



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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PAT QUINN, GOVERNOR

June 2, 2011

Ms. Cheryl A. Newton, Director  
Office of the Air and Radiation Division  
U.S. Environmental Protection Agency, Region V (R18J)  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3507

Dear Ms. Newton:

On behalf of Governor Quinn and pursuant to the U.S. Environmental Protection Agency's revision to the National Ambient Air Quality Standards (NAAQS) for SO<sub>2</sub> dated June 2, 2010, I am submitting our recommendations for attainment and nonattainment designations for the State of Illinois. Included with these recommendations is supporting documentation prepared by the Illinois Environmental Protection Agency (Illinois EPA). The Illinois EPA is also providing this documentation to your staff in electronic format to facilitate your timely review.

Specifically, the following designations are recommended for Illinois:

County (Partial)	Designation	Name of Area
<u>Tazewell County:</u> <ul style="list-style-type: none"> <li>• Pekin and Cincinnati Townships</li> <li>• Remainder of Tazewell County</li> </ul>	Nonattainment Unclassifiable	Tazewell County
<u>La Salle County:</u> <ul style="list-style-type: none"> <li>• La Salle Township</li> <li>• Remainder of La Salle County</li> </ul>	Nonattainment Unclassifiable	La Salle County
<u>Cook County:</u> <ul style="list-style-type: none"> <li>• Lemont Township</li> <li>• Remainder of Cook County</li> </ul>	Nonattainment Unclassifiable	Cook County
<u>Will County:</u> <ul style="list-style-type: none"> <li>• Lockport and DuPage Townships</li> <li>• Remainder of Will County</li> </ul>	Nonattainment Unclassifiable	Will County
<u>Madison County:</u> <ul style="list-style-type: none"> <li>• Chouteau and Wood River</li> <li>• Remainder of Madison County</li> </ul>	Nonattainment Unclassifiable	Madison
All Other Counties	Unclassifiable	Illinois

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We are recommending that portions of the following counties be designated as nonattainment for the 2010 primary 1-hour SO<sub>2</sub> NAAQS: Tazewell (Pekin and Cincinnati Townships), La Salle (La Salle Township), Cook (Lemont Township), Will (Lockport and DuPage Townships) and Madison (Chouteau and Wood River Townships). As violations of the revised SO<sub>2</sub> standard have been measured in these areas during 2008-2010, designating them as nonattainment is appropriate. We recommend that the remainder of Illinois be designated as unclassifiable.

If there are any questions, please feel free to contact Rob Kaleel (217-524-4343), or myself.

Sincerely,

A handwritten signature in cursive script that reads "Laurel L. Kroack".

Laurel L. Kroack  
Chief, Bureau of Air

Attachment

**Technical Support Document:**  
**Recommended Attainment/Nonattainment Designations**  
**in Illinois for the 2010 Revised Primary 1-Hour SO<sub>2</sub>**  
**National Ambient Air Quality Standard**

**AQPSTR 11-02**

**June 2, 2011**

**Illinois Environmental Protection Agency  
Division of Air Pollution Control  
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## Introduction

On June 2, 2010, the U.S. Environmental Protection Agency (U.S. EPA) revised the primary Sulfur Dioxide (SO<sub>2</sub>) National Ambient Air Quality Standard (NAAQS) in response to current scientific evidence which links short-term exposure to SO<sub>2</sub> with adverse health effects in humans. U.S. EPA health studies show that short-term exposure to SO<sub>2</sub>, ranging from 5-minutes to 24-hours, results in adverse respiratory effects and increased asthma symptoms, particularly in children, the elderly, and asthmatics. According to U.S. EPA, there is currently little evidence suggesting a relationship between long-term exposure to SO<sub>2</sub> and health effects. As a result, U.S. EPA revoked both the previous 24-hour and annual primary SO<sub>2</sub> standards and established a new primary 1-hour SO<sub>2</sub> standard at a level of 75 parts per billion (ppb) (75 FR 35520; June 22, 2010). As part of the 2010 revised primary SO<sub>2</sub> NAAQS (further referenced as the revised SO<sub>2</sub> standard), U.S. EPA also modified how attainment is determined. The revised SO<sub>2</sub> standard is attained when the three-year average of the annual 99<sup>th</sup> percentile 1-hour daily maximum concentrations does not exceed 75 ppb (75 FR 35520; June 22, 2010). U.S. EPA will address the secondary SO<sub>2</sub> standard as part of a separate review.

Section 107(d) of the Clean Air Act (CAA) governs the process for area designations, and directs states to submit their SO<sub>2</sub> designation recommendations to U.S. EPA by June 3, 2011.

Following the promulgation of a new or revised air quality standard, the Clean Air Act (CAA) requires the Governor to recommend initial designations of the attainment status for all areas of the State. Areas can be classified as *nonattainment* (does not meet, or contributes to a nearby area that does not meet the NAAQS), *attainment* (meets the NAAQS), or *unclassifiable* (cannot be classified based on available data). Illinois is, therefore, required to provide recommendations for attainment/nonattainment area boundaries for the 2010 revised primary SO<sub>2</sub> standard. The U.S. EPA will act on the State's recommendations by both affirming and promulgating the recommended designation boundaries, or by promulgating new designations. U.S. EPA stated in its preamble to the 2010 NAAQS, that in addition to air monitoring data, refined dispersion modeling information may be used as part of an analytical approach to designations. However, according to the U.S. EPA March 24, 2011 memorandum entitled, *Area Designations for the*

*2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards*, the U.S. EPA does not believe it would be “realistic or appropriate to expect states to complete modeling for all significant sources of SO<sub>2</sub> and assess the results in time for the June 2011 designation recommendations”. States would instead present modeling to address additional violations in the course of developing State Implementation Plan (SIP) revisions under Section 110(a) of the Clean Air Act as a, “basis for re-designation of nonattainment and unclassifiable areas to attainment” (75 FR at 35570). Illinois does not intend to submit dispersion modeling in support of designations at this time. Rather, IEPA will complete dispersion modeling in the course of developing SIP revisions.

## **Federal Guidance**

The Illinois Environmental Protection Agency (IEPA) relied on guidance identified in a memorandum issued by U.S. EPA on March 24, 2011 which referenced pages in the preamble of the lead NAAQS final rule regarding criteria for developing this recommendation and for establishing the geographic boundaries of nonattainment areas (NAA) for the 2010 revised SO<sub>2</sub> standard. In this guidance, U.S. EPA recommended that states designate areas with air quality data showing violations of the SO<sub>2</sub> NAAQS, and nearby areas that cause or contribute to NAAQS violations, be designated nonattainment. Due to the localized nature of SO<sub>2</sub> impacts, U.S. EPA also recommends that the “county line” associated with the violating monitor(s) serve as the starting point, or presumptive boundary, for new SO<sub>2</sub> nonattainment areas. U.S. EPA provides states with the ability to depart from county boundaries based on area-specific analyses. States may request nonattainment area boundaries that are smaller than the existing violating county boundaries where counties, or portions of counties, do not contribute to nonattainment based on an examination of five factors. States may also request nonattainment area boundaries that are larger than the current county to include adjacent counties when those counties contain emission sources and other factors that may contribute to the nonattainment problem. This report provides the basis for recommendations by the IEPA for attainment/nonattainment designation boundaries for all areas in the State of Illinois for the revised SO<sub>2</sub> standard.

## Five Factor Analysis

The U.S. EPA recommends that states consider the following five factors in assessing whether to depart from county boundaries as the designated nonattainment area boundary:

1. **Air Quality Data:** an evaluation of the design value calculations for each monitor in the State. This calculation consists of the 3-year average of the annual 99th percentile daily maximum 1-hour SO<sub>2</sub> concentrations collected at each monitor. A detailed discussion of air quality in Illinois is provided in the sections below.
2. **Emissions-Related Data:** an evaluation of SO<sub>2</sub> emissions from sources located in and around the violating area which may potentially contribute to observed or modeled violations of the NAAQS. The emissions data used in this analysis are based on actual SO<sub>2</sub> emissions reported to the IEPA for 2007 through 2009.
3. **Meteorology:** an evaluation of weather conditions, including wind speed and direction that affect the plume of sources contributing to ambient and monitored SO<sub>2</sub> concentrations. Pollution roses are derived from IEPA sites in the proposed NAA areas, and all sites use either collocated wind measurements, or the nearest IEPA monitoring site with wind direction measurements, along with hourly SO<sub>2</sub> concentrations. The pollution roses show the frequency of wind directions at the monitor when 1-hour concentrations of SO<sub>2</sub> that exceed the standard are occurring. Detailed meteorology used in IEPA's analysis is discussed in the following sections.
4. **Geography/Topography:** Includes an evaluation of the physical features of the land that might have an effect on the airshed and, therefore, on the distribution of SO<sub>2</sub> at and near the monitors. Due to the fact that none of the recommended SO<sub>2</sub> nonattainment areas in Illinois have any geographical or topographical barriers that significantly limit air

pollution transport within the airsheds, the geography/topography factor did not play a significant role in determining the nonattainment boundaries in Illinois.

5. **Jurisdictional Boundaries:** Includes an analysis of areas that provide clearly defined legal boundaries including landmarks or geographic coordinates to carry out air quality planning and enforcement functions for the nonattainment area. The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries, or “county line” definitions, outlined in U.S. EPA’s guidance documentation. Sub-county boundaries in this study reflect 2009 Political Township boundaries provided by Property Tax Division of the Illinois Department of Revenue.

