
Draft Technical Support Document (TSD)

This is a revised TSD supporting our SO₂ designations letter of February 6, 2013 informing the State of Iowa our intent to designate Muscatine County, Iowa nonattainment for the 2010 1-hr SO₂ primary National Ambient Air Quality Standard (NAAQS). We have elected to revise the TSD to use the most recent certified data for the Musser Park monitor which is 2009 through 2011. Using this 3 year data period (instead of 2008 through 2010), and replacing flagged data in 2009 and 2010 (there were no flagged data in 2011) with a concentration of 0.0 ppb, we calculate a design value of 127 ppb. We note that using either three year period to establish the design value results in a determination that the Musser Park monitor is violating the 2010 1-hr primary SO₂ NAAQS, and therefore does not change our intended designation of nonattainment for Muscatine County, Iowa.

**Iowa
Area Designations For the
2010 SO₂ Primary National Ambient Air Quality Standard**

Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must initially designate areas as either “unclassifiable”, “attainment”, or “nonattainment” for the 2010 1-hour sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to poor air quality in a nearby area that does not meet the NAAQS. Table 1 below identifies the counties or portions of counties (or Indian Country) in Iowa that EPA intends to initially designate “nonattainment” based on monitored violations.

Table 1. Nonattainment Area Designations for Iowa

County Name	Iowa Recommended Designation of Areas/Counties	EPA’s Intended Designation of Areas/Counties
Muscatine	Unclassifiable	Nonattainment

Background

On June 2, 2010, EPA revised the primary SO₂ NAAQS (75 FR 35520, June 22, 2010) by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is attained when the 3-year average of the 99th percentile of the daily maximum 1-hour average concentration at each monitor in an area does not exceed 75 ppb. EPA has determined that this is the level necessary to provide protection of public health with an adequate margin of safety, especially for children, the elderly and those with asthma. These groups are particularly susceptible to the health effects associated with breathing SO₂. The Agency is revoking the two prior primary standards of 140 ppb evaluated over 24-hours, and 30 ppb evaluated over an entire year because the standards will not add additional public health protection given a 1-hour standard at 75 ppb. Accordingly, EPA is not designating areas in this process on the basis of

either of these two prior primary standards. Similarly, the secondary standard for SO₂ has not been revised, so EPA is not designating areas in this process on the basis of the secondary standard.

EPA's SO₂ Designation Approach

Section 107(d) of the CAA requires that not later than 1 year after promulgation of a new or revised NAAQS, state Governors must submit their recommendations for designations and boundaries to EPA. This deadline was in June, 2011. Section 107(d) also requires EPA to provide a notification to states of no less than 120-days prior to promulgating an initial area designation that is a modification of a state's recommendation. EPA has reviewed the State's recommendations and has notified the State Commissioner through letter signed by the Regional Administrator of any intended modifications. If a State or Indian Country did not submit designation recommendations, EPA will promulgate the designations that it deems appropriate. If a state or Indian Country disagrees with EPA's intended area designations, they have an opportunity to demonstrate why any proposed modification is inappropriate.

Designations guidance was issued by EPA through a March 24, 2011, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. This memorandum identifies factors EPA intends to evaluate in determining boundaries for areas designated nonattainment. These 5 factors include: 1) Air quality data; 2) Emissions and emissions-related data (location of sources and potential contribution to ambient SO₂ concentrations); 3) Meteorology (weather/transport patterns); 4) Geography/topography (mountain ranges or other air basin boundaries); and 5) Jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations, metropolitan planning organization), among any other information deemed relevant to establishing appropriate area designations and boundaries for the 1-hour SO₂ NAAQS.

The March 24, 2011, memo recommended that area boundaries be defaulted to the county boundary unless additional provided information justifies a larger or smaller boundary than that of the county. EPA believes it is appropriate to evaluate each potential area on a case-by-case basis, and to recognize that area-specific analyses conducted by states, Indian Country and/or EPA may support a different boundary than a default county boundary.

In this TSD, EPA discusses its review and technical analysis of the recommendations submitted by the Iowa for designations of the 1-hour SO₂ standard and any modifications from these recommendations.

Definition of important terms used in this document:

- 1) **Designated "nonattainment" area** – an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO₂ NAAQS, based on the most recent three years of air quality monitoring data, or contributes to a violation in a nearby area.
- 2) **Recommended nonattainment area** – an area a State or Indian Country has recommended to EPA be designated as nonattainment.

3) **Violating monitor** – an ambient air monitor meeting all methods, quality assurance and citing criteria and requirements whose valid design value exceeds 75 ppb, as described in Appendix T of 40 CFR part 50.

4) **2010 SO₂ NAAQS** - 75 ppb, national ambient air quality standard for SO₂ promulgated in 2010. Based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations

5) **Design Value** – a statistic that describes the air quality status of a given area relative to the level of the NAAQS.

