

## **Appendix B**

### **2010 SO<sub>2</sub> 1-Hour Standard Nonattainment Area State Implementation Plan (SIP): Emissions Inventory and Projections**

CAA Sections 172(c)(3) and 172(c)(4) require states to develop an emissions inventory as a part of a state's Nonattainment Area State Implementation Plan (SIP).

U.S. EPA's *Guidance for 1-Hour SO<sub>2</sub> Nonattainment Area SIP Submissions* (SO<sub>2</sub> nonattainment area SIP guidance), issued April 23, 2014, to Regional Air Division Directors suggests states should develop a comprehensive, accurate and current inventory of actual emissions from all sources of sulfur dioxide (SO<sub>2</sub>) emissions in each area.

U.S. EPA's SO<sub>2</sub> nonattainment area SIP guidance suggests states should also submit a projected attainment year inventory that includes estimated emissions for all emission sources of SO<sub>2</sub>. This inventory should reflect projected emissions for the attainment year for all SO<sub>2</sub> sources in the nonattainment area, taking into account emission changes that are expected after the base year. Such emissions changes would include any expected emission reductions from existing control measures, from any new measures that may be adopted as part of the local area attainment plan, or from expected source shutdowns, so long as the existing and new control measures and source shutdowns are enforceable; and would include any expected emission increases due to new sources or growth by existing sources.

The Ohio Environmental Protection Agency (Ohio EPA) has prepared this inventory for the 2010 1-hour SO<sub>2</sub> National Ambient Air Quality Standard (NAAQS). The nonattainment areas addressed in this document include: the Lake County, OH area which includes all of Lake County; the Muskingum River, OH area which includes partial areas of Washington and Morgan Counties; and the Steubenville OH-WV area which is an interstate area that includes partial areas of Jefferson County in Ohio and Brooke County in West Virginia).

The initial step of developing this SO<sub>2</sub> inventory was to identify the preferred base year. Ohio selected 2011 as the base year. Ohio EPA prepares a new periodic inventory for all SO<sub>2</sub> emission sectors every three years and submits this inventory to U.S. EPA to be used in the National Emissions Inventory (NEI). The 2011 periodic inventory has been identified as one of the preferred databases for SIP development and coincides with nonattainment air quality in the three nonattainment areas included in this SIP. The 2011 inventory is used as the base year for the purpose of this submittal and is being submitted to U.S. EPA with this document to fulfill the base-year emissions inventory requirements under the 2010 SO<sub>2</sub> standard.

October 4, 2018 is the attainment date for the 2010 SO<sub>2</sub> standard; therefore, 2018 was selected as the future year and the projected inventory is being submitted to U.S. EPA

with this document to fulfill the projected year emissions inventory requirements under the 2010 SO<sub>2</sub> standard.

This document provides the specific sources of data and methods used to prepare the 2011 actual inventory and 2018 projected inventory. Sectors included in the inventory are Electrical Generating Units (EGU Point); Non-Electrical Generating Units (Non-EGU); Non-road (Non-road mobile); Area (non-point); MAR (marine, air and rail) and On-road Mobile (On-road).

## Data Sources

The Emissions Modeling Clearinghouse (EMCH) has been designed to support and promote emission modeling activities both internal and external to U.S. EPA. It provides emissions model input formatted inventories based on the latest versions of the NEI databases as well as the projection of these emissions.

In this analysis, 2011 and projected 2018 emissions data for area (non-point), on-road, MAR, and non-road sources were downloaded from the 2011NEI version 1-based Emissions Modeling Platform (2011v6) (<ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/>) on the EMCH website. The following identifies the exact files from the Emissions Modeling Platform that were downloaded and used as the data source for the sectors analyzed, except EGU and non-EGU sectors.

### 2011 Data Sources:

- Non-point inventories are contained in the spreadsheet named “OH\_2011NEIv1\_nonpoint\_20130911\_19sep2013\_v1” in the OH\_nonpoint\_2011.zip file at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint_by_state/)

- On-road inventories are contained in the spreadsheet named “Ohio\_2011ec\_onroad” in the Ohio\_2011ec\_onroad.csv.gz file located at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/onroad\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/onroad_by_state/)

- Non-road inventories are contained in the spreadsheet named “Ohio\_2011ec\_nonroad” in the Ohio\_2011ec\_nonroad.zip file located at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonroad\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonroad_by_state/)

- Emissions from the aircraft sector are included in the spreadsheet named “OH\_2011NElv1\_POINT\_20130723\_revised\_ptnonipm\_15aug2013\_v3” in the OH\_point\_2011.zip file at:

ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/point\_by\_state/

The data contained in the above file includes all point source data. Therefore, to segregate only the portion attributable to the aircraft sector, emissions associated with the following Source Classification Codes (SCC) were included:

- 2265008xxx for airport support equipment powered by gasoline
  - 2267008xxx for airport support equipment powered by liquid petroleum gas (LPG)
  - 2268008xxx for airport support equipment powered by compressed natural gas (CNG)
  - 2270008xxx for airport support equipment powered by diesel fuel
  - 2275xxxxxx for all aircraft
- Emissions from commercial marine sector are contained in the spreadsheet named “OH\_2010LADCO\_CMV\_19sep2013\_v1” in the OH\_nonpoint\_2011.zip file at:

ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint\_by\_state/

- Emissions from railroad sector are contained in the spreadsheet named “OH\_rail\_2011NElv1\_nonpoint\_20130911\_20sep2013\_v1” in the OH\_nonpoint\_2011.zip file at:

ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint\_by\_state/

#### 2018 Data Sources:

- Non-point inventories are contained in the spreadsheet named “OH\_2018ed\_from\_2011NElv1\_nonpoint\_20130911\_04dec2013\_v0” in the OH\_nonpoint\_2018.zip file at:

ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint\_by\_state/

- On-road inventories are contained in the spreadsheet named “Ohio\_2018ed\_onroad” in the Ohio\_2018ed\_onroad.zip file located at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/onroad\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/onroad_by_state/)

