Iowa
State Implementation Plan

Interstate Transport – Prongs 1 and 2
2010 1-Hour Sulfur Dioxide (SO_2) NAAQS

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Executive Summary

The federal Clean Air Act (CAA) includes provisions to protect downwind states from air pollution that may originate in upwind states. These provisions are known as the "interstate transport" or "good neighbor" provisions. Section 110(a)(2)(D)(i) of the CAA establishes four good neighbor components, or "prongs." Iowa has not yet addressed either prong 1 or prong 2 for the 2010 1-hour sulfur dioxide (SO_2) national ambient air quality standard (NAAQS). The purpose of this State Implementation Plan (SIP) revision is to fulfill those remaining obligations by demonstrating that Iowa's sources do not contribute significantly to nonattainment (prong 1), or interfere with maintenance (prong 2), of the 2010 1-hour SO_2 NAAQS in any other state.

The interstate transport provisions are typically addressed, along with other mandatory elements, in "infrastructure" SIPs, due within three years of any NAAQS revision. Consistent with that timeframe, the Iowa Department of Natural Resources (DNR) submitted the state's 1-hour SO_2 infrastructure SIP to the U.S. Environmental Protection Agency (EPA) in 2013. However, at that time EPA did not expect states to address prongs 1 or 2, an approach necessitated by a 2012 court decision. While that ruling was eventually overturned after appeal, further delays in the development of "transport SIPs" were driven by the unusually long and multiple-round 1-hour SO_2 designations process. Such complications no longer remain, allowing the DNR to evaluate SO_2 emissions sources near Iowa's border and conclude, based on the data and results documented in this transport SIP, that the state is complying with its good neighbor requirements for the 2010 1-hour SO_2 NAAQS.

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1. Introduction

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to set national ambient air quality standards (NAAQS) for specific pollutants known as criteria pollutants. EPA must periodically review and update the NAAQS as necessary to ensure they provide adequate health and environmental protections.

EPA last promulgated revisions to the sulfur dioxide (SO_2) NAAQS on June 3, 2010, adding a new 1-hour primary standard of 75 parts per billion (ppb) and revoking the primary 24-hour average (140 ppb) and annual average (30 ppb) standards (75 FR 35520, June 22, 2010). Under a separate review, EPA concluded that no revisions to the existing 3-hour 0.5 part per million (ppm) secondary standard were needed (77 FR 20218, April 3, 2012).

Whenever EPA revises an existing or establishes a new NAAQS, each state must adopt and submit a revision to its State Implementation Plan (SIP) to provide for the implementation, maintenance, and enforcement of that NAAQS. Section 110(a)(1) of the CAA requires the SIP submission within 3 years of NAAQS promulgation and §110(a)(2) identifies the required elements that the plan must address. Since many of the elements pertain to the basic infrastructure of an air quality management program, such as having the necessary legal authority and adequate resources, those SIP revisions are often referred to as "infrastructure SIPs." However, not all aspects of an infrastructure SIP are administrative.

1.1. Interstate Transport Provisions

Depending upon the pollutant, the most complex infrastructure SIP elements may pertain to the interstate transport provisions of CAA section 110(a)(2)(D), which require that each state's SIP:

> *(D) contain adequate provisions –*
>
> *(i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will –*
>
> *(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or*
>
> *(II) interfere with measures required to be included in the applicable implementation plan for any other State under part C of this subchapter to prevent significant deterioration of air quality or to protect visibility.*

EPA organizes these "good neighbor" requirements into four distinct components, commonly referred to as "prongs." The first two prongs reference §110(a)(2)(D)(i)(I) and prohibit emissions activity in one state from contributing significantly to nonattainment (prong 1) or from interfering with maintenance (prong 2) of the NAAQS in another state. The last two prongs reference §110(a)(2)(D)(i)(II) and prohibit emissions activity in one state from interfering with measures to prevent significant deterioration of air quality (prong 3) or to protect visibility (prong 4) in another state.

1.2. Iowa's 1-Hour SO_2 Infrastructure SIP

On July 23, 2013, the Iowa Department of Natural Resources (DNR) submitted the state's infrastructure SIP for the 2010 1-hour SO_2 NAAQS to EPA.[1] However, the prong 1 and prong 2 interstate transport provisions were the subject of ongoing federal legal complexities at that time and the DNR stated, consistent with EPA expectations, that:

> *"It is not appropriate to address Section 110(a)(2)(D)(i)(I) at this time due to recent court decisions, ongoing litigation, and associated regulatory uncertainty. DNR participates in EPA's conference calls and meetings on interstate transport. DNR looks forward to working with EPA in a collaborative approach to find a final, equitable solution to address interstate transport."*

EPA approved Iowa's SO_2 infrastructure SIP on March 22, 2018 (83 FR 12486), but as expected took no action on prongs 1 or 2. EPA also took no action on prong 4, but did approve prong 3. The DNR has since addressed prong 4 through a revision to Iowa's first regional haze plan.[2]

[1] See the DNR's Implementation Plans webpage for a copy of Iowa's infrastructure SIP for the 2010 1-hour SO_2 NAAQS.

[2] The DNR submitted a SIP revision dated May 13, 2019, to replace reliance on the Clean Air Interstate rule (CAIR) with reliance on the Cross State Air Pollution Rule (CSAPR) to satisfy prong 4 obligations through the regional haze program. See the "First Regional Haze Plan" section on the DNR's Implementation Plans website for a copy. EPA approval occurred December 3, 2019 (84 FR 66075).

1.3. Purpose of Plan Revision

The purpose of this plan revision, or "transport SIP," is to fulfil the state's remaining good neighbor obligations for the 2010 1-hour SO_2 NAAQS by addressing the prong 1 and prong 2 interstate transport provisions. This plan will demonstrate that no Iowa sources contribute to nonattainment or interfere with maintenance of 2010 1-hour SO_2 NAAQS in any downwind state.

1.4. Timing Delays

While unusually delayed, two factors outside state control previously prevented the development of this transport SIP. The initial delay, as indicated above, concerned legal complexities surrounding the prong 1 and prong 2 requirements. That legal uncertainty remained until the cases were fully resolved in 2015. See Appendix A for an abbreviated and simplified review of the legal issues.

The second factor was the lengthy 1-hour SO_2 designations process, which wasn't officially completed until 2021, nearly 11 years after the 2010 1-hour SO_2 NAAQS revision. Designations were needed pursuant to prongs 1 and 2 to explicitly identify any nearby downwind nonattainment areas and to identify possible nearby maintenance areas, which could include areas designated unclassifiable. Although CAA §107(d) provides EPA with up to three years to promulgate designations after a NAAQS revision,[3] by 2013 only a limited number of areas in the U.S. had been designated. To address the delays, EPA agreed to a consent decree in 2015 that established criteria and deadlines for three new rounds of 1-hour SO_2 designations. That same year EPA also promulgated the Data Requirements Rule (DRR, 80 FR 51052, August 21, 2015). The DRR required states to utilize modeling or monitoring methods to characterize maximum 1-hour SO_2 concentrations around sources emitting more than 2,000 tons of SO_2 per year. The resulting information would later inform the third and fourth rounds of designations, which EPA unofficially[4] completed in late 2017 and 2020, respectively. See Appendix B for additional information on the 2010 1-hour SO_2 NAAQS designations process, the DRR, and the resulting designations in Iowa, including the nonattainment area in Muscatine.

[3] Appendix B starts with a brief introduction to the designations process to assist any readers unfamiliar with those requirements.
[4] In accordance with the deadlines in the March 2015 Consent Decree, EPA signed for publication in the Federal Register the Round 3 and Round 4 designations in late 2017 and 2020, respectively, but they weren't officially published and effective until 2018 and 2021.

2. Evaluating 1-Hour SO_2 Interstate Transport

EPA typically provides guidance documents to assist states in the development of their SIP revisions. However, final SO_2 interstate transport guidance was not provided, and EPA instead recommended that states use the draft "*Guidance for 1-Hour SO_2 NAAQS SIP Submissions*" (Public Review Draft 9/22/2011). In accordance with its recommendations, the DNR assessed whether or not emissions from Iowa SO_2 sources located within 50 kilometers (km) of the state border have associated interstate transport impacts.

The 50 km spatial scale is appropriate as maximum 1-hour SO_2 concentrations will be found near the emissions source. Sulfur dioxide does not commonly contribute to widespread nonattainment over broad or distant areas. The transport of SO_2 is more localized and in most cases maximum impacts occur within the first 10 to 20 km of the source. Additionally, EPA generally limits near field applications of its preferred modeling platform, the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), to distances of 50 km or less. Since long-range transport is not a concern in this case, the geographic scope of this transport SIP is limited to the nearby areas in the six states adjacent to Iowa: Illinois, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin.

To determine if Iowa sources contribute to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in downwind states, DNR evaluated monitoring data, emissions, meteorological conditions, and transport distances. AERMOD air quality modeling results were reviewed where available. This is consistent with EPA's draft guidance.

2.1. Ambient SO_2 Monitoring Data

A reasonable first step in the good neighbor evaluation process is reviewing monitored 1-hour SO_2 design values. This provides an objective, quantitative method for identifying areas of immediate concern. Design values of 76 ppb or greater represent a NAAQS violation and a likely nonattainment problem, whereas values near that threshold may indicate possible maintenance issues. Computationally, the 1-hour SO_2 design value is the 3-year average of annual 99th percentile daily maximum 1-hour values for a monitoring site, as determined in accordance with 40 CFR 50 Appendix T.

For this review, the DNR excluded the 2020 ambient data to avoid potential anomalies caused by the COVID-19 pandemic (with lower than normal SO_2 concentrations the more likely anomaly). Until the 2023 data become available, the most recent design values which meet that condition will utilize the 2017-2019 data. As shown in Table 2-1, the 2017-2019 1-hour SO_2 design values for all sites in Iowa range from 2 to 35 ppb. This is less than half the NAAQS, at 3% to 47% of the 75 ppb standard.[5] For the Iowa sites within 50 km of the border, the maximum design value is 25 ppb, or 33% of the NAAQS. Table 2-2 provides the 2017-2019 design values for all SO_2 monitors located within 50 km of Iowa's border in any of the six adjacent states. Only sites in Nebraska and South Dakota are found in that zone, and each yields a design value in the 3 to 41 ppb range, or at most 55% of the NAAQS. While the data suggest there are no transport issues, not all sites are designed to capture maximum 1-hour SO_2 impacts, thus a source-by source review is needed.

Table 2-1. Iowa's 2017-2019 monitored 1-hour SO_2 design values.

State	County	Site ID	Site Name	Distance to IA Border (km)	2017-2019 Design Value (ppb)	Percent of 75 ppb NAAQS
Iowa	Clinton	19-045-0019	Chancy Park	2.5	18	24%
Iowa	Linn	19-113-0040	Public Health	82	8	11%
Iowa	Linn	19-113-0041	Tait Cummins Park	77	35	47%
Iowa	Muscatine	19-139-0016	Greenwood Cemetery	2.2	17	23%
Iowa	Muscatine	19-139-0019	High School East Campus	1.5	21	28%
Iowa	Muscatine	19-139-0020	Musser Park	1.1	25	33%
Iowa	Scott	19-163-0015	Jefferson School	1.7	4	5%
Iowa	Van Buren	19-177-0006	Lake Sugema	9.9	2	3%

[5] Note, attainment would still be met at 100% of the standard. A NAAQS violation requires a design value of 76 ppb or greater.

Table 2-2. Neighboring state monitored 2017-2019 1-hour SO_2 design values at sites within 50 km of Iowa's border.

State	County	Site ID	Site Name	Distance to IA Border (km)	2017-2019 Design Value (ppb)	Percent of 75 ppb NAAQS
Nebraska	Douglas	31-055-0019	Omaha NCore	4.5	24	32%
Nebraska	Douglas	31-055-0053	Whitmore	0.5	41	55%
Nebraska	Douglas	31-055-0057	OPPD North Omaha Station	0.6	34	45%
South Dakota	Minnehaha	46-099-0008	SD School	9.8	3	4%
South Dakota	Union	46-127-0001	Union County #1	5.8	3	4%

2.2. Iowa Facility Selection

To evaluate possible interstate transport impacts, the DNR first identified all Iowa facilities located within 50 km of the border that had actual SO_2 emissions, on a facility-wide basis, of 100 tons per year (tpy) or more in 2019, the most recent pre-pandemic year. The 100 ton per year threshold is consistent with EPA's draft 2011 guidance and provides a reasonable threshold for identifying the sources with the greatest potential for impacting SO_2 concentrations in downwind states. It further captures the majority of Iowa's major source SO_2 emissions. Facilities in Iowa subject to the Title V permitting program collectively emitted 33,940 tons of SO_2 in 2019. Of that total, 33,114 tons, or 98%, is accounted for by examining facilities with actual SO_2 emissions of at least 100 tpy.

Using the above selection criteria yields 16 Iowa sources that warrant review. These facilities are listed in Table 2-3 and mapped in Figure 2-1. Table 2-4 provides the annual emissions from each source for 2015-2019, the most recent consecutive five-year period that excludes 2020. Between 2015 and 2019, the total annual emissions summed from all 16 sources decreased by 10,347 tons, or 27%, as indicated in Figure 2-2.

Table 2-3. Iowa sources located within 50 km of the Iowa border that emitted 100 tons or more of SO_2 in 2019.

Facility Name (Source)	Facility ID	County	Distance[6] to IA Border (km)	2019 SO_2 Emissions (tons)
ADM – Clinton	23-01-006	Clinton	1.4	713
Climax Molybdenum Co.	56-02-021	Lee	3.3	178
Continental Cement Co. – Davenport Plant	82-04-005	Scott	0.3	1,087
Guardian Industries Corporation	23-02-013	Clinton	19	135
Heidelberg Materials US Cement	17-01-005	Cerro Gordo	36	101
Iowa Army Ammunition Plant (IAAP)	29-01-004	Des Moines	13	204
IPL – Burlington Generating Station	29-01-013	Des Moines	0.4	3,129
IPL – Lansing Generating Station[7]	03-03-001	Allamakee	0.3	127
MidAmerican Energy Co. – George Neal North	97-04-010	Woodbury	0.2	3,113
MidAmerican Energy Co. – George Neal South	97-04-011	Woodbury	0.5	2,617
MidAmerican Energy Co. – Louisa Station	58-07-001	Louisa	1.7	5,286
MidAmerican Energy Co. – Walter Scott Jr. Energy Center	78-01-026	Pottawattamie	0.4	8,895
Muscatine Power & Water (MPW)	70-01-011	Muscatine	0.5	1,715
Roquette America, Inc.	56-01-009	Lee	0.5	293
SSAB Iowa, Inc. – Muscatine (SSAB)	70-08-002	Muscatine	2.8	127
University of Iowa	52-01-005	Johnson	49	176

[6] DNR used Google Earth Pro to measure these distances and to produce other distance estimates provided elsewhere in this document. All such values should be treated as approximations. For measurements involving sources, the largest stack generally served as a facility's reference point. Greater uncertainty exists for sources with multiple stacks or with no easily discernable stack.
[7] Note, IPL – Lansing permanently closed in 2022.

Table 2-4. Annual SO_2 emissions by facility from 2015-2019 for the 16 Iowa sources.

Facility Name (Source)	2015	2016	2017	2018	2019
ADM – Clinton	636	552	520	559	713
Climax Molybdenum Co.	139	124	131	133	178
Continental Cement Co. – Davenport Plant	603	502	811	1,258	1,087
Guardian Industries Corporation	212	198	76	150	135
Heidelberg Materials US Cement	166	222	212	142	101
Iowa Army Ammunition Plant (IAAP)	452	262	205	188	204
IPL – Burlington Generating Station	3,355	3,044	3,059	3,325	3,129
IPL – Lansing Generating Station (see footnote 7 above)	1,622	246	313	303	127
MidAmerican Energy Co. – George Neal North	5,182	3,291	4,128	4,336	3,113
MidAmerican Energy Co. – George Neal South	7,968	4,888	4,356	5,628	2,617
MidAmerican Energy Co. – Louisa Station	6,098	5,129	5,233	7,332	5,286
MidAmerican Energy Co. – Walter Scott Jr. Energy Center	9,075	8,975	9,753	9,952	8,895
Muscatine Power & Water (MPW)	1,714	1,769	1,167	1,458	1,715
Roquette America, Inc.	353	307	270	326	293
SSAB Iowa, Inc. - Muscatine (SSAB)	157	171	282	234	127
University of Iowa	510	273	201	109	176
TOTAL (may not sum as shown due to rounding)	**38,242**	**29,952**	**30,718**	**35,432**	**27,895**

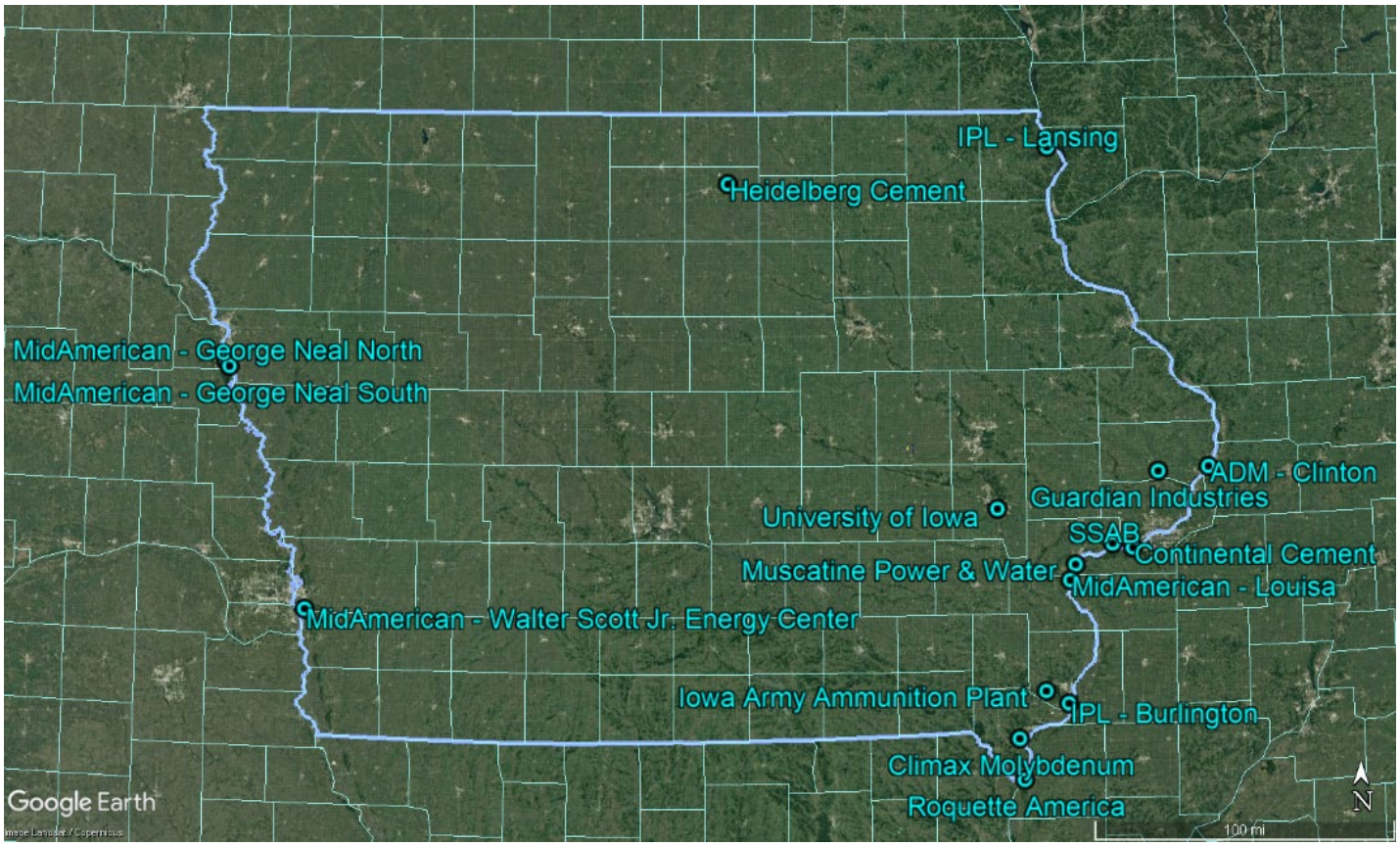

Figure 2-1. The 16 Iowa sources located within 50 km of Iowa's border that emitted 100 tons or more of SO_2 in 2019.

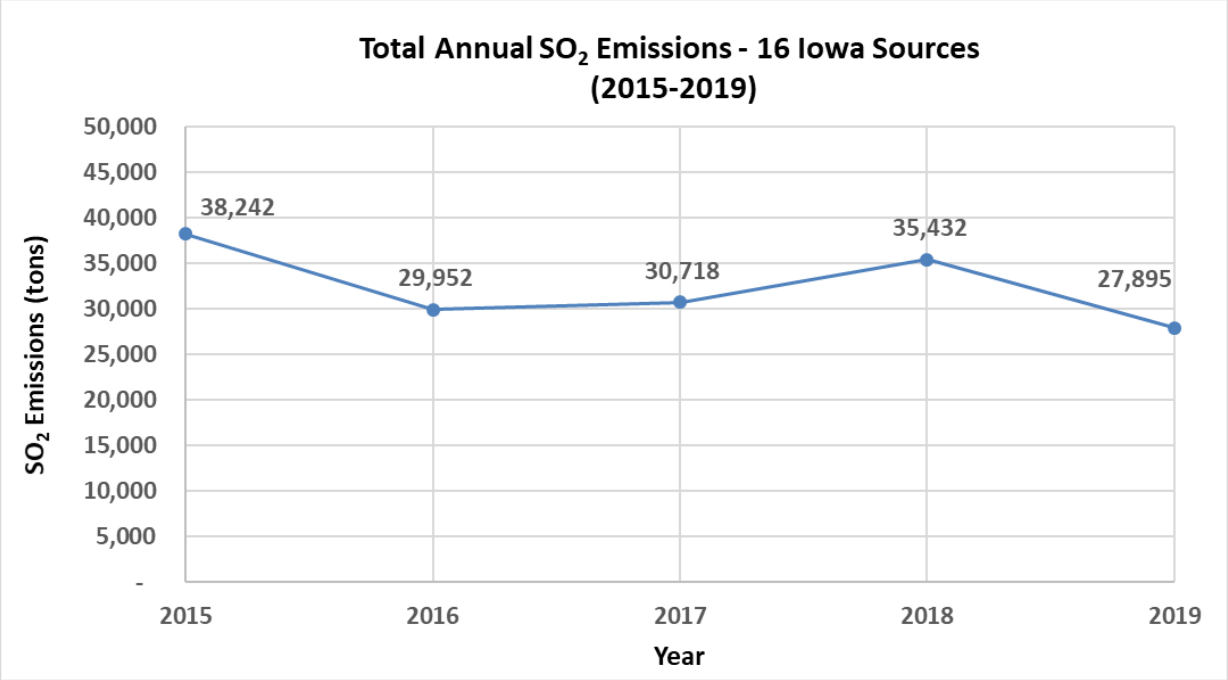

Figure 2-2. Total annual SO_2 emissions (tons) from 2015-2019 for the 16 Iowa sources.

2.3. Iowa's Comprehensive SO_2 Emissions Inventory

To assess the potential importance of any other sources, the DNR conducted a comprehensive review of Iowa's SO_2 emissions by evaluating the January 2021 version of the 2017 National Emissions Inventory (2017 NEI). The NEI provides a complete and detailed emissions inventory of all sources and sources types. For summary purposes, the data can be consolidated into the following five common source categories: point, nonpoint, onroad, nonroad, and fire. Due to the level of effort required, the NEI is generally available every third year only. With 2018 and 2019 being "off" years, the 2017 dataset represents the most recent version uninfluenced by the pandemic.

As shown in Table 2-5 and Figure 2-3, point sources account for an overwhelming majority of Iowa's SO_2 emissions, representing 97.3% of the statewide total. The remaining 2.7% is unimportant for interstate transport purposes. The statewide emissions totals for the nonpoint, onroad, nonroad, and fire categories are relatively small in magnitude and these emissions are not concentrated in any given location but more generally distributed across the entire state. Given these factors there was no need to develop lesser subtotals to quantify only those emissions found within 50 km of the Iowa border. Based on this information, the DNR concludes that the emissions from the nonpoint, onroad, nonroad, and fire source categories do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in any adjacent state. In Iowa, only the 16 sources listed above in Table 2-3 require further review.

Table 2-5. Iowa's 2017 NEI statewide SO_2 emissions totals by source category.

Source Category	2017 SO_2 (tons)[8]	Percentage
Point	38,576	97.3%
Nonpoint	441	1.1%
Onroad	279	0.7%
Nonroad	63	0.2%
Fire	277	0.7%
Total	**39,635**	**100%**

[8] For this analysis, the DNR moved the agricultural field burning emissions (uncommon in Iowa) from the nonpoint category to the fire category and also moved the locomotive and commercial marine emissions from the nonpoint category to the nonroad category. Additionally, all industrial nonpoint coal emissions were set to zero to correct a known double counting error that only affects Iowa's 2017 NEI data. Without this correction Iowa's 2017 total SO_2 emissions would be overestimated by 29,343.28 tons.

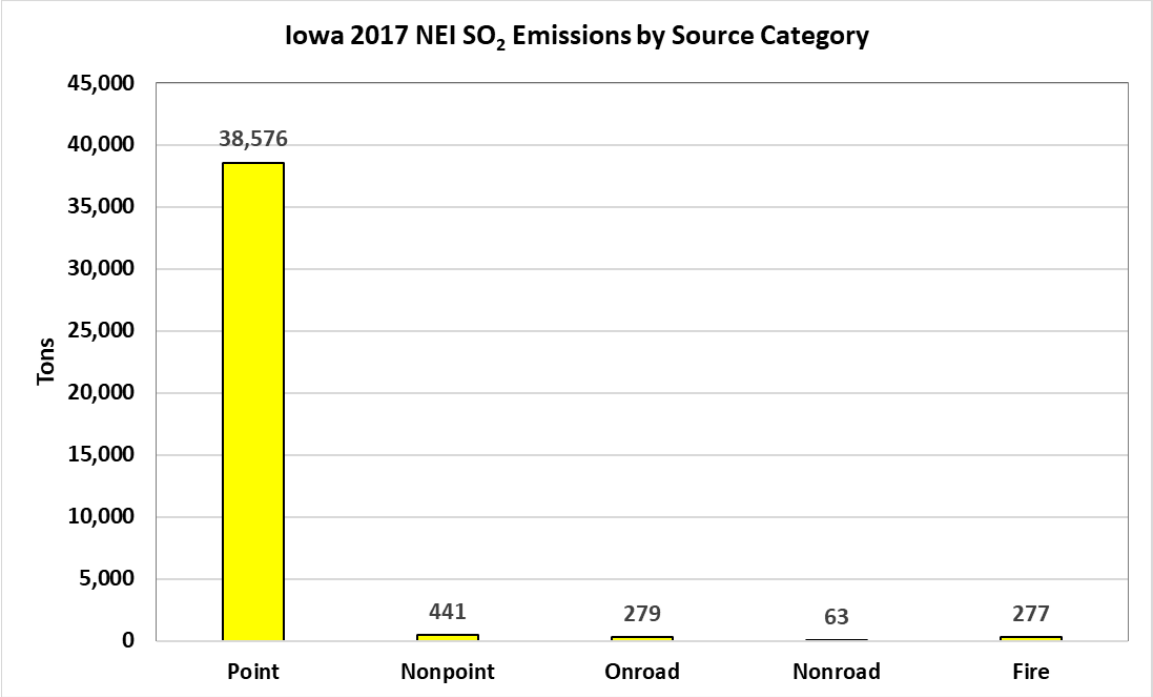

Figure 2-3. Iowa's 2017 NEI statewide SO_2 emissions totals (tons) by source category.

2.4. Designations in Adjacent States

Identifying any nearby nonattainment or maintenance areas is a necessary step in the good neighbor evaluation process. As reviewed in Appendix B, EPA issued initial designations for the 2010 1-hour SO_2 NAAQS through four separate rounds of actions.[9] In Iowa, no areas remained undesignated following Round 3 (83 FR 1098, January 9, 2018), but that was not the case for all nearby locations. Douglas County, Nebraska (the Omaha area) remained undesignated until Round 4. Absent that area's designation, the DNR could not address prongs 1 and 2 without speculation, not knowing if that area might be designated nonattainment. This was resolved on March 26, 2021 (86 FR 16055), with EPA's attainment/unclassifiable designation for Douglas County, Nebraska.

Through actions in Rounds 2 and 3, EPA had designated nearly all other counties within 50 km of Iowa's border as attainment/unclassifiable. The one exception was an unclassifiable designation in Round 2 for Lancaster County, Nebraska. However, this area was later redesignated to attainment/unclassifiable (86 FR 37683, July 16, 2021), meaning all locations in the adjacent states within 50 km of Iowa are currently designated attainment/unclassifiable for the 1-hour SO_2 NAAQS. Furthermore, no 1-hour SO_2 nonattainment or maintenance areas are located in Minnesota, Nebraska, or South Dakota. While Illinois, Missouri, and Wisconsin do contain such areas, Table 2-6 shows that none are nearby.

Table 2-6. Nonattainment and maintenance areas for the 1-hour SO_2 NAAQS in the adjacent states.

State	Area Name	Status	Minimum Distance to Iowa Border (km)	Nearest Iowa SO_2 Source	Distance to Iowa Source (km)
Illinois	Alton Township	Nonattainment	197	Roquette, Inc.	198
Illinois	Lemont	Maintenance	168	ADM – Clinton	171
Illinois	Pekin	Maintenance	107	IPL – Burlington	116
Missouri	Jackson County	Maintenance	158	Walter Scott	253
Missouri	Jefferson County	Maintenance	236	Roquette, Inc.	236
Missouri	New Madrid County	Nonattainment	456	Roquette, Inc.	456
Wisconsin	Rhinelander	Maintenance	264	IPL – Lansing	278

[9] For additional information, EPA's SO_2 Designations webpage provides a robust history of regulatory actions and related data, while EPA's SIP Tools webpage links to a "*Nonattainment and Maintenance Area Population Tool*" that includes mapping options.

2.5. Nearby Sources in Adjacent States

Similar to the approach for Iowa's sources, the DNR conducted a search for out-of-state facilities located within 50 km of the Iowa border that emitted 100 tons per year or more of SO_2. The presence of such sources near an Iowa source may indicate a greater potential for combined impacts. To encompass all point sources in each of the six adjacent states, a comprehensive emissions dataset was required. The 2017 NEI remained the appropriate choice. A total of 8 facilities met the selection criteria. They reside in either Illinois , Nebraska, or Wisconsin and are listed in Table 2-7. There are no applicable sources in Minnesota, Missouri, or South Dakota.

Table 2-7. Adjacent state sources within 50 km of Iowa's border that emitted 100 tons or more of SO_2 in 2017.

State	Facility Name (Source)	EIS[10] Facility ID	County	2017 SO_2 Emissions (tons)	Distance to IA Border (km)	Nearest Iowa Source	Distance to IA Source (km)
IL	City of Monmouth	9686511	Warren	120	26	IPL – Burlington	46
IL	Illinois Veterans Home	3342111	Adams	601	47	Roquette, Inc.	48
NE	Ash Grove Cement Co.	7287311	Cass	694	24	Walter Scott	33
NE	Douglas County / Pheasant Point Landfill	7699311	Douglas	131	21	Walter Scott	41
NE	Lon D Wright Power Plant	7766111	Dodge	926	33	Walter Scott	59
NE	OPPD – North Omaha	6732411	Douglas	7,897	0.3	Walter Scott	62
NE	OPPD – Nebraska City	7303711	Otoe	15,950	0.4	Walter Scott	19
WI	Dairyland Power Cooperative Genoa Station[11]	7711211	Vernon	397	6.5	IPL – Lansing	25

Table 2-8 provides the annual SO_2 emissions across the 2015-2019 five-year period for the 8 identified sources in the adjacent states. Only through specific data requests to the neighboring states did the DNR obtain emissions for the years outside the 2017 timeframe. Between 2015 and 2019, the total emissions from these facilities decreased by 16,889 tons or 47%. Chapter 4 provides additional information on each source.

Table 2-8. Annual 2015-2019 SO_2 emissions by facility for the 8 identified sources in the adjacent states.

State	Source	2015 SO_2 (tons)	2016 SO_2 (tons)	2017 SO_2 (tons)	2018 SO_2 (tons)	2019 SO_2 (tons)
Illinois	City of Monmouth	183	76	120	149	155
Illinois	Illinois Veterans Home	478	493	601	454	437
Nebraska	Ash Grove Cement Co.	736	741	694	898	681
Nebraska	Douglas County/Pheasant Point Landfill	116	133	131	131	165
Nebraska	Lon D Wright Power Plant	1,451	1,048	926	1,065	985
Nebraska	OPPD – North Omaha	13,892	8,902	7,897	7,285	5,793
Nebraska	OPPD – Nebraska City	18,548	14,722	15,950	17,209	10,387
Wisconsin	Dairyland Power Cooperative Genoa Station[11]	401	253	397	470	313
TOTAL	(may not sum as shown due to rounding)	**35,804**	**26,368**	**26,717**	**27,661**	**18,915**

2.6. Long-Term Emissions Trends

For Iowa and the nearby states, Table 2-9 and Figure 2-4 provide the statewide total SO_2 emissions for the NEI years in the 2002 through 2017 timeframe. Across that timeframe the total SO_2 emissions from all seven states decreased by 1,375,543 tons, a 78% reduction. Iowa's percentage decrease was better than average, at 82%. While not a definitive

[10] Emissions Inventory System (EIS) facility IDs assigned by EPA.

[11] Note, Dairyland Power Cooperative Genoa Station permanently closed in 2021.

interstate transport assessment, the trends clearly show substantial improvements that should help minimize the potential for Iowa's emissions to interfere with maintenance of the 1-hour SO_2 NAAQS in the downwind states. Additionally, the geographic scope of these reductions and their large sizes strongly suggest that they are not transient effects from reversible causes, and thus there is very low likelihood that a strong upward trend in emissions will occur that might cause areas presently in attainment to violate the 2010 1-hour SO_2 NAAQS.

Table 2-9. Statewide total SO_2 emissions for the NEI years from 2002 through 2017 and overall changes.