Nonattainment Designations

Introduction

In Iowa's designation recommendation letter to EPA, dated June 2, 2011, Terry E. Branstad, Governor of Iowa, recommended that 5 counties be designated as attainment for the 2010 SO₂ NAAQS based on monitored air quality data from 2008-2010, with all other counties designated as unclassifiable.

Based on EPA's technical analysis, EPA is intending to initially designate based on monitored violations 1 county in the State of Iowa as nonattainment (Table 1). EPA is not yet prepared to address other areas in Iowa.

The 5 factors were used to analyze the nonattainment area for 1-hour SO₂ designations:

1. Air quality data. We reviewed SO₂ air quality monitoring data from EPA's Air Trends website (see <http://www.epa.gov/airtrends/values.html>), including the design value calculated for the monitor in Muscatine County, Iowa for the years 2009 - 2011. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 2010 SO₂ NAAQS is met at a monitoring site when the identified design value is valid and less than or equal to 75 ppb as described in Appendix T of 40 CFR Part 50; however, data from the Musser Park monitor in Muscatine, IA could not be validated using the standard procedure found in Appendix T because a substantial amount of data had been flagged from the years 2008, 2009 and 2010.

The data was flagged as a result of a malfunction of the internal calibration system of the monitor. The malfunction wasn't detected immediately and the monitor continued to collect data for over a year. The malfunction was discovered following performance of a reference procedure on the monitor's SO₂ calibration system. Following the reference procedure a reference audit was completed which informed IDNR and EPA that the monitor had been operating out of specification. Following the audit, EPA and IDNR reviewed the results and jointly agreed to: 1) adjust the original recorded values to account for the calibration error; 2) certify the adjusted values into the Air Quality System (AQS) database; and, 3) flag the adjusted data in the AQS database so it could not be used for regulatory purposes.

Due to the large amount of flagged data the Musser Park monitor no longer met the minimum data completeness criteria for the period of time which we are using to evaluate compliance with the NAAQS. The completeness criteria specified in Appendix T of 40 CFR Part 50 requires 3

years of complete data to establish a design value. A year is complete when all 4 quarters are complete. A quarter is complete when 75% of the days are complete. A day is complete when it has 75% of its hours. Although Appendix T of 40 CFR Part 50 includes data substitution provisions, due to the large amount of missing data from the Musser Park monitor, the data substitution provisions were not applicable. However, 40 CFR Part 50 Appendix T 3(d) allows the Administrator of EPA to consider other factors, such as consistency and levels of the valid concentration measurements that are available for the purpose of establishing a design value.

The Appendix T 3(d) provision was applied in the Musser Park situation because the valid data recorded from the monitor for the number of years preceding and following the malfunction included sufficient high hourly measurements to demonstrate the ambient SO₂ concentration in Muscatine, IA was significantly above the new health-based standard of the 2010 SO₂ 1-hr primary NAAQS. In fact, in evaluating whether to apply the Appendix T 3(d) provision to the Musser Park data, EPA Region 7 took the most conservative approach possible and assumed that all the data that was flagged between the dates of August 30, 2008 to September 20, 2010 was zero (i.e., the monitor reported a zero daily concentration of SO₂ in the ambient air for the period of malfunction). This approach resulted in a design value 127ppb (when calculated for the three year period beginning on January 1, 2009 and ending on December 31, 2011), which exceeds the NAAQS by 150%, and demonstrates that the monitor is recording a violation of the 1-hr standard.

2. Emissions and emissions-related data. We reviewed data from the 2008 National Emissions Inventory (NEI), version 2 (NEI2008V2.0), which was the most current version of the national inventory available in 2011 when these data were compiled for the designations process, (see <http://www.epa.gov/ttn/chief/net/2008inventory.html>). EPA recognizes that there might be new information associated with any changes in emissions that may have occurred after 2008, and will consider more recent years if available. For example, certain large sources of emissions in or near an area may have installed emission controls or otherwise significantly reduced emissions since 2008. Two source categories from the 2008 NEI were examined: the point source inventory and the nonpoint source inventory. Generally, the point source inventory represents the bulk of the SO₂ emissions in Region 7.
3. Meteorology. We evaluated meteorological data to help determine how weather conditions, including wind speed and direction, affect the plume of sources contributing to ambient SO₂ concentrations. The National Weather Service maintains surface and upper air monitoring sites across the United States. Automated Surface Observing System (ASOS) (<http://www.weather.gov/asos>) sites collect hourly averaged wind measurements including wind direction and wind speed.
4. Geography/topography. We examined the physical features of the land that might affect the distribution of SO₂ over an area. River valleys, escarpments, or other physical features may affect the distribution of emissions, and may help define boundaries. Satellite images depicting river valleys and point sources were constructed and evaluated to determine the effects of the topography on point source emissions.

5. Jurisdictional boundaries. Once the geographic area associated with the area violating the SO₂ standard and the nearby area contributing to violations were determined, we considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary for carrying out the air quality planning and enforcement functions for the nonattainment area. If an existing jurisdictional boundary is used to help define the nonattainment area, it encompasses all of the area that has been identified as meeting the nonattainment definition. These existing boundaries may include an existing nonattainment or maintenance area boundary, a county or township boundary, a metropolitan area boundary, an air management district, or an urban planning boundary established for coordinating business development or transportation activities. Where existing jurisdictional boundaries are not adequate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates are used.

