PERMIT-TO-INSTALL APPLICATION
VOLUME IV

CLASS II AIR QUALITY MODELING

For:
AMERICAN MUNICIPAL POWER
GENERATING STATION

Submitted By:
AMERICAN MUNICIPAL POWER-OHIO, INC.

May 2006

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PERMIT-TO-INSTALL APPLICATION
VOLUME IV

CLASS II AIR QUALITY MODELING REPORT

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The proposed American Municipal Power Generating Station (AMPGS) project is the development of a new pulverized coal-fired electric generating facility. The facility will consist of two steam generators designed for base load operation with a nominal net power output of 480 MW each or a maximum heat input capacity of 5,191 MMBtu/hr each. The units will burn a blend of Ohio, Central Appalachian and/or Powder River Basin coals. The proposed project is located in Meigs County (Ohio) in UTM Zone 17, 420,794 meters easting and 4,306,082 meters northing. A site plan for the proposed AMPGS is included in Appendix A.

This project will involve major emissions for SO_2, NO_x, PM_{10} and CO. As a result, air quality modeling is required for each of these pollutants, including a PSD increment analysis for SO_2, NO_2 and PM_{10}. The maximum emission rates presented in the PTI application for the emissions units that are included in this Class II modeling analysis are presented in Appendix A.

The Class II air dispersion modeling was completed using US EPA's AERMOD dispersion model and pursuant to the guidelines established in Ohio EPA Engineering Guide #69 and the US EPA New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting (Draft October 1990). Details on the modeling methodology and the predicted off-site impacts are included in this report. Table 1-1 summarizes the maximum predicted off-site air quality impact from the AMPGS.

Table 1-1
Air Quality Modeling Summary
Predicted Maximum Off-Site Impact from the AMPGS

Pollutant	Avg. Period	Maximum Predicted Concentration (µg/m³)	Second High Predicted Concentration (µg/m³)	PSD Significant Impact Increment (µg/m³)	PSD Monitoring De Minimis Concentration (µg/m³)	½ Class II PSD Increment (µg/m³)	NAAQS (µg/m³)
SO_2	3-Hr	63.61	56.68	25	NA	256[1]	1,300
	24-Hr	15.79	12.38	5	13	45.5[1]	365
	Annual	1.53	NA	1	NA	10	80
NO_2[2]	Annual	0.99	NA	1	14	12.5	100
PM_{10}	24-Hr	3.46	2.93	5	10	15	150
	Annual	0.73	NA	1	NA	8.5	50
CO	1-Hr	66.74	48.59	2,000	NA	10,000[1][3]	40,000
	8-Hr	28.11	23.67	500	575	2,500[1][3]	10,000

Notes:

(1) The Class II PSD Increment value can not be exceeded more than once per year.
(2) The maximum NO_x emission rates have been used in this Class II analysis rather than the NO_2 fraction. This is conservative and results in predicted NO_2 concentrations that are higher than would result if the NO_2 emission rates were used.
(3) There are no Class II PSD Increments assigned for CO. The values presented are ¼ of the NAAQS as instructed in Ohio EPA Guidelines.

The Class II modeling results summarized in Table 1-1 indicate that interactive NAAQS modeling is required for SO_2. The other pollutants evaluated in this analysis have off-site impacts less than the PSD significant level and interactive modeling is not required.

The interactive NAAQS analysis for SO_2, presented in Section 4 of this report, identifies several predicted NAAQS exceedances for the 3-hour, 24-hour and annual averaging periods. However, the contribution of the AMPGS to each of these predicted exceedances is less than the PSD significance levels (i.e., the impact of the AMPGS is less than 25 $\mu g/m^3$ for the 3-hr averaging period, 5 $\mu g/m^3$ for the 24-hour averaging period and 1 $\mu g/m^3$ for the annual averaging period).

An analysis of different load scenarios for the two main coal-fired boilers was performed to verify that the "worst case" operating scenarios had been evaluated for Class II air quality impacts. The alternative load analysis, presented in Section 9 of this report, demonstrated that the "worst case" impact is predicted when both boilers are operating at 100% load. As a result, this is the load scenario used throughout this Class II analysis.

In addition to the air quality modeling required by the PSD rules and guidelines, the air quality impact analysis for the AMPGS includes an evaluation pursuant to Ohio EPA's Air Toxic Policy (ATP) that is presented in Section 8 of this report. This modeling demonstrates that the AMPGS will not have any adverse impact on local air quality.

