St. Louis-St. Charles-Farmington, Missouri-Illinois Area Designation for the 2008 Ozone National Ambient Air Quality Standards

Table 1, below, identifies the areas in Illinois and Missouri that EPA is designating as "nonattainment" for the 2008 ozone NAAQS as part of the St. Louis-St. Charles-Farmington, Missouri-Illinois (MO-IL) multi-state nonattainment area. In accordance with section 107(d) of the Clean Air Act, EPA must designate an area (county or part of a county) "nonattainment" if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area. The technical analyses supporting the boundaries for this nonattainment area are provided below.

Table 1. Areas in Missouri and Illinois Included in the St. Louis-St. Charles-Farmington, MO-IL Nonattainment Area

State	State Recommended Nonattainment Counties/Areas	EPA's Nonattainment Counties/Areas
Missouri	Franklin County Jefferson County St. Charles County St Louis County St Louis City	Franklin County Jefferson County St. Charles County St Louis County St Louis City
Illinois	Madison County Monroe County St. Clair County	Madison County Monroe County St. Clair County

EPA is designating the remaining counties in Missouri that are not listed in the table above as "unclassifiable/attainment" for the 2008 ozone NAAQS. EPA is also designating the remaining counties in Illinois that are not listed in the table above or being considered for inclusion as part of the Chicago-Naperville, IL-IN-WI ozone nonattainment area as "unclassifiable/attainment" for the 2008 ozone NAAQS. EPA will issue no later than May 31, 2012 one or more designations for the areas being considered as part of the Chicago-Naperville, IL-IN-WI ozone nonattainment area and will prepare a separate technical support document for that action.

The analysis below provides the basis for nonattainment area boundaries for the St. Louis-St. Charles-Farmington, Missouri-Illinois (MO-IL) multi-state nonattainment area. It relies on our analysis of whether and which monitors are violating the 2008 ozone NAAQS, based on certified air quality monitoring data from 2008-2010 and an evaluation of whether nearby areas are contributing to such violations. EPA has evaluated contributions from nearby areas based on a weight of evidence analysis considering the factors identified below. EPA issued guidance on December 4, 2008, that identified these factors as ones EPA would consider in determining nonattainment area boundaries and recommended that states consider these factors in making their designations recommendations to EPA.[1]

1. Air quality data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor in the area);
2. Emissions and emissions-related data (including location of sources and population, amount of emissions and emissions controls, and urban growth patterns);

[1] The December 4, 2008 guidance memorandum "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards" refers to 9 factors. In this technical support document we have grouped the emissions-related factors together under the heading of "Emissions and Emissions-Related Data," which results in 5 categories of factors.

3. Meteorology (weather/transport patterns);
4. Geography and topography (mountain ranges or other basin boundaries);
5. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Indian country, metropolitan planning organizations (MPOs))

Ground-level ozone is generally not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Because NOx and VOC emissions from a broad range of sources over a wide area typically contribute to violations of the ozone standards, EPA believes it is important to consider whether there are contributing emissions from a broad geographic area. Accordingly, EPA chose to examine the 5 factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).[2] All data and information used by EPA in this evaluation are the latest available to EPA and/or provided to EPA by states or tribes.