Nonattainment Designations **Technical analysis for Muscatine County, Iowa**

Introduction

This technical analysis for Muscatine County, Iowa identifies the entire county with a monitor (AQS ID 191390020) that violates the 2010 SO₂ NAAQS based on 2009-2011 data, and evaluates nearby counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the weight of evidence of the factors recommended in the March 24, 2011, issued EPA guidance.

Figure 1 is a map of the area in IA that EPA intends to initially designate nonattainment for the 2010 1-hr SO₂ NAAQS including source information and the location of the monitor violating the standard.

Figure 1. Muscatine County, IA Intended Nonattainment Boundary
Muscatine, IA

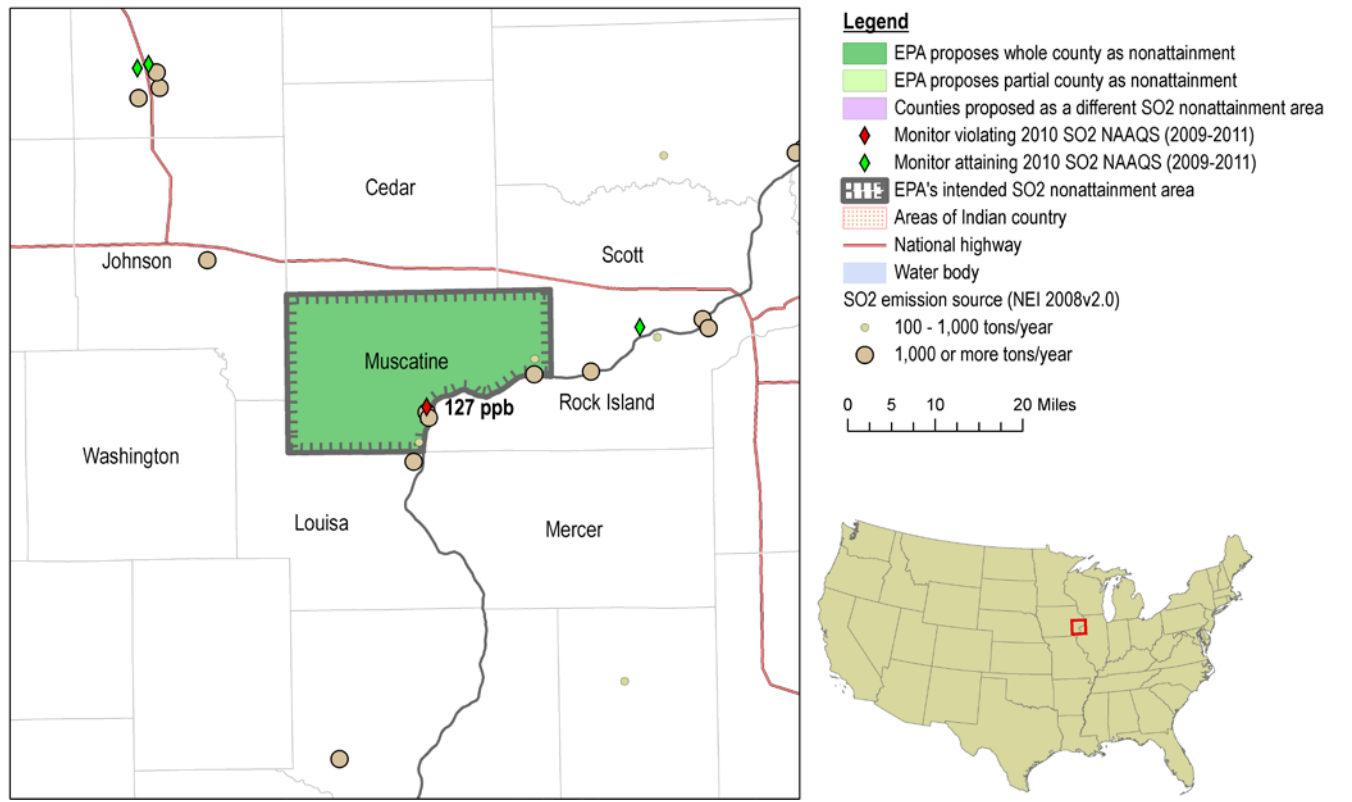
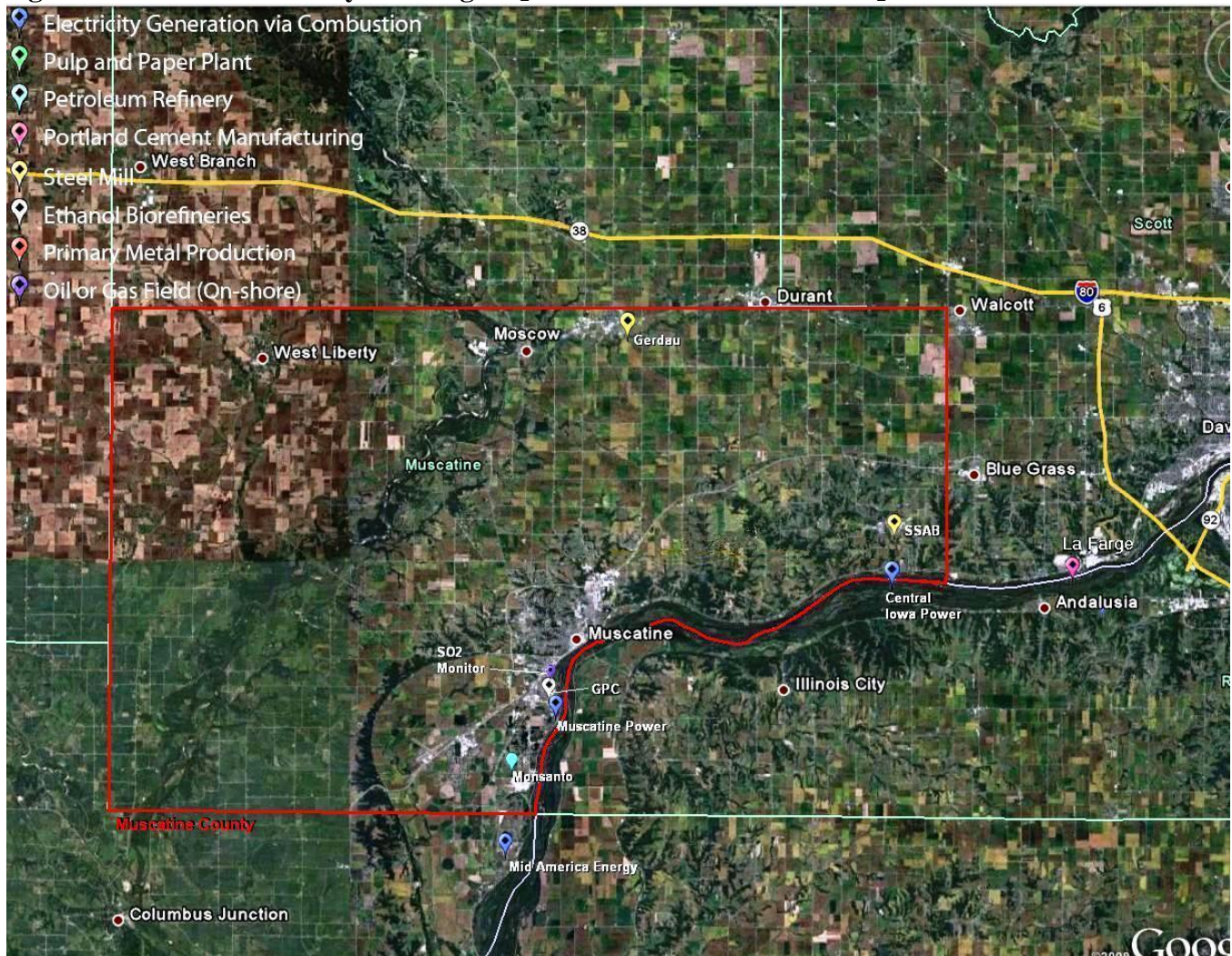


