



**Environmental  
Protection Agency**

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**Ohio's  
2010 Revised Sulfur Dioxide National Ambient  
Air Quality Standard  
Recommended Designations and  
Nonattainment Boundaries**

**Prepared by:  
The Ohio Environmental Protection Agency  
Division of Air Pollution Control**

**April 2011**

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## Table of Contents

|   |    |
|---|----|
| An Explanation of Ohio EPA's Analysis .....   | 1  |
| General Discussion .....  | 1  |
| Ohio EPA's Approach.....  | 3  |
| Factor 1: Air Quality Data .....  | 4  |
| Factor 2: Emissions Data .....  | 4  |
| Factor 3: Meteorology .....   | 7  |
| Factor 4: Topography and Land Use/Land Cover .....  | 7  |
| Factor 5: Jurisdictional Boundaries .....   | 8  |
| Organization of this Document .....   | 8  |
| Section 1: Counties Containing Violating SO <sub>2</sub> Monitors, Recommended<br>Nonattainment .....   | 9  |
| Cuyahoga County.....  | 10 |
| Recommended Nonattainment Boundary: Cuyahoga County .....   | 11 |
| Discussion: .....   | 11 |
| Factor 1: Air Quality Data.....   | 12 |
| Factor 2: Emissions .....   | 13 |
| Factor 3: Meteorology .....   | 17 |
| Factor 4: Topography and Land Use/Land Cover.....   | 19 |
| Factor 5: Jurisdictional Boundaries.....  | 19 |
| Belmont County.....   | 21 |
| Recommended Nonattainment Boundary: Belmont County .....  | 22 |
| Discussion: .....   | 22 |
| Factor 1: Air Quality Data.....   | 23 |
| Factor 2: Emissions .....   | 24 |
| Factor 3: Meteorology .....   | 26 |
| Factor 4: Topography and Land Use/Land Cover.....   | 27 |
| Factor 5: Jurisdictional Boundaries.....  | 28 |
| Jefferson County .....  | 29 |
| Recommended Nonattainment Boundary: Jefferson County.....   | 30 |
| Discussion: .....   | 30 |
| Factor 1: Air Quality Data.....   | 31 |
| Factor 2: Emissions .....   | 32 |
| Factor 3: Meteorology .....   | 34 |
| Factor 4: Topography and Land Use/Land Cover.....   | 35 |
| Factor 5: Jurisdictional Boundaries.....  | 36 |
| Columbiana County.....  | 37 |
| Recommended Nonattainment Boundary: Columbiana County.....  | 38 |
| Discussion: .....   | 38 |
| Factor 1: Air Quality Data.....   | 39 |
| Factor 2: Emissions .....   | 40 |
| Factor 3: Meteorology .....   | 42 |
| Factor 4: Topography and Land Use/Land Cover.....   | 43 |
| Factor 5: Jurisdictional Boundaries.....  | 44 |
| Meigs County .....  | 45 |
| Recommended Nonattainment Boundary: Meigs County and Partial<br>Gallia County (Cheshire Township) ..... | 46 |

|   |    |
|---|----|
| Discussion: .....   | 46 |
| Factor 1: Air Quality Data.....   | 47 |
| Factor 2: Emissions .....   | 48 |
| Factor 3: Meteorology .....   | 50 |
| Factor 4: Topography and Land Use/Land Cover .....  | 51 |
| Factor 5: Jurisdictional Boundaries.....  | 52 |
| Lake County .....   | 54 |
| Recommended Nonattainment Boundary: Lake County .....   | 55 |
| Discussion: .....   | 55 |
| Factor 1: Air Quality Data.....   | 56 |
| Factor 2: Emissions .....   | 57 |
| Factor 3: Meteorology .....   | 60 |
| Factor 4: Topography and Land Use/Land Cover .....  | 62 |
| Factor 5: Jurisdictional Boundaries.....  | 62 |
| Morgan County .....   | 63 |
| Recommended Nonattainment Boundary: Morgan County and Partial<br>Washington County (Waterford Township) ..... | 64 |
| Discussion: .....   | 64 |
| Factor 1: Air Quality Data.....   | 65 |
| Factor 2: Emissions .....   | 66 |
| Factor 3: Meteorology .....   | 68 |
| Factor 4: Topography and Land Use/Land Cover .....  | 69 |
| Factor 5: Jurisdictional Boundaries.....  | 70 |
| Section 2: Counties Containing Non-Violating SO <sub>2</sub> Monitors, Recommended<br>Unclassifiable.....     | 72 |
| Counties Recommended Unclassifiable: .....  | 73 |
| Discussion: .....   | 73 |
| Air Quality Data:.....  | 73 |
| Emissions: .....  | 75 |
| Section 3: Counties Without SO <sub>2</sub> Monitors .....  | 77 |
| Section 3A: Counties That May Necessitate Modeling, Recommended<br>Unclassifiable .....                       | 78 |
| Counties Recommended Unclassifiable: .....  | 79 |
| Discussion: .....   | 79 |
| Emissions: .....  | 80 |
| Section 3B: Counties That Do Not Necessitate Modeling, Recommended<br>Attainment .....                        | 81 |
| Counties Recommended Attainment: .....  | 82 |
| Discussion: .....   | 82 |
| Emissions: .....  | 83 |

## Table of Figures and Tables

|   |    |
|---|----|
| Figure 1: 2008 SO <sub>2</sub> Emissions (TPY) in Each Ohio County .....  | 5  |
| Figure 2: 2008 Source Location and Magnitude of SO <sub>2</sub> Emissions (TPY) in Ohio .....   | 6  |
| Figure 3: Recommended Nonattainment Boundary for Cuyahoga County ...  | 11 |
| Figure 4: Cuyahoga County SO <sub>2</sub> Monitor Locations and Site ID Numbers ...   | 13 |
| Figure 5: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Cuyahoga County Violating Monitor.....     | 17 |
| Figure 6: Cuyahoga County Wind Roses.....   | 18 |
| Figure 7: Cuyahoga County Land Use/Land Cover .....   | 19 |
| Figure 8: Recommended Nonattainment Boundary for Belmont County .....   | 22 |
| Figure 9: Belmont County SO <sub>2</sub> Monitor Locations and Site ID Numbers .....  | 24 |
| Figure 10: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Belmont County Violating Monitor .....    | 26 |
| Figure 11: Belmont County Wind Rose.....  | 27 |
| Figure 12: Belmont County Land Use/Land Cover.....  | 28 |
| Figure 13: Recommended Nonattainment Boundary for Jefferson County...   | 30 |
| Figure 14: Jefferson County SO <sub>2</sub> Monitor Locations and Site ID Numbers...  | 32 |
| Figure 15: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Jefferson County Violating Monitor .....  | 34 |
| Figure 16: Jefferson County Wind Rose .....   | 35 |
| Figure 17: Jefferson County Land Use/Land Cover.....  | 36 |
| Figure 18: Recommended Nonattainment Boundary for Columbiana County .....   | 38 |
| Figure 19: Columbiana County SO <sub>2</sub> Monitor Locations and Site ID Numbers .....  | 40 |
| Figure 20: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Columbiana County Violating Monitor ..... | 42 |
| Figure 21: Columbiana County Wind Rose.....   | 43 |
| Figure 22: Columbiana County Land Use/Land Cover.....   | 44 |
| Figure 23: Recommended Nonattainment Boundary for Meigs and Gallia County .....   | 46 |
| Figure 24: County SO <sub>2</sub> Monitor Locations and Site ID Numbers.....  | 48 |
| Figure 25: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Meigs County Violating Monitor.....       | 50 |
| Figure 26: Meigs and Gallia County Wind Rose .....  | 51 |
| Figure 27: Meigs County Land Use/Land Cover .....   | 52 |
| Figure 28: Gallia County Land Use/Land Cover .....  | 52 |
| Figure 29: Recommended Nonattainment Boundary for Lake County.....  | 55 |
| Figure 30: Lake County SO <sub>2</sub> Monitor Locations and Site ID Numbers .....  | 57 |
| Figure 31: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Lake County Violating Monitor .....       | 60 |
| Figure 32: Lake County Wind Roses .....   | 61 |
| Figure 33: Lake County Land Use/Land Cover.....   | 62 |
| Figure 34: Recommended Nonattainment Boundary for Morgan and Washington County.....   | 64 |
| Figure 35: Morgan County SO <sub>2</sub> Monitor Locations and Site ID Numbers.....   | 66 |

|  |    |
|--|----|
| Figure 36: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of the Morgan County Violating Monitor .....  | 68 |
| Figure 37: Morgan and Washington County Wind Rose .....  | 69 |
| Figure 38: Morgan County Land Use/Land Cover.....  | 70 |
| Figure 39: Washington County Land Use/Land Cover.....  | 70 |
| Figure 40: SO <sub>2</sub> Monitor Locations and Site ID Numbers for Non-Violating Monitors in Ohio.....   | 75 |
| Figure 41: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) within 50 Kilometers of Non-Violating Monitors in Ohio .....   | 76 |
| Figure 42: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) Within the County Borders for Counties Without Monitors that are Recommended as Unclassifiable in Ohio ..... | 80 |
| Figure 43: 2008 Ohio Sources of SO <sub>2</sub> Emissions (TPY) Within the County Borders for Counties Without Monitors that are Recommended as Attainment in Ohio .....     | 84 |

### **List of Appendices**

- A - Air Quality System (AQS) data sheets
- D - SLAMS 2010 certification
- C - Emissions inventory by emissions unit
- D - Geography and topography maps
- E - Jurisdiction boundary maps
- F - Public notice, public hearing, and response to comments documentation

## An Explanation of Ohio EPA's Analysis

### **General Discussion**

Promulgated on June 2, 2010 and effective August 23, 2010, U.S. EPA revised the primary national ambient air quality standard (NAAQS) for sulfur dioxide (SO<sub>2</sub>) [75 FR 35520]. Ohio currently has no counties designated nonattainment for SO<sub>2</sub>.

On June 2, 2010, U.S. EPA replaced the 24-hour<sup>1</sup> and annual<sup>2</sup> standards with a new short-term standard based on the 3-year average of the 99<sup>th</sup> percentile of the yearly distribution of 1-hour daily maximum SO<sub>2</sub> concentrations. U.S. EPA established the level of the new 1-hour standard at 75 parts per billion (ppb).

In accordance with Clean Air Act (CAA) Section 107(d), U.S. EPA must designate areas as "attainment," "nonattainment" or "unclassifiable" for the new 1-hour SO<sub>2</sub> standard within two years following promulgation of the new standard, or June 3, 2012<sup>3</sup>. States are expected to submit initial area designation recommendations by June 3, 2011.

U.S. EPA's final area designations are expected to be based principally on 2008 to 2010 air quality data reported from SO<sub>2</sub> monitors currently in place, and any refined modeling the States choose to conduct specifically for initial area designations. U.S. EPA expects to designate areas in the following manner:

- Nonattainment if either monitoring data or appropriate refined modeling results show a violation.
- Attainment if monitoring and appropriate modeling data show no violations. For an area to be designated as attainment, appropriate dispersion modeling regarding such sources needs to show the absence of violations even if monitoring does not show a violation.<sup>4</sup>
- Unclassifiable for all other areas lacking monitoring data and air quality modeling results showing no violations.

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<sup>1</sup> 0.14 part per million (ppm) averaged over a 24-hour period, not to be exceeded more than once per year.

<sup>2</sup> 0.030 ppm annual arithmetic mean

<sup>3</sup> Although U.S. EPA promulgated (signed) the standard on June 2, States were not notified until June 3. As such, the due dates are based upon when States were notified.

<sup>4</sup> This has been U.S. EPA's general position throughout the history of implementation of the SO<sub>2</sub> NAAQS program. See, e.g., "Air Quality Control Regions, Criteria, and Control Techniques; Attainment Status Designations," 43 FR 40412, 40415-16 (Sept. 11, 1978); "Air Quality Control Regions, Criteria, and Control Techniques," 43 FR 45993, 46000-02 (Oct. 5, 1978); "Air Quality Implementation Plans: State Implementation Plans; General Preamble," 57 FR 13498, 13545, 13547-48 (Apr. 16, 1992); "Approval and Promulgation of State Implementation Plans; Call for Sulfur Dioxide SIP Revisions for Billings/Laurel, MT," 58 FR 41430 (Aug. 4, 1993); "Designation of Areas for Air Quality Planning Purposes; Ohio," 59 FR 12886, 12887 (Mar. 18, 1994); "Ambient Air Quality Standards, National and Implementation Plans for Sulfur Oxides (Sulfur Dioxide)," 60 FR 12492, 12494-95 (Mar. 7, 1995); "Air Quality Implementation Plans; Approval and Promulgation: Various States: Montana," 67 FR 22167, 22170-71, 22183-887 (May 2, 2002).

U.S. EPA's final rule acknowledges the unique challenges presented by SO<sub>2</sub> [75 FR 35550 - 35551]. U.S. EPA clarifies that for a short-term 1-hour standard it is more technically appropriate, efficient, and effective to use modeling as the principle means of assessing compliance for medium to larger sources. Whereas for other NAAQS pollutants, there is comparatively less dependence upon conducting refined modeling and air quality monitoring is more appropriate for determining whether all areas are attaining the NAAQS. U.S. EPA states that favoring modeling to determine compliance with the SO<sub>2</sub> standard is consistent with U.S. EPA's historical practice.

U.S. EPA's final rule anticipates the identification of violations and compliance with the 1-hour SO<sub>2</sub> standard for areas without currently operating monitors, but with sources that might have the potential to cause or contribute to violations of the NAAQS, would primarily be accomplished through refined, source oriented air quality dispersion modeling analyses, supplemented with a new, limited network of ambient air quality monitors.

U.S. EPA identified the need to issue guidance in order for modeling to be done on the scale sufficient to identify all areas that might violate the new 1-hour SO<sub>2</sub> standard. However, the agency also acknowledged it would take more time to issue this guidance than is available in order to use it for this initial round of attainment designations. This guidance, entitled "Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards," was provided on March 24, 2011 (herein referred to as "SO<sub>2</sub> Designation Guidance"). Consequently, U.S. EPA stated in the final rule that it does not believe it would be realistic or appropriate to expect States to complete such modeling and incorporate the results in initial designation recommendations by June 3, 2011. Rather, the agency more likely expect States will accept the county level presumption for counties with violating monitors and submit unclassifiable recommendations where monitoring shows no violation or where there is a lack of monitoring.

U.S. EPA further anticipates that a post-designation approach would rely on CAA Section 110(a)(1) State Implementation Plans (SIPs), often referred to as "maintenance" or "infrastructure" SIPs. The Infrastructure SIP will ensure that all areas attain and maintain the 1-hour SO<sub>2</sub> standard on a timely basis even if they are designated "unclassifiable" initially. The Infrastructure SIP is due within 3 years after promulgation of the new NAAQS, or June 3, 2013, and does not depend upon designating an area "nonattainment" based on recently monitored or modeled SO<sub>2</sub> levels. This period of time would allow States to use U.S. EPA's anticipated guidance on modeling for the new 1-hour SO<sub>2</sub> standard. Additionally, this period of time will allow States to account for SO<sub>2</sub> reduction levels at individual sources that are anticipated to result from promulgated national and regional rules. Ultimately, States must show attainment and maintenance of the new 1-hour SO<sub>2</sub> standard as expeditiously as practicable, but no later than five years after initial designation (or approximately August 2017).

In contrast, but similar, State SIPs that address areas designated as nonattainment (*i.e.*, “nonattainment area SIPs”) are due within 18 months from the effective date of the designation (or approximately February 2014), under CAA Section 192.

Once areas have both appropriate monitoring data (if required) and modeling data (as appropriate and consistent with the new guidance) showing no violations of the SO<sub>2</sub> standard, and have met other applicable requirements of CAA Section 107(d)(3), U.S. EPA would consider re-designating them from unclassifiable or nonattainment to attainment under CAA Section 107(d)(3).

### ***Ohio EPA’s Approach***

This submittal is Ohio’s recommendation for the initial designations. Ohio EPA is recommending areas of the State with 2008 to 2010 air quality data showing a violation as nonattainment areas. In accordance with U.S. EPA’s final rule, the expected presumptive boundary for any area designated nonattainment would be the county boundary associated with the violation unless additional information is provided to U.S. EPA demonstrating a different boundary is appropriate. Ohio EPA is not conducting additional modeling analysis as a part of this submittal.

In addition, Ohio EPA is recommending certain areas be designated as attainment. Any area where monitoring is lacking and modeling is not appropriate (based on a lack of sources emitting 100 TPY and a lack of smaller sources with the potential to cause or contribute to a violation of the new SO<sub>2</sub> standard) is recommended as an attainment area. As stated in U.S. EPA’s final rule, the agency only intends to designate an area as attainment if monitoring and appropriate modeling data show no violations. As further stated in the SO<sub>2</sub> Designation Guidance, an area can be designated as attainment if there are no monitored violations and where appropriate modeling analysis is conducted, “if needed.” This approach is suitable as not all areas of a Ohio contained monitoring or have sources that emit over 100 TPY of SO<sub>2</sub> or have a collection of smaller sources that have the potential to cause or contribute to a violation of the SO<sub>2</sub> standard. In these cases modeling is not appropriate or necessitated and these areas should be designated as attainment consistent with U.S. EPA’s broader approach for designations. This document will provide adequate justification for such areas using data from the 2008 actual emissions information submitted by Ohio’s sources for incorporation into the 2008 National Emissions Inventory (NEI).

The remaining areas of the State are recommended as unclassifiable. After additional modeling occurs in the future, Ohio EPA will address areas recommended as unclassifiable in the upcoming Infrastructure SIP.

The following summarizes the major factors included in Ohio’s analysis for designation recommendations. Specifically, Ohio has used the five factor analysis approach, as recommended in the SO<sub>2</sub> Designation Guidance, to support nonattainment boundary recommendations.

**Factor 1: Air Quality Data**

The air quality analysis looks at the 3-year average of the 99<sup>th</sup> percentile of the yearly distribution of 1-hour daily maximum SO<sub>2</sub> concentrations for each county based on data for 2008 to 2010. The level of the new 1-hour SO<sub>2</sub> standard is 75 ppb. Data is retrieved from the U.S. EPA's Air Quality System (AQS) at <http://www.epa.gov/ttn/airs/airsaqs/> and is presented in ppb in all tables. The three-year averages for monitors that are violating the standard are highlighted in yellow. Monitoring sites that have less than 75 percent capture in any one quarter are highlighted in red. Ohio EPA operates a network of federally approved monitors. AQS data retrieval sheets are provided in Appendix A. The State and local air monitoring stations (SLAMS) data certification report for calendar year 2010 is provided in Appendix B.

**Factor 2: Emissions Data**

Emissions of SO<sub>2</sub> for 2008 are derived from Ohio EPA's Fee Emission Reports (FERs) which are the basis for Ohio's 2008 NEI submittal. Tables identified in this analysis show all stationary sources with reported SO<sub>2</sub> emissions in TPY at the facility level within each county. U.S. EPA's Designation Guidance identifies that significant emissions levels in a nearby area may indicate the potential for the area to contribute to a violation of the SO<sub>2</sub> NAAQS. U.S. EPA also suggests considering sources within 50 kilometers (km) of a violating monitor when conducting modeling to support nonattainment recommendations. Therefore, for counties with violating monitors, Ohio sources within 50 kilometers (km) of the monitor are included in the inventory analysis for each recommended nonattainment area. In addition, for counties with non-violating monitors, sources within 50 kilometers (km) of the monitor are included in the inventory analysis. For counties without monitors, only sources within the county borders are included in the inventory analysis for Ohio's recommendation. Appendix C contains a detailed list of all SO<sub>2</sub> sources in the State.

Within Ohio, there are a total of 858,551 TPY of actual SO<sub>2</sub> emissions in 2008 as depicted in Figure 1 below:

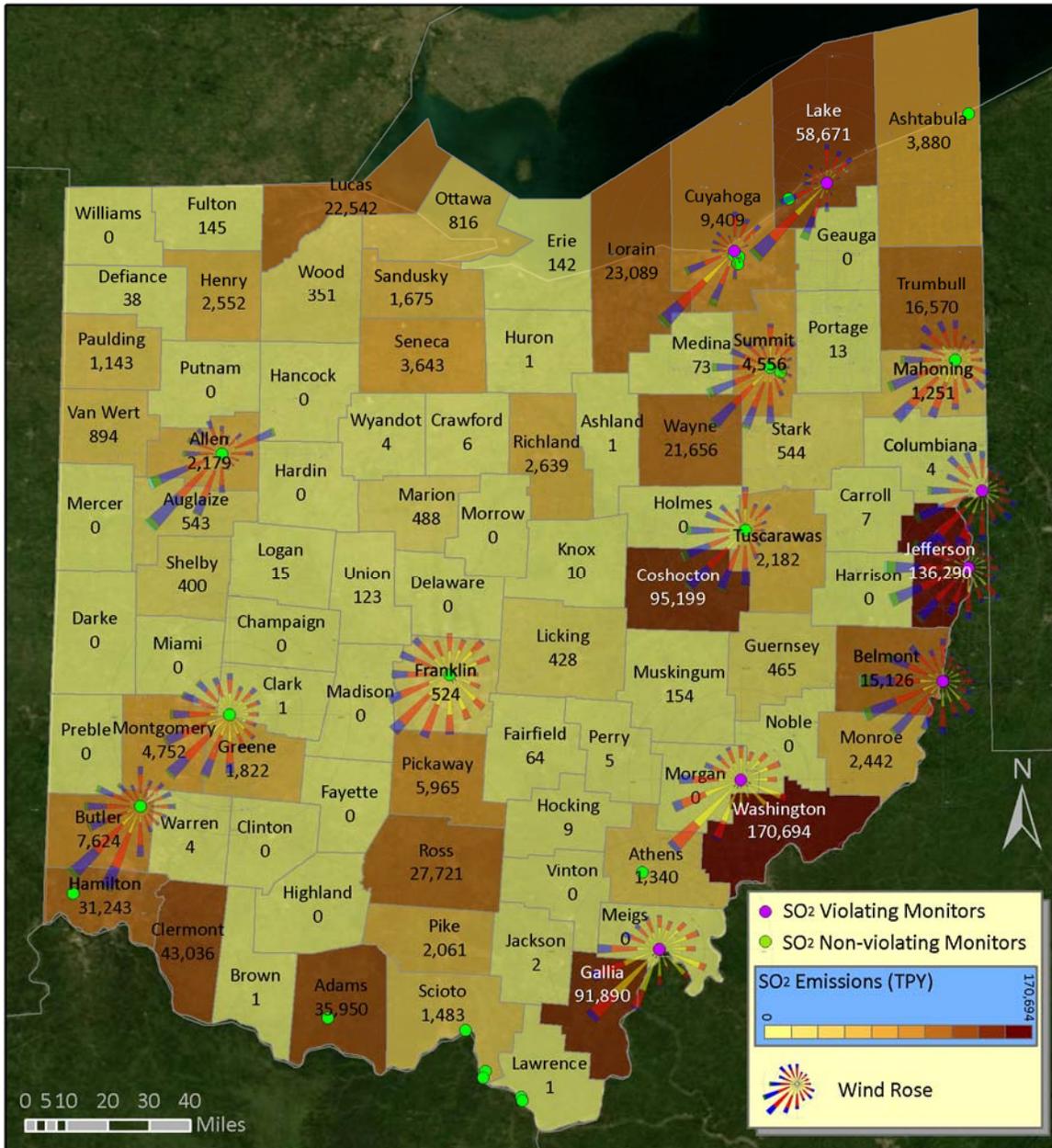


Figure 1: 2008 SO<sub>2</sub> Emissions (TPY) in Each Ohio County

As depicted in Figure 2 below, the most significant emissions occur in urbanized areas such as Cleveland and Cincinnati and along Lake Erie and the Ohio River, where the predominant sources are electric generating units (EGUs).

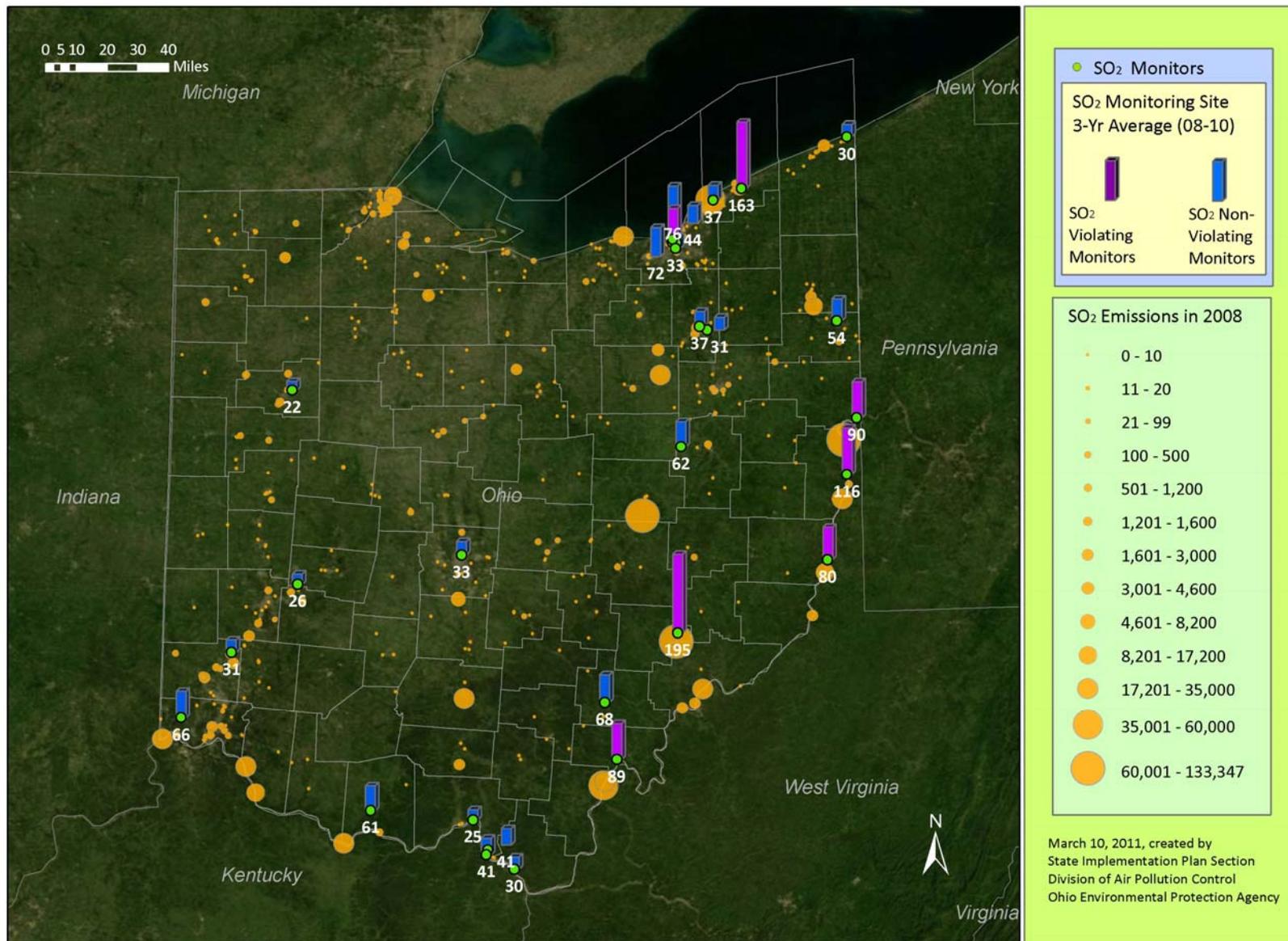


Figure 2: 2008 Source Location and Magnitude of SO<sub>2</sub> Emissions (TPY) in Ohio

### **Factor 3: Meteorology**

The meteorology review looks at wind data gathered at stations in and near Ohio by the National Weather Service (NWS). Figures presented under this factor indicate the annual average winds for each NWS site. These data may also suggest that emissions in some directions relative to the violation may be more prone to contribute than emissions in other directions.