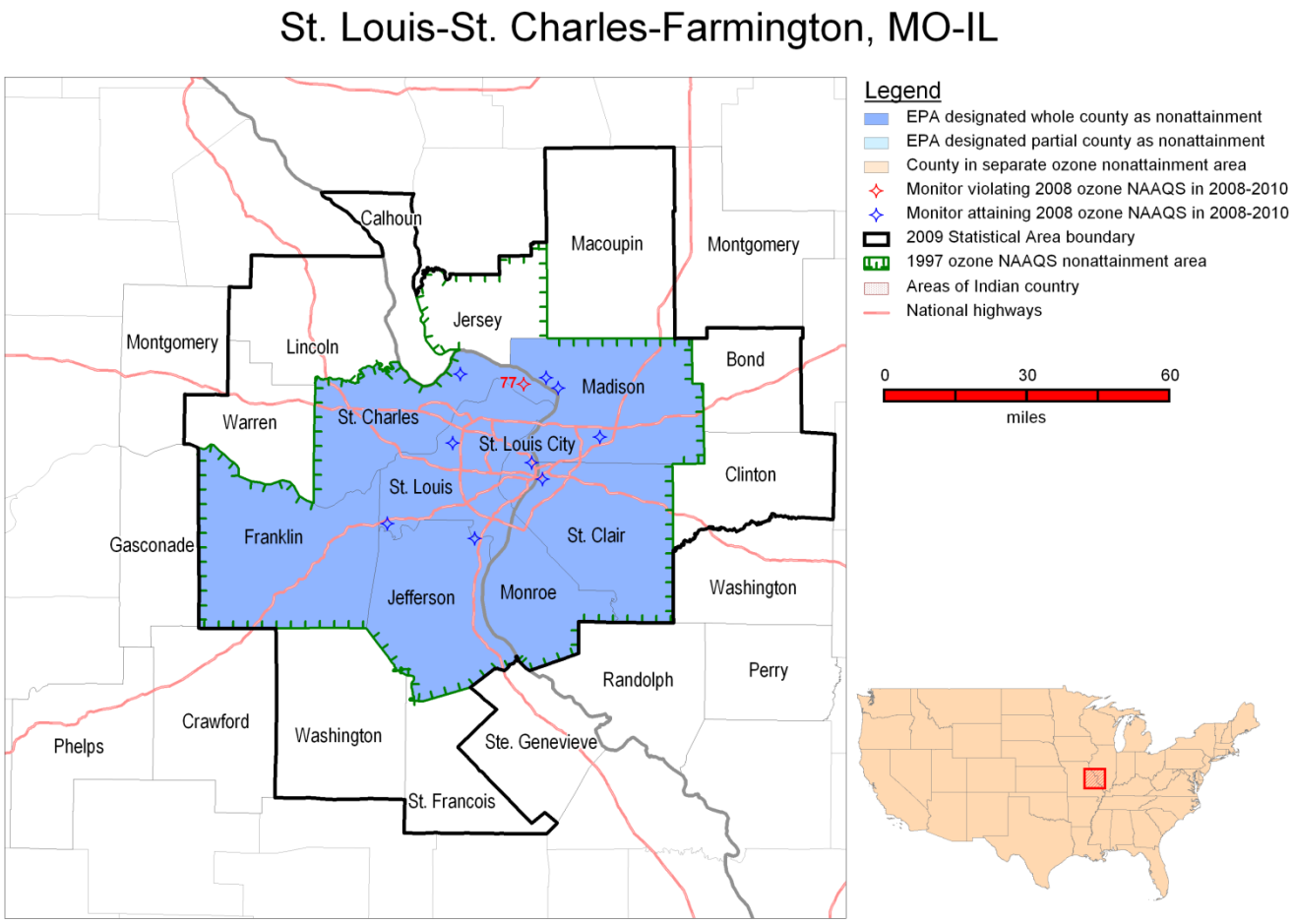
In EPA's designations guidance for the 2008 ozone NAAQS EPA recommended examining CSA/CBSAs because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in this technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. Congress required a similar approach in 1990 for areas classified as serious or above for the 1-hour ozone standard and EPA used the same basic approach in the designation process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CSA or CBSA, EPA's guidance recommended using the boundary of the county containing the violating monitor as the starting point for considering the nonattainment area's boundary.

Technical Analysis for St. Louis-St. Charles-Farmington, MO-IL

Figure 1 is a map of the St. Louis-St. Charles-Farmington, MO-IL nonattainment area. The map provides other relevant information including the locations and design values of air quality monitors, county and other jurisdictional boundaries, St. Louis-St. Charles-Farmington, MO-IL CSA boundary, existing nonattainment boundary for 1997 ozone NAAQS, and major transportation arteries.