- Non-road inventories are contained in the spreadsheet named “Ohio\_2018ed\_nonroad” in the Ohio\_2018ed\_nonroad.zip file located at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonroad\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonroad_by_state/)

- Emissions from aircraft sector are included in the spreadsheet named “OH\_2018ed\_from\_no\_ethanol\_2011NElv1\_POINT\_20130723\_revised\_ptnonipm\_05dec2013\_v0” in the OH\_point\_2018.zip file at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/point\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/point_by_state/)

Just as with the 2011, inventory data source, SCC codes for aircraft sector include:

- 2265008xxx for airport support equipment powered by gasoline
  - 2267008xxx for airport support equipment powered by liquid petroleum gas (LPG)
  - 2268008xxx for airport support equipment powered by compressed natural gas (CNG)
  - 2270008xxx for airport support equipment powered by diesel fuel
  - 2275xxxxxx for all aircraft
- Emissions from commercial marine sector are contained in the spreadsheet named “OH\_c1c2rail\_noCALIF\_2018ed\_06dec2013\_v0” in the OH\_nonpoint\_2018.zip file at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint_by_state/)

The data contained in the above file includes both 2018 marine and railroad sector source data. Therefore, to segregate only the portion attributable to the marine sector, emissions associated with the following Source Classification Codes (SCC) were included:

- 2280xxxxxx for all commercial marine vessels
- Emissions from railroad sector are contained in the spreadsheet named “OH\_c1c2rail\_noCALIF\_2018ed\_06dec2013\_v0” in the OH\_nonpoint\_2018.zip file at:

[ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint\\_by\\_state/](ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint_by_state/)

The data contained in the above file includes both 2018 marine and railroad sector source data. Therefore, to segregate only the portion attributable to the rail sector, emissions associated with the following Source Classification Codes (SCC) were included:

- 2285002006 for Class 1 locomotives powered by diesel fuel
- 2285002007 for Class 2 and 3 locomotives powered by diesel fuel
- 2285002008 for passenger locomotives powered by diesel fuel
- 2285002009 for commuter locomotives powered by diesel fuel

Emissions from the above data source are available at the county level. As discussed below, these emissions are adjusted for Ohio's partial county areas.

Ohio's point source inventory includes only EGU and non-EGU within the nonattainment boundaries whether an entire county or partial area. Emissions and source specific data for Title V and synthetic minor point sources were developed for the 2011 inventory by the Ohio EPA from the Emissions Inventory System (EIS) (<http://www.epa.ohio.gov/dapc/aqmp/eiu/eis.aspx#126013925-download-eis-data-and-reports>). These data were reported by the sources annually. In Ohio, major point sources in all counties are required to submit air emissions information annually, in accordance with U.S. EPA's Consolidated Emissions Reporting Rule (CERR).

### On-Road Considerations

2011 on-road inventory available in this Emission Modeling Platform was developed using the Motor Vehicles Emission Simulator 2010b (MOVES 2010b), but for SIP purposes, the newest version of MOVES should be used. Ohio EPA ran MOVES 2014 with default options for Lake, Jefferson, Morgan and Washington County in Ohio and compared MOVES 2014 results with the U.S. EPA's latest estimates in the Emissions Modeling Platform. Table 1 below shows the modeled on-road emissions for each county using MOVES 2014 and corresponding Emissions Modeling Platform data from the 2011 NEI that relied on MOVES 2010b.

County	On-road emissions based on MOVES2014 (tpy)	On-road emissions based on NEI data (tpy)
Lake	25	25.28
Jefferson	7	7.78
Morgan	2	1.96
Washington	8	8.75

**Table 1: Comparison of On-Road Emissions from MOVES2014 and MOVES 2010b.**

Considering the small difference between these two sets of data and the insignificance of mobile SO<sub>2</sub> emissions compared to other sector emissions, Ohio EPA is conservatively using on-road emission data from the Emissions Modeling Platform generated from MOVES 2010b for our 2011 and 2018 inventory in order to not expend unnecessary resources to develop these inventories using the newest version of MOVES, MOVES2014.

County Level Emissions Adjustment for Partial Areas

For non-road, MAR and non-point emissions, the county-wide emissions were adjusted to township level emissions for partial nonattainment areas using a population ratio based on population in each township compared to the entire county. The estimated 2011 township level and county-wide populations were estimated by the U.S. Census Bureau from the April 1, 2010 census results found in "Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013 " report provided by U.S. Census Bureau, Population Division. (Appendix A) While township level emission estimates were available for 2011, the same data was not available at the township level for projected 2018 populations. Therefore, Ohio EPA assumed the population ratio of each township to the entire county would remain the same in 2018 as it was in 2011. Meaning, the 2011 township to county population ratios were applied to both 2011 and 2018 emissions. Calculations for the percentage of population in townships is shown in Table 2.

	2011 Population
<b>Morgan County</b>	15,079.00
<i>Center Township</i>	746.00
<i>Population %</i>	4.95%
<b>Washington County</b>	61,572.00
<i>Waterford Township</i>	3,696.00
<i>Population %</i>	6.00%
<b>Jefferson County</b>	68,875.00
<i>Cross Creek Township</i>	8,238.00
<i>Population %</i>	11.96%
<i>City of Steubenville</i>	18,551.00
<i>Population %</i>	26.93%
<i>Steubenville Township</i>	4,263.00
<i>Population %</i>	6.19%
<i>Warren Township</i>	4,169.00
<i>Population %</i>	6.05%
<i>Wells Township</i>	2,792.00
<i>Population %</i>	4.05%

**Table 2: Percent Adjustment Applied to Townships Based on Percentage of Population in Townships Compared to the County.**

For on-road emissions, the county-wide emissions were adjusted to township level based on the Vehicles Miles Traveled (VMT) ratio of each township to the entire county.