State	2002	2005	2008	2011	2014	2017[12]	Difference 2002-2017 (tons)	Difference 2002-2017 (%)
Illinois	541,115	517,707	385,966	287,830	192,311	95,069	-446,046	-82%
Iowa	216,254	221,947	164,983	130,830	92,893	39,635	-176,619	-82%
Minnesota	160,524	156,148	114,177	70,880	50,791	34,532	-125,992	-78%
Missouri	425,990	424,512	417,072	261,903	174,149	128,560	-297,430	-70%
Nebraska	114,129	121,627	80,775	76,213	65,903	57,759	-56,370	-49%
South Dakota	28,425	28,491	15,033	17,905	16,123	4,865	-23,559	-83%
Wisconsin	280,009	263,837	202,644	147,401	88,834	30,482	-249,527	-89%
Total[13]	**1,766,445**	**1,734,268**	**1,380,650**	**992,961**	**681,005**	**390,903**	**-1,375,543**	**-78%**

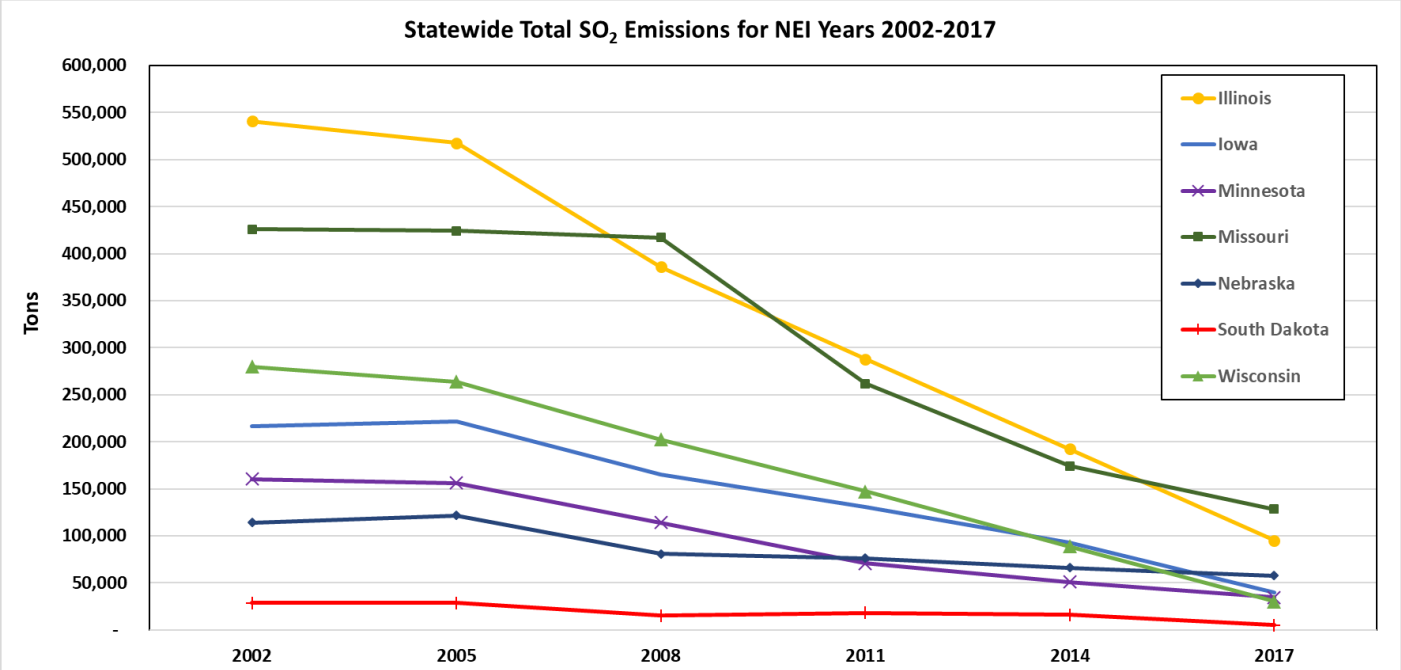

Figure 2-4. Statewide SO_2 emissions totals (tons) for the NEI years from 2002 through 2017.

2.7. Preconstruction Permitting

Pursuant to 567 Iowa Administrative Code (IAC) 22.1(1), no person shall construct, install, reconstruct or alter any equipment without first obtaining a construction permit, unless exempt. Should any Iowa sources propose new SO_2 emissions increases, significant increases from major sources would be subject to Iowa's Prevention of Significant Deterioration (PSD) preconstruction permitting program (567 IAC 33), while Iowa's minor new source review permit program would address minor sources (567 IAC 22). Both programs are SIP-approved under 40 CFR 52 Subpart Q and will help ensure that ambient SO_2 concentrations in neighboring states do not exceed the NAAQS as a result of new facility construction or modification activities in Iowa.

[12] Note, the DNR corrected Iowa's 2017 NEI emissions total to address a double counting error as explained in footnote 8.
[13] The emissions totals (and 2002-2017 differences) may not sum as shown due to rounding.

3. Iowa Source Assessments

For purposes of complying with CAA §110(a)(2)(D)(i)(I), this chapter documents the DNR's source-specific good neighbor analyses and it demonstrates that Iowa sources do not contribute significantly to nonattainment (prong 1) or interfere with the maintenance (prong 2) of the 2010 1-hour SO_2 NAAQS in any other state.

3.1. ADM – Clinton (23-01-006)

Archer Daniels Midland (ADM) in Clinton, Iowa (ADM – Clinton), is a corn wet milling facility that handles grain storage, wet milling, by-product processing, and several finishing steps to produce sweeteners, corn oil, ethanol, starches, dry specialty products, and animal feeds. Figure 3-1 depicts that ADM – Clinton is located ~1.4 km west of the Illinois border along the Mississippi River on the eastern edge of Clinton. The facility's largest SO_2 sources are three coal-fired boilers. Those boilers, in combination with two natural gas units, generate steam for facility heat and power (co-generation). Other pertinent SO_2 sources at ADM – Clinton include dryers, scrubbers, tanks, and a wet feed silo. Table 3-1 lists the facility's total[14] annual SO_2 emissions from 2015 through 2019 and shows the percentage change across that period.

Figure 3-1. ADM – Clinton and the Chancy Park monitor locations in Clinton, Iowa.

Table 3-1. ADM – Clinton's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change[15]
636	552	520	559	713	12.0% Increase

There is one SO_2 monitoring site near ADM – Clinton, the Chancy Park site (19-045-0019). It is located ~1.1 km west of the coal-fired boilers at ADM – Clinton. The site's 2017-2019 1-hour SO_2 design value was 18 ppb, which is 24% of the 75 ppb NAAQS. There are no SO_2 monitors in Illinois within 50 km of Iowa's border. The closest relevant Illinois source, the City of Monmouth wastewater treatment plant, is located ~104 km SSW[16] of ADM – Clinton, as indicated in Figure 3-2.

[14] For Title V (operating permit) purposes, the ADM – Clinton facility is split into "ADM Corn Processing – Clinton," "ADM Clinton Bioprocessing," and "ADM Clinton Cogeneration." The emission totals here include all SO_2 sources from all three groupings.
[15] Note, the annual emissions data shown here are rounded to the nearest ton, but the calculation of the overall change utilized the unrounded 2015 and 2019 values. This is the case throughout this chapter, but this footnote will not be repeated in later tables.
[16] Following compass notation, SSW means located in a southerly direction, not straight south, but partially southwesterly.

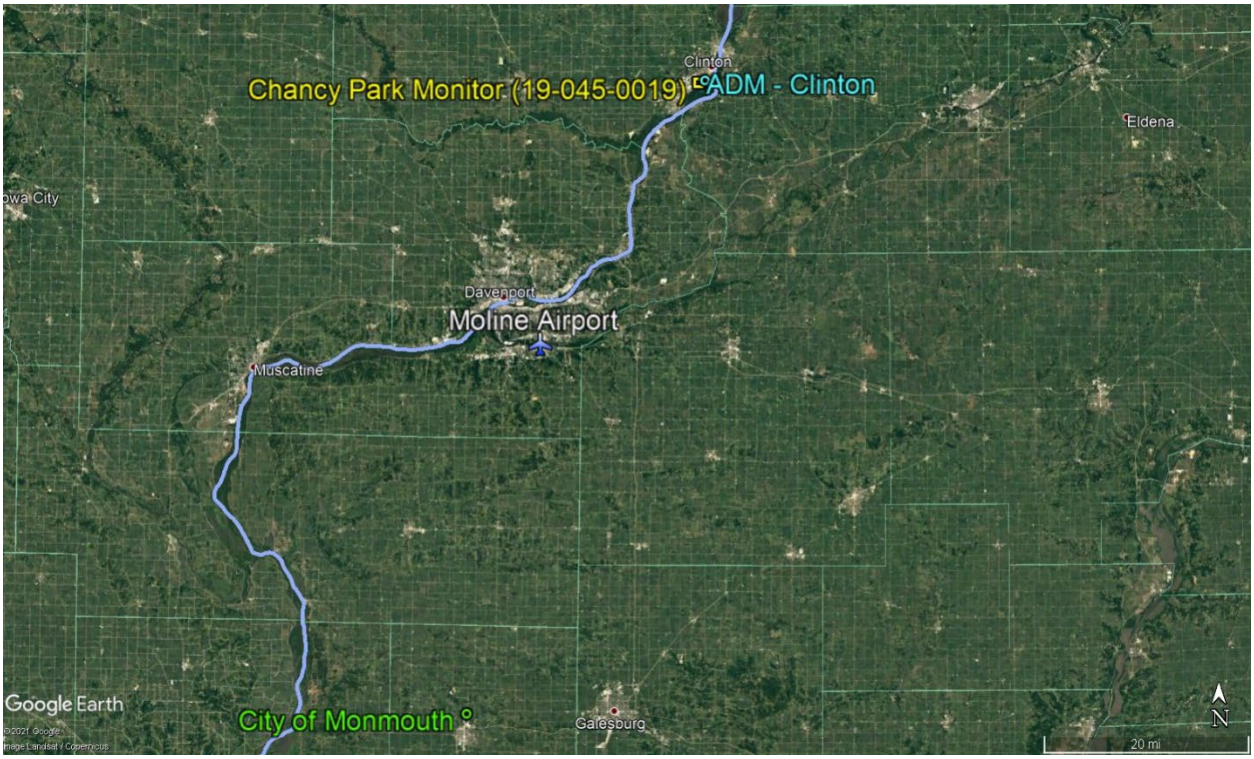

Figure 3-2. ADM – Clinton's location in relation to City of Monmouth, Moline airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near ADM – Clinton, the DNR produced a wind rose using 2015-2019 metrological data from the Moline airport. The Moline airport is located ~49 km SSW of ADM – Clinton and is representative[17] of the meteorological conditions at the facility. The wind rose indicates predominately WNW,[18] SSW, and E winds, as shown in Figure 3-3, which do not align with transport from ADM – Clinton to City of Monmouth. The common WNW wind directions could predicate SO_2 transport from ADM – Clinton to Illinois, however, measured concentrations from the nearby Chancy Park monitor demonstrate that easterly winds yield design values well below the 2010 1-hour SO_2 NAAQS. The DNR expects comparable concentrations in the neighboring portions of Illinois when the winds are from the WNW. Based on this information, the Iowa DNR concludes that ADM – Clinton does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

[17] The Iowa DNR conducts an extensive meteorological representativity analysis every five years to update its default dispersion modeling metrological input files. Results from the most recent analysis determine which meteorological site to use when generating a wind rose for a given Iowa source. A TSD provides additional information on the most recent representativity analysis.

[18] Following meteorological notation, WNW means that winds are coming from a westerly direction, not straight west, but partially northwesterly. To further clarify meteorological standards, wind direction indicates the direction from which the wind originates, not the direction the wind is heading. For example, an east (E) wind moves from east to west, not west to east, and minor deviations from those cardinal directions are not of concern. Applications that require greater precision utilize wind directions measured in decimal degrees, with 0 degrees denoting a north wind (from the north), then increasing clockwise (*i.e.* 90° is an east wind and 270° is a west wind).

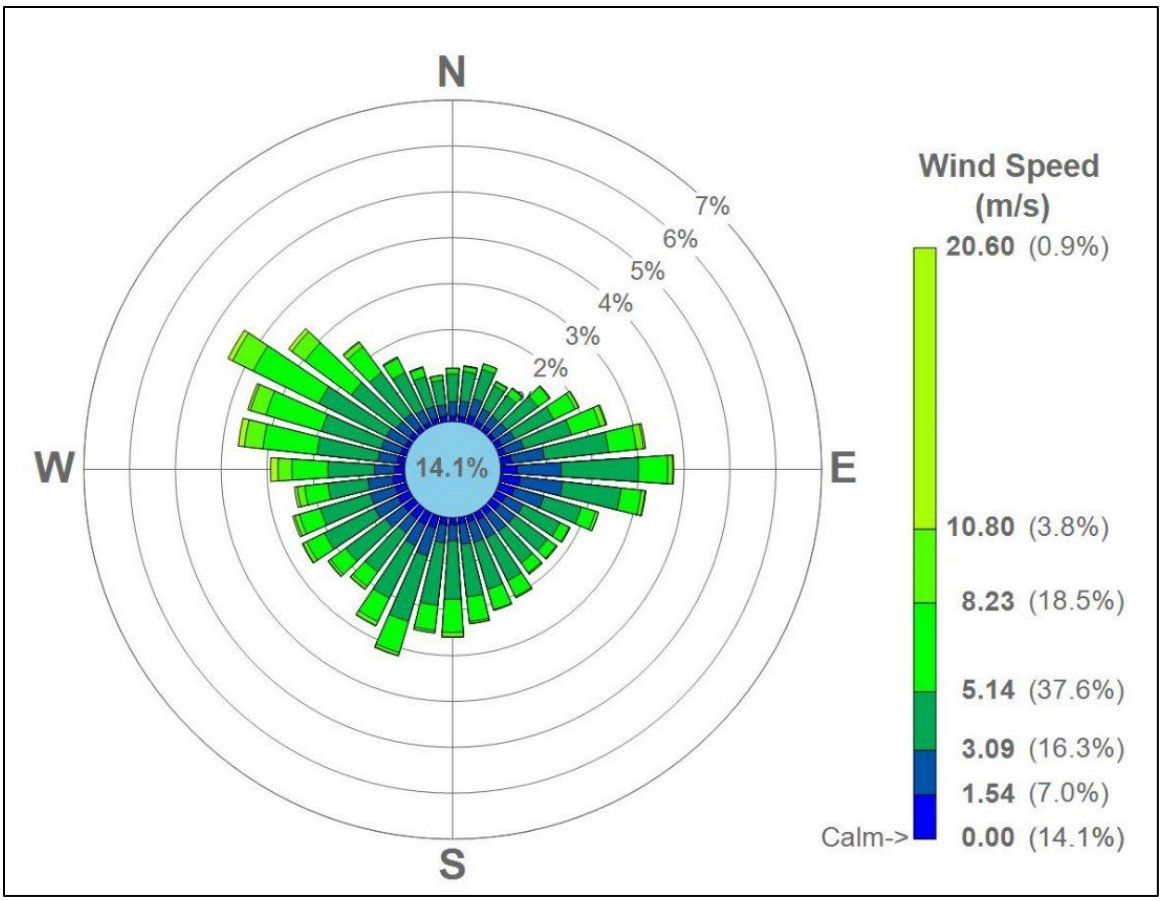

Figure 3-3. Wind rose (2015-2019) for the Moline airport.

3.2. Climax Molybdenum Co. (56-02-021)

The Climax Molybdenum Company (Climax) facility is located in Lee County, in southeastern Iowa, and produces molybdenum trioxide and molybdenum products. Figure 3-4 depicts that Climax is located along the Mississippi River southwest of Fort Madison. The nearest points to the Illinois and Missouri borders lie ~3.3 km southeast and ~17 km southwest of the facility, respectively. The pertinent SO_2 sources at Climax are two roasters. Table 3-2 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-4. Climax's location in Fort Madison, Iowa.

Table 3-2. Climax's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
139	124	131	133	178	27.8% Increase

Climax is located ~50 km ESE of the nearest SO_2 monitoring site, the Lake Sugema site (19-177-0006) in Iowa. The Lake Sugema site is representative of background concentrations and thus does not assess impacts from Climax or any other individual facility. The 2017-2019 1-hour SO_2 design value for the Lake Sugema site was 2 ppb. There are no SO_2 monitors in Illinois or Missouri within 50 km of Iowa's borders. The closest relevant Illinois source is the Illinois Veterans Home, located ~70 km south of Climax, as indicated in Figure 3-5. A second Illinois source, the City of Monmouth wastewater treatment plant, is located ~77 km NE of Climax. Figure 3-5 also depicts the location of the Lake Sugema monitoring site and the Burlington airport. The airport is located ~33 km NE of Climax. There are no relevant SO_2 sources in Missouri within 50 km of the Iowa border.

Figure 3-5. Climax's location in relation to the Illinois sources, Burlington airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near Climax, the DNR produced a wind rose using 2015-2019 meteorological data from the Burlington airport. The Burlington airport is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW and SSW winds, as shown in Figure 3-6. These common wind directions do not align with transport from Climax to the Illinois Veterans Home. The common SSW wind directions could align with the City of Monmouth, however, the separation distance is ~77 km. This data suggest that Climax has little to no impact on SO_2 concentrations around either Illinois source. The common NW wind directions could predicate SO_2 transport from Climax to Illinois. However, most of Climax's SO_2 emissions are emitted[19] at a height of ~150 feet and at an exit temperature of ~180° Fahrenheit, which should contribute to good dispersion. Additionally, Climax's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Based on this information, the Iowa DNR concludes that Climax does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois or Missouri.

[19] Through the sulfuric acid plant stack, emission point ID: ST20.

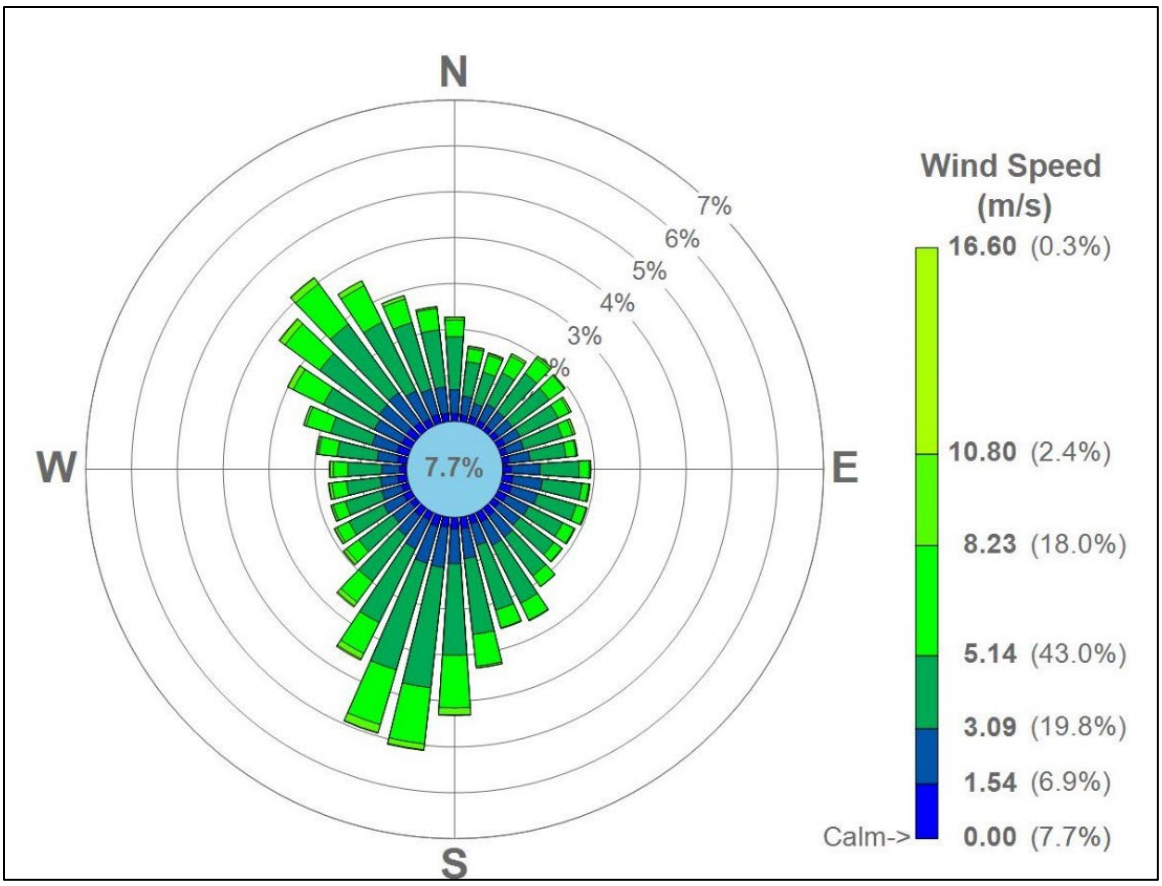

Figure 3-6. Wind rose (2015-2019) for the Burlington airport.

3.3. Continental Cement Co. – Davenport Plant (82-04-005)

Continental Cement Company is a Portland cement manufacturer located in Scott County, Iowa. Figure 3-7 depicts that Continental Cement is located along the Mississippi River southwest of Davenport and is ~0.3 km north of the Illinois border. The pertinent SO_2 source at Continental Cement is the main kiln. Table 3-3 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-7. Continental Cement and Jefferson School monitor locations in Davenport, Iowa.

Table 3-3. Continental Cement's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
603	502	811	1,258	1,087	80.1% Increase

Continental Cement is located ~12 km southwest of the nearest SO_2 monitoring site, the Jefferson School site (19-163-0015) in Davenport, Iowa. The Jefferson School site captures urban SO_2 concentrations but does not assess impacts from Continental Cement. The 2017-2019 1-hour design value for the Jefferson School site was 4 ppb. There are no SO_2 monitors in Illinois within 50 km of Iowa's border. The closest Illinois source is City of Monmouth, which is located ~60 km south of Continental Cement, as indicated in Figure 3-8.

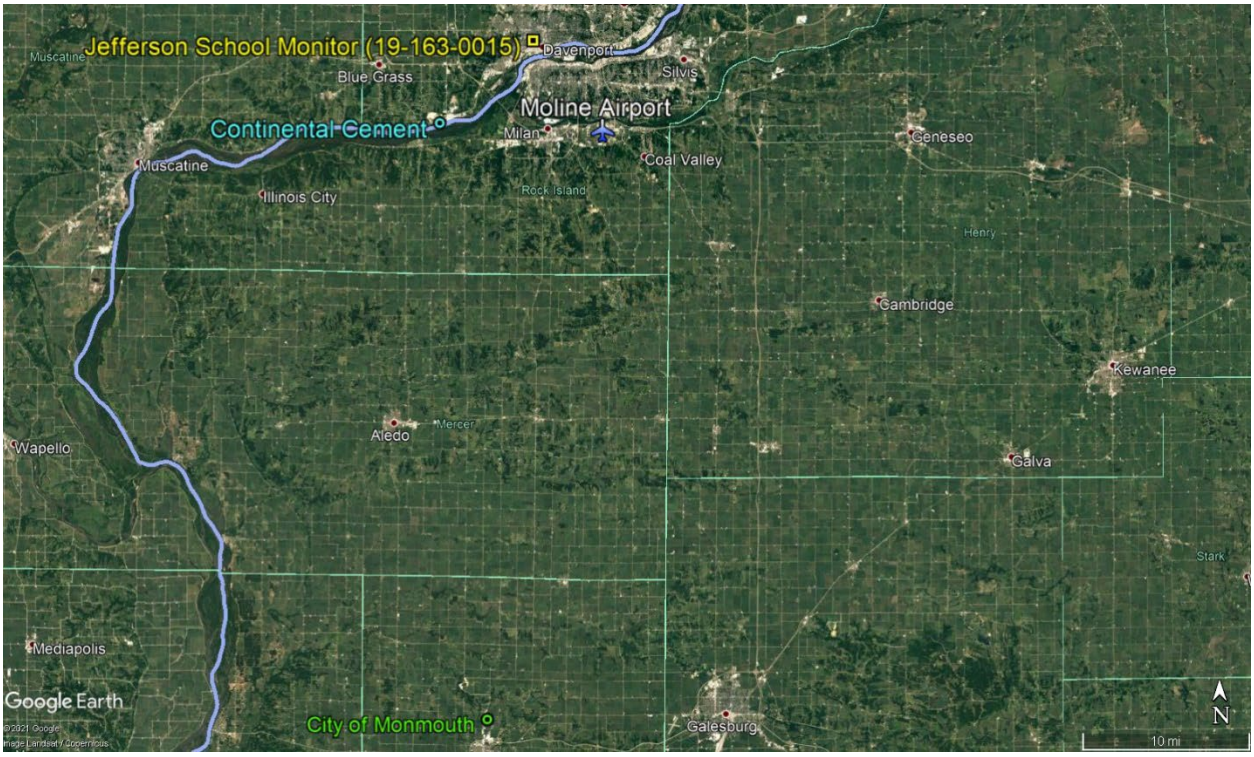

Figure 3-8. Continental's location in relation to City of Monmouth, Moline airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near Continental Cement, the DNR produced a wind rose using 2015-2019 meteorological data from the Moline airport. The Moline airport is located ~14 km east of Continental Cement and is representative of the meteorological conditions at the facility. The wind rose indicates predominately WNW, SSW and E winds, as shown in Figure 3-9. These common wind directions do not align with transport from Continental Cement to City of Monmouth. This data suggest that Continental Cement has little to no impact on SO_2 concentrations around City of Monmouth. The common WNW wind directions could predicate SO_2 transport from Continental Cement to Illinois. However, most of Continental Cement's SO_2 emissions are emitted[20] at a height of ~340 feet and at an exit temperature of ~300° Fahrenheit, which should contribute to good dispersion.

Additionally, a reversal in Continental's increasing SO_2 emissions trends is expected following the completion of a project that will result in reduced coal use at the facility, its primary source of SO_2 emissions. On April 4, 2023, the DNR received a permit application from Continental Cement to increase the quantity of alternate fuels burned in the rotary cement kiln from approximately 20,000 tpy to 120,000 tpy by installing a pyrolysis system and making supporting changes. Decreases in the kiln's coal throughput, and thus its SO_2 emissions, will accompany the increased use of alternate fuels. The DNR thoroughly reviewed the project before issuing the associated air construction permits, including revisions for the main kiln. Deadlines within the kiln's modified permit, number 99-A-579-P10, compel Continental to begin and complete project construction within 18 and 36 months, respectively, of the permit's June 23, 2023, issuance date. The DNR's air construction permits are legal documents issued through the state's SIP-approved permitting program and are enforceable at both the state and federal level. Based on this information, the Iowa DNR concludes that Continental Cement does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

[20] Through the main kiln stack, emission point ID: 0466-0.

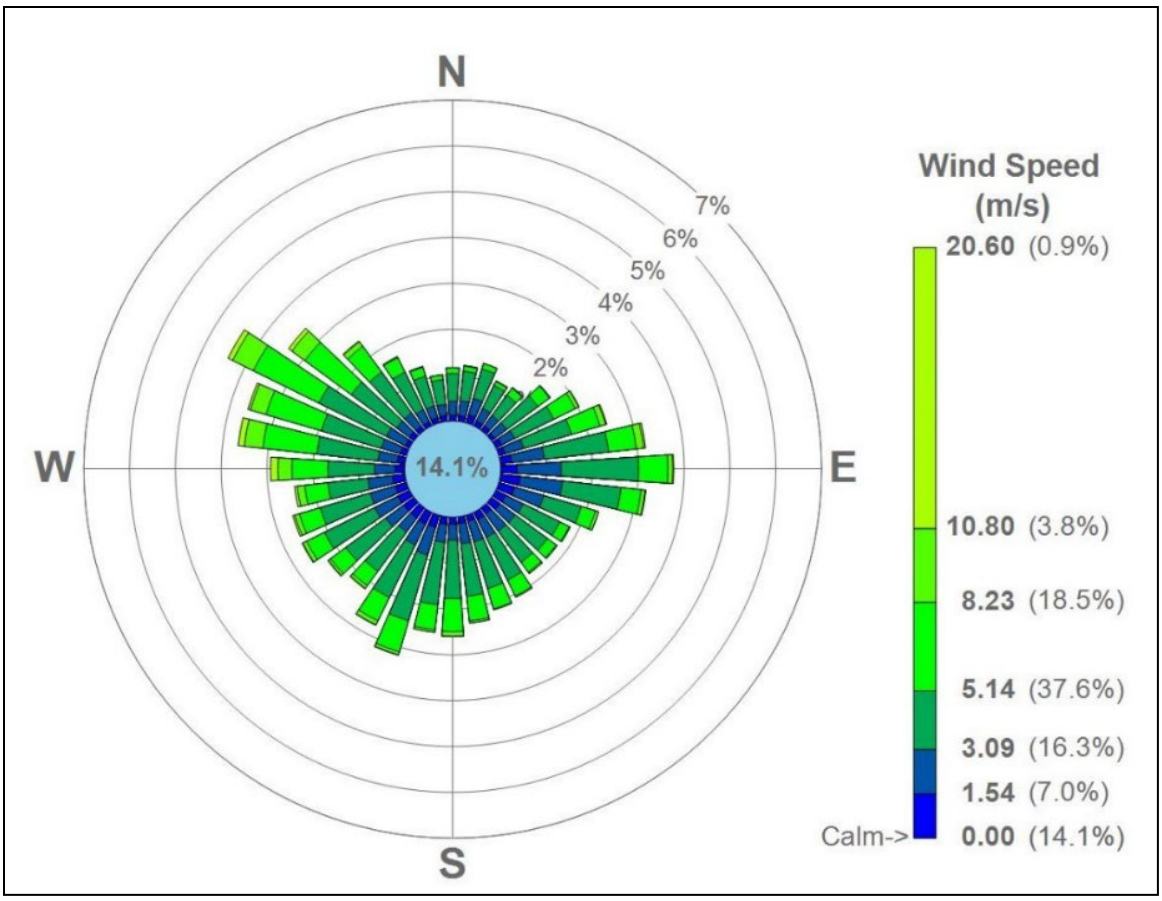

Figure 3-9. Wind rose (2015-2019) for the Moline airport.

3.4. Guardian Industries Corporation (23-02-013)

Guardian Industries Corporation (Guardian) is a glass manufacturing facility located in Clinton County, Iowa. Figure 3-10 depicts that Guardian is located on the southeastern side of DeWitt. The Illinois border lies ~19 km east of the facility. The pertinent SO_2 source at Guardian is a melting furnace. Table 3-4 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-10. Guardian's location in DeWitt, Iowa.

Table 3-4. Guardian's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
212	198	76	150	135	36.4% Decrease

Guardian is located ~26 km west of the nearest SO_2 monitoring site, the Chancy Park site (19-045-0019) in Clinton. The Chancy Park site is located near ADM – Clinton and does not assess impacts from Guardian. There are no SO_2 monitors in Illinois within 50 km of Iowa's border. The closest relevant Illinois source is City of Monmouth, located ~96 km south of Guardian, as indicated in Figure 3-11.

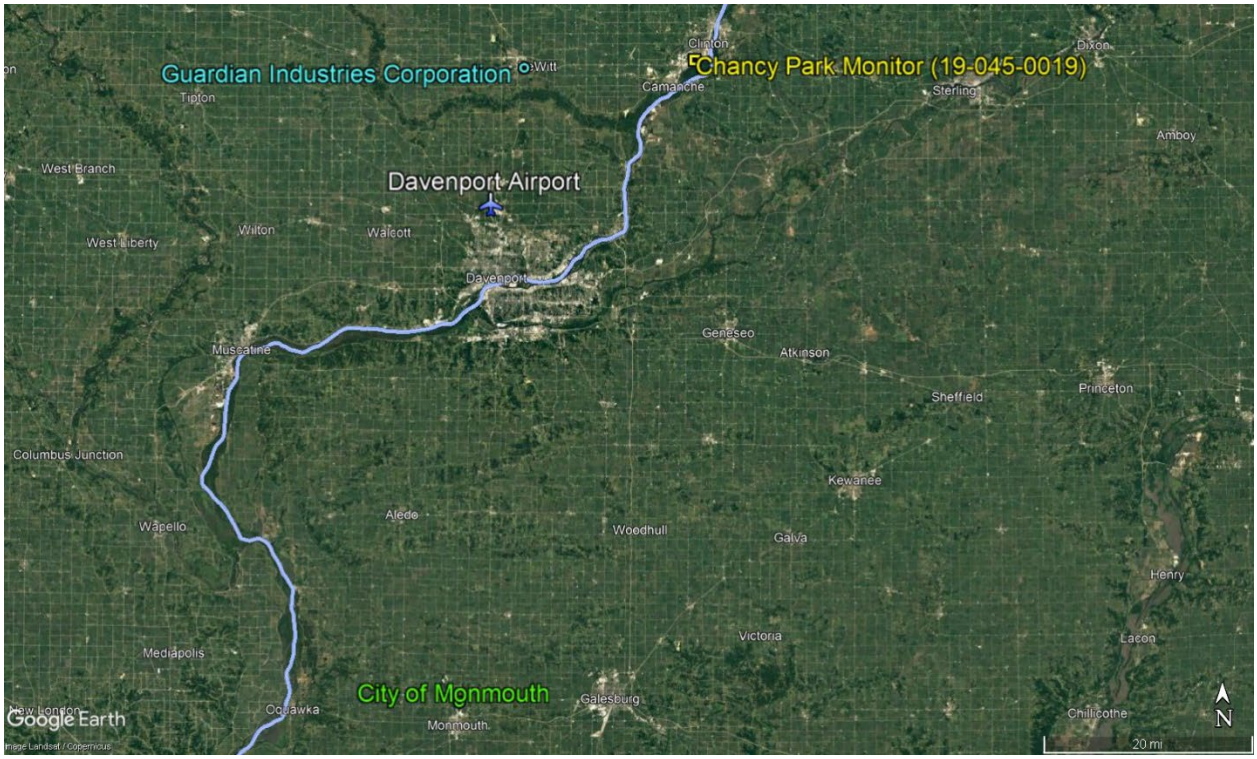

Figure 3-11. Guardian's location in relation to City of Monmouth, Davenport airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near Guardian, the DNR produced a wind rose using 2015-2019 meteorological data from the Davenport airport. The Davenport airport is located ~22 km SW of Guardian and is representative of the meteorological conditions at the facility. The wind rose indicates predominately WNW and SSW winds, as shown in Figure 3-12. These common wind directions do not align with transport from Guardian to City of Monmouth. This data suggest that Guardian has little to no impact on SO_2 concentrations around City of Monmouth. The common WNW wind directions could predicate SO_2 transport from Guardian to Illinois. However, most of Guardian's SO_2 emissions are emitted[21] at a height of ~298 feet and at an exit temperature of ~770° Fahrenheit, which should contribute to good dispersion, especially when combined with the ~19 km separation distance to the Illinois border. Additionally, Guardian's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Furthermore, the facility's SO_2 emissions have trended downward in recent years, with a 36% reduction occurring over the 2015 through 2019 period. Based on this information, the Iowa DNR concludes that Guardian does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

[21] Through the melting furnace stack, emission point ID: F001.