[2] Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html . The lists are periodically updated by the Office of Management and Budget. EPA used the most recent update, based on 2008 population estimates, issued on December 1, 2009 (OMB Bulletin No. 10-02).

Figure 1.



For purposes of the 1997 8-hour ozone NAAQS, portions of this area were designated nonattainment. The boundary for the nonattainment area for the 1997 ozone NAAQS included the entire counties of Jersey, Madison, Monroe and St. Clair Counties in Illinois and St. Louis City and Franklin, Jefferson, St. Charles and St. Louis Counties in Missouri.

In March 2009, Missouri submitted its initial designation recommendations based on air quality data from 2006-2008. In December 2011, Missouri submitted a revised recommendation to include the entire counties of Franklin, Jefferson, St. Charles, and St. Louis and the City of St. Louis as "nonattainment" for the 2008 ozone NAAQS based on air quality data from 2008-2010. The State recommended designating the remaining areas of the State as attainment/unclassifiable.[3] In March 2009, Illinois recommended that Madison, Monroe and St. Clair Counties be designated as "nonattainment" for the

[3] Missouri submitted its designation recommendations in a March 11, 2009, letter from Mark N. Templeton, Director of the Missouri Department of Natural Resources, which included enclosures containing an analysis of data supporting the State's recommendations. Missouri revised its recommendations and MDNR requested EPA to act on the revisions in a letter dated December 5, 2011.

2008 ozone NAAQS based on air quality data from 2006-2008.[4] The recommendations from both Missouri and Illinois rely on data from FRM monitors or FEM monitors sited and operated in accordance with 40 CFR Part 58.

After considering these recommendations and based on EPA's technical analysis described below, EPA is designating the areas in Illinois and Missouri listed in Table 1 above as "nonattainment" for the 2008 ozone NAAQS as part of the St. Louis-St. Charles-Farmington, MO-IL multi-state nonattainment area.

Factor Assessment

Factor 1: Air Quality Data

For this factor, we considered 8-hour ozone design values (in ppm) for air quality monitors in counties in the St. Louis-St. Charles-Farmington, MO-IL CSA based on data for the 2008-2010 period (i.e., the 2010 design value), which are the most recent years with fully-certified air quality data for both states. A monitor's design value is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years is 0.075 ppm or less. A design value is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the design value for the county or area is determined by the monitor with the highest level.

Note: Monitors that are eligible for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are sited in accordance with 40 CFR Part 58, Appendix D (Section 4.1) and operating with a federal reference method (FRM) or federal equivalent method (FEM) monitor that meets the requirements of 40 CFR part 58, appendix A. All data from a special purpose monitor (SPM) using an FRM or FEM which has operated for more than 24 months is eligible for comparison to the NAAQS unless the monitoring agency demonstrates that the data came from a particular period during which the requirements of appendix A (quality assurance requirements) or appendix E (probe and monitoring path siting criteria) were not met.

The 2010 design values for the ozone NAAQS for counties in the St. Louis-St. Charles-Farmington, MO-IL CSA are shown in Table 2.

[4] Illinois submitted its designation recommendations in a March 9, 2009, letter from Douglas P. Scott, Director of the Illinois Environmental Protection Agency. The state also provided a Technical Support Document dated March 9, 2009, which included a nine factor analysis to support the State's recommendations.

Table 2. Air Quality Data for Counties in the St. Louis-St. Charles-Farmington, MO-IL CSA.