Figure 2 is a map of the area analyzed showing the location of the air quality monitors in the area, the Muscatine County line in red, and large sources of SO₂ in the greater Muscatine Co. area.

Figure 2: Muscatine County Showing SO₂ Monitor and Sources of SO₂



On June 2, 2011 Governor of Iowa, Terry E. Branstad, recommended that 5 counties in Iowa with SO₂ monitors reporting ambient concentrations below the 75ppb standard be designated attainment and all other areas of the state be designated unclassifiable for the 2010 SO₂ NAAQS based on monitored air quality data from 2008-2010. The state provided no further information or analysis supporting their attainment recommendations other than the monitored values for the years 2008 through 2010.

EPA, based on its technical analysis described below, is intending to initially designate one county in Iowa as nonattainment, based on monitored violations. EPA is proposing to designate all of Muscatine County, Iowa as nonattainment, based upon currently available information, and the application of 40 CFR Part 50 Appendix T 3(d). The county listed for nonattainment is listed above in Table 1. EPA is not yet prepared to address other areas in Iowa.

Detailed Assessment

Air Quality Data

This factor considers the SO₂ air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in Muscatine County and the surrounding area based on data for the 2009-2011 period.

EPA Region 7's proposal is based on data from (a) Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor(s) located in the state.

The 2011 SO₂ NAAQS design values for all counties (containing a monitor) in the State of Iowa and surrounding area are shown in Table 2.