The results from the Class II modeling were considered in the Additional Impacts Analysis that is also included in this Volume of the PTI application for the AMPGS. The Additional Impacts Analysis demonstrates that the AMPGS will not cause any adverse environmental impacts.

SITE OVERVIEW

AMPGS is located in Letart Township in Meigs County, Ohio. 40 CFR Part 51, Appendix W-Guideline on Air Quality Models, Section 8.2.3 defines "rural" as a population density of less than 750 people/square kilometer. The population of Letart Township is 646 people and the area of Letart Township is approximately 36 square kilometers. This is a population density of 18 people/km^2 and therefore is classified as rural. A review of the topographic map also supports a "rural" classification as the area is primarily forested. The nearby areas impacted by emissions from this facility are designated as Class II areas pursuant to the PSD rules, 40 CFR Part 51.

Figure 2-1 is a topographical map of the immediate vicinity of the AMPGS.

Figure 2-1
Topographical Map

AIR DISPERSION MODEL

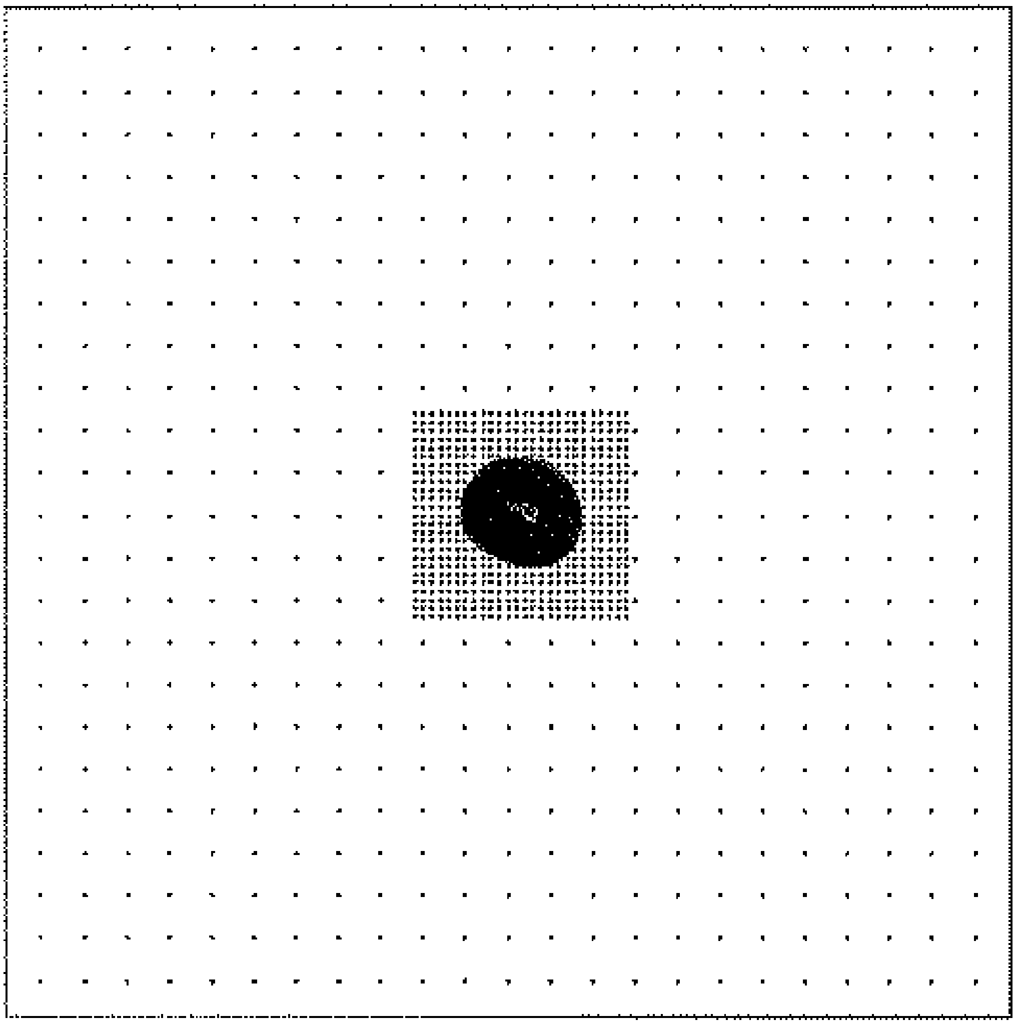
The analysis was completed using the US EPA approved AERMOD modeling programs including AERMET, AERMAP and AERMOD. The Building Profile Input Program Prime (BPIP Prime) preprocessor was used to determine the Good Engineering Practice (GEP) building dimensions for downwash calculations.