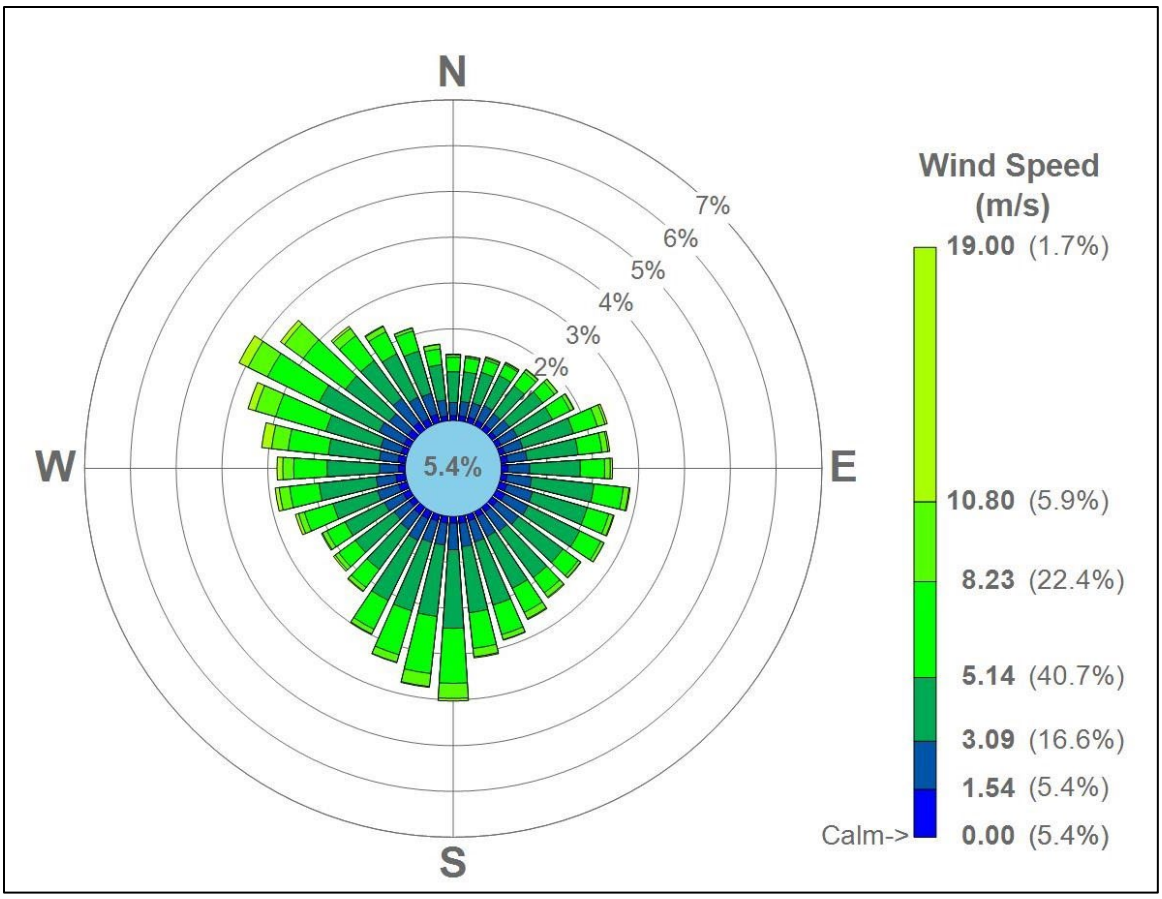

Figure 3-12. Wind rose (2015-2019) for the Davenport airport.

3.5. Heidelberg Materials US Cement (17-01-005)

Heidelberg Materials US Cement LLC (Heidelberg Cement or simply Heidelberg)[22] is a Portland cement manufacturer located in Cerro Gordo County, Iowa. Figure 3-13 depicts that Heidelberg is located on the northern edge of Mason City. The Minnesota border lies ~36 km north of the facility. The pertinent SO_2 source at Heidelberg is the main kiln. Table 3-5 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

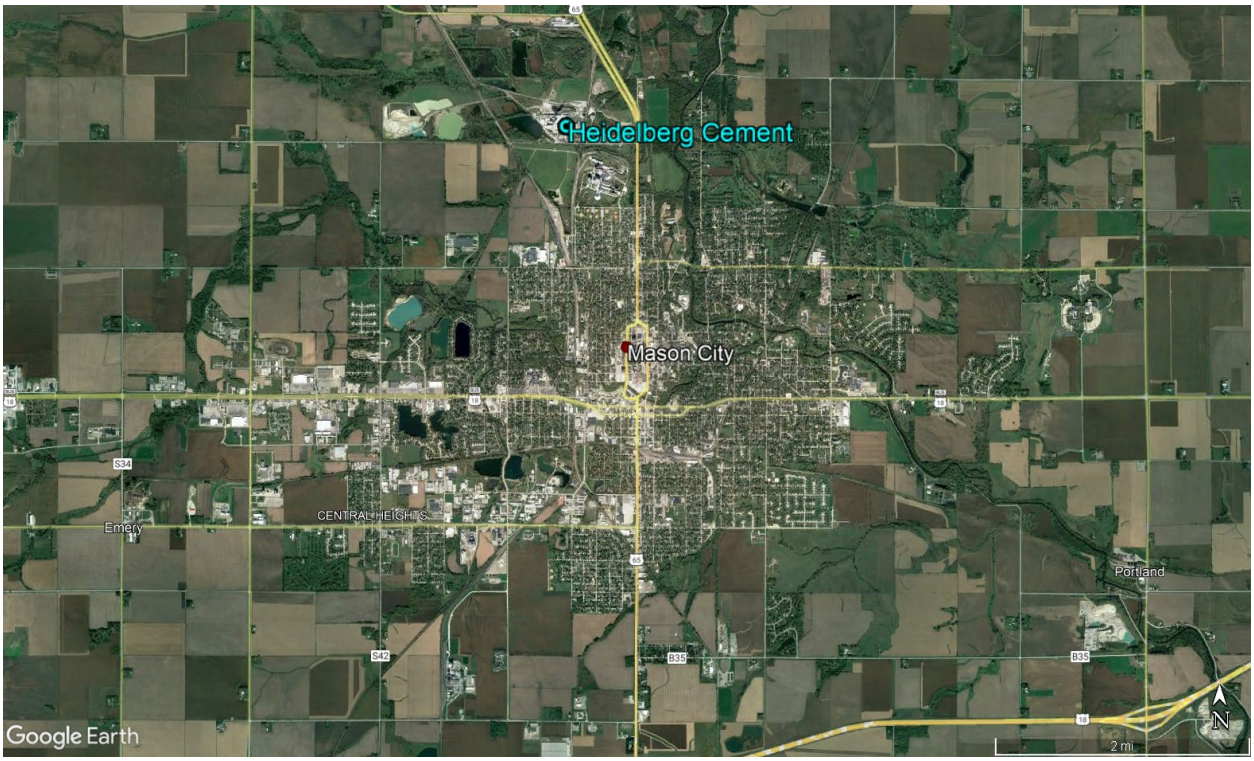

Figure 3-13. Heidelberg's location in Mason City, Iowa.

Table 3-5. Heidelberg's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
166	222	212	142	101	39.5% Decrease

There are no SO_2 monitors within 50 km of Heidelberg in Iowa or Minnesota. The closest relevant source was Dairyland Power Cooperative in Genoa, Wisconsin, located ~165 km ENE of Heidelberg, as shown in Figure 3-14. The modest SO_2 emission rates and the distance between Heidelberg and Dairyland Power suggests that Heidelberg had no impact on SO_2 concentrations near that facility. Additionally, Dairyland Power has permanently closed.

[22] This facility was formerly known as Lehigh Cement Co. – Mason City.

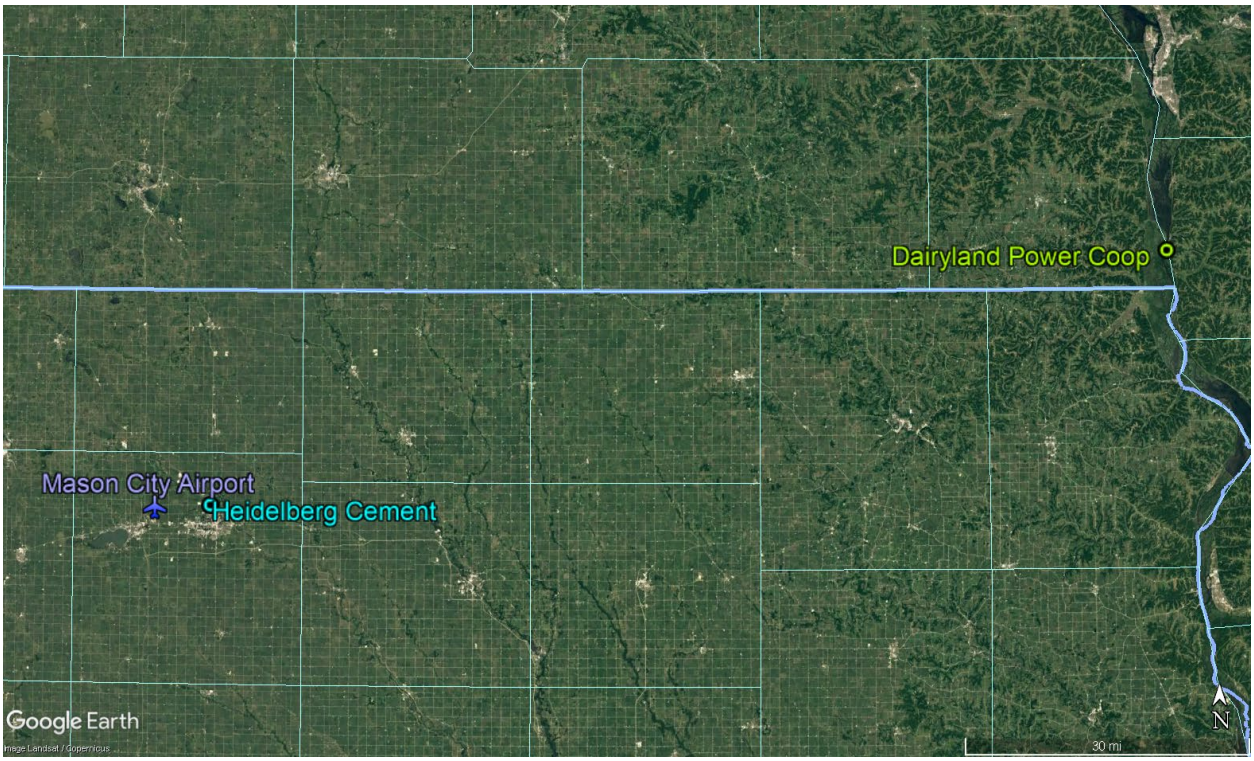

Figure 3-14. Heidelberg's location in relation to Dairyland Power Cooperative and the Mason City airport.

To evaluate prevalent transport patterns near Heidelberg, the DNR produced a wind rose using 2015-2019 meteorological data from the Mason City airport. The Mason City airport is located ~9.5 km west of Heidelberg and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW and SSE winds, as shown in Figure 3-15. The common SSE wind directions could predicate SO_2 transport from Heidelberg to Minnesota. However, most of Heidelberg's SO_2 emissions are emitted[23] at a height of ~269 feet and at an exit temperature of ~130° Fahrenheit, which should contribute to good dispersion, especially when combined with the ~36 km separation distance to the Minnesota border. Additionally, Heidelberg's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Furthermore, the facility's SO_2 emissions have trended downward in recent years, with a 40% reduction occurring over the 2015 through 2019 period. Based on this information, the Iowa DNR concludes that Heidelberg Cement does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Minnesota.

[23] Through the kiln/calciner/preheater stack, emission point ID: 25.

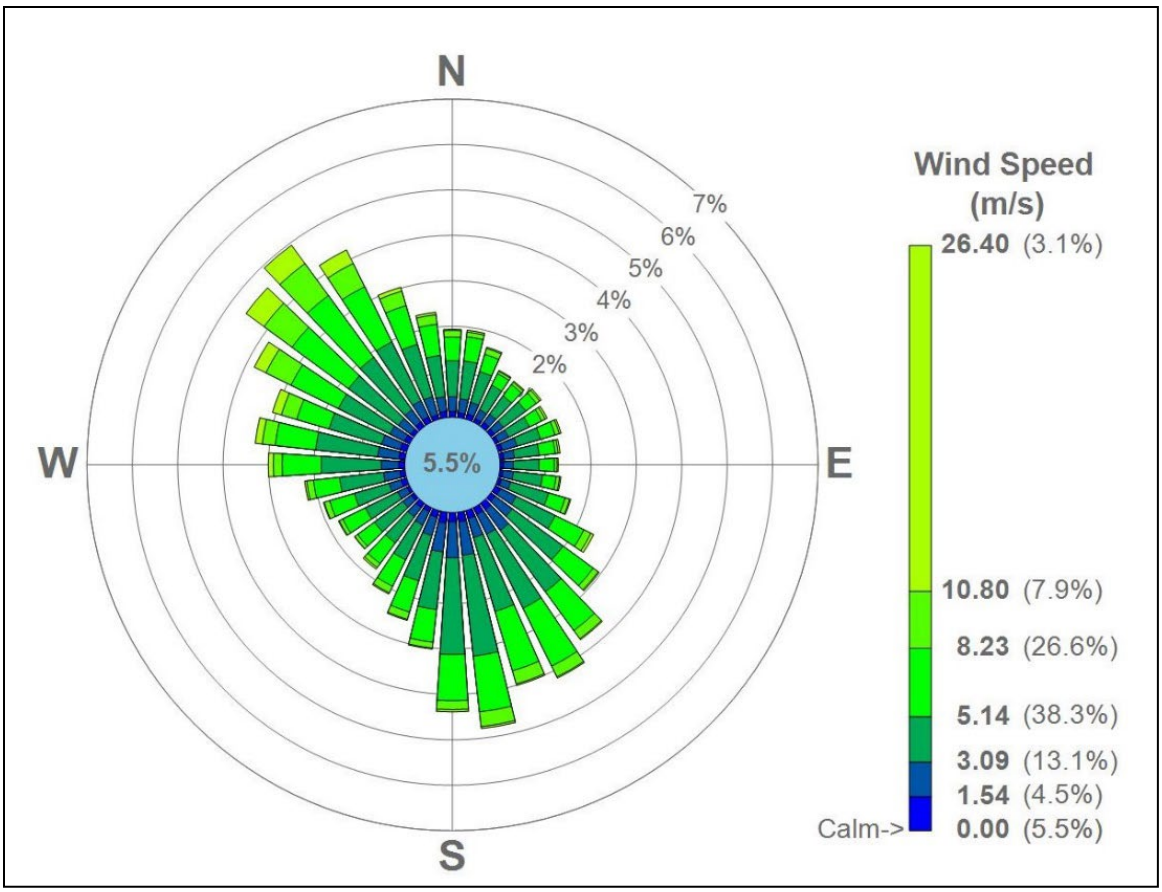

Figure 3-15. Wind rose (2015-2019) for the Mason City airport.

3.6. Iowa Army Ammunition Plant (29-01-004)

Iowa Army Ammunition Plant (IAAP) loads, assembles, and packs medium and large caliber ammunition and is located in Des Moines County, Iowa. Figure 3-16 depicts that IAAP is located west of Burlington and is ~13 km west of the Illinois border. The Missouri border lies ~42 km south of the facility. The pertinent SO_2 sources at IAAP are two coal-fired boilers. Table 3-6 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-16. IAAP and IPL – Burlington locations in Burlington, Iowa.

Table 3-6. IAAP's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
452	262	205	188	204	54.9% Decrease

To facilitate the Round 2 designations process, the DNR modeled a nearby source, IPL – Burlington, and submitted the final results to EPA in December 2015. Due to its proximity, that modeling analysis also incorporated the common stack through which IAAP's two coal-fired boilers vent. IAAP's modeled emission rate was derived from actuals, using the maximum annual value in the 2012-2014 timeframe of 753.26 tpy (converted to 171.98 lb/hr).

The modeled receptor grid was centered on IPL – Burlington and extended 5 km in each cardinal direction, which placed receptors in Illinois as IPL – Burlington lies only ~0.4 km west of the Iowa/Illinois border. Grid resolution increased at stepped intervals nearer IPL – Burlington to a maximum density of 50 meter spacing. Receptors were removed from facility property and, consistent with Section 4.2 of EPA's December 2013 draft "*SO_2 NAAQS Designations Modeling Technical Assistance Document*" (modeling TAD), removed over water. The meteorological modeling period spanned the 2012-2014 three-year timeframe, which was also consistent with that TAD. DNR's Round 2 TSD (dated December 23, 2015) provides additional modeling details.

IAAP is unique in that it has an exceptionally large property, placing the coal boilers far from ambient air. The nearest ambient air is ~1.9 km to the north of the boiler stack, which restricts the largest concentration gradients to its property. To simplify the modeling assessment, receptors were placed on IAAP's fence line and the maximum predicted concentration, 21.29 µg/m^3, was then added to the maximum predicted impact from IPL – Burlington. This conservative

approach produced a maximum modeled impact, including background concentrations, of 114.2 µg/m^3, or 58% of the NAAQS.[24] As a result, EPA designated Des Moines County attainment/unclassifiable in Round 2 (81 FR 45039, July 12, 2016).

That modeling analysis informs this interstate transport assessment. The Iowa/Illinois border lies over 6 km from IAAP's eastern fence line and any impacts from the facility at that distance will be much less than its maximum modeled fence line concentration of 21.29 µg/m^3. Additionally, the emission rates modeled for IPL – Burlington are no longer representative of actual operations following that facility's fuel switch from coal to natural gas (see section 3.7).

There are no SO_2 monitors within 50 km of IAAP in Iowa, Illinois, or Missouri. The closest relevant Illinois sources are City of Monmouth and the Illinois Veterans Home, which are located ~53 km ENE of IAAP and ~94 km south of IAAP, respectively, as shown in Figure 3-17. There are no applicable SO_2 sources in Missouri within 50 km of the Iowa border.

Figure 3-17. IAAP's location in relation to the closest Illinois sources and Burlington airport.

To evaluate prevalent transport patterns near IAAP, the DNR produced a wind rose using 2015-2019 meteorological data from the Burlington airport. The Burlington airport is located ~10 km east of IAAP and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW and SSW winds, as shown in Figure 3-18. These common wind directions do not align with transport from IAAP to either City of Monmouth or the Illinois Veterans Home, which suggests IAAP has little to no impact on SO_2 concentrations around those facilities. The common NW wind directions could predicate SO_2 transport from IAAP to Illinois. However, the aforementioned Round 2 modeling included receptors in Illinois and the maximum predicted cumulative impact from IAAP, IPL – Burlington (based on coal combustion), and background concentrations met the 2010 1-hour SO_2 NAAQS. Furthermore, the modeled impacts for IAAP were representative of fence-line concentrations and assumed an annual emissions total of 753.26 tons, which exceeds all other values in the 2015-2019 range. For Missouri, the transport distances from IAAP are even greater than those to Illinois and the common wind directions do not align with transport to Missouri. Based on this information, the Iowa DNR concludes that IAAP does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois or Missouri.

[24] The 75 ppb level of the 2010 1-hour SO_2 standard equates to ~196 µg/m^3 at standard temperature (25° C) and pressure (1 atm).

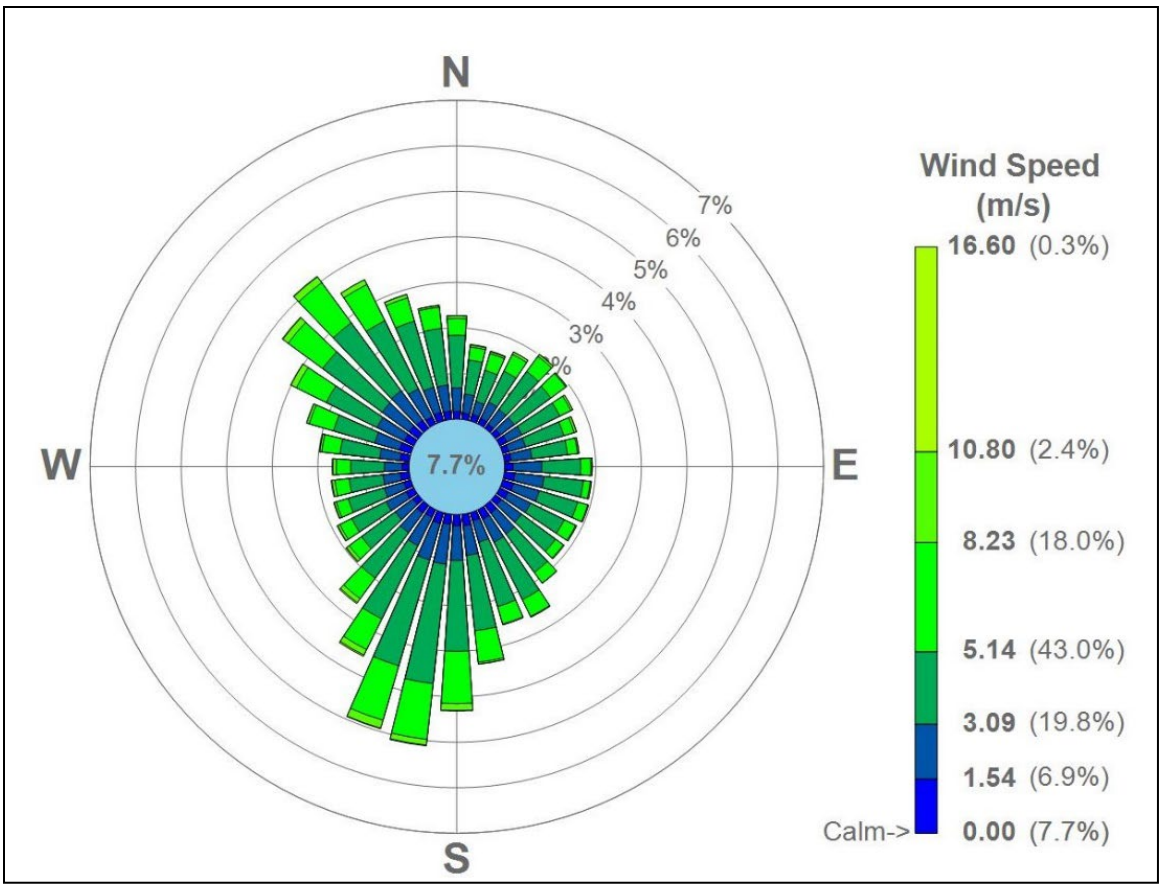

Figure 3-18. Wind rose (2015-2019) for the Burlington airport.

3.7. IPL – Burlington Generating Station (29-01-013)

Burlington Generating Station (IPL – Burlington) is an electric generating facility located in Des Moines County, Iowa. It is operated by Interstate Power & Light Company (IPL), a subsidiary of Alliant Energy. Figure 3-19 depicts that IPL – Burlington is located along the Mississippi River south of Burlington and is ~0.4 km west of the Illinois border. The Missouri border lies ~47 km south of the facility. Historically, the pertinent SO_2 source at IPL – Burlington was the main coal-fired boiler, but that unit is now limited to firing natural gas only, as discussed below. Table 3-7 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-19. IPL – Burlington and IAAP locations in Burlington, Iowa.

Table 3-7. IPL – Burlington's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
3,355	3,044	3,059	3,325	3,129	6.7% Decrease

To facilitate the Round 2 designations process, the DNR modeled IPL – Burlington and submitted the final results to EPA in December 2015. As discussed in the previous section, the maximum modeled impact, including background concentrations and contributions from IAAP, was 114.2 µg/m^3, or 58% of the 2010 1-hour SO_2 NAAQS. As a result, EPA designated Des Moines County attainment/unclassifiable in Round 2 (81 FR 45039, July 12, 2016).

However, that modeling is no longer representative of current operations. IPL – Burlington converted the coal-fired boiler to natural gas in 2021 and coal combustion is prohibited by Iowa DNR Air Quality Construction Permit number 93-A-390-S13, issued December 27, 2021. This fuel conversion is clearly reflected in the facility's 2022 annual SO_2 emission, which totaled 0.14 tons. Based on this information, the Iowa DNR concludes that IPL – Burlington does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois or Missouri. No additional evaluation is needed.

3.8. IPL – Lansing Generating Station (03-03-001)

Lansing Generating Station (IPL – Lansing) was a coal-fired electric generating facility located in Allamakee County, Iowa. It was operated by Interstate Power & Light Company (IPL), a subsidiary of Alliant Energy. Figure 3-20 depicts that IPL – Lansing was located along the Mississippi River southeast of Lansing, with the Wisconsin border lying ~0.3 km ENE of the facility. The Minnesota border lies ~19 km north of the facility.

Figure 3-20. IPL – Lansing's location in Lansing, Iowa. (The facility is now permanently closed.)

IPL – Lansing permanently closed in 2022 and on August 3, 2023, Alliant requested that all construction permits, and the Title V operating permit, be rescinded for the facility. No further evaluation is needed.

3.9. MidAmerican Energy Co. – George Neal North (97-04-010)

George Neal North (GNN) is a coal-fired electric generating facility located in Woodbury County, Iowa. It is operated by MidAmerican Energy Company, a subsidiary of Berkshire Hathaway Energy. Figure 3-21 depicts that GNN is located along the Missouri River south of Sergeant Bluff and is ~0.2 km east of the Nebraska border. The South Dakota border lies ~19 km NNW of the facility. The pertinent SO_2 source at GNN is the one remaining coal-fired boiler, Unit 3. Table 3-8 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-21. George Neal North and Souths' locations in Sergeant Bluff, Iowa.

Table 3-8. George Neal North's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
5,182	3,291	4,128	4,336	3,113	39.9% Decrease

To facilitate the Round 2 designations process, the DNR modeled a nearby source, George Neal South (GNS), and submitted the final results to EPA in 2015. Due to its proximity that modeling analysis also included George Neal North. Each facility contains one coal-fired boiler and DNR derived the modeled SO_2 emission rates for those units based on permitted maximum allowable emission limits in accordance with EPA guidance for converting longer term averages into 1-hour critical values, as further explained in DNR's Round 2 TSD (dated December 23, 2015). The resulting modeled emission rates were 2707.5 lb/hr and 3396.7 lb/hr, respectively, for Unit 3 at GNN at Unit 4 at GNS. Two other boilers at GNN (Units 1 and 2) were modeled assuming a conversion to natural gas.

The modeled receptor grid was centered on GNS and originally extended 5 km in each cardinal direction, which placed receptors in Nebraska as the George Neal facilities lie close (no more than ~0.5 km) to the Iowa/Nebraska border. Grid resolution increased at stepped intervals nearer the facilities to a maximum density of 50 meter spacing. Receptors were removed from facility property and, consistent with Section 4.2 of EPA's December 2013 draft modeling TAD, removed over water. The meteorological modeling period spanned the 2012-2014 three-year timeframe, which was also consistent with that TAD.

The maximum modeled impact, including background concentrations, occurred in Iowa and was 194.8 µg/m^3, which meets the 2010 1-hour SO_2 NAAQS. The receptor grid was later expanded to 10 km to accommodate EPA feedback (the DNR also increased the grid resolution around the area of maximum impact). The updated modeling continued to show attainment throughout the domain with concentrations decreasing towards the boundaries of the receptor grid. This negated any need to further expand the domain to include areas in South Dakota, which lie a minimum of ~19 km to the NNW of GNN.

While the modeling showed attainment, EPA finalized an unclassifiable designation for Woodbury County (81 FR 45039, July 12, 2016) in Round 2 because the DNR modeled Units 1 and 2 at George Neal North as burning natural gas and not coal. A consent decree[25] required Units 1 and 2 to cease burning solid fuel by April 16, 2016, but was not considered federally enforceable by EPA. This issue is now moot as GNN Units 1 and 2 were permanently retired in 2016. EPA has yet to act on the Governor's request to redesignate Woodbury County to attainment/unclassifiable.[26]

George Neal North is located ~54 km SE of the nearest SO_2 monitoring site, the Union County #1 site (46-127-0001)in South Dakota, as shown in Figure 3-22. The Union County #1 site is representative of background concentrations and its 2017-2019 1-hour SO_2 design value was 3 ppb, or 4% of the NAAQS. There are no relevant SO_2 sources in South Dakota or Nebraska within 50 km of GNN. The closest relevant SO_2 source is the Douglas County/Pheasant Point Landfill, located ~105 km S of GNN, near Bennington, NE.

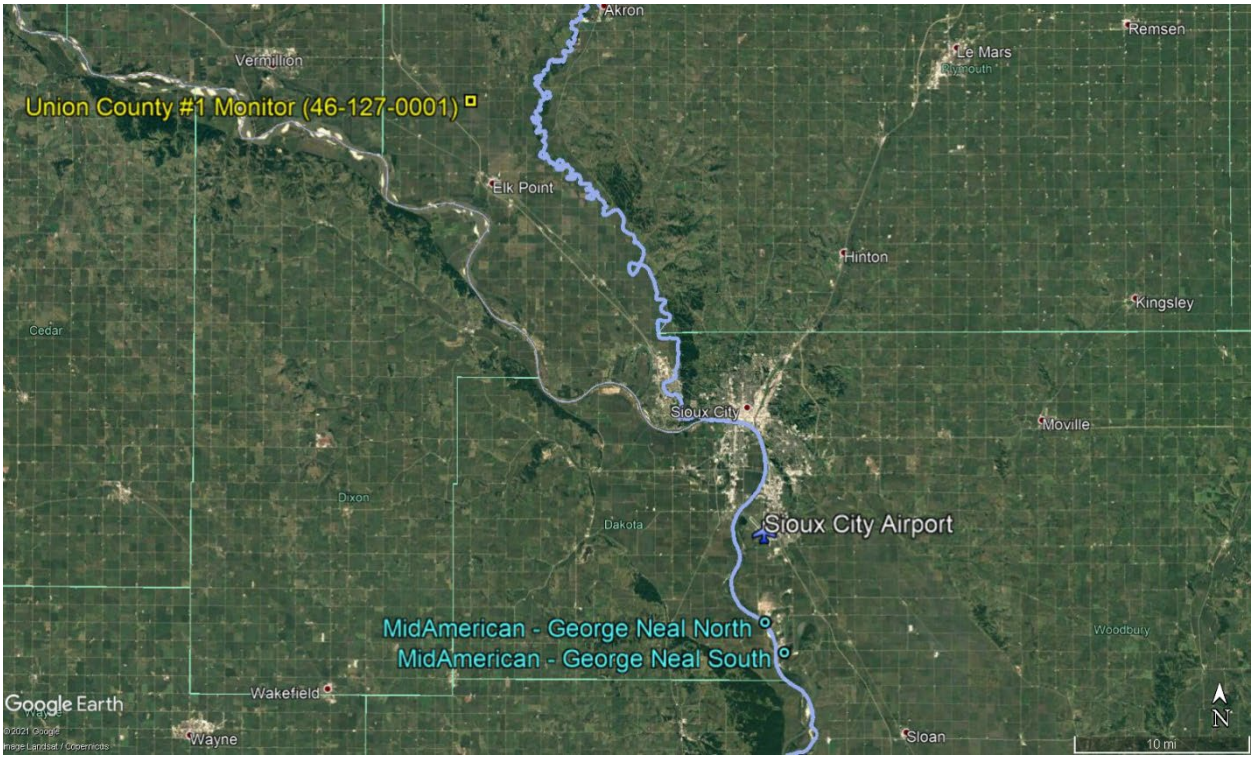

Figure 3-22. George Neal North and Souths' locations in relation to the Sioux City airport and closest SO_2 monitor.

To evaluate prevalent transport patterns near George Neal North, the DNR produced a wind rose using 2015-2019 meteorological data from the Sioux City airport. The Sioux City airport is located ~7.3 km north of GNN and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW winds and a range of southeasterly winds, as shown in Figure 3-23. The common southeasterly winds could predicate SO_2 transport from GNN to Nebraska and South Dakota. However, the Round 2 modeling for GNS (and GNN) included receptors in Nebraska, where concentrations would be higher than the more distant South Dakota, and the maximum predicted

[25] Case No. 4:13-CV-00021, filed January 22, 2013, in the US District Court for the Southern District of Iowa.
[26] The Governor's letter for the Round 3 designations, dated January 5, 2017, included the Woodbury County redesignation request.

impact met the 2010 1-hour SO_2 NAAQS. Additionally, the modeled emission rates were based on permitted maximum allowable emission limits. For GNN Unit 3, the modeled rate of 2707.5 lb/hr equates to 11,859 tons per year, or more than double the facility's total actual 2015 emissions. Furthermore, GNN reduced its emissions by 40% over the 2015-2019 five-year period and Units 1 and 2 have been permanently retired. Based on this information, the Iowa DNR concludes that George Neal North does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Nebraska or South Dakota.

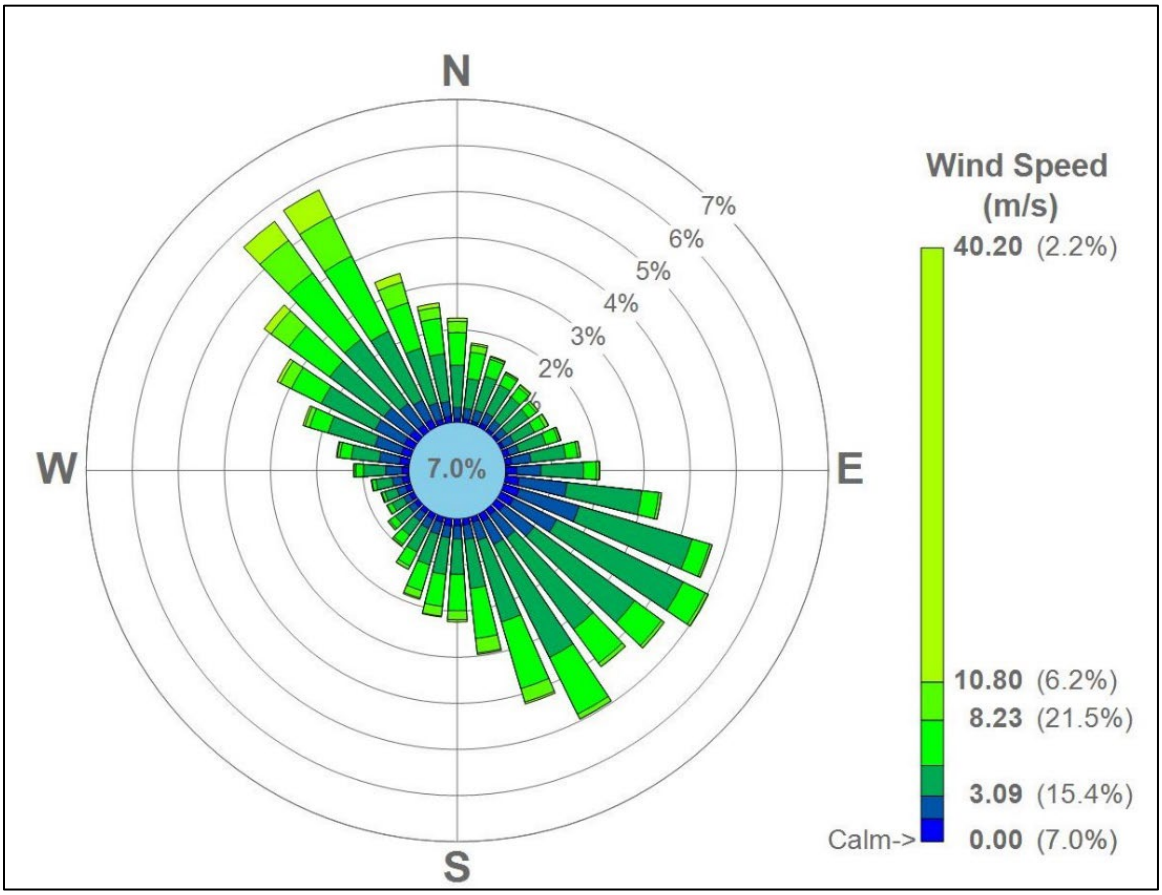

Figure 3-23. Wind rose (2015-2019) for the Sioux City airport.