County-wide 2011 VMT data were obtained from the Vehicles Miles Traveled Report available on Ohio Department of Transportation's (ODOT) website (<http://www.dot.state.oh.us/Divisions/Planning/TechServ/traffic/Pages/DVMT.aspx>) and are contained in Appendix B.

In order to identify township level VMT, ODOT supplied Ohio EPA with the 2010 and 2040 VMT estimations based on their Travel Demand Model (TDM) results. This set of data included both the county-wide and township level VMT data by each functional class of road. From the data, Ohio EPA computed an annual conservative growth rate for each functional road class in the counties and townships. For counties, the annual growth rate was used to derive county level VMT for 2018 based on growing the 2011 VMT contained in Appendix B. For townships, 2010 VMT for county and township was used to calculate the percentage of 2010 VMT in the township. The percentage of 2010 VMT in the township was multiplied by the 2011 VMT for the county contained in Appendix B to derive the 2011 township VMT. The 2011 township VMT was then used with the township annual growth rate to derive township level 2018 VMT. Adding VMTs for all functional classes of road together provided Ohio EPA with the final 2011 and 2018 VMT data for township areas. Dividing VMT for township areas with the county-wide VMT, the VMT ratios of each township to the entire county were then obtained. The calculation and formulas are provided in Tables 3, 4 and 5 below.

<b>Washington County</b>						
Functional Classes of Road	A-Modelled VMT10	B- Modelled VMT40	C - Annual Growth Rate (C = (B/A)^(1/30)-1)	D - 2011 VMT	E - Projected 2018 VMT (E = D*(1+C)^7)	
1	208,131.64	269,539.97	0.87%	202,900.00	215,583.83	
2	303,225.51	411,125.07	1.02%	319,810.00	343,355.17	
6	213,676.35	290,031.70	1.02%	243,740.00	261,684.71	
7	90,095.92	103,249.33	0.46%	107,160.00	110,658.54	
8	70,284.89	82,109.19	0.52%	90,670.00	94,022.32	
9	45,817.87	56,758.57	0.72%	310,670.00	326,670.06	
11	60,958.84	81,394.71	0.97%	57,880.00	61,926.28	
14	265,843.63	334,377.35	0.77%	302,780.00	319,481.71	
16	49,564.52	66,054.59	0.96%	116,950.00	125,039.04	
17	79,169.14	98,187.42	0.72%	82,960.00	87,232.59	
19	2,697.42	3,374.79	0.75%	95,190.00	100,301.33	
Sum				<b>1,930,710.00</b>	<b>2,045,955.58</b>	
(A), (B) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
(D) Appendix B						
<b>Waterford Township in Washington County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F)^(1/30)-1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J = D * I)	K - Projected 2018 VMT (K = (1+H)^7 * J)
6	34,873.63	47,887.91	1.06%	16.32%	39,778.37	42,825.46
7	6,611.98	7,529.48	0.43%	7.34%	7,865.54	8,105.37
8	1,079.72	1,233.41	0.44%	1.54%	1,396.32	1,439.90
9	1,852.49	2,758.21	1.34%	4.04%	12,551.07	13,776.76
Sum					<b>61,591.30</b>	<b>66,147.49</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Washington County	1,930,710.00	2,045,955.58				
Waterford Township	61,591.30	66,147.49				
VMT Ratio (Township/County)	<b>3.19%</b>	<b>3.23%</b>				

**Table 3: Washington County: Percent Adjustment Applied to Townships Based on Percentage of VMT in Townships Compared to the County.**

<b>Morgan County</b>						
Functional Classes of Road	A-Modelled VMT10	B- Modelled VMT40	C - Annual Growth Rate (C = (B/A) <sup>1/30</sup> -1)	D - 2011 VMT	E - Projected 2018 VMT (E = D*(1+C) <sup>7</sup> )	
6	88,086.99	98,852.42	0.39%	117,320.00	120,560.55	
7	77,935.57	85,029.35	0.29%	102,190.00	104,282.59	
8	20,510.72	22,348.00	0.29%	29,540.00	30,144.90	
9	15,015.56	15,350.85	0.07%	130,100.00	130,738.83	
17	3,634.77	3,971.12	0.30%	2,360.00	2,410.01	
19	0.00	0.00	0.00%	630.00	630.00	
Sum				<b>382,140.00</b>	<b>388,766.88</b>	
(A), (B) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
(D) Appendix B						
<b>Center Township in Morgan County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F) <sup>1/30</sup> -1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = (1+H) <sup>7</sup> *J)
6	4,674.02	6,882.83	1.30%	5.31%	6,229.69	6,819.19
7	2,258.15	2,382.57	0.18%	2.90%	2,963.51	3,001.05
8	0.00	0.00	0.00%	0.00%	0.00	0.00
9	288.66	340.52	0.55%	1.92%	2,497.92	2,595.69
Sum					<b>11,691.12</b>	<b>12,415.93</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Morgan County	382,140.00	388,766.88				
Center Township	11,691.12	12,415.93				
VMT Ratio (Township/County)	<b>3.06%</b>	<b>3.19%</b>				

**Table 4: Morgan County: Percent Adjustment Applied to Townships Based on Percentage of VMT in Townships Compared to the County.**

