3 Modeled Year	3-Year Average Modeled Years	Percent Decrease in 2024 Compared to 3-Year Average of Round 3 Modeled Years	2022-2024 3-Year Average Emissions	Percent Decrease in 2022-2024 3- Year Average Compared to 3- Year Average of Round 3 Modeled Years
McLean		Coal Creek Station	16,273	6,342	61%	15,893	60%	6,051	62%
County / Eastern 2012– Mercer 2014 County Area	2012-	Leland Olds Station	38,324	1,848	95%	15,794	88%	1,918	88%
	2014	Stanton Station	2,591	0	Shutdown	2,334	Shutdown	0	Shutdown
		Full Region	57,188	8,190	86%	34,021	76%	7,969	77%
Central Mercer County Area	2012– 2014	Coyote Station	12,777	12,591	1%	11,999	-5%	12,650	-5%
Northern Mercer 2013– County 2015 Area	Coyote Station	12,777	12,591	1%	11,381	-11%	12,650	-11%	
	2013-	Antelope Valley Station	13,654	11,794	14%	13,055	10%	11,512	12%
	2015	Great Plains Synfuels Plant	3,818	3,218	16%	3,245	1%	2,803	14%
		Full Region	30,249	27,603	9%	27,681	0%	26,964	3%

Table 3: Multiple Scenarios Presented for Comparison of: Recent Emissions to Highest Modeled Year, Recent Emissions to 3-
Year Average Modeled Years, and Recent 3-Year Average Emissions to 3-Year Average Modeled Years

Modeled Region	Year Span Modeled	Sources Included	Highest Emitting Round 3 Modeled Year	2024 Emissions	Percent Decrease in 2024 Compared to Highest Emitting Round 3 Modeled Year	3-Year Average Modeled Years	Percent Decrease in 2024 Compared to 3-Year Average of Round 3 Modeled Years	2022-2024 3-Year Average Emissions	Percent Decrease in 2022-2024 3- Year Average Compared to 3- Year Average of Round 3 Modeled Years		
Oliver County Area 2013– 2015		Coal Creek Station	15,825	6,342	60%	15,617	59%	6,051	61%		
	Coyote Station	12,777	12,591	1%	11,381	-11%	12,650	-11%			
		Leland Olds Station	7,622	1,848	76%	3,602	49%	1,918	47%		
	Milton R. Young Station	2,735	2,150	21%	2,234	4%	2,012	10%			
	R.M. Heskett Station	3,369	0	Shutdown	3,135	Shutdown	110	96%			
	Stanton Station	2,591	0	Shutdown	2,262	Shutdown	0	Shutdown			
					Full Region	44,919	22,930	49%	38,230	40%	22,741
Burleigh County and Morton County 2013– 2015	0.10	R.M. Heskett Station	3,369	0	Shutdown	3,135	Shutdown	110	96%		
	2013– 2015	Mandan Refinery	279	164	41%	262	38%	199	24%		
	Full Region	3,648	164	96%	3,397	95%	309	91%			

Notes:

The percentage decrease calculations are based on an EPA recommendation from August 13, 2019, and June 1, 2021.

-BOLD % represents an increase

-BOLD % represents a 15% or more increase

Table 2 shows that individual source emissions from 2024 were generally comparable to 2023 emissions. Total SO₂ emissions were ~1,200 tons higher than 2023, and ~1,300 tons higher than 2022. Table 3 indicates that all but one of the modeled regions experienced a decrease in emissions from the 2022-2024 3-year average emissions compared to the average of the round 3 modeled years emissions. These decreases ranged from 3% in the Northern Mercer County Area to 91% in the Burleigh and Morton County Area. Similarly, all but one of the regions modeled experienced decreases in 2024 when compared to the average round 3 modeled year emissions ranging from 0% in Northern Mercer County Area to 95% in Burleigh and Morton County Area. All regions modeled experienced decreases in 2024 when compared to the highest emitting round 3 modeled year. These reductions ranged from 1% in Central Mercer County Area, to 96% in Burleigh and Morton County Area.

The only modeled region to show an increase in any category was Central Mercer County Area, which consists of a single source, Coyote Station. In 2024, the facility experienced a 5% increase when compared to the round 3 modeled years as well as a 5% increase when the 3-year average was compared to the round 3 modeled years. However, these comparisons do not account for differences in operating hours across the evaluated time frames. Further analysis showed that Coyote Station operated 8.93% more hours in 2024 compared to the average from 2012-2014. Despite the increase in operational time, SO₂ emission rates from 2024 decreased by 3.63% when compared to the same baseline period. These results are shown in Table 4. This indicates that, although total emissions were slightly higher in 2024, Coyotes Station's operational efficiency improved, resulting in lower emissions per hour of operation.

Year	Operating Hours	Average SO ₂ (lb/hr)
2012	6394	3328
2013	7175	3506
2014	7641	3344
2012-2014 (avg)	7070	3393
2024	7701	3270
Percent increase in 2024 versus 2012- 2014	8.93%	-3.63%

Table 4: Coyote Station Operating Hours and Emission Rates

All facilities other than Coyote Station showed decreases in every category in Table 3. The percent decrease in the 2022-2024 3-year average compared to the 3-year average of round 3 modeled years among locations that are still operational ranged from 10% at Milton R. Young Station to 96% at R.M. Heskett Station. The percent decrease in 2024 compared to the 3-year average modeled years ranged from 1% at GSPS to 88% at Leland Olds Station. The percent decrease in 2024 compared to the highest emitting round 3 modeled year ranged from 1% at Coyote Station to 95% at Leland Olds Station.

Given the above information, the Department's position is that the sources modeled using actual emissions in the DRR modeling analyses in North Dakota are not expected to exhibit significantly higher design values. The Department's review of the complete data set indicates that any increase in the design values would be minor and not threaten the SO₂ NAAQS using more recent years of data, thus maintaining compliance with the 1-hour SO₂ NAAQS is expected. Therefore, based on regulatory guidance, the Department's determination is that no additional modeling or monitoring is required under the Data Requirements Rule.

FOR THE NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY

Date

By

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