Table 2. Air Quality Data for All Monitors in the State of Iowa

County	State Recommended Nonattainment?	Monitor Name	Monitor Air Quality System ID	Monitor Location	SO ₂ Design Value, 2009-2011 (ppb)
Muscatine	No	Musser Park	191390020	Muscatine, IA	127*
Clinton	No	Chancy Park	190450019	Clinton	30
Linn	No	Scottish Rite Temple	191130031	Cedar Rapids	38
Polk	No	Public Health Building	191530030	Des Moines	3
Scott	No	Jefferson School	191630015	Davenport	10
Van Buren	No	Lake Sugema	191770006	Keosuaqua	5

* The DV is based on an application of the 40 CFR Part 50 Appendix T 3(d) providing authority for the Administrator to approve the use of an incomplete data set to establish a valid DV.

The Musser Park monitor in Muscatine, IA shows a violation of the 2010 SO₂ NAAQS. Therefore, EPA must determine the appropriate boundaries for the area surrounding the violating monitor to be designated nonattainment, otherwise by default EPA identifies the entire county as the area of nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for inclusion in a nonattainment area as well. Each area has been evaluated based on the weight of evidence of the five factors and other relevant information.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emissions data for SO₂ and any growth in SO₂ emitting activities since the date represented by those emissions data.

Emissions

EPA recognizes that there may be important new information on emissions levels for the period after 2008, and would consider more recent information if available. EPA relied on verified emissions data currently available in the 2008 National Emissions Inventory (NEI) emissions database (NEI2008V2.0).

Table 3 shows total emissions of SO₂ (given in tons per year) for violating and potentially contributing counties in and around the Muscatine County, Iowa including sources emitting greater than 100 tons per year of SO₂ according to the 2008 NEI. The two IA counties adjacent to Muscatine, Co with sources within 50 kilometers and emitting greater than 100 tons per year are found in Louisa County, IA, and Scott County, IA. The source in Louisa County is an electric generating unit owned and operated by MidAmerican Energy (the Louisa Power Station). The other source of SO₂ (2,488 tons per year-not listed in the table 3 below) located outside of Muscatine Co. is Lafarge North America Cement Kiln in Buffalo, IA (Scott County) approximately 31.5 kilometers East-Northeast of the violating monitor. Based on the distance of these sources from the violating monitor, and the predominant wind patterns in the area at times violations are recorded at the monitor, EPA is not prepared to conclude that these sources impact the monitor to cause or contribute to the violation.

Table 3. Annual SO₂ Emissions 2008

County	Facility >80 tpy (EIS or State Facility ID)	Facility Emissions (tpy)	Total County SO ₂ Emissions (tons per year)
Muscatine	Grain Processing Corporation	14,979	26,479
	Central Iowa Power – Fair Station	7,068	
	Muscatine Power and Water	3,458	
	Monsanto Company	520	
	SSAB Iowa Inc	374	
	Gerdau Ameristeel US	80	
Louisa	Mid American – Louisa Station	2,453	2,453
Scott	La Farge North American	2,488	2,488
Area Total			31,420

Emissions Controls

The emissions data used by EPA in this technical analysis and provided in Table 3 represent emissions levels taking into account any control strategies implemented on stationary sources in Muscatine and Louisa County up to and including the year 2008. EPA has not received any additional information on emissions reductions resulting from federally enforceable controls put into place after 2008. Emission control information for the sources identified in Table 3 is summarized below.

Grain Processing Corporation (GPC)

GPC processes grain for the production of food and liquor grade ethanol, as well as a variety of grain based food products and animal feeds. GPC is located 1.2 kilometers South-Southeast of the violating monitor. As part of the grain conversion and production process GPC operates a variety of boilers for heating and power production. GPC's main source of SO₂ emissions is emission point #1 (EP-1) which includes boilers 1, 2, 3, 4, 6 and 7. The boilers range in heat input capacity from 105 – 230 MMBtu/hr. The boilers are capable of burning coal and natural gas. EP-1 is limited to 3915 lbs of SO₂/hr (averaged over a 24-hour period) and 6 lb/MMBtu. EP-1 is not equipped with any SO₂ control system. EP-1 is equipped with an SO₂ continuous emission monitor (CEM). GPC operates four germ dryers. The germ dryers have the following SO₂ emission limits: 13.73 lb/hr (EP-15), 9.20 lb/hr (EP-97), 0.53 lb/hr (EP-

126) and 500 ppm (EP-178). The germ dryers are not equipped with any SO₂ control systems. EP-600 is capable of burning biogas and natural gas. EP-600 is limited to 4.86 lb SO₂/hr. EP-600 is equipped with a wet gas scrubber. GPC operates gluten flash dryer #4 (EP-173) which is capable of burning biogas. EP-173 has a heat input capacity of 29 MMBtu/hr. EP-173 is limited to no more than 4.5 lb SO₂/hr. The dryer is equipped with a wet scrubber that is expected to achieve a 91.2% control efficiency while burning biogas. GPC operates four natural gas-fired “Power House Boilers” (EP-103, 104, 142 and 153) with heat input capacities that range from 120 – 124 MMBtu/hr. These boilers burn natural gas only and have an emission limit of 500 ppm. These units are not equipped with any SO₂ control system. GPC operates an additional “Power House Boiler” (EP-177) with a heat input capacity of 360 MMBtu/hr. This unit is limited to 500 ppm and 0.23 lb SO₂/hr. This unit is also not equipped with any SO₂ control system. GPC operates several small natural-gas fired emission units including dryers. These units are limited to 500 ppm SO₂ and are not equipped with any SO₂ control system.