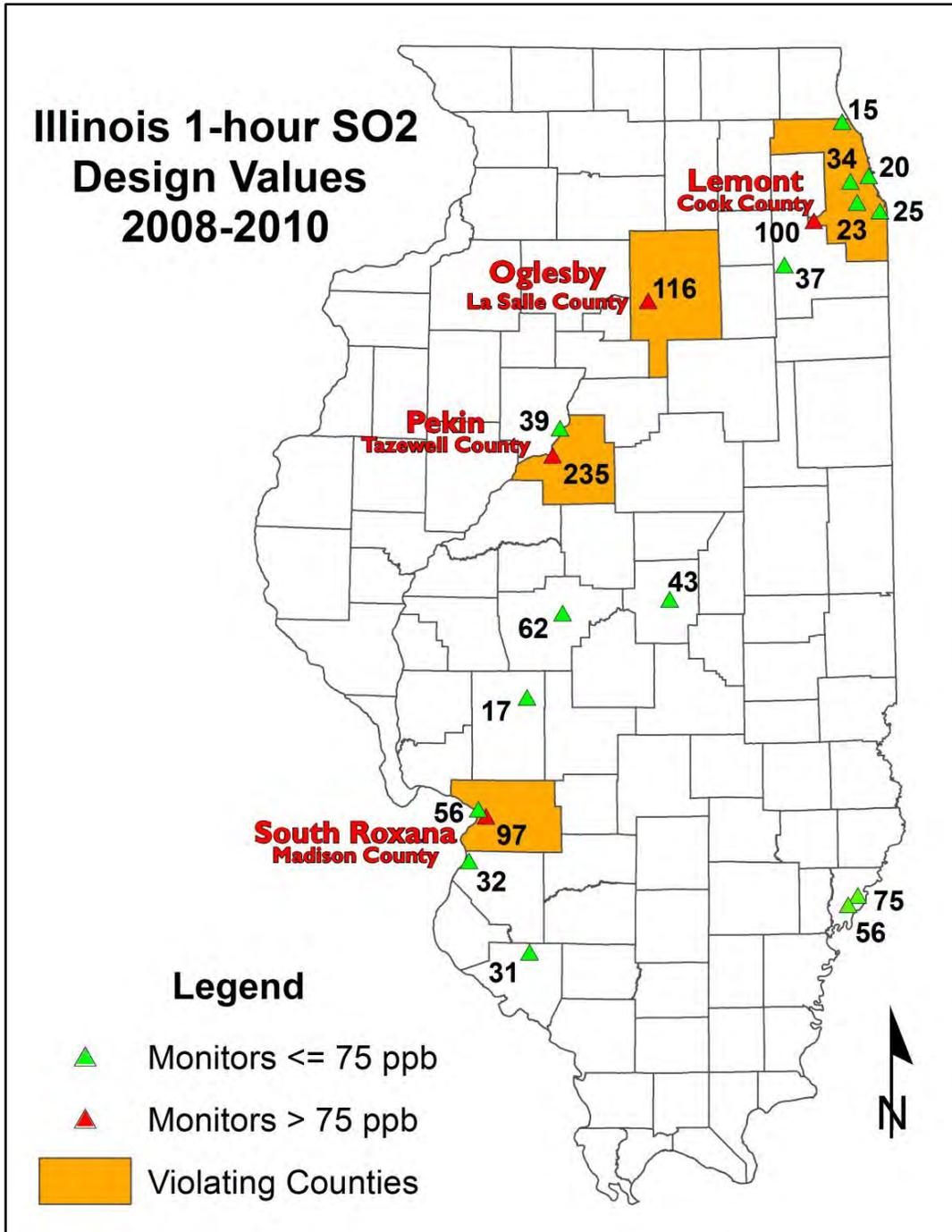
## **Illinois Air Quality**

As recommended by U.S. EPA, the first step in identifying areas that are in violation of the revised SO<sub>2</sub> NAAQS is to evaluate the most recent three years of ambient air monitoring data. Table 1 shows the most recent three consecutive years of quality assured air monitoring data for 2008 through 2010, along with the resulting design values. The design value is defined as the 3-year average of the annual 99<sup>th</sup> percentile daily maximum 1-hour SO<sub>2</sub> concentrations collected at each monitor (which is generally the fourth highest daily maximum 1-hour concentration, averaged over three consecutive years). The general trend in annual 1-hour 99<sup>th</sup> percentile values statewide has been downward. Overall, 16 of the 19 Illinois SO<sub>2</sub> monitoring sites had 99<sup>th</sup> percentile values in 2010 that were lower than those same values in 2008. Despite the significant improvement in air quality statewide, four monitoring sites currently violate the revised SO<sub>2</sub> NAAQS. These four monitors are located in Tazewell, La Salle, Cook, and Madison counties (see Figure 1). The remaining fifteen monitoring sites are attaining the revised SO<sub>2</sub> NAAQS, most by a considerable margin.

**Table 1**  
**2008-2010 Illinois SO<sub>2</sub> Design Values (ppb)**

AQS Code	County	Site	Annual 99 <sup>th</sup> Percentiles			Design Value
			2008	2009	2010	
170310050	Cook	Chicago - SE Police	35	19	21	25
170310063	Cook	Chicago - CTA	26	21	14	20
170310076	Cook	Chicago - Com Ed	26	24	20	23
170311601	Cook	Lemont	97	114	90	<b>100</b>
170314002	Cook	Cicero	43	29	31	34
170314201	Cook	Northbrook	13	17	15	15
170990007	La Salle	Oglesby	326	8	14	<b>116</b>
171150013	Macon	Decatur	44	36	49	43
171170002	Macoupin	Nilwood	20	16	15	17
171191010	Madison	South Roxana	152	81	57	<b>97</b>
171193007	Madison	Wood River WTP	67	46	54	56
171430024	Peoria	Peoria	52	21	43	39
171570001	Randolph	Houston	35	26	31	31
171630010	St. Clair	East St. Louis	35	30	31	32
171670006	Sangamon	Springfield	131	24	31	62
171790004	Tazewell	Pekin	243	233	228	<b>235</b>
171850001	Wabash	Mount Carmel	90	69	66	75
171851001	Wabash	Rural Wabash Co.	57	53	59	56
171970013	Will	Joliet	56	32	24	37

Figure 1



## Illinois 5 Factor Analysis

The U.S. EPA recommends that states consider the following five factors in assessing whether to depart from county boundaries as the designated nonattainment area boundary. As previously mentioned, Illinois has four counties where monitored violations of the revised SO<sub>2</sub> NAAQS are occurring. The information in the following sections provides boundary recommendations based on the five factors outlined in U.S. EPA guidance within each violating county or adjacent county.

### Tazewell County

#### Air Quality

There are two SO<sub>2</sub> monitors in the Peoria area. The first monitor is located west of the Illinois River in Peoria, while the second monitor is located east of the Illinois River in Pekin (see Figure 2). Monitoring data for both sites is listed below in Table 2. The 2008-2010 design value for the Peoria monitor is below the revised 1-hour NAAQS, while the design value for the Pekin monitor is well above the revised 1-hour NAAQS. The 2008 through 2010 annual 99<sup>th</sup> percentiles show a small decrease at the Peoria site and consistently high values at the Pekin site.

**Table 2 – Peoria Area Air Quality Data for 2008-2010 (ppb)**

AQS Code	County	Site	Annual 99 <sup>th</sup> Percentiles			Design Value
			2008	2009	2010	
171430024	Peoria	Peoria	52	21	43	39
171790004	Tazewell	Pekin	243	233	228	<b>235</b>

#### Emissions

Table 3 lists the major SO<sub>2</sub> emission sources (reported SO<sub>2</sub> emissions over 100 tons per year for at least one of the years from 2007 through 2009) within both Tazewell and Peoria counties. The locations of these sources are shown in Figure 2. From Figure 2, there are two sources in the vicinity of the violating monitor in Pekin: Aventine Renewable Energy, and Midwest Generation – Powerton. Overall, there has been a small decrease in SO<sub>2</sub> emissions within the Peoria area

during the period, however Aventine and Midwest Generation-Powerton, have shown either steady or increasing emissions trends during this period.

**Table 3 – Tazewell and Peoria County Reported SO<sub>2</sub> Emissions for 2007-2009**

County	ID Number	Facility Name	Reported SO <sub>2</sub> Emissions (Tons per Year)		
			2007	2008	2009
Tazewell	179060ACR	Aventine Renewable Energy Inc	12239.93	11830.31	11819.57
Tazewell	179801AAA	Midwest Generation – Powerton	20543.67	22355.08	22125.00
Peoria	143065AJE	Archer Daniels Midland Co	3140.00	3049.00	2587.00
Peoria	143805AAG	Ameren – Edwards	14535.90	11224.10	11734.40
Peoria	143808AAA	Keystone Steel & Wire Co	109.26	137.53	86.61

**Figure 2 – Location of Major SO<sub>2</sub> Emission Sources in Tazewell and Peoria Counties**

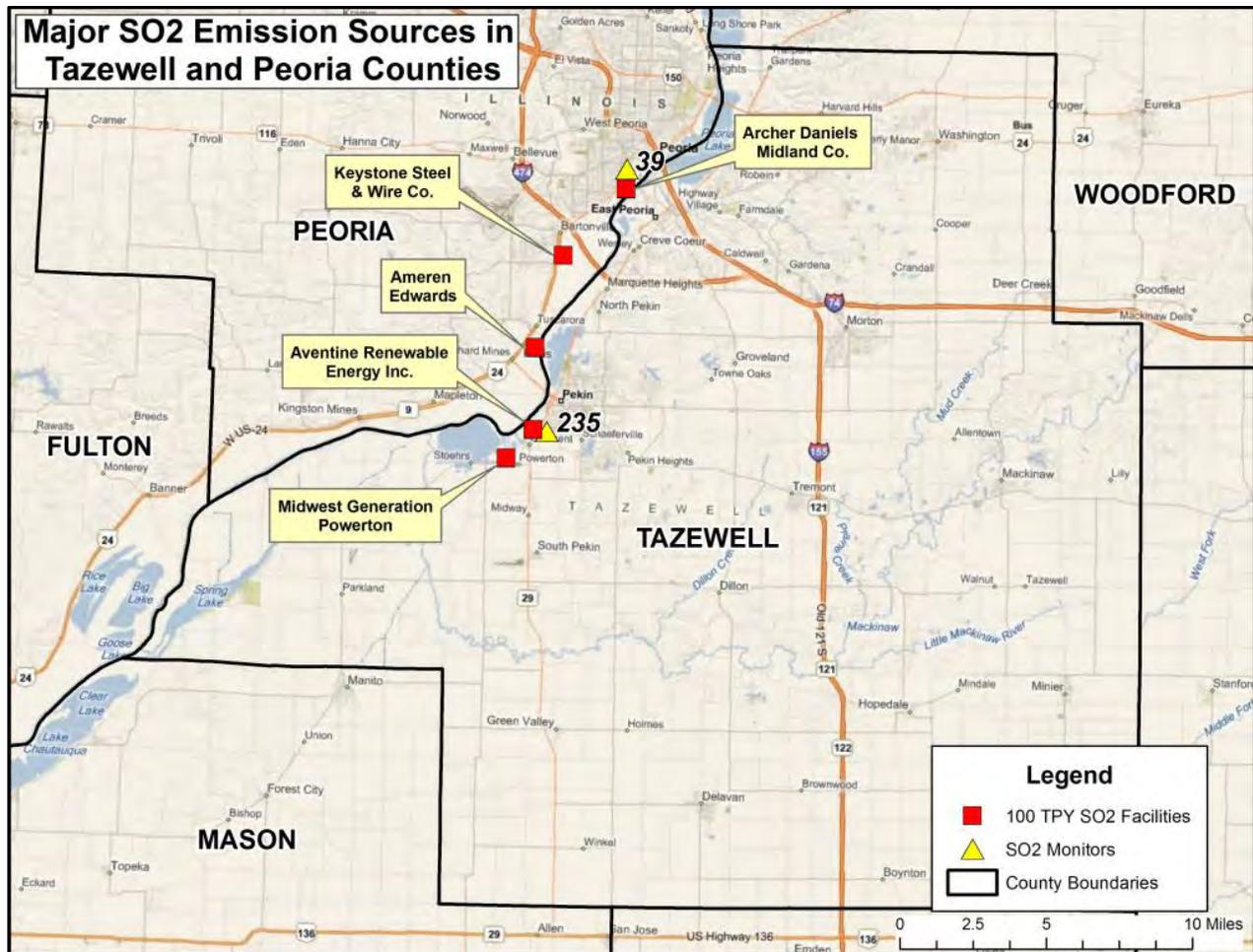
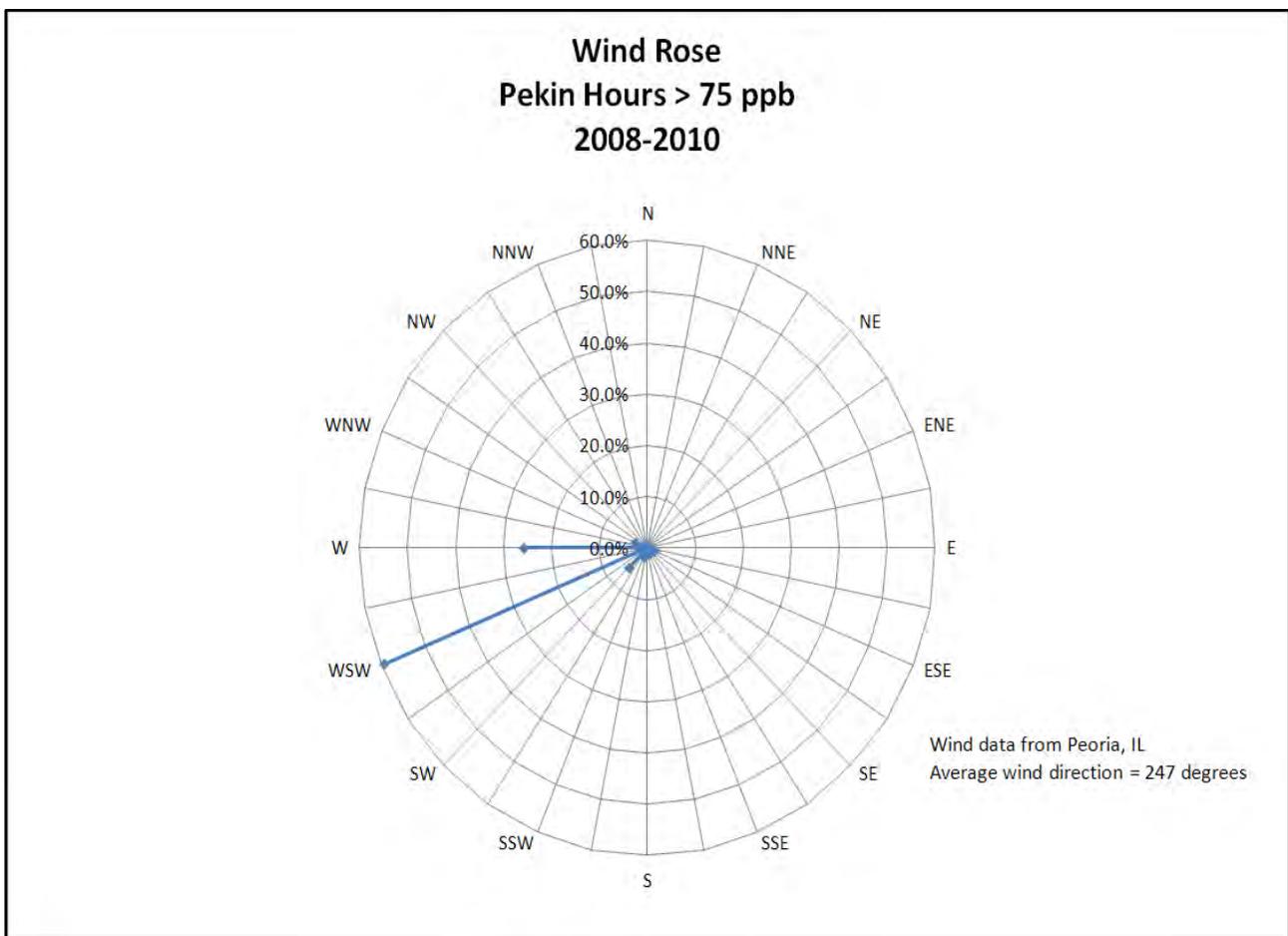