County	State Recommended Nonattainment?	2008-2010 Design Value (ppb)
Missouri:		
Franklin County	Yes	
Jefferson County	Yes	72
Lincoln County	No	72
St. Charles County	Yes	77
St. Francois County	No	
St. Louis County	Yes	71
St. Louis City	Yes	69
Warren County	No	
Washington County	No	
Illinois:		
Bond County	No	
Calhoun County	No	
Clinton County	No	
Jersey County	No	69
Macoupin County	No	66
Madison County	Yes	72
Monroe County	Yes	
St. Clair County	Yes	68

St Charles County in Missouri shows a violation of the 2008 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated, as discussed below, based on the five factors to determine whether it contributes to the nearby violation.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions of ozone precursors (NOx and VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

EPA evaluated county-level emission data for NOx and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. This is the most recently available NEI. (See http://www.epa.gov/ttn/chief/net/2008inventory.html) Significant emissions levels in a nearby area indicate the potential for the area to contribute to the observed ozone standard violation.

Table 3 shows 2008 emissions of NOx and VOC (in tons per year) for all counties in the St. Louis-St. Charles-Farmington, MO-IL CSA. This table also indicates which of the counties were recommended to be nonattainment for the 2008 ozone NAAQS by their respective states.

Table 3. Total 2008 NOx and VOC Emissions.

County	State Recommended Nonattainment?	NOx (tpy)	VOC (tpy)
Missouri:			
Franklin County	Yes	14,094	4,939
Jefferson County	Yes	11,769	6,729
Lincoln County	No	1,855	2,081
St. Charles County	Yes	15,894	11,652
St. Francois County	No	2,030	2,349
St. Louis County	Yes	36,455	41,894
St. Louis City	Yes	17,576	14,027
Warren County	No	1,749	2,064
Washington County	No	678	862
	Missouri total:	102,100	86,597
Illinois:			
Bond County	No	1,422	1,181
Calhoun County	No	607	1,057
Clinton County	No	4,409	2,515
Jersey County	No	1,125	1,166
Macoupin County	No	2,286	2,147
Madison County	Yes	23,109	12,351
Monroe County	Yes	2,410	1,551
St. Clair County	Yes	10,804	8,719
	Illinois total:	46,172	30,687
	Areawide:	148,272	117,284

The emission data in Table 3 indicate that for Missouri, the highest NOx and VOC emissions reside in St. Louis County and the City of St. Louis. In 2008 these two areas accounted for 53% and 65% of NOx and VOC emissions respectively for the Missouri portion of the area. In addition, Franklin and Jefferson Counties also have comparatively high NOx emissions (behind St. Louis and St. Charles Counties and the City of St. Louis) and form a contiguous area with the three top emitting areas. Together, the City of St. Louis, Franklin, Jefferson, and St. Louis Counties make up 78% of both NOx and VOC emissions in the Missouri portion of the area, and 54% of the NOx emissions and 58% of the VOC emissions for the entire St. Louis-St. Charles-Farmington, MO-IL CSA.

The NOx and VOC emissions are relatively low in Warren, Washington, and Lincoln counties. Together in 2008 these counties account for 4% of NOx emissions and 6% of VOC emissions in the Missouri portion of the area, and 3% of NOx emissions and 4% of VOC emissions in the entire St. Louis-St. Charles-Farmington, MO-IL CSA.

The emissions data in Table 3 show that, for Illinois, comparatively high 2008 NOx and VOC emissions originate in Madison and St. Clair Counties. In 2008, these counties account for 73% of the NOx emissions and 69% of the VOC emissions for the Illinois portion of the area Taken together, in 2008 the three counties that Illinois recommends be included within the nonattainment area - Madison, Monroe and St. Claire Counties - account for 79% of the NOx emissions and 74% of the VOC emissions in the Illinois portion of the area and 24% of the NOx emissions and 19% of the VOC emissions for the entire St. Louis-St. Charles-Farmington, MO-IL CSA.

The VOC and NOx emissions originating in Bond, Calhoun, Clinton, Jersey and Macoupin Counties are significantly smaller than those originating in the higher emitting counties elsewhere in the St. Louis-St. Charles-Farmington, MO-IL CSA. Taken together, in 2008 these counties account for 21% of the NOx emissions and 26% of the VOC emissions for the Illinois portion of the area and only 7% of the NOx emissions and 7% of the VOC emissions for the entire St. Louis-St. Charles-Farmington, MO-IL CSA.