RECEPTOR GRID AND ELEVATIONS

A primary receptor grid for the Class II modeling was established along the AMPGS property line and extending to a distance of 5,000 meters from the site. Receptors on this grid are placed 100 meters apart. A second receptor grid extends an additional 10,000 meters with receptors placed 1,000 meters apart. A third receptor grid extends 50,000 meters with receptors placed 5,000 meters apart. In addition, receptors were placed along Route 124 which crosses through the property. A total of 14,464 receptors are included in this analysis.

Receptor elevations were obtained from digitized United States Geological Survey USGS 7.5 minute quadrangles. These digital elevation models (DEMs) were obtained from Micropath Corporation (Golden, CO). Figure 2-2 is a graphic representation of the receptor grid.

Figure 2-2
Receptor Grid



AERMET

National Weather Service (NWS) hourly surface observations and twice-daily upper air soundings were used to process AERMET. NWS data for years 1988-1992 were obtained from www.webmet.com (The Meteorological Resource Center). Upper air and surface data from station number 03860 (Huntington Tri-State Airport) were employed to process AERMET. This station is located at 38.365° N latitude, 82.555° W longitude. It has a base elevation of 837 ft and an anemometer height of 20 ft. The upper air data are NCDC TD-6201 FB format. The hourly surface data are in SCRAM format (Met144).

AERMET requires user-defined surface roughness (z_o), albedo (r) and Bowen ratio (B_o) coefficients. The surface characteristics for this model are calculated by averaging the land use in a 3-km radius from the meteorological site consistent with guidance in the AERMOD Implementation Guide (September 27, 2005) and at the recommendation of Ohio EPA.

The land use determination for the AERMOD Class II analysis was generated using CTGPROC.EXE in the CALPUFF modeling program using the huntington.cmp land use file. 16.40% of the land in the 3-km radius surrounding the Huntington Tri-State Airport meteorological station is urban (land use 10-19), 14.68% is cultivated (land use 20-29), 2.84 % is barren and 66.09% is forested (land use 40-49). The barren land was assumed to be forested land, the predominant land use type in the 3-km area, for the sake of this analysis. The Cabell County Soil Survey states that 10% of the forested lands in the county are pine types (p. 51). Therefore, 62.03% of the land is deciduous forest and 6.89% of the land is coniferous forest. Refer to Appendix B for calculations and the landuse.dat file generated by CTGPROC.

Table 2-1 lists the coefficients employed in the model. The coefficients vary by season.

Table 2-1
Surface Characteristics Employed in AERMET

Surface Characteristic	Spring	Summer	Autumn	Winter
surface roughness (z_o)	0.878	1.089	0.757	0.565
Albedo (r)	0.126	0.138	0.139	0.480
Bowen ratio (B_o)	0.690	0.608	1.106	1.500

The seasonal surface roughness values in Table 2-1 were calculated using Table 4-3 of the Addendum to the User's Guide for the AERMOD Meteorological Preprocessor (AERMET) (August 2002). The Albedo values were calculated using Table 4-1 of the User's Guide. The Bowen ratio was calculated using Table 4-2b of the User's Guide.

AERMAP

120 7.5' digital elevation models (DEMs) were obtained from Micropath Corporation (private vendor using USGS data) to run AERMAP. The DEM in the northwest corner of the modeling domain is South Bloomingville, OH (39082D5). Raven Rock, WV (39081D2) is the DEM in the northeast corner of the domain. Catlettsburg, KY (38082D5) is the DEM in the southwest corner. Bentree, WV (38082D5) is the DEM in the southeast corner of the modeling domain.

The modeling domain was developed consistent with Section 2.21 of the Revised Draft User's Guide for the AERMOD Terrain Preprocessor (AERMAP) Draft 8/14/02. It will include all terrain features that exceed 10% elevation slope from any given receptor.

Appendix A of this Class II analysis includes a table with dynamic and static stack parameters employed for each stack/vent emissions source as well as the dispersion parameters employed for the area and volume sources evaluated in the analysis. The maximum emissions rates utilized in the Class II modeling are also presented in Appendix A. The emission rates are also included in the application forms submitted in Volume I of the AMPGS PTI application.

GEP STACK HEIGHT

The GEP stack height is the optimum stack height for avoiding downwash effects when conducting Class I and Class II air quality modeling. It is also the maximum stack height that can be used when conducting Class I and Class II air quality modeling. The GEP stack heights for the AMPGS were calculated based on the requirements of OAC rule 3745-16-02 and guidance provided in the "Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)" (US EPA June 1985).