Ohio is located in what is meteorologically termed the Mid-Latitudes. For pollutant dispersion, the most important meteorological parameter is wind speed and wind direction. In this region, surface weather systems predominantly travel from west to east, guided by either the sub-tropical or polar jet streams. The resulting surface transport winds associated with these systems will generally have a western component with additional southern components in the summer and northern components in the winter, although, on any given day, winds can blow from any direction.

Discussions regarding this factor will show representative wind roses for several locations in-and-around Ohio. The regional nature of mid-latitude wind distributions may best be represented by the Columbus and Dayton airport wind roses. Columbus and Dayton are located in a relatively flat area in the central part of the State, generally unaffected by significant orographic or other surface features (e.g., Lake Erie).

These general wind patterns can be modified by two general geographic features. Ohio is bounded on the north by Lake Erie which can provide localized modifications to the general flow, primarily by the introduction of land breezes and lake breezes along the Lake during periods of low synoptic wind speeds. These effects would best be represented by the Toledo and Cleveland airport wind roses.

The second major geographic feature affecting winds in Ohio is the hilly terrain located in the east, south and southeast portions of the State. While the remainder of the State is primarily agricultural, these portions of the State, which represent the foot hills of the Appalachians, have significant forested areas which modify the surface roughness lengths and can impact wind speed and wind direction. The Covington, Huntington and Pittsburgh airport wind roses best illustrate the range of deviations that can occur.

As stated above, at any location within the State, winds can blow from any direction. Any given period could have average winds from any direction, thus making counties in all directions from the urban industrial core area potentially important emission source areas.

### **Factor 4: Topography and Land Use/Land Cover**

The topography and land use/land cover analysis looks at physical features and land use or cover that might have an effect on the airshed and, therefore, the distribution of pollutants over an area. Ohio does not have significant topographic features that significantly influence the distribution of SO<sub>2</sub> concentrations within the areas. Tables

presented under this factor show the land use/land cover for each county in percentage of urban (residential, commercial, industrial, transportation, grasses), cropland, pasture, forest, and wetlands (all types). Maps for this section are provided in Appendix D. The sources for the information provided in this section are:

Ohio Department of Natural Resources, Division of Soil and Water  
<http://www.dnr.state.oh.us/default/soils/surveysupplements/tabid/17839/Default.aspx>

Ohio Department of Development, Office of Strategic Research  
<http://www.odod.state.oh.us/research/files/s0.htm>

### ***Factor 5: Jurisdictional Boundaries***

The analysis of jurisdictional boundaries looks at the planning and organizational structure of an area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner. Core Based Statistical Areas (CBSAs), comprised of Metropolitan Statistical Areas (MSAs) and Combined Statistical Areas (CSAs), boundaries were considered for these recommendations. Maps showing the CBSAs, MSAs and CSAs in Ohio and a Metropolitan Planning Organizations (MPO) map are provided in Appendix E. For information on the MPOs referenced in this document, please see: <http://www.odotnet.net/Planning/ACCESS%20OHIO/Final/AppendixB.pdf>.

### ***Organization of this Document***

Ohio EPA's analysis below is divided into three sections for all of Ohio. Section 1 is comprised of all counties containing a monitor showing violations. To support the boundary recommendations, analyses of the factors (described above) is included in this document. Section 2 is comprised of all counties containing a monitor(s) showing no violations. Section 3 is for all counties without a monitor and is further divided into two sections. Section 3A is counties that may necessitate additional modeling in the future as part of Ohio's Infrastructure SIP. Section 3B is for counties that do not necessitate additional modeling due to low SO<sub>2</sub> emissions, as discussed above.

**Section 1**

**Counties Containing Violating SO<sub>2</sub> Monitors**

**Recommended Nonattainment**

***Cuyahoga County***

## Recommended Nonattainment Boundary: Cuyahoga County

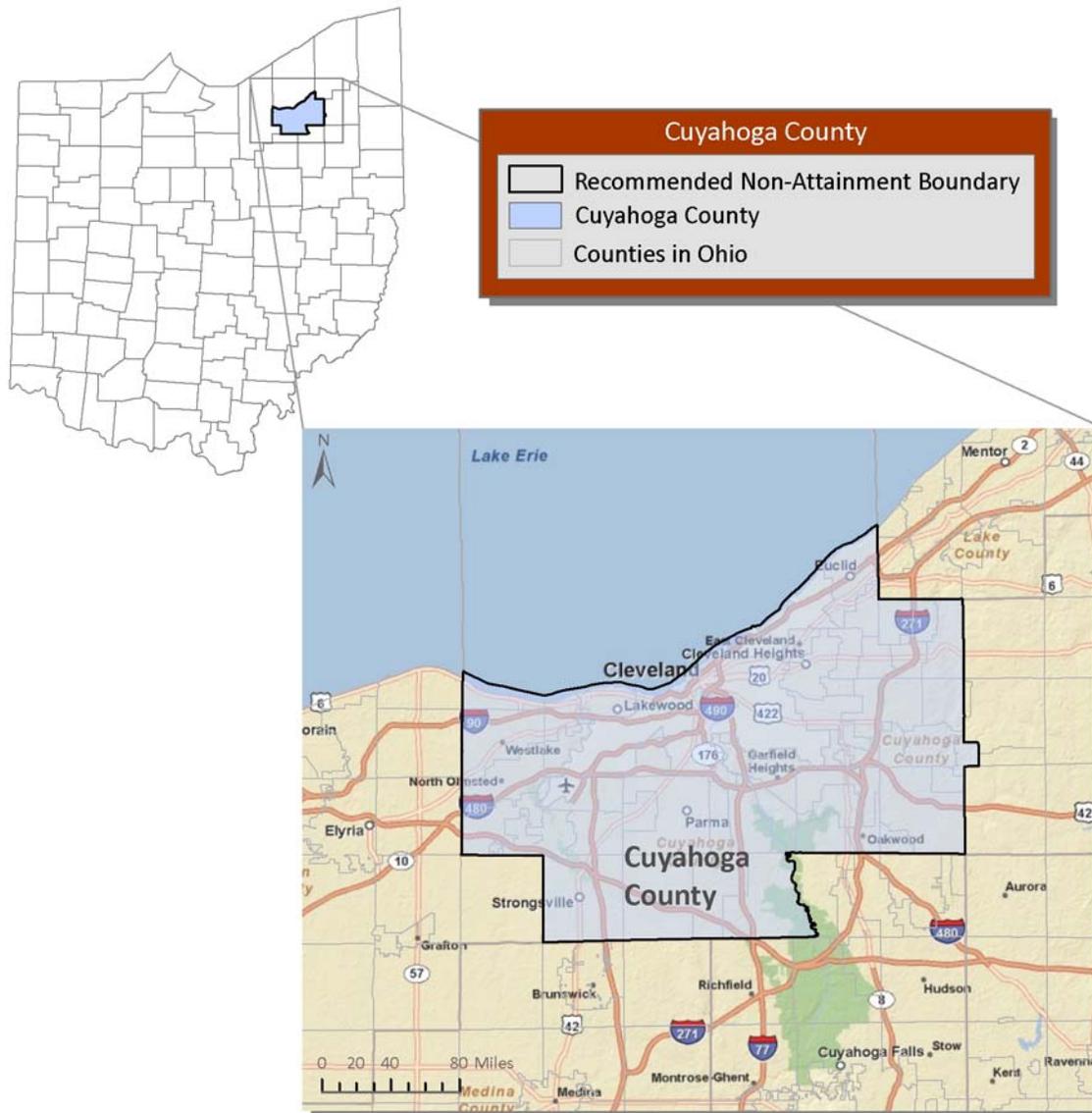


Figure 3: Recommended Nonattainment Boundary for Cuyahoga County

### Discussion:

Ohio EPA is recommending nonattainment of Cuyahoga County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Cuyahoga County contains four monitors, of which one is violating for the 2008 to 2010 air quality period. Monitors to the south and southeast of

the violating monitors are significantly below the standard, indicating this is likely a more localized issue. As seen under Table 2 below, there are 95,733.32 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor. There are 9,344 TPY of SO<sub>2</sub> emissions within Cuyahoga County, representing 9.8% of the emissions within 50 km. The majority of emissions, 61.3% or 58,671 TPY, are from Lake County. Lake County is also being recommended as nonattainment due to a violating monitor. In addition, Lorain County contributes 24.1%, or 23,089 TPY, of the SO<sub>2</sub> emissions. The majority of these emissions are from one source, the Avon Lake power plant. Avon Lake is located northwest of the violating monitor while winds in Cuyahoga County are predominantly from the southwest. Lorain County does not contain a monitor and is being recommended as unclassifiable. Additional modeling may be necessitated under Ohio's Infrastructure SIP. Ohio EPA does not believe emissions outside of Cuyahoga County are a significant contributor to Cuyahoga's nonattainment indicative in the fact that only one localized monitor is violating. It would be expected that if emissions from surrounding counties were significantly contributing to nonattainment in Cuyahoga County, all monitors would see impacts. Ohio EPA believes the violating monitor is impacted by more localized sources.

As indicated in Figure 5 below, the majority of sources are located within the City of Cleveland area, where the monitors are located, although more significant emissions are located throughout the 50 km radius as discussed above.

**Factor 1: Air Quality Data**

**Table 1: Cuyahoga County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Cuyahoga                           | 39-035-0038 | 81                    | 60   | 76   | 72                  |
|                                    | 39-035-0045 | 43                    | 50   | 38   | 44                  |
|                                    | 39-035-0060 | 70                    | 83   | 75   | <b>76</b>           |
|                                    | 39-035-0065 | 50                    | 25   | 25   | 33                  |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

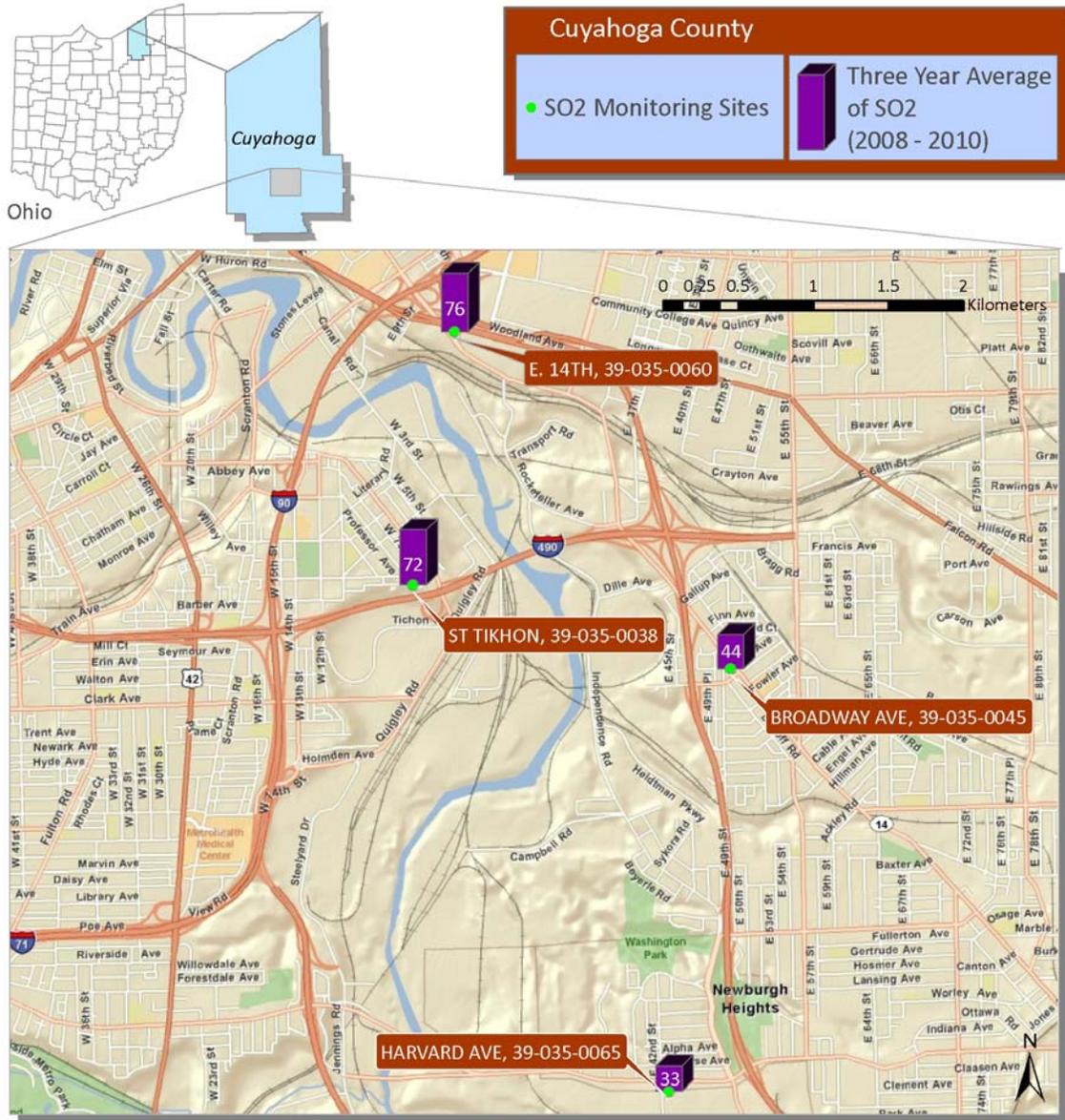


Figure 4: Cuyahoga County SO<sub>2</sub> Monitor Locations and Site ID Numbers

## Factor 2: Emissions

There are 95,733.32 TPY of actual SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

**Table 2: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Cuyahoga County Violating Monitors**

| State | County   | Facility ID | Facility Name   | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|----------|-------------|---|--------------------------------------|----------------------------|
| OH    | Cuyahoga | 1318000250  | Cleveland Electric Illuminating Co., Lake Shore Plant | 4582.10                              | 5.7                        |
| OH    | Cuyahoga | 1318003060  | The Medical Center Company                            | 2203.14                              | 4.8                        |
| OH    | Cuyahoga | 1318000250  | Cleveland Thermal LLC                                 | 1331.85                              | 1.0                        |
| OH    | Cuyahoga | 1318001610  | ArcelorMittal Cleveland Inc.                          | 718.09                               | 4.8                        |
| OH    | Cuyahoga | 1318270380  | DiGeronimo Aggregates LLC                             | 406.98                               | 15.1                       |
| OH    | Cuyahoga | 1318120180  | Ford Motor Company, Cleveland Casting Plant           | 64.87                                | 15.2                       |
| OH    | Cuyahoga | 1318171620  | Charter Steel - Cleveland Inc                         | 60.91                                | 5.7                        |
| OH    | Cuyahoga | 1318172480  | Southerly Wastewater Treatment Center                 | 34.27                                | 7.7                        |
| OH    | Cuyahoga | 1318958480  | Independence Recycling, Inc.                          | 2.42                                 | 1.6                        |
| OH    | Cuyahoga | 1318247810  | Cuyahoga Regional Sanitary Landfill                   | 2.18                                 | 21.0                       |
| OH    | Cuyahoga | 1318538150  | MM Cuyahoga Energy LLC                                | 0.37                                 | 20.7                       |
| OH    | Cuyahoga | 1318001170  | NASA John H. Glenn Research Center - Lewis Field      | 0.30                                 | 15.4                       |
| OH    | Cuyahoga | 1318170310  | ALCOA-Cleveland Works                                 | 0.29                                 | 5.3                        |
| OH    | Cuyahoga | 1318120180  | Ford Motor Company, Cleveland Engine Plants           | 0.23                                 | 15.4                       |
| OH    | Cuyahoga | 1318281220  | GrafTech International Holdings Inc.                  | 0.23                                 | 7.8                        |
| OH    | Cuyahoga | 1318202140  | The Lincoln Electric Company                          | 0.16                                 | 17.4                       |
| OH    | Cuyahoga | 1318247720  | BFI - Glenwillow Landfill                             | 0.15                                 | 23.5                       |
| OH    | Cuyahoga | 1318002700  | Sunoco Partners Marketing & Terminals LP              | 0.14                                 | 4.7                        |
| OH    | Cuyahoga | 1318002970  | MetroHealth Medical Center                            | 0.11                                 | 3.8                        |
| OH    | Cuyahoga | 1318001620  | SIFCO Forge Group, Inc.                               | 0.06                                 | 4.0                        |
| OH    | Cuyahoga | 1318000100  | PPG Industries, Inc. - Cleveland                      | 0.05                                 | 10.1                       |
| OH    | Cuyahoga | 1318451030  | General Motors LLC - Parma Plant                      | 0.05                                 | 11.3                       |
| OH    | Cuyahoga | 1318394000  | Southwest General Health Center                       | 0.03                                 | 18.4                       |
| OH    | Cuyahoga | 1318617350  | USG Interiors, Inc., American Metals Corp., Westlake  | 0.03                                 | 22.7                       |
| OH    | Cuyahoga | 1318030170  | Hukill Chemical Corporation                           | 0.02                                 | 19.1                       |
| OH    | Cuyahoga | 1318170170  | Angstrom Graphics Midwest, Inc.                       | 0.01                                 | 4.0                        |

| State                 | County   | Facility ID | Facility Name                                       | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|-----------------------|----------|-------------|---|--------------------------|----------------------------|
| OH                    | Cuyahoga | 1318226140  | Automated Packaging Systems                         | 0.01                     | 10.8                       |
| OH                    | Cuyahoga | 1318000130  | Cleveland Public Power - Service Center             | <0.00                    | 2.9                        |
| OH                    | Cuyahoga | 1318000840  | Manufacturers Plating Company, Inc.                 | <0.00                    | 4.4                        |
| OH                    | Cuyahoga | 1318000130  | Cleveland Public Power - Collinwood Substation      | <0.00                    | 11.5                       |
| <b>Cuyahoga Total</b> |          |             |   | <b>9344.19</b>           |                            |
| OH                    | Lake     | 0243160009  | CLEVELAND ELECTRIC ILLUMINATING CO., EASTLAKE PLANT | 50519.40                 | 28.4                       |
| OH                    | Lake     | 0243110008  | PAINESVILLE MUNICIPAL ELECTRIC PLANT                | 7211.41                  | 43.9                       |
| OH                    | Lake     | 0243030257  | Carmeuse Lime, Inc - Grand River Operations         | 910.00                   | 43.7                       |
| OH                    | Lake     | 0243000024  | The Lubrizol Corporation                            | 22.94                    | 42.2                       |
| OH                    | Lake     | 0243150025  | The Lubrizol Corporation - Wickliffe Facility       | 6.72                     | 21.8                       |
| OH                    | Lake     | 0243111362  | Avery Dennison STD, Bldg 5                          | 0.06                     | 44.1                       |
| OH                    | Lake     | 0243111361  | Avery Dennison MFD, Bldg 7                          | 0.02                     | 44.1                       |
| OH                    | Lake     | 0243081207  | CFF of Avery Dennison                               | 0.02                     | 40.2                       |
| OH                    | Lake     | 0243001188  | Marking Films Div. of Avery Dennison Building #11   | 0.02                     | 47.5                       |
| OH                    | Lake     | 0243111416  | Avery Dennison PFF, Bldg 3                          | 0.01                     | 44.1                       |
| <b>Lake Total</b>     |          |             |   | <b>58670.60</b>          |                            |
| OH                    | Lorain   | 0247030013  | Avon Lake Power Plant                               | 22598.10                 | 25.9                       |
| OH                    | Lorain   | 0247100408  | OBERLIN COLLEGE                                     | 467.85                   | 50.6                       |
| OH                    | Lorain   | 0247000760  | BFI - Lorain County Facilities                      | 8.16                     | 46.3                       |
| OH                    | Lorain   | 0247080229  | Republic Engineered Products, Inc                   | 5.42                     | 38.5                       |
| OH                    | Lorain   | 0247100968  | Lorain County LFG Power Station                     | 5.38                     | 46.8                       |
| OH                    | Lorain   | 0247050278  | Ross Incineration Services, Inc.                    | 2.89                     | 34.9                       |
| OH                    | Lorain   | 0247080961  | Lorain Tubular Company LLC                          | 0.54                     | 38.2                       |
| OH                    | Lorain   | 0247080049  | EDGEWATER PLANT                                     | 0.50                     | 42.4                       |
| OH                    | Lorain   | 0247030471  | Ford Motor Company - Ohio Assembly Plant            | 0.31                     | 32.4                       |
| OH                    | Lorain   | 0247040014  | Elyria Foundry                                      | 0.10                     | 39.2                       |

| State                | County  | Facility ID | Facility Name                                     | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|----------------------|---------|-------------|---|--------------------------|----------------------------|
| OH                   | Lorain  | 0247100320  | Oberlin Municipal Light & Power System            | 0.09                     | 50.7                       |
| OH                   | Lorain  | 0247040195  | BASF Catalysts, LLC                               | 0.06                     | 37.8                       |
| OH                   | Lorain  | 0247040822  | 3M Elyria   | 0.02                     | 40.5                       |
| <b>Lorain Total</b>  |         |             |   | <b>23089.42</b>          |                            |
| OH                   | Medina  | 1652050040  | Owens Corning Roofing and Asphalt, LLC            | 72.79                    | 43.4                       |
| OH                   | Medina  | 1652050060  | 3M Medina   | 0.01                     | 44.3                       |
| <b>Medina Total</b>  |         |             |   | <b>72.80</b>             |                            |
| OH                   | Portage | 1667040090  | Kent State University Heating Plant               | 0.29                     | 48.8                       |
| OH                   | Portage | 1667040020  | Schneller LLC                                     | 0.02                     | 48.6                       |
| <b>Portage Total</b> |         |             |   | <b>0.31</b>              |                            |
| OH                   | Summit  | 1677010760  | Akron Thermal Energy Corporation                  | 2244.44                  | 48.2                       |
| OH                   | Summit  | 1677010030  | Cargill, Incorporated - Salt Division (Akron, OH) | 1437.72                  | 51.0                       |
| OH                   | Summit  | 1677010030  | Emerald Performance Materials, LLC                | 872.37                   | 50.9                       |
| OH                   | Summit  | 1677010980  | Akron Regional Landfill Inc                       | 1.20                     | 39.4                       |
| OH                   | Summit  | 1677010190  | Goodyear Tire & Rubber Co.                        | 0.20                     | 50.1                       |
| OH                   | Summit  | 1677110030  | Morgan Adhesives Company (MACTac)                 | 0.04                     | 39.0                       |
| OH                   | Summit  | 1677010090  | The University of Akron                           | 0.02                     | 48.4                       |
| OH                   | Summit  | 1677000110  | Pechiney Plastic Packaging Inc                    | 0.01                     | 40.0                       |
| <b>Summit Total</b>  |         |             |   | <b>4556.00</b>           |                            |
| <b>Grand Total</b>   |         |             |   | <b>95733.32</b>          |                            |

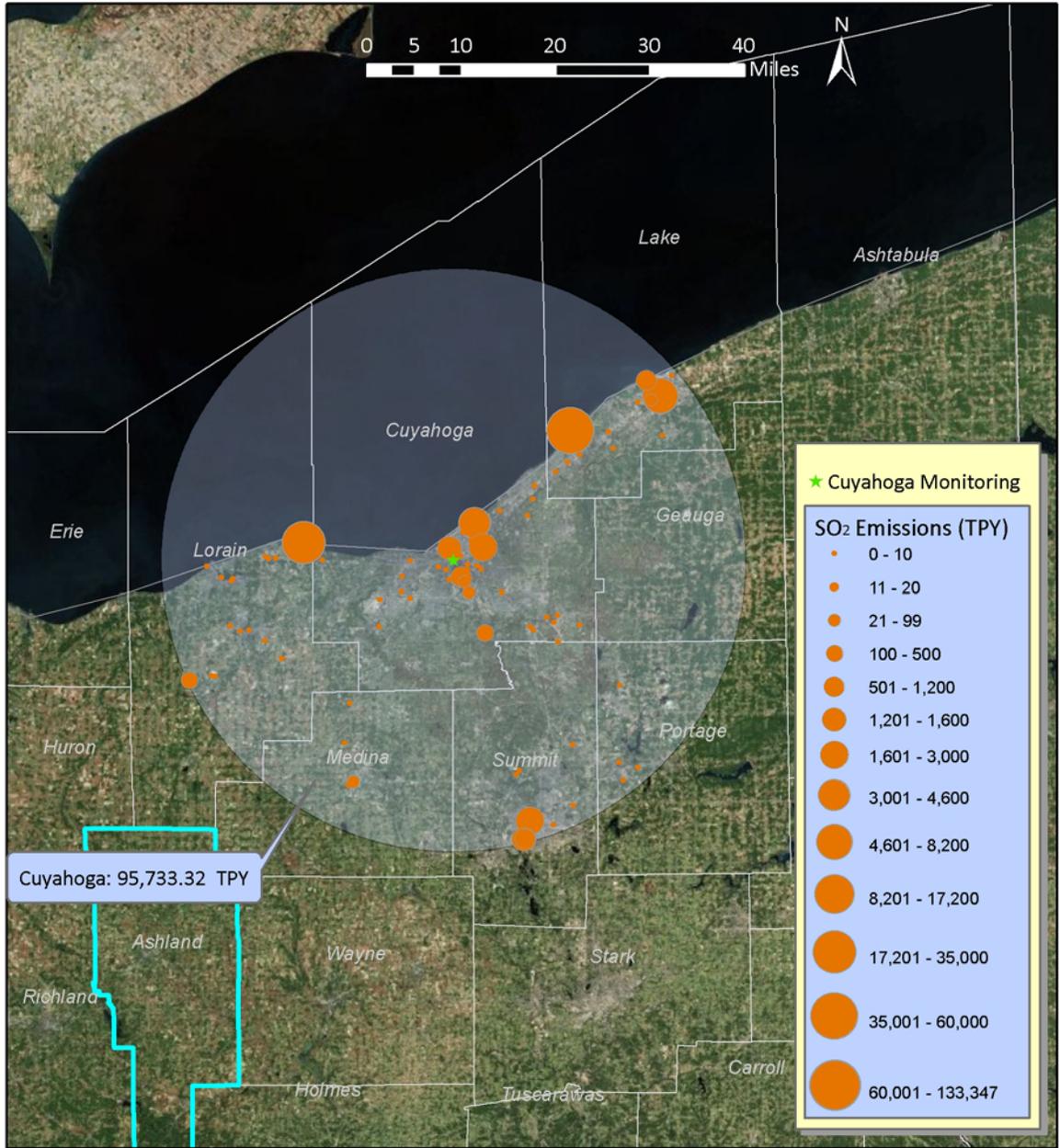


Figure 5: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Cuyahoga County Violating Monitor

### Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Cuyahoga County.

Ohio is bounded on the north by Lake Erie which can provide localized modifications to the general wind pattern, primarily by the introduction of land breezes and sea breezes along the Lake during periods of low synoptic wind speeds. Sea breezes typically form

during the day as surface winds blow from water to land. Land breezes typically form during the evening as surface winds blow from land to water. These effects would best be represented by the Toledo and Cleveland airport wind roses.