Population Density and Degree of Urbanization

EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include ozone-creating emissions from on-road and off-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NOx and VOC emissions. Rapid growth in population or Vehicle Miles Traveled (VMT) (see below) in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to include the area associated with area source and mobile source emissions as part of the nonattainment area. Table 4 shows the population, population density, and population growth information for each county in the area.

Table 4. Population and Growth.

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Missouri:					
Franklin County	Yes	101,492	0.11	7,434	+8%
Jefferson County	Yes	218,733	0.33	19,995	+10%
Lincoln County	No	52,566	0.08	13,310	+34%
St. Charles County	Yes	360,485	0.61	74,322	+26%
St. Francois County	No	65,359	0.14	9,615	+17%
St. Louis County	Yes	998,954	1.91	-17,376	-2%
St. Louis City	Yes	319,294	4.83	-27,570	-8%
Warren County	No	32,513	0.07	7,793	+32%
Washington County	No	25,195	0.03	1,785	+8%
	Missouri total:	2,174,591		89,308	+4%
Illinois:					
Bond County	No	17,768	0.05	118	+1%
Calhoun County	No	5,089	0.02	-1	0%
Clinton County	No	37,762	0.08	2,233	+6%
Jersey County	No	22,985	0.06	1,330	+6%
Macoupin County	No	47,765	0.06	-1,224	-2%
Madison County	Yes	269,282	0.36	10,165	+4%
Monroe County	Yes	32,957	0.08	5,193	+19%
St. Clair County	Yes	270,056	0.40	13,852	+5%
	Illinois total:	703,664		31,666	+5%
	Areawide:	2,878,255		120,974	+4%

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

In the Missouri portion of the St. Louis-St. Charles-Farmington, MO-IL CSA, St. Louis and St. Charles counties along with the City of St. Louis have comparatively high population and high population density. This also correlates to those three counties having the highest amount of NOx and VOC emissions in the area. Warren, Washington, and St. Francois Counties have relatively low population, population density, and lowest absolute change in population. Lincoln County has relatively low population for the area, as well as one of the lowest population densities (behind Warren and Washington Counties) among the Missouri Counties in the CSA.

For Illinois, population data show that Madison and St. Clair Counties have comparatively high populations and population densities. This implies that the population-related NOx and VOC emissions in these counties are comparatively high. Monroe County in Illinois has the highest percentage population growth and third highest absolute change in population (behind St. Clair and Madison Counties) among the Illinois Counties in the CSA.

Traffic and Commuting Patterns

EPA evaluated the commuting patterns of residents in the area, as well as the total VMT for each county. In combination with the population/population density data and the location of main transportation arteries (see Figure 1 above), this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and indicates the presence of motor vehicle emissions that may contribute to ozone formation. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to include this county in the ozone nonattainment area, particularly if the VOC and/or NOx emissions in this county are a significant portion of the total emissions in the nonattainment area.

Table 5 shows traffic and commuting pattern data, including total 2008 VMT for each county, number of commuters in each county who drive to another county within the area, and the percent of total commuters in each county who commute to other counties within the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2008 VMT* (million miles)	Number Commuting to or within any violating counties**	Percent Commuting to or within any violating counties**
Missouri:				
Franklin County	Yes	1,637	776	2%
Jefferson County	Yes	1,885	1,337	1%
Lincoln County	No	495	5,529	30%
St. Charles County	Yes	2,728	70,282	47%
St. Francois County	No	548	92	0%
St. Louis County	Yes	11,925	13,513	3%
St. Louis City	Yes	3,450	1,502	1%
Warren County	No	525	2,967	25%
Washington County	No	220	27	0%
	Missouri total:	23,413	96,025	10%
Illinois				

Bond County	No	284	20	0%
Calhoun County	No	40	109	5%
Clinton County	No	389	49	0%
Jersey County	No	192	125	1%
Macoupin County	No	415	36	0%
Madison County	Yes	2,839	1,126	1%
Monroe County	Yes	361	84	1%
St. Clair County	Yes	2,666	729	1%
	Illinois total:	7,186	2,278	1%
	Areawide:	30,599	98,303	8%

* MOBILE model VMTs are those inputs into the NEI version 1.5.
** U.S. Census Bureau estimates for 2000 County-to-County Worker Flow http://www.census.gov/hhes/commuting/data/commuting.html.