Figure 3-1 depicts the structures on the plant property that were entered into the Class II modeling for downwash calculation purposes. Table 3-2 summarizes the dimensions of each structure identified in Figure 3-1. Since all of the buildings shown in Figure 3-1 are connected, all the structures shown are considered to be "nearby" as defined in OAC rule 3745-16-01(G)(1). Since all of the buildings shown in Figure 3-1 are "nearby", the height of the tallest building (Building 7 at 270 ft) is used to calculate the GEP stack height together with the lesser of: (a) the overall width of the entire complex (502 ft); or (b) the height of the tallest building (Building 7 at 270 ft).

The GEP stack height is calculated in accordance with the equation found in OAC rule 3745-16-01(F)(2)(b) as follows:

$$\text{GEP Height} = H + 1.5 \times L$$

Hg = 270 feet (*Building 7 height*) + 1.5 x (270 feet) = 675 feet

Note: *The height of Building 7 (270 ft) is less than the entire structure width (502 feet)*

Figure 3-1
Stack and Building Profiles

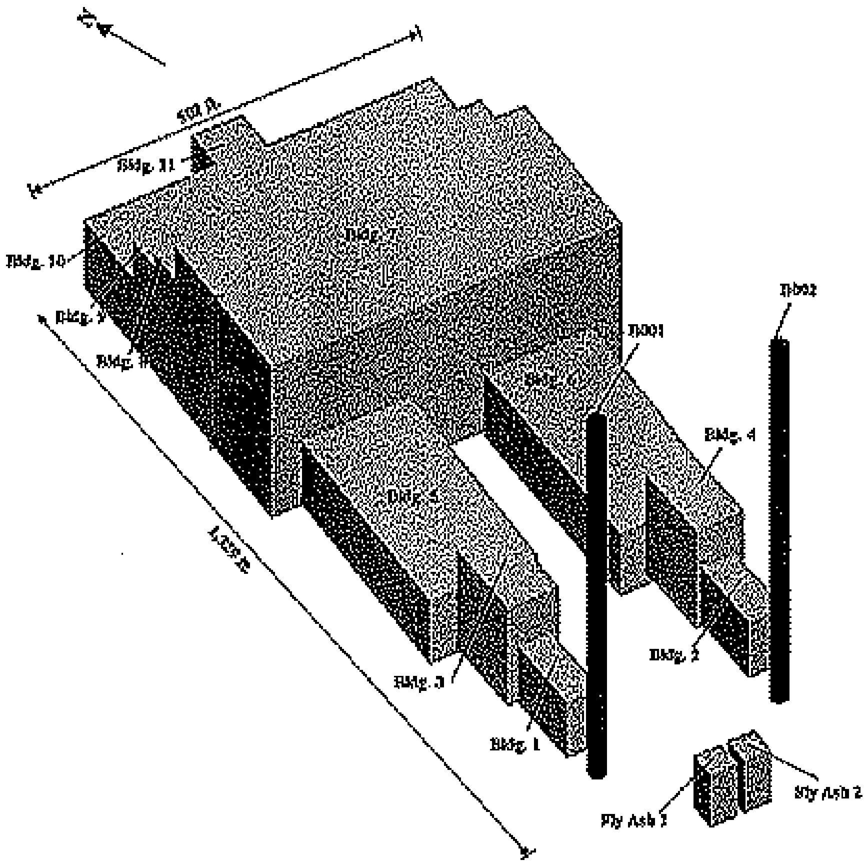


Table 3-2 BUILDING PARAMETERS			
Building	**Length (ft)**	**Width (ft)**	**Height (ft)**
1	75	50	101
2	75	50	101
3	70	70	160
4	70	70	160
5	200	160	114
6	200	160	114
7	502	160	270
8	502	120	210
9	502	64	187
10	502	120	120
11	104	71	65
Fly Ash 1	40	40	95
Fly Ash 2	40	40	95

The proposed AMPGS is classified as a major source of SO_2 emissions (estimated maximum emissions with both boilers operating at full load for 8,760 hours of 6,820 tpy). The air quality modeling analysis for SO_2 includes an assessment of the maximum predicted off-site air quality impact for an annual average, a 24-hour averaging period and a 3-hour averaging period. The air quality analysis for SO_2 includes:

1. A review of the PSD Significant Impact Increments;
2. A determination if the predicted off-site impacts exceed the PSD Monitoring De Minimis Concentration rates;
3. An assessment of Class II PSD Increment Consumption; and
4. An interactive NAAQS evaluation (the cumulative air quality impact of the proposed AMPGS with other existing SO_2 emissions sources).