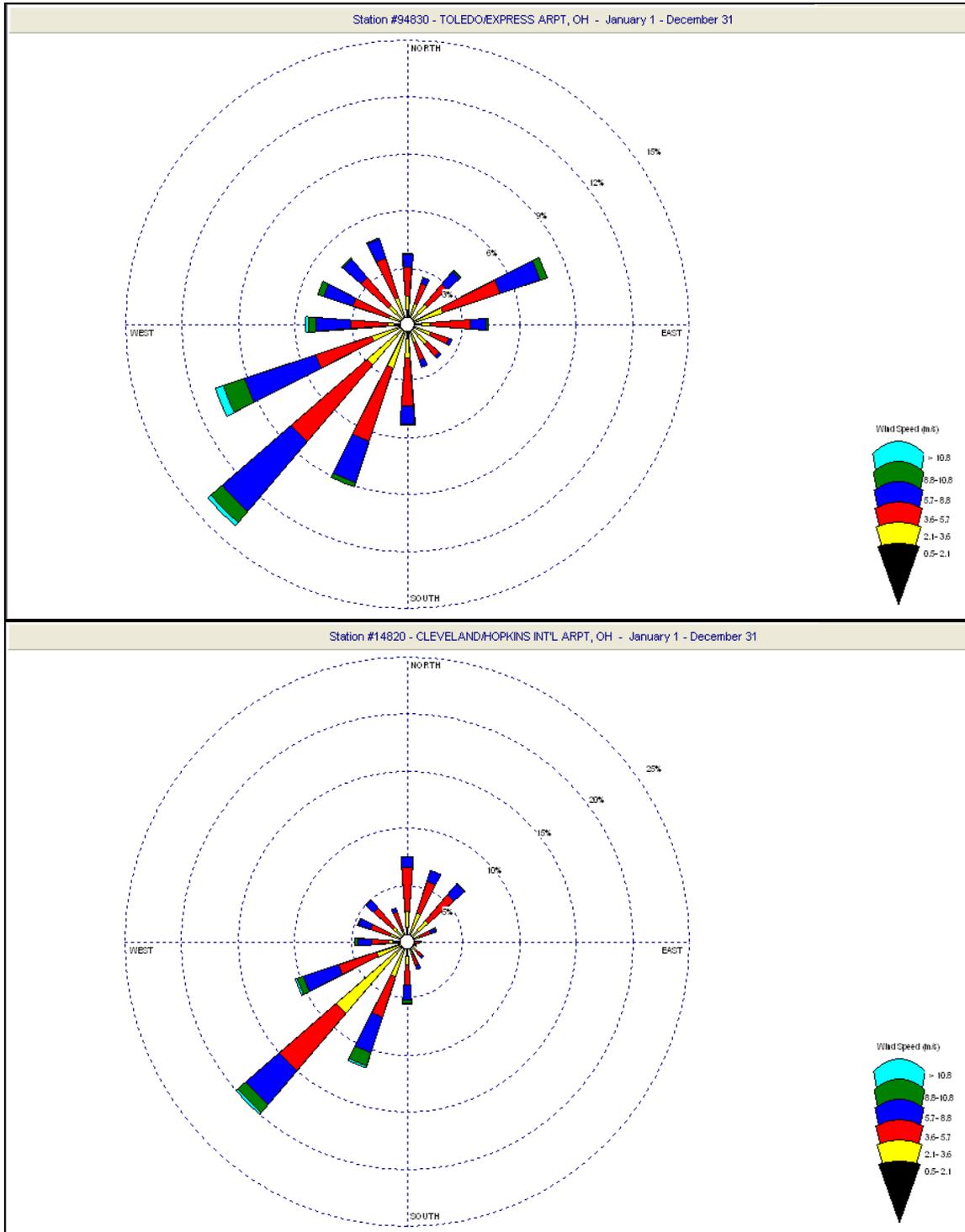


Figure 6: Cuyahoga County Wind Roses

#### Factor 4: Topography and Land Use/Land Cover

Cuyahoga County is located within two physiographic provinces: the glaciated Allegheny Plateau of the Appalachian Plateaus Province on the south and east and the Huron-Erie Lake Plains and Till Plains sections of the Central Lowland Province on the west and north (see Appendix E). The shore of Lake Erie is 569 feet above sea level. The City of Cleveland lies on a series of irregular bluffs lying roughly parallel to the lake. The land rises quickly from the lakeshore with an elevation of 791 feet above sea level at the Hopkins Airport five miles inland from the lake.

As shown in the following pie chart, the land use/land cover in Cuyahoga County, as expected is predominately residential, commercial and industrial.

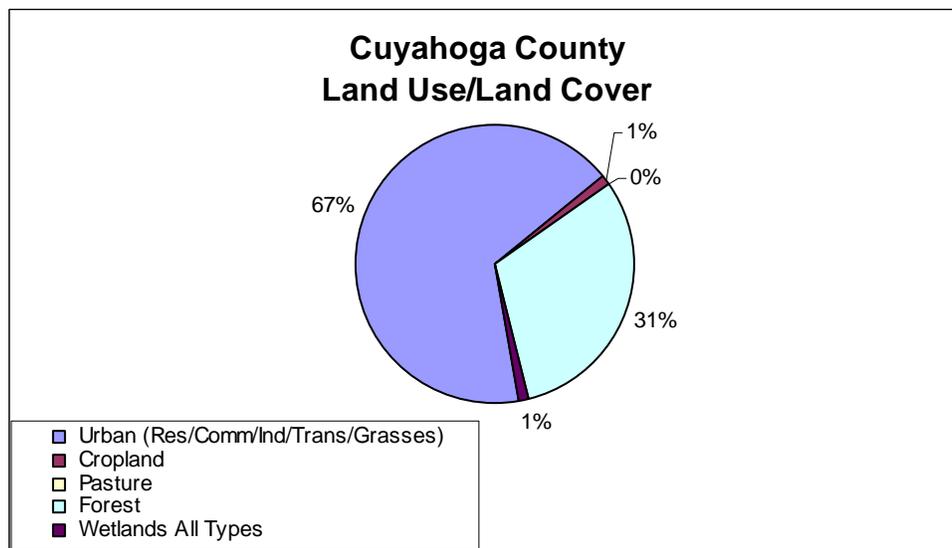


Figure 7: Cuyahoga County Land Use/Land Cover

The Cuyahoga County area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

#### Factor 5: Jurisdictional Boundaries

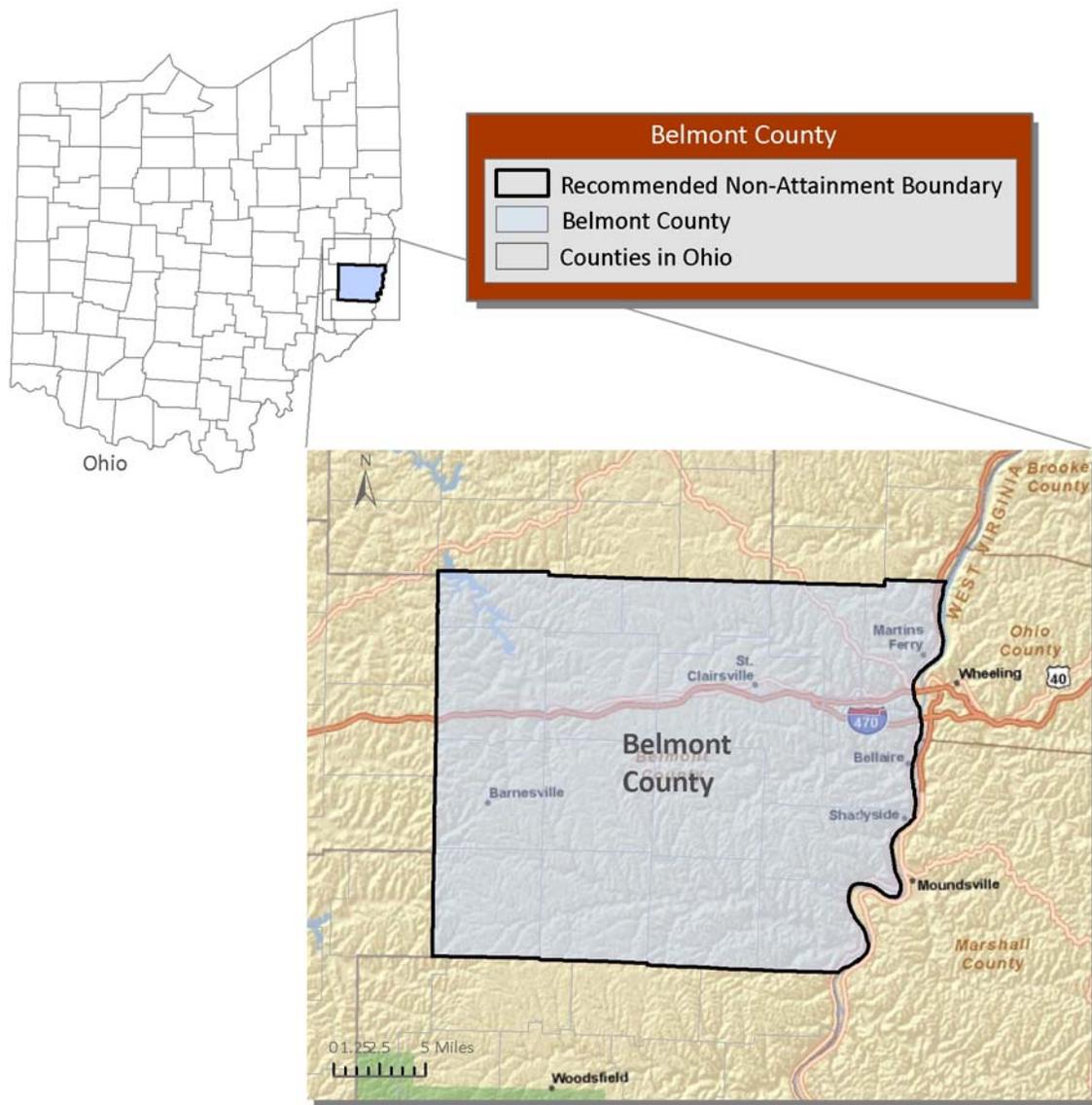
The Cleveland-Elyria-Mentor, OH MSA includes Cuyahoga, Geauga, Lake, Lorain and Medina Counties in Ohio. The principal cities are Cleveland, Elyria and Mentor. The CSA also includes Ashtabula, Portage and Summit Counties.

The Ohio EPA Central Office and Cleveland Division of Air Quality are responsible for air quality planning within all areas of Cuyahoga County. The Northeast Ohio Areawide coordinating Agency (NOACA) is the planning agency designated as the Metropolitan Planning Organization for the greater Cleveland area. The NOACA region is composed

of five counties: Cuyahoga, Geauga, Lake, Lorain, and Medina. The Akron Metropolitan Area Transportation Study (AMATS) is the planning agency designated as the MPO for the Akron area. The AMATS region is composed of two counties: Summit and Portage.

***Belmont County***

## Recommended Nonattainment Boundary: Belmont County



**Figure 8: Recommended Nonattainment Boundary for Belmont County**

### Discussion:

Ohio EPA is recommending nonattainment of Belmont County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Belmont County contains one monitor, which is violating for the 2008 to 2010 air quality period. As seen under Table 4 below, there are 51,662.17

TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor. There are 15,126 TPY of SO<sub>2</sub> emissions within Belmont County, representing 29.3% of the emissions within 50 km. The majority of emissions, 66.0% or 34,095 TPY, are within Jefferson County. Jefferson County is also being recommended as nonattainment due to a violating monitor.

As indicated in Figure 10 below, the majority of sources are to the north or south of Shadyside, Ohio, where the monitor is located, along the Ohio River.

**Factor 1: Air Quality Data**

**Table 3: Belmont County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Belmont                            | 39-013-3002 | 105                   | 74   | 62   | 80                  |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

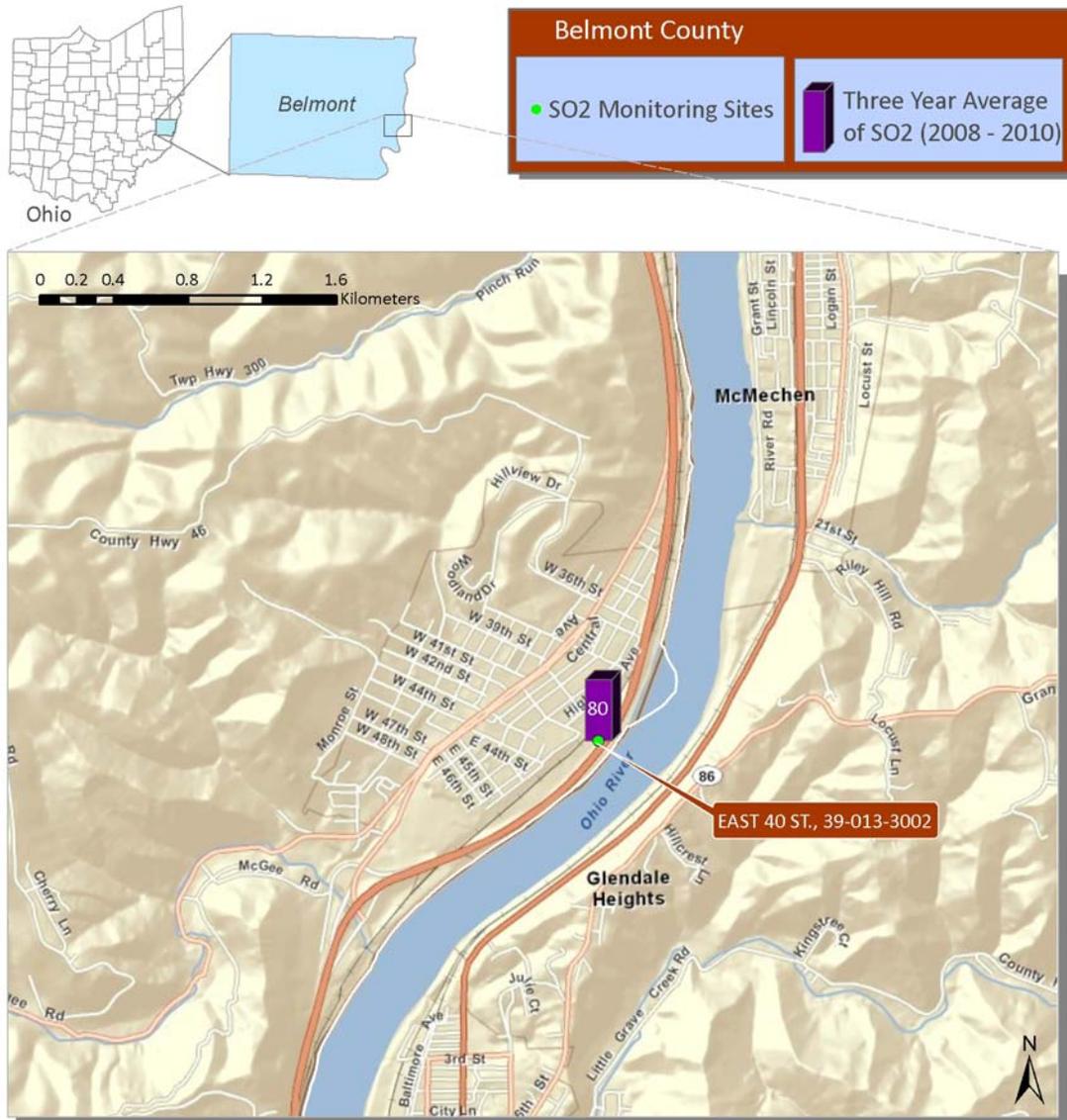


Figure 9: Belmont County SO<sub>2</sub> Monitor Locations and Site ID Numbers

## Factor 2: Emissions

There are 51,662.17 TPY of actual SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

**Table 4: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Belmont County Violating Monitor**

| State                  | County    | Facility ID | Facility Name                                     | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|------------------------|-----------|-------------|---|--------------------------------------|----------------------------|
| OH                     | Belmont   | 0607130015  | R. E. BURGER PLANT                                | 15126.00                             | 6.7                        |
| OH                     | Belmont   | 0607090013  | Severstal Wheeling, Inc.- Martins Ferry           | 0.06                                 | 17.6                       |
| OH                     | Belmont   | 0607090208  | Nickles Bakery of Martins Ferry Inc.              | 0.01                                 | 13.8                       |
| <b>Belmont Total</b>   |           |             |   | <b>15126.07</b>                      |                            |
| OH                     | Jefferson | 0641050002  | Cardinal Power Plant (Cardinal Operating Company) | 33311.90                             | 32.6                       |
| OH                     | Jefferson | 0641090010  | Severstal Wheeling, Inc                           | 699.99                               | 40.9                       |
| OH                     | Jefferson | 0641090234  | Mingo Junction Energy Center, LLC                 | 82.37                                | 40.9                       |
| OH                     | Jefferson | 0641120012  | Severstal Wheeling, Inc - Yorkville Plant         | 0.24                                 | 31.6                       |
| <b>Jefferson Total</b> |           |             |   | <b>34094.50</b>                      |                            |
| OH                     | Monroe    | 0656000001  | Ormet Primary Aluminum Corp.                      | 2441.60                              | 30.5                       |
| <b>Monroe Total</b>    |           |             |   | <b>2441.60</b>                       |                            |
| <b>Grand Total</b>     |           |             |   | <b>51662.17</b>                      |                            |

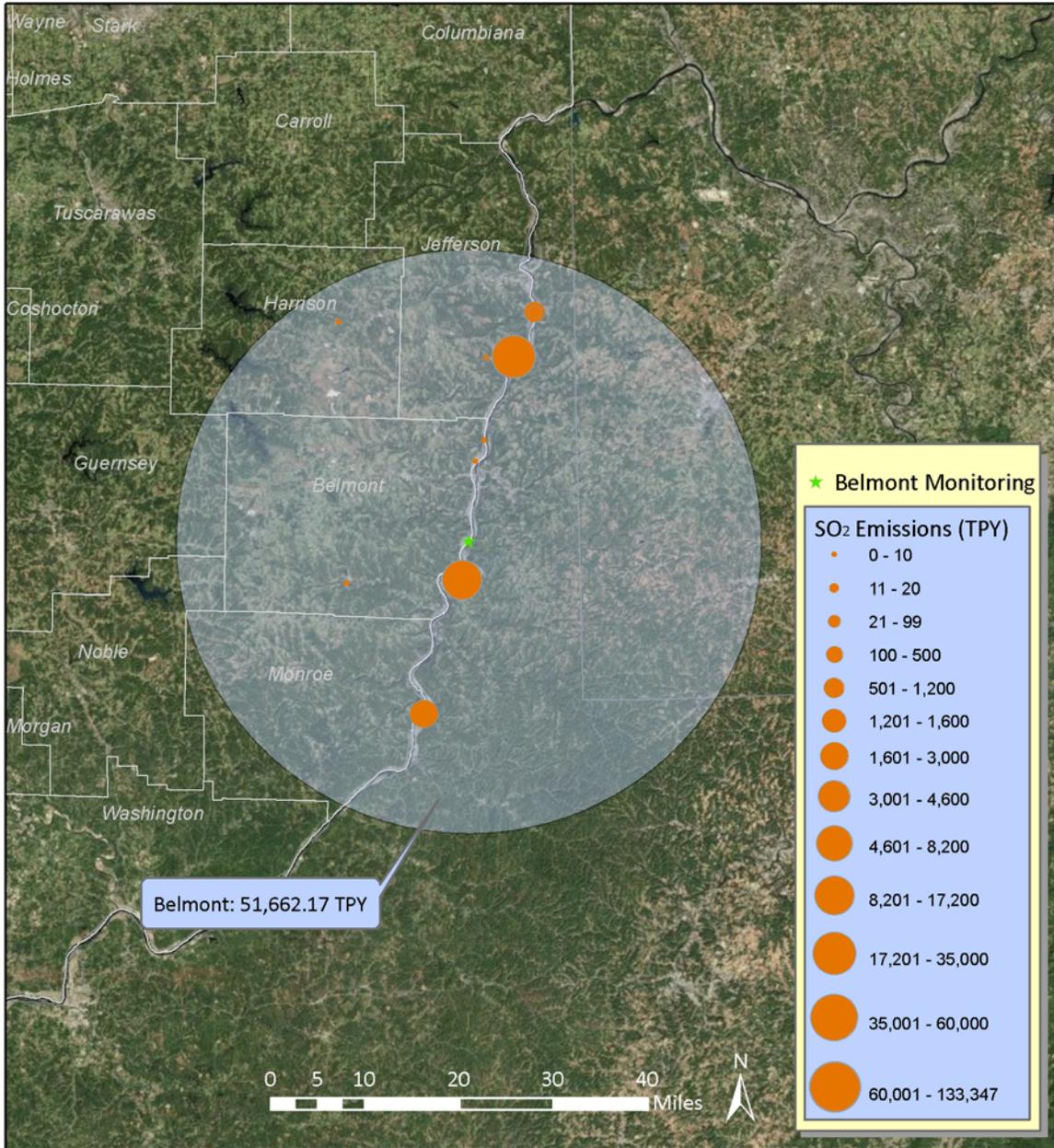


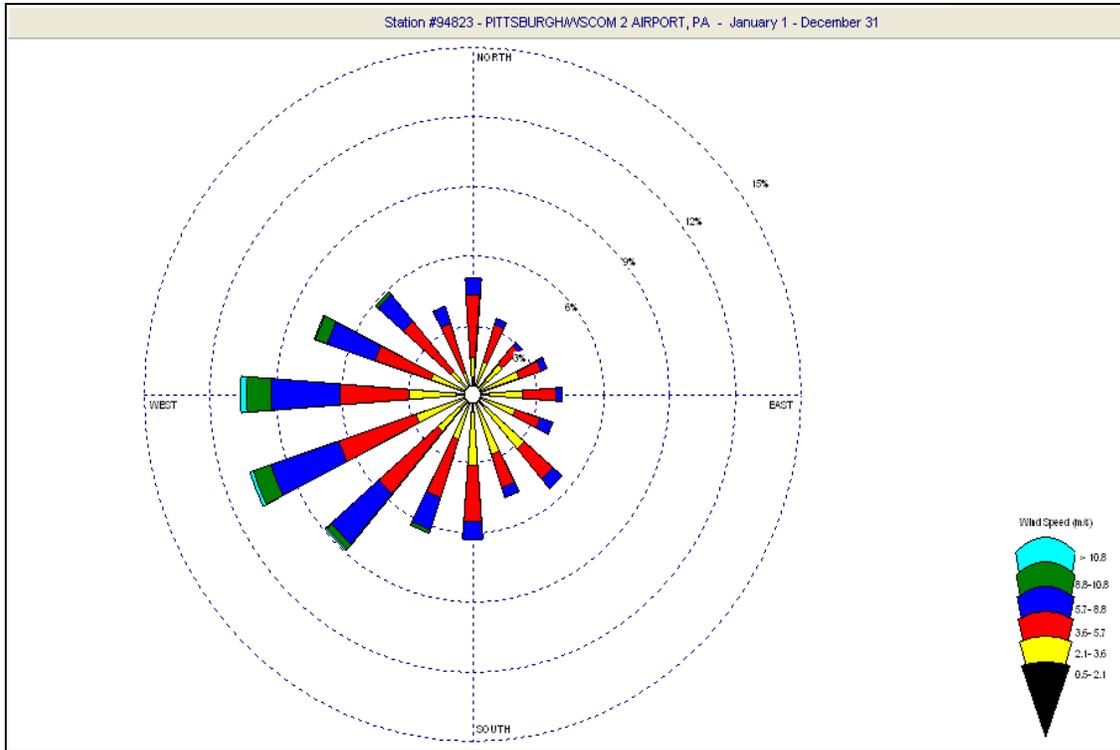
Figure 10: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Belmont County Violating Monitor

### Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Belmont County.

Ohio is bounded on the east by the Ohio River and Appalachian Mountains. During the day, surface winds blow from the bottom of the valley to higher elevations creating a

valley breeze; however, during the evening, a mountain breeze forms as surface winds blow from higher elevations down in to the valley. The valleys also experience nighttime inversions which can influence wind patterns. These effects would best be represented by the Pittsburgh International airport wind rose.

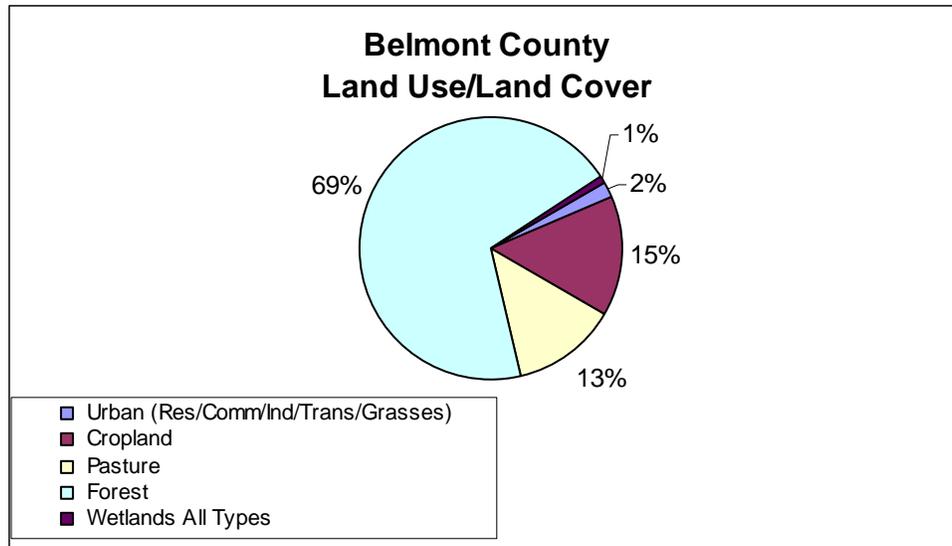


**Figure 11: Belmont County Wind Rose**

**Factor 4: Topography and Land Use/Land Cover**

Belmont County is located within one physiographic province: the Marietta Plateau to the west and the Little Switzerland Plateau to the east of the Allegheny Plateaus (see Appendix E). Belmont County is bordered to the east by the Ohio River. The highest elevation in the County is 1,397 ft. at Galloway’s Knob near St. Clairsville. The lowest elevation is 625 ft, the normal pool elevation of the Ohio River.

As shown in the following pie chart, the land use/land cover in Belmont County is predominately forested.



**Figure 12: Belmont County Land Use/Land Cover**

The Belmont County area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from any these analyses.

**Factor 5: Jurisdictional Boundaries**

The Wheeling, WV-OH MSA includes: Marshall and Ohio Counties in West Virginia and Belmont County in Ohio. The principal city is Wheeling, WV. There is no CSA for this area.

The Ohio EPA Central Office and Southeast District Office are responsible for air quality planning within all areas of Belmont County. The Bel-O-Mar Regional Council and Interstate Planning Commission is the planning agency designated as the Metropolitan Planning Organization for the greater Wheeling area. The Bel-O-Mar region is composed of Belmont County in Ohio as well as both Ohio and Marshall Counties in West Virginia.