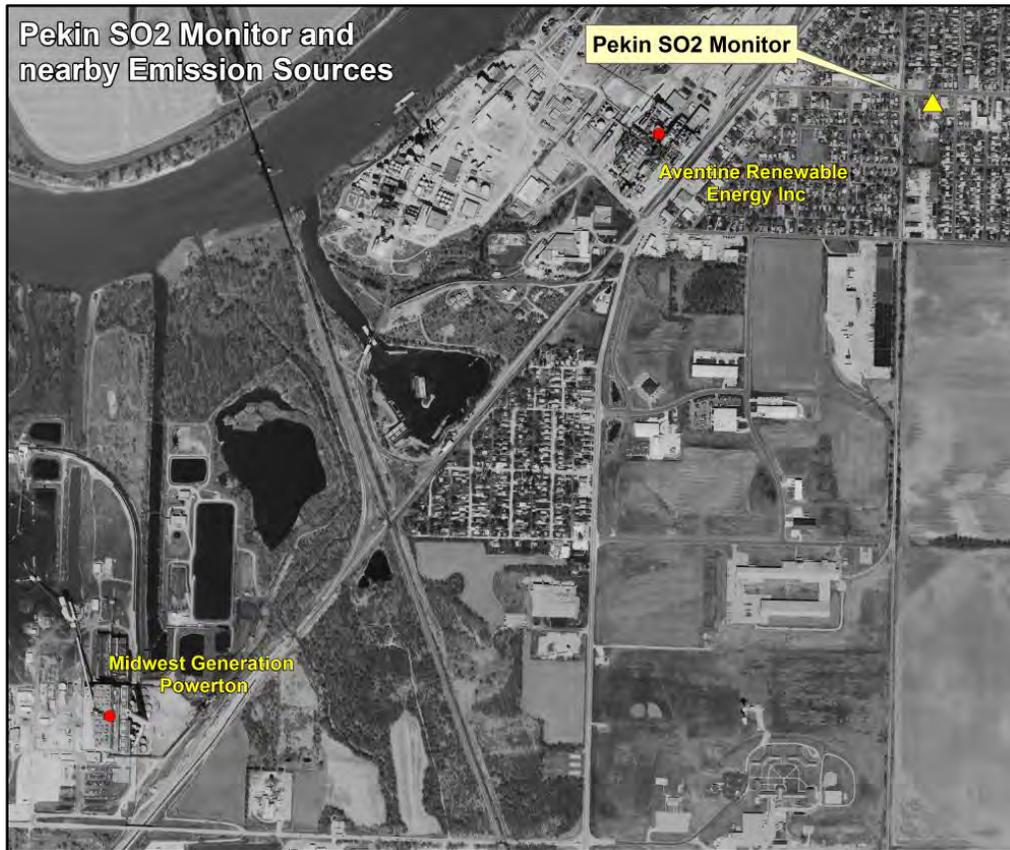


Figure 4 shows the pollution rose for the Pekin monitor, which depicts the wind directions associated with measured SO<sub>2</sub> concentrations exceeding 75 ppb at this location. Comparing the pollution rose in Figure 4 to Figure 5, which shows the locations of major SO<sub>2</sub> emission sources with respect to the Pekin monitor, it is apparent that the wind direction during exceedance hours is either from the west or west-southwest, which aligns the nearby Aventine facility, and, to a lesser extent, Midwest Generation – Powerton with the monitor location.

**Figure 4 – Pekin Pollution Rose**



**Figure 5 - Aerial Photo of the Pekin Monitor and nearby Facilities**



Since the Pekin monitor is at a slightly higher elevation than the two facilities to the west-southwest, IEPA believes that the high concentrations that are occurring at this monitor are primarily due to emissions from these local sources.

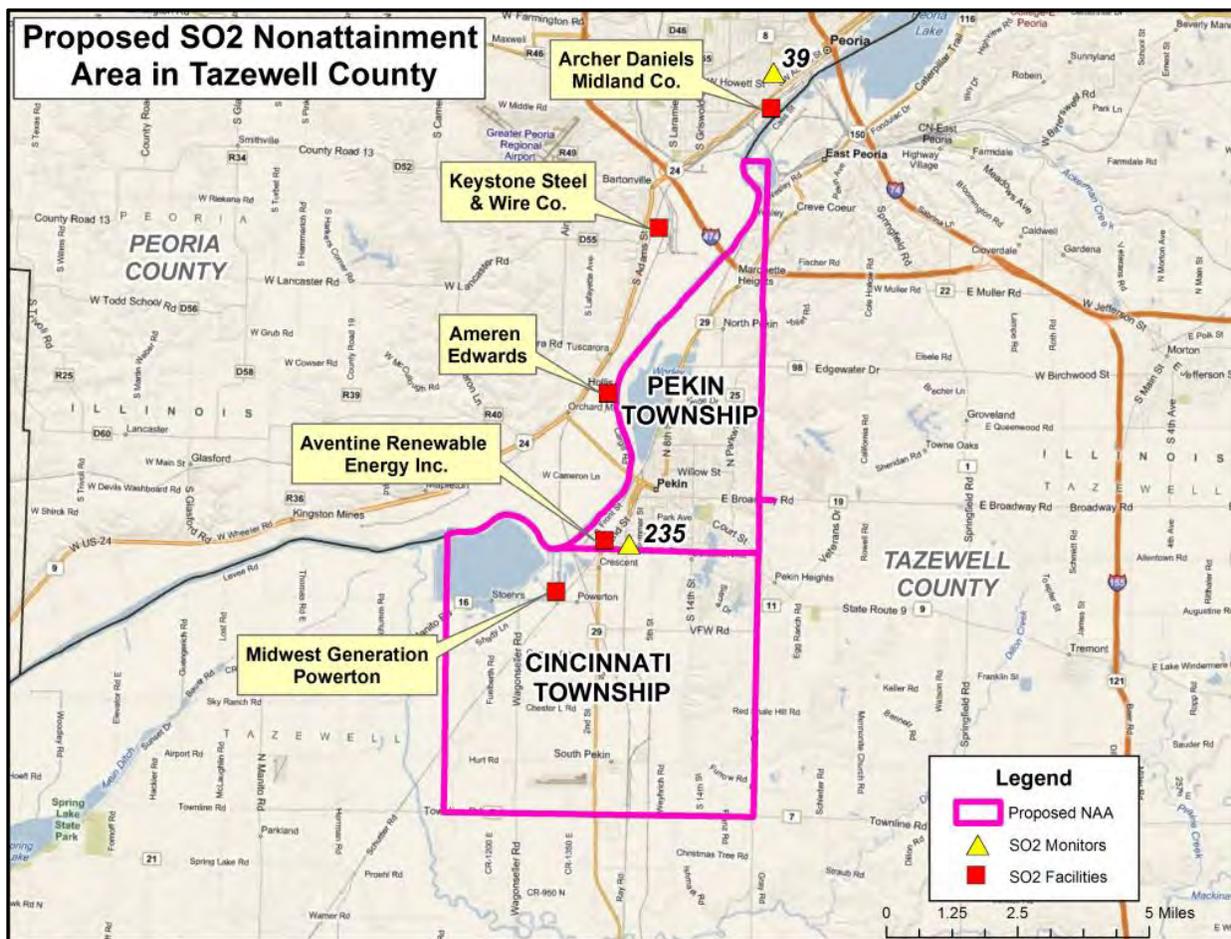
### **Jurisdictional Boundaries**

The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries, or “presumptive boundary” definitions, outlined in U.S. EPA’s guidance documentation. Boundaries in this study reflect the 2009 political township boundaries provided by the Property Tax Division of the Illinois Department of Revenue. Based on the geographic location of Pekin and the individual sources, it is expected that the coordination of planning activities required to address the nonattainment designation can be carried out in a cohesive manner.