MAXIMUM OFF-SITE IMPACT FROM THE AMPGS

As indicated in Table 4-1, the maximum predicted 3-hour average off-site concentration that results from the proposed maximum SO_2 emissions used in this analysis is 63.61 μg/m³. This concentration was predicted from meteorological data for July 22, 1989 (refer to Appendix C). The location of this peak 3-hour average SO_2 concentration is north of the proposed site property (refer to Figure 4-1).

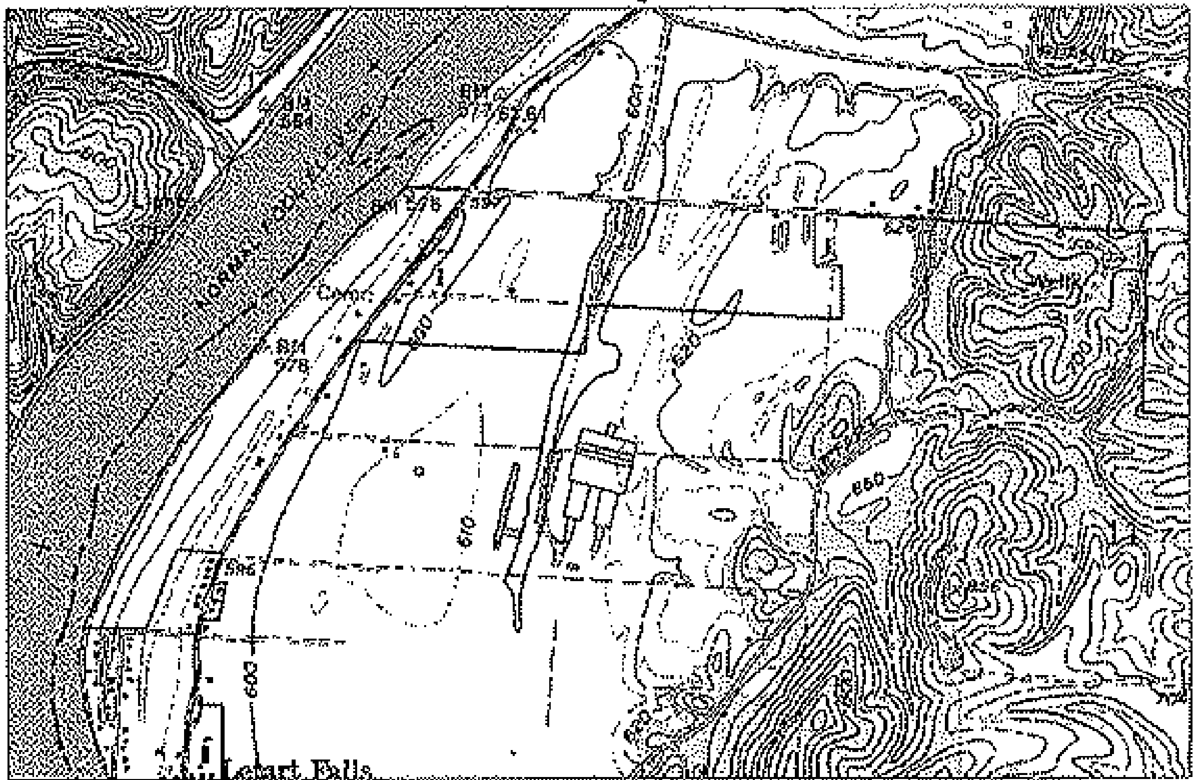
Table 4-1
AMPGS SO_2 Off-Site Impact
3-Hour Averaging Period

Year	Maximum Predicted Off-Site Impact (μg/m³)	Second High Predicted Off-Site Impact (μg/m³)	PSD Significant Impact Increment (μg/m³)	PSD Monitoring De minimis Concentration (μg/m³)	½ Class II PSD Increment (μg/m³)
1988	60.64	56.68	25	NA	256⁽¹⁾
1989	63.61	55.85			
1990	62.01	56.05			
1991	62.92	52.79			
1992	58.12	56.60			

Note:

(1) The Class II PSD Increment can not be exceeded more than once per year.

Figure 4-1
Maximum Predicted SO_2 Concentration 3-Hour Average
1989 Meteorological Data



Note: Maximum Concentration = 63.61 µg/m³ located north of the property line.