3.10. MidAmerican Energy Co. – George Neal South (97-04-011)

George Neal South (GNS) is a coal-fired electric generating facility located in Woodbury County, Iowa. It is operated by MidAmerican Energy Company, a subsidiary of Berkshire Hathaway Energy. Figure 3-24 depicts that GNS is located along the Missouri River south of Sergeant Bluff and is ~0.5 km east of the Nebraska border. The South Dakota border lies ~22 km NNW of the facility. The pertinent SO_2 source at GNS is the coal-fired boiler, Unit 4. Table 3-9 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-24. George Neal South and Norths' locations in Sergeant Bluff, Iowa.

Table 3-9. George Neal South's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
7,968	4,888	4,356	5,628	2,617	67.2% Decrease

To facilitate the Round 2 designations process, the DNR modeled GNS and submitted the final results to EPA in 2015. As discussed in the previous section, the maximum modeled impact, including background concentrations and contributions from GNN, occurred in Iowa and was 194.8 µg/m^3, which meets the 2010 1-hour SO_2 NAAQS.

George Neal South is located ~58 km SE of the nearest SO_2 monitoring site, the Union County #1 site (46-127-0001)in South Dakota, as shown in Figure 3-25. The Union County #1 site is representative of background concentrations and its 2017-2019 1-hour SO_2 design value was 3 ppb, or 4% of the NAAQS. There are no relevant SO_2 sources in South Dakota or Nebraska within 50 km of GNS. The closest relevant SO_2 source is the Douglas County/Pheasant Point Landfill, located ~102 km S of GNS, near Bennington, NE.

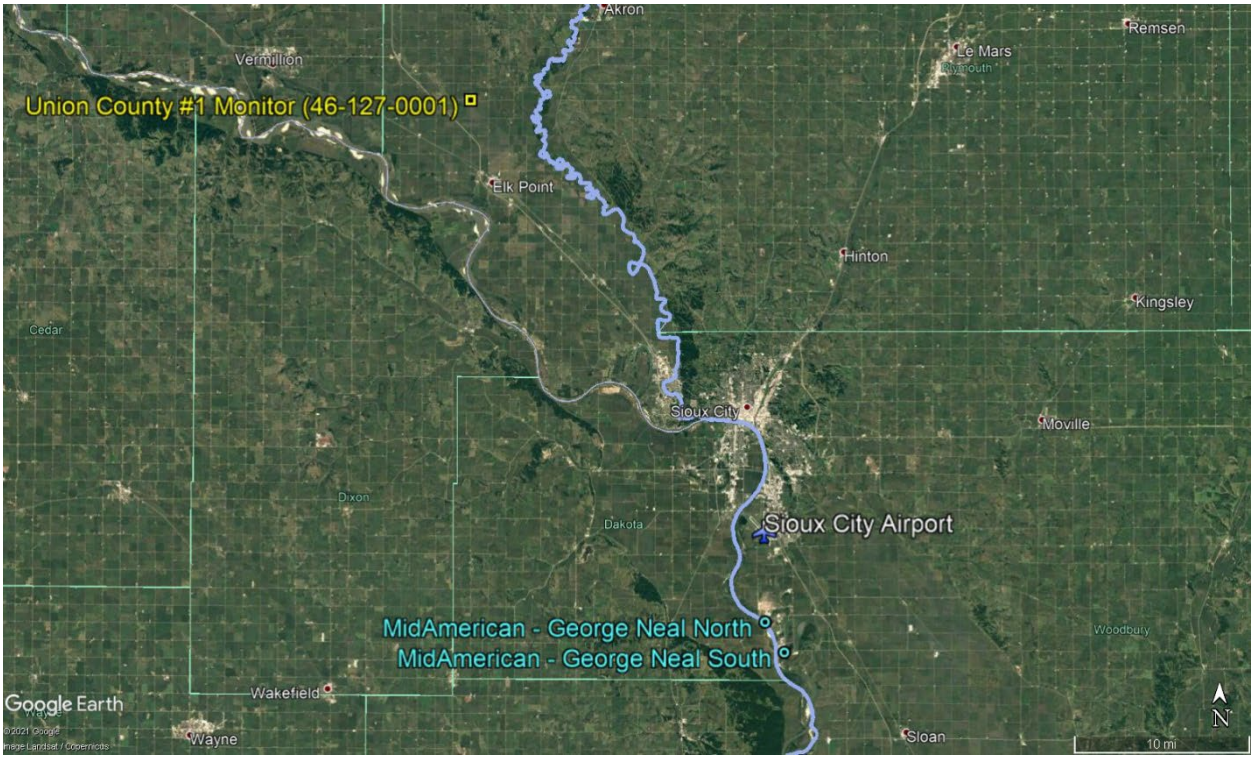

Figure 3-25. George Neal South and Norths' locations in relation to the Sioux City airport and closest SO_2 monitor.

To evaluate prevalent transport patterns near George Neal South, the DNR produced a wind rose using 2015-2019 meteorological data from the Sioux City airport. The Sioux City airport is located ~10 km north of GNS and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW winds and a range of southeasterly winds, as shown in Figure 3-26. The common southeasterly winds could predicate SO_2 transport from GNS to Nebraska and South Dakota. However, the Round 2 modeling for GNS (and GNN) included receptors in Nebraska, where concentrations would be higher than the more distant South Dakota, and the maximum predicted impact met the 2010 1-hour SO_2 NAAQS. Additionally, the modeled emission rates were based on permitted maximum allowable emission limits. For GNS Unit 4, the modeled rate of 3396.7 lb/hr equates to 14,878 tons per year, or not quite twice the facility's total actual 2015 emissions. Furthermore, GNS reduced its emissions by 67% over the 2015-2019 five-year period. Based on this information, the Iowa DNR concludes that George Neal South does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Nebraska or South Dakota.

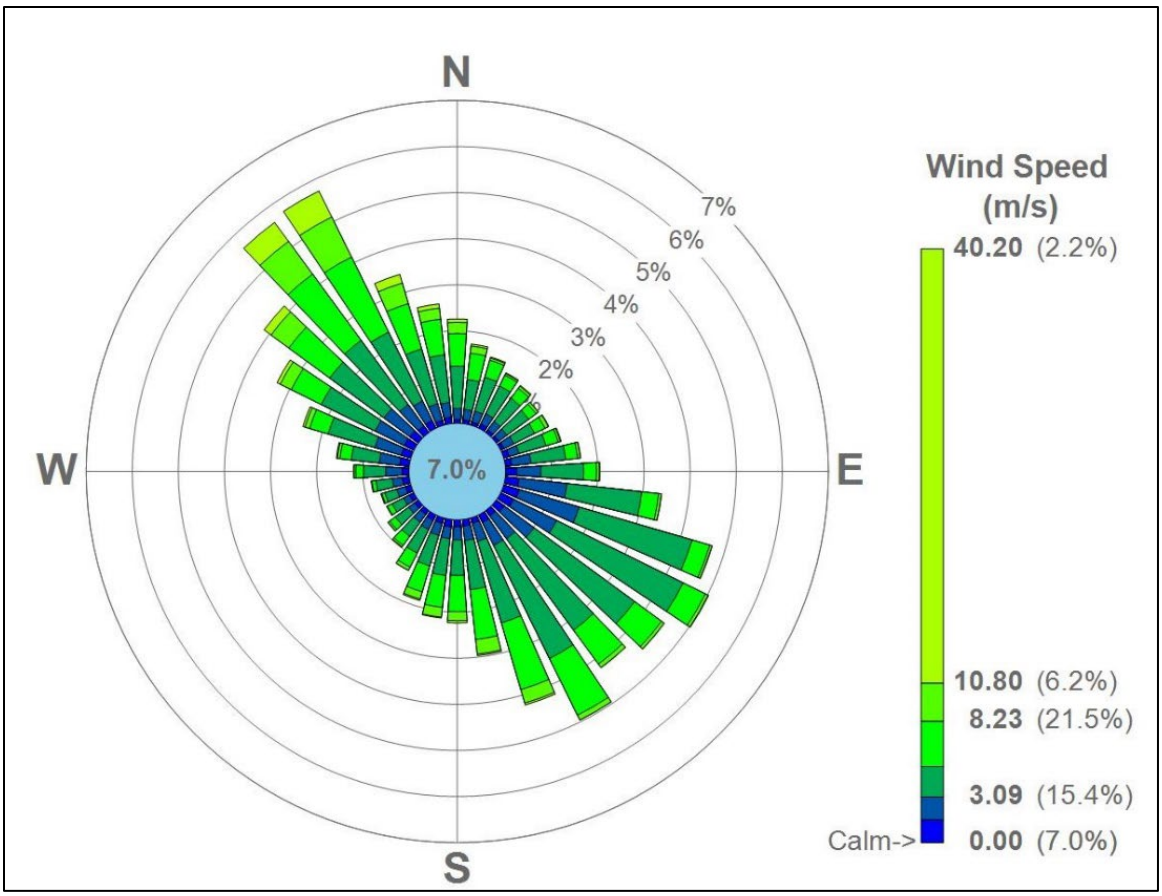

Figure 3-26. Wind rose (2015-2019) for the Sioux City airport.

3.11. MidAmerican Energy Co. – Louisa Station (58-07-011)

Louisa Generating Station (Louisa) is a coal-fired electric generating facility located in Louisa County, Iowa. It is operated by MidAmerican Energy Company, a subsidiary of Berkshire Hathaway Energy. Figure 3-27 depicts that Louisa is located along the Mississippi River south of Muscatine and is ~1.7 km west of the Illinois border. The pertinent SO_2 source at Louisa is the coal-fired boiler. Table 3-10 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-27. Louisa's location in Muscatine, Iowa.

Table 3-10. Louisa's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
6,098	5,129	5,233	7,332	5,286	13.3% Decrease

For purposes of the DRR, the DNR modeled Louisa and submitted the final results to EPA in January of 2017. DNR derived the modeled SO_2 emission rate for Louisa's main boiler based on its permitted maximum allowable emission limit in accordance with EPA guidance for converting longer term averages into 1-hour critical values, as further explained in DNR's Round 3 TSD. The resulting modeled emission rate was 4,270.89 lb/hr. The DRR modeling analysis for Louisa also included the three pertinent facilities located within the Muscatine County 1-hour SO_2 nonattainment area: Grain Processing Corporation (GPC), Muscatine Power & Water (MPW), and Bayer CropScience LP (Bayer; formerly known as Monsanto Co. – Muscatine). Each of those three facilities were modeled using the same permitted maximum allowable emission rates and source parameters as found in the modeled attainment demonstration for the Muscatine 1-hour SO_2 nonattainment SIP,[27] with the exception of Boiler #8 (EP195) at Bayer, which was modeled using actual[28] emissions from the 2012-2014 timeframe.

[27] The DNR submitted the state's attainment plan for the Muscatine 2010 1-hour SO_2 NAAQS nonattainment area to EPA on May 17, 2016. A copy of the attainment plan (*State Implementation Plan, 1-Hour SO_2 Nonattainment, Muscatine, Iowa*) and its attachments are available on the DNR's Implementation Plans website. EPA approved the attainment plan on November 17, 2020 (85 FR 73218), with an effective date of December 17, 2020. Additionally, the DNR submitted a maintenance plan to EPA on November 17, 2021, which accompanied the Governor's request to redesignate the Muscatine area to attainment (also available on the DNR's Implementation Plans website); EPA has not yet acted on that submittal.

[28] Boiler #8 at Bayer was fueled primarily by coal during the 2012-2014 timeframe but now must burn only natural gas.

The modeled receptor grid was centered on Louisa and extended 10 km in each cardinal direction, which placed receptors in Illinois as Louisa lies ~1.7 km west of the Iowa/Illinois border. Grid resolution increased at stepped intervals nearer Louisa to a maximum density of 50 meter spacing. Receptors were removed from facility property and, consistent with Section 4.2 of EPA's December 2013 draft modeling TAD, removed over water. The meteorological modeling period spanned the 2012-2014 three-year timeframe, which was also consistent with that TAD.

The maximum modeled impact, including background concentrations, occurred in Iowa and was 194 µg/m^3, which meets the 2010 1-hour SO_2 NAAQS. As a result, EPA designated Louisa County as attainment/unclassifiable in Round 3 (83 FR 1098, January 9, 2018). The model results also showed concentrations decreasing towards the boundaries of the receptor grid, negating the need for any expansion of the modeling domain.

Louisa is located ~9.5 to ~11 km south of the three SO_2 monitors in the Muscatine area: the High School East Campus (19-139-0019), Musser Park (19-139-0020), and Greenwood Cemetery (19-139-0016) sites. The Musser Park monitor historically yields the highest 1-hour SO_2 design value of those three sites. Its 2017-2019 design value was 25 ppb, or 33% of the NAAQS. There are no SO_2 monitors in Illinois within 50 km of Iowa's borders. The closest relevant Illinois SO_2 source is City of Monmouth, which is located ~56 km SE of Louisa, as indicated in Figure 3-28.

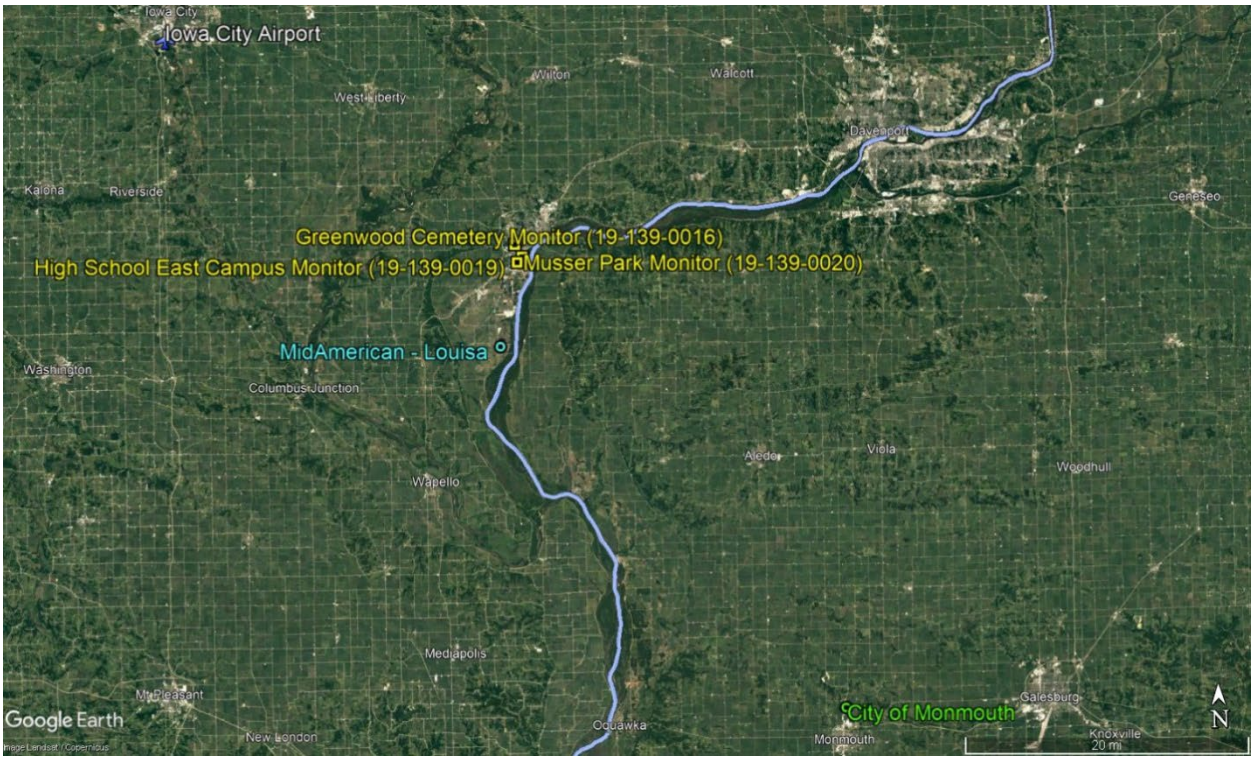

Figure 3-28. Louisa's location in relation to City of Monmouth, Iowa City airport, and Muscatine SO_2 monitors.

To evaluate prevalent transport patterns near Louisa, the DNR produced a wind rose using 2015-2019 meteorological data from the Iowa City airport. The Iowa City airport is located ~50 km NW of Louisa and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW and SE winds, as shown in Figure 3-29. The NW wind directions do align with potential transport from Louisa to City of Monmouth, however, the separation distance is ~56 km, which minimizes Louisa's impact on the SO_2 concentration around City of Monmouth. For the more immediate spatial scales, the DRR modeling for Louisa included receptors in Illinois and the maximum predicted impact met the 2010 1-hour SO_2 NAAQS. Furthermore, the modeling was based on permitted maximum allowable emission limits (with one exception for Boiler #8 at Bayer). For Louisa's main boiler, the modeled emission rate of 4,270.89 lb/hr equates to 18,706 tons per year, or more than twice the facility's 2018 total and over three times the values from any other year in the 2015-2019 range. Based on this information, the Iowa DNR concludes that Louisa does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

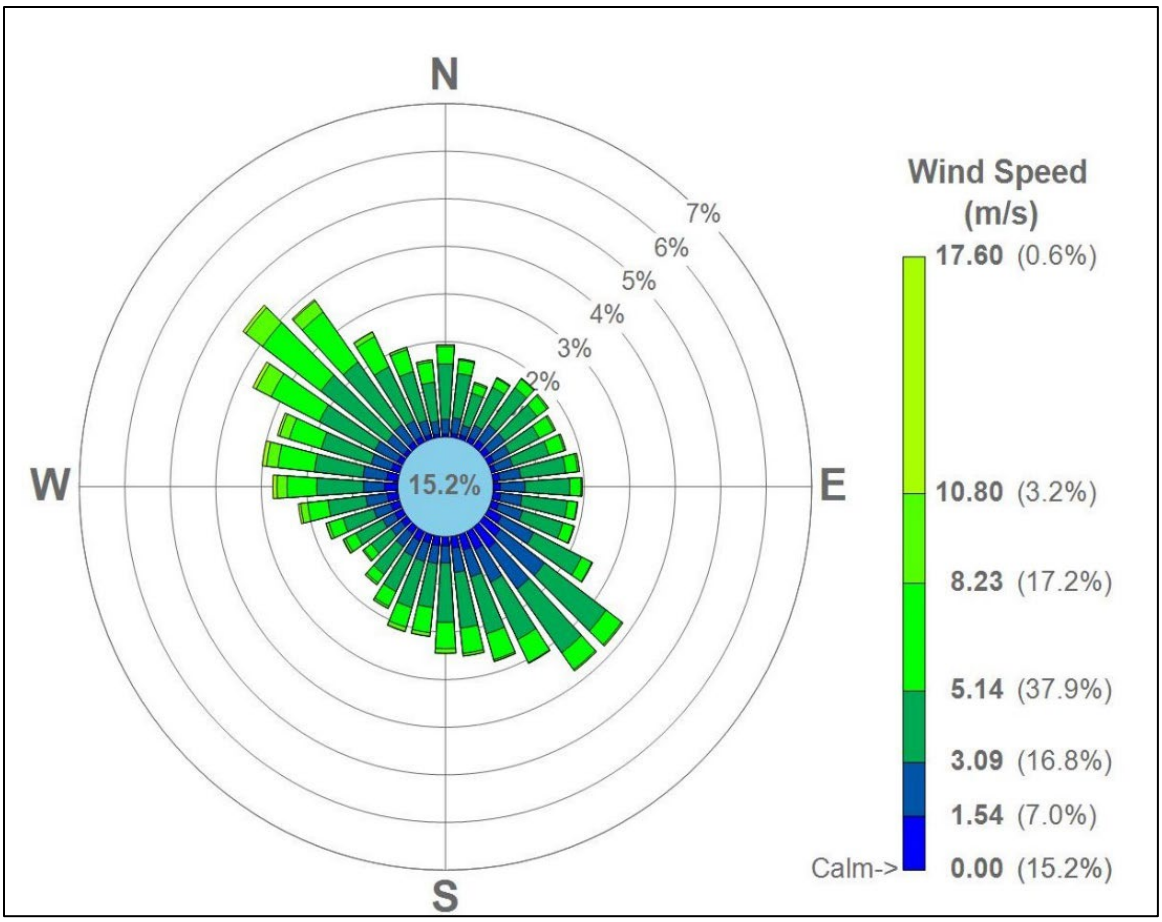

Figure 3-29. Wind rose (2015-2019) for the Iowa City airport.

Although not needed for interstate transport provisions prongs 1 or 2, the DNR recently established new permit conditions to further reduce Louisa's SO_2 emissions. No later than December 31, 2023, MidAmerican must implement operational improvements to Louisa's existing dry scrubber system and meet an emission limit that is based on a 65.6% reduction in SO_2 emissions from the baseline years of 2017 to 2019. These conditions are designed to protect visibility[29] pursuant to the second planning period (2019-2028) of the regional haze program and are enforceable through Iowa DNR Air Quality Construction Permit number 05-A-031-P6, included with Iowa's August 2023 regional haze SIP.[30]

[29] Visibility protections pertain directly to interstate transport provision prong 4 but are unrelated to this plan revision.

[30] See the DNR's Implementation Plans website for a copy of Iowa's Second Regional Haze SIP. EPA has not yet acted on that plan.

3.12. MidAmerican Energy Co. – Walter Scott Jr. Energy Center (78-01-026)

Walter Scott Jr. Energy Center (Walter Scott or WSEC) is a coal-fired electric generating facility located in Pottawattamie County, Iowa. It is operated by MidAmerican Energy Company, a subsidiary of Berkshire Hathaway Energy. Figure 3-30 depicts that WSEC is located along the Missouri River south of Council Bluffs and is ~0.4 km east of the Nebraska border. The pertinent SO_2 sources at WSEC are two coal-fired boilers, Units 3 and 4. Table 3-11 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 3-30. WSEC's location in Council Bluffs, Iowa.

Table 3-11. WSEC's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
9,075	8,975	9,753	9,952	8,895	2.0% Decrease

For purposes of the DRR, the DNR modeled WSEC and submitted the final results to EPA in January of 2017. DNR derived the modeled SO_2 emission rate for WSEC Unit 4 based on its permitted maximum allowable emission limit in accordance with EPA guidance for converting longer term averages into 1-hour values, as further explained in DNR's Round 3 TSD. The resulting modeled emission rate for WSEC Unit 4 was 909.8 lb/hr. Unit 3 at WSEC was modeled using 2012-2014 time-varying actual hourly emissions recorded by its continuous emission monitoring system (CEMS).

The modeled receptor grid was centered on WSEC and extended 10 km in each cardinal direction, which placed receptors in Nebraska as WSEC lies ~0.4 km east of the Iowa/Nebraska border. Grid resolution increased at stepped intervals nearer WSEC to a maximum density of 50 meter spacing. Receptors were removed from facility property and, consistent with Section 4.2 of EPA's December 2013 draft modeling TAD, removed over water. The meteorological modeling period spanned the 2012-2014 three-year timeframe, which was also consistent with that TAD.

The modeling analysis additionally included the two remaining coal-fired boilers at the Omaha Public Power District (OPPD) – North Omaha facility, a power plant in Nebraska located ~19 km NNW of WSEC. Both coal-fired boilers at OPPD – North Omaha were modeled using hourly CEMS data. While the receptor grid did not encompass the areas immediately surrounding the OPPD – North Omaha facility due to the distance from WSEC, that was unnecessary as Nebraska was utilizing ambient monitoring to characterize maximum 1-hour SO_2 concentrations pursuant to the DRR.

Furthermore, the DNR's modeling showed that the impacts from WSEC were decreasing towards that source and at all other edges of the modeling domain. The maximum modeled impact, including background concentrations, occurred in Iowa and was 134 µg/m^3, or 68% of the 2010 1-hour SO_2 NAAQS. As a result, EPA designated Pottawattamie County as attainment/unclassifiable in round 3 (83 FR 1098, January 9, 2018). EPA later designated Douglas County, NE, as attainment/unclassifiable in round 4 (86 FR 16055, March 26, 2021,) based on ambient monitoring data.

WSEC is located ~13 km SE of the closest SO_2 monitor in the Omaha area, the Omaha NCore site (31-055-0019), shown in Figure 3-31. The other two Omaha area SO_2 monitors, the OPPD North Omaha Station (31-055-0057) and Whitmore (31-055-0053) sites, are both located ~18 km NW of WSEC. The OPPD North Omaha Station monitoring location was sited to characterize maximum 1-hour SO_2 concentrations from the OPPD – North Omaha power plant.

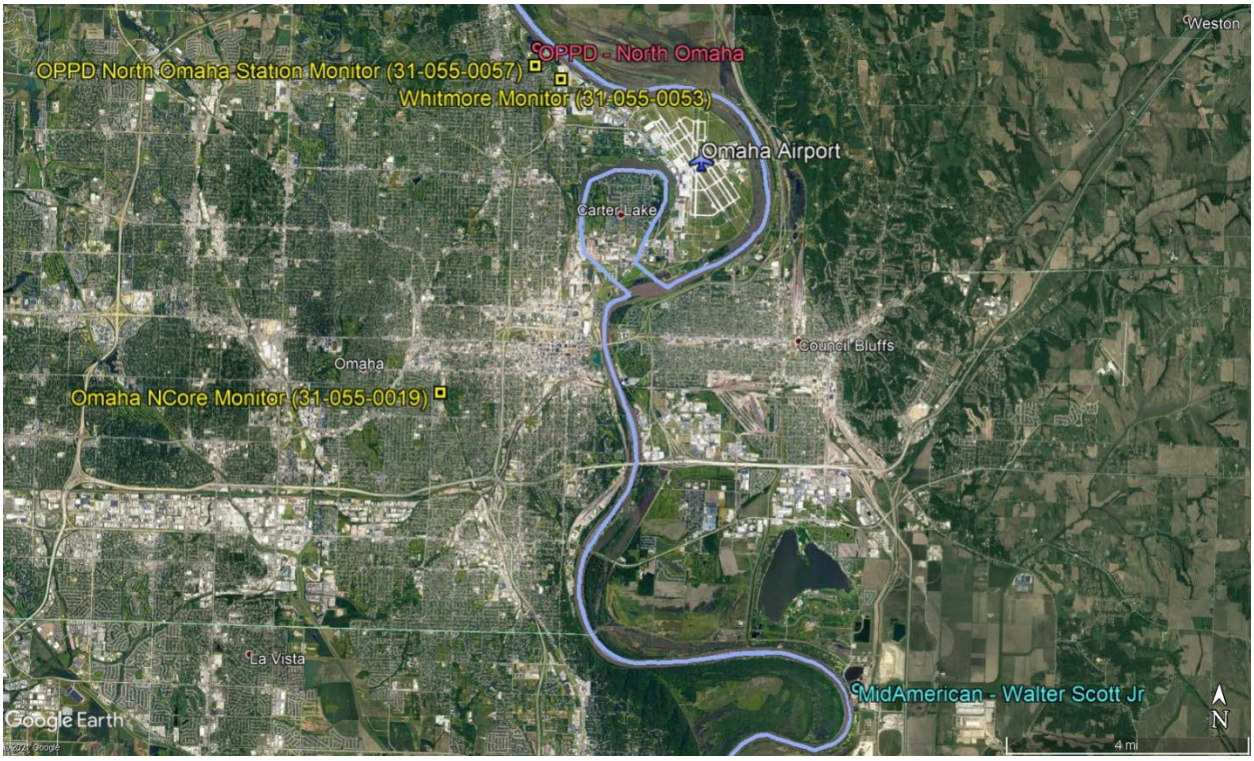

Figure 3-31. WSEC's location in relation to OPPD – North Omaha, Omaha airport, and Omaha SO_2 monitors.

To evaluate prevalent transport patterns near WSEC, the DNR produced a wind rose using 2015-2019 meteorological data from the Omaha airport. The Omaha airport is located ~13 km NNW of WSEC and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NNW and SSE winds, as shown in Figure 3-32. The frequent SSE winds could predicate SO_2 transport from WSEC to areas around the OPPD – North Omaha facility and the three monitoring sites in Omaha. However, those monitors all show compliance with the 1-hour SO_2 NAAQS. The OPPD North Omaha Station site's 2017-2019 design value was 34 ppb, the Whitmore site's 2017-2019 design value was 41 ppb, and the Omaha NCore site's 2017-2019 design value was 24 ppb. This further supports that WSEC's impacts on areas in Nebraska are compliant with the CAA's prong 1 and prong 2 good neighbor provisions.

Additionally, the DRR modeling for WSEC included receptors in the Omaha area and the maximum predicted impact met the 2010 1-hour SO_2 NAAQS. While WSEC – Unit 3 was modeled using actuals, its annual emissions are lower in the years subsequent to the 2012-2014 modeled period, as shown in Table 3-12. While OPPD – North Omaha's emissions trends are not necessarily the same, this needs no further investigation as all 1-hour SO_2 design values in the area meet the NAAQS and incorporate locations intended to characterize peak 1-hour SO_2 concentrations around that source. Based on this information, the Iowa DNR concludes that WSEC does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Nebraska.

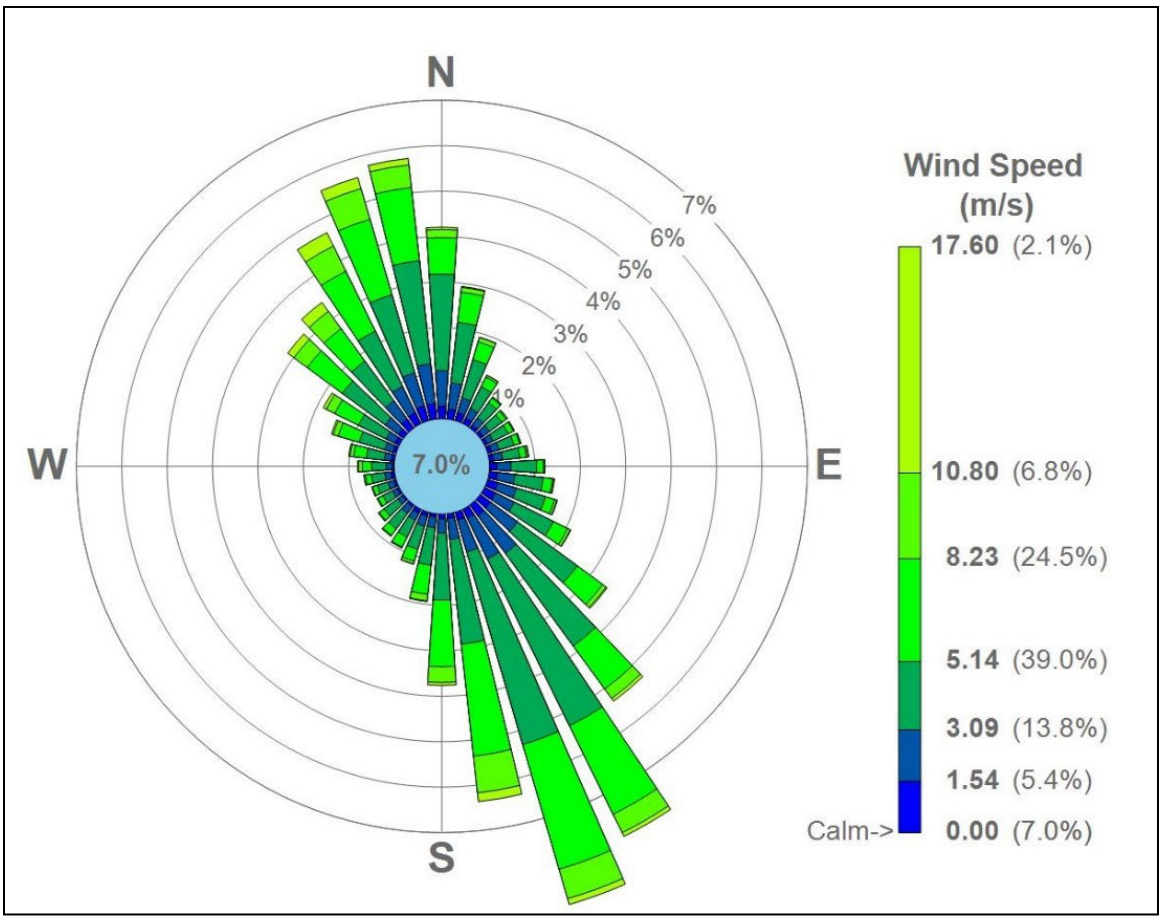

Figure 3-32. Wind rose (2015-2019) for the Omaha airport.

Table 3-12. WSEC – Unit 3's annual SO_2 emissions (tons) from 2012 through 2019, as reported to CAMD.

2012	2013	2014	2015	2016	2017	2018	2019
9,335	9,043	9,119	6,630	7,365	8,486	8,118	7,520

Although not needed for interstate transport provisions prongs 1 or 2, the DNR recently established new permit conditions to further reduce WSEC's SO_2 emissions. No later than December 31, 2023, MidAmerican must implement operational improvements to Unit 3's existing dry scrubber system and meet an emission limit that is based on a 72% reduction in SO_2 emissions from the baseline years of 2017 to 2019. These conditions are designed to protect visibility[31] pursuant to the second planning period (2019-2028) of the regional haze program and are enforceable through Iowa DNR Air Quality Construction Permit number 75-A-357-P9, included with Iowa's August 2023 regional haze SIP.[32]

[31] Visibility protections pertain directly to interstate transport provision prong 4 but are unrelated to this plan revision.

[32] See the DNR's Implementation Plans website for a copy of Iowa's Second Regional Haze SIP. EPA has not yet acted on that plan.