## Recommendation

Based on the factors discussed above, Illinois recommends that Pekin and Cincinnati Townships in Tazewell County be designated as nonattainment for the 2010 1-hour SO<sub>2</sub> NAAQS (see Figure 6). These two townships contain both the violating monitor and the two most culpable emission sources.

Figure 6 – Proposed SO<sub>2</sub> Nonattainment Area Boundary for Tazewell County



## La Salle County

### **Air Quality**

There is one SO<sub>2</sub> monitor in La Salle County located in Oglesby. Monitoring data for this site is listed below in Table 4. The 2008-2010 design value for the Oglesby monitor currently exceeds the revised 1-hour NAAQS. However, the 2008 through 2010 annual 99<sup>th</sup> percentiles show a large decline in SO<sub>2</sub> values measured at the Oglesby site related to the suspension of operations at the Lone Star Industries cement plant in 2008. The 99<sup>th</sup> percentiles for both 2009 and 2010 were the lowest values in the state and the Oglesby monitor is expected to attain the revised 1-hour NAAQS by the end of 2011.

**Table 4 – La Salle County Air Quality Data for 2008-2010 (ppb)**

AQS Code	County	Site	Annual 99 <sup>th</sup> Percentiles			Design Value
			2008	2009	2010	
170990007	La Salle	Oglesby	326	8	14	<b>116</b>

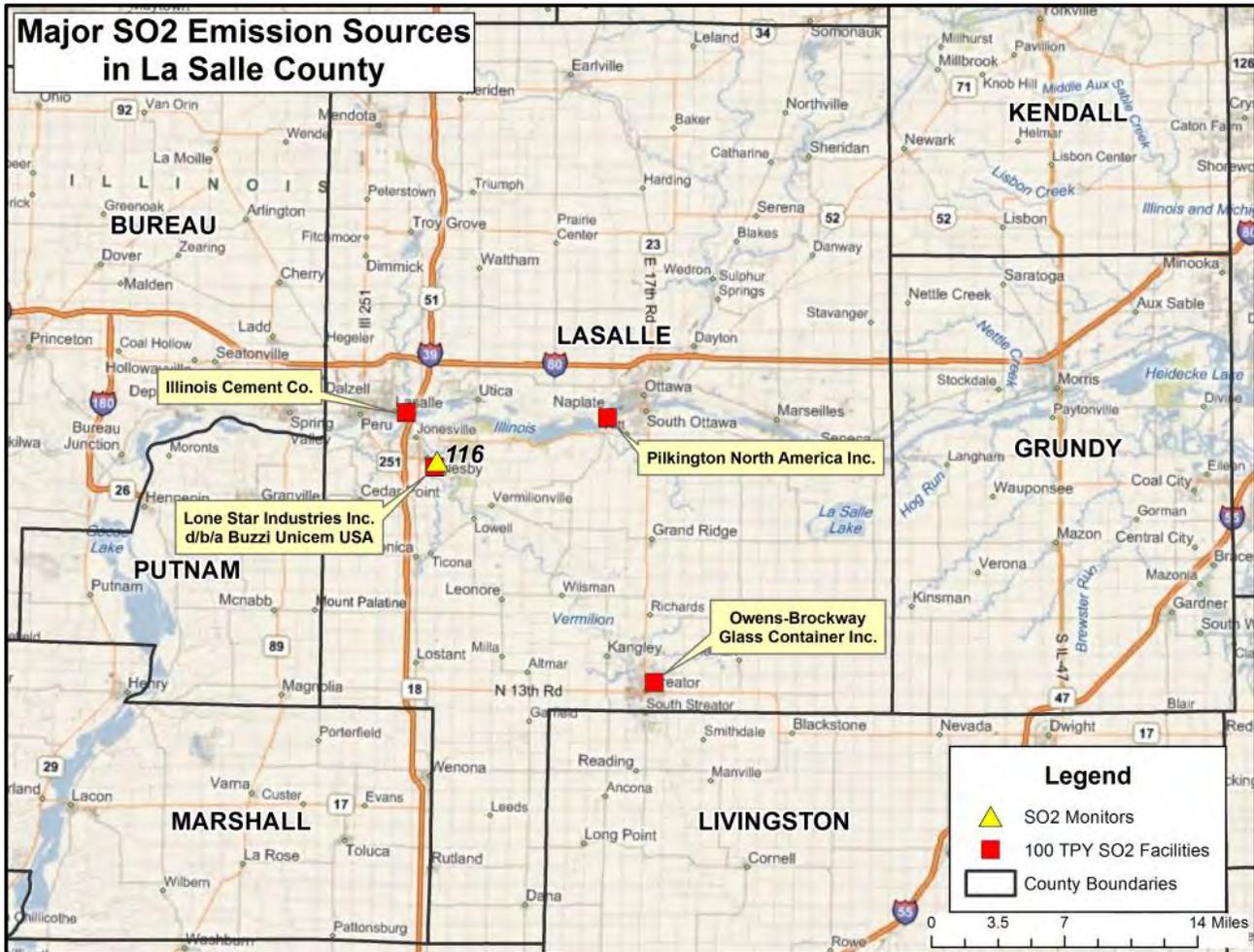
### **Emissions**

Table 5 lists the major SO<sub>2</sub> emission sources (reported SO<sub>2</sub> emissions over 100 tons per year for at least one of the years from 2007 through 2009) in La Salle County. The locations of these sources are shown in Figure 7. From Figure 7, there is only one source in the vicinity of the violating monitor in Oglesby: Lone Star Industries. This facility has been closed since 2008, which is reflected in the large decrease in SO<sub>2</sub> emissions shown in Table 5. There has also been a significant reduction in SO<sub>2</sub> emissions at the Illinois Cement Company plant in La Salle, although this facility remains operational.

**Table 5 – La Salle County Reported SO<sub>2</sub> Emissions for 2007-2009**

County	ID Number	Facility Name	Reported SO <sub>2</sub> Emissions (Tons per Year)		
			2007	2008	2009
La Salle	099030AAZ	Illinois Cement Co	167.8	160.34	90.17
La Salle	099490AAD	Owens-Brockway Glass Container Inc	228.24	221.72	208.69
La Salle	099816AAF	Lone Star Industries Inc	2937.16	2241.18	0.00
La Salle	099825AAG	Pilkington North America Inc	293.66	255.1	308.22

Figure 7 – Location of Major SO<sub>2</sub> Emission Sources in La Salle County



### Meteorology

The Oglesby monitor is in north-central Illinois, roughly the same distance from NWS stations at the Rockford Airport and at the Peoria Airport. Figure 8 shows the climatological wind rose for the Rockford airport. The Rockford wind rose looks very similar to the Peoria wind rose, presented previously in Figure 3. There is a pronounced maximum frequency of southerly winds at Rockford, as at Peoria, with a secondary maximum from the northwest. The IEPA considers these NWS stations to generally be representative of conditions occurring in La Salle County, although it is recognized that the Vermillion River valley, where the Lone Star facility is located, may cause localized meteorological influences.

**Figure 8 - Greater Rockford Airport Climatological Wind Rose**

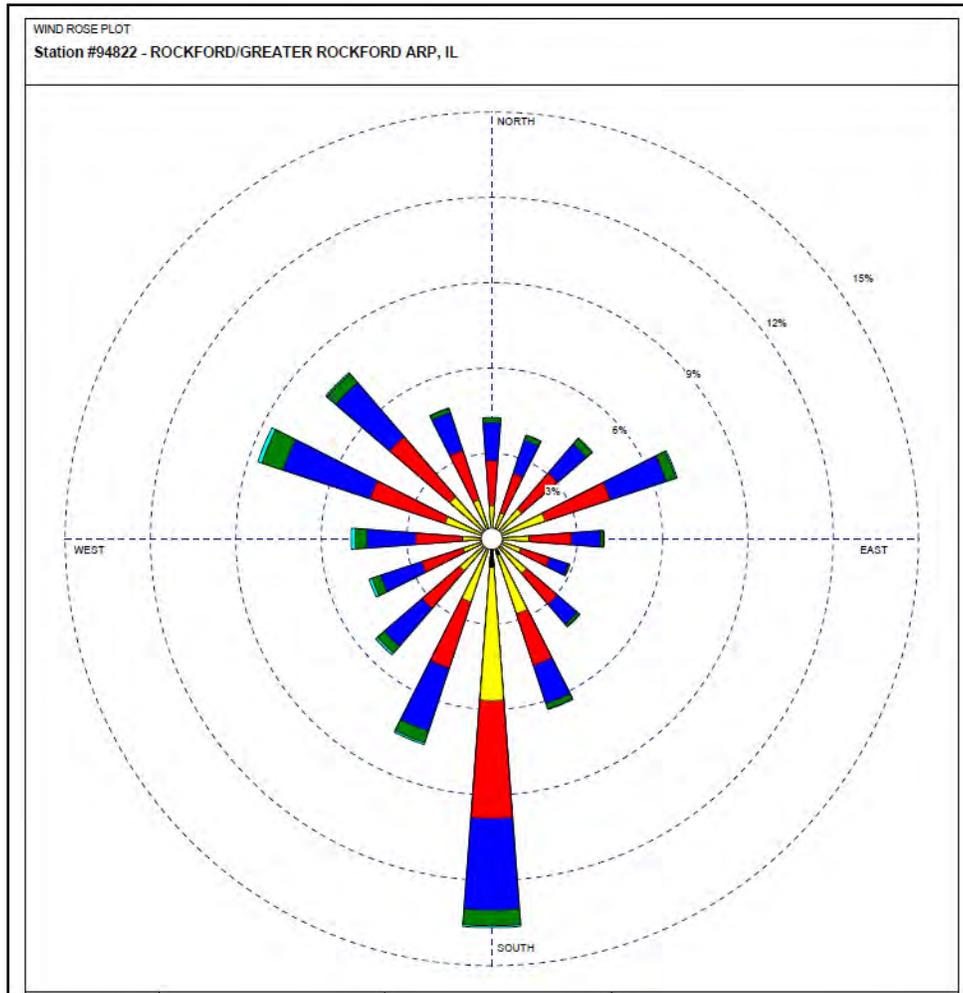
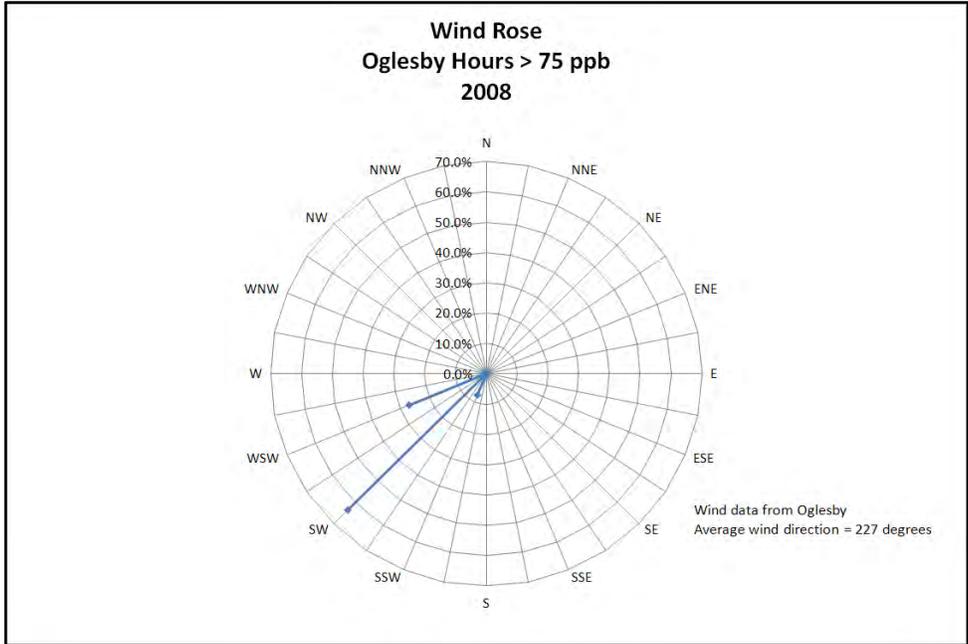


Figure 9 shows the pollution rose for the Oglesby monitor, while Figure 10 is an aerial photo that shows the relationship of the one large source to the monitor. The pollution rose shows that the wind direction during exceedance hours is primarily from the southwest, which corresponds well with the location of Lone Star Industries, which is located to the south and southwest of the monitor. Based on this analysis, the IEPA concludes that exceedances of the revised 1-hour SO<sub>2</sub> NAAQS at Oglesby are due primarily to emissions from the Lone Star facility.