***Jefferson County***

## Recommended Nonattainment Boundary: Jefferson County

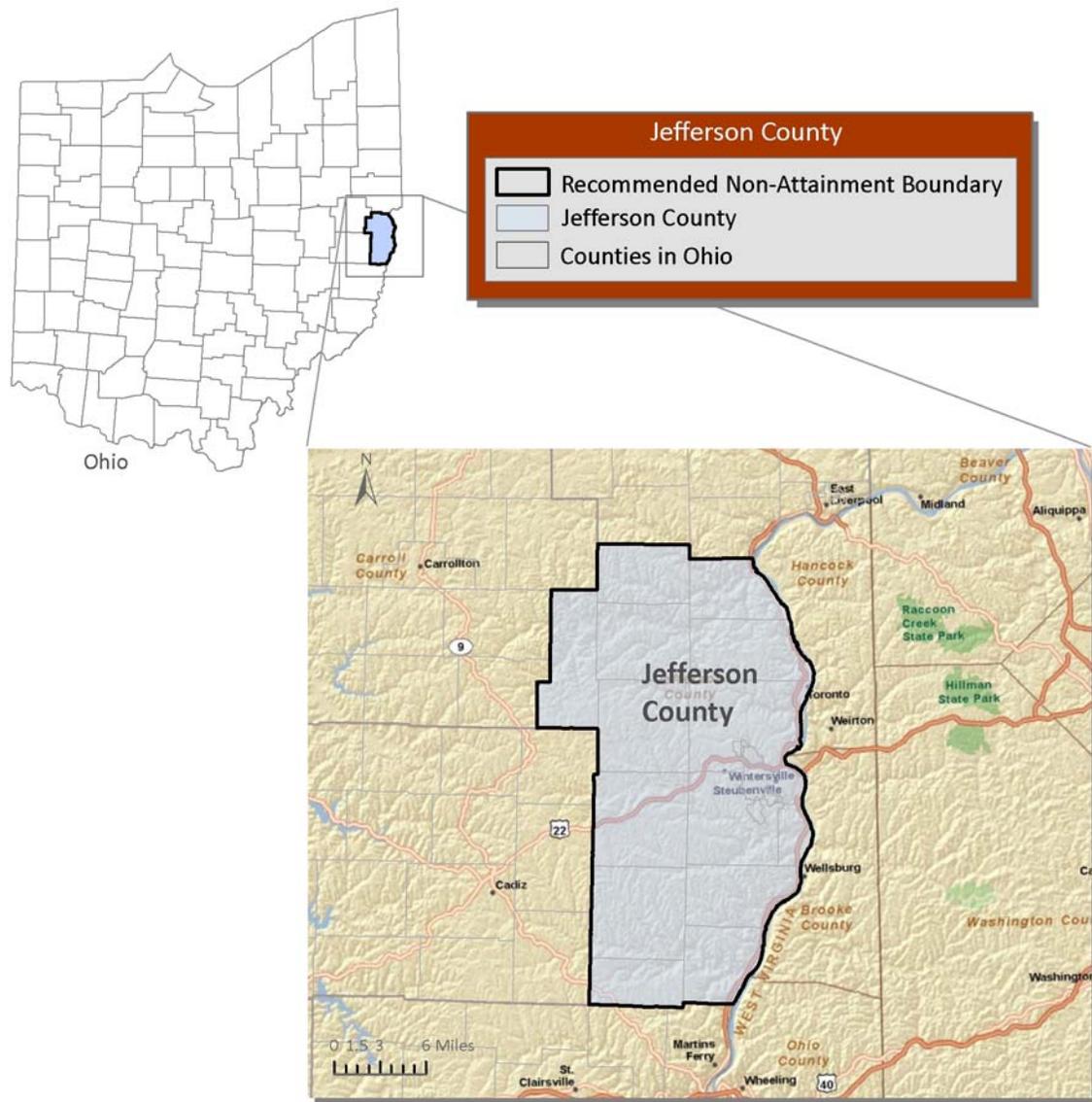


Figure 13: Recommended Nonattainment Boundary for Jefferson County

### Discussion:

Ohio EPA is recommending nonattainment of Jefferson County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Jefferson County contains one monitor which is violating for the 2008 to 2010 air quality period. As seen under Table 6 below, there are 136,293.62 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

There are 136,289.77 TPY of SO<sub>2</sub> emissions within Jefferson County, representing >99% of the emissions within 50 km.

As indicated in Figure 15 below, the majority of sources are to the north or south of Steubenville, Ohio, where the monitor is located, along the Ohio River.

**Factor 1: Air Quality Data**

**Table 5: County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Jefferson                          | 39-081-0017 | 135                   | 85   | 127  | 116                 |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

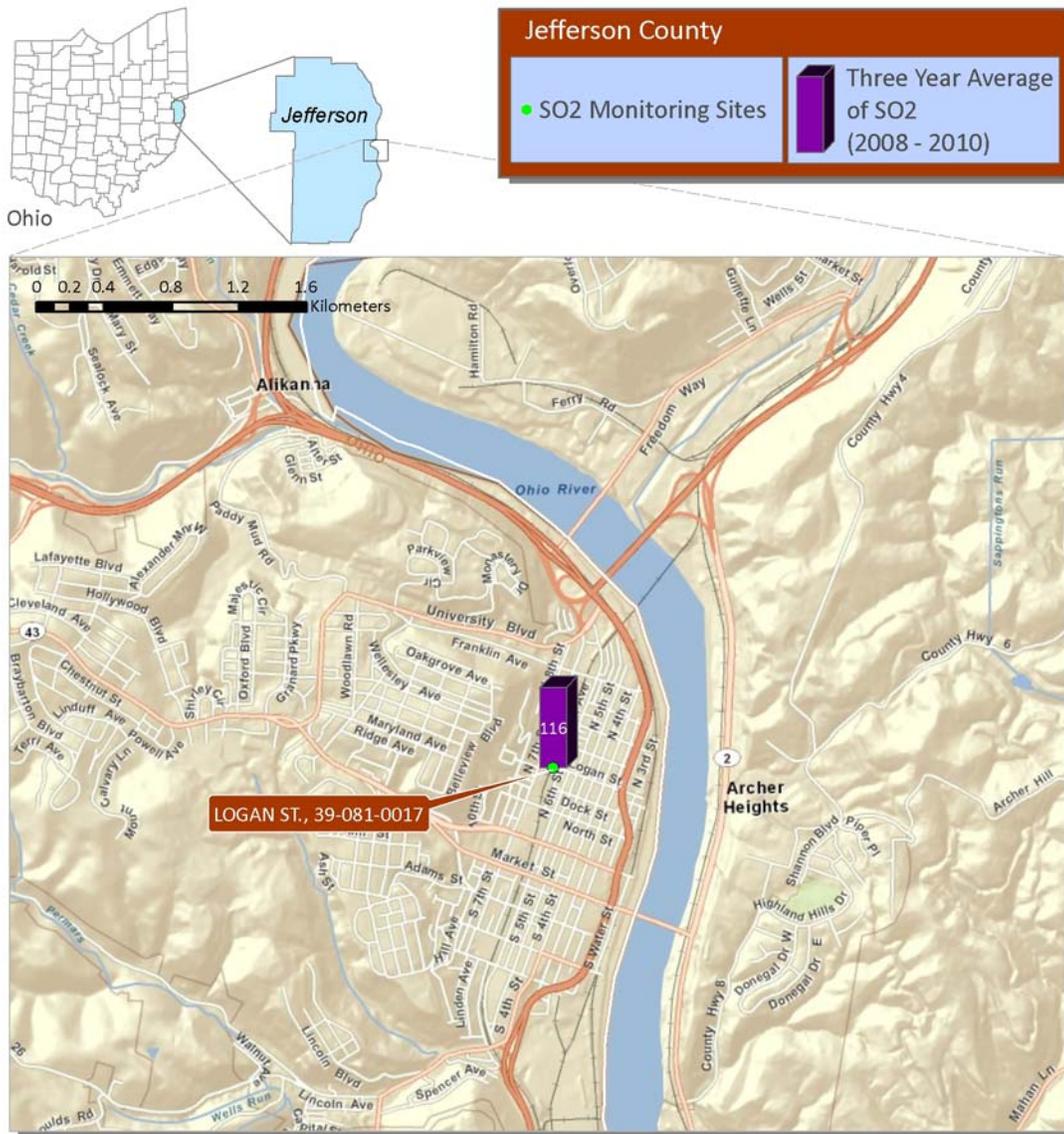


Figure 14: Jefferson County SO<sub>2</sub> Monitor Locations and Site ID Numbers

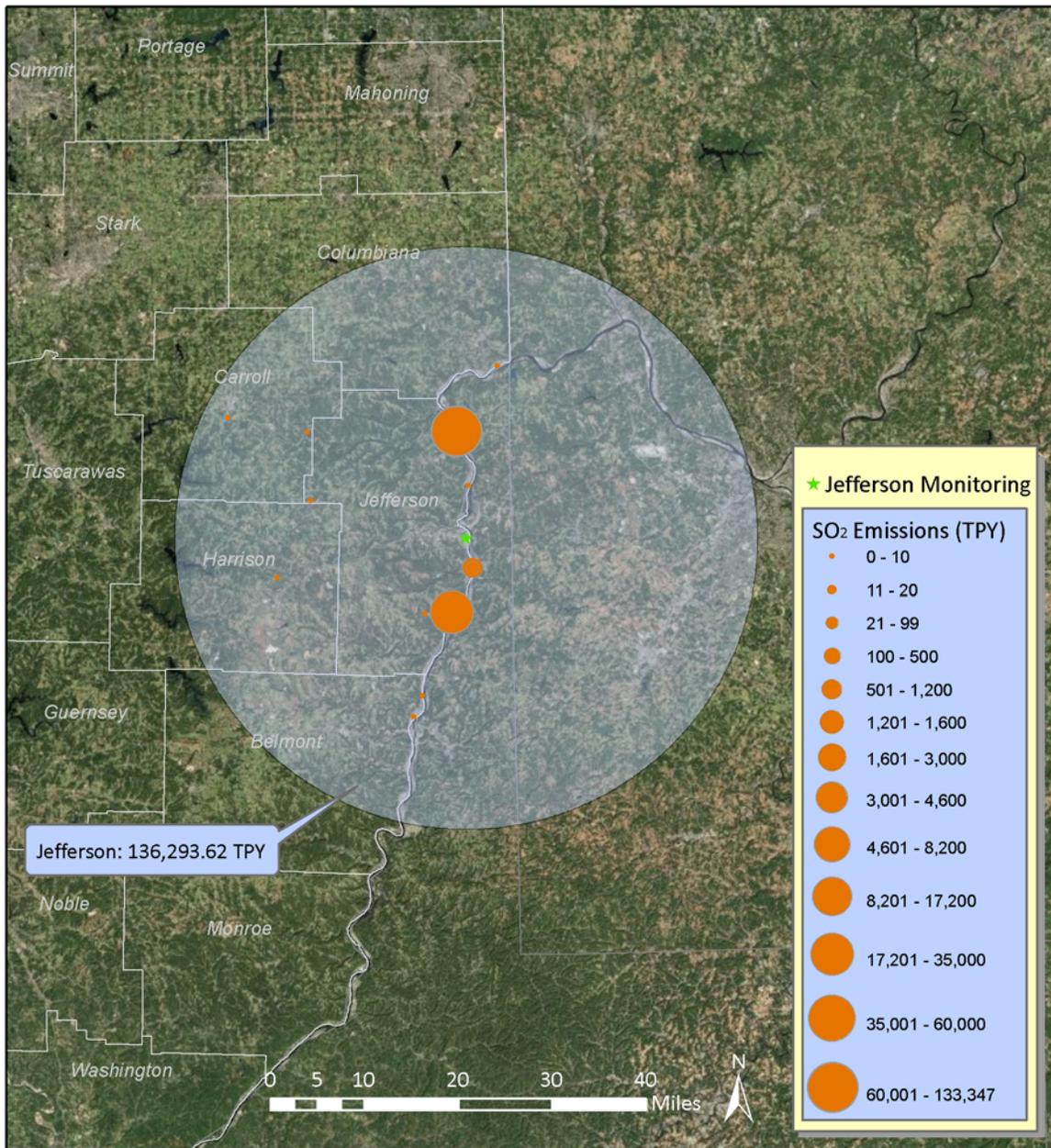
## Factor 2: Emissions

There are 136,293.62 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

Table 6: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Jefferson County Violating Monitor

| State | County  | Facility ID | Facility Name                           | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|---------|-------------|---|--------------------------------------|----------------------------|
| OH    | Belmont | 0607090013  | Severstal Wheeling, Inc.- Martins Ferry | 0.06                                 | 28.1                       |

| State                   | County     | Facility ID | Facility Name                                     | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|-------------------------|------------|-------------|---|--------------------------|----------------------------|
| OH                      | Belmont    | 0607090208  | Nickles Bakery of Martins Ferry Inc.              | 0.01                     | 32.0                       |
| <b>Belmont Total</b>    |            |             |   | <b>0.07</b>              |                            |
| OH                      | Carroll    | 0210000046  | Tennessee Gas Pipeline- Station 214               | 0.22                     | 45.7                       |
| OH                      | Carroll    | 0210000101  | Dominion Transmission-Carroll Station             | 0.01                     | 32.7                       |
| <b>Carroll Total</b>    |            |             |   | <b>0.23</b>              |                            |
| OH                      | Columbiana | 0215020233  | Heritage - WTI, Inc.                              | 3.55                     | 30.0                       |
| <b>Columbiana Total</b> |            |             |   | <b>3.55</b>              |                            |
| OH                      | Jefferson  | 0641160017  | W. H. SAMMIS PLANT                                | 102195.00                | 18.4                       |
| OH                      | Jefferson  | 0641050002  | Cardinal Power Plant (Cardinal Operating Company) | 33311.90                 | 13.0                       |
| OH                      | Jefferson  | 0641090010  | Severstal Wheeling, Inc                           | 699.99                   | 5.3                        |
| OH                      | Jefferson  | 0641090234  | Mingo Junction Energy Center, LLC                 | 82.37                    | 5.3                        |
| OH                      | Jefferson  | 0641120012  | Severstal Wheeling, Inc - Yorkville Plant         | 0.24                     | 14.8                       |
| OH                      | Jefferson  | 0641180064  | Titanium Metals Corporation                       | 0.20                     | 9.0                        |
| OH                      | Jefferson  | 0641000223  | Apex Environmental, LLC - Sanitary Landfill       | 0.07                     | 27.3                       |
| <b>Jefferson Total</b>  |            |             |   | <b>136289.77</b>         |                            |
| <b>Grand Total</b>      |            |             |   | <b>136293.62</b>         |                            |



**Figure 15: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Jefferson County Violating Monitor**

### **Factor 3: Meteorology**

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Jefferson County.

Ohio is bounded on the east by the Ohio River and Appalachian Mountains. During the day, surface winds blow from the bottom of the valley to higher elevations creating a valley breeze; however, during the evening, a mountain breeze forms as surface winds blow from higher elevations down in to the valley. The valleys also

experience nighttime inversions which can influence wind patterns. These effects would best be represented by the Pittsburgh International airport wind rose.

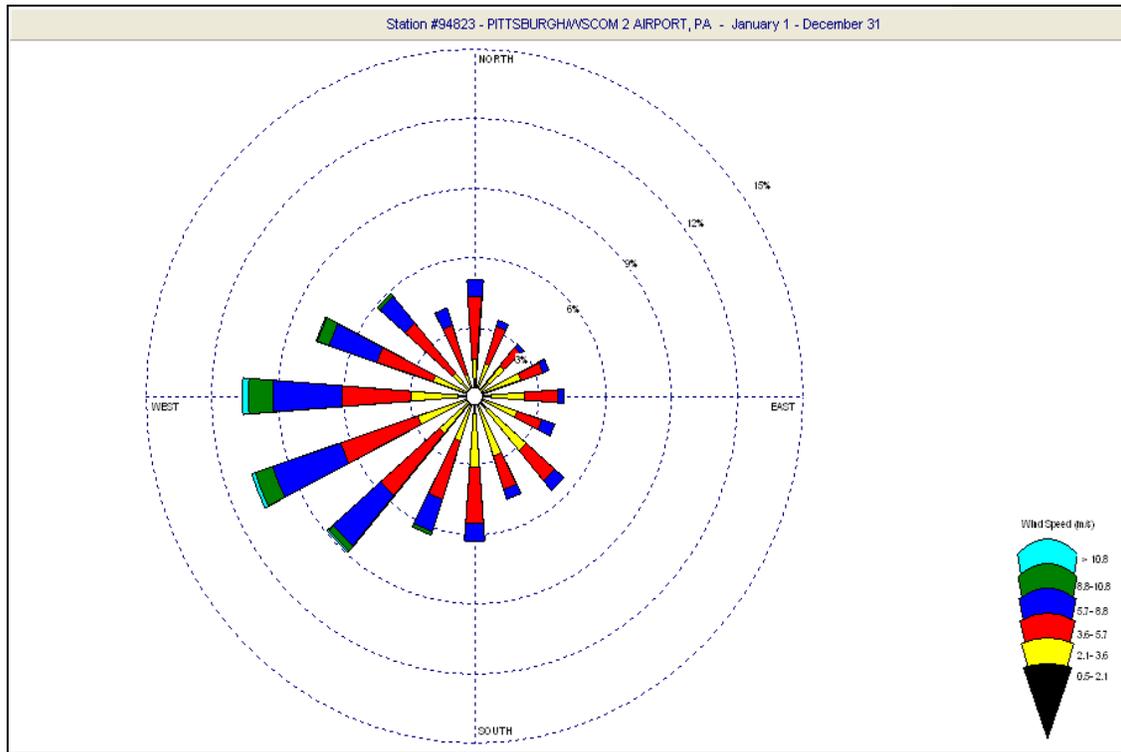
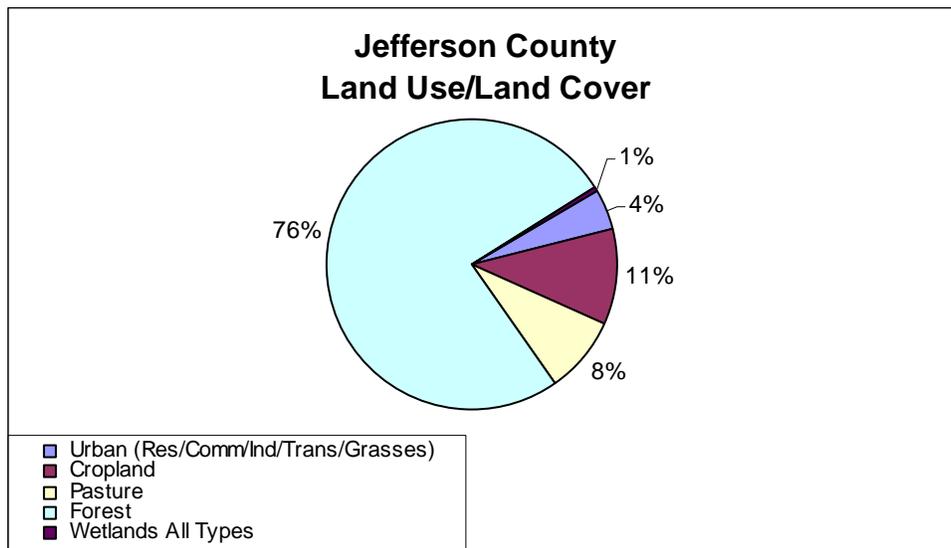


Figure 16: Jefferson County Wind Rose

#### Factor 4: Topography and Land Use/Land Cover

Jefferson County is in the unglaciated Allegheny Plateau region (see Appendix E). The county has been extensively dissected by drainageways that empty into the Ohio River, which is the sinuous eastern border of the county. Relief is generally greatest in the eastern part of the county. The elevation ranges from 1,388 feet to about 644 feet above sea level.

As shown in the following pie chart, the land use/land cover in Jefferson County is predominately characterized as forest area.



**Figure 17: Jefferson County Land Use/Land Cover**

The Jefferson County area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

**Factor 5: Jurisdictional Boundaries**

The Weirton-Steubenville, WV-OH MSA includes: Brooke and Hancock Counties, West Virginia and Jefferson County, Ohio. The principal cities are Weirton, WV and Steubenville, OH. There is no CSA for this area.

The Ohio EPA Central Office and Southeast District Office are responsible for air quality planning within all areas of Jefferson County. The Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJMPO) is the planning agency designated as the Metropolitan Planning Organization for the Weirton-Steubenville area. The BHJMPO region is composed of three counties: Hancock and Brooke Counties in West Virginia and Jefferson County in Ohio.

***Columbiana County***

## Recommended Nonattainment Boundary: Columbiana County

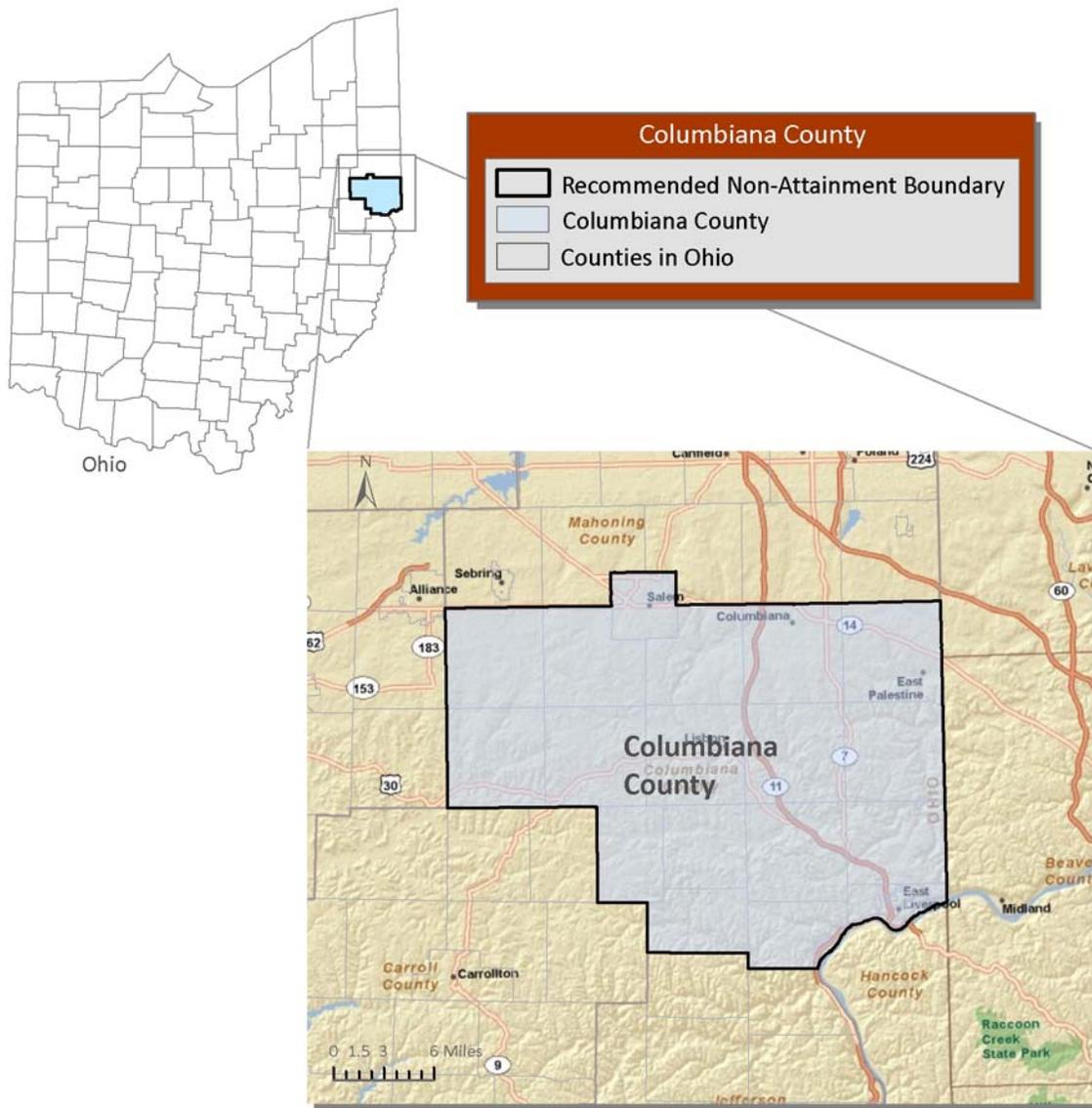


Figure 18: Recommended Nonattainment Boundary for Columbiana County

### Discussion:

Ohio EPA is recommending nonattainment of Columbiana County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Columbiana County contains one monitor which is violating for the 2008 to 2010 air quality period. As seen under Table 8 below, there are 136,665.47 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

There are 3.57 TPY of SO<sub>2</sub> emissions within Columbiana County, representing <1% of the emissions within 50 km. The majority of emissions, >99.7% or 136,289.77 TPY, are within Jefferson County. Jefferson County is also being recommended as nonattainment due to a violating monitor.

As indicated in Figure 20 below, the majority of sources are to the north or south of East Liverpool, Ohio, where the monitor is located, along the Ohio River. One Ohio source, WTI Heritage, is co-located with the monitor. Although WTI Heritage's emissions are very low (3.55 TPY in 2008), the company is located at a lower elevation and up-wind of the monitor.