As indicated in Table 4-2, the maximum predicted 24-hour average off-site concentration that results from the proposed maximum SO_2 emissions used in this analysis is 15.79 µg/m³. This concentration was predicted from meteorological data for July 30, 1992 (refer to Appendix C). The location of this peak 24-hour average SO_2 concentration is north of the proposed site (refer to Figure 4-2).

Table 4-2
AMPGS SO_2 Off-Site Impact
24-Hour Averaging Period

Year	Maximum Predicted Off-Site Impact (µg/m³)	Second High Predicted Off-Site Impact (µg/m³)	PSD Significant Impact Increment (µg/m³)	PSD Monitoring De minimis Concentration (µg/m³)	½ Class II PSD Increment (µg/m³)
1988	14.73	11.26			
1989	13.43	11.78			
1990	15.32	11.33	5	13	45.5(1)
1991	14.62	12.38			
1992	15.79	12.36			

Note:

(1) The Class II PSD Increment can not be exceeded more than once per year.

Figure 4-2
Maximum Predicted SO2 Concentration 24-Hour Average
1992 Meteorological Data

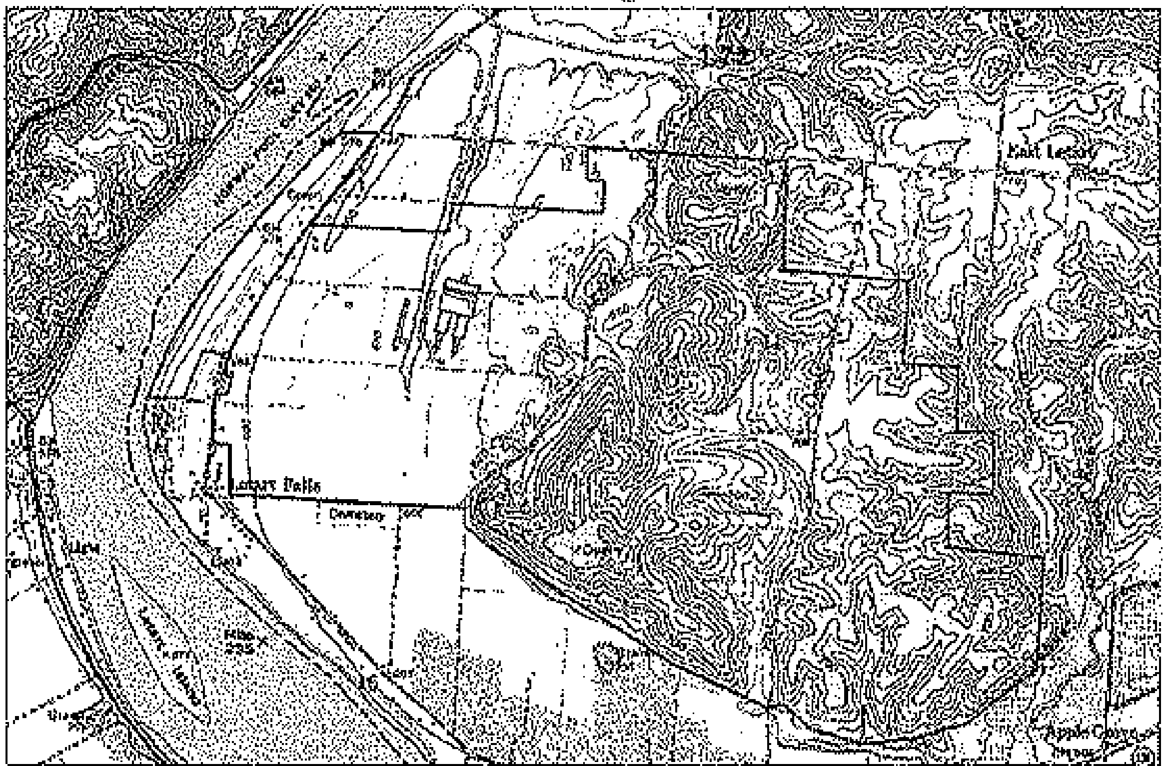
Note: Maximum Concentration = 15.79 μg/m³ located north of the property.

As indicated in Table 4-3, the maximum predicted annual average off-site concentration that results from the proposed maximum SO_2 emissions used in this analysis is 1.72 μg/m³. This concentration was predicted from meteorological data for 1990 (refer to Appendix C). The location of this peak annual average SO_2 concentration is north of the proposed site property line (refer to Figure 4-3).