Central Iowa Power Coop – Fair Station (CIPC)

Central Iowa Power Coop (Fair Station) is an electric generating facility that is located 25.4 kilometers East-Northeast of the violating monitor. CIPC’s main SO₂ emission sources are EP-1 and EP-2. EP-1 is a 280 MMBtu/hr boiler that is capable of burning coal and natural gas. EP-1 is limited to 6 lb SO₂/MMBtu. EP-1 is not equipped with any SO₂ control system. EP-1 is not equipped with a SO₂ CEM. EP-2 is a 477 MMBtu/hr boiler that is capable of burning coal and natural gas. EP-2 is limited to 6 lb SO₂/MMBtu. EP-2 is not equipped with any SO₂ control system. EP-2 is equipped with a SO₂ CEM. CIPC also operates a small natural gas/diesel boiler and two small emergency generators.

Muscatine Power & Water (MPW)

MPW is a nonprofit public utility offering electric, water, and communications services to the greater Muscatine municipal area located 1.9 km South-Southeast of the violating monitor. MPW’s main SO₂ emission sources are electric generating units designated EP-70, EP-80 and EP-90. EP-70 is a 289 MMBtu/hr boiler that is capable of burning coal and natural gas. EP-70 is limited to 6 lb SO₂/MMBtu. EP-70 and EP-80 are also limited to a combined 2,772 lb SO₂/hr (averaged over a 24-hour calendar day) and 12,141 tons SO₂/yr. EP-70 is not equipped with any SO₂ control system. EP-70 is equipped with a SO₂ CEM. EP-80 is a 890 MMBtu/hr boiler that is capable of burning coal, natural gas, waste solvent (limited), diesel oil (limited) and waste oil (limited). EP-80 is limited to 6 lb SO₂/MMBtu. EP-70 and EP-80 are also limited to a combined 2,772 lb SO₂/hr (averaged over a 24-hour calendar day) and 12,141 tons SO₂/yr. EP-80 is not equipped with any SO₂ control system. EP-80 is equipped with a SO₂ CEM. EP-90 is a 1,556 MMBtu/hr boiler that is capable of burning coal and natural gas. EP-90 is limited to 0.56 lb SO₂/MMBtu (averaged over a 24-hr calendar day) and 0.45 lb SO₂/MMBtu (averaged over a 30-day period). EP-90 is also subject to a 92% reduction in SO₂ from the flue gas desulfurization system (scrubbers CE-93 and CE-94). EP-90 is also subject to NSPS Da emission limits. As mentioned, EP-90 is equipped with two scrubbers (CE-93 and CE-94) that control SO₂ emissions. EP-90 is equipped with a SO₂ CEM. MPW also operates several small diesel and gasoline-powered emission units.

La Farge – North American

Lafarge's cement manufacturing plant located in Buffalo, IA main source of SO₂ emissions is the preheater/precalciner/kiln/raw mill system (EP 0466-0) located approximately 31 kilometers East of the violating monitor in Muscatine, IA. The cement processing plant has a capacity of 145.3 tons clinker per hour. EP 0466-0 is limited to 4,850 tons SO₂/yr and 2,900 lb SO₂/hr. EP 0466-0 is equipped with a dry

absorbent addition system. EP 0466-0 is also equipped with an SO₂ continuous emission monitor. Lafarge can burn a range of approved materials in the kiln.

Lafarge also has a couple of small fossil-fired emission units including a diesel-fired emergency generator and a diesel-fired water pump that are limited to 2.5 lb SO₂/MMBtu limit and are not equipped with any SO₂ controls.

MidAmerican Energy Company – Louisa Generating Station (MidAmerican)

MidAmerican Energy Company is a for profit power production company that operates an electric generating facility in Louisa County, IA 13.9 kilometers South-Southwest of the violating monitor, located in Muscatine County, IA. The Louisa generating station is just south of the Muscatine county line with a portion of its property lying across the county line. MidAmerican's main SO₂ emission source is EP-1 (Utility Boiler). MidAmerican also operates two auxiliary boilers (EP-2 and EP-3) and two emergency generators (EP-4 and EP-5).