**Factor 1: Air Quality Data**

**Table 7: Columbiana County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Columbiana                         | 39-029-0022 | 111                   | 113  | 47   | 90                  |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

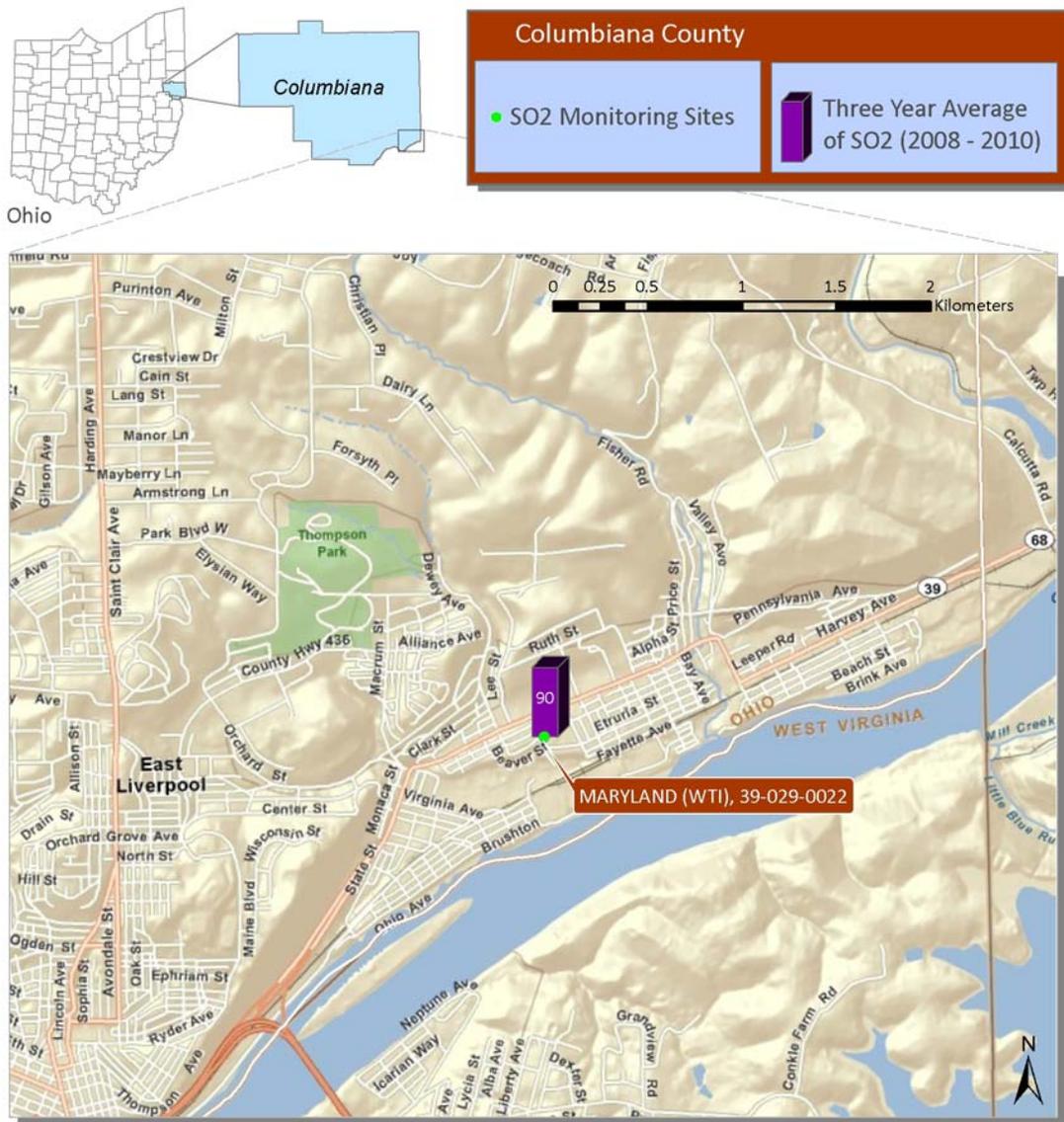


Figure 19: Columbiana County SO<sub>2</sub> Monitor Locations and Site ID Numbers

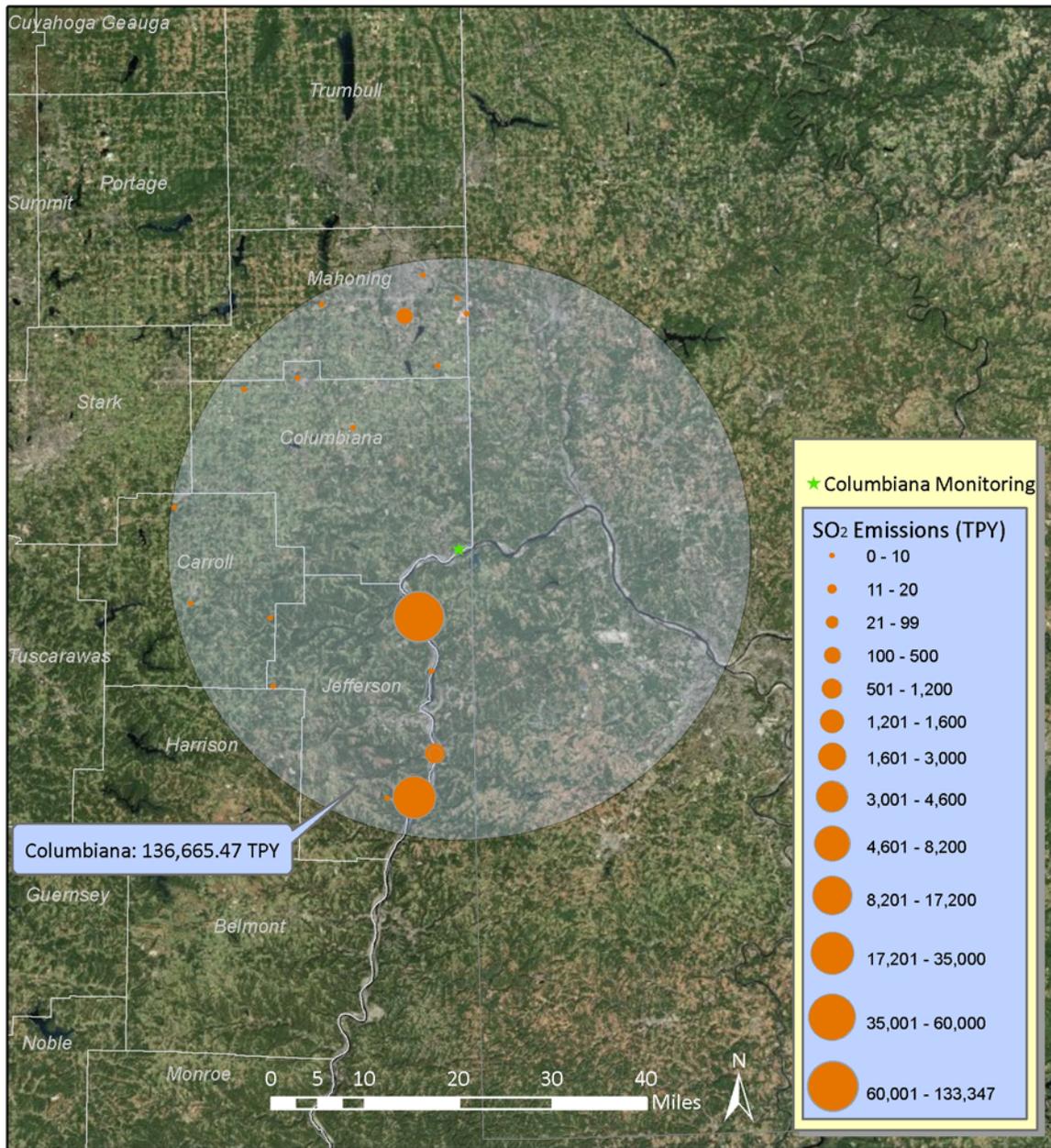
## Factor 2: Emissions

There are 136,665.47 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

Table 8: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Columbiana County Violating Monitor

| State | County  | Facility ID | Facility Name                           | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|---------|-------------|---|--------------------------------------|----------------------------|
| OH    | Carroll | 0210000047  | Summitville Tiles, Inc. - Minerva Plant | 6.67                                 | 49.3                       |

| State                   | County     | Facility ID | Facility Name                                      | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|-------------------------|------------|-------------|--|--------------------------|----------------------------|
| OH                      | Carroll    | 0210000046  | Tennessee Gas Pipeline- Station 214                | 0.22                     | 46.9                       |
| OH                      | Carroll    | 0210000101  | Dominion Transmission-Carroll Station              | 0.01                     | 34.5                       |
| <b>Carroll Total</b>    |            |             |  | <b>6.91</b>              |                            |
| OH                      | Columbiana | 0215020233  | Heritage - WTI, Inc.                               | 3.55                     | 0.5                        |
| OH                      | Columbiana | 0215050202  | BRINKER COMPRESSOR STATION                         | 0.01                     | 27.5                       |
| OH                      | Columbiana | 0215000182  | Dominion East Ohio - Columbiana Compressor Station | 0.01                     | 45.8                       |
| <b>Columbiana Total</b> |            |             |  | <b>3.57</b>              |                            |
| OH                      | Jefferson  | 0641160017  | W. H. SAMMIS PLANT                                 | 102195.00                | 13.6                       |
| OH                      | Jefferson  | 0641050002  | Cardinal Power Plant (Cardinal Operating Company)  | 33311.90                 | 43.4                       |
| OH                      | Jefferson  | 0641090010  | Severstal Wheeling, Inc                            | 699.99                   | 35.4                       |
| OH                      | Jefferson  | 0641090234  | Mingo Junction Energy Center, LLC                  | 82.37                    | 35.4                       |
| OH                      | Jefferson  | 0641120012  | Severstal Wheeling, Inc - Yorkville Plant          | 0.24                     | 44.7                       |
| OH                      | Jefferson  | 0641180064  | Titanium Metals Corporation                        | 0.20                     | 21.5                       |
| OH                      | Jefferson  | 0641000223  | Apex Environmental, LLC - Sanitary Landfill        | 0.07                     | 39.6                       |
| <b>Jefferson Total</b>  |            |             |  | <b>136289.77</b>         |                            |
| OH                      | Mahoning   | 0250050996  | Carbon Limestone Landfill Gas Power Station        | 9.30                     | 40.3                       |
| OH                      | Mahoning   | 0250000840  | Mahoning Landfill, Inc.                            | 2.92                     | 31.6                       |
| OH                      | Mahoning   | 0250000989  | BAIRD BROTHERS SAWMILL INC                         | 0.27                     | 48.1                       |
| OH                      | Mahoning   | 0250070850  | Carbon Limestone Sanitary Landfill                 | 0.14                     | 43.1                       |
| OH                      | Mahoning   | 0250090626  | Astro Coatings, Incorporated                       | 0.03                     | 47.4                       |
| <b>Mahoning Total</b>   |            |             |  | <b>12.66</b>             |                            |
| OH                      | Trumbull   | 0278000013  | Denman Tire Corporation                            | 352.56                   | 41.0                       |
| <b>Trumbull Total</b>   |            |             |  | <b>352.56</b>            |                            |
| <b>Grand Total</b>      |            |             |  | <b>136665.47</b>         |                            |



**Figure 20: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Columbiana County Violating Monitor**

### **Factor 3: Meteorology**

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Columbiana County.

Ohio is bounded on the east by the Ohio River and Appalachian Mountains. During the day, surface winds blow from the bottom of the valley to higher elevations creating a valley breeze; however, during the evening, a mountain breeze forms as surface winds blow from higher elevations down in to the valley. The valleys also

experience nighttime inversions which can influence wind patterns. These effects would best be represented by the Pittsburgh International airport wind rose.

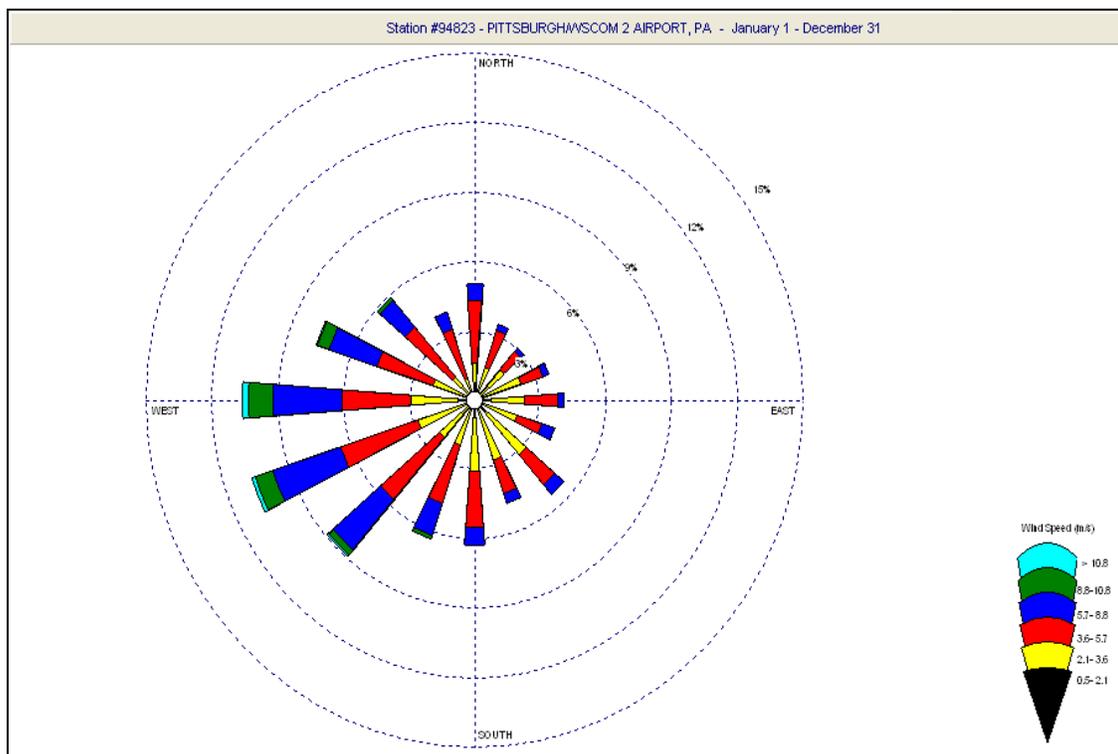
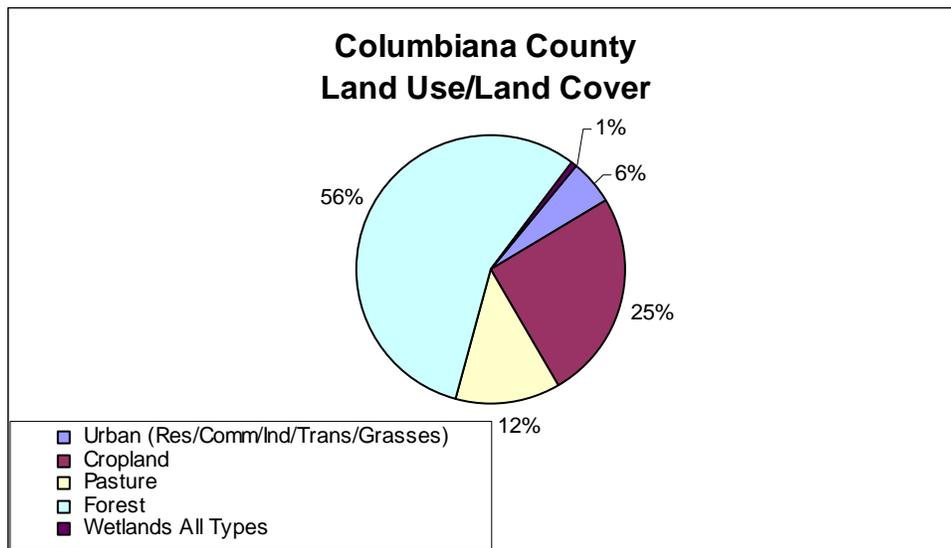


Figure 21: Columbiana County Wind Rose

#### Factor 4: Topography and Land Use/Land Cover

Columbiana County is in the Allegheny Plateau region (see Appendix E), with the southern third of the county on the edge of the unglaciated Allegheny Plateau Province. Topography varies from rolling uplands in the northern part of the county to higher relief and steep uplands in the central area and a more rugged landscape in the unglaciated portion in the southern part of the county.

As shown in the following pie chart, the land use/land cover is predominately characterized as forest and cropland.



**Figure 22: Columbiana County Land Use/Land Cover**

The Columbiana County area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

**Factor 5: Jurisdictional Boundaries**

Columbiana County is the only county in the East Liverpool-Salem, OH metropolitan statistical area. The Youngstown-Warren-Boardman, OH-PA MSA includes: Mahoning and Trumbull Counties in Ohio and Mercer County in Pennsylvania. The CSA also includes Columbiana County.

The Ohio EPA Central Office and Northeast District Office are responsible for air quality planning within all areas of Columbiana County. Columbiana County is not represented by an MPO.

***Meigs County***

## Recommended Nonattainment Boundary: Meigs County and Partial Gallia County (Cheshire Township)

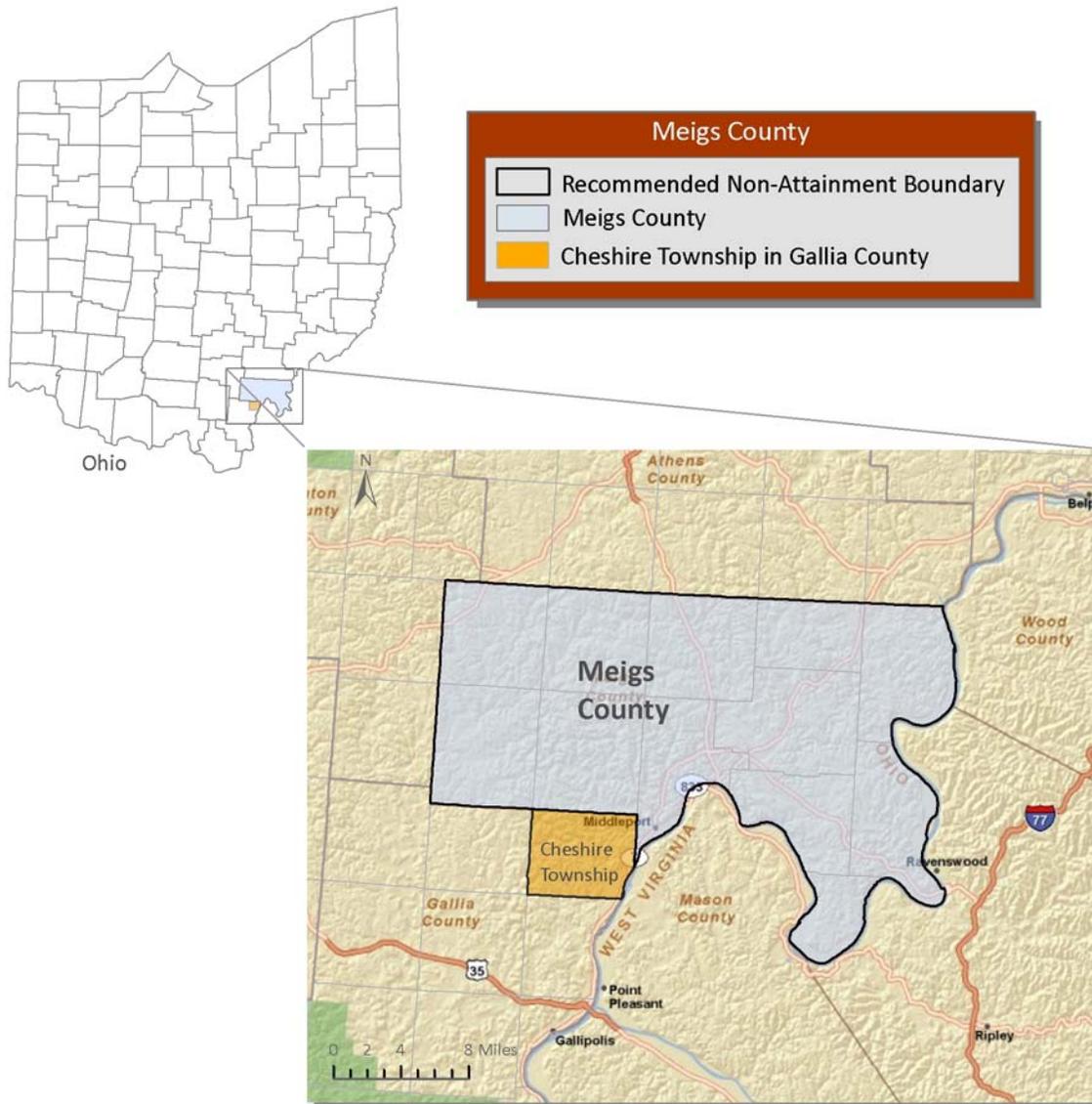


Figure 23: Recommended Nonattainment Boundary for Meigs and Gallia County

### Discussion:

Ohio EPA is recommending nonattainment of Meigs County and partial nonattainment of Gallia County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Meigs County contains one monitor which is violating for the 2008 to 2010 air quality period. As seen under Table 10 below, there are 96,222.90 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor. There are 0 TPY of SO<sub>2</sub> emissions within Meigs County. The majority of emissions, 95.5% or 91,889.50 TPY, are from Gallia County. Specifically, these emissions emanate from two sources located within the boundary suggested as partial nonattainment for Gallia County. These sources are south-southwest of the violating monitor and wind patterns are generally from the southwest. Ohio EPA believes it would not be appropriate to designate all of Gallia County nonattainment because there are no other significant sources of SO<sub>2</sub> emissions within Gallia County.

As indicated in Figure 25 below, the most significant sources are located south of Pomeroy, Ohio, where the monitor is located nearby, along the Ohio River.

**Factor 1: Air Quality Data**

**Table 9: Meigs County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Meigs                              | 39-105-1001 | 78                    | 94   | 94   | 89                  |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

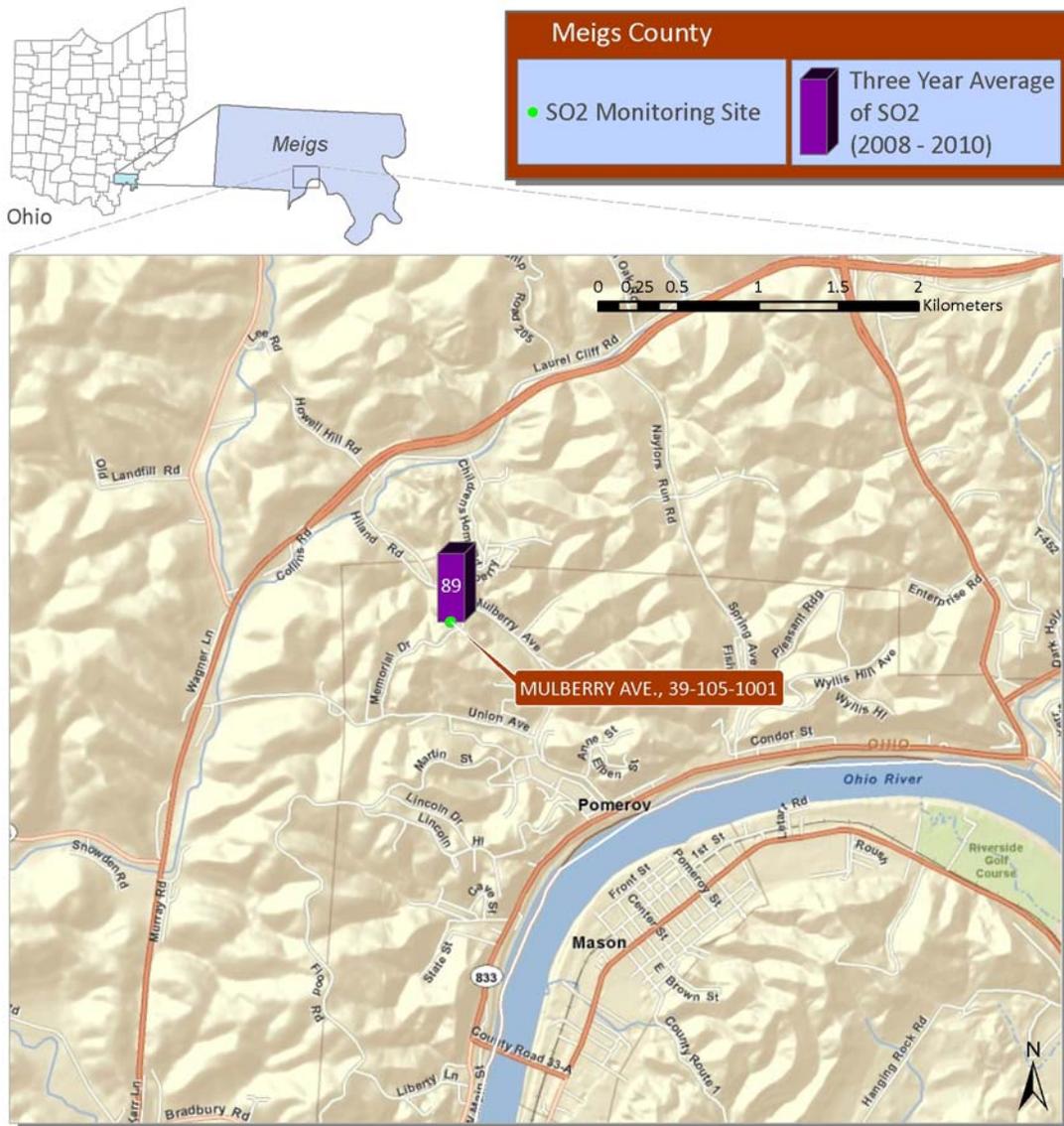


Figure 24: County SO<sub>2</sub> Monitor Locations and Site ID Numbers

## Factor 2: Emissions

There are 96,222.90 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

Table 10: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Meigs County Violating Monitor

| State | County | Facility ID | Facility Name                         | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|--------|-------------|---------------------------------------|--------------------------------------|----------------------------|
| OH    | Athens | 0605010016  | Ohio University Lausche Heating Plant | 1338.13                              | 32.8                       |

| State                          | County     | Facility ID | Facility Name                                   | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|--------------------------------|------------|-------------|---|--------------------------|----------------------------|
| OH                             | Athens     | 0605000008  | Texas Eastern Transmission LP - Athens          | 2.14                     | 23.5                       |
| OH                             | Athens     | 0605000020  | Tennessee Gas Pipeline Station 204              | 0.08                     | 24.7                       |
| <b><i>Athens Total</i></b>     |            |             |   | <b>1340.35</b>           |                            |
| OH                             | Gallia     | 0627000003  | Ohio Valley Electric Corp., Kyger Creek Station | 59635.30                 | 15.3                       |
| OH                             | Gallia     | 0627010056  | General James M. Gavin Power Plant              | 32254.20                 | 13.1                       |
| <b><i>Gallia Total</i></b>     |            |             |   | <b>91889.50</b>          |                            |
| OH                             | Vinton     | 0682000012  | MCARTHUR COMPRESSOR STATION                     | 0.01                     | 48.4                       |
| <b><i>Vinton Total</i></b>     |            |             |   | <b>0.01</b>              |                            |
| OH                             | Washington | 0684010011  | KRATON Polymers U.S. LLC                        | 2993.04                  | 43.8                       |
| <b><i>Washington Total</i></b> |            |             |   | <b>2993.04</b>           |                            |
| <b><i>Grand Total</i></b>      |            |             |   | <b>96222.90</b>          |                            |

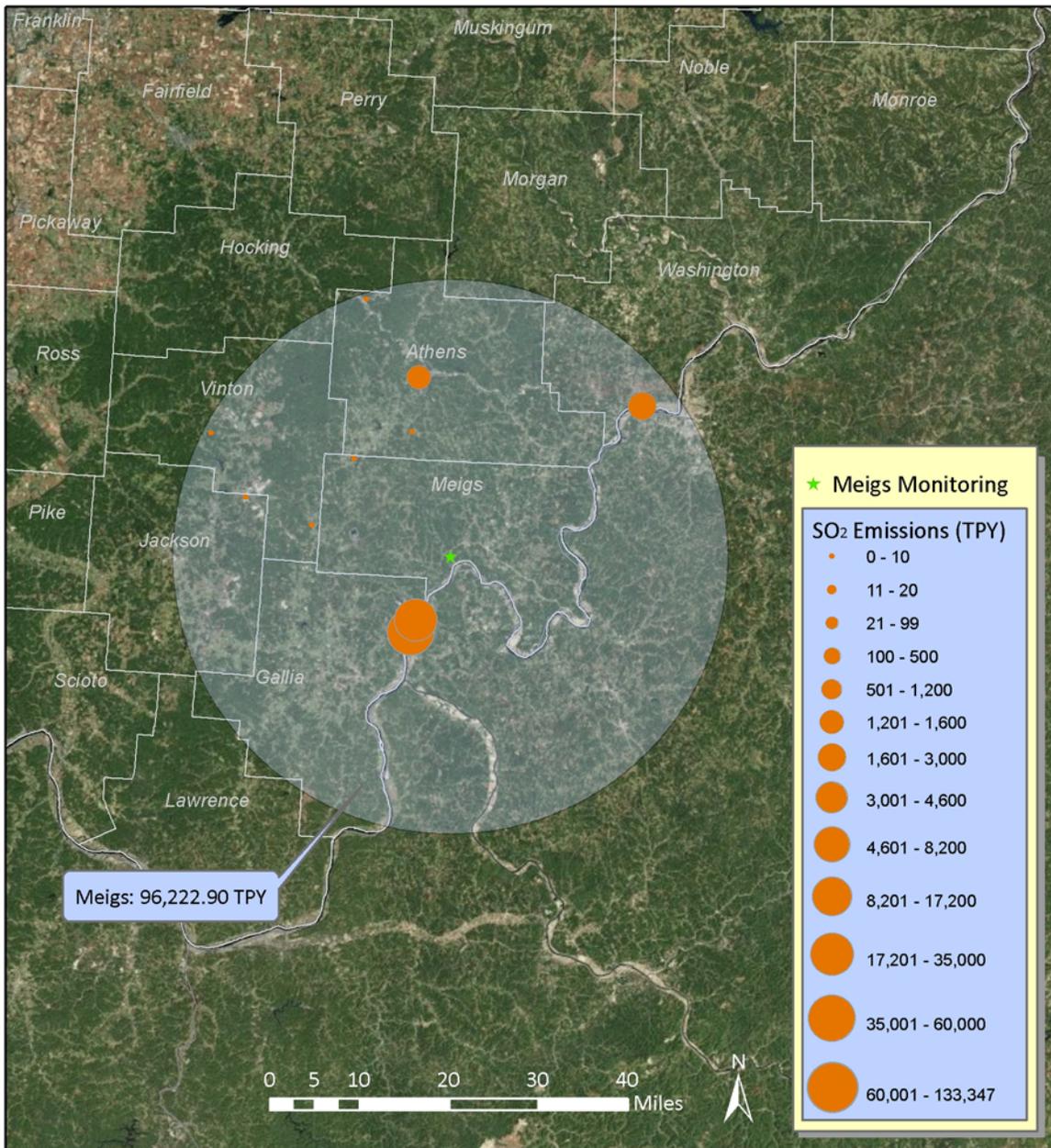


Figure 25: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Meigs County Violating Monitor

### Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Meigs and Gallia Counties.