3.13. Muscatine Power & Water (70-01-011)

Muscatine Power & Water (MPW) is a coal-fired electric generating facility located in Muscatine County, Iowa. Figure 3-33 depicts that MPW is located along the Mississippi River in the city of Muscatine and is ~0.5 km west of the Illinois border. The pertinent SO_2 sources at MPW are three coal-fired boilers (Units 7, 8, and 9). Table 3-13 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

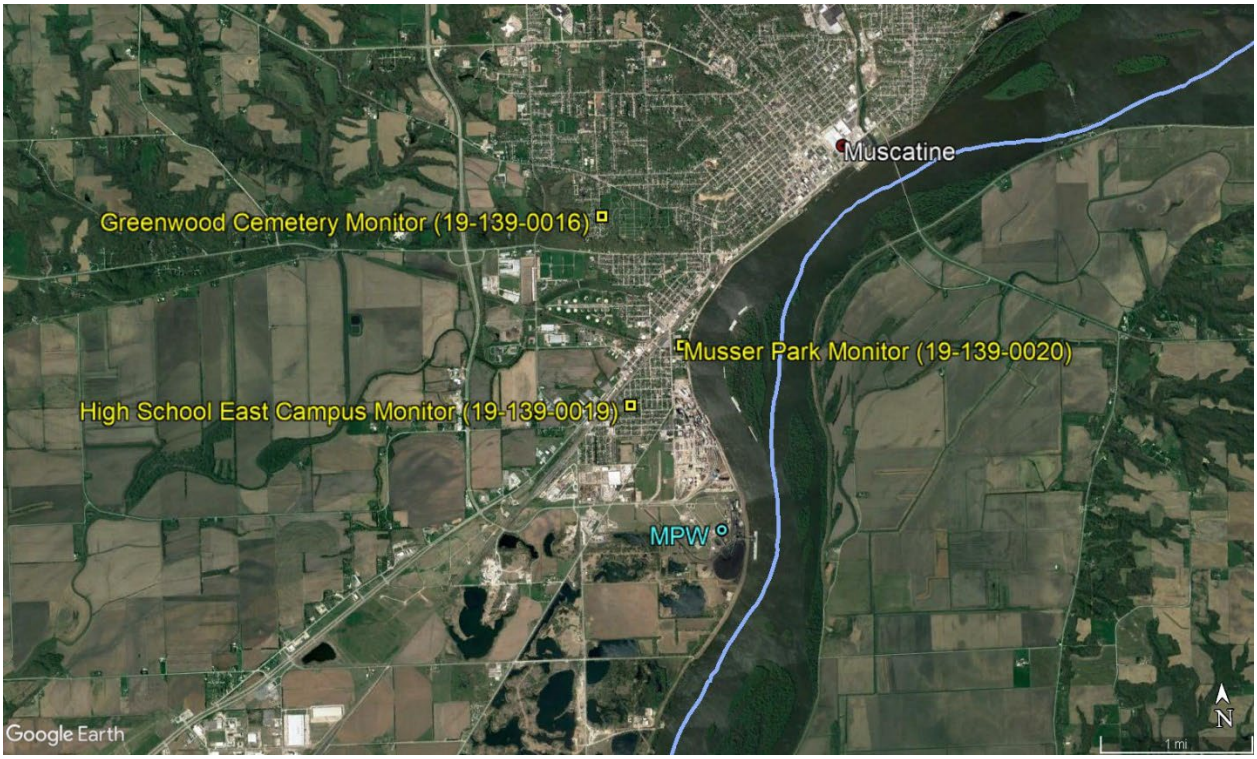

Figure 3-33. MPW's location in Muscatine, Iowa.

Table 3-13. MPW's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
1,714	1,769	1,167	1,458	1,715	0.03% Increase

The DRR dispersion modeling analysis that the DNR submitted to EPA in January of 2017 for MidAmerican's Louisa Generating Station directly informs the evaluation of MPW. As discussed in Section 3.11, that analysis provides for a comprehensive assessment of 1-hour SO_2 concentrations around not just Louisa, but also MPW and the other two sources in the Muscatine nonattainment area. As a reminder, the units at MPW were modeled at their permitted maximum allowable emission limits, as were all but one emission point in that analysis (Boiler #8 at Bayer). The maximum modeled impact was 194 µg/m^3, which meets the 2010 1-hour SO_2 NAAQS. While the receptor grid was centered on Louisa and not MPW, expansion of the modeled domain is unnecessary as the results showed that the maximum impact occurred in Iowa and that all concentrations were decreasing towards the edges of the grid.

Additionally, the DNR measures ambient SO_2 concentration at three monitoring sites in Muscatine: the High School East Campus (13-139-0019), Musser Park (19-139-0020), and Greenwood Cemetery (19-139-0016) sites. MPW is located approximately ~1.5 km, ~1.8 km, and ~3.3 km south of those sites, respectively. Each has attained the 1-hour SO_2 NAAQS beginning with the 2015-2017 three-year period. The Musser Park monitor historically yields the highest 1-hour SO_2 design value of the three sites, and its 2017-2019 design value was 25 ppb, or 33% of the NAAQS. While there are no SO_2 monitors in Illinois within 50 km of Iowa's borders, lower concentrations would be expected in nearby areas in Illinois as distances increase form the Iowa sources. The closest Illinois source is City of Monmouth, which is located ~61 km SSE of MPW, as indicated in Figure 3-34.

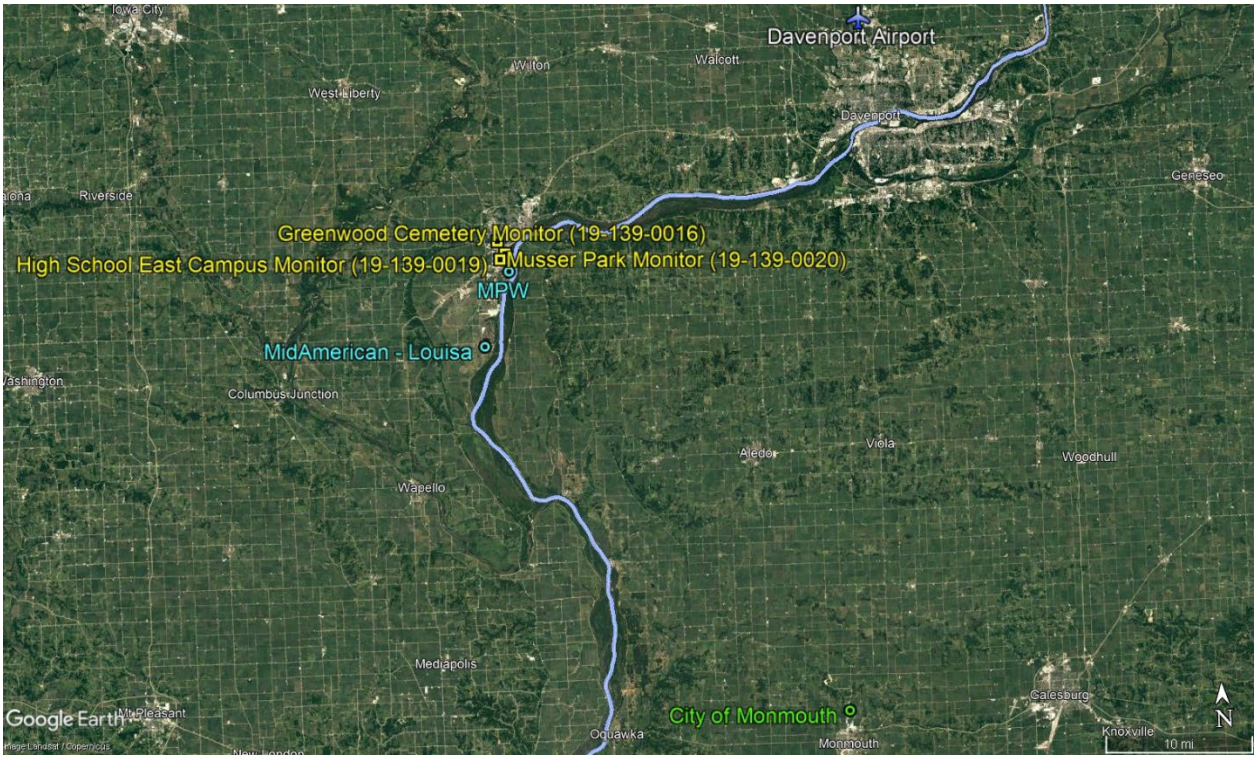

Figure 3-34. MPW's location in relation to City of Monmouth, Davenport airport, and Muscatine SO_2 monitors.

To evaluate prevalent transport patterns near MPW, the DNR produced a wind rose using 2015-2019 data from the Davenport airport. The Davenport airport is located ~49 km NE of MPW and is representative of the meteorological conditions at the facility. The wind rose indicates predominately WNW and SSW winds, as shown in Figure 3-35. The WNW wind directions could predicate SO_2 transport to Illinois but do not generally align with the City of Monmouth, and the ~61 km separation distance suggests MPW has little to no impact on the SO_2 concentrations around that Illinois source. The SSW wind directions, while not aligned with transport to Illinois, do place MPW upwind of the three Muscatine monitors, all of which now attain the 1-hour SO_2 standard. This suggests that the WNW winds would not prohibitively elevate SO_2 concentrations in Illinois.

Furthermore, the relevant DRR modeling included receptors in Illinois and the maximum predicted impact met the 2010 1-hour SO_2 NAAQS. That modeling was based on permitted maximum allowable emission limits (except Boiler #8 at Bayer, which now combusts only natural gas). For MPW, the modeled SO_2 emission rates could vary depending upon which combinations of its three boilers were allowed to operate, but totaled 1,370 lb/hr when all were operating, which would equate to 6,001 tons per year, or more than three to five times the facility's actual emission in the 2015-2019 range. Based on this information, the Iowa DNR concludes that MPW does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

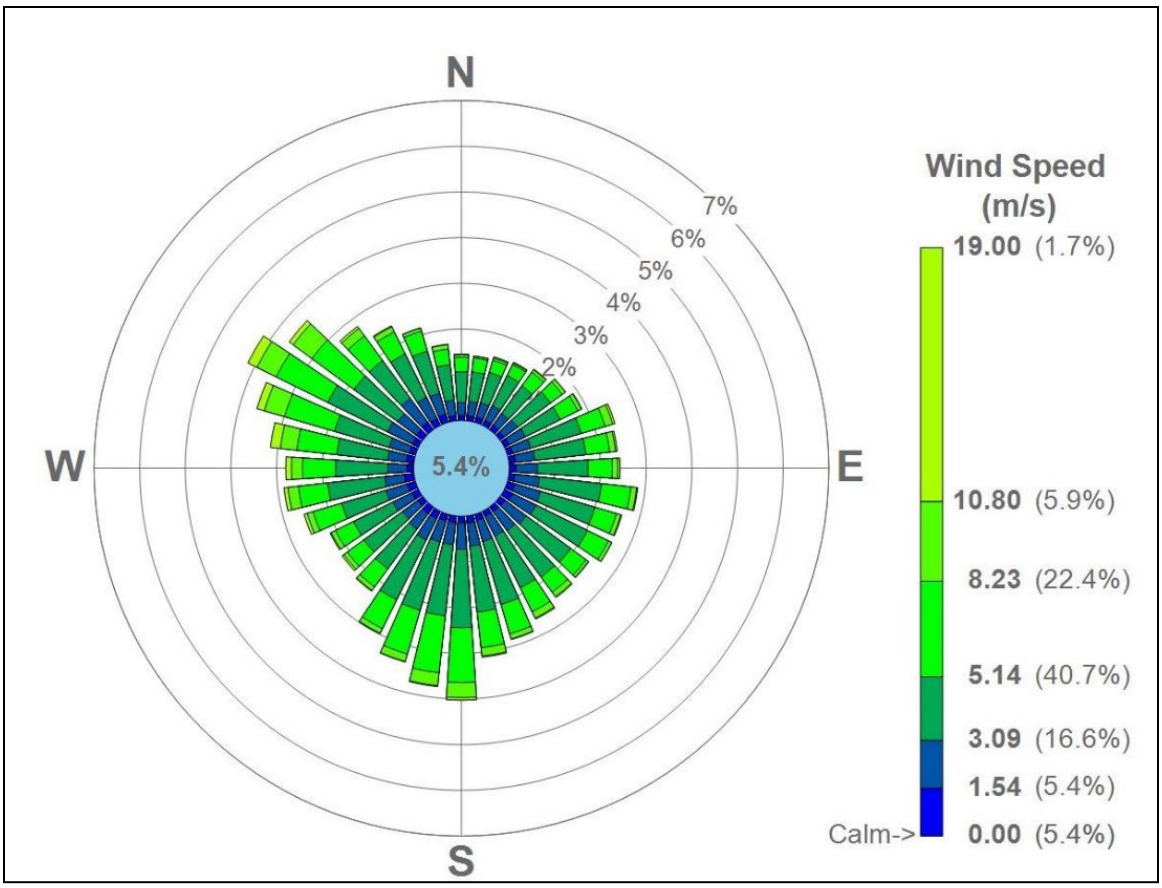

Figure 3-35. Wind rose (2015-2019) for the Davenport airport.

3.14. Roquette America, Inc. (56-01-009)

Roquette America, Inc. (Roquette) is a corn wet milling facility located in Lee County, Iowa. Figure 3-36 depicts that Roquette is located along the Mississippi River in Keokuk and is ~0.5 km north of the Illinois border. It also lies ~2.5 km ENE of the Missouri border. The pertinent SO_2 sources at Roquette are a boiler, germ dryer, steep vent, vacuum jet, and fiber washing separation. Table 3-14 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

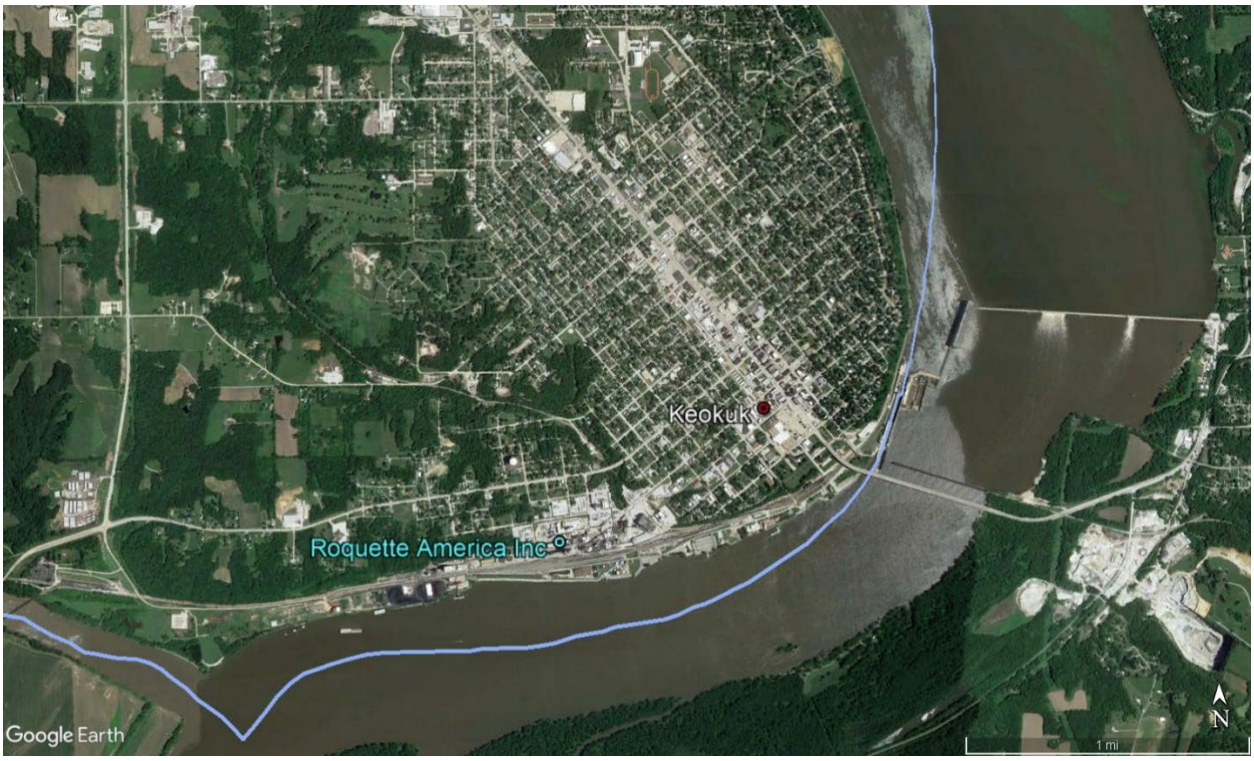

Figure 3-36. Roquette's location in Keokuk, Iowa.

Table 3-14. Roquette's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
353	307	270	326	293	16.8% Decrease

There are no SO_2 monitors within 50 km of Roquette. The closest relevant Illinois source is the Illinois Veterans Home, located ~48 km south of Roquette, shown in Figure 3-37. There are no relevant SO_2 sources in Missouri within 50 km of the Iowa border.

Figure 3-37. Roquette's location in relation to Illinois Veterans Home and Burlington airport.

To evaluate prevalent transport patterns near Roquette, the DNR produced a wind rose using 2015-2019 meteorological data from the Burlington airport. The Burlington airport is located ~48 km NNE of Roquette and is representative of the meteorological conditions at the facility. The wind rose indicates predominately NW and SSW winds, as shown in Figure 3-38. These common wind directions do not align with transport from Roquette to the Illinois Veterans Home. This data suggest that Roquette has little to no impact on SO_2 concentrations around the Illinois Veterans Home. The common NW wind directions could predicate SO_2 transport from Roquette to Illinois. However, most of Roquette's SO_2 emissions are emitted[33] at a height of ~350 feet and at an exit temperature of ~185° Fahrenheit or at a height of ~61 feet and at an exit temperature of ~115° Fahrenheit, which should contribute to good dispersion, particularly through the taller stack. Additionally, Roquette's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Furthermore, the facility's SO_2 emissions have trended downward in recent years, with a 17% reduction occurring over the 2015 through 2019 period. This suggests Roquette's impact on nearby areas in Illinois and Missouri are minimal. Based on this information, the Iowa DNR concludes that Roquette does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois or Missouri.

[33] Through either the circulating fluidized bed (CFB) boiler stack, emission point ID: 121; or the Fiber Washing/Separation stack, emission point ID: 8-5.

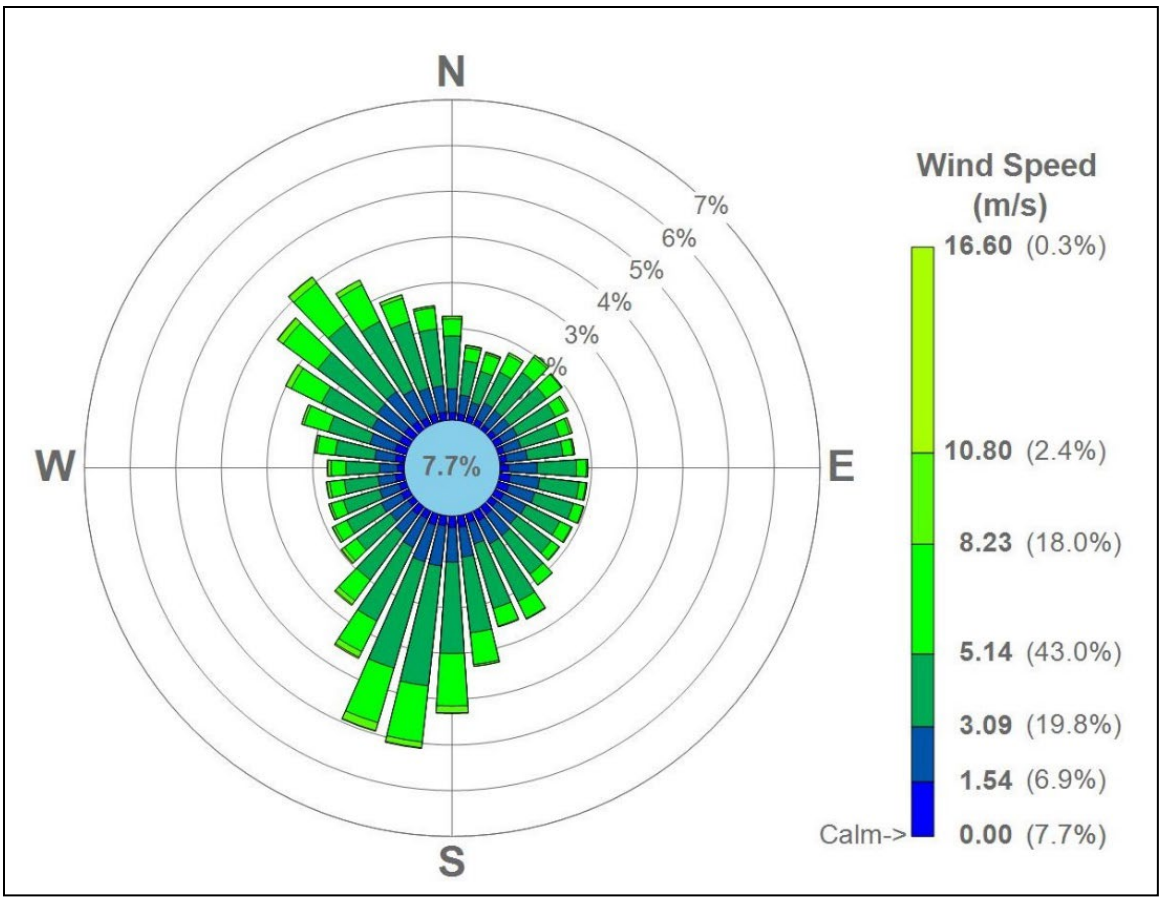

Figure 3-38. Wind rose (2015-2019) for the Burlington airport.

3.15. SSAB Iowa, Inc. – Muscatine (70-08-002)

SSAB Iowa, Inc. (SSAB) is an iron and steel mill and ferroalloy-manufacturing facility located in Muscatine County, Iowa. Figure 3-39 depicts that SSAB is located ENE of the city of Muscatine and is ~2.8 km north of the Illinois border. The pertinent SO_2 sources at SSAB are two melt shops. Table 3-15 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

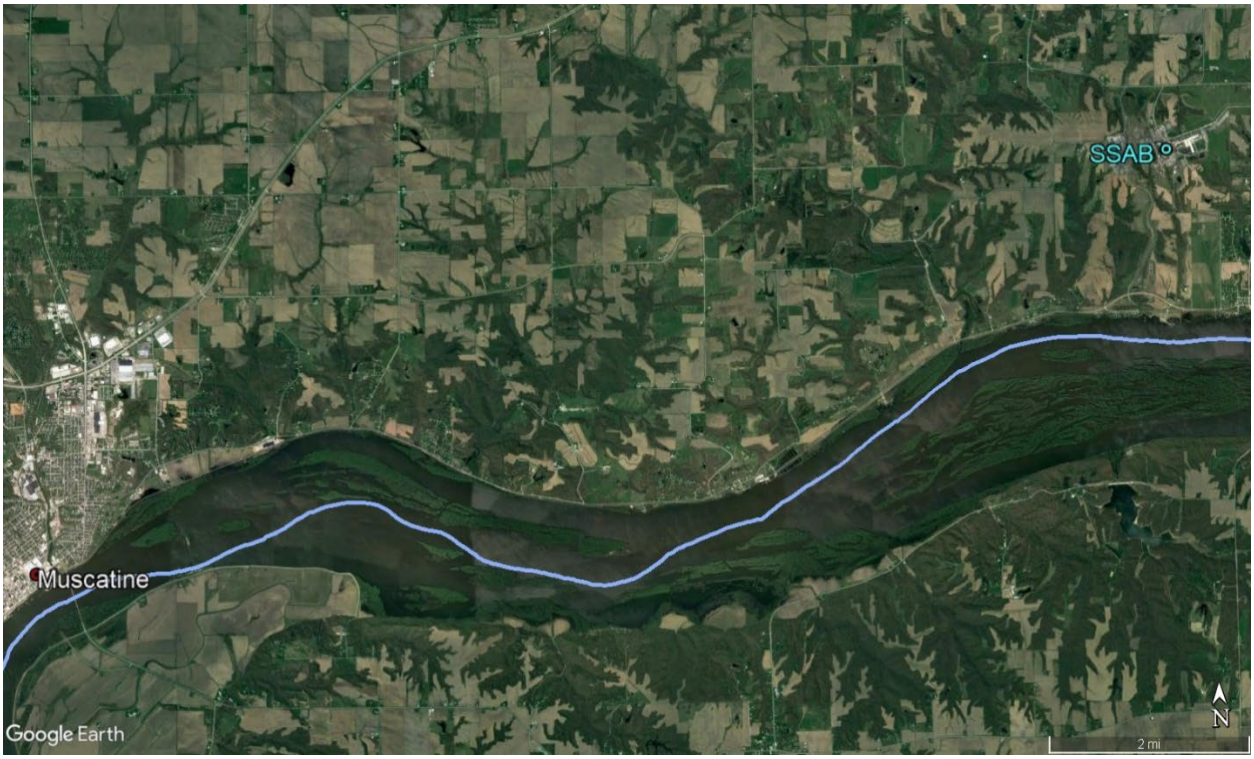

Figure 3-39. SSAB's location in Muscatine, Iowa.

Table 3-15. SSAB's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
157	171	282	234	127	19.1% Decrease

SSAB is located ~20 km WSW of the closest SO_2 monitor, the Jefferson School site (19-163-0015) in Davenport. The Jefferson School site captures urban SO_2 concentrations but does not assess impacts from SSAB. Its 2017-2019 1-hour SO_2 design value was 4 ppb, or 5% of the NAAQS. There are no relevant Illinois SO_2 sources within 50 km of SSAB. The closest relevant SO_2 source in Illinois is City of Monmouth, which is located ~60 km SSE of SSAB, shown in Figure 3-40.

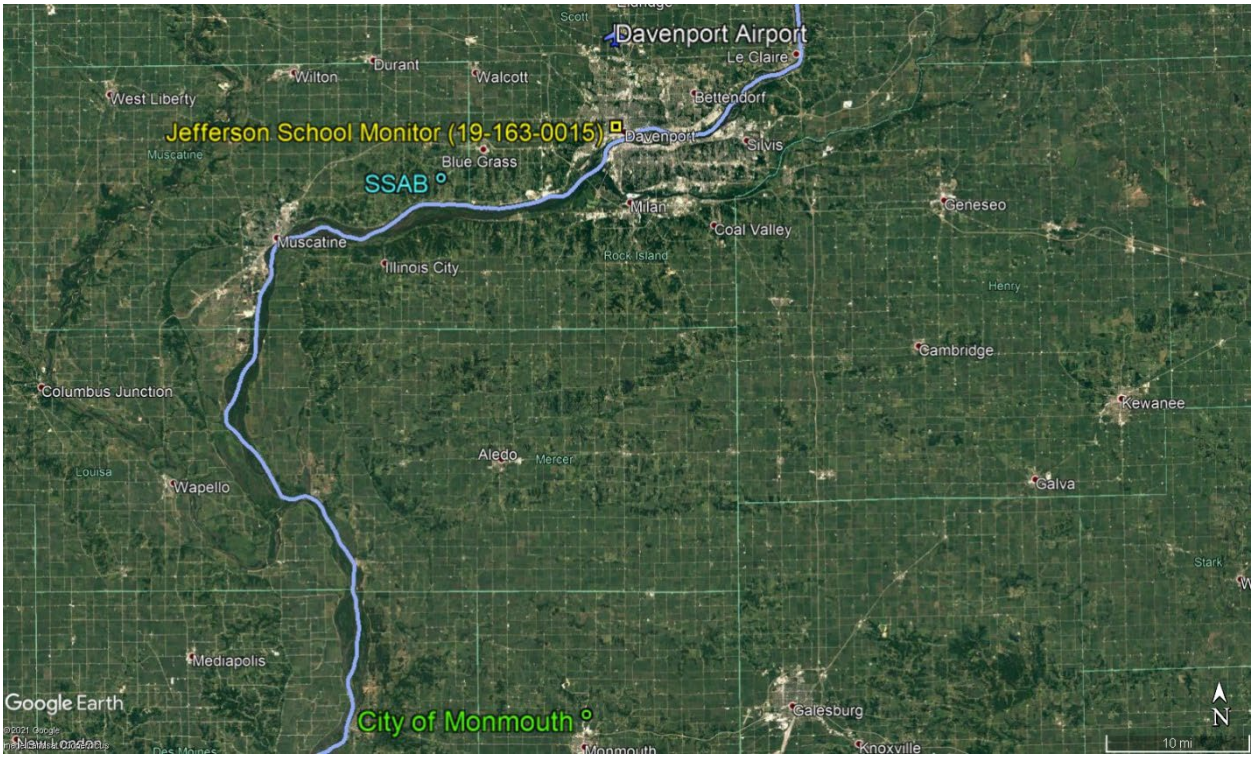

Figure 3-40. SSAB's location in relation to City of Monmouth, Davenport airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near SSAB, the DNR produced a wind rose using 2015-2019 meteorological data from the Davenport airport. The Davenport airport is located ~24 km NE of SSAB and is representative of the meteorological conditions at the facility. The wind rose indicates predominately WNW and SSW winds, as shown in Figure 3-41. These common wind directions do not align with transport from SSAB to City of Monmouth. This data suggest that SSAB has little to no impact on SO_2 concentrations around City of Monmouth. The common WNW wind directions could predicate SO_2 transport from SSAB to Illinois. However, most of SSAB's SO_2 emissions are emitted[34] at heights above ~100 feet and at exit temperatures of at least ~150° Fahrenheit, which should contribute to good dispersion. Additionally, SSAB's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Furthermore, the facility's SO_2 emissions have trended downward in recent years, with a 19% reduction occurring over the 2015 through 2019 period. Based on this information, the Iowa DNR concludes that SSAB does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

[34] Through either of two stacks associated with the electric arc furnace and ladle metallurgy furnace (EAF/LMF) melt shops, emission point IDs: EP 1A and EP 1B.

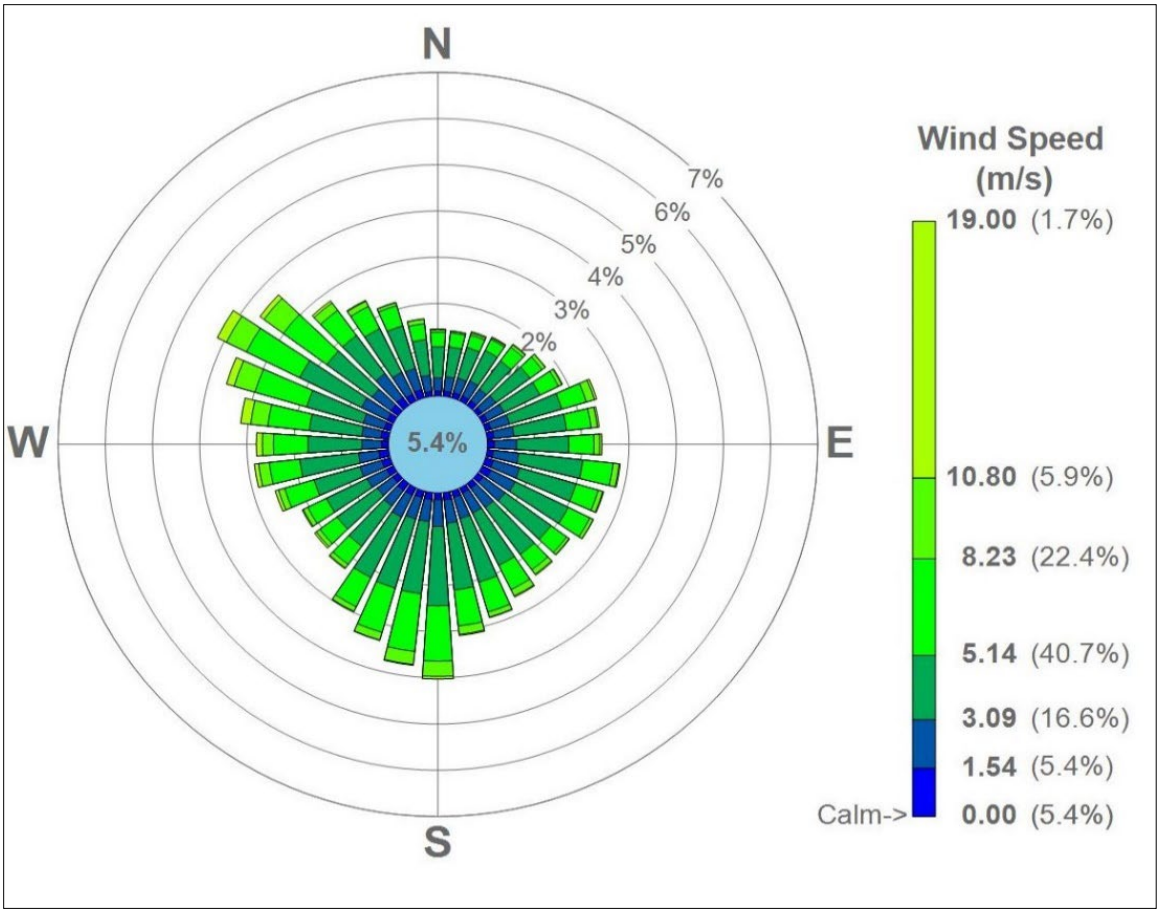

Figure 3-41. Wind rose (2015-2019) for the Davenport airport.