EP-1 is a 8,624 MMBtu/hr boiler that is capable of burning coal, #2 fuel oil and natural gas. EP-1 is limited to 0.96 lb SO₂/MMBtu (BACT) (averaged over a 30-day period), 1.20 lb SO₂/MMBtu (NSPS D) while burning solid fossil fuel, and 0.80 lb SO₂/MMBtu (NSPS D) while burning liquid fossil fuel. EP-1 is also limited to 3,450 lb SO₂/hr (averaged over a 30-day period). The sulfur content of any coal is limited to 2.0 lb/MMBtu or less. EP-1 is equipped with a lime spray dryer flue gas desulfurization system (scrubber). EP-1 is equipped with a SO₂ CEM. EP-2 and EP-3 are 98 MMBtu/hr boilers that are capable of burning natural gas and #2 fuel oil. EP-2 and EP-3 are limited to 98.3 lb SO₂/hr each. The sulfur content of the fuel oil is limited to 0.5% by weight. EP-2 and EP-3 are not equipped with any SO₂ control system. EP-2 and EP-3 are not equipped with an SO₂ CEM. EP-4 and EP-5 are 16 MMBtu/hr emergency generators that are capable of #2 fuel oil only. EP-4 and EP-5 are limited to 8.4 lb SO₂/hr each. The sulfur content of the fuel oil is limited to 0.5% by weight. EP-4 and EP-5 are not equipped with any SO₂ control system. EP-4 and EP-5 are not equipped with an SO₂ CEM.

Monsanto Company (Monsanto)

Monsanto is an agricultural services company that produces on-site power and heat at its product development facility approximately 9.0 kilometers South-Southwest of the violating monitor, Monsanto's main SO₂ emission sources are Boiler #6, #7 and #8. EP-33 (Boiler #6) is a 73 MMBtu/hr boiler that is capable of burning fuel oil and natural gas. EP-33 is limited to 36.6 lb SO₂/hr. The amount of fuel oil EP-33 can combust is dependent on whether EP-45 is burning fuel oil. The sulfur content of the fuel oil is limited to 0.5% by weight. EP-33 is not equipped with any SO₂ control system. EP-33 is not equipped with an SO₂ CEM. EP-45 (Boiler #7) is a 124 MMBtu/hr boiler that is capable of burning fuel oil and natural gas. EP-45 is limited to 61.4 lb SO₂/hr. The amount of fuel oil EP-45 can combust is dependent on whether EP-33 is burning fuel oil. The sulfur content of the fuel oil is limited to 0.5% by weight. EP-45 is not equipped with any SO₂ control system. EP-45 is not equipped with an SO₂ CEM. EP-195 (Boiler #8) is a 150 MMBtu/hr boiler that is capable of burning coal, sludge (limited) and seed corn (limited). EP-195 is limited to 292.5 lb SO₂/hr and 1.95 lb SO₂/MMBtu (averaged over a 3-hr period). EP-195 is not equipped with any SO₂ control system. EP-195 is equipped with an SO₂ CEM. EP-21 (Boiler #5) is a 73 MMBtu/hr boiler that is capable of natural gas only. EP-21 is limited to 500 ppm SO₂. Monsanto also operates several small natural gas-fired emission units and a small diesel emergency generator.

SSAB Iowa, Inc. (SSAB)

SSAB Inc. is a steel manufacturer that is located 21.6 kilometers East-Northeast of the violating monitor, SSAB's main SO₂ emission source is EP-1 (EAF/LMF). EP-1 is an electric arc furnace and a ladle metallurgy furnace. The electric arc furnace has a capacity of 200 tons of liquid steel/hr. EP-1 is limited to 0.70 lb SO₂/ton of steel produced and 613.2 tons SO₂/yr. EP-1 is not equipped with any SO₂ control system. EP-1 is not equipped with an SO₂ CEM. SSAB also operates a 371 MMBtu/hr furnace (EP-13) that burns natural gas only. EP-13 is limited to 0.52 lb SO₂/hr and 2 tons of SO₂/yr. SSAB also operates several small natural gas and diesel-fired emission units.

Gerdau Ameristeel US, Inc. (Gerdau)