**Figure 9 – Oglesby Pollution Rose**



**Figure 10 - Aerial photo of the Oglesby Monitor and nearby Facility**



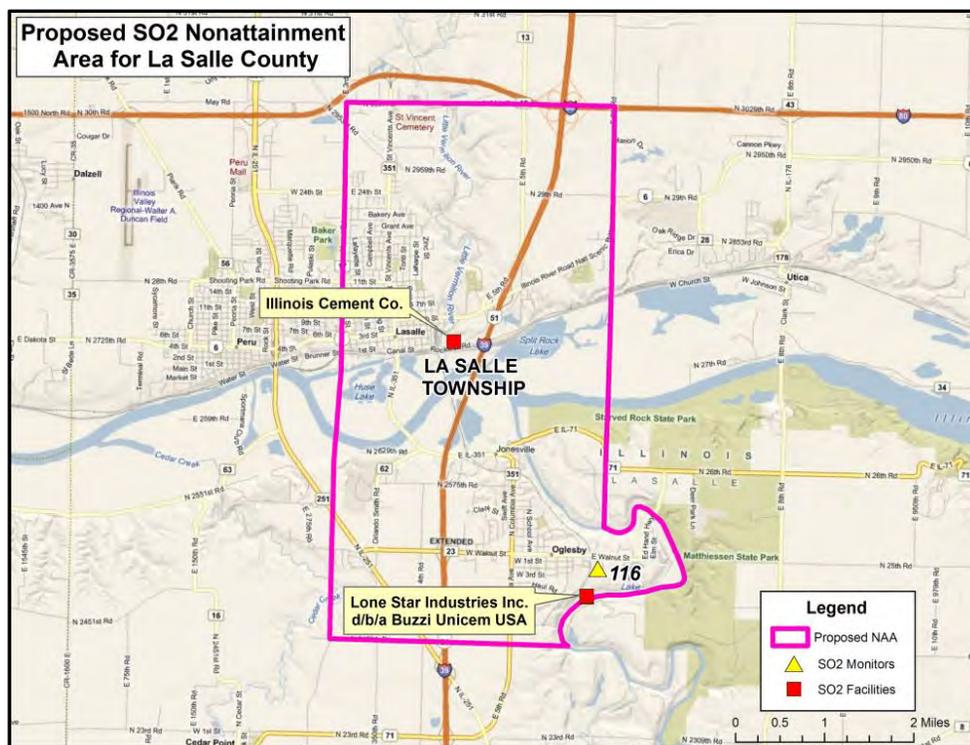
## Jurisdictional Boundaries

The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries, or “presumptive boundary” definitions, outlined in U.S. EPA’s guidance documentation. Boundaries in this study reflect the 2009 political township boundaries provided by the Property Tax Division of the Illinois Department of Revenue. Based on the geographic location of Oglesby and the individual sources, it is expected that the coordination of planning activities required to address the nonattainment designation can be carried out in a cohesive manner.

## Recommendation

Based on the factors discussed above, Illinois recommends that La Salle Township in La Salle County be designated as nonattainment for the 2010 1-hour SO<sub>2</sub> NAAQS (see Figure 11). This township contains both the violating monitor and the most culpable source of SO<sub>2</sub> emissions.

**Figure 11 – Proposed SO<sub>2</sub> Nonattainment Area Boundary for La Salle County**



## Cook and Will Counties

### Air Quality

There are seven SO<sub>2</sub> monitors located in Cook and Will Counties. Monitoring data for these sites are listed below in Table 6. The 2008-2010 design values for all of the sites are well below the revised 1-hour NAAQS, except for the monitor at Lemont. As can be seen in Figure 12, the distribution of design values across northeastern Illinois indicates that the Lemont monitor represents a “hot spot” due to impacts from local emission sources.

**Table 6 – Cook and Will County Air Quality Data for 2008-2010 (ppb)**

AQS Code	County	Site	Annual 99 <sup>th</sup> Percentiles			Design Value
			2008	2009	2010	
170310050	Cook	Chicago - SE Police	35	19	21	25
170310063	Cook	Chicago – CTA	26	21	14	20
170310076	Cook	Chicago - Com Ed	26	24	20	23
170311601	Cook	Lemont	97	114	90	<b>100</b>
170314002	Cook	Cicero	43	29	31	34
170314201	Cook	Northbrook	13	17	15	15
171970013	Will	Joliet	56	32	24	37

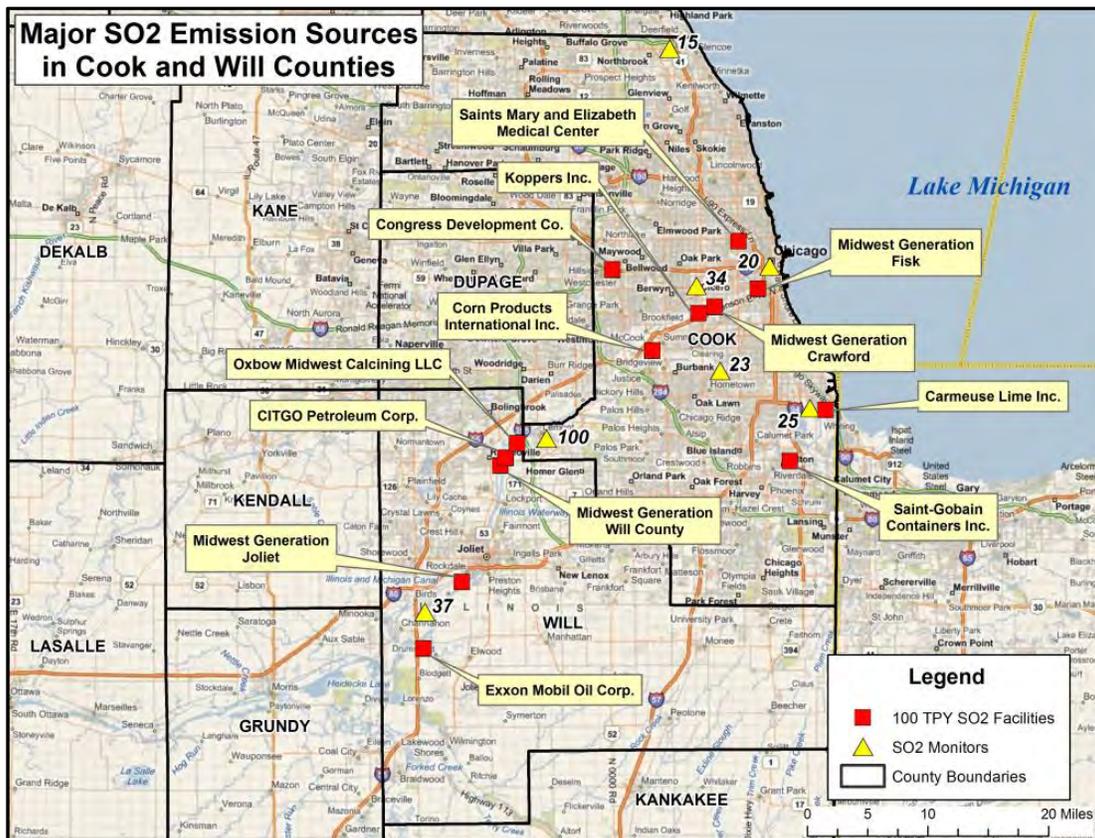
### Emissions

Table 7 lists the major SO<sub>2</sub> emission sources (reported SO<sub>2</sub> emissions over 100 tons per year for at least one of the years from 2007 through 2009) within Cook and Will counties. The locations of these sources are shown in Figure 12. From Figure 12, there are three sources in the vicinity of the violating monitor in Lemont: Oxbow Midwest Calcining, CITGO Petroleum, and Midwest Generation – Will County. It should be noted that all three nearby sources are located in Will County, although the Lemont monitor is located in Cook County. Overall, SO<sub>2</sub> emissions in Cook and Will counties have dropped by almost 50% since 2007, with the most significant reductions occurring at the two oil refineries (CITGO and Exxon Mobil).

**Table 7 – Cook and Will County Reported SO<sub>2</sub> Emissions for 2007-2009**

County	ID Number	Facility Name	Reported SO <sub>2</sub> Emissions (Tons per Year)		
			2007	2008	2009
Cook	031012ABI	Corn Products International Inc	1942.00	2203.00	991.00
Cook	031069AAI	Saint-Gobain Containers Inc	354.05	344.84	300.30
Cook	031123ABP	Congress Development Co	57.43	81.33	204.00
Cook	031300AAJ	Koppers Inc	846.80	823.17	705.38
Cook	031600ADY	Carmeuse Lime Inc	359.57	321.46	0.00
Cook	031600AIN	Midwest Generation - Crawford	8881.90	6626.90	7107.50
Cook	031600AMI	Midwest Generation - Fisk	4954.51	4485.561	4217.56
Cook	031600CTF	Saints Mary and Elizabeth Med. Center	0.07	0.10	125.01
Will	197090AAI	CITGO Petroleum Corp	14170.75	6135.86	336.62
Will	197800AAA	Exxon Mobil Oil Corp	22095.05	16404.03	1914.79
Will	197803AAK	Oxbow Midwest Calcining LLC	7153.21	6204.85	4990.62
Will	197809AAO	Midwest Generation – Joliet	20265.72	18281.72	17996.87
Will	197810AAK	Midwest Generation - Will County	17310.81	16496.78	12602.53

**Figure 12 – Location of Major SO<sub>2</sub> Emission Sources in Cook and Will Counties**



## Meteorology

The Lemont monitor is located in Cook County, so the nearest NWS site is at Chicago's O'Hare Airport. Since the Lemont site is a similar distance from Lake Michigan as O'Hare airport, the effect of Lake Michigan on local wind directions should be comparable. Figure 13 shows the climatological wind rose for O'Hare Airport. Unlike the Peoria and Rockford wind roses shown previously, a higher frequency of wind directions occur at O'Hare from southerly through westerly, with a secondary maximum from the northeast.