Table 4-3
AMPGS SO_2 Off-Site Impact
Annual Averaging Period

Year	Maximum Predicted Off-Site Impact (μg/m³)	PSD Significant Impact Increment (μg/m³)	PSD Monitoring De Minimis Concentration (μg/m³)	½ Class II PSD Increment (μg/m³)
1988	1.53			
1989	1.39			
1990	1.72	1.0	NA	10
1991	1.49			
1992	1.53			

Figure 4-3
Maximum Predicted SO_2 Concentration Annual Average
1990 Meteorological Data



Note: Maximum Concentration = 1.72 µg/m³ located north of the property.

PSD SIGNIFICANT IMPACT INCREMENT

The PSD Significant Impact Increments for SO_2 are 25.0 µg/m³ for a 3-hour average concentration, 5.0 µg/m³ for a 24-hour average concentration, and 1.0 µg/m³ for an annual average. As indicated in Tables 4-1 through 4-3, the maximum emissions rates used in this analysis result in predicted maximum off-site air quality impact higher than the PSD Significant Impact Increments for these averaging periods. As a result, US EPA and Ohio EPA air quality modeling guidelines require that a NAAQS assessment be performed with interactive modeling (i.e., the emissions from the proposed facility must be modeled in combination with emissions from other major sources in the surrounding area).

PSD MONITORING DE MINIMIS CONCENTRATION

The PSD Monitoring De Minimis Concentration for SO_2 is 13 µg/m³ for a 24-hour average concentration. There is no PSD Monitoring De Minimis concentration for either an annual average or a 3-hour average for SO_2. As indicated in Table 4-2 for the maximum off-site 24-hour average, the maximum emissions rates used in this analysis result in predicted 24-hour average concentrations that are slightly greater than the PSD Monitoring De Minimis Concentration. There are over 35 air quality monitors operated in the state of Ohio which measure ambient SO_2 air quality. One of these monitors is located in Pomeroy (12 miles from the proposed project site). The presence of this local monitor and the fact that the predicted maximum contribution of the AMPGS is only slightly above the PSD Monitoring De Minimis Concentration supports a determination by Ohio EPA that preconstruction monitoring not be required for this project.

PSD CLASS II INCREMENT CONSUMPTION

The Class II PSD increments for SO_2 are 20 μg/m^3 for an annual average concentration, 91 μg/m^3 for a 24-hour average concentration and 512 μg/m^3 for a 3-hour average concentration. Ohio EPA guidelines limit the available increment for any new source to ½ of the PSD increment. The 24-hour and 3-hour averaging period increments can not be exceeded more than once per year. As indicated in Tables 4-1, 4-2 and 4-3, the maximum emissions rates used in this analysis will not exceed ½ the Class II PSD increments for SO_2 at any off-site location. However, since the PSD Significant Impact Increment is exceeded, US EPA and Ohio EPA air quality modeling guidelines require that a more detailed air quality assessment be performed with interactive modeling (i.e., the emissions from the proposed facility must be modeled in combination with emissions from other sources in the surrounding area).