3.16. University of Iowa (52-01-005)

The University of Iowa is a public research university located in Iowa City in Johnson County. The pertinent SO_2 sources are the two coal-fired boilers at the University's power plant. The power plant, whose location is depicted in Figure 3-42, provides steam and electricity for the campus. The Illinois border lies ~49 km SE of the boilers. Table 3-16 lists the University's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

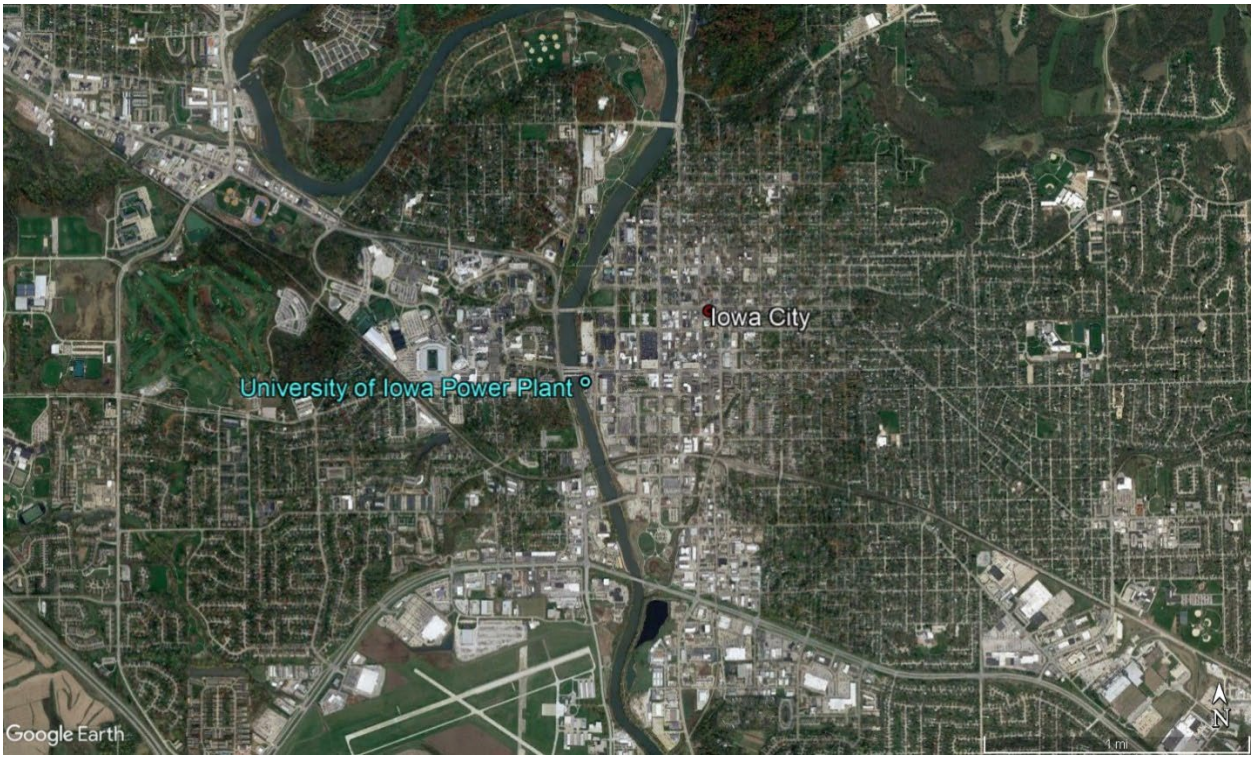

Figure 3-42. University of Iowa's power plant location in Iowa City, Iowa.

Table 3-16. University of Iowa's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
510	273	201	109	176	65.5% Decrease

The University of Iowa power plant is located within 50 km of five SO_2 monitoring sites: the Public Health (19-113-0040) and Tait Cummins Park (19-113-0041) sites in Cedar Rapids, Iowa, and the three sites in Muscatine, Iowa, as shown in Figure 3-43. None are closer than the Tait Cummins Park site in Cedar Rapids, ~33 km NNW of the facility. The 2017-2019 design values for each of the five sites attain the standard, but these sites are not intended to assess impacts from the University of Iowa. There are no SO_2 monitors in Illinois within 50 km of Iowa's borders. As indicated in Figure 3-43 the closest Illinois source, City of Monmouth, is located ~109 km SE of the University.

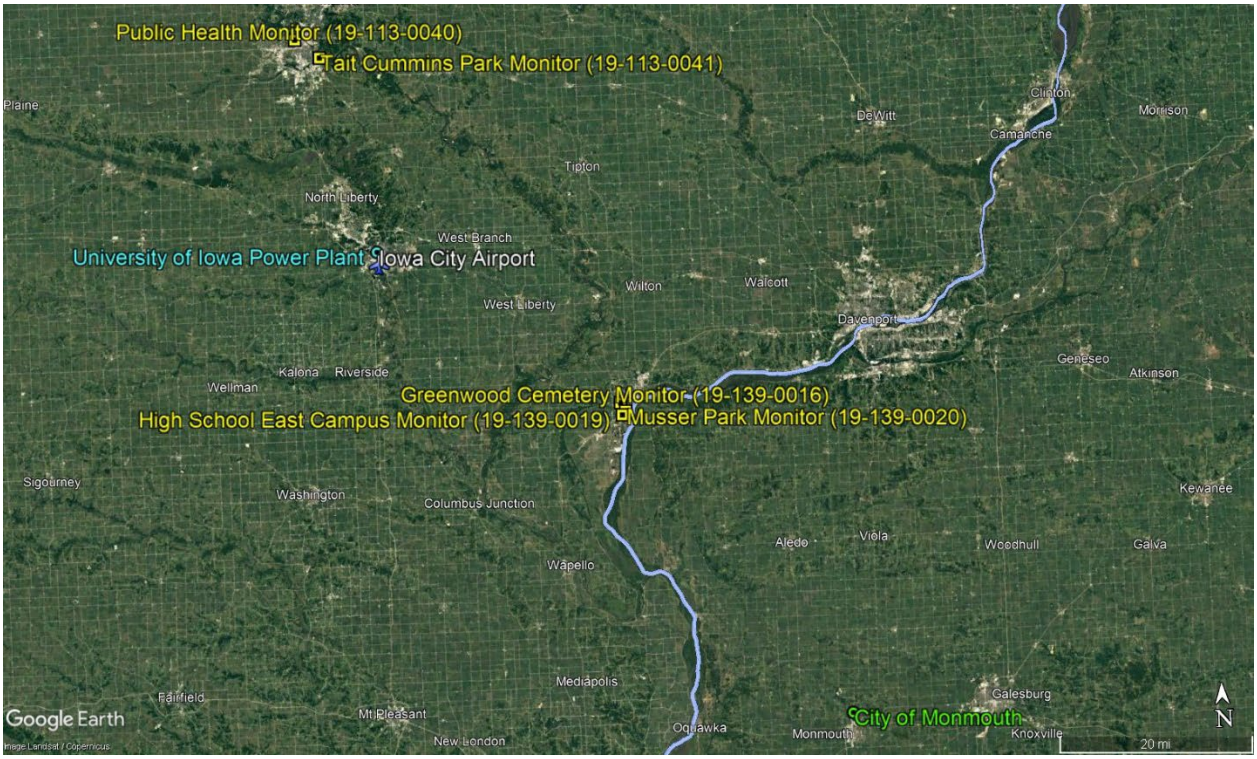

Figure 3-43. University of Iowa's location in relation to City of Monmouth, Iowa City airport, and SO_2 monitors.

To evaluate prevalent transport patterns near the University of Iowa, the DNR produced a wind rose using 2015-2019 meteorological data from the Iowa City airport. The Iowa City airport is located ~2.0 km south of the University's power plant and is representative of the meteorological conditions at this source. The wind rose indicates predominately NW and SE winds, as shown in Figure 3-44. The common NW wind directions could predicate SO_2 transport from the University of Iowa to City of Monmouth, however, the separation distance is ~109 km. This suggests that the University of Iowa has little to no impact on SO_2 concentrations around City of Monmouth. The common NW wind directions could also predicate SO_2 transport from the University of Iowa to the state of Illinois. However, the transport distance is nearly 50 km and the likely pathway appears to align with the city of Muscatine, where all three SO_2 monitors attain the standard. Additionally, most of the University's SO_2 emissions are emitted[35] at a height of ~198 feet and at an exit temperature of ~325° Fahrenheit, which should contribute to good dispersion. Furthermore, the University's SO_2 emissions are lower than other Iowa sources with nearby monitors and in such cases the recent (2017-2019) design values attain the 1-hour SO_2 NAAQS. Finally, the facility's SO_2 emissions have trended downward in recent years, with a 66% reduction occurring over the 2015 through 2019 period. Based on this information, the Iowa DNR concludes that the University of Iowa does not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in Illinois.

[35] Through the boiler #11 stack, emission point ID: EP-PP07.

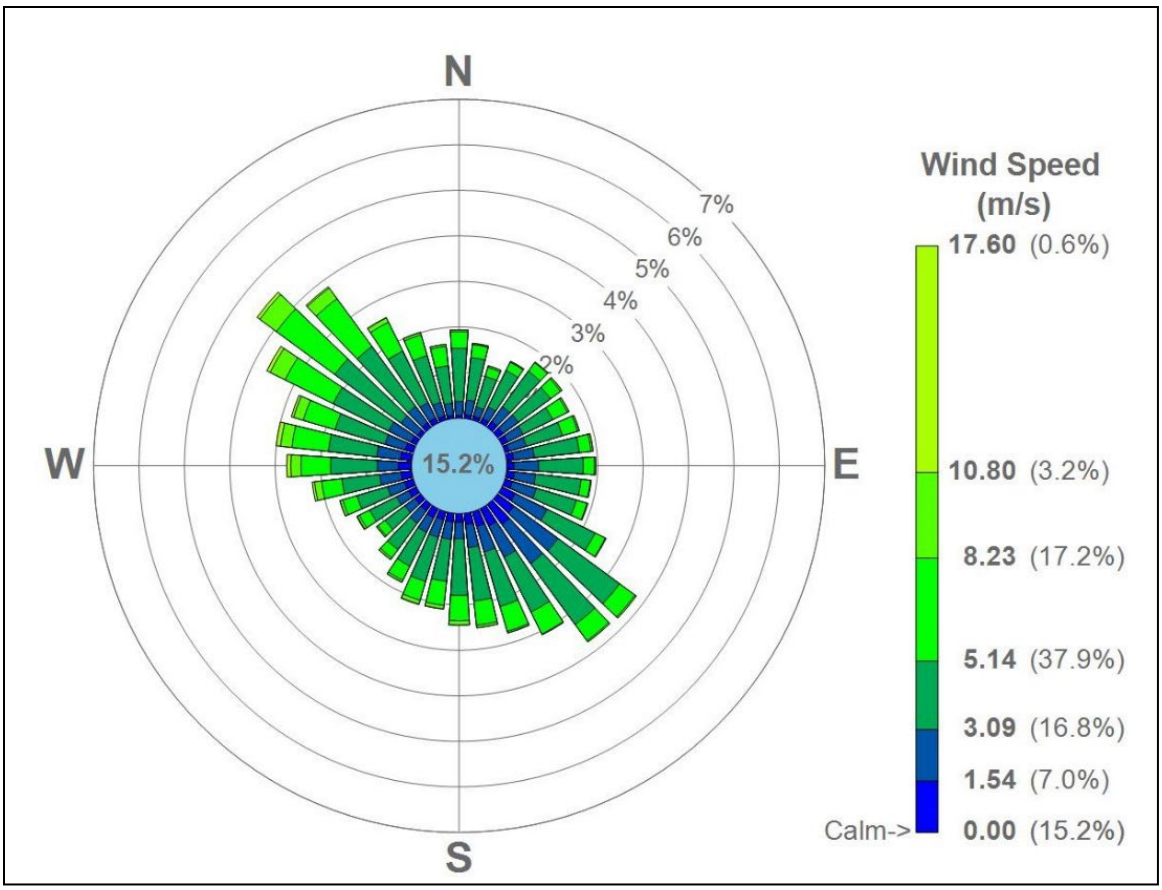

Figure 3-44. Wind rose (2015-2019) for the Iowa City airport.

4. SO_2 Sources in Adjacent States

This chapter provides a brief overview of the 8 sources identified in the adjacent states that are located within 50 km of Iowa's border and emitted 100 tons per year or more of SO_2 in 2017. The DNR investigated the potential for transport from these sources toward Iowa. While not required pursuant to Iowa's good neighbor obligations, the information can be beneficial for purposes of this transport SIP where it provides additional evidence that a given source is unlikely to cause impacts along Iowa's border.

4.1. Illinois

Two Illinois facilities warrant an assessment of potential SO_2 transport impacts on locations pertinent to Iowa: the City of Monmouth (wastewater treatment plant) and the Illinois Veterans Home.

4.1.1. City of Monmouth

City of Monmouth is a wastewater treatment plant located in Warren County, Illinois. Figure 4-1 depicts the facility location, which is ~26 km from the Iowa border. City of Monmouth's pertinent SO_2 source is the anaerobic wastewater treatment lagoon, which includes a biogas collection system, collection blowers, and stick flares. Table 4-1 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

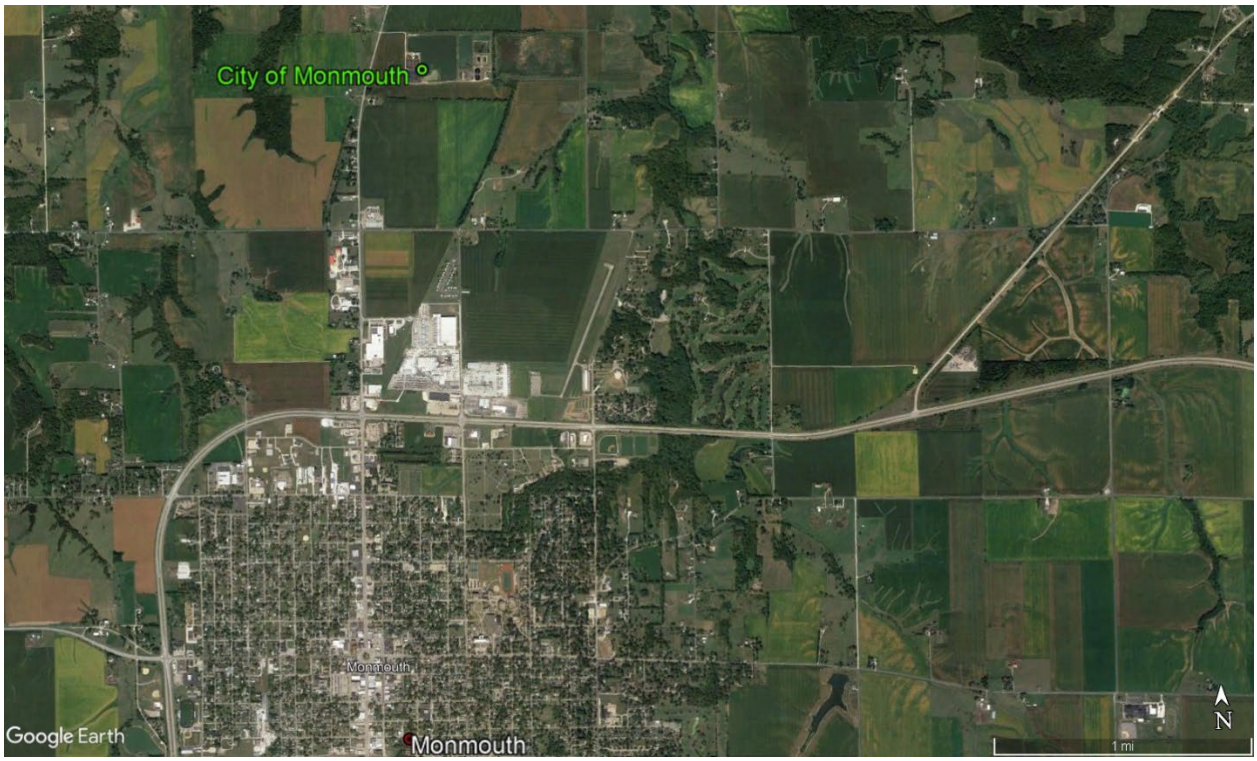

Figure 4-1. City of Monmouth's (wastewater treatment plant) location in Monmouth, Illinois.

Table 4-1. City of Monmouth's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
183	76	120	149	155	15.1% Decrease

There are no SO_2 monitors in Illinois within 50 km of Iowa's border and there are no Iowa SO_2 monitors within 50 km of City of Monmouth. The closest Iowa source is IPL – Burlington, located ~46 km SW of City of Monmouth. The Pekin, Illinois, 1-hour SO_2 maintenance area[36] is located no less than ~83 km SE of City of Monmouth, as indicated in Figure 4-2.

[36] The closest point of the Pekin maintenance area is ~107 km from Iowa's border, meaning any SO_2 impacts from any Iowa sources would be minimal in that area.

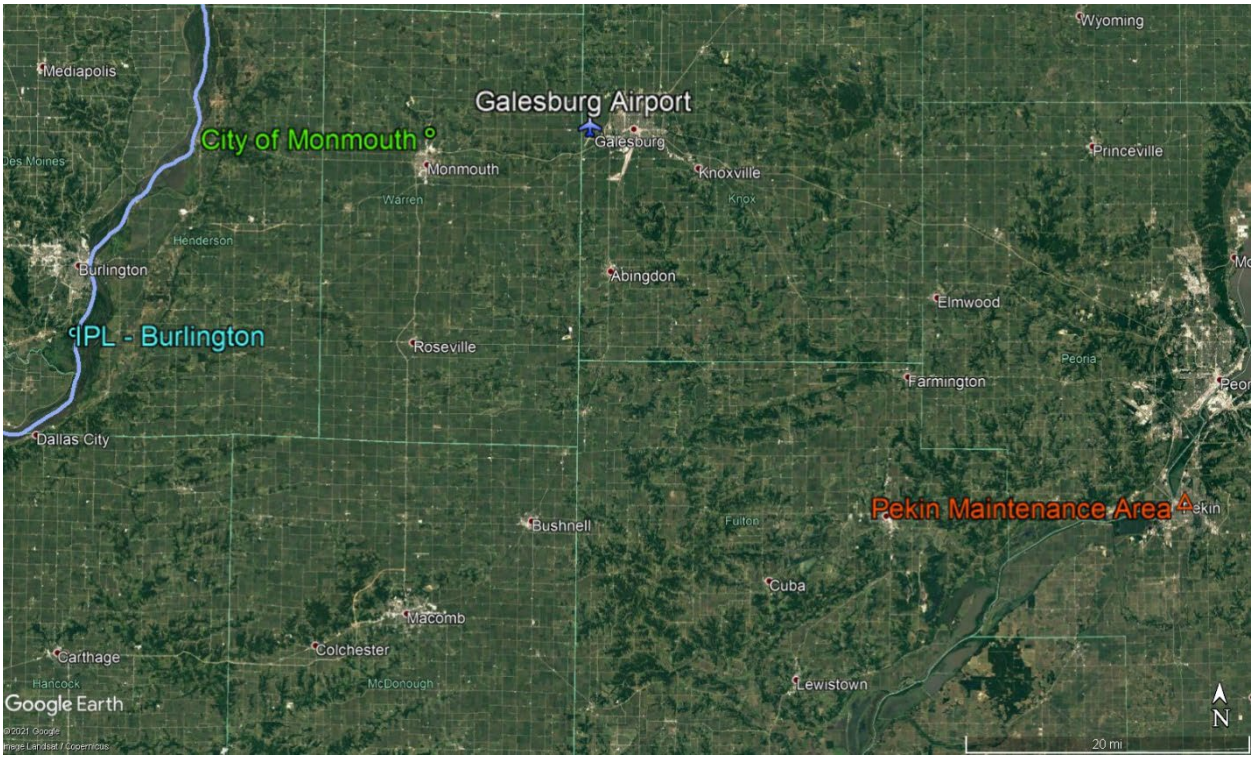

Figure 4-2. City of Monmouth's location in relation to IPL-Burlington, Galesburg airport, and Pekin maintenance area.

To evaluate prevalent transport patterns near City of Monmouth, the DNR produced a wind rose using 2015-2019 meteorological data from the Galesburg airport. The Galesburg airport is located ~17 km east of City of Monmouth and hosts the nearest automated surface observing system (ASOS) meteorological site. The Galesburg airport and the City of Monmouth are both located in similar terrain and neither are influenced by a river valley, meaning the Galesburg airport data should provide a good approximation of the winds at City of Monmouth.[37]

The Galesburg airport wind rose indicates predominately WNW, ESE, and SW winds, as shown in Figure 4-3. The common wind directions do not align with transport from City of Monmouth to IPL – Burlington. This suggests City of Monmouth has little to no impact on SO_2 concentrations around IPL – Burlington. The ESE wind directions suggest the potential for SO_2 transport to Iowa, however, due to the distance to Iowa's border and the emission reductions trend, any impacts in Iowa from this source would be minimal. Based on this information, the Iowa DNR concludes that SO_2 emissions from City of Monmouth do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

[37] For the sources in the adjacent states, the Iowa DNR did not complete a representativity analysis for the meteorological site and instead chose a nearby ASOS site.

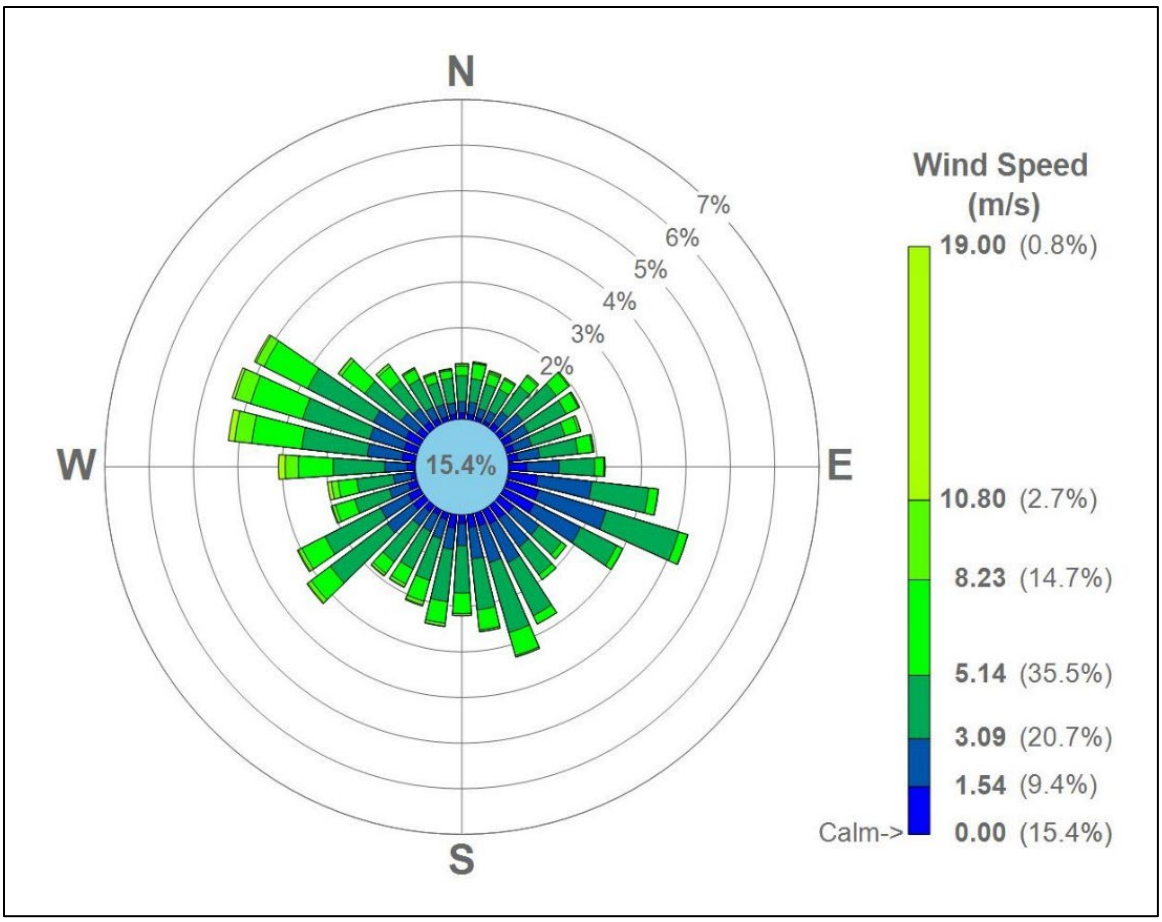

Figure 4-3. Wind rose (2015-2019) for the Galesburg airport.

4.1.2. Illinois Veterans Home

The Illinois Veterans Home provides long-term care for veterans and their spouses and is located in Adams County, Illinois. Figure 4-4 depicts that the Illinois Veterans Home is located on the northern side of the city of Quincy. Iowa's border lies ~47 km north of the facility. The pertinent SO_2 sources at the Illinois Veterans Home are three coal-fired boilers. Table 4-2 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

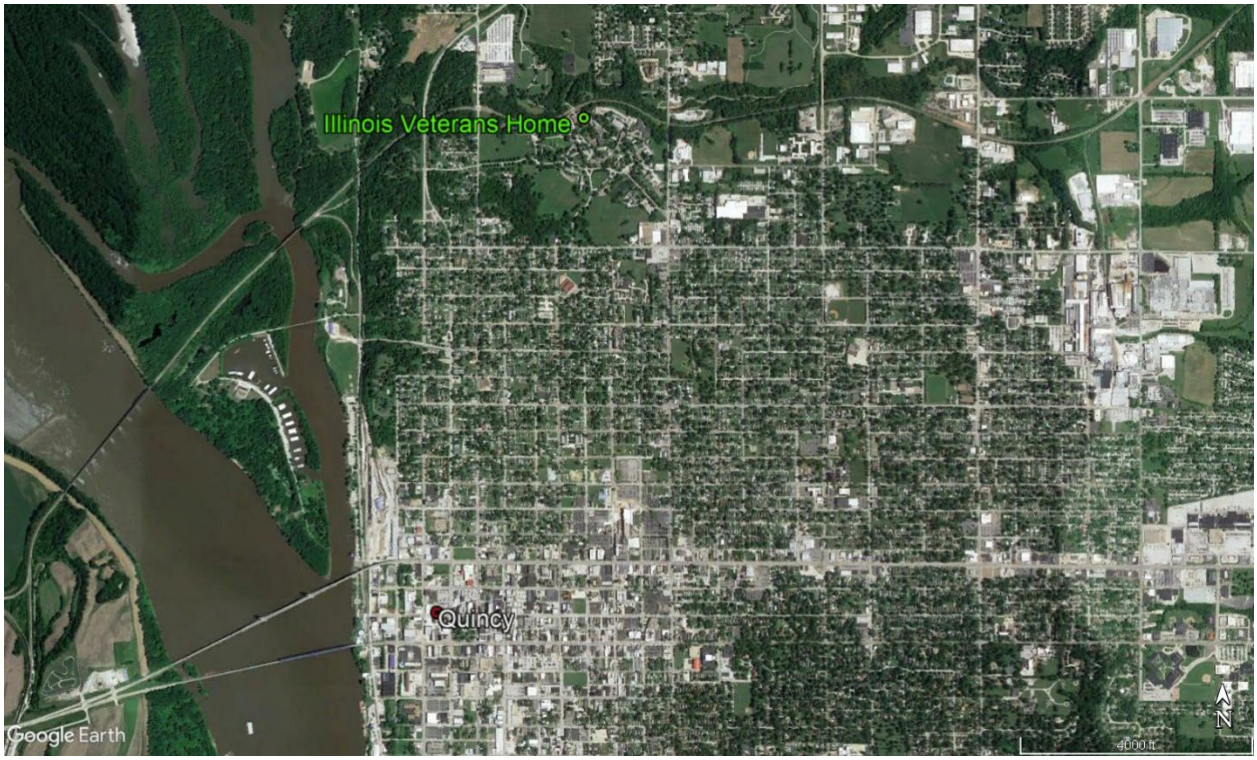

Figure 4-4. Illinois Veterans Home's location in Quincy, Illinois.

Table 4-2. Illinois Veterans Home's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
478	493	601	454	437	8.6% Decrease

There are no SO_2 monitors in Illinois within 50 km of Iowa's border. In Iowa, the nearest SO_2 monitoring site is the Lake Sugema site (19-177-0006), located ~97 km NNW of the Illinois Veterans Home. The Lake Sugema site is representative of background concentrations and its 2017-2019 1-hour SO_2 design value was 2 ppb.

The closest Iowa source is Roquette, Inc., and it is located ~48 km north of the Illinois Veterans Home, as indicated in Figure 4-5. The Illinois Veterans Home is located ~160 km NW of the Alton Township nonattainment area and ~155 km SW of the Pekin maintenance area, both in Illinois.[38]

[38] The Pekin maintenance area and the Alton Township nonattainment area are no less than ~107 km and ~197 km from the nearest points to the Iowa border, respectively, meaning any SO_2 impacts from any Iowa sources would be minimal at both locations.

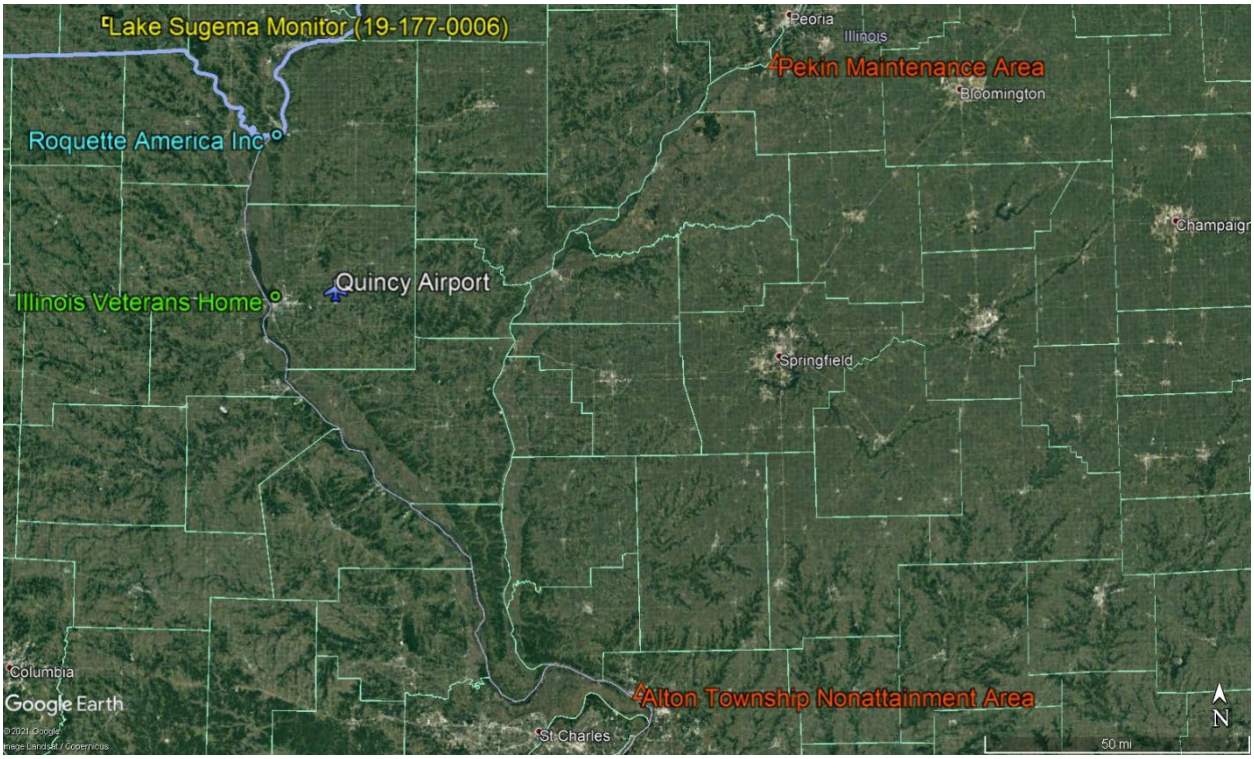

Figure 4-5. Illinois Veterans Home's location in relation to Roquette, Quincy airport, closest SO_2 monitor, Pekin maintenance area, and Alton Township nonattainment area.

To evaluate prevalent transport patterns near the Illinois Veterans Home, the DNR produced a wind rose using 2015-2019 meteorological data from the Quincy airport. The Quincy airport is located ~17 km east of the Illinois Veterans Home and hosts the nearest ASOS meteorological site. The Quincy airport and Illinois Veterans Home are both located in similar terrain and neither is influenced by a river valley, meaning the Quincy airport data should provide a good approximation of the winds at the Illinois Veterans Home.

The Quincy airport wind rose indicates predominately NW winds and a range of southerly winds, as shown in Figure 4-6. The southerly wind directions may potentially transport SO_2 from the Illinois Veterans Home to Roquette, however the ~48 km transport distance suggests any impact would be minimal. Based on this information, the Iowa DNR concludes that SO_2 emissions from the Illinois Veterans Home do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

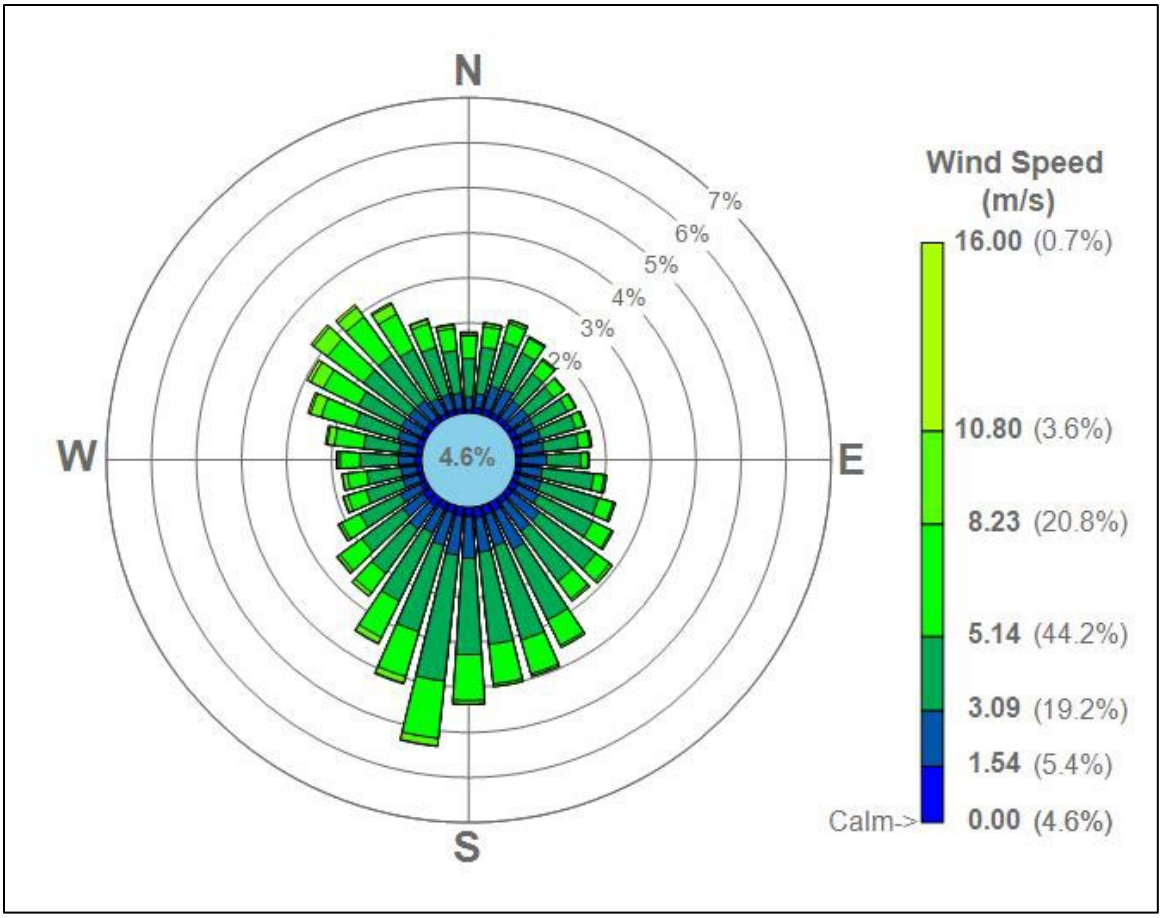

Figure 4-6. Wind rose (2015-2019) for the Quincy airport.