<b>Jefferson County</b>						
Functional Classes of Road	A-Modelled VMT10	B- Modelled VMT40	C - Annual Growth Rate (C = $(B/A)^{(1/30)}-1$ )	D - 2011 VMT	E - Projected 2018 VMT (E = $D*(1+C)^7$ )	
2	196,711.89	262,712.27	0.97%	134,280.00	143,667.27	
6	66,162.34	103,545.24	1.50%	45,280.00	50,253.78	
7	123,094.67	138,398.06	0.39%	189,440.00	194,672.62	
8	64,663.39	84,894.17	0.91%	69,370.00	73,911.35	
9	30,376.96	36,838.31	0.64%	205,790.00	215,188.30	
12	596,178.60	826,777.14	1.10%	528,190.00	570,227.64	
14	127,221.45	146,968.53	0.48%	141,020.00	145,827.05	
16	102,279.97	124,645.22	0.66%	131,020.00	137,194.30	
17	63,864.48	94,387.36	1.31%	75,750.00	82,975.30	
19	8,912.89	11,758.87	0.93%	178,210.00	190,140.22	
Sum				<b>1,698,350.00</b>	<b>1,804,057.83</b>	
(A), (B) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
(D) Appendix B						
<b>City of Steubenville in Jefferson County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = $(G/F)^{(1/30)}-1$ )	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = $(1+H)^7*J$ )
12	43,772.91	60,949.02	1.11%	7.34%	38,769.15	41,883.70
14	65,576.43	70,100.96	0.22%	51.55%	72,695.81	73,822.74
16	52,576.51	59,847.09	0.43%	51.40%	67,344.28	69,397.68
17	19,046.46	27,150.15	1.19%	29.82%	22,588.65	24,538.81
19	3,219.35	3,717.07	0.48%	36.12%	64,369.45	66,563.66
Sum					<b>265,767.34</b>	<b>276,206.59</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Jefferson County	1,698,350.00	1,804,057.83				
City of Steubenville	265,767.34	276,206.59				
VMT Ratio (Township/County)	<b>15.65%</b>	<b>15.31%</b>				

**Table 5: Jefferson County: Percent Adjustment Applied to Townships Based on Percentage of VMT in Townships Compared to the County.**

<b>Cross Creek Township in Jefferson County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F) <sup>1/30</sup> -1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = (1+H) <sup>7</sup> *J)
7	1,945.45	2,454.85	0.78%	1.58%	2,993.15	3,160.45
8	2,570.49	2,847.03	0.34%	3.98%	2,760.93	2,827.31
9	1,769.19	2,058.91	0.51%	5.82%	11,976.98	12,411.16
12	13,974.25	22,458.20	1.59%	2.34%	12,359.65	13,802.66
14	78,787.52	85,652.39	0.28%	61.93%	87,333.69	89,059.88
16	14,567.79	19,553.46	0.99%	14.24%	18,657.25	19,989.24
17	13,927.31	16,866.89	0.64%	21.81%	16,521.08	17,275.59
19	2,468.80	2,982.61	0.63%	27.70%	49,364.17	51,582.71
Sum					<b>201,966.90</b>	<b>210,109.00</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Jefferson County	1,698,350.00	1,804,057.83				
Cross Creek Township	201,966.90	210,109.00				
VMT Ratio (Township/County)	<b>11.89%</b>	<b>11.65%</b>				
<b>Warren Township in Jefferson County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F) <sup>1/30</sup> -1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = (1+H) <sup>7</sup> *J)
2	44,243.38	57,749.93	0.89%	22.49%	30,199.57	32,131.99
7	9,224.09	8,765.11	-0.17%	7.49%	14,189.06	14,021.07
8	7,125.48	7,965.87	0.37%	11.02%	7,644.57	7,844.78
9	3,039.82	3,112.47	0.08%	10.01%	20,599.58	20,715.21
12	42,509.25	51,935.86	0.67%	7.13%	37,659.95	39,462.10
17	5,434.51	6,097.01	0.38%	8.51%	6,446.33	6,619.77
19	1,225.71	1,644.81	0.99%	13.75%	24,503.88	26,253.27
Sum					<b>141,242.94</b>	<b>147,048.19</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Jefferson County	1,698,350.00	1,804,057.83				
Warren Township	141,242.94	147,048.19				
VMT Ratio (Township/County)	<b>8.32%</b>	<b>8.15%</b>				

**Table 5 continued: Jefferson County: Percent Adjustment Applied to Townships Based on Percentage of VMT in Townships Compared to the County.**

<b>Steubenville Township in Jefferson County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F) <sup>1/30</sup> -1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = (1+H) <sup>7</sup> *J)
7	3,410.74	3,435.84	0.02%	2.77%	5,247.49	5,254.84
9	987.27	886.85	-0.36%	3.25%	6,688.18	6,521.45
12	124,897.03	182,561.28	1.27%	20.95%	110,655.81	120,875.95
14	22,586.82	24,274.63	0.24%	17.75%	25,031.05	25,454.61
16	36,285.42	40,206.05	0.34%	35.48%	46,485.90	47,603.61
17	5,759.03	6,325.65	0.31%	9.02%	6,832.65	6,982.30
19	3,680.21	4,343.84	0.55%	41.29%	73,582.91	76,463.03
Sum					<b>274,523.99</b>	<b>289,155.79</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Jefferson County	1,698,350.00	1,804,057.83				
Steubenville Township	274,523.99	289,155.79				
VMT Ratio (Township/County)	<b>16.16%</b>	<b>16.03%</b>				
<b>Wells Township in Jefferson County</b>						
Functional Classes of Road	F - Modelled VMT10	G- Modelled VMT40	H - Annual Growth Rate (H = (G/F) <sup>1/30</sup> -1)	I - 2010 Share of County (I = F/A)	J - 2011 VMT (4) (J= D * I)	K - Projected 2018 VMT (K = (1+H) <sup>7</sup> *J)
2	22,392.22	30,277.09	1.01%	11.38%	15,281.06	16,394.72
7	4,120.62	4,223.85	0.08%	3.35%	6,346.24	6,346.24
8	4,499.85	6,427.71	1.20%	6.96%	4,828.15	5,248.61
9	4,885.11	5,490.04	0.39%	16.08%	33,091.03	34,005.05
12	60,649.85	102,599.22	1.77%	10.17%	53,716.92	60,736.47
16	430.50	1,752.89	4.79%	0.42%	550.28	763.52
17	1,057.58	991.30	-0.22%	1.66%	1,257.45	1,238.21
19	346.42	597.10	1.83%	3.89%	6,932.37	7,870.67
Sum					<b>122,003.50</b>	<b>132,603.49</b>
(F), (G) Modelled VMT10 and VMT40, provided by Ohio Department of Transportation						
<b>Percentage of County Level VMT in Township</b>						
	2011 VMT	Projected 2018 VMT				
Jefferson County	1,698,350.00	1,804,057.83				
Wells Township	122,003.50	132,603.49				
VMT Ratio (Township/County)	<b>7.18%</b>	<b>7.35%</b>				

**Table 5 continued: Jefferson County: Percent Adjustment Applied to Townships Based on Percentage of VMT in Townships Compared to the County.**

From the above data sources, 2011 actual emissions and 2018 project emissions for all sectors were derived and adjusted as necessary using the methodology explained above. A discussion with relevant emission inventory for each area is described below.