**Figure 13 – Chicago-O'Hare Airport Climatological Wind Rose**

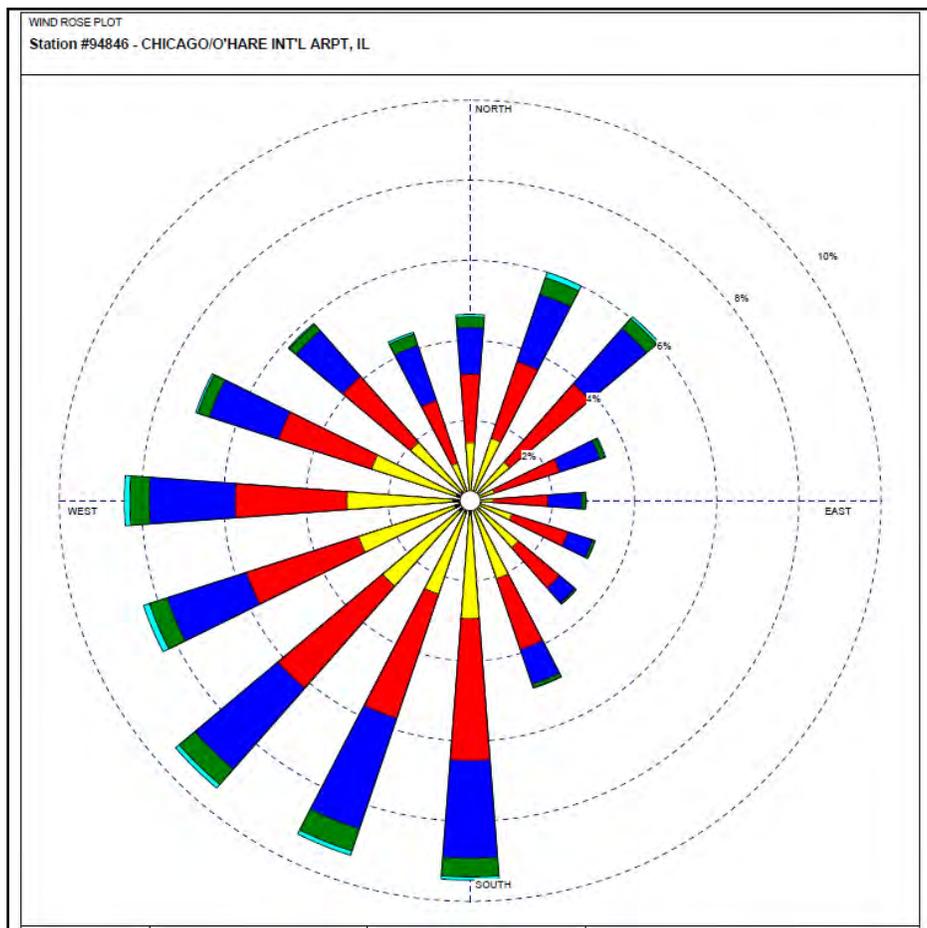
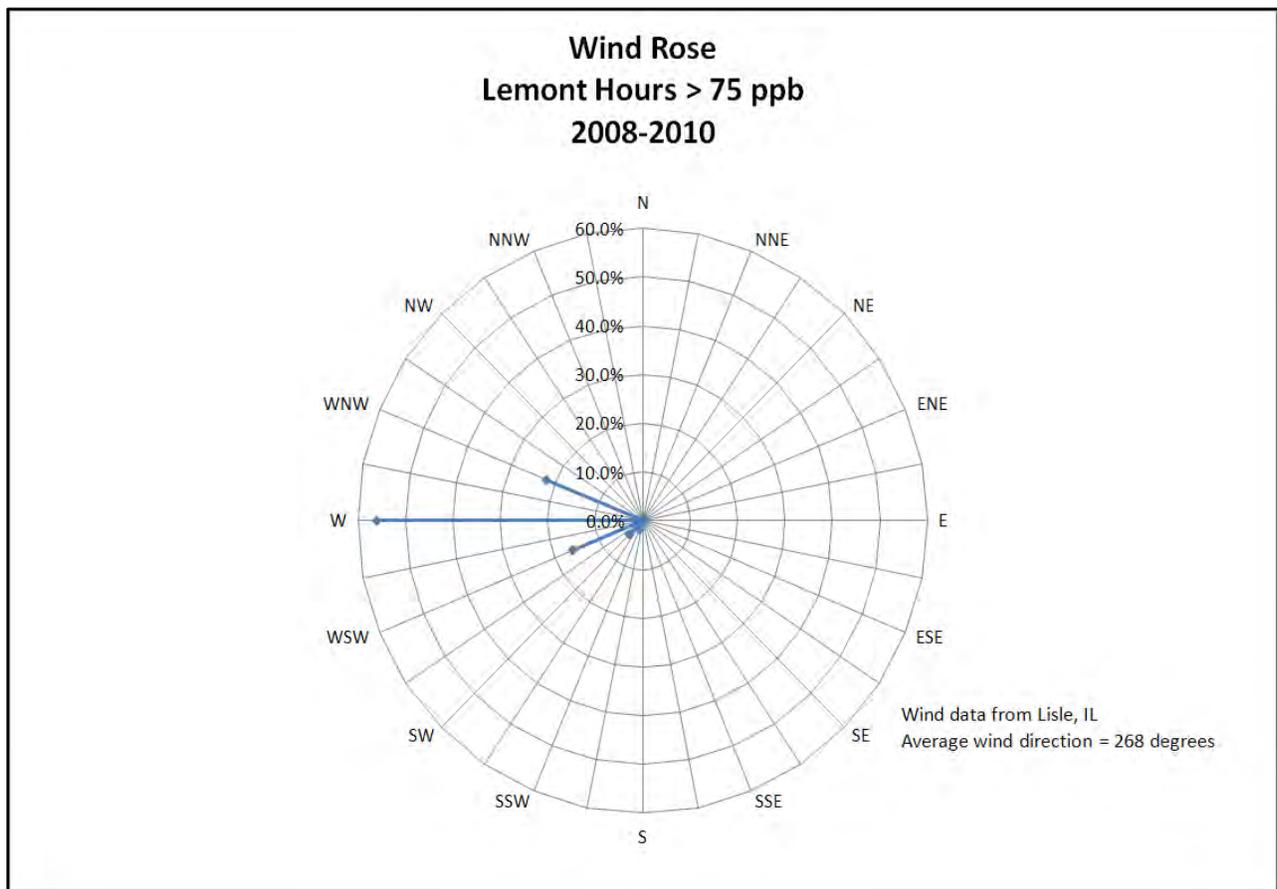


Figure 14 shows the pollution rose for the Lemont monitor, while Figure 15 is an aerial photo that shows the spatial relationship of major emission sources to the monitor. The pollution rose shows that the wind direction during exceedance hours is mostly from the west, which indicates likely contributions from Oxbow Midwest Calcining, and, to a lesser extent, CITGO Petroleum. With the close proximity of major sources upwind from the monitor on high concentration days, IEPA believes that nonattainment at the Lemont monitor is primarily due to these local sources.

**Figure 14 - Lemont Pollution Rose**



**Figure 15 - Aerial photo of the Lemont monitor and nearby Facilities**



### **Jurisdictional Boundaries**

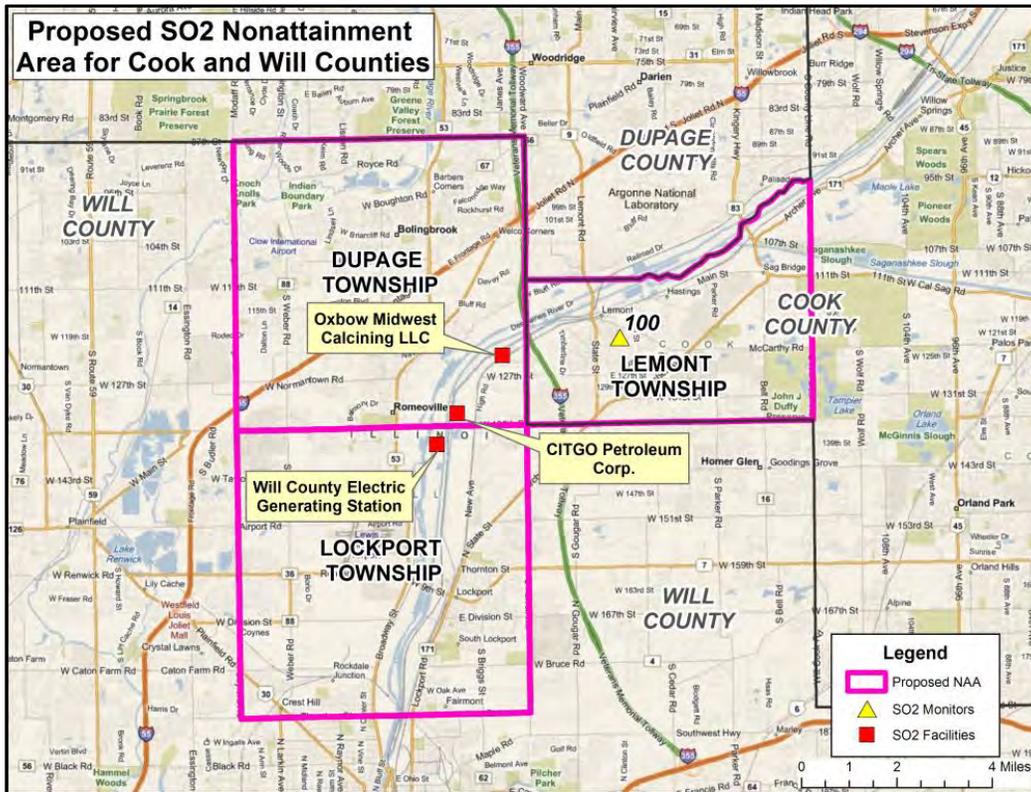
The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries, or “presumptive boundary” definitions, outlined in U.S. EPA’s guidance documentation. Boundaries in this study reflect the 2009 political township boundaries provided by the Property Tax Division of the Illinois Department of Revenue. Based on the geographic location of Lemont and the individual sources, it is expected that the coordination of planning activities required to address the nonattainment designation can be carried out in a cohesive manner.

### **Recommendation**

Based on the factors discussed above, Illinois recommends that Lemont Township in Cook County and DuPage and Lockport Townships in Will County be designated as nonattainment for the 2010 1-hour SO<sub>2</sub> NAAQS (see Figure 16). These three townships contain both the violating

monitor and the most culpable sources of SO<sub>2</sub> emissions impacting the Lemont monitor.