For Missouri, the VMT data show that VMT levels in St. Louis City, St. Louis County, and St. Charles County are significantly higher than those in other Missouri counties in the St. Louis-St. Charles-Farmington, MO-IL CSA. Cumulatively, the VMT in these counties are a significant portion of the total VMT for the St. Louis-St. Charles-Farmington, MO-IL CSA.

For Illinois, the VMT data show that VMT levels in Madison and St. Clair Counties are significantly higher than those in the other Illinois counties in the St. Louis-St. Charles-Farmington, MO-IL CSA. The VMT from these two counties along with the VMT for the Monroe County, which the state also recommended as nonattainment, accounts for 82% of the VMT in the Illinois portion of the St. Louis-St. Charles-Farmington, MO-IL CSA and 19 percent of the VMT in the entire CSA.

Factor 3: Meteorology (Weather/Transport Patterns)

EPA evaluated available meteorological data to help determine how meteorological conditions, such as weather, transport patterns and stagnation conditions, would affect the fate and transport of precursor emissions contributing to ozone formation. EPA examined the frequency distribution of wind directions during the summer by averaging National Weather Service direction-sorted wind directions for each county for a 30 year period. To apply the results of this data analysis to the St. Louis-St. Charles-Farmington, MO-IL CSA, we have considered the wind direction frequencies during the summer months (June-August) for St. Charles County in Missouri, the only county with a recorded violation of the 2008 ozone NAAQS (see Table 2). Table 6 shows the summertime 30-year averaged percentages of wind directions (winds blowing indo the subject county from the specified wind direction sector) for St. Charles County in Missouri.

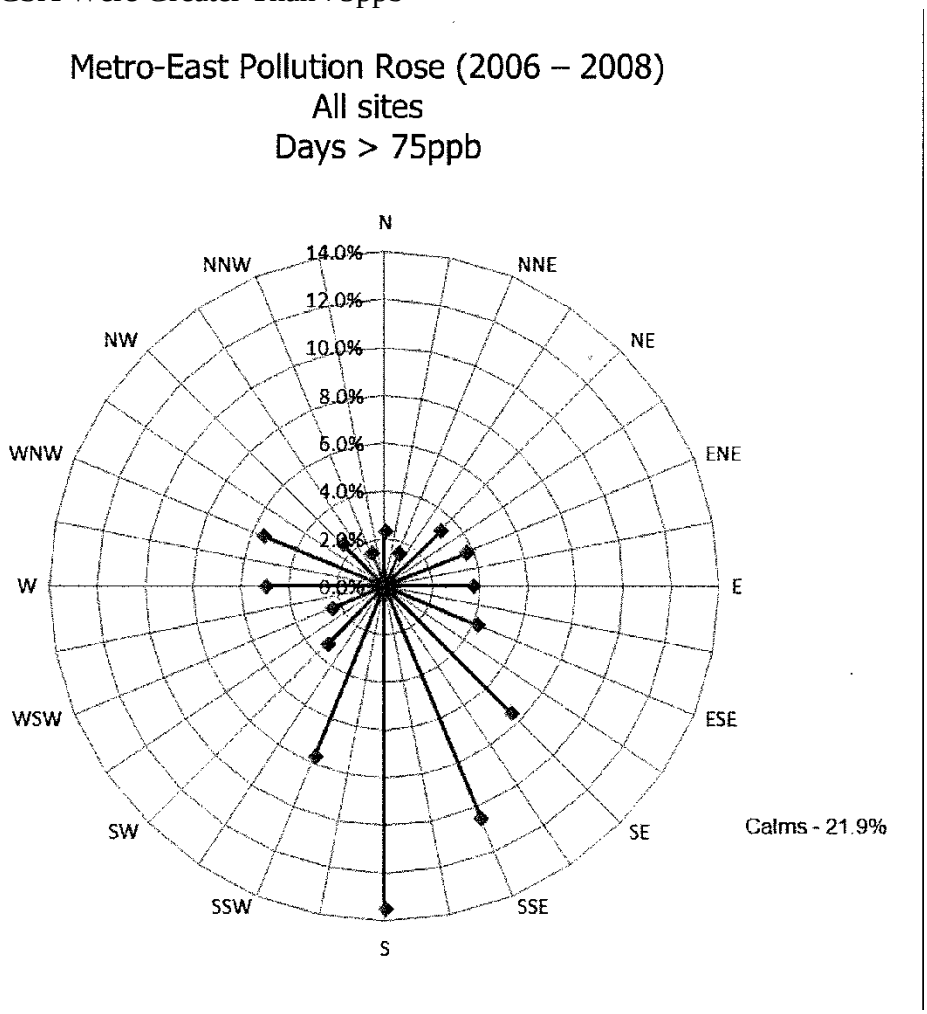
Table 6. Averaged Summertime Wind Direction Percentages for St. Charles County, MO