## Lake County, OH

Table 6 provides a summary of the Lake County 2011 actual base year and 2018 projected year inventories.

Sector	2011 Base Year (tpy)	2018 Projected Year (tpy)
<b>EGU Point</b>	48,303.10	1,659.53
<b>Non-EGU</b>	3,664.19	1,583.44
<b>Non-road</b>	4.23	2.38
<b>MAR</b>	104.94	13.09
<b>Area</b>	53.83	53.83
<b>On-road</b>	25.28	10.04
<b>TOTAL</b>	<b>52,155.57</b>	<b>3,322.31</b>

Table 6: Lake County SO<sub>2</sub> Inventory.

The data sources described in the above section were used to derive the above inventories. No adjustments were necessary for all the sectors except EGU and non-EGU since the entirety of Lake County is nonattainment (i.e., no partial townships). EGU and non-EGU 2018 projected year emissions were adjusted from 2011 base year actual emissions as discussed below.

There are 12 point source (EGU and non-EGU) facilities located in this nonattainment area. Table 7 (EGU) and Table 8 (non-EGU) identify these sources.

Facility ID	Facility Name	County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
0243160009	CLEVELAND ELECTRIC ILLUMINATING CO., EASTLAKE PLANT	Lake	B001	4,305.50	Emission reduction of 84.5%	667.35
			B002	3,057.40		473.90
			B003	3,328.90		515.98
			B004	3,336.50	Shut-down	0.00
			B005	34,272.50	Shut-down	0.00
			B006	2.30	N/A	2.30
Total				<b>48,303.10</b>		<b>1,659.53</b>

Table 7: Lake County EGU SO<sub>2</sub> Inventory.

The Eastlake Plant is the only facility with EGUs (B001 to B005) in Lake County. 2018 emissions from emission units (EUs) B001, B002 and B003 were estimated based on an emission reduction of 84.5% that is a part of the control strategy included in Ohio

EPA's nonattainment area SIP<sup>1</sup>. This level of reduction was calculated based on the previously permitted emission rate of 7473 lbs/hr and the maximum allowable emission rate of 1159 lbs/hr. Assuming actual emission reductions equal to 84.5% is conservative because the facility has indicated they will permanently shut down. EUs B004 and B005 haven't been operated since 2013 and will be permanently shut down and emissions from these two EUs in 2018 will be zero. B006 was maintained at the same emission level to be conservative.

Facility ID	Facility Name	County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
024300024	The Lubrizol Corporation	Lake	B001	0.02	N/A	0.02
			B002	0.04		0.04
			B003	0.03		0.03
			B004	0.06		0.06
			N001	0.41		0.41
			P006	3.49		3.49
			P012	12.83		12.83
			P020	0.00		0.00
			P022	0.00		0.00
			P030	3.92		3.92
			P052	0.13		0.13
P053	0.00	0.00				
0243000491	GRAND RIVER ASPHALT CO	Lake	P904	0.10	N/A	0.10
0243001188	Marking Films Div. of Avery Dennison Building #11	Lake	K002	0.01	N/A	0.01
			K003	0.00		0.00
0243030257	Carmeuse Lime, Inc - Grand River Operations	Lake	P001	429.80	N/A	429.80
			P002	460.80		460.80
0243081177	Avery Dennison, Specialty Tape Division, Bldg. 14&19	Lake	K005	0.00	N/A	0.00
0243081207	CFF of Avery Dennison	Lake	K001	0.01	N/A	0.01
			K002	0.01		0.01
0243110008	PAINESVILLE MUNICIPAL ELECTRIC PLANT	Lake	B001	2,297.05	10% of capacity and only one unit may operate at a time (conservative)	664.54
			B004	448.24		
0243111198	LAKE COUNTY SOLID WASTE FACILITY	Lake	F002	0.11	N/A	0.11
0243111361	Avery Dennison MFD, Bldg 7	Lake	K001	0.00	N/A	0.00
			K002	0.00		0.00
0243111362	Avery Dennison STD, Bldg 5	Lake	K003	0.02	N/A	0.02
			K016	0.00		0.00
0243111416	Avery Dennison PFF, Bldg 3	Lake	K007	0.00	N/A	0.00
			K008	0.00		0.00
			K015	0.00		0.00
0243150025	The Lubrizol Corporation - Wickliffe Facility	Lake	B001	0.02	N/A	0.02
			B002	0.03		0.03
			B003	0.02		0.02
			B005	0.01		0.01
			B006	0.00		0.00
			P009	7.03		7.03
			P011	0.00		0.00
			P012	0.00		0.00
0243161415	Momentive Performance Materials Quartz Inc	Lake		0.00	N/A	0.00
Total				<b>3,664.19</b>		<b>1,583.44</b>

**Table 8: Lake County non-EGU SO<sub>2</sub> Inventory.**

<sup>1</sup> Emissions in excess of those needed for Ohio's attainment strategy will remain surplus for the purpose of creditable emission reductions.