4.2. Nebraska

Five Nebraska facilities warrant an assessment of potential SO_2 transport impacts on locations pertinent to Iowa: Ash Grove Cement Co.; Douglas County/Pheasant Point Landfill; Lon D Wright Power Plant; Omaha Public Power District (OPPD) – North Omaha; and OPPD – Nebraska City.

4.2.1. Ash Grove Cement Co.

Ash Grove Cement Company (Ash Grove) is a cement manufacturer located in Cass County, Nebraska. Figure 4-7 depicts that Ash Grove is located along the Platte River on the north side of Louisville, Nebraska. Iowa's border lies ~24 km east of the facility. The pertinent SO_2 sources at Ash Grove are two kilns. Table 4-3 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 4-7. Ash Grove's location in Louisville, Nebraska.

Table 4-3. Ash Grove's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
736	741	694	898	681	7.4% Decrease

Ash Grove is located ~31 km SSW of the nearest SO_2 monitor, the Omaha NCore site (31-055-0019). The Omaha NCore site is representative of the urban neighborhood-scale conditions in the area and it is not designed to assess SO_2 impacts from individual facilities. The 2017-2019 1-hour SO_2 design value for the Omaha NCore site was 24 ppb, or 32% of the NAAQS. There are no SO_2 monitors in Iowa within 50 km of the Iowa/Nebraska border. The closest relevant Iowa source is Walter Scott, which is located ~33 km NE of Ash Grove, as indicated in Figure 4-8.

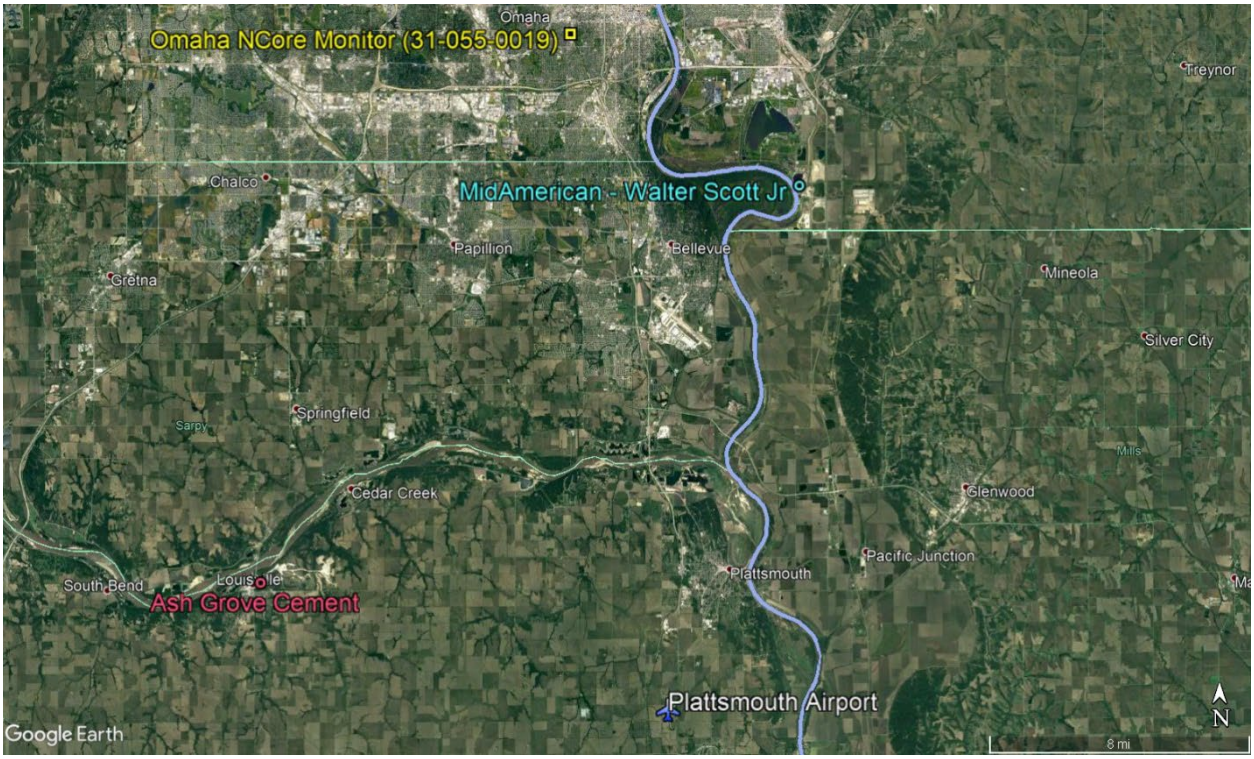

Figure 4-8. Ash Grove's location in relation to Walter Scott, Plattsmouth airport, and closest SO_2 monitor.

To evaluate prevalent transport patterns near Ash Grove, the DNR produced a wind rose using 2015-2019 meteorological data from the Plattsmouth airport. The Plattsmouth airport is located ~21 km ESE of Ash Grove and hosts the nearest ASOS meteorological site. Ash Grove and the Plattsmouth airport are both located in similar terrain and neither is likely significantly[39] influenced by a river valley, meaning the Plattsmouth airport data should provide a good approximation of the winds at Ash Grove.

The Plattsmouth airport wind rose indicates predominately NW and SSE winds, as shown in Figure 4-9. These wind directions do not align with transport from Ash Grove to Walter Scott or to the nearest locations along Iowa's border. This information suggests Ash Grove has little impact on SO_2 concentrations in Iowa. Based on this information, the Iowa DNR concludes that SO_2 emissions from the Ash Grove cement plant do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

[39] While Ash Grove Cement is located along the Platte River, the DNR is presuming, based on a brief review of the location, that any river valley influences on the winds at this location would not be significant.

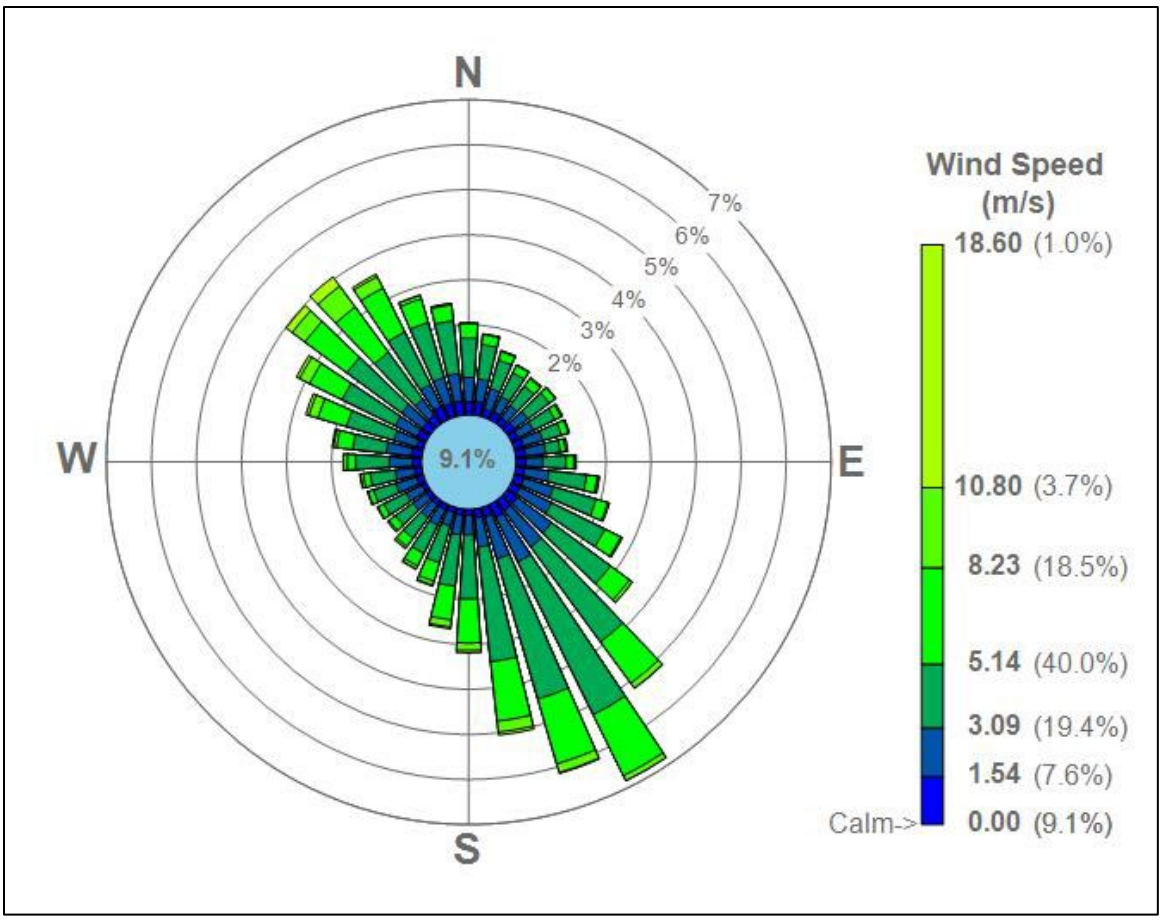

Figure 4-9. Wind rose (2015-2019) for the Plattsmouth airport.

4.2.2. Douglas County/Pheasant Point Landfill

The Douglas County/Pheasant Point (DC/PP) Landfill is located west of the city of Bennington, Nebraska, as depicted in Figure 4-10. The nearest point on the Iowa border lies ~21 km northeast of the facility. The main SO_2 sources at the landfill are a flare, engine, and leachate evaporation system. Table 4-4 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 4-10. Douglas County (DC/PP) Landfill's location near Bennington, Nebraska.

Table 4-4. Douglas County/Pheasant Point Landfill's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
116	133	131	131	165	42.4% Increase

The DC/PP Landfill is located ~26 km WNW of the nearest SO_2 monitor, the OPPD North Omaha Station site (31-055-0057), as indicated in Figure 4-11. The OPPD North Omaha Station site is located to assess maximum 1-hour SO_2 impacts from the OPPD – North Omaha power plant, and this site's 2017-2019 1-hour SO_2 design value was 34 ppb, or 45% of the NAAQS. The next nearest SO_2 monitor, the Whitmore site (31-055-0053), is located ~27 km ESE of the DC/PP Landfill. The Nebraska Department of Environment and Energy (NDEE) identifies the Whitmore site as a neighborhood-scale site. Its 2017-2019 1-hour SO_2 design value was 41 ppb, or 55% of the NAAQS. There are no SO_2 monitors in Iowa within 50 km of the Iowa/Nebraska border. The closest relevant Iowa source is Walter Scott, which is located ~41 km SE of DC/PP Landfill.

Figure 4-11. Douglas County (DC/PP) Landfill's location in relation to Walter Scott, Blair airport, and Omaha SO_2 monitors.

To evaluate prevalent transport patterns near DC/PP Landfill, the DNR produced a wind rose using 2015-2019 meteorological data from the Blair airport. This airport is located ~12 km ENE of DC/PP Landfill and hosts the nearest ASOS meteorological site. The Blair airport and the facility are both located in similar terrain and neither is influenced by a river valley, meaning the Blair airport data should provide a good approximation of the winds at DC/PP Landfill.

The Blair airport wind rose indicates predominately N, NNW, NW, and SSE winds, as shown in Figure 4-12. The NW wind directions may position the OPPD North Omaha Station and Whitmore SO_2 monitoring sites downwind from the DC/PP Landfill, but such transport would generally require the less common WNW wind directions. Nonetheless, it is known that all SO_2 monitoring sites in Omaha are attaining the 1-hour SO_2 NAAQS and are at most 55% of the NAAQS. Additionally, DC/PP Landfill is not a particularly large SO_2 emitter, nor is it positioned close to the Iowa border. This information suggests that even if DC/PP Landfill is impacting the Omaha area, or areas in Iowa, the impacts are small. This is particularly true for areas around Walter Scott, as the separation distance from the DC/PP Landfill is even greater, at ~41 km. Based on this information, the Iowa DNR concludes that SO_2 emissions from the DC/PP Landfill do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

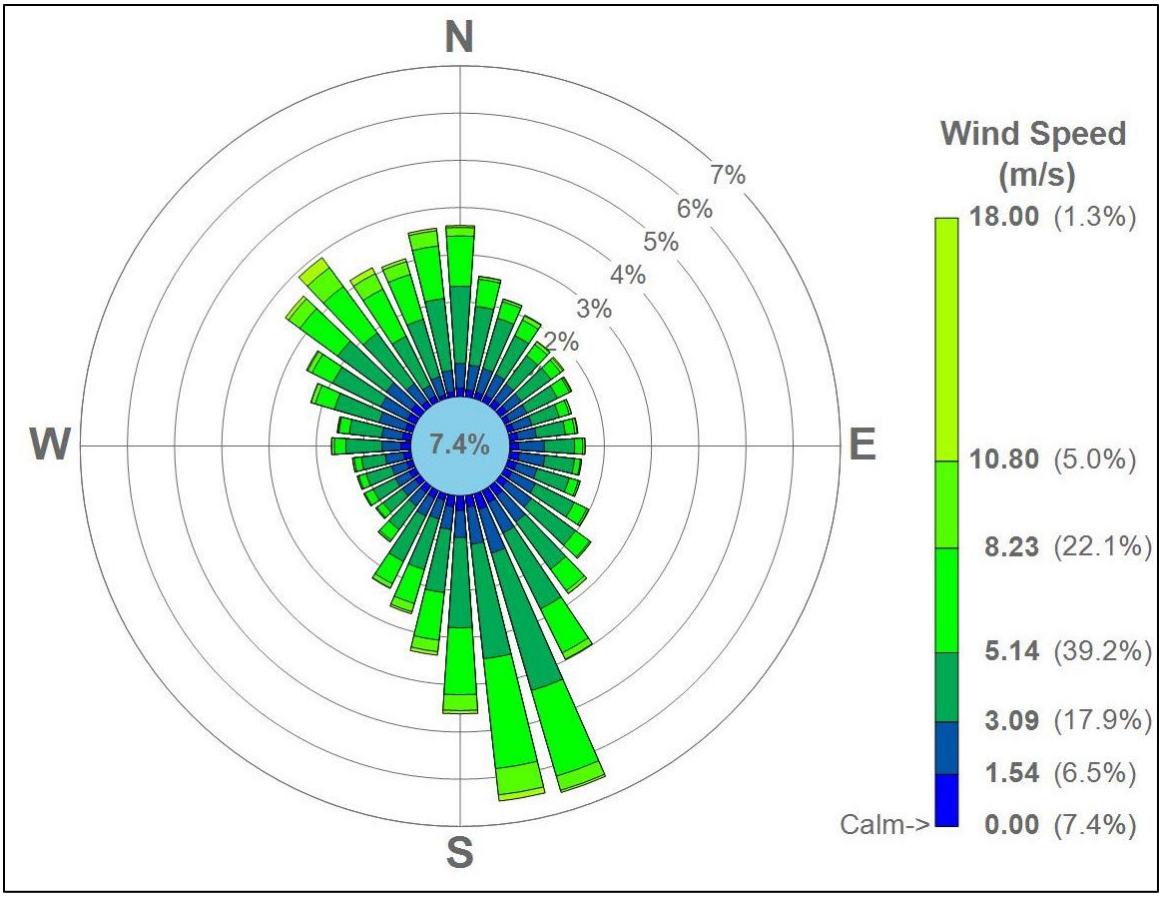

Figure 4-12. Wind rose (2015-2019) for the Blair airport.

4.2.3. Lon D Wright Power Plant

Lon D Wright is a coal-fired electric generating facility located in Dodge County, Nebraska. It is operated by the Fremont Department of Utilities. Figure 4-13 depicts that Lon D Wright is located on the east side of the city of Fremont. The nearest point to Iowa's border lies ~33 km ENE of the facility. Lon D Wright's pertinent SO_2 sources are three boilers that predominantly burn coal (Units 6, 7, and 8). Table 4-5 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

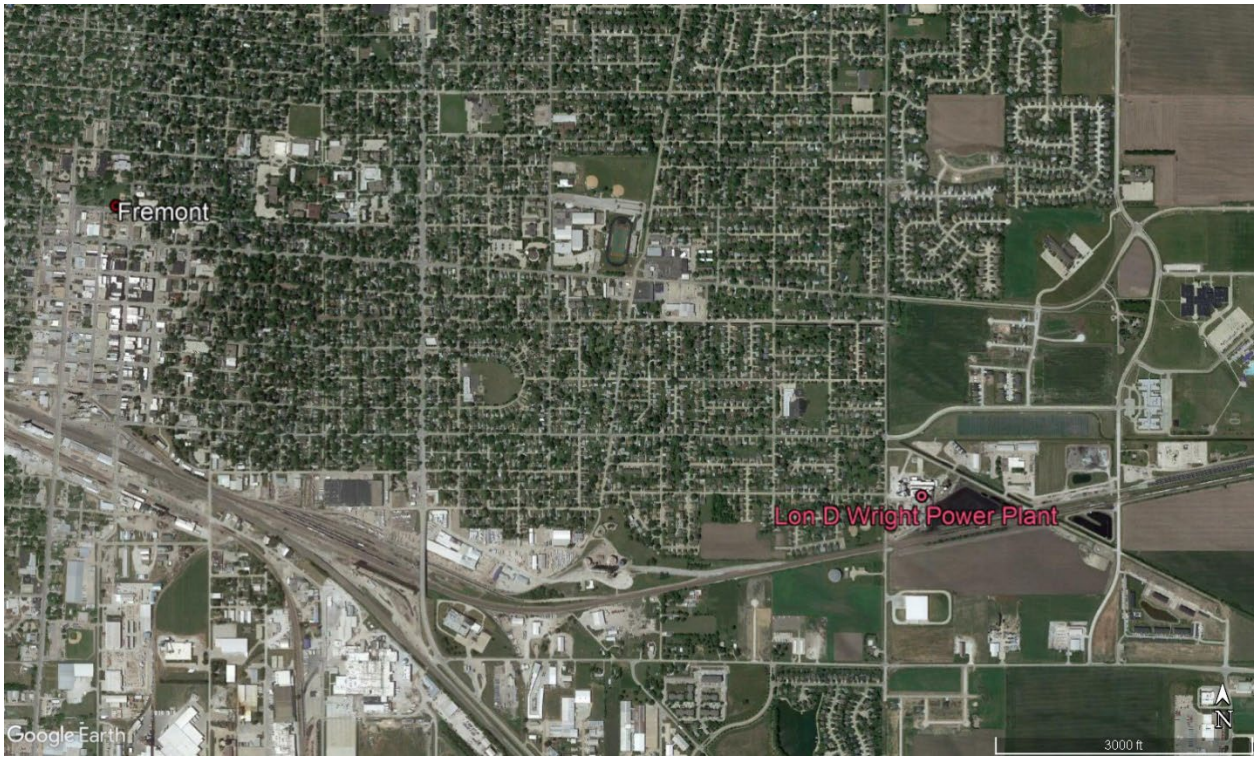

Figure 4-13. Lon D Wright's location in Fremont, NE.

Table 4-5. Lon D Wright's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
1,451	1,048	926	1,065	985	32.1% Decrease

Lon D Wright is located ~44 km WNW of the nearest SO_2 monitor, the OPPD North Omaha Station site (31-055-0057). This site is located to assess maximum 1-hour SO_2 impacts from the OPPD – North Omaha power plant and the site's 2017-2019 1-hour SO_2 design value was 34 ppb, or 45% of NAAQS. The next nearest SO_2 monitoring site is the Whitmore monitor (31-055-0053), located ~45 km ESE of Lon D Wright. The NDEE identifies the Whitmore site as a neighborhood-scale site. Its 2017-2019 1-hour SO_2 design value was 41 ppb, or 55% of the NAAQS. The closest relevant Iowa source is Walter Scott, located ~59 km SE of Lon D Wright, as shown in Figure 4-14.

Figure 4-14. Lon D Wright's location in relation to Walter Scott, Blair airport, and Omaha SO_2 monitors.

To evaluate prevalent transport patters near Lon D Wright, the DNR produced a wind rose using 2015-2019 meteorological data from the Blair airport. The Blair airport is located ~29 km east of Lon D Wright and hosts the closest ASOS meteorological site. The Blair airport and Lon D Wright are both located in similar terrain and neither is influenced by a river valley, meaning the Blair airport data should provide a good approximation of the winds at Lon D Wright.

The Blair airport wind rose indicates predominately N, NNW, NW, and SSE winds, as shown in Figure 4-15. The NW wind directions may position the OPPD North Omaha Station and Whitmore SO_2 monitoring sites downwind from the Lon D Wright facility, but such transport generally requires the less common WNW wind directions. Nonetheless, it is known that all SO_2 monitoring sites in Omaha are attaining the 1-hour SO_2 NAAQS, and at most are 55% of the NAAQS. Additionally, while Lon D Wright is not a small SO_2 source, it is not particularly close to the Iowa border. This information suggests that even if Lon D Wright is impacting the Omaha area, or areas in Iowa, the impacts are small. This is particularly true for areas around Walter Scott, as the separation distance from Lon D Wright is even greater, at ~58 km. Based on this information, the Iowa DNR concludes that SO_2 emissions from Lon D Wright do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

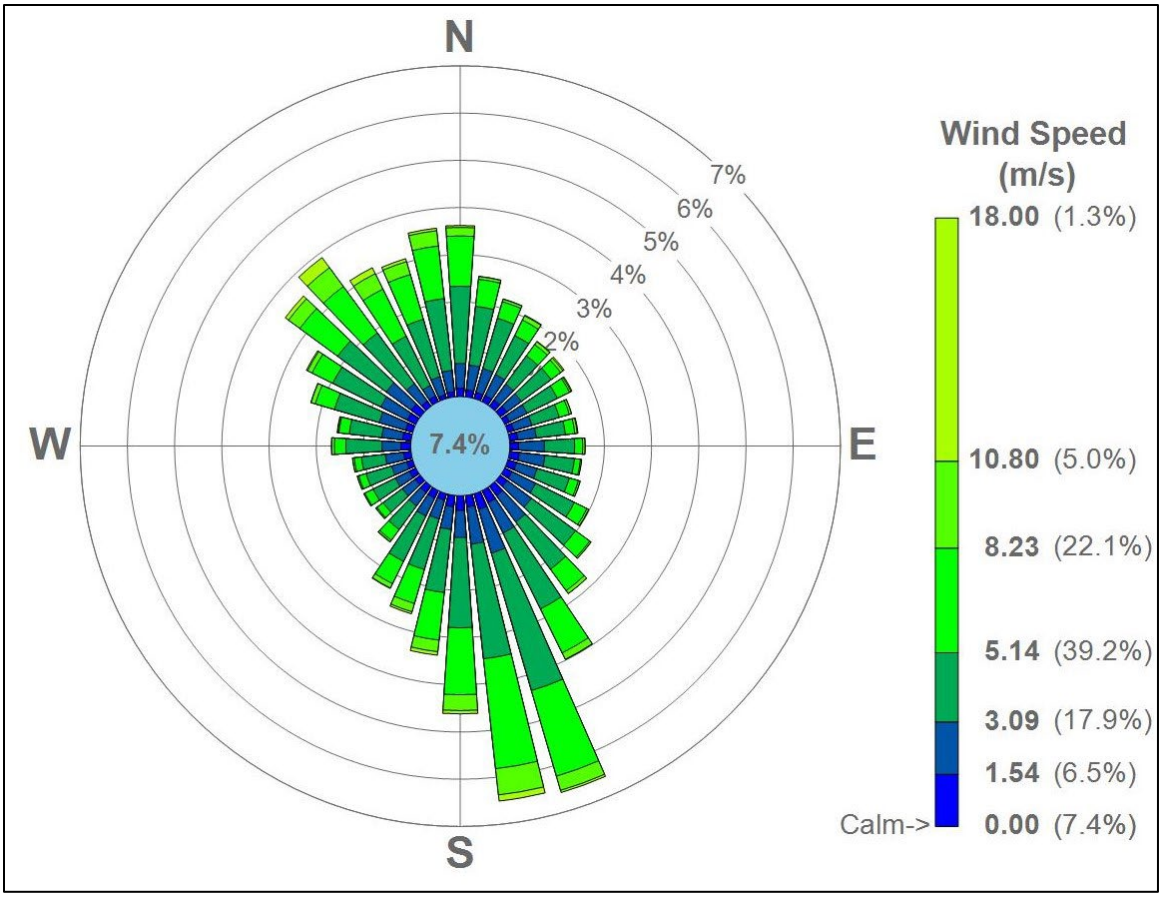

Figure 4-15. Wind rose (2015-2019) for the Blair airport.

4.2.4. OPPD – North Omaha

OPPD – North Omaha is a coal-fired electric generating facility located in Douglas County, Nebraska. Figure 4-16 depicts that OPPD – North Omaha is located along the Missouri River in northern Omaha and lies ~0.3 km SW of the closest point to the Iowa border. The facility's pertinent SO_2 sources are two coal-fired boilers, Units 4 and 5. Three boilers, Units 1, 2, and 3, ceased burning coal in 2016 following a fuel switch to natural gas. The two remaining coal units are currently expected to convert to natural gas by 2026, but this is not a federally enforceable requirement and is not relied upon for any purpose in this evaluation. Table 4-6 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 4-16. OPPD – North Omaha's location in Omaha, NE.

Table 4-6. OPPD – North Omaha's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
13,892	8,902	7,897	7,285	5,793	58.3% Decrease

To facilitate Round 3 designations, the DNR submitted DRR modeling for Walter Scott to EPA in January 2017. That modeling included OPPD – North Omaha. The maximum modeled impact, including background concentrations, was 134 µg/m^3, or 68% of the NAAQS. EPA designated Pottawattamie County (where Walter Scott is located) as attainment/unclassifiable on January 9, 2018 (83 FR 1098).

To satisfy its DRR requirements, NDEE chose source-oriented monitoring for OPPD – North Omaha, and subsequently added the nearby OPPD North Omaha Station site (31-055-0057). The new site was located ~0.4 km south of the facility, as shown in Figure 4-17. Its 2017-2019 design value was 34 ppb or 45% of the NAAQS. The next closest monitor, the Whitmore site (31-055-0053), is located ~1.0 km southeast of OPPD – North Omaha. It also shows compliance with the NAAQS, with a 2017-2019 design value of 41 ppb or 55% of the NAAQS. In Round 4, EPA designated Douglas County as attainment/unclassifiable (86 FR 16055, March 26, 2021).

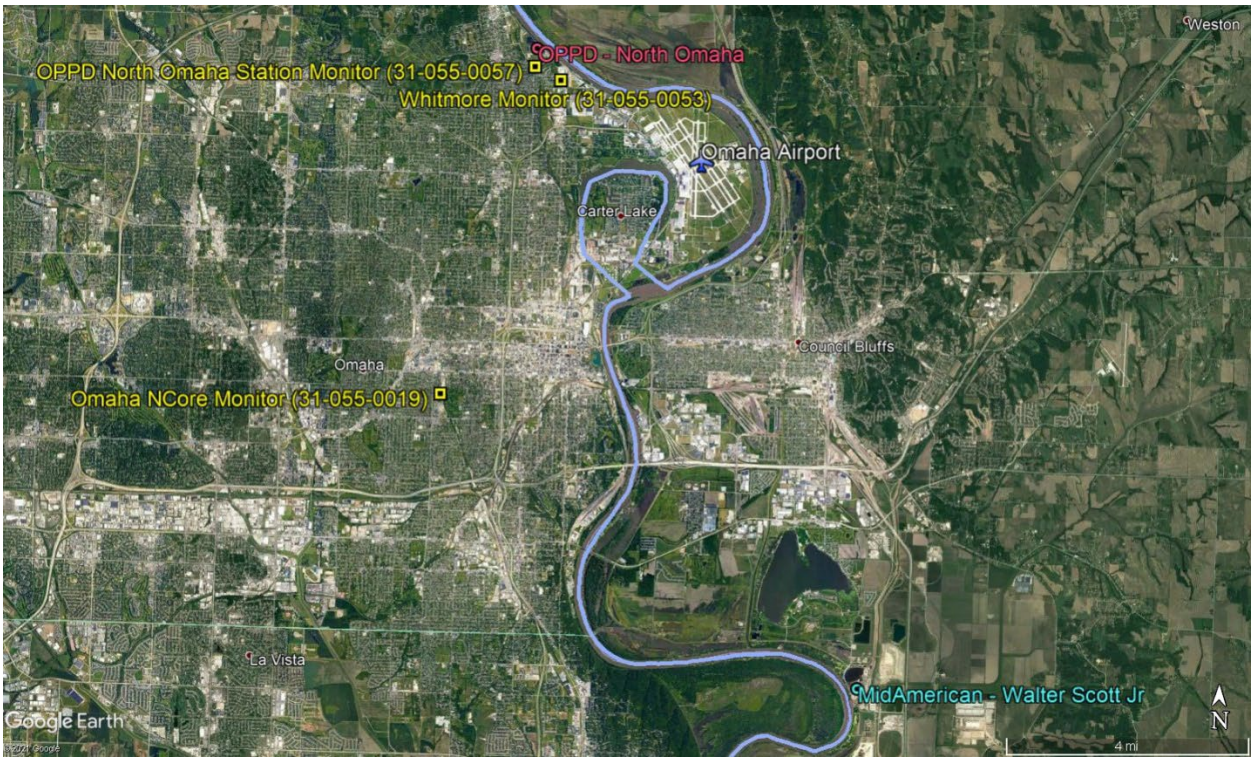

Figure 4-17. OPPD – North Omaha's location in relation to Walter Scott, Omaha airport, and Omaha SO_2 monitors.

To evaluate prevalent transport patterns near OPPD – North Omaha, the DNR produced a wind rose using 2015-2019 meteorological data from the Omaha airport. The Omaha airport is located ~4.2 km SE of OPPD – North Omaha and hosts the closest ASOS meteorological site. The Omaha airport and OPPD – North Omaha are relatively close to one another and both are located in the Missouri River Valley, meaning the Omaha airport should provide a good approximation of the winds at OPPD – North Omaha.

The Omaha airport wind rose indicates predominately NNW and SSE winds, as indicated in Figure 4-18. The NNW wind directions suggest that emissions from OPPD – North Omaha affect the two nearby SO_2 monitoring sites and may impact areas around Walter Scott, which is located ~19 km SSE of OPPD – North Omaha. However, given the results of Iowa's DRR modeling for Walter Scott, the ambient monitoring conducted by NDEE, and EPA's attainment/unclassifiable designations for both Douglas County, Nebraska and Pottawattamie County, Iowa, the Iowa DNR concludes that SO_2 emissions from OPPD – North Omaha do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

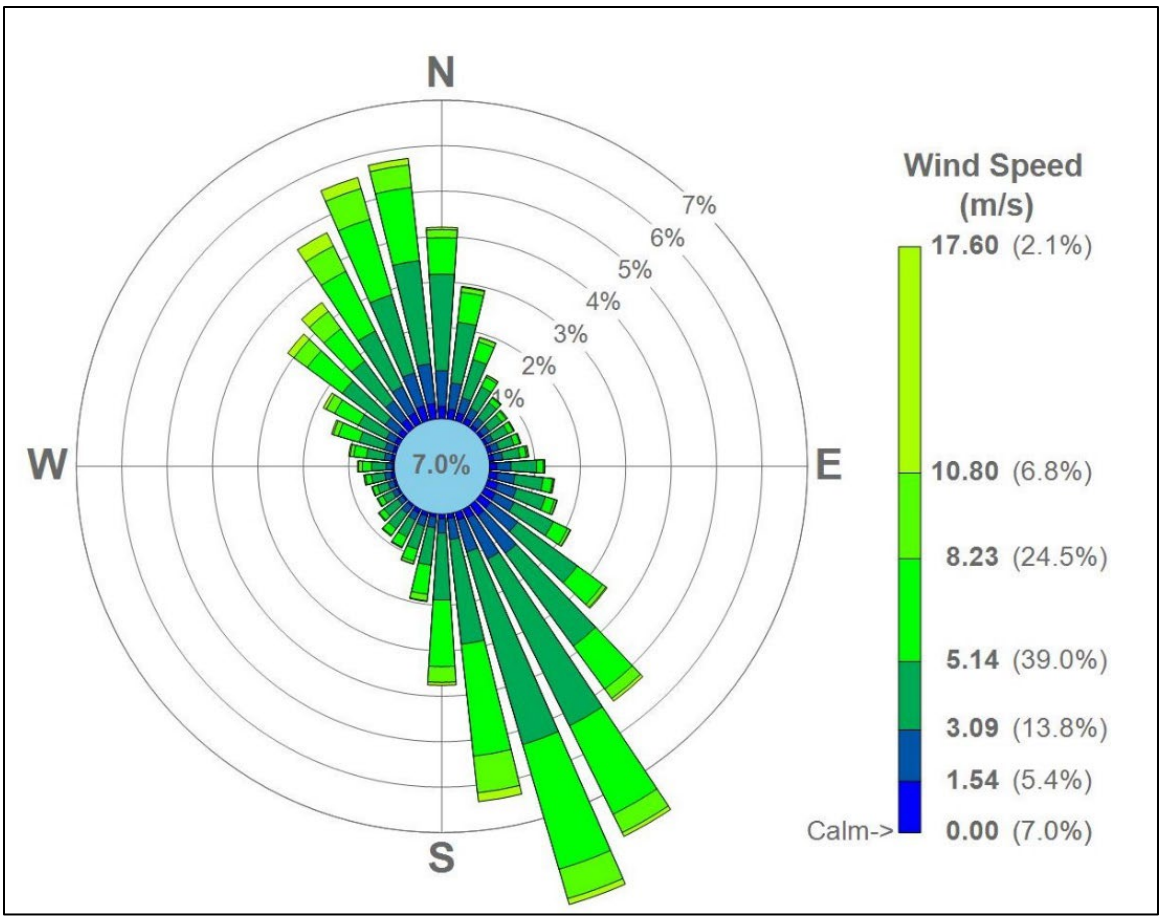

Figure 4-18. Wind rose (2015-2019) for the Omaha airport.

4.2.5. OPPD – Nebraska City

OPPD – Nebraska City is a coal-fired electric generating facility located in Otoe County, Nebraska. Figure 4-19 depicts that OPPD – Nebraska City is located along the Missouri River south of Nebraska City and lies ~0.4 km west of the Iowa border. The facility's pertinent SO_2 sources are two coal-fired boilers. Table 4-7 lists the facility's total annual SO_2 emissions from 2015 through 2019 and shows the percentage change across those years.

Figure 4-19. OPPD – Nebraska City's location in Nebraska City, NE.