Wind Direction	Percentage
North-Northeast	9.82%
East-Northeast	7.24%
East-Southeast	13.66%
South-Southeast	14.41%
South-Southwest	20.01%
West-Southwest	14.64%
West-Northwest	12.84%
North-Northwest	7.39%

The wind direction percentages show that there is no "preferred" wind direction during the summertime. Transport winds can and do blow from all directions into the county with a recorded violation of the 2008 ozone NAAQS. There is, however an indication that winds from the south-southwest may be slightly more prevalent than winds from other directions during the summertime, and there is a southerly component 62.72% of the time.

Illinois provided wind direction data for days from 2006 through 2008 when ozone concentrations were greater than 75 ppb at any monitor in the Illinois portion of the St. Louis-St. Charles-Farmington, MO-IL CSA. Wind data was taken from Edwardsville in Madison County, IL. This data is presented in Figure 2.

Figure 2. Primary Wind Direction Percentages at Edwardsville in Madison County, IL for Days from 2006 Through 2008 When Ozone Concentrations in the Illinois Portion of the St. Louis-St. Charles-Farmington, MO-IL CSA Were Greater Than 75ppb



Data in Figure 2 indicate that when considering wind direction at Edwardsville in Madison County, IL for days from 2006 through 2008 when ozone concentrations in the Illinois portion of the St. Louis-St. Charles-Farmington, MO-IL CSA were greater than 75ppb, prevailing winds were from the south-southwest through the southeast approximately 40% of the time. Edwardsville is slightly to the east and south of the violating monitor in St. Charles County, Missouri. All of the counties proposed as nonattainment lie to the south of or directly east or west of the nonattainment monitor in St. Charles County. As shown in Figure 1, Franklin, St. Louis and Jefferson Counties and St. Louis City in Missouri and Monroe and St. Clair Counties in Illinois all range from southwest of the violating monitor in St. Charles County, to east of the violating monitor.

Factor 4: Geography/Topography (Mountain Ranges or Other Air Basin Boundaries)

The geography/topography analysis evaluates the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. The St. Louis-St. Charles-Farmington, MO-IL CSA does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a significant role in this evaluation.

Factor 5: Jurisdictional Boundaries

Once the general areas to be included in the nonattainment area were determined, EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary and carrying out the air quality planning and enforcement functions for nonattainment areas. Examples of jurisdictional boundaries include existing/prior nonattainment area boundaries for ozone or other urban-scale pollutants, county lines, air district boundaries, township boundaries, areas covered by a metropolitan planning organization, state lines, and Reservation boundaries.