Two non-EGUs were analyzed as a part of Ohio EPA's nonattainment area SIP strategy, Painesville Municipal Power Plant and Carmeuse Lime. For Painesville Municipal Power Plant, two primary SO<sub>2</sub> emission sources had emissions in 2011; B001 and B004. A third unit at this facility is B003. B003 and B004 share a combined stack and in some years they each operate while in others only one will operate. For example, in 2012 both units operated for total combined emissions of 243.71 tpy while in 2013 only B004 operated with 220.88 tpy of SO<sub>2</sub> emissions. Considering 2011 emissions for B004 were at 448.24 tpy of SO<sub>2</sub>, Ohio EPA made no allowances for B003 although this does not imply B003 was permanently shut down for base year inventory purposes. Projected 2018 emissions from these EUs are reduced based on the control strategy included in Ohio EPA's nonattainment area SIP. Multiple strategies are part of the control of this facility but for the purposes of computing a future year 2018 ton per year projection, Ohio EPA is accounting for the 10% "limited use" restriction on capacity and the restriction that only one EU will be operated at a time. The unrestricted capacity of the three EUs is 249 MMBtu/hr (B001), 218.5 MMBtu/hr (B002) and 379.3 MMBtu/hr (B003). Since only one unit will be able to operate at a time in the strategy, the 379.3 MMBtu/hr unrestricted heat input capacity was considered and reduced by 10% to 37.93 MMBtu/hr<sup>2</sup>. The facility will also be restricted to an SO<sub>2</sub> limit of no more than 4.0 lb SO<sub>2</sub>/MMbtu. Taking this restriction into consideration and conservatively estimating the unit would operate 8760 hours in the year; emissions for the entire facility are conservatively estimated at 664.54 tpy.

Carmeuse Lime did not require a control strategy in order for the area to model attainment of the standard. There is no indication that they will expand operations in the future, thus the projected 2018 emissions is assumed to be the same as the 2011 emissions. Since the estimated population in the county is expected to decline between 2010 to 2020 (Appendix B), the population growth rate is not applied in order to maintain conservatism.

For the rest of the non-EGU point source facilities in the Lake County nonattainment area, Ohio EPA assumed emissions would remain constant from 2011 to 2018, and no population growth rate was applied in order to be conservative for the same reason mentioned above.

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<sup>2</sup> The Boiler MACT's 10% limited use provision allows flexibility for the unit to either operate 10% of the capacity or 10% of the hours at full capacity. Either computation method would provide the same level of annual emissions.

## Muskingum River, OH

Table 9 provides a summary of the Muskingum River, OH area 2011 actual base year and 2018 projected year inventories.

Sector	2011 Base Year (tpy)	2018 Projected Year (tpy)
EGU Point	104,113.16	0.00
Non-EGU	1,203.02	1,203.02
Non-road	0.06	0.02
MAR	0.10	0.01
Area	0.99	0.99
On-road	0.34	0.14
<b>TOTAL</b>	<b>105,317.67</b>	<b>1,204.18</b>

Table 9: Muskingum River, OH Area SO<sub>2</sub> Inventory.

The data sources described in the above section were used to derive the above inventories. This nonattainment area is comprised of Center Township in Morgan County and Waterford Township in Washington County. Therefore, adjustments were necessary for all sectors using the adjustment factors discussed in Tables 2, 3 and 4 above, as identified below.

Center Township	2011 Base Year			2018 Projected Year		
	Entire Morgan County (tpy)	Adjustment Factor	Center Township (tpy)	Entire Morgan County (tpy)	Adjustment Factor	Center Township (tpy)
EGU Point	-	n/a	0.00	-	n/a	0.00
Non-EGU	-	n/a	0.00	-	n/a	0.00
Non-road	0.17	4.95%	0.01	0.07	4.95%	0.00
MAR	0.08	4.95%	0.00	0.08	4.95%	0.00
Area	5.90	4.95%	0.29	5.90	4.95%	0.29
On-road	1.96	3.06%	0.06	0.80	3.19%	0.03
<b>TOTAL</b>	-	-	<b>0.36</b>	-	-	<b>0.32</b>

Table 10: Center Township Adjustment and SO<sub>2</sub> Inventory

Waterford Township	2011 Base Year			2018 Projected Year		
	Entire Washington County (tpy)	Adjustment Factor	Waterford Township (tpy)	Entire Washington County (tpy)	Adjustment Factor	Waterford Township (tpy)
EGU Point	-	n/a	104,113.16	-	n/a	0.00
Non-EGU	-	n/a	1,203.02	-	n/a	1,203.02
Non-road	0.81	6.00%	0.05	0.35	6.00%	0.02
MAR	1.66	6.00%	0.10	0.16	6.00%	0.01
Area	11.61	6.00%	0.70	11.61	6.00%	0.70
On-road	8.75	3.19%	0.28	3.56	3.23%	0.11
<b>TOTAL</b>	-	-	<b>105,317.31</b>	-	-	<b>1,203.86</b>

Table 11: Waterford Township Adjustment and SO<sub>2</sub> Inventory

EGU and non-EGU 2018 projected year emissions were adjusted from 2011 base year actual emissions as discussed below.

There are 4 point sources located in the nonattainment area and all are located in Washington County<sup>3</sup>. Table 12 (EGU) and Table 13 (non-EGU) identify these sources.

Facility ID	Facility Name	County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
0684000000	Muskingum River Power Plant	Washington	B001	16.33	Shut-down	0.00
			B002	18,190.01		0.00
			B003	17,420.33		0.00
			B004	24,684.52		0.00
			B005	24,314.03		0.00
			B006	19,487.94		0.00
Total				<b>104,113.16</b>		<b>0.00</b>

Table 12: Muskingum River, OH Area EGU SO<sub>2</sub> Inventory.

The Muskingum River Power Plant is the only facility with EGUs (B001 to B006) in the Muskingum River, OH nonattainment area. The facility will permanently shut down by June 2015. Thus projected 2018 emissions from Muskingum River Power Plant will be zero.

<sup>3</sup> The Muskingum River Power Plant (EGU) facility is actually located in both Washington (Waterford Township) and Morgan (Center Township) Counties; however, all emissions are reported in Washington County.