Ohio is bounded on the east by the Ohio River and Appalachian Mountains. During the day, surface winds blow from the bottom of the valley to higher elevations creating a valley breeze; however, during the evening, a mountain breeze forms as surface winds blow from higher elevations down in to the valley. The valleys also

experience nighttime inversions which can influence wind patterns. These effects would best be represented by the Pittsburgh International airport wind rose.

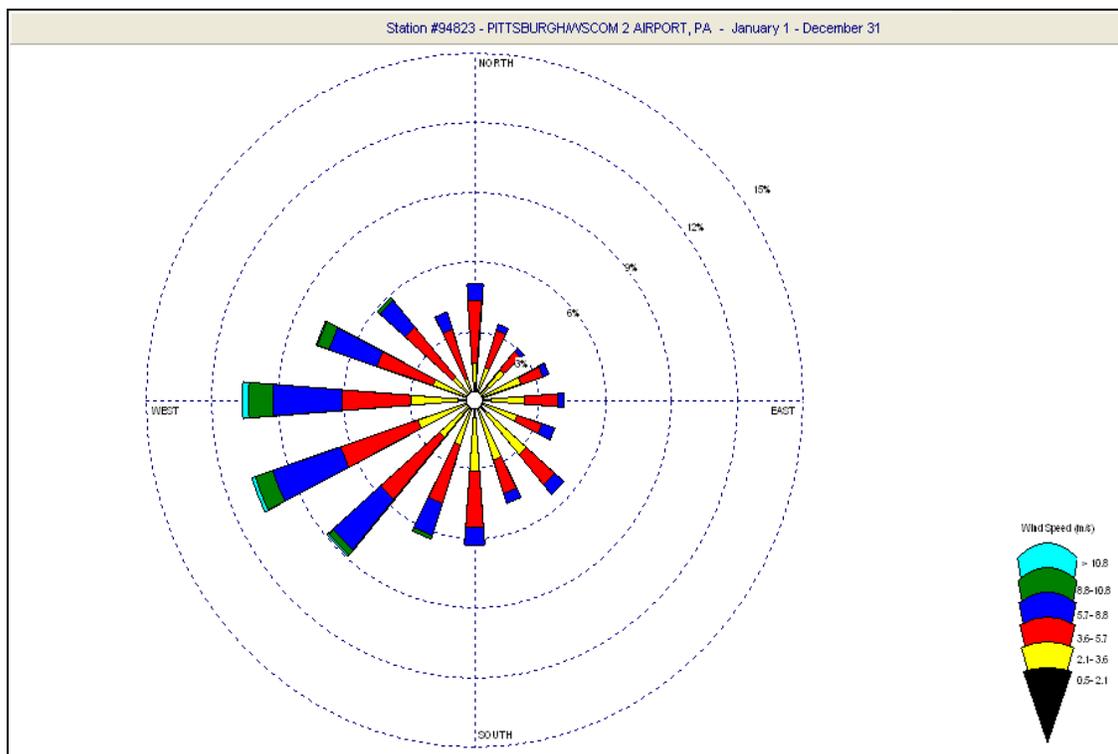
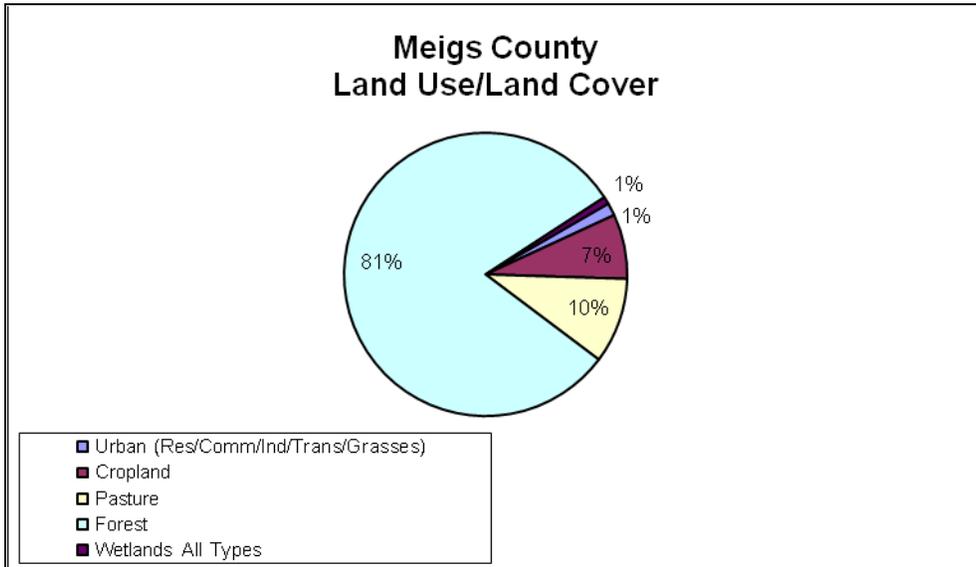


Figure 26: Meigs and Gallia County Wind Rose

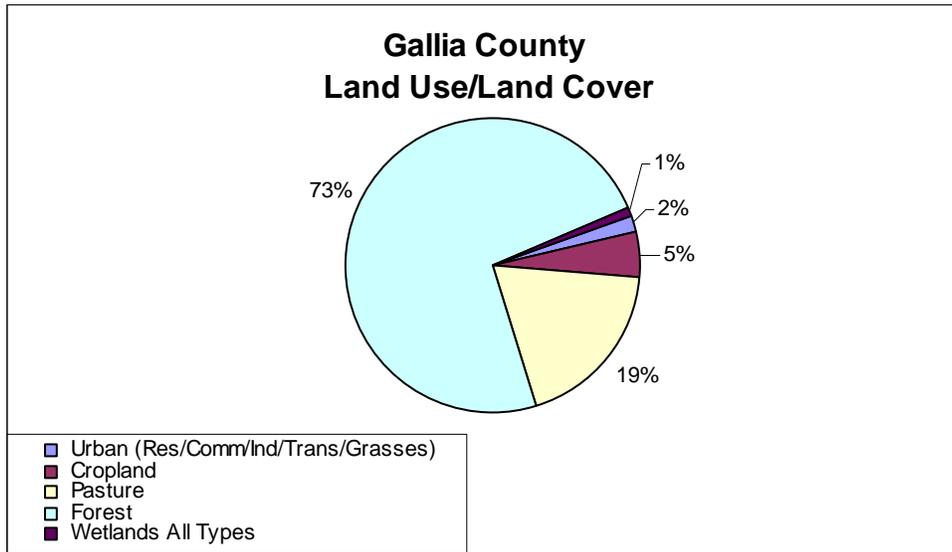
#### Factor 4: Topography and Land Use/Land Cover

Meigs and Gallia Counties are located within one physiographic province: the Marietta Plateau to the east and the Iron-ton Plateau on the very western edge of the Alleghany Plateaus (see Appendix E). Meigs and Gallia Counties are bordered to the east by the Ohio River. The highest point in Meigs County, about 1,007 feet above sea level, is Greenler, in Scipio Township. The lowest point in Meigs County, about 540 feet above sea level, is in an area of Salisbury Township where the Ohio River leaves the county. The average elevation difference from ridge crest to drainage notch is about 250 feet in Meigs County. Gallia County is extensively dissected by drainage ways and has hilly and rough topography. The highest point in the county is about 1,060 feet and the lowest is about 515 feet above sea level. Cheshire Township in Gallia County is at 823 feet.

As shown in the following pie charts, the land use/land cover in Meigs and Gallia Counties are predominately forest.



**Figure 27: Meigs County Land Use/Land Cover**



**Figure 28: Gallia County Land Use/Land Cover**

The Meigs and Gallia Counties area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

**Factor 5: Jurisdictional Boundaries**

There is no MSA or CSA for Meigs and Gallia Counties.

The Ohio EPA Central Office and Southeast District Office are responsible for air quality planning within all areas of Meigs and Gallia Counties. Meigs and Gallia Counties are not represented by an MPO.

The partial nonattainment boundary for Gallia County was selected at the township jurisdictional boundary.

***Lake County***

## Recommended Nonattainment Boundary: Lake County

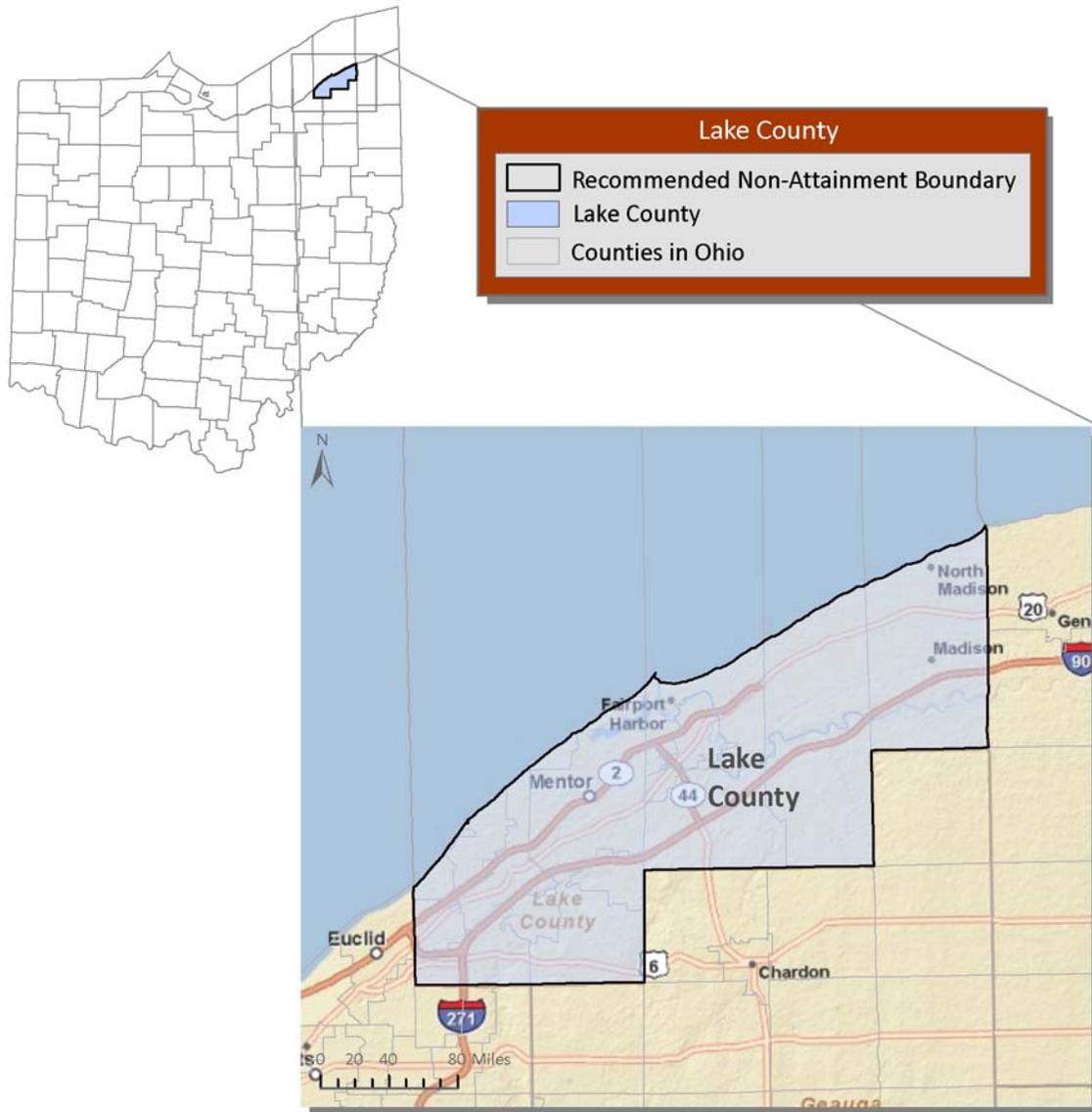


Figure 29: Recommended Nonattainment Boundary for Lake County

### Discussion:

Ohio EPA is recommending nonattainment of Lake County, as indicated in the map above, and supported by an analysis of the factors. This discussion summarizes the most relevant results of these analyses.

As seen under Factor 1, Lake County contains two monitors, of which one is violating for the 2008 to 2010 air quality period. The violating monitor is east northeast, and up-wind, of the non-violating monitor and Cuyahoga County. As seen

under Table 12 below, there are 71,486.91 TPY of SO<sub>2</sub> emissions within 50 km of the violating monitor. There are 58,670.72 TPY of SO<sub>2</sub> emissions within Lake County, representing 82.1% of the emissions within 50 km. Additionally, there are emissions of 8,936.29 TPY, or 12.5%, within Cuyahoga County. However, it is not believed that Cuyahoga County emissions are a significant contributor to the Lake County monitor's violations. These emissions are downwind of the non-violating monitor and Ohio EPA would expect if Cuyahoga County emissions were significantly contributing to Lake County nonattainment then both Lake County monitors would be violating. Regardless, Cuyahoga County is also recommended as nonattainment due to its own violating monitor. Ashtabula County contains 3,879.90 TPY, or 5.4%, of SO<sub>2</sub> the areas emissions. This is attributed predominantly to one source located more than 48 km upwind of the violating monitor. Therefore, Ohio EPA does not believe Ashtabula County emissions contribute to nonattainment in Lake County.

**Factor 1: Air Quality Data**

**Table 11: Lake County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |                          | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|--------------------------|-----------------------|------|------|---------------------|
| County                             | Site ID                  | 2008                  | 2009 | 2010 | 2008-2010           |
| Lake                               | 39-085-0003              | 42                    | 37   | 31   | 37                  |
|                                    | 39-085-0007 <sup>5</sup> |                       | 186  | 139  | 163                 |
|                                    | 39-085-3002              | 164                   |      |      |                     |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

<sup>5</sup> Monitor -3002 was replaced by monitor -0007 as part of a relocation approved under Ohio's Annual Monitoring Plan. Therefore, 2008 to 2010 data is combined.

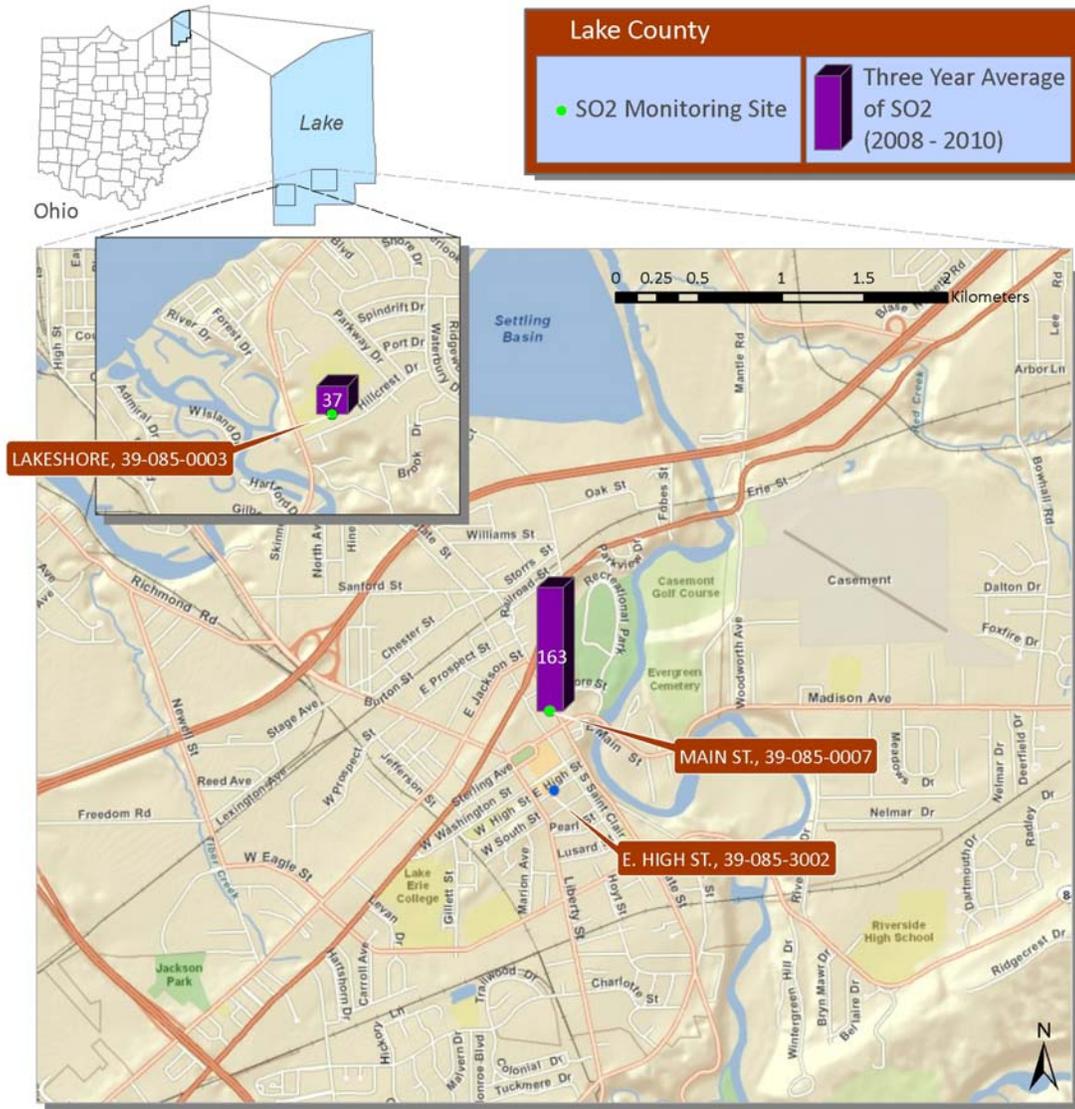


Figure 30: Lake County SO2 Monitor Locations and Site ID Numbers

## Factor 2: Emissions

There are 71,486.91 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

Table 12: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Lake County Violating Monitor

| State | County    | Facility ID | Facility Name                                    | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|-----------|-------------|--|--------------------------------------|----------------------------|
| OH    | Ashtabula | 0204010000  | FirstEnergy Generation Corp.,<br>Ashtabula Plant | 3850.10                              | 48.6                       |

| State                  | County    | Facility ID | Facility Name   | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|------------------------|-----------|-------------|---|--------------------------|----------------------------|
| OH                     | Ashtabula | 0204010193  | Millennium Inorganic Chemicals, Inc. - Plant 2        | 19.68                    | 43.4                       |
| OH                     | Ashtabula | 0204010200  | Millennium Inorganic Chemicals, Inc. Plant #1         | 6.41                     | 44.9                       |
| OH                     | Ashtabula | 0204030303  | USA Waste Geneva Landfill, Inc.                       | 2.93                     | 28.4                       |
| OH                     | Ashtabula | 0204010230  | Molded Fiber Glass Companies, Plant 2                 | 0.78                     | 39.9                       |
| <b>Ashtabula Total</b> |           |             |   | <b>3879.90</b>           |                            |
| OH                     | Cuyahoga  | 1318000250  | Cleveland Electric Illuminating Co., Lake Shore Plant | 4582.10                  | 39.3                       |
| OH                     | Cuyahoga  | 1318003060  | The Medical Center Company                            | 2203.14                  | 40.6                       |
| OH                     | Cuyahoga  | 1318000250  | Cleveland Thermal LLC                                 | 1331.85                  | 45.3                       |
| OH                     | Cuyahoga  | 1318001610  | ArcelorMittal Cleveland Inc.                          | 718.09                   | 46.8                       |
| OH                     | Cuyahoga  | 1318171620  | Charter Steel - Cleveland Inc                         | 60.91                    | 47.0                       |
| OH                     | Cuyahoga  | 1318172480  | Southerly Wastewater Treatment Center                 | 34.27                    | 47.7                       |
| OH                     | Cuyahoga  | 1318958480  | Independence Recycling, Inc.                          | 2.42                     | 45.4                       |
| OH                     | Cuyahoga  | 1318247810  | Cuyahoga Regional Sanitary Landfill                   | 2.18                     | 43.3                       |
| OH                     | Cuyahoga  | 1318538150  | MM Cuyahoga Energy LLC                                | 0.37                     | 42.0                       |
| OH                     | Cuyahoga  | 1318170310  | ALCOA-Cleveland Works                                 | 0.29                     | 48.7                       |
| OH                     | Cuyahoga  | 1318202140  | The Lincoln Electric Company                          | 0.16                     | 27.3                       |
| OH                     | Cuyahoga  | 1318247720  | BFI - Glenwillow Landfill                             | 0.15                     | 46.0                       |
| OH                     | Cuyahoga  | 1318002700  | Sunoco Partners Marketing & Terminals LP              | 0.14                     | 43.5                       |
| OH                     | Cuyahoga  | 1318002970  | MetroHealth Medical Center                            | 0.11                     | 48.0                       |
| OH                     | Cuyahoga  | 1318001620  | SIFCO Forge Group, Inc.                               | 0.06                     | 41.0                       |
| OH                     | Cuyahoga  | 1318030170  | Hukill Chemical Corporation                           | 0.02                     | 46.1                       |
| OH                     | Cuyahoga  | 1318170170  | Angstrom Graphics Midwest, Inc.                       | 0.01                     | 45.3                       |
| OH                     | Cuyahoga  | 1318226140  | Automated Packaging Systems                           | 0.01                     | 43.9                       |
| OH                     | Cuyahoga  | 1318000130  | Cleveland Public Power - Service Center               | <0.00                    | 48.8                       |
| OH                     | Cuyahoga  | 1318000840  | Manufacturers Plating Company, Inc.                   | <0.00                    | 41.6                       |
| OH                     | Cuyahoga  | 1318000130  | Cleveland Public Power - Collinwood Substation        | <0.00                    | 34.6                       |
| <b>Cuyahoga Total</b>  |           |             |   | <b>8936.29</b>           |                            |
| OH                     | Lake      | 0243160009  | CLEVELAND ELECTRIC ILLUMINATING CO., EASTLAKE PLANT   | 50519.40                 | 17.4                       |
| OH                     | Lake      | 0243110008  | PAINESVILLE MUNICIPAL ELECTRIC PLANT                  | 7211.41                  | 1.0                        |
| OH                     | Lake      | 0243030257  | Carmeuse Lime, Inc - Grand River Operations           | 910.00                   | 4.2                        |
| OH                     | Lake      | 0243000024  | The Lubrizol Corporation                              | 22.94                    | 2.7                        |

| State              | County | Facility ID | Facility Name  | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|--------------------|--------|-------------|--|--------------------------|----------------------------|
| OH                 | Lake   | 0243150025  | The Lubrizol Corporation - Wickliffe Facility          | 6.72                     | 22.9                       |
| OH                 | Lake   | 0243111198  | LAKE COUNTY SOLID WASTE FACILITY                       | 0.11                     | 4.4                        |
| OH                 | Lake   | 0243111362  | Avery Dennison STD, Bldg 5                             | 0.06                     | 1.1                        |
| OH                 | Lake   | 0243111361  | Avery Dennison MFD, Bldg 7                             | 0.02                     | 1.1                        |
| OH                 | Lake   | 0243081207  | CFF of Avery Dennison                                  | 0.02                     | 4.9                        |
| OH                 | Lake   | 0243001188  | Marking Films Div. of Avery Dennison Building #11      | 0.02                     | 3.5                        |
| OH                 | Lake   | 0243111416  | Avery Dennison PFF, Bldg 3                             | 0.01                     | 1.1                        |
| OH                 | Lake   | 0243161415  | Momentive Performance Materials Quartz Inc             | <0.00                    | 20.4                       |
| OH                 | Lake   | 0243081365  | Avery Dennison Corporation - Fasson Roll North America | <0.00                    | 12.8                       |
| OH                 | Lake   | 0204000423  | Sigma Ohio Inc. PLT 3 formerly Picken's Plastics Inc.  | <0.00                    | 40.3                       |
| <b>Lake Total</b>  |        |             |  | <b>58670.72</b>          |                            |
| <b>Grand Total</b> |        |             |  | <b>71486.91</b>          |                            |

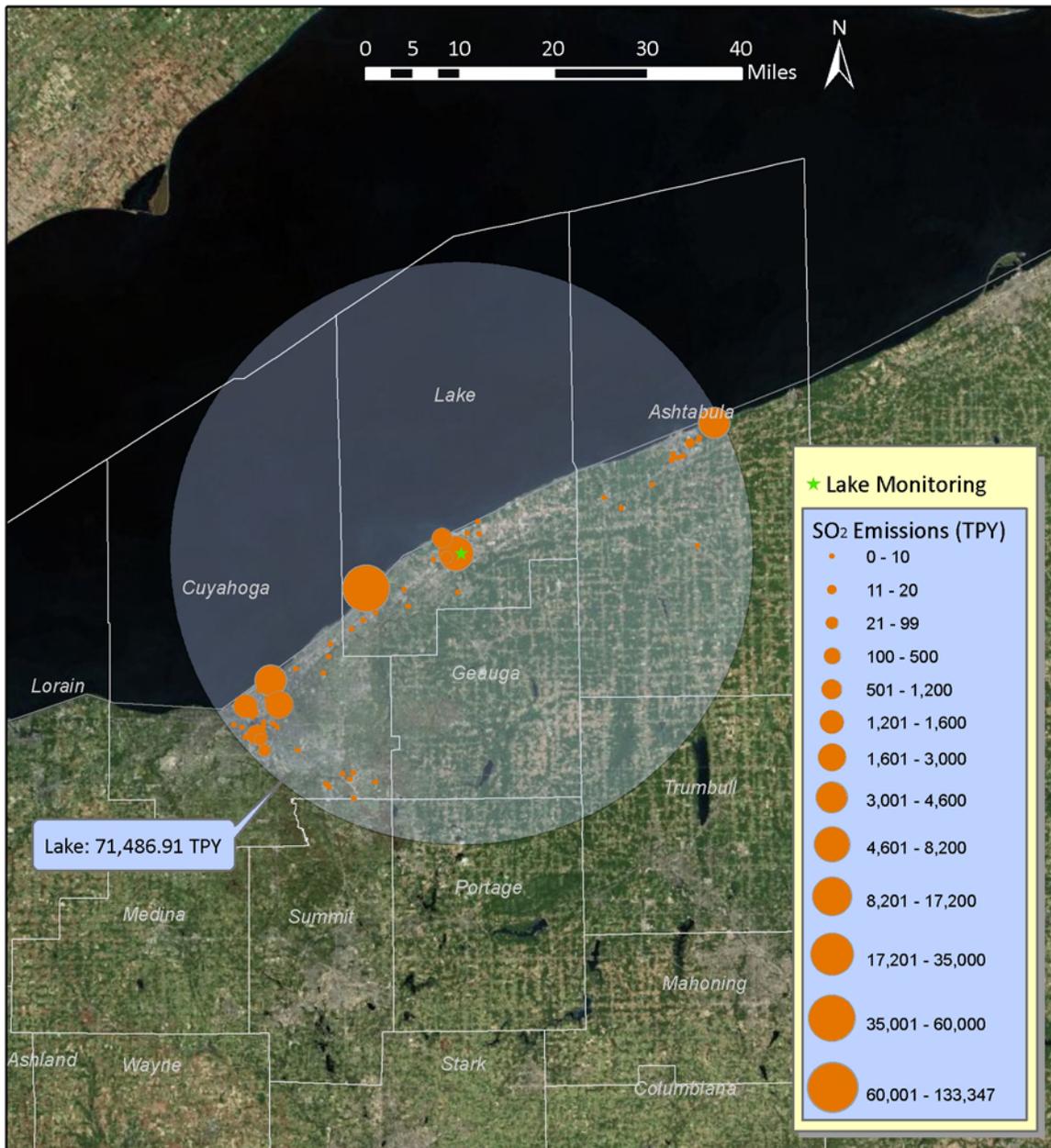


Figure 31: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Lake County Violating Monitor

### Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Lake County.

Ohio is bounded on the north by Lake Erie which can provide localized modifications to the general wind pattern, primarily by the introduction of land breezes and sea breezes along the Lake during periods of low synoptic wind speeds. Sea breezes typically form during the day as surface winds blow from water to land. Land breezes typically form during the evening as surface winds blow from land to water.