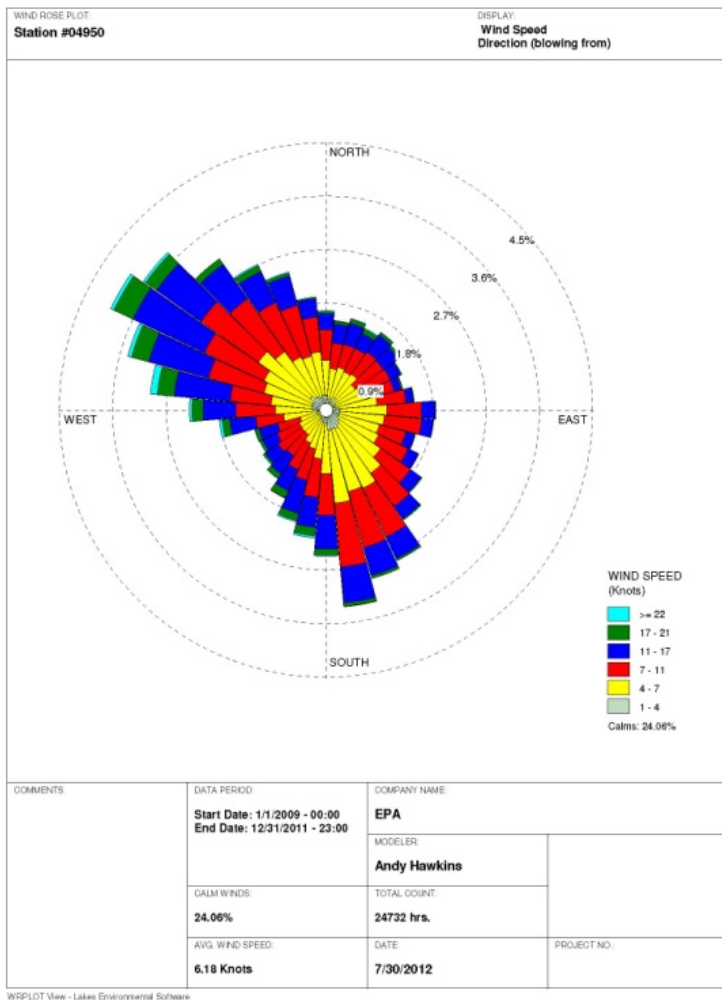
Gerdau Ameristeel is a steel manufacturer that is located 20.5 kilometers North of the violating monitor. Gerdau's main SO₂ source is EP-01 (which includes the electric arc furnace). The electric arc furnace has a capacity of 90 tons of liquid steel/hr. EP-01 is limited to 70.2 lb SO₂/hr and 190 tons SO₂/yr. There are permit conditions that limit the amount of liquid steel processed, the carbon sources for the electric arc furnace and the amount of natural gas combusted. EP-01 is not equipped with any SO₂ control system. EP-01 is not equipped with an SO₂ CEM. Gerdau also operates a 150 MMBtu/hr Billet Reheat Furnace (EP-04). This furnace burns natural gas only. The SO₂ emissions are limited to 500 ppm. Gerdau also operates several small natural gas and diesel-fired emission units.

Meteorology (weather/transport patterns)

Evidence of source-receptor relationships between specific emissions sources and high SO₂ values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered recent hourly or sub-hourly meteorological data from the site nearest to the violating monitor to determine which wind vectors might be associated with 1-hour SO₂ exceedances. For Muscatine County, IA, the meteorological data used in this analysis were based on 2009-2011 data from the National Weather Service Station located 11.4 kilometers from the violating monitor.

Figure 2 lists the frequency of wind direction and wind speed observations associated with the years 2009 through 2011. The winds in Muscatine, IA over the three year period show a pattern of blowing consistently out of the West-Northwest or South-Southeast. Winds from the South-Southeast are in-line with SO₂ sources located at GPC and Muscatine Power facilities. The GPC facility is the largest source of SO₂ in Muscatine County and Muscatine Power is the third largest source. Additional SO₂ sources in neighboring Louisa and Scott County are not close enough to the violating monitor nor are they inline with the predominant winds for us to conclude at this time that they impact the reading at the monitor on days exceedances are observed. I.e., During recorded exceedances at the Muscatine, IA monitor, the winds are coming predominantly from the south in a direction from GPC and Muscatine Power and Water.

Figure 2: Wind Rose Analysis 2009-2011



Geography/Topography (mountain ranges or other air basin boundaries)

Muscatine County, IA does not have any significant geographical or topographical barriers significantly limiting air-pollution transport within its air shed; however, Muscatine County rests on the western shore of the upper Mississippi river. This factor did not play a significant role in determining the nonattainment boundary. The river valley created by the Mississippi River can impact local winds by channeling them along the valley north and south, and can serve to limit the impact of a particular source on a monitor sited in proximity to the river valley. In the case of Muscatine, as the Mississippi River flows south it makes a strong bend to the West across the Eastern edge of the county then abruptly turns South again at the City of Muscatine, IA. The existence of the river channel through across the Eastern edge of the county is not expected to impact the emissions observed at the violating monitor located in Muscatine, IA.

Jurisdictional Boundaries

EPA reviewed jurisdiction boundary information, including townships, city limits, and a previous SO₂ nonattainment boundary. EPA has elected to propose the nonattainment boundary as the Muscatine County line, which is the default boundary identified by EPA in its Designation Guidance.

Other Relevant Information

EPA did not collect additional information relevant to establishing a nonattainment area boundary for this area and we believe the information included above is sufficient to satisfactorily establish an intended nonattainment area boundary for Muscatine County, IA.

Conclusion

The air quality monitor in Muscatine County shows a violation of the 2010 SO₂ NAAQS, based on 2009-2011 air quality data. As a result Muscatine County or some portion of Muscatine County must be designated as nonattainment. Based upon the consideration of all the relevant and available information, as described above, EPA believes that the boundaries described herein encompass the appropriate initial nonattainment area of Muscatine County, Iowa that does not meet (or that contributes to ambient air quality in the area that does not meet) the 2010 SO₂ NAAQS, based on the violating monitor.