Facility ID	Facility Name	County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
0684000105	Globe Metallurgical Inc.	Washington	P902	218.73	N/A	218.73
			P903	196.03		196.03
			P904	256.48		256.48
			P907	234.61		234.61
			P908	286.57		286.57
0684000212	Washington Energy Facility	Washington	X003	0.01	N/A	0.01
			B001	0.01		0.01
			P001	3.20		3.20
0684000213	Columbus Southern Power Company - Waterford Plant	Washington	P002	2.01	N/A	2.01
			B001	0.00		0.00
			P001	1.70		1.70
			P002	1.77		1.77
Total				<b>1,203.02</b>		<b>1,203.02</b>

**Table 13: Muskingum River, OH Area non-EGU SO<sub>2</sub> Inventory.**

There are three non-EGUs in the nonattainment area and none were analyzed as a part of Ohio EPA's nonattainment area SIP strategy. There is no indication that they will expand operations in the future, thus the projected 2018 emissions is assumed to be the same as the 2011 emissions. Since the estimated population in the county is expected to decline between 2010 to 2020 (Appendix B), the population growth rate is not applied in order to maintain conservatism.

### Steubenville, OH-WV (Ohio Portion Only)

Table 14 provides a summary of the Ohio portion of the Steubenville, OH-WV area 2011 actual base year and 2018 projected year inventories.

Sector	2011 Base Year (tpy)	2018 Projected Year (tpy)
<b>EGU Point</b>	25,122.43	10,685.76
<b>Non-EGU</b>	223.44	188.49
<b>Non-road</b>	0.28	0.12
<b>MAR</b>	5.20	0.61
<b>Area</b>	53.42	53.42
<b>On-road</b>	4.62	1.82
<b>TOTAL</b>	<b>25,409.39</b>	<b>10,930.22</b>

**Table 14: Ohio Portion of the Steubenville, OH-WV Area SO<sub>2</sub> Inventory.**

The data sources described in the above section were used to derive the above inventories. This nonattainment area is comprised of Cross Creek, Steubenville, Warren and Wells Townships and Steubenville City in Jefferson County, OH and the Cross Creek Tax District in Brooke County, WV<sup>4</sup>. Therefore, adjustments were necessary for all sectors using the adjustment factors discussed in Tables 2 and 5 above, as identified below.

<sup>4</sup> Refer to West Virginia DEQ's SIP submittal for inventory information.

Cross Creek Township	2011 Base Year			2018 Projected Year		
	Entire Jefferson County (tpy)	Adjustment Factor	Cross Creek Township (tpy)	Entire Jefferson County (tpy)	Adjustment Factor	Cross Creek Township (tpy)
EGU Point	-	n/a	0.00	-	n/a	0.00
Non-EGU	-	n/a	0.00	-	n/a	0.00
Non-road	0.53	11.96%	0.06	0.24	11.96%	0.03
MAR	9.44	11.96%	1.13	1.11	11.96%	0.13
Area	96.81	11.96%	11.58	96.81	11.96%	11.58
On-road	7.78	11.89%	0.93	3.12	11.65%	0.36
<b>TOTAL</b>	-	-	<b>13.70</b>	-	-	<b>12.10</b>

Table 15: Cross Creek Township Adjustment and SO<sub>2</sub> Inventory

Steubenville Township	2011 Base Year			2018 Projected Year		
	Entire Jefferson County (tpy)	Adjustment Factor	Steubenville Township (tpy)	Entire Jefferson County (tpy)	Adjustment Factor	Steubenville Township (tpy)
EGU Point	-	n/a	0.00	-	n/a	0.00
Non-EGU	-	n/a	223.24	-	n/a	188.29
Non-road	0.53	6.19%	0.03	0.24	6.19%	0.01
MAR	9.44	6.19%	0.58	1.11	6.19%	0.07
Area	96.81	6.19%	5.99	96.81	6.19%	5.99
On-road	7.78	16.16%	1.26	3.12	16.03%	0.50
<b>TOTAL</b>	-	-	<b>231.10</b>	-	-	<b>194.86</b>

Table 16: Steubenville Township Adjustment and SO<sub>2</sub> Inventory

Warren Township	2011 Base Year			2018 Projected Year		
	Entire Jefferson County (tpy)	Adjustment Factor	Warren Township (tpy)	Entire Jefferson County (tpy)	Adjustment Factor	Warren Township (tpy)
EGU Point	-	n/a	0.00	-	n/a	0.00
Non-EGU	-	n/a	0.20	-	n/a	0.20
Non-road	0.53	6.05%	0.03	0.24	6.05%	0.01
MAR	9.44	6.05%	0.57	1.11	6.05%	0.07
Area	96.81	6.05%	5.86	96.81	6.05%	5.86
On-road	7.78	8.32%	0.65	3.12	8.15%	0.25
<b>TOTAL</b>	-	-	<b>7.31</b>	-	-	<b>6.39</b>

Table 17: Warren Township Adjustment and SO<sub>2</sub> Inventory

Wells Township	2011 Base Year			2018 Projected Year		
	Entire Jefferson County (tpy)	Adjustment Factor	Wells Township (tpy)	Entire Jefferson County (tpy)	Adjustment Factor	Wells Township (tpy)
EGU Point	-	n/a	25,122.43	-	n/a	10,681.56
Non-EGU	-	n/a	0.00	-	n/a	0.00
Non-road	0.53	4.05%	0.02	0.24	4.05%	0.01
MAR	9.44	4.05%	0.38	1.11	4.05%	0.04
Area	96.81	4.05%	3.92	96.81	4.05%	3.92
On-road	7.78	7.18%	0.56	3.12	7.35%	0.23
<b>TOTAL</b>	-	-	<b>25,127.31</b>	-	-	<b>10,685.76</b>

Table 18: Wells Township Adjustment and SO<sub>2</sub> Inventory

City of Steubenville	2011 Base Year			2018 Projected Year		
	Entire Jefferson County (tpy)	Adjustment Factor	City of Steubenville (tpy)	Entire Jefferson County (tpy)	Adjustment Factor	City of Steubenville (tpy)
EGU Point	-	n/a	0.00	-	n/a	0.00
Non-EGU	-	n/a	0.00	-	n/a	0.00
Non-road	0.53	26.93%	0.14	0.24	26.93%	0.06
MAR	9.44	26.93%	2.54	1.11	26.93%	0.30
Area	96.81	26.93%	26.07	96.81	26.93%	26.07
On-road	7.78	15.65%	1.22	3.12	15.31%	0.48
<b>TOTAL</b>	-	-	<b>29.97</b>	-	-	<b>26.91</b>

Table 19: City of Steubenville Adjustment and SO<sub>2</sub> Inventory

EGU and non-EGU 2018 projected year emissions were adjusted from 2011 base year actual emissions as discussed below.