These effects would best be represented by the Toledo and Cleveland airport wind roses.

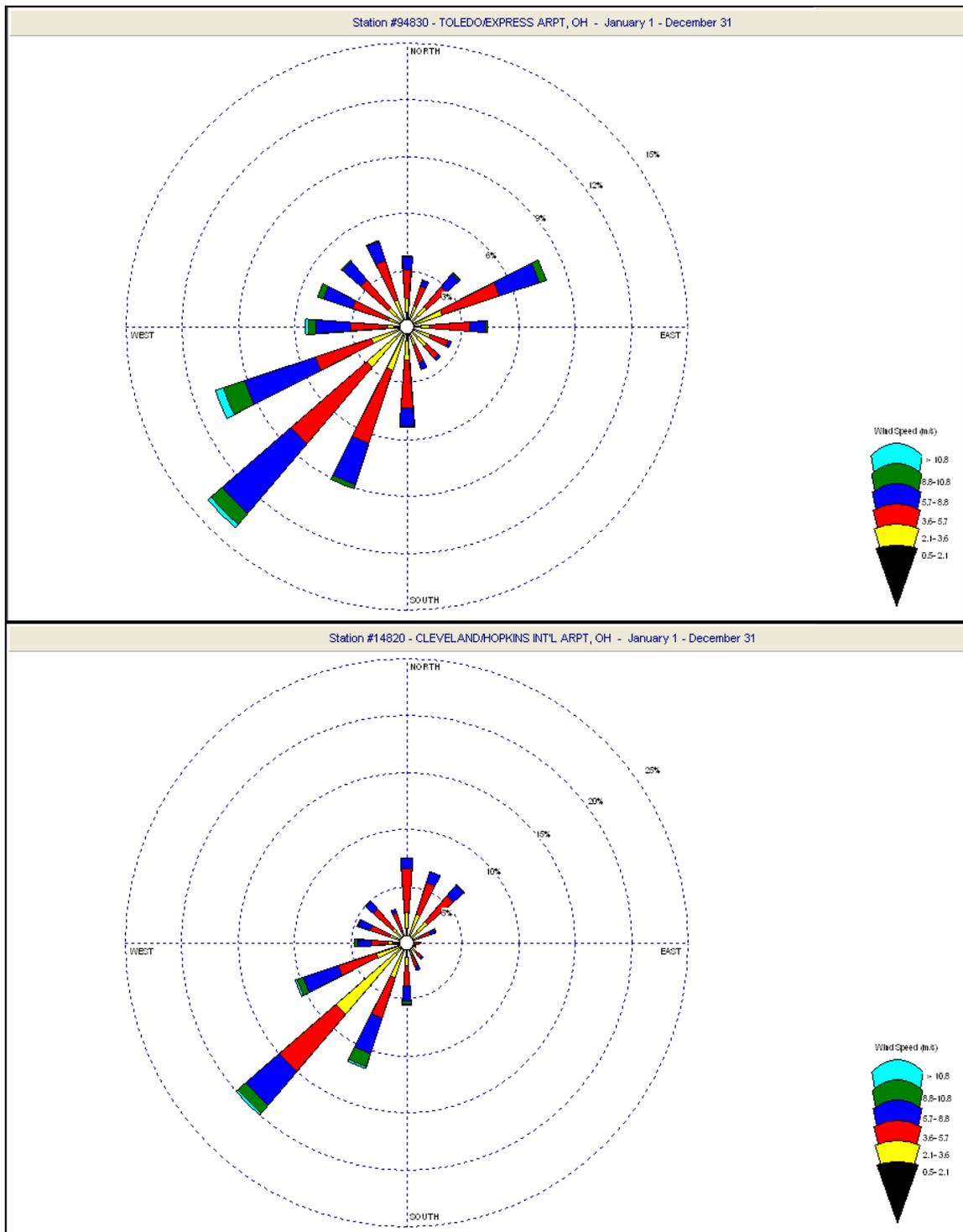


Figure 32: Lake County Wind Roses

#### Factor 4: Topography and Land Use/Land Cover

Lake County is located within two physiographic provinces: the glaciated Allegheny Plateau of the Killbuck-Glaciated Pittsburgh Plateau on the south and the Huron-Erie Lake Plains section of the Central Lowland Province on the north (see Appendix E). Elevation ranges between 1250 and 1260 feet above sea level.

As shown in the following pie charts the land use/land cover in Lake County is predominately forest and to a lesser extent, urban.

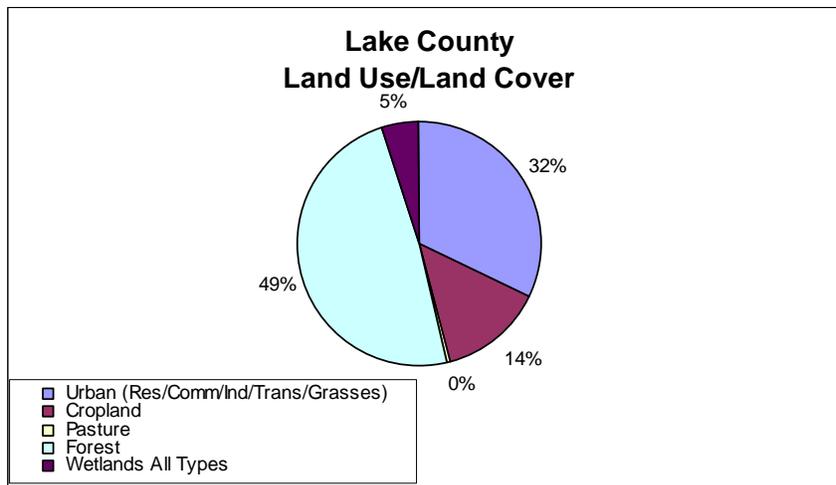


Figure 33: Lake County Land Use/Land Cover

The Lake County area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

#### Factor 5: Jurisdictional Boundaries

The Cleveland-Elyria-Mentor, OH MSA includes Cuyahoga, Geauga, Lake, Lorain and Medina Counties in Ohio. The principal cities are Cleveland, Elyria and Mentor. The CSA also includes Ashtabula, Portage and Summit Counties.

The Ohio EPA Central Office and Northeast District Office are responsible for air quality planning within all areas of Lake County. The Northeast Ohio Areawide coordinating Agency (NOACA) is the planning agency designated as the Metropolitan Planning Organization for the greater Cleveland area. The NOACA region is composed of five counties: Cuyahoga, Geauga, Lake, Lorain, and Medina.

***Morgan County***

## Recommended Nonattainment Boundary: Morgan County and Partial Washington County (Waterford Township)

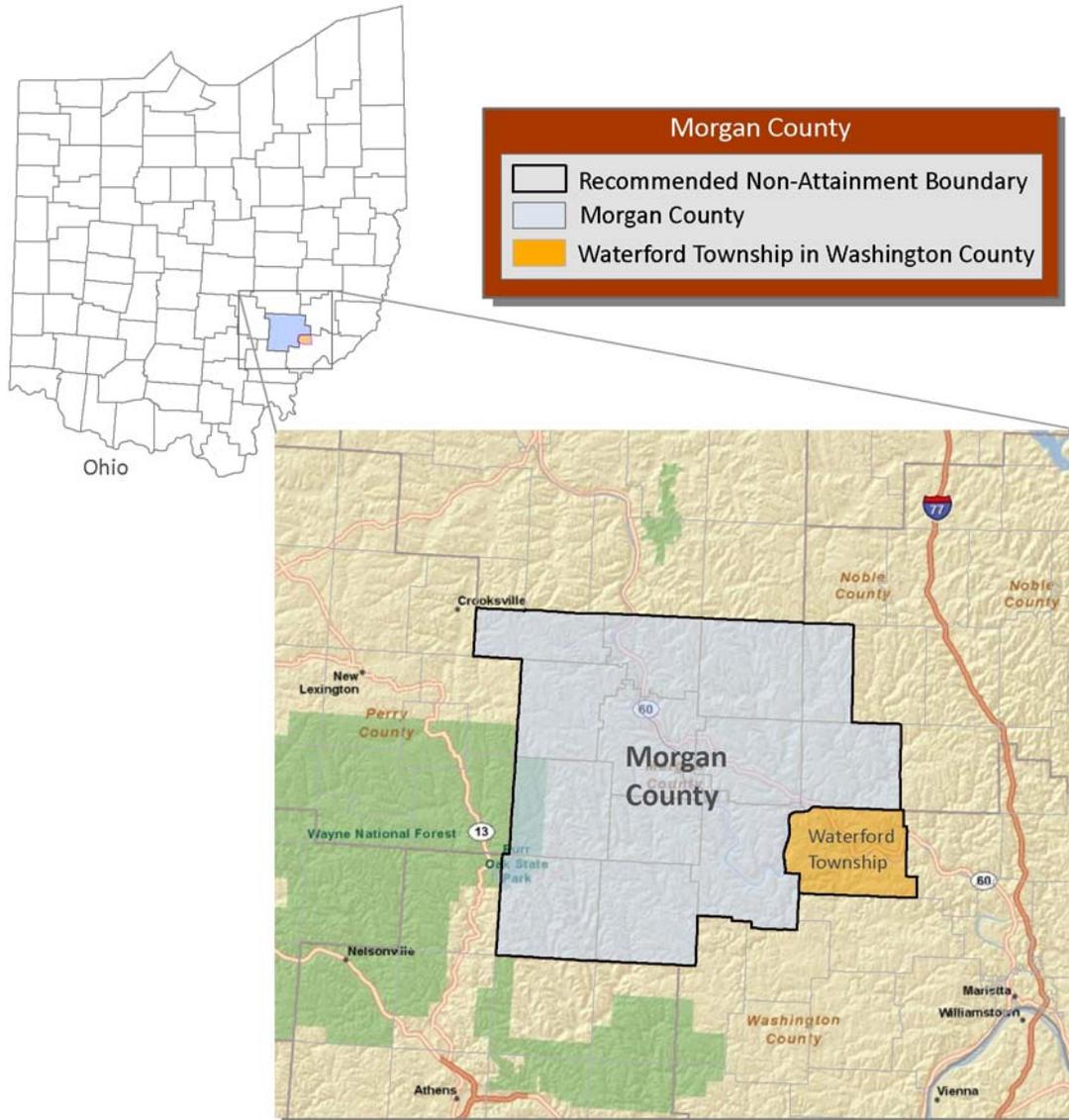


Figure 34: Recommended Nonattainment Boundary for Morgan and Washington County

### Discussion:

Ohio EPA is recommending nonattainment of Morgan County and partial nonattainment of Washington County, as indicated in the map above, and supported by an analysis of the factors.

As seen under Factor 1, Morgan County contains one monitor which is violating for the 2008 to 2010 air quality period. As seen under Table 14 below, there are 140,750.18 TPY of SO<sub>2</sub> emissions within 50 km of the violating monitor. There are 0 TPY of SO<sub>2</sub> emissions within Morgan County. The majority of emissions, 99.6% or

140,130.47 TPY, are from Washington County. Specifically, these emissions emanate from one source located within the boundary suggested as partial nonattainment for Washington County. Ohio EPA believes it would not be appropriate to designate all of Washington County nonattainment because there are no other significant sources of SO<sub>2</sub> emissions within Washington County that are in close proximity (and upwind) to significantly impact the Morgan County monitor.

As indicated in Figure 36 below, the majority of significant sources are located in the recommended partial nonattainment area south southeast of the violating monitor in adjacent Washington County, as discussed above.

**Factor 1: Air Quality Data**

**Table 13: Morgan County 2008 to 2010 SO<sub>2</sub> Air Quality Data**

| SO <sub>2</sub> Monitoring Site(s) |             | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|-------------|-----------------------|------|------|---------------------|
| County                             | Site ID     | 2008                  | 2009 | 2010 | 2008-2010           |
| Morgan                             | 39-115-0004 | 220                   | 198  | 167  | 195                 |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

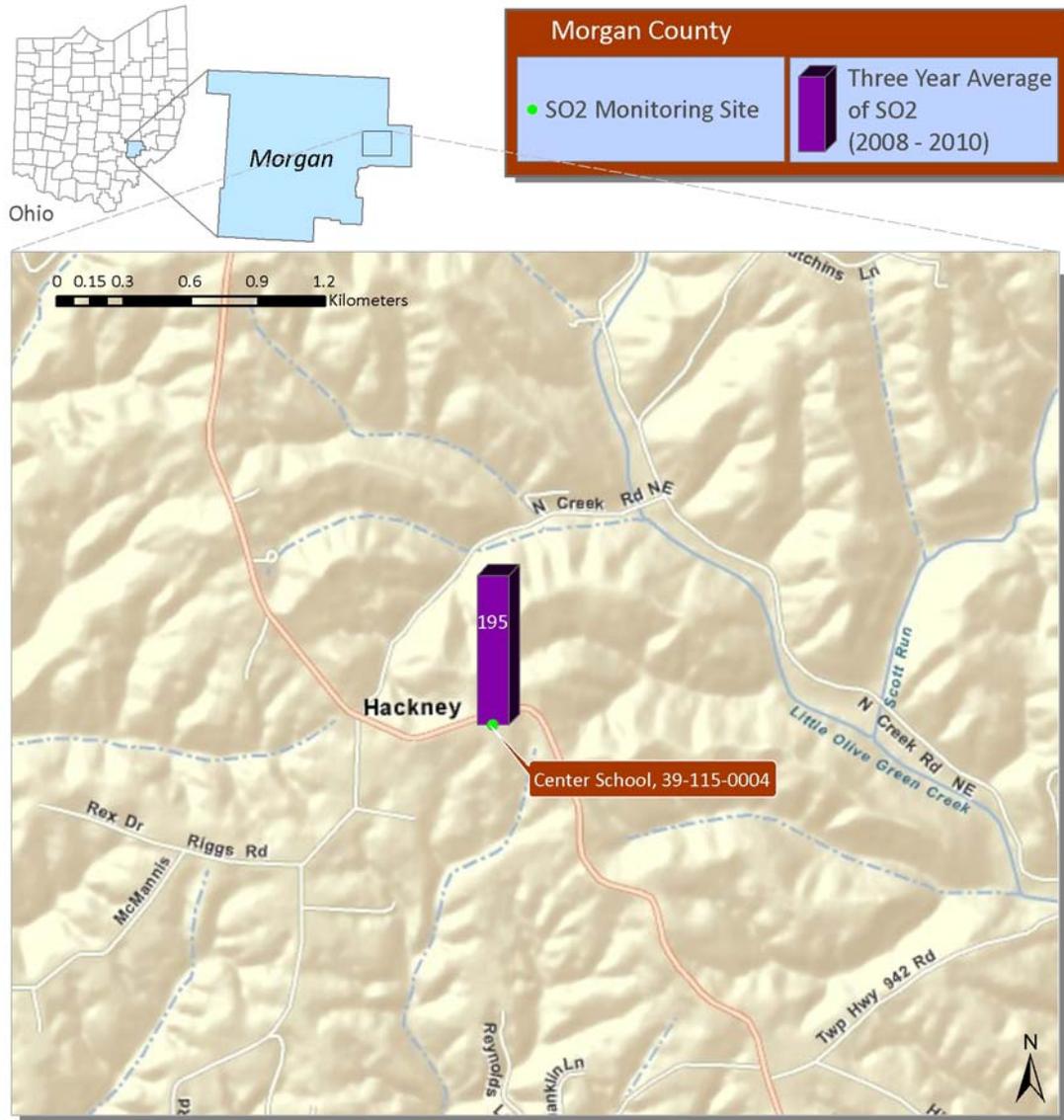


Figure 35: Morgan County SO<sub>2</sub> Monitor Locations and Site ID Numbers

## Factor 2: Emissions

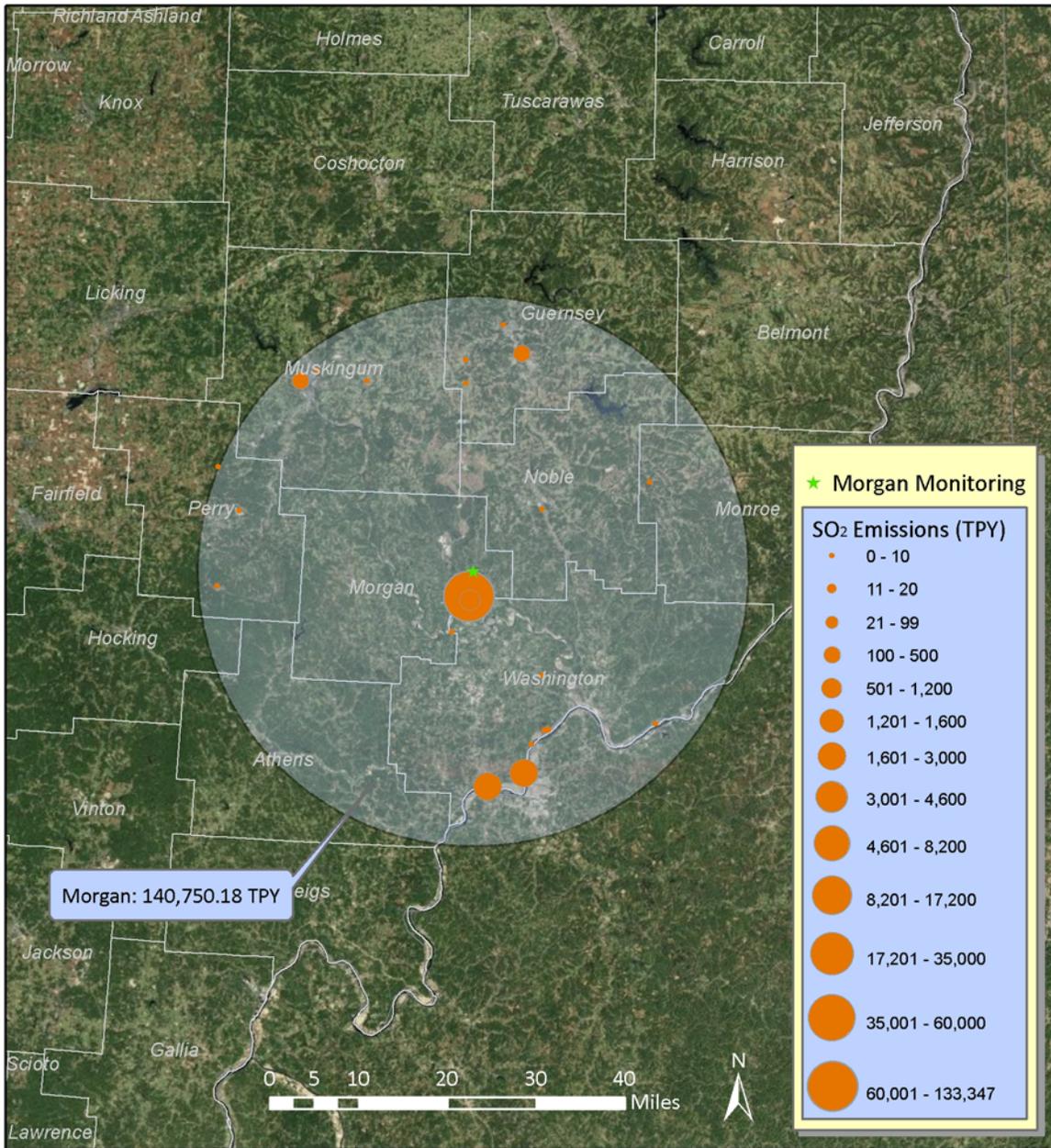
There are 140,750.18 TPY of SO<sub>2</sub> emissions from Ohio within 50 km of the violating monitor.

Table 14: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Morgan County Violating Monitor

| State | County   | Facility ID | Facility Name                      | 2008 SO <sub>2</sub> Emissions (TPY) | Distance from Monitor (km) |
|-------|----------|-------------|------------------------------------|--------------------------------------|----------------------------|
| OH    | Guernsey | 0630010005  | Metallurg Vanadium Corporation     | 463.57                               | 40.5                       |
| OH    | Guernsey | 0630000001  | Tennessee Gas Pipeline Station 209 | 1.71                                 | 34.1                       |

| State                   | County     | Facility ID | Facility Name  | 2008 SO2 Emissions (TPY) | Distance from Monitor (km) |
|-------------------------|------------|-------------|--|--------------------------|----------------------------|
| OH                      | Guernsey   | 0630010006  | Centria  | 0.05                     | 45.2                       |
| OH                      | Guernsey   | 0630000104  | Cambridge Compressor - New Concord                     | 0.01                     | 38.5                       |
| <b>Guernsey Total</b>   |            |             |  | <b>465.34</b>            |                            |
| OH                      | Monroe     | 0656000032  | Texas Eastern Transmission LP - Berne                  | 0.04                     | 35.8                       |
| <b>Monroe Total</b>     |            |             |  | <b>0.04</b>              |                            |
| OH                      | Muskingum  | 0660010007  | Owens Brockway Glass Containers - Plant #12            | 151.95                   | 46.7                       |
| OH                      | Muskingum  | 0660010101  | Burnham Foundry  | 2.07                     | 47.6                       |
| OH                      | Muskingum  | 0660010006  | AK Steel - Zanesville Works                            | 0.29                     | 46.2                       |
| OH                      | Muskingum  | 0660000235  | New Bakery of Ohio, Inc                                | 0.01                     | 39.6                       |
| <b>Muskingum Total</b>  |            |             |  | <b>154.32</b>            |                            |
| OH                      | Noble      | 0661000027  | International Converter, Inc. - Caldwell               | 0.01                     | 16.7                       |
| <b>Noble Total</b>      |            |             |  | <b>0.01</b>              |                            |
| OH                      | Perry      | 0664000067  | Superior Fibers Shawnee LLC                            | 0.01                     | 46.4                       |
| <b>Perry Total</b>      |            |             |  | <b>0.01</b>              |                            |
| OH                      | Washington | 0684000000  | Muskingum River Power Plant                            | 133347.00                | 4.7                        |
| OH                      | Washington | 0684020037  | R. H. Gorsuch Station <sup>6</sup>                     | 30564.00                 | 32.1                       |
| OH                      | Washington | 0684010011  | KRATON Polymers U.S. LLC                               | 2993.04                  | 39.3                       |
| OH                      | Washington | 0684010049  | Evonik Degussa Corporation                             | 2593.10                  | 37.8                       |
| OH                      | Washington | 0684000105  | Globe Metallurgical Inc.                               | 1190.61                  | 5.4                        |
| OH                      | Washington | 0684020006  | Eramet Marietta, inc.                                  | 4.89                     | 31.7                       |
| OH                      | Washington | 0684000212  | Washington Energy Facility                             | 0.81                     | 5.9                        |
| OH                      | Washington | 0684000213  | Columbus Southern Power Company - Waterford Plant      | 0.66                     | 11.7                       |
| OH                      | Washington | 0684020001  | Americas Styrenics, LLC                                | 0.32                     | 31.8                       |
| OH                      | Washington | 0684020008  | Solvay Advanced Polymers LLC                           | 0.02                     | 32.0                       |
| OH                      | Washington | 0684020025  | Churchtown Compressor Station (Cobra Pipeline Co. LTD) | 0.01                     | 22.7                       |
| <b>Washington Total</b> |            |             |  | <b>140130.47</b>         |                            |
| <b>Grand Total</b>      |            |             |  | <b>140750.18</b>         |                            |

<sup>6</sup> This source was permanently shut down at the end of 2010 and is not included in the emission totals.



**Figure 36: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of the Morgan County Violating Monitor**

**Factor 3: Meteorology**

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Morgan and Washington County.

Morgan County lies in the foothills of the Appalachian Mountains. Although the area is gently rolling, local meteorology is influenced by the terrain. Foothill valleys experience nighttime inversions which can control local wind patterns. The general

wind patterns typically follow a southwest to northeast flow. These effects would best be represented by the Huntington, West Virginia wind rose.

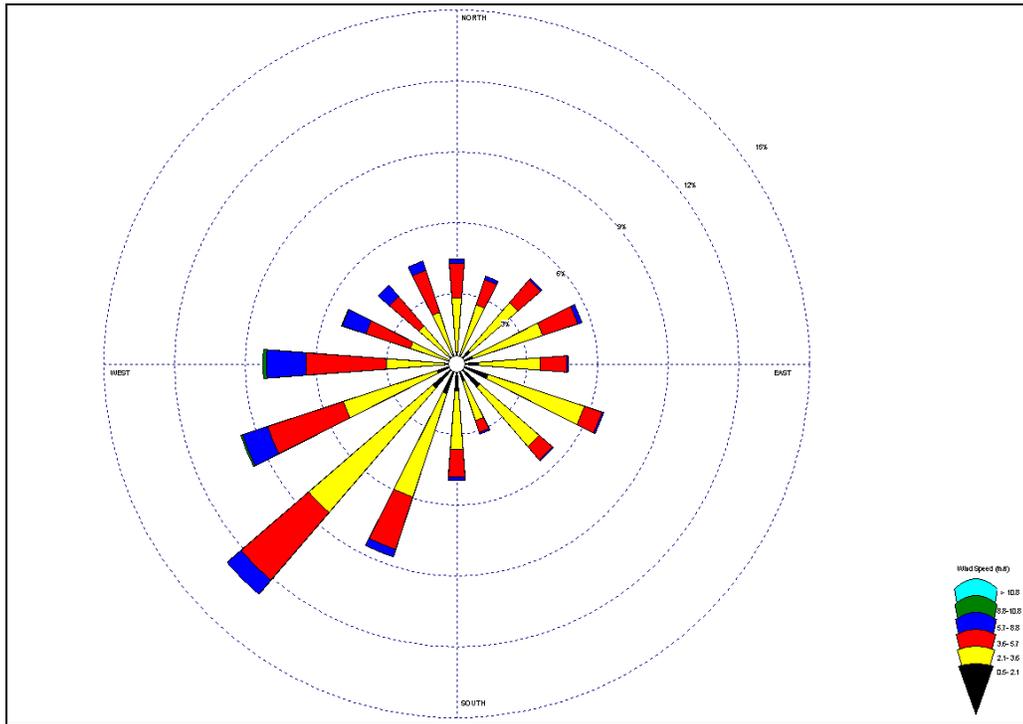
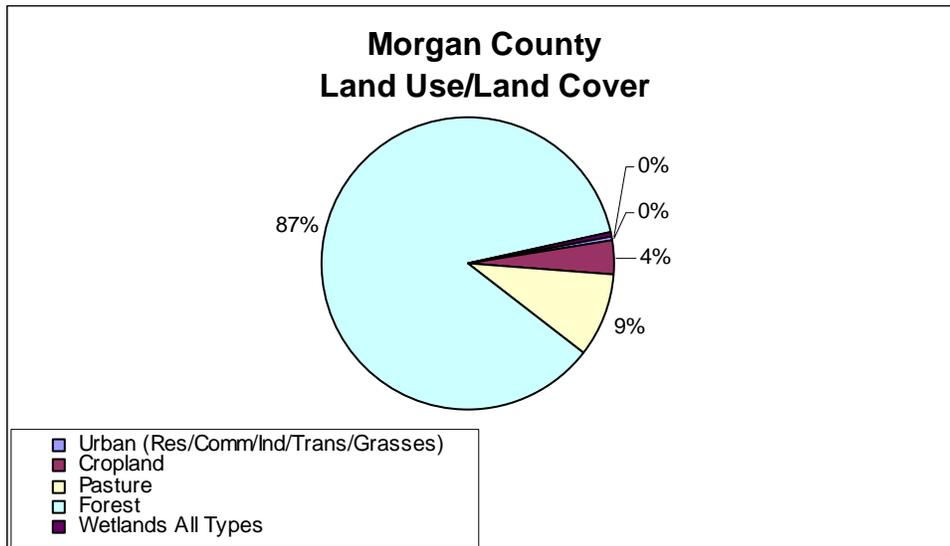


Figure 37: Morgan and Washington County Wind Rose

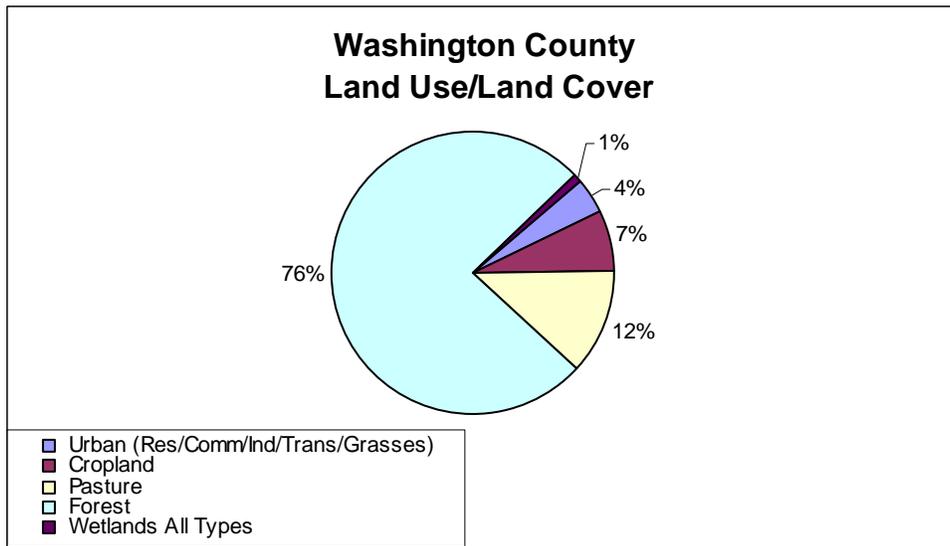
#### Factor 4: Topography and Land Use/Land Cover

Morgan and Washington Counties lie in the unglaciated Appalachian Plateaus Province (see Appendix E). Rugged, they consist mostly of steep hillsides and narrow ridgetops with Washington County also containing stream valleys. Some broad, gently sloping uplands are in the western part of Morgan County. The elevation ranges from about 630 feet to 1115 feet above sea level. The eastern part of Washington County is rugged with steep to very steep slopes while the central and western parts of the county have a more rolling topography, wider ridgetops and fewer steep side slopes. The lowest point in the county is 580 feet and the highest is more than 1,200 feet above sea level.