**Figure 16 – Proposed SO<sub>2</sub> Nonattainment Area Boundary for Cook and Will Counties**



## Madison County

### **Air Quality**

There are three SO<sub>2</sub> monitors in the Metro-East area. Two of the monitors are located in western Madison County, while the third monitor is located in East St. Louis in St. Clair County. Monitoring data for all three sites is listed in Table 8. The 2008-2010 design values for the Wood River and East St. Louis monitors are well below the revised 1-hour NAAQS, while the design value for the South Roxana monitor exceeds the revised 1-hour NAAQS. The 2008 through 2010 annual 99<sup>th</sup> percentiles decreased at all three sites, with the most significant improvement occurring at the South Roxana monitor.

**Table 8 – Metro-East Area Air Quality Data for 2008-2010 (ppb)**

AQS Code	County	Site	Annual 99 <sup>th</sup> Percentiles			Design Value
			2008	2009	2010	
171191010	Madison	South Roxana	152	81	57	<b>97</b>
171193007	Madison	Wood River WTP	67	46	54	56
171630010	St. Clair	East St. Louis	35	30	31	32

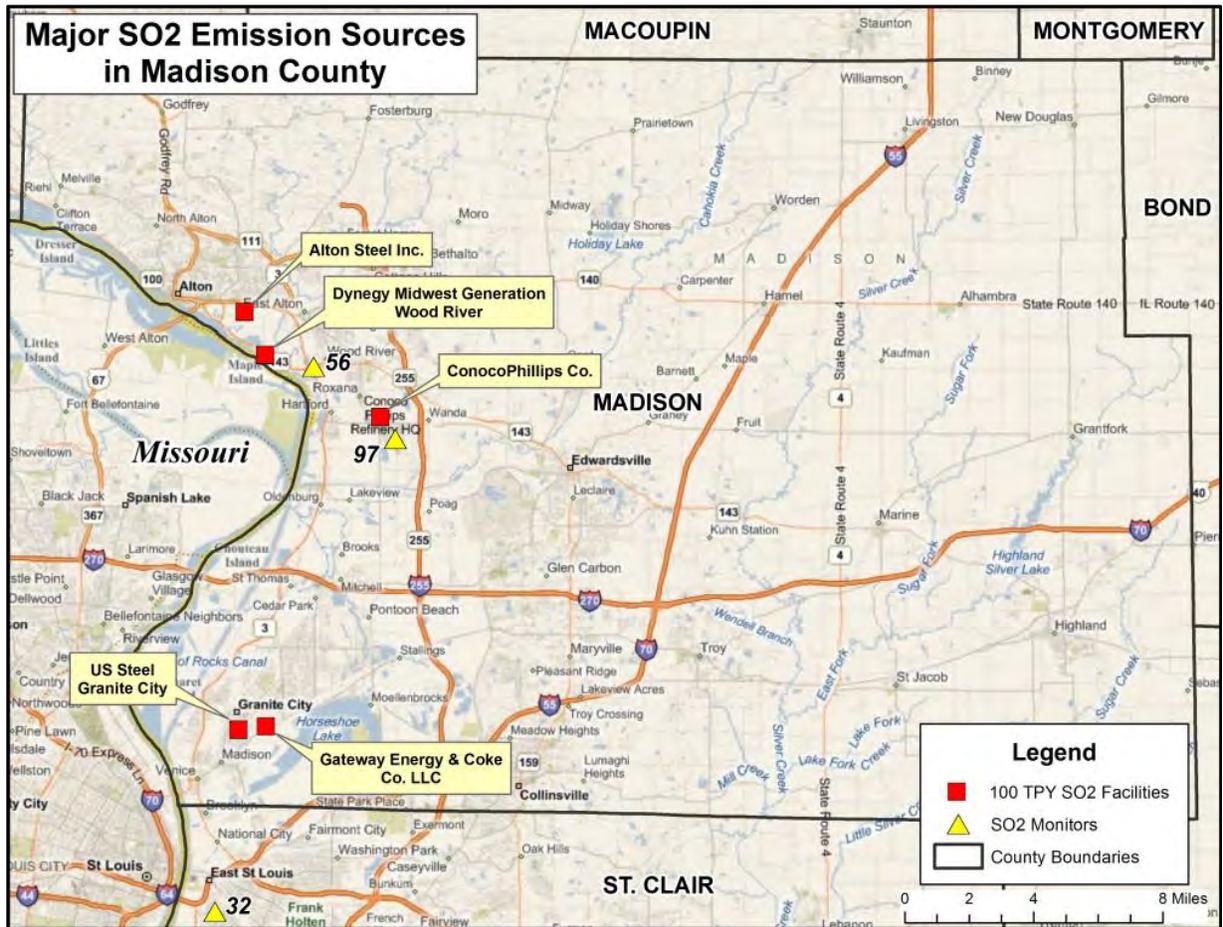
**Emissions**

Table 9 lists the major SO<sub>2</sub> emission sources (reported SO<sub>2</sub> emissions over 100 tons per year for at least one of the years from 2007 through 2009) in Madison County. The locations of these sources are shown in Figure 17. From Figure 17, there is only one source in proximity to the violating monitor in South Roxana: ConocoPhillips. SO<sub>2</sub> emissions in Madison County have decreased significantly during the 2007-2009 period. The largest reductions occurred at the ConocoPhillips oil refinery, which is located near the South Roxana monitor, and US Steel’s Granite City Works.

**Table 9 – Madison County Reported SO<sub>2</sub> Emissions for 2007-2009**

County	ID Number	Facility Name	Reported SO <sub>2</sub> Emissions (Tons per Year)		
			2007	2008	2009
Madison	119010AAE	Alton Steel Inc	121.43	142.88	63.25
Madison	119020AAE	Dynegy Midwest Gen. – Wood River	6462.30	6873.20	9089.10
Madison	119040ATN	Gateway Energy & Coke Co LLC	0.00	0.00	580.34
Madison	119090AAA	ConocoPhillips Co	13629.96	12273.72	5761.00
Madison	119813AAI	US Steel - Granite City	6187.15	5612.67	1428.31

Figure 17 – Location of Major SO<sub>2</sub> Emission Sources in Madison County



## Meteorology

The nearest NWS site to Madison County is Lambert Field in St. Louis. Figure 18 shows the climatological wind rose for Lambert Field. Unlike the wind roses previously shown, the most frequent wind directions are from the south through southeast, with a strong secondary maximum from the northwest. The IEPA considers the meteorological conditions at Lambert Field to generally be representative of conditions occurring in Madison County, although it is recognized that the South Roxana Louis monitor is located on the flood plain of the Mississippi River and may experience some localized differences.

**Figure 18 - St. Louis-Lambert Field Climatological Wind Rose**

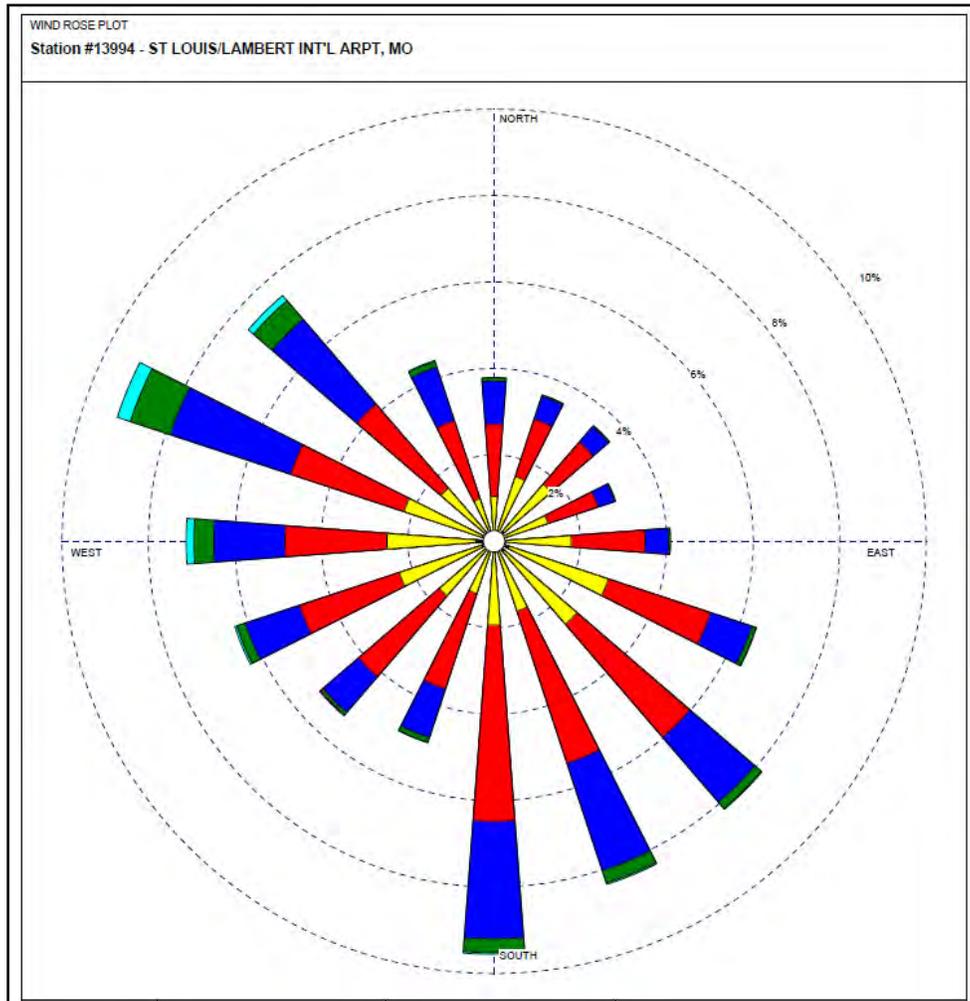
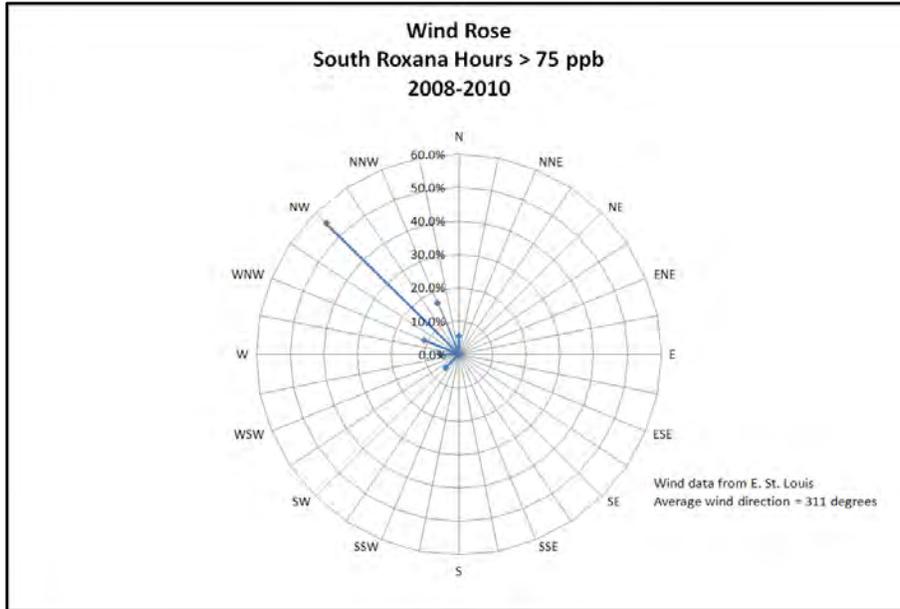


Figure 19 shows the pollution rose for the South Roxana monitor, while Figure 20 is an aerial photo that shows the relationship of the one large source to the monitor. The pollution rose shows that the wind direction during exceedance hours is primarily from the northwest which aligns the nearby ConocoPhillips refinery with the monitor location. With the proximity of this major nearby source to the monitor, IEPA concludes that emissions from this facility are primarily responsible for exceedances of the revised 1-hour SO<sub>2</sub> NAAQS at South Roxana.