There are 5 point sources located in the Ohio portion of the nonattainment area. Table 20 (EGU) and Table 21 (non-EGU) identify these sources.

Facility ID	Facility Name	Township/County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
0641050002	Cardinal Power Plant (Cardinal Operating Company)	Wells/Jefferson	B001	3,165.91	N/A	4,635.80
			B002	1,651.38	N/A	3,993.10
			B008	1.33	N/A	1.33
			B009	20,302.21	Install FGD (prior to this SIP)	2,049.73
			B010	1.60	N/A	1.60
Total				<b>25,122.43</b>		<b>10,681.56</b>

Table 20: Ohio Portion of the Steubenville, OH-WV Area EGU SO<sub>2</sub> Inventory.

The Muskingum River Power Plant is the only facility with EGUs (B001 to B006) in the Muskingum River, OH nonattainment area. The facility will permanently shut down by June 2015. Thus projected 2018 emissions from Muskingum River Power Plant will be zero.

Cardinal Power Plant is the only EGU in the area and did not require reductions under Ohio EPA’s nonattainment area SIP strategy. The facility has three main boilers (B001, B002 and B009) and two auxiliary boilers (B008 and B010). B009 installed an FGD in 2012, reducing SO<sub>2</sub> emissions. There is no indication that operation of the other boilers will change; however, 2013 reported emissions indicated an increased throughput for all three boilers, which were all controlled by FGD during that period. Therefore, Ohio EPA will use 2013 emissions as the projected 2018 emissions for the three main boilers. B008 and B010 will remain unchanged from 2011. Estimating projected 2018 emissions with this approach is conservative considering the facility will be required to comply with U.S. EPA’s Mercury and Air Toxics Standards (MATS) in the future, which may result in further reductions in SO<sub>2</sub> depending upon the strategy employed.

Facility ID	Facility Name	Township/County	Emission Unit	2011 Emissions (tpy)	Control Strategy	2018 Emissions (tpy)
0641090010	RG Steel Wheeling LLC- Mingo Junction Facility	Steubenville/Jefferson	P016 (and EAF)	0.03	N/A	183.11
0641090234	Mingo Junction Energy Center, LLC		B002	12.36	Emission reduction of 98%	0.25
			B003	136.52		2.73
			B004	73.6		1.47
0641950044	Ewusiak Development LLC	Steubenville/Jefferson	P904	0.73	N/A	0.73
0641120012	RG Steel Wheeling, LLC - Yorkville Plant	Warren/Jefferson	B011	0.04	N/A	0.04
			B012	0.03		0.03
			B013	0.05		0.05
			P011	0.06		0.06
			P012	0.02		0.02
Total				<b>223.44</b>		<b>188.49</b>

**Table 21: Ohio Portion of the Steubenville, OH-WV Area non-EGU SO<sub>2</sub> Inventory.**

There are four non-EGUs in the nonattainment area of which two were analyzed as a part of Ohio EPA’s nonattainment area SIP strategy; the former RG Steel Wheeling Pittsburg Steel Plant and the Mingo Junction Energy Center.

The former RG Steel Wheeling Pittsburg Steel Plant has not officially operated since prior to the 2011 base year which is why only one unit reported emissions in the 2011 inventory (storage pile). However, there is potential that new ownership could resume operation of the facility, and specifically the electric arc furnace (EAF) (P913) in the future. Thus, projected 2018 emissions were estimated to be the same as the highest recorded SO<sub>2</sub> emissions from P913 from 2005 to 2008.<sup>5</sup> While the electric arc furnace did not require reductions as a part of Ohio EPA’s nonattainment area SIP strategy, four furnaces at the facility, three of which were previously permitted to burn sulfur containing coke oven gas will be restricted to burning natural gas in the future. Therefore, SO<sub>2</sub> emissions will be minimal and are accounted for in the above conservative projection. Those EUs did not report 2011 emissions because they were not in operation but they are not being removed from Ohio EPA’s base year inventory.<sup>6</sup>

<sup>5</sup> The EAF was permitted in 2005 and employed best available technology.

<sup>6</sup> With respect to the entire base year and future year inventory for all of the nonattainment areas, unless specifically noted, indication of specific emissions units in these inventories is not indicative of those emissions units that are permanently shutdown and therefore excluded from future operation.

Mingo Junction Energy Center has four boilers (B001, B002, B003 and B004) that were permitted to burn a variety of gasses, included coke oven gas (including desulfurized) from the Mountain State Carbon facility in West Virginia. As a part of Ohio EPA's nonattainment area SIP strategy, the emissions rate will be lowered significantly. However, Mountain State Carbon has also indicated no intend to request Mingo Junction Energy Center burn coke oven gas in the future; therefore, Ohio's best projection that is if the facility does continue operations, it will be restricted to burning natural gas. For the purpose of estimating future year reductions in SO<sub>2</sub> emissions, Ohio EPA is reducing 2011 emissions by 98%.

There is no indication that RG Steel Wheeling, - Yorkville Plant or Ewusiak Development will change their operations in the future; therefore, SO<sub>2</sub> emissions from these two facilities are estimated to remain the same from 2011 to 2018. Since the estimated population in the county is expected to decline between 2010 to 2020 (Appendix B), the population growth rate is not applied in order to maintain conservatism.