The St. Louis, MO-IL area has previously established nonattainment boundaries associated with the 1-hour and 1997 8-hour ozone NAAQS. The portion of the St. Louis-St. Charles-Farmington, MO-IL CSA that we are designating as nonattainment for the 2008 ozone NAAQS is the same area that we designated as nonattainment under the 1-hour NAAQS. Under the 1997 8-hour ozone NAAQS, Jersey County, IL was also included in the nonattainment area due to a monitored violation of the standard in that county. The state of Illinois has recommended designating Jersey County, IL as attainment for the 2008 ozone NAAQS. The monitor in Jersey County, IL is currently monitoring attainment and, we do not believe Jersey County is contributing to nonattainment at the violating monitors in the area.

Conclusion

Based on the assessment of factors described above, EPA has concluded that the following counties/areas meet the CAA criteria for inclusion in the St. Louis-St. Charles-Farmington, MO-IL nonattainment area: Franklin County, Jefferson County, St. Charles County, St. Louis City, and St. Louis County in Missouri and Madison County, Monroe County, and St. Clair County in Illinois. These are the same counties that were included in the St. Louis, MO-IL nonattainment area for the 1-hour ozone NAAQS. Under the 1997 ozone NAAQS, Jersey County, IL was also included in the nonattainment area due to a monitored violation of the NAAQS in that county. The monitor in Jersey County, IL is currently well below the standard and the other factors do not support inclusion of the county within the St. Louis-St. Charles-Farmington, MO-IL nonattainment area. Jersey county has low emissions, low population, low VMT and is located north of, and therefore generally downwind of, the violating monitor in St. Charles County. One air quality monitor, located in St. Charles County, Missouri, indicates a violation of the 2008 ozone NAAQS based on 2010 design values, therefore this county is included in the nonattainment area. There are no air quality monitors in Illinois counties indicating violations of the 2008 ozone NAAQS based on the 2010 design values. Franklin County, Jefferson County, St. Louis City, and St. Louis County in Missouri and Madison County, Monroe County, and St. Clair County in Illinois are nearby counties that do not have violating monitors based on 2010 design values, but EPA has concluded that these areas contribute to the ozone concentrations in violation of the 2008 ozone NAAQS in St. Charles County. Based on 2008 data, Franklin County, Jefferson County, St. Charles County, St. Louis City, and St. Louis County in Missouri and Madison County and St. Clair County in Illinois together represent the counties with the seven highest emissions of NOx and VOC.

While emissions are low in Monroe County, we note that the State has recommended inclusion of the county as part of the nonattainment area. Monroe County is an integral part of the core area of the St. Louis-St. Charles-Farmington, MO-IL area and borders Jefferson County, St. Louis County and the City of St. Louis in Missouri and St. Clair County in Illinois, all of which are included in the nonattainment area and all of which have high ozone precursor emissions and high VMT. These high emissions areas surround Monroe County on three sides. Furthermore, prevailing wind direction on days where ozone levels exceeded 75 parts per billion (ppb) were from the southeast through south-southwest. Given that the violating ozone monitor in St. Charles County, Missouri is located directly north of Monroe County, Illinois and that the monitor is within 30 miles of Monroe County, we can conclude that any emissions originating in Monroe County are likely to contribute to elevated ozone levels at the St. Charles ozone monitor. Taken together Franklin County, Jefferson County, St. Charles County, St. Louis City, and St. Louis County in Missouri and Madison County, Monroe County, and St. Clair County in Illinois represent 89 percent of the total NOx emissions and 87 percent of the total VOC emissions in the St. Louis-St. Charles-Farmington, MO-IL CSA. Comparatively low emissions, population, and VMT in the remaining counties in the St. Louis-St. Charles-Farmington, MO-IL CSA and the fact that these counties are largely downwind of the violating monitor on days when it has exceeded the standard support the exclusion of these counties from the ozone nonattainment area for the 2008 8-hour ozone NAAQS.