**Figure 19 - South Roxana Pollution Rose**



**Figure 20 - Aerial photo of the South Roxana Monitor and nearby Facility**



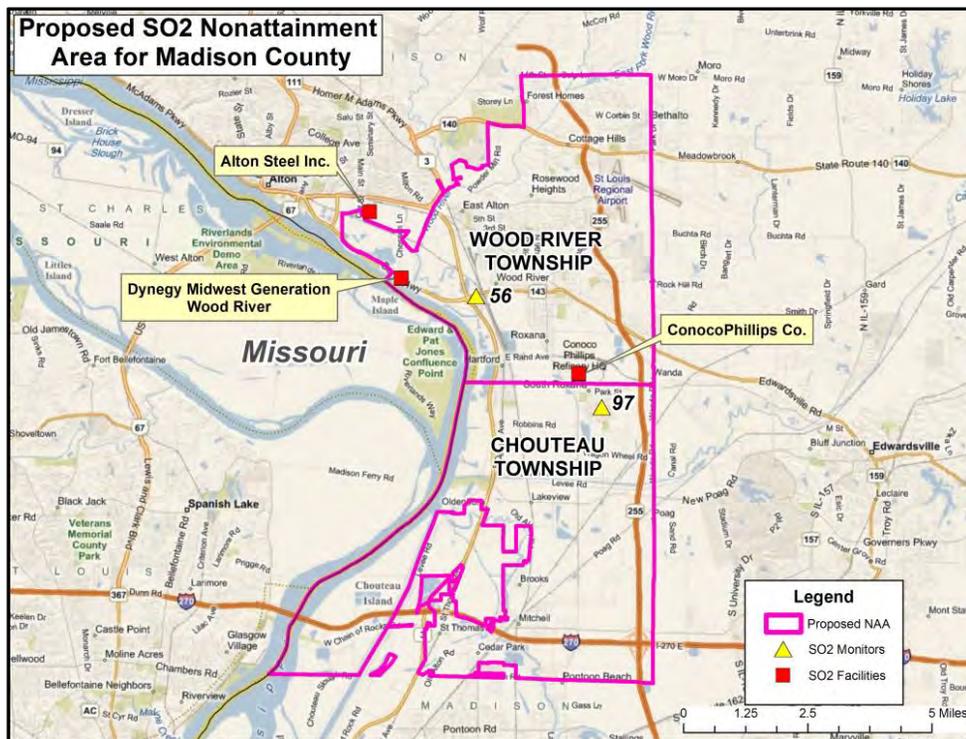
## Jurisdictional Boundaries

The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries, or “presumptive boundary” definitions, outlined in U.S. EPA’s guidance documentation. Boundaries in this study reflect the 2009 political township boundaries provided by the Property Tax Division of the Illinois Department of Revenue. Based on the geographic location of Roxana and the individual sources, it is expected that the coordination of planning activities required to address the nonattainment designation can be carried out in a cohesive manner.

## Recommendation

Based on the factors discussed above, Illinois recommends that Chouteau and Wood River Townships in Madison County be designated as nonattainment for the 2010 1-hour SO<sub>2</sub> NAAQS (see Figure 21). These two townships contain both the violating monitor and the most culpable source of SO<sub>2</sub> emissions impacting the South Roxana monitor.

**Figure 21 – Proposed SO<sub>2</sub> Nonattainment Area Boundary for Madison County**



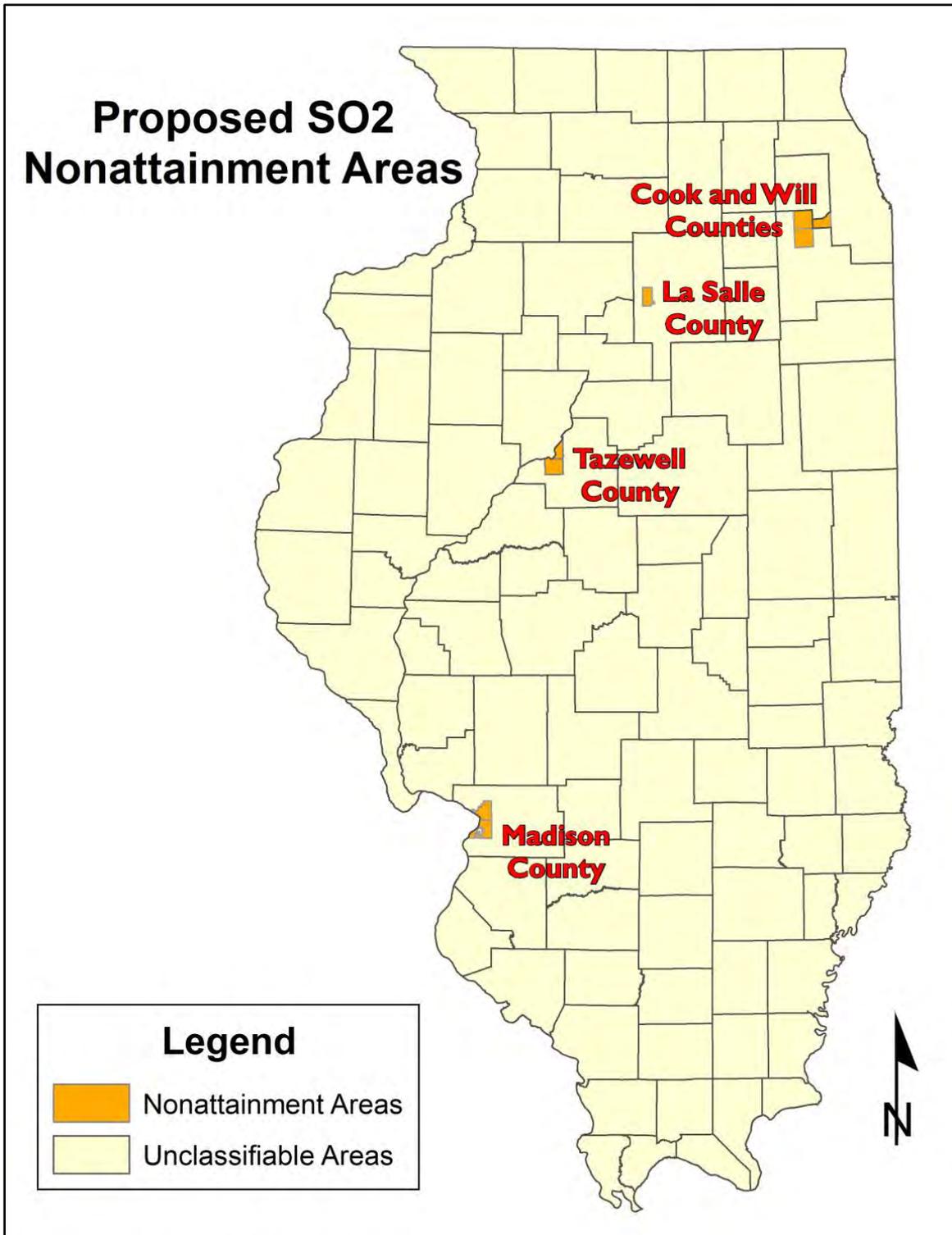
## **Recommendations**

IEPA's recommendations for attainment/nonattainment boundary designations in Illinois for the 2010 revised 1-hour SO<sub>2</sub> national ambient air quality standard are contained in Table 10.

Current air quality data collected by the IEPA indicates that the 2010 revised primary SO<sub>2</sub> NAAQS is not being met in the areas listed in Table 10, and that they should be designated as nonattainment areas. The locations of IEPA's recommended SO<sub>2</sub> nonattainment areas for the State of Illinois are shown in Figure 22.

The Clean Air Act does not specify the geographic boundaries, size, or the extent to which source contributions would require that an area be designated as nonattainment for the 2010 revised primary SO<sub>2</sub> standard, nor has U.S. EPA promulgated rules prescribing such. IEPA's recommendations are consistent with the guidance memorandum provided by U.S. EPA and are based on an evaluation of current air quality, the location and magnitude of SO<sub>2</sub> emission sources, and other factors. The IEPA recognizes that each of the factors considered in this evaluation, when evaluated individually, are not necessarily conclusive. Rather, IEPA's recommendations are based on consideration of all of the factors taken together. It is expected that the coordination of planning activities required to address the nonattainment designations can be carried out in a cohesive manner. The data sources utilized in the preparation of this report are summarized in Table 11.

Figure 22



**Table 10**

**Recommended Attainment/Nonattainment Designations in Illinois for the 2010 Revised Primary 1-hour SO<sub>2</sub> National Ambient Air Quality Standard**

<b>County (Partial)</b>	<b>Designation</b>	<b>Name of Area</b>
<u>Tazewell County:</u> <ul style="list-style-type: none"> <li>• Pekin and Cincinnati Townships</li> <li>• Remainder of Tazewell County</li> </ul>	Nonattainment Unclassifiable	Tazewell County
<u>La Salle County:</u> <ul style="list-style-type: none"> <li>• La Salle Township</li> <li>• Remainder of La Salle County</li> </ul>	Nonattainment Unclassifiable	La Salle County
<u>Cook County:</u> <ul style="list-style-type: none"> <li>• Lemont Township</li> <li>• Remainder of Cook County</li> </ul>	Nonattainment Unclassifiable	Cook County
<u>Will County:</u> <ul style="list-style-type: none"> <li>• Lockport and DuPage Townships</li> <li>• Remainder of Will County</li> </ul>	Nonattainment Unclassifiable	Will County
<u>Madison County:</u> <ul style="list-style-type: none"> <li>• Chouteau and Wood River Townships</li> <li>• Remainder of Madison County</li> </ul>	Nonattainment Unclassifiable	Madison County
All Other Counties	Unclassifiable	Illinois

**Table 11**  
**SO<sub>2</sub> NAA Five Factor Documentation**

<b>Factor</b>	<b>Data Analysis</b>	<b>Data Source</b>	<b>Date of Study</b>
1. Air Quality	SO <sub>2</sub> 2008-2010 Design Values at individual monitors (statewide)	IEPA BOA Database, Air Monitoring Section	2008-2010
2. Emissions	Emission inventory information for SO <sub>2</sub>	IEPA 2007-2009 Reported Emissions,	2009
3. Geography/Topography	Statewide elevations	Google Maps Data	2008
4. Jurisdictional Boundaries	Illinois Department of Revenue, Political Townships	Illinois Department of Revenue, Property Tax Division, Springfield, Illinois	2009
5. Meteorology	Weather patterns – Wind Roses and Pollution Roses. 1961 – 1990	National Weather Service, Illinois State Climatologist Office	October 7, 2004