As shown in the following pie charts, the land use/land cover in Morgan and Washington Counties are predominately forest.



**Figure 38: Morgan County Land Use/Land Cover**



**Figure 39: Washington County Land Use/Land Cover**

The Morgan and Washington Counties area does not have any geographical or topographical barriers significantly affecting transport of SO<sub>2</sub> within its air shed. Therefore, this factor provides no reason to delineate sources potentially included versus excluded from these analyses.

**Factor 5: Jurisdictional Boundaries**

There is no MSA or CSA for Morgan County. Morgan County is not represented by an MPO.

The Parkersburg-Marietta-Vienna, WV-OH MSA includes: Pleasants, Wirt and Wood Counties in West Virginia; and Washington County in Ohio. The principal cities are Parkersburg and Vienna in West Virginia, and Marietta in Ohio. There is no CSA for this area.

The Wood, Wirt, Washington Interstate Planning Commission (WWWIPC) is the planning agency designated as the Metropolitan Planning Organization for Parkersburg-Marietta area. The WWWIPC region is composed of two counties: Wood County, WV and the greater Marietta area of Washington County, OH.

The Ohio EPA Central Office and Southeast District Office are responsible for air quality planning within all areas of Morgan and Washington County.

The partial nonattainment boundary for Washington County was selected at the township jurisdictional boundary.

**Section 2**

**Counties Containing Non-Violating SO<sub>2</sub> Monitors**

**Recommended Unclassifiable**

## Counties Recommended Unclassifiable:

1. Adams County
2. Allen County
3. Ashtabula County
4. Athens County
5. Butler County
6. Clark County
7. Franklin County
8. Lawrence County
9. Hamilton County
10. Mahoning County
11. Scioto County
12. Summit County
13. Tuscarawas County

## Discussion:

Ohio EPA is recommending the above counties be designated as unclassifiable. U.S. EPA's rule states that in order for an area to be designated attainment there must be monitoring and appropriate modeling data showing no violations. Although each of these counties contains a monitor(s) indicating attainment, there are, or may be, sources of emissions within 50 km of these monitors that may necessitate additional modeling in the future under Ohio's Infrastructure SIP.

## Air Quality Data:

Table 15: 2008 to 2010 SO<sub>2</sub> Air Quality Data for Non-Violating Monitors in Ohio

| SO <sub>2</sub> Monitoring Site(s) |                          | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|--------------------------|-----------------------|------|------|---------------------|
| County                             | Site ID                  | 2008                  | 2009 | 2010 | 2008-2010           |
| Adams                              | 39-001-0001              | 59                    | 80   | 43   | 61                  |
| Allen                              | 39-003-0002 <sup>7</sup> | 20                    | 23   |      | 22                  |
|                                    | 39-003-0009              |                       | 13   | 23   |                     |
| Ashtabula                          | 39-007-1001              | 36                    | 34   | 20   | 30                  |
| Athens                             | 39-009-0004              | 76                    | 58   | 71   | 68                  |
| Butler                             | 39-017-1004 <sup>8</sup> | 32                    | 30   | 31   | 31                  |
| Clark                              | 39-023-0003              | 24                    | 27   | 28   | 26                  |

<sup>7</sup> Monitor -0002 was replaced by monitor -0009 as part of a relocation approved under Ohio's Annual Monitoring Plan. Therefore, 2009 data is combined.

<sup>8</sup> This monitor was an approved discontinuation in April of 2010 as a part of Ohio's Annual Monitoring Plan. Therefore, data substitution analysis was not performed on this site. The 2006 to 2008 design value of 41 ppb and the 2007-2009 design value of 33 ppb is further evidence that this site has historically attained the standard.

| SO <sub>2</sub> Monitoring Site(s) |                           | Yearly averages (ppb) |      |      | 3-yr averages (ppb) |
|------------------------------------|---------------------------|-----------------------|------|------|---------------------|
| County                             | Site ID                   | 2008                  | 2009 | 2010 | 2008-2010           |
| Franklin                           | 39-049-0034 <sup>9</sup>  | 29                    | 36   |      | 33                  |
| Hamilton                           | 39-061-0010 <sup>10</sup> |                       |      | 66   | 66                  |
| Lawrence <sup>11</sup>             | 39-087-0006               | 37                    | 23   | 26   | 30                  |
|                                    | 39-087-0012               |                       |      | 33   |                     |
| Mahoning                           | 39-099-0013               | 60                    | 54   | 48   | 54                  |
| Scioto                             | 39-145-0013               | 30                    | 22   | 24   | 25                  |
|                                    | 39-145-0020               | 44                    | 36   | 52   | 41                  |
|                                    | 39-145-0022               | 39                    | 32   | 50   | 41                  |
| Summit                             | 39-153-0017               | 34                    | 31   | 27   | 31                  |
|                                    | 39-153-0022               | 37                    | 35   | 38   | 37                  |
| Tuscarawas                         | 39-157-0006               | 64                    | 64   | 58   | 62                  |

\*Yellow highlights denote violation of SO<sub>2</sub> NAAQS (75 ppb)

\*Red highlights denote <75% capture in any one quarter

<sup>9</sup> This monitor was an approved discontinuation in 2009 as a part of Ohio's Annual Monitoring Plan. Only two quarters of data were collected in 2009. Therefore, data substitution analysis was not performed on this site. The 2006 to 2008 design value of 33 ppb and the 2007-2009 design value of 33 ppb is further evidence that this site has historically attained.

<sup>10</sup> This is a new monitor that began running February 22, 2010 as a part of Ohio's Annual Monitoring Plan. Data incompleteness is attributed to this start date. Data since February 22, 2010 has been complete.

<sup>11</sup> Monitor -0006 was replaced with -0012 on April 1, 2010 as a part of Ohio's Annual Monitoring Plan. Therefore, 2010 data is combined.

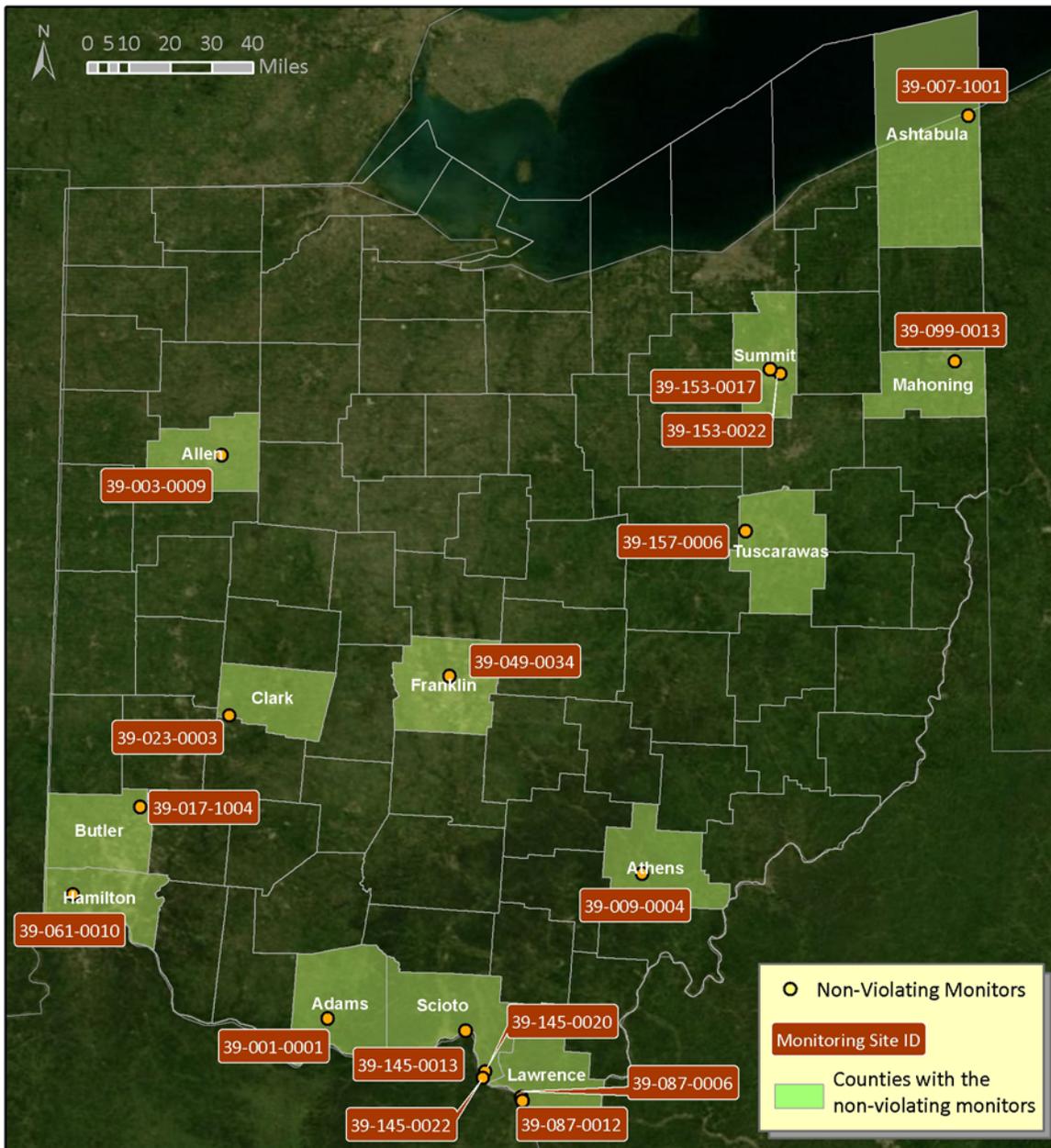


Figure 40: SO<sub>2</sub> Monitor Locations and Site ID Numbers for Non-Violating Monitors in Ohio

**Emissions:**

Figure 41 below identifies the total emissions from Ohio within the 50 km radius of each county's non-violating monitor.

Appendix C contains a detailed list of all SO<sub>2</sub> sources in the State of Ohio.

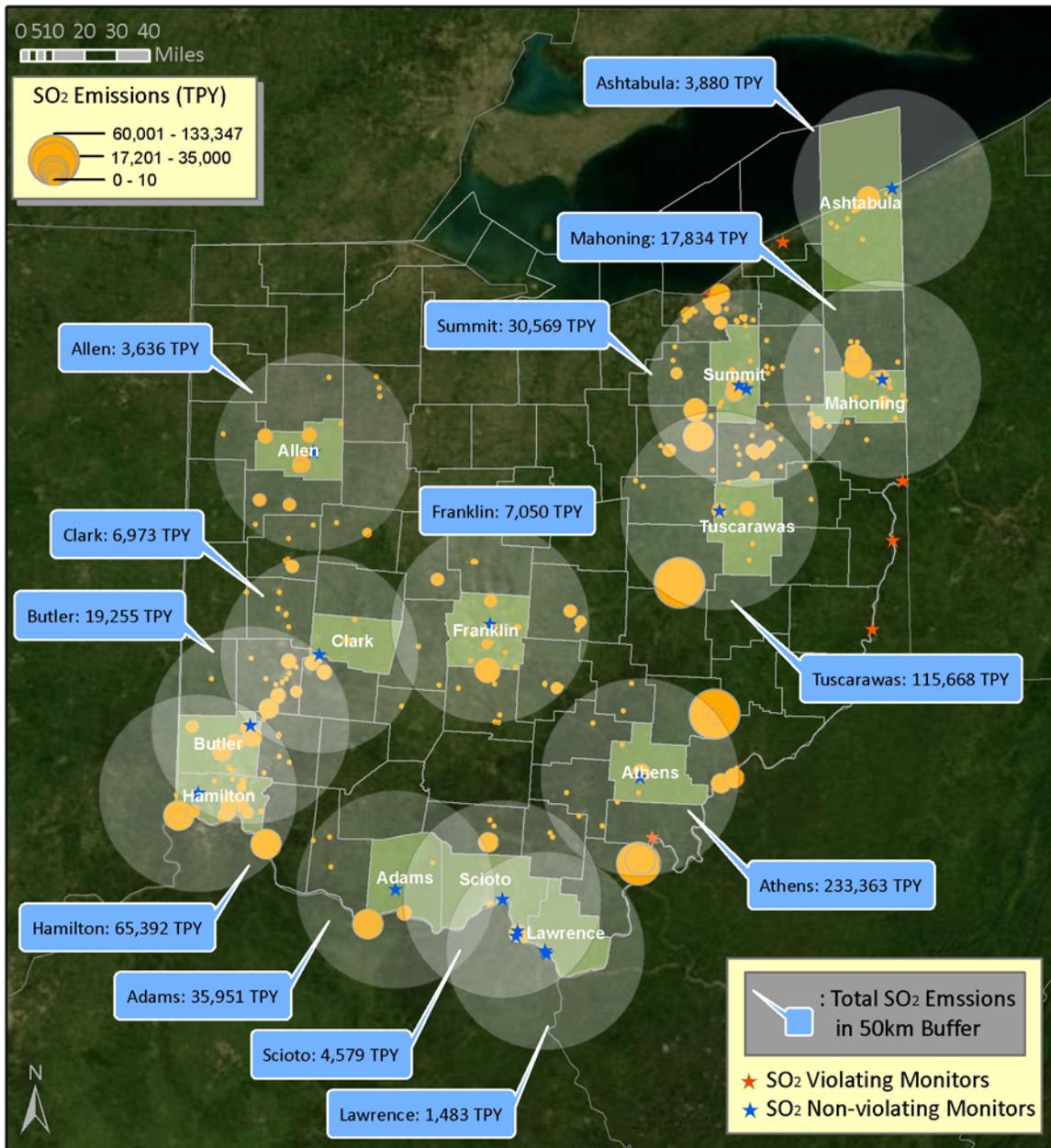


Figure 41: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) within 50 Kilometers of Non-Violating Monitors in Ohio

**Section 3**

**Counties Without SO<sub>2</sub> Monitors**

***Section 3A***

***Counties That May Necessitate Modeling***

***Recommended Unclassifiable***

**Counties Recommended Unclassifiable:**

1. Auglaize County
2. Clermont County
3. Coshocton County
4. Erie County
5. Fulton County
6. Gallia County (except Cheshire Township)
7. Greene County
8. Guernsey County
9. Henry County
10. Licking County
11. Lorain County
12. Lucas County
13. Marion County
14. Monroe County
15. Montgomery County
16. Muskingum County
17. Ottawa County
18. Paulding County
19. Pickaway County
20. Pike County
21. Richland County
22. Ross County
23. Sandusky County
24. Seneca County
25. Shelby County
26. Stark County
27. Trumbull County
28. Union County
29. VanWert County
30. Washington County (except Waterford Township)
31. Wayne County
32. Wood County

**Discussion:**

Ohio EPA is recommending the above counties be designated as unclassifiable. Each of these counties does not contain a monitor indicating current air quality and these counties have sources of emissions within the county border that may necessitate additional modeling in the future under Ohio's Infrastructure SIP.

## Emissions:

Figure 42 below identifies the total emissions within the each county identified above. Appendix C contains a detailed list of all SO<sub>2</sub> sources in the State of Ohio.

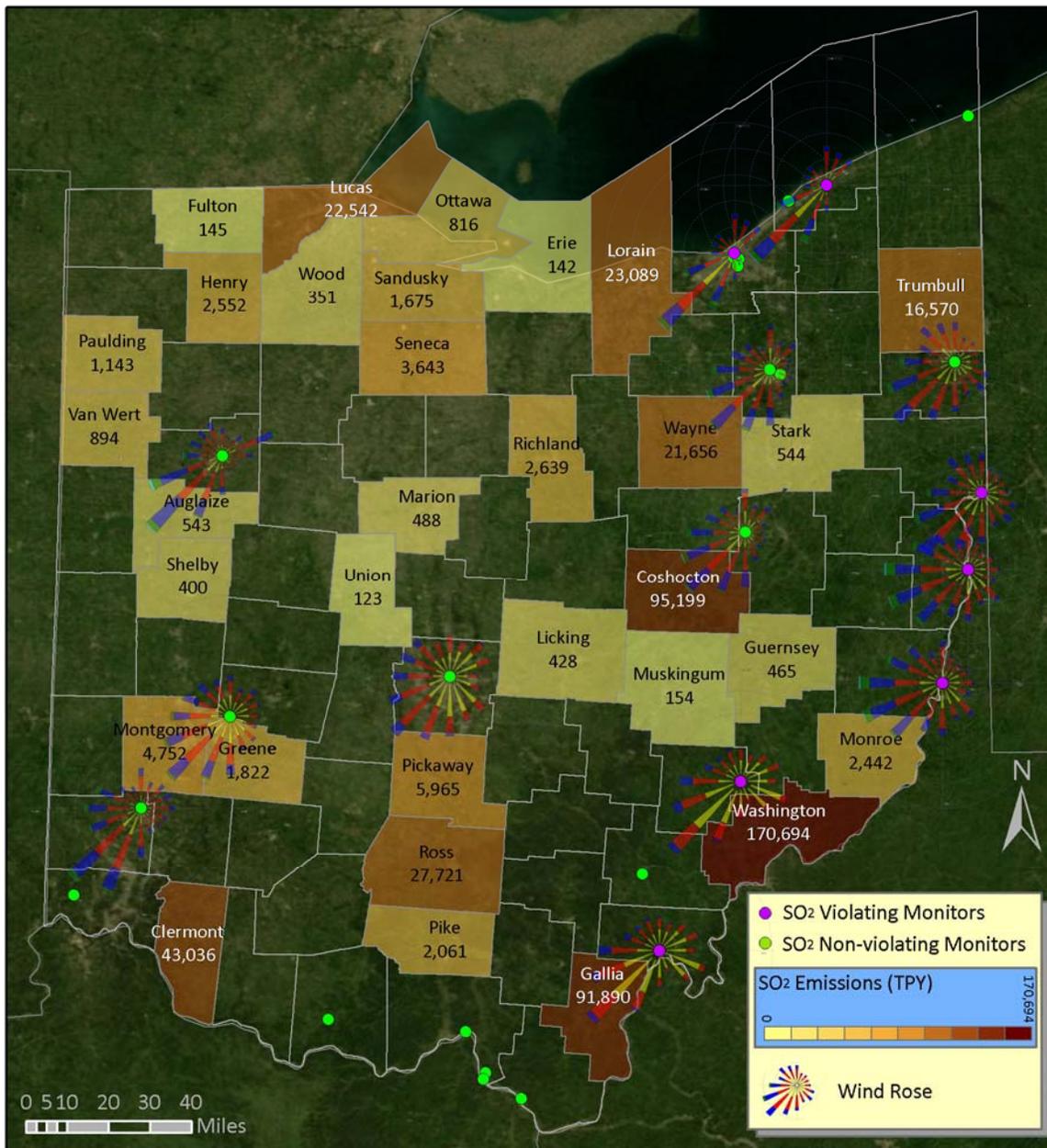


Figure 42: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) Within the County Borders for Counties Without Monitors that are Recommended as Unclassifiable in Ohio

***Section 3B***

***Counties That Do Not Necessitate Modeling***

***Recommended Attainment***

**Counties Recommended Attainment:**

1. Ashland County
2. Brown County
3. Carroll County
4. Champaign County
5. Clinton County
6. Crawford County
7. Darke County
8. Defiance County
9. Delaware County
10. Fairfield County
11. Fayette County
12. Geauga County
13. Hancock County
14. Hardin County
15. Harrison County
16. Highland County
17. Hocking County
18. Holmes County
19. Huron County
20. Jackson County
21. Knox County
22. Logan County
23. Madison County
24. Medina County
25. Mercer County
26. Miami County
27. Morrow County
28. Noble County
29. Perry County
30. Portage County
31. Preble County
32. Putnam County
33. Vinton County
34. Warren County
35. Williams County
36. Wyandot County

**Discussion:**

Ohio EPA is recommending the above counties be designated as attainment. These counties do not necessitate monitoring and these are counties where modeling would not be appropriate based on a lack of sources emitting 100 or more tons of SO<sub>2</sub> per year and a lack of smaller sources with the potential to cause or contribute to a violation of the new SO<sub>2</sub> standard. As stated in U.S. EPA's final rule, they only

intend to designate an area as attainment if monitoring and appropriate modeling data show no violations. Ohio's approach for recommending these counties be designated attainment is appropriate as not all counties in Ohio have sources that emit over 100 tons of SO<sub>2</sub> per year or have a collection of smaller sources that have the potential to cause or contribute to a violation of the SO<sub>2</sub> standard. For each of the 36 counties above, total county-wide emissions are less than 75 TPY in 2008 within each of those counties.

In addition, not all areas of Ohio necessitate monitoring. These 36 counties are not currently being monitored. Under U.S. EPA's final rule, additional monitoring may be necessitated in certain areas of the State based on a population weighted emissions index (PWEI) within core based statistical areas (CBSAs<sup>12</sup>). Eleven of the counties identified above (Brown, Delaware, Fairfield, Geauga, Madison, Medina, Miami, Morrow, Portage, Preble and Warren Counties) are within CBSAs that may require additional monitoring. However, based on the siting requirements in U.S. EPA's rule [75 FR 35561], Ohio would not be siting monitors that could indicate a violation within these counties of the CBSAs as they represent counties within each CBSA with the lowest expected concentrations and very insignificant sources.

For the reasons stated above, these areas should be designated as attainment consistent with U.S. EPA's broader approach for designations.

**Emissions:**

Figure 43 below identifies the total emissions within each county identified above. Appendix C contains a detailed list of all SO<sub>2</sub> sources in the State of Ohio.

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<sup>12</sup> A map of Ohio's CBSA's can be found in Appendix D

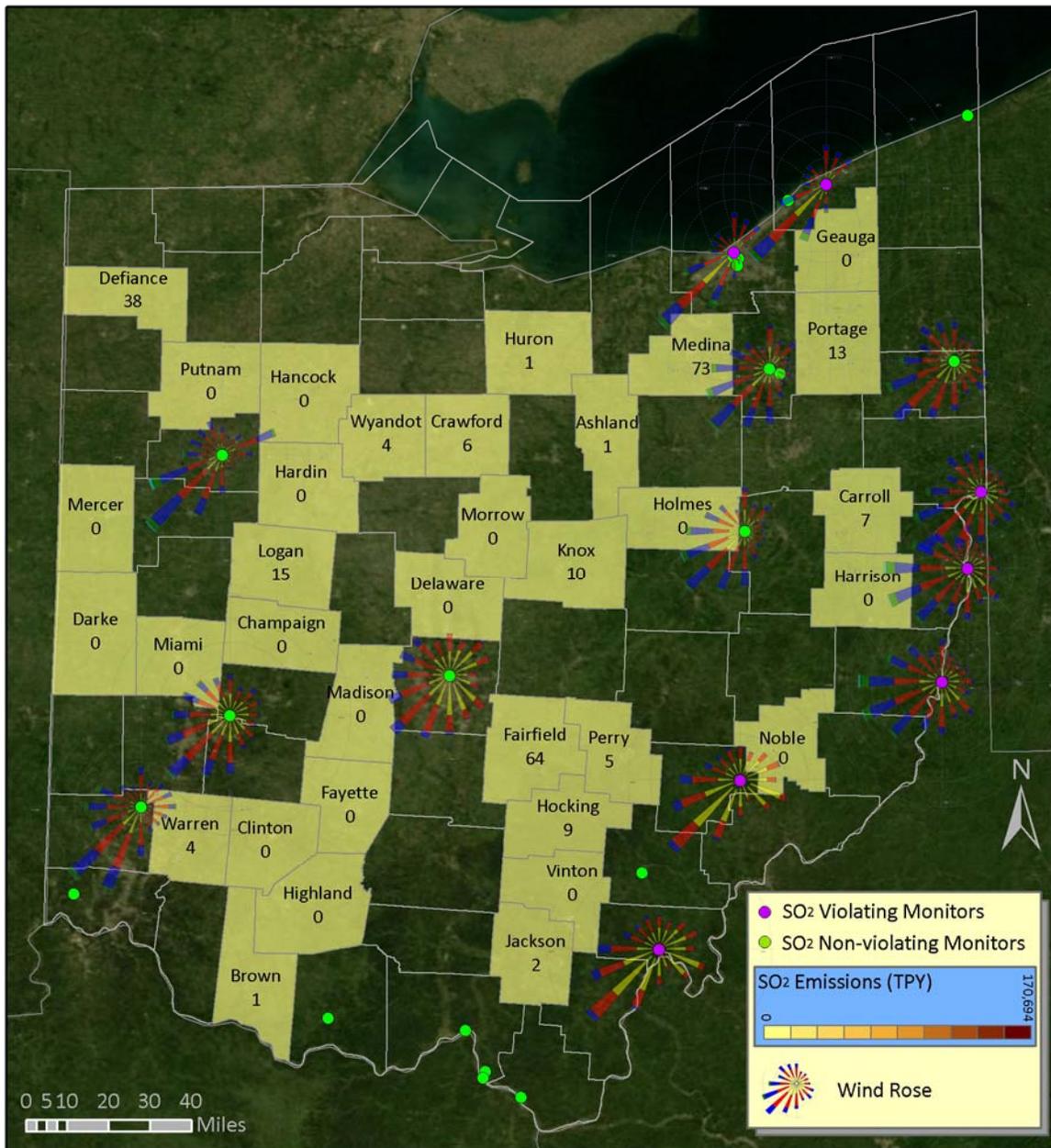


Figure 43: 2008 Ohio Sources of SO<sub>2</sub> Emissions (TPY) Within the County Borders for Counties Without Monitors that are Recommended as Attainment in Ohio