Table 4-7. OPPD – Nebraska City's annual SO_2 emissions (tons) from 2015 through 2019.

2015	2016	2017	2018	2019	Overall Change
18,548	14,722	15,950	17,209	10,387	44.0% Decrease

The NDEE submitted DRR modeling for OPPD – Nebraska City to EPA in 2015 to support the Round 2 designations process. The maximum modeled impact, including background concentrations, was 78.5 µg/m^3, or 40% of the 2010 1-hour SO_2 NAAQS. The modeling included receptors in Iowa. There are no relevant Iowa SO_2 sources within 50 km of OPPD – Nebraska City. Otoe County, Nebraska, was designated by EPA in Round 2 as unclassifiable/attainment (81 FR 45039, July 12, 2016).

OPPD – Nebraska City is located ~72 km SSE of the nearest SO_2 monitor, the Omaha NCore site (31-055-0019). Its 2017-2019 1-hour SO_2 design value was 24 ppb, or 32% of the NAAQS. The closest relevant Iowa source, Walter Scott, is located ~62 km north of OPPD – Nebraska City, as indicated in Figure 4-20.

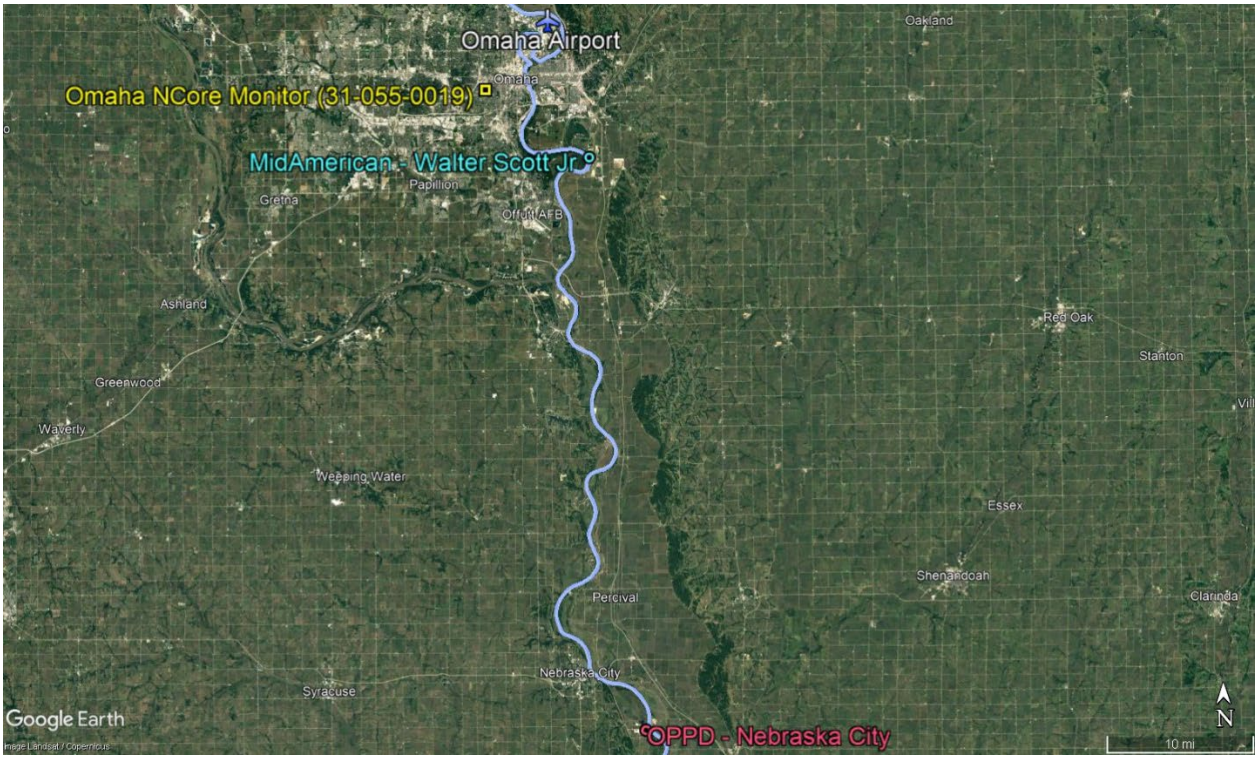

Figure 4-20. OPPD – Nebraska City's location in relation to Walter Scott, Omaha airport, and Omaha NCore monitor.

To evaluate prevalent transport patterns near OPPD – Nebraska City, the DNR produced a wind rose using 2015-2019 meteorological data from the Omaha airport. The Omaha airport is located ~77 km north of OPPD – Nebraska City and hosts the closest ASOS meteorological site located in similar terrain. The Omaha airport and OPPD – Nebraska City are both located in the Missouri River valley in areas with similar river orientation, which suggests that the Omaha airport data should provide a good approximation of the winds at OPPD – Nebraska City.

The Omaha airport wind rose indicates predominately NNW and SSE winds, as shown in Figure 4-21. The SSE winds could align with transport to Walter Scott and the Omaha NCore monitor, but the 24 ppb design value (2017-2019) at that site, in combination with the ~62 km transport distances, suggests that any 1-hour SO_2 impacts from OPPD – Nebraska City around Walter Scott are minimal. In addition, NDEE's DRR modeling, which included receptors in Iowa, predicted compliance with the 2010 1-hour SO_2 NAAQS. Based on this information, the Iowa DNR concludes that SO_2 emissions from OPPD – Nebraska City do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS along the border or in Iowa.

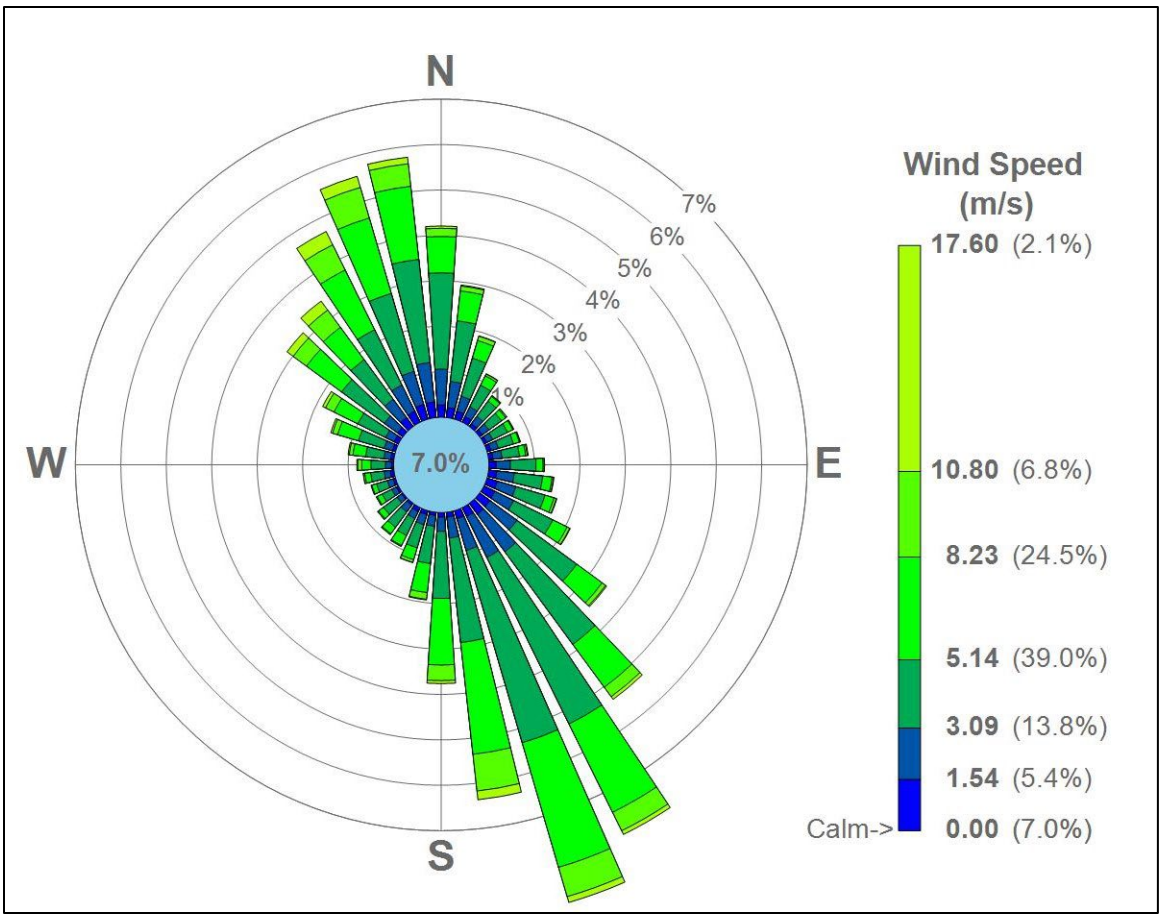

Figure 4-21. Wind rose (2015-2019) for the Omaha airport.

4.3. Wisconsin

Based on the selection criteria, one Wisconsin facility warranted an assessment of potential SO_2 transport impacts on locations pertinent to Iowa: Dairyland Power Cooperative Genoa Station.

4.3.1. Dairyland Power Cooperative Genoa Station

Dairyland Power Cooperative Genoa Station (Dairyland, Dairyland Power, or Genoa) was a coal-fired electric generating facility located in Vernon County, WI. Figure 4-22 depicts that the facility was located ~2.0 km south of the city of Genoa, which placed it ~6.5 km north of the Iowa border.

Figure 4-22. Dairyland Power's location in Genoa, Wisconsin. (The facility is now permanently closed.)

Dairyland Power permanently closed in June of 2021 and its permits were rescinded effective December 30, 2021, via a rescission letter from the Wisconsin Department of Natural Resources. No further evaluation is needed.

5. Conclusions

The DNR finds that sources in Iowa do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in any of the six neighboring states: Illinois, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin. This conclusion is based on analyses of:

- Ambient SO_2 monitoring data,
- SO_2 emissions data,
- Meteorological data,
- Specific information for SO_2 sources in Iowa and neighboring states within 50 km of the Iowa border, and
- Dispersion modeling results, where available.

The DNR also reviewed long-term emission trends and identified the DNR's SIP-approved preconstruction permitting programs for major and minor sources as mechanisms that will help ensure that ambient concentrations of SO_2 in neighboring states are not exceeded as a result of new facility construction or modification activities in Iowa. The combination of generally low measured ambient concentrations in and near Iowa and the overall downward trend in SO_2 emissions in Iowa and neighboring states further indicate that Iowa has fully satisfied the prong 1 and prong 2 interstate transport obligations of CAA §110(a)(2)(D)(i)(I) for the 2010 1-hour SO_2 NAAQS.

6. Public Participation

The public comment period for this proposed SIP revision began on February 21, 2024, and ended March 21, 2024, with a public hearing held virtually on March 21, 2024. The DNR's public participation process followed procedures meeting the applicable requirements in 40 CFR 51.102 and Appendix V to 40 CFR 51.

6.1. Response to Comments

The DNR received 2 written comments during the 30-day public comment period, both from private citizens. No comments were provided during the public hearing. The responsiveness summary below summarizes the comments and incudes the DNR's responses. Comment numbering and order are not indicative of importance. Copies of the original emailed comments are available upon request.

Comment #1

The commenter fully supports the effort for Iowa to not contribute to CO_2 problems in other states. Iowa should never contribute to other states' air or water quality problems.

DNR Response

The purpose, data, and conclusions pertaining to this SIP revision demonstrate that SO_2 emissions sources in Iowa comply with the interstate transport provisions of CAA 110(a)(2)(D)(i)(I) with respect to the 2010 1-hour SO_2 NAAQS. The DNR appreciates support for this effort but to the extent the comments concern water quality problems or pollutants other than SO_2 (such as CO_2), they are beyond this plan's scope.

Comment #2

Some students and staff at the North Winneshiek school had severe negative health impacts due to the proximity of sulfur dioxide and ammonia emitting hog confinements. Since out of state investors don't care about the effect on people who live near pollution emitters, the strongest possible regulations are needed in order to protect child health.

DNR Response

In accordance with its purpose, this SIP revision demonstrates that Iowa's SO_2 emissions sources do not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in any other state. To support plan development and comply with EPA guidance, the DNR identified and evaluated all Iowa SO_2 sources emitting 100 tons per year or more located within 50 km of Iowa's border. Although not a required element of this SIP revision, the DNR also investigated the pertinent SO_2 sources near Iowa's border in the adjacent states and found no evidence that such sources were impacting Iowa's SO_2 concentrations with respect to the provisions of CAA 110(a)(2)(D)(i)(I). In the agricultural livestock waste sector, EPA's comprehensive national emissions inventories (NEIs) do not identify animal feeding operations as a direct source of SO_2 emissions. Ammonia emissions are unrelated to this plan and outside its scope.

6.2. Evidence of Public Notice

The public notice of the DNR's intention to revise Iowa's SIP to address the prong 1 and prong 2 CAA interstate transport provisions for the 2010 1-hour SO_2 NAAQS was published in the *Des Moines Register* on February 21, 2024. The printed notice announced both the public comment period and the public hearing. Proof of publication is provided below. Additionally, the DNR's Air Quality News listserve distributed a similar notice electronically to nearly 30,000 subscribers and the public hearing was listed on the State of Iowa's public meetings calendar and the DNR's event calendar.

An electronic copy of the draft SIP and participation instructions for the public hearing were posted to the DNR – Air Quality Bureau (AQB) public participation webpage (imaged below) prior to the start of the public comment period. The public could also arrange to access those materials at the Wallace State Office Building, 502 East 9th St., Des Moines, IA 50319.

The DNR certifies that the public hearing was held virtually on March 21, 2024, at 2:00 p.m. in accordance with the publicized materials and the state's laws and constitution.

Proof of Publication

pd upk Paid 2-15-24 ky

LocaliQ
Iowa
GANNETT

PO Box 631851 Cincinnati, OH 45263-1851

PROOF OF PUBLICATION

A. Q.

Iowa Dnr State Parks Bureau
502 E 9Th ST
Des Moines IA 50319-5005

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FEB 26 2024

STATE OF WISCONSIN, COUNTY OF BROWN

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02/21/2024

and that the fees charged are legal.
Sworn to and subscribed before on 02/21/2024

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IOWA DEPT. OF NATURAL RESOURCES

Public Notice
Iowa Department of Natural Resources

The Department of Natural Resources (DNR) is requesting public comment on a proposed revision to Iowa's state implementation plan (SIP) to address the interstate transport provisions of Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I) for the 2010 1-hour sulfur dioxide (SO2) national ambient air quality standard (NAAQS).

The interstate transport, or "good neighbor" provisions of the CAA are designed to protect downwind states from air pollution that may originate in upwind states. To comply with its requirements, the DNR is proposing a SIP revision to demonstrate that no air emissions sources in Iowa contribute significantly to nonattainment or interfere with maintenance of 2010 1-hour SO2 NAAQS in any other state.

The public comment period for this proposed SIP revision starts on February 21, 2024. All written comments must be received no later than 4:30 p.m. on March 21, 2024. Direct written comments to Matthew Johnson, Department of Natural Resources, Wallace State Office Building, 502 East 9th St., Des Moines, IA 50319-0034; or by email to Matthew.Johnson@dnr.iowa.gov.

DNR will hold a public hearing for oral comments on Thursday, March 21, 2024, at 2:00 p.m. The public hearing will be held virtually and will be accessible by video conference or by telephone.

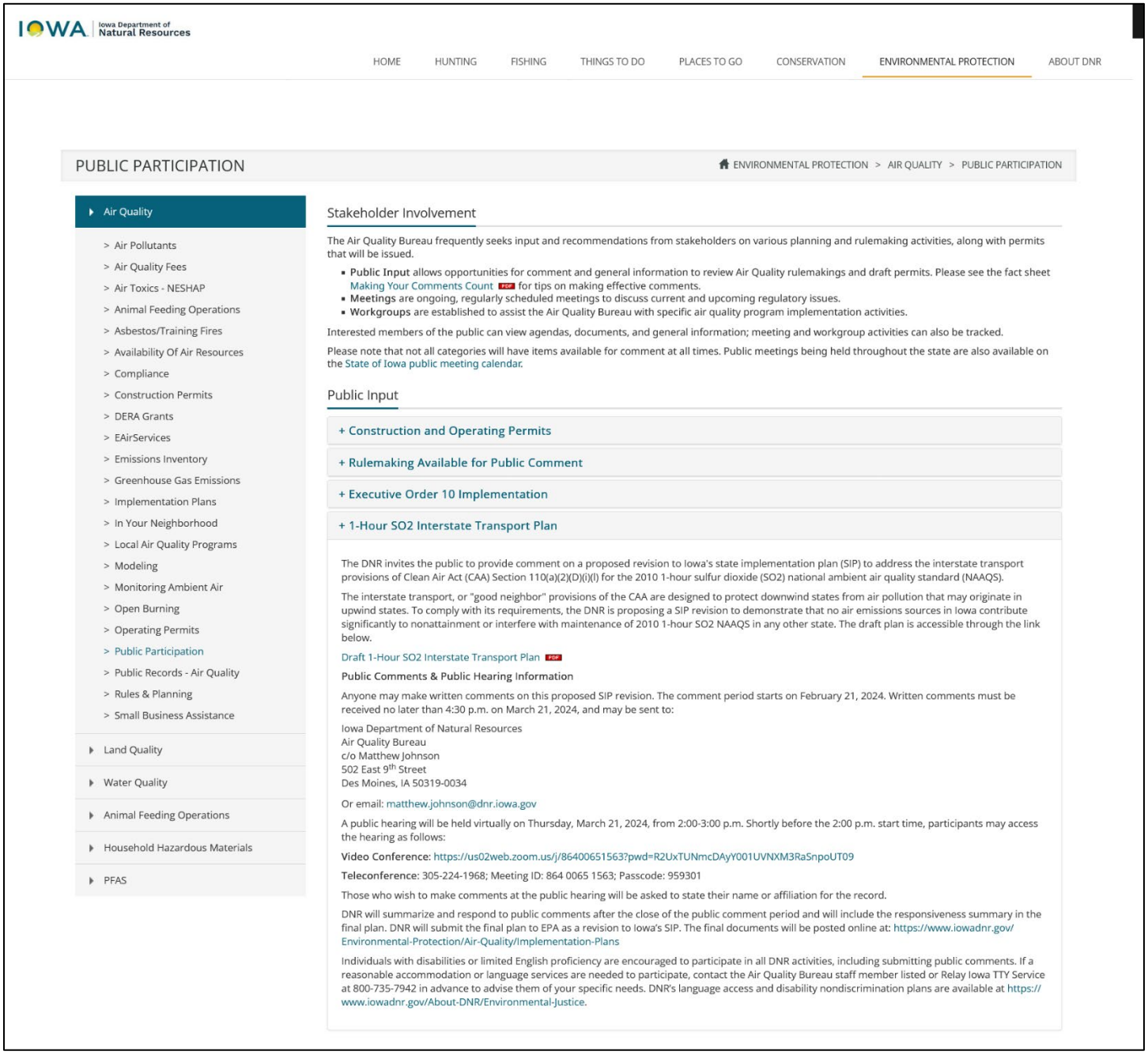
Find the draft plan and learn how to participate in the public hearing through the DNR's Air Quality Public Participation webpage at https://www.iowadnr.gov/airpublicinput. Look in the Public Input section under "1-Hour SO2 Interstate Transport Plan." To view copies of the materials at the Wallace State Office Building, please contact Matthew Johnson at the email address above or by phone at (515) 725-9554 to setup a viewing time.

DNR will summarize and respond to public comments after the close of the public comment period and will include the responsiveness summary in the final plan, which DNR will submit to the U.S. Environmental Protection Agency (EPA) as a revision to Iowa's SIP.

Individuals with disabilities or limited English proficiency are encouraged to participate in all DNR activities, including submitting public comments. If a reasonable accommodation or language services are needed to participate, contact the Air Quality Bureau staff member listed or Relay Iowa TTY Service at 800-735-7942 in advance to advise them of your specific needs. DNR's language access and disability nondiscrimination plans are available at https://www.iowadnr.gov/About-DNR/Environmental-Justice.

February 21 2024
LIOW0062704

Screenshot of the DNR – AQB Public Participation Webpage[40]



[40] Image captured at ~6:45 am CST on 2/21/2024.

7. Administrative Materials

The submittal of this SIP revision complies with the procedural elements of 40 CFR 51 Subpart F and addresses the remaining applicable criteria in Appendix V to 40 CFR 51, as discussed below.

A formal letter of submittal from the Governor's designee requesting EPA approval of this proposed revision to Iowa's SIP accompanies this document. The DNR has followed all applicable procedural requirements of the state's laws and constitution in the adoption of this plan. The date of adoption is addressed in the transmittal letter to EPA.

7.1. Legal Authority

The DNR is the regulatory agency with primary responsibility for outdoor air quality permitting and compliance activities in the State of Iowa. The DNR's authority is set forth in chapter 455B of the Iowa Code and implemented through 567 IAC Chapters 10 and 20-35, and 561 IAC Chapters 2 and 7. The DNR's permitting and compliance programs and associated rules have previously been approved by EPA as part of Iowa's SIP.

The DNR has the necessary legal authority under state statute to adopt and implement this plan. Iowa Code section 455B.133(3) provides that the Iowa Environmental Protection Commission shall "[a]dopt, amend, or repeal ambient air quality standards for the atmosphere of this state on the basis of providing air quality necessary to protect the public health and welfare." The federal SO_2 NAAQS are adopted by reference at 567 IAC 28. Iowa Code section 455B.133(4) provides that the commission shall "[a]dopt, amend, or repeal emission limitations or standards relating to the maximum quantities of air contaminants that may be emitted from any air contaminant source." Iowa Code section 455B.134(9) states that the duties of the director include issuing "orders consistent with rules to cause the abatement or control of air pollution, or to secure compliance with permit conditions."

In combination with the DNR's existing legal authority and associated administrative regulations, this SIP revision is adequate to satisfy Iowa's obligations to prohibit any source or other type of emissions activity within Iowa from emitting SO_2 in amounts which contribute significantly to nonattainment, or interfere with maintenance, of the 2010 1-hour SO_2 NAAQS in any other state.

Appendix A. Review of Legal Uncertainties

In accordance with CAA section 110(a)(1), states typically address the "good neighbor" provisions and other required elements of §110(a)(2) within an "infrastructure SIP," due within three years of any NAAQS revision. However, for the 1-hour SO_2 infrastructure SIPs that were due June 3, 2013, EPA did not expect states to address either prongs 1 or 2 of CAA §110(a)(2)(D)(i)(I), nor did EPA intend to make findings that states failed to submit SIPs to comply with those provisions.

As discussed in the November 19, 2012, memo[41] from Gina McCarthy, that policy change was prompted by the August 21, 2012, decision[42] by the D.C. Circuit Court of Appeals to vacate the Cross State Air Pollution Rule (CSAPR, 76 FR 48208, August 8, 2011). The court held that a SIP cannot be deemed deficient for failing to meet the good neighbor [prong 1 and prong 2] obligations before EPA quantifies those obligations, but under CSAPR, when EPA quantified the states' good neighbor obligations, it did not allow the states the initial opportunity to implement the required reductions. Instead, EPA quantified the states' good neighbor obligations and simultaneously set forth a Federal Implementation Plan [CSAPR].

On April 29, 2014, the U.S. Supreme Court reversed the D.C. Circuit decision, finding that "…*the CAA does not command that States be given a second opportunity to file a SIP after EPA has quantified the State's interstate pollution obligations*." The Supreme Court also remanded the case back to the D.C. Circuit for further proceedings. In those proceedings, EPA filed a motion asking the D.C. Circuit to lift the stay[43] of CSAPR and to delay (toll) by three years (the expected length of the stay) all CSAPR compliance deadlines that had not passed as of the date of the stay order. On October 23, 2014, the DC Circuit Court granted EPA's motion and subsequently on July 28, 2015, denied most of the petitioners' remaining claims. This fully resolved the legal uncertainties relevant to this "transport SIP."

[41] "N*ext Steps for Pending Redesignation Requests and Pending State Implementation Plan Actions Affected by the Recent Court Decision Vacating the 2011 Cross-State Air Pollution Rule*," EPA memo from Gina McCarthy, November 19, 2012.
[42] E*ME Homer City Generation, L.P. v. EPA* (Case No. 11-1302).
[43] Prior to issuing its vacatur, the D.C. Circuit had stayed CSAPR in an order filed December 30, 2011 (Case No. 11-1302).

Appendix B. Designations Process and Data Requirements Rule (DRR) Review

Following any NAAQS revision, CAA §107(d) requires that states and EPA engage in a designations process. Within one year of the promulgation date of a NAAQS revision, the governor of each state must submit their recommendations to EPA regarding which areas in their state should be designated as attainment, nonattainment, or unclassifiable. Within two years of the revision, EPA must finalize the designations it finds appropriate, after first discussing with each state any intended modifications to their recommendations. If insufficient information exists, EPA may extend its deadline by one year. Promulgation of the 1-hour SO_2 NAAQS occurred on June 3, 2010, thus the designations process was required to be completed by June 3, 2013. However, at that time EPA was still developing its designations strategy and had only designated areas with ambient monitoring data that showed a NAAQS violation (design values of 76 ppb or greater). Those associated nonattainment designations impacted 29 areas in 16 states and eventually became known as having occurred in the first round (**Round 1**) of designations. Meanwhile, the vast majority of the U.S. remained undesignated.

Due to the generally localized impacts of SO_2 emissions, EPA had not historically considered monitoring data alone to be an adequate, nor the most appropriate, tool to identify all maximum SO_2 concentrations. After the first round of designations, EPA expected to undertake a hybrid approach, incorporating both new monitoring data and new modeling data, but the implementation details remained in flux and would be further delayed as EPA also anticipated the need for additional rulemaking and guidance.

B-1. Consent Decree Requirements

To address the delays, EPA agreed to a consent decree (CD), filed March 2, 2015, in the U.S. District Court for the Northern District of California, establishing three new rounds of designation. The CD contained the following criteria and deadlines governing which areas would be designated in the three new rounds, now known as Rounds 2, 3, and 4:

Round 2 – Due July 2, 2016

- Any undesignated areas which: 1) had a monitored NAAQS violation; or
- 2) contained any stationary source that has not been "announced for retirement,"[44] and that, according to the 2012 SO_2 emissions data in EPA's Clean Air Markets Database, either (1) emitted more than 16,000 tons, or (2) emitted more than 2,600 tons and had an annual average SO_2 emission rate of 0.45 lb/MMBtu.

Round 3 – Due December 31, 2017

- All remaining undesignated areas which, by January 1, 2017, had not installed and began operating a new SO_2 monitoring network.

Round 4 – Due December 31, 2020

- All remaining undesignated areas [generally those that installed a new SO_2 monitoring network by January 1, 2017].

B-2. Data Requirements Rule (DRR)

Not long after signing the March 2015 CD, EPA finalized the *Data Requirements Rule for the 2010 1-Hour [SO_2] Primary [NAAQS]* (80 FR 51052, August 21, 2015). The DRR included requirements for states to characterize 1-hour SO_2 concentrations around facilities that emitted 2,000 tpy or more of SO_2, based on the most current annual inventory of actual emission available at the time of evaluation. States could choose to model such sources or, by January 1, 2017, begin operating new or relocated monitors sited to characterize peak 1-hour SO_2 concentrations. Alternatively, states could avoid the DRR's source characterization requirements through permitting, by permanently limiting the emissions of each source to less than 2,000 tpy. For sources to be modeled, the DRR established January 13, 2017, as the deadline for states to submit the modeling results to EPA. That date also served as the compliance deadline for any new federally enforceable emission limits established for DRR purposes. Given the CD's deadlines, any information supplied by states pursuant to the DRR could inform designations in Rounds 3 and 4, but not Round 2.

[44] In summary, "announced for retirement" meant any stationary source with a coal-fired unit that as of January 1, 2010, had a capacity of over five (5) megawatts (MW) and that had announced that unit will cease burning coal.

In accordance with the DRR, specifically 40 CFR 51.1203(a), in a letter to EPA dated December 15, 2015, the DNR identified eleven Iowa facilities with 2014 annual SO_2 emissions of at least 2,000 tpy. The DNR subsequently informed EPA, via a letter dated June 20, 2016, that the DNR would use dispersion modeling to characterize ambient SO_2 air quality around eight of those facilities and would limit SO_2 emissions at each of the remaining three facilities to less than 2,000 tpy (see Table B-1). The DNR did not establish new SO_2 ambient monitoring sites for DRR purposes. For this reason, the initial designations process in Iowa was completed in Round 3, but this wasn't the case in all nearby areas. There was one exception, Douglas County, Nebraska, which was designated in Round 4. The sections below summarize the 1-hour SO_2 designation process in Iowa and briefly discuss the designations for the nearby areas in adjacent states.

Table B-1. Iowa sources listed pursuant to the DRR and the round in which the associated county was designated.

County	Facility (Source) Name	Facility ID	DRR Method	Round
Allamakee	IPL - Lansing Generating Station	03-03-001	Limit Emissions	3
Clinton	IPL - M. L. Kapp Generating Station	23-01-014	Limit Emissions	3
Des Moines	IPL - Burlington Generating Station	29-01-013	Modeling	2
Linn	IPL - Prairie Creek Generating Station	57-01-042	Modeling	3
Linn	ADM Corn Processing - Cedar Rapids	57-01-080	Modeling	3
Louisa	MidAmerican - Louisa Station	58-07-001	Modeling	3
Pottawattamie	MidAmerican - Walter Scott Jr Energy Center	78-01-026	Modeling	3
Scott	MidAmerican - Riverside Station	82-02-006	Limit Emissions	3
Wapello	IPL - Ottumwa Generating Station	90-07-001	Modeling	2
Woodbury	MidAmerican - George Neal North	97-04-010	Modeling	2
Woodbury	MidAmerican - George Neal South	97-04-011	Modeling	2

B-3. Iowa's 1-Hour SO_2 Designations

Round 1

On August 5, 2013 (78 FR 47191), EPA published a nonattainment designation for a portion of Muscatine County, based on 2009-2011 ambient air quality monitoring and other data. The DNR submitted the Muscatine 1-hour SO_2 attainment plan (also known as a nonattainment SIP) to EPA on May 17, 2016, and EPA approved that plan on November 17, 2020 (85 FR 73218). Beginning with the 2015-2017 three-year period, all 1-hour SO_2 design values at each of the three ambient monitoring sites in the Muscatine area have attained the NAAQS. On November 17, 2021, the DNR submitted a maintenance plan that accompanied the Governor's request to redesignate the area to attainment, but EPA has not yet acted on that submission. (See DNR's Implementation Plans webpage for copies of the attainment and maintenance plans as well as designations documents for this and subsequent rounds[45] of 1-hour SO_2 designations.)

Round 2

In a March 20, 2015, letter to the DNR (provided shortly after the filing of the March 2, 2015, CD and approximately five months before EPA finalized the DRR), EPA identified the three Iowa power plants listed in Table B-2 as meeting the CD's applicability criteria for the second round of 1-hour SO_2 designations. EPA also welcomed, but did not require, the submission of revised[46] designation recommendations and supporting information for the associated counties.

Table B-2. Iowa sources identified by EPA as subject to Round 2 and the 1-hour SO_2 designation for the county.

Facility Name	DNR Facility ID	County	Designation
Burlington Generating Station	29-01-013	Des Moines	Attainment/Unclassifiable
Ottumwa Generating Station	90-07-001	Wapello	Attainment/Unclassifiable
George Neal South	97-04-011	Woodbury	Unclassifiable

[45] Note, documents specific to Round 2 may refer to it as the "first new round" of designations, and what are now known as Rounds 3 and 4 may be identified as the "second" and "third" "new rounds" of 1-hour SO_2 designations. That terminology is no longer in use but was common at the time, in reference to the three new rounds of designations required by the March 2015 Consent Decree.

[46] To comply with the CAA, on June 2, 2011, the Governor submitted 1-hour SO_2 designation recommendations. The Governor recommended "attainment" for Clinton, Linn, Polk, Scott, and Van Buren Counties and "unclassifiable" for all remaining counties.

The DNR chose to conduct dispersion modeling of the identified sources. Based on the results, the Governor amended his previous recommendation of an unclassifiable designation for Des Moines, Wapello, and Woodbury Counties to that of attainment (letter dated November 4, 2015). The DNR's September 18, 2015, technical support document (TSD), superseded by the TSD dated December 23, 2015, detailed the modeling analyses supporting the new recommendation.

EPA published the Round 2 designations on July 12, 2016 (81 FR 45039), with signature having occurred on June 30, 2016, prior to the CD's deadline. EPA designated Des Moines and Wapello Counties as attainment/unclassifiable but Woodbury County as unclassifiable. Due to their proximity, the DNR's modeling for Woodbury County included both George Neal North (GNN) and George Neal South (GNS). Consistent with a consent decree[47] between MidAmerican Energy and Sierra Club, the DNR modeled GNN Units 1 and 2 as fueled by natural gas. However, EPA chose the unclassifiable designation because it did not consider that consent decree to be federally enforceable. GNN Units 1 and 2 have both since permanently ceased operation, and as part of the Round 3 recommendations, the Governor requested that EPA redesignate Woodbury County to attainment. EPA has not yet acted on that redesignation request.

Round 3

Because new monitors were not sited in Iowa for DRR purposes, the third round completed the initial 1-hour SO_2 designations process for the state, as summarized in Table B-3. Consistent with the Governor's January 5, 2017, amended recommendations, EPA designated all remaining areas in Iowa as attainment/unclassifiable, with one exception, an unclassifiable designation for Linn County. DNR modeled sources in Linn County utilizing the most recent representative emissions data, but EPA cited a lack of federal enforceability on a fuel switch to low-sulfur coal at IPL – Prairie Creek as a basis for Linn County's unclassifiable designation. The DNR's final TSD, dated April 3, 2017, (superseding the version of December 19, 2016) documented the DNR's dispersion modeling and other supporting information. EPA signed the Round 3 designations on December 21, 2017, prior to the CD's December 31, 2017, deadline, with publication on January 9, 2018 (83 FR 1098). This completed the initial designations process in Iowa.

Table B-3. Summary of EPA's Round 3 designations in Iowa.

Area	EPA Designation
Linn County	Unclassifiable
Louisa County	Attainment/Unclassifiable
Pottawattamie County	Attainment/Unclassifiable
Statewide (each remaining undesignated county[48] in Iowa)	Attainment/Unclassifiable

Round 4

Round 4 (86 FR 16055, March 26, 2021) did not directly impact Iowa.

[47] For GNN, the consent decree required Units 1 and 2 to cease burning solid fuel on or before April 16, 2016 (Case No. 4:13-CV-00021, consent decree filed January 22, 2013, in the US District Court for the Southern District of Iowa).

[48] This also includes the portion of Muscatine County not designated nonattainment in Round 1.