INTERACTIVE MODELING

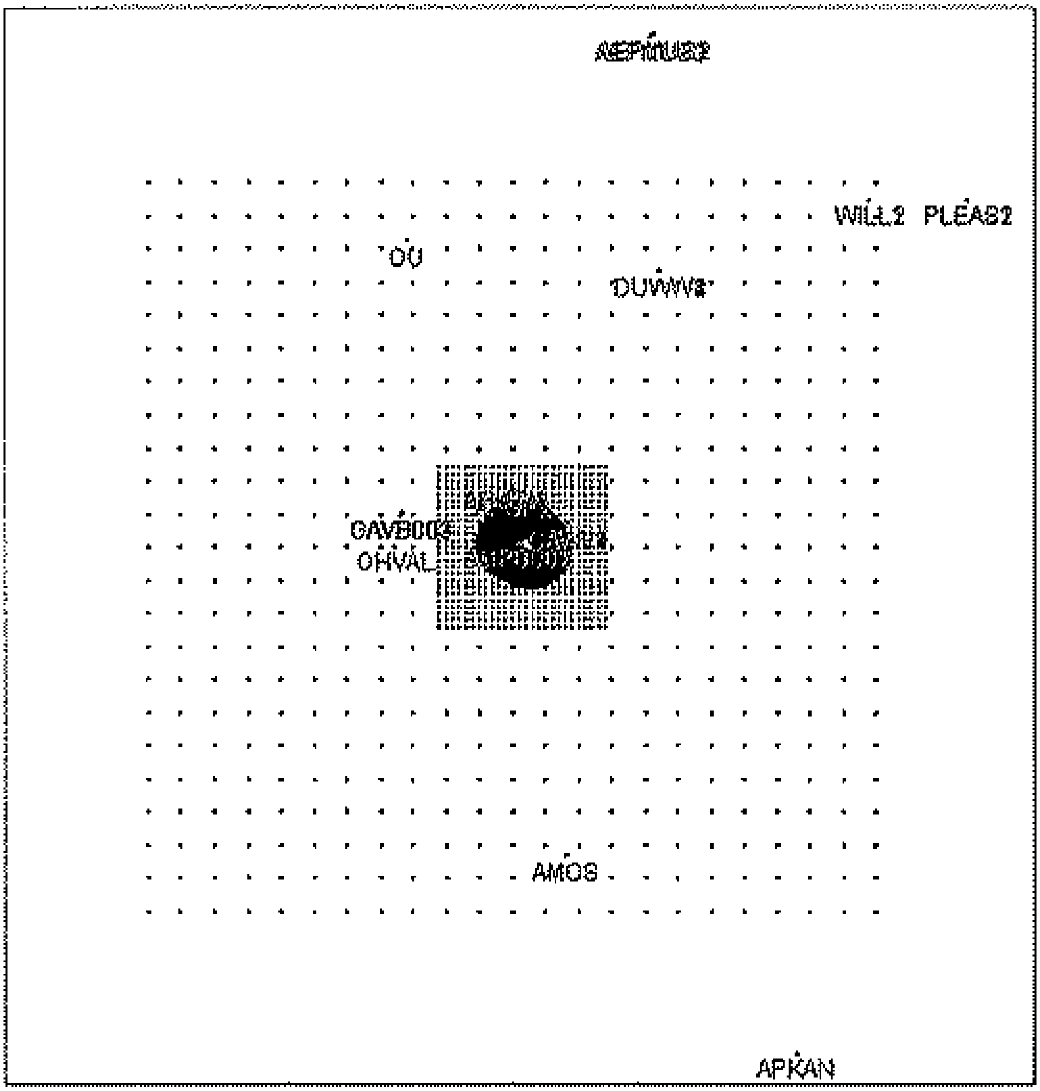
An interactive NAAQS analysis is required for SO_2 since the emissions from the proposed AMPGS are predicted to cause off-site impact greater than the PSD significant impact increment for SO_2.

Ohio EPA policy requires that the interactive SO_2 NAAQS analysis include the emissions units at the AMPGS project and all other sources that pass the "20D analysis" within the counties bordering the county where the source is located (i.e., Meigs, Athens, Gallia and Vinton Counties). The "20D analysis" is defined as any source with emission greater than 20 times the distance from the proposed AMP-Ohio project. In addition, Ohio EPA requested that the Muskingum River Power Plant in Washington County be included. Refer to Appendix A for a summary table of the Ohio sources included in the SO_2 interactive NAAQS analysis.

West Virginia DEQ policy requires that the interactive SO_2 NAAQS analysis include the emissions units at the AMPGS project and other "large" sources within a 100 km radius of the proposed project. West Virginia DEQ provided an inventory of 530 sources located within a 100 km radius of the AMPGS. That source inventory provided actual SO_2 emissions, but not allowable emissions. Allowable SO_2 emission rates were obtained from Title V permits available on West Virginia DEQ's website for each source with actual emissions greater than 10 tons/yr. Sources with actual emissions less than 10 tons/yr were excluded from the interactive NAAQS analysis. The West Virginia source inventory was further reduced by excluding sources that were deemed to be too far away and/or have allowable emissions that were too low to have a significant impact on the interactive SO_2 NAAQS analysis. Refer to Appendix A for a table of the West Virginia sources included in the SO_2 interactive NAAQS analysis.

Prior to the completion of the interactive modeling, Ohio EPA and West Virginia DEQ were provided the proposed source inventories for review and comment. Figure 4-4 shows the receptor grid with the locations of the interactive sources included in the model.

Figure 4-4
Receptor Grid with Interactive SO_2 Sources



MAXIMUM CONCENTRATIONS FROM INTERACTIVE SO_2 MODELING

As indicated in Table 4-4, the maximum predicted 3-hour average off-site concentration that results from the SO_2 emission sources modeled in this interactive analysis is 4,860.96 $\mu g/m^3$. This concentration was predicted from meteorological data for August 28, 1991 (refer to Appendix C). The location of this peak 3-hour average SO_2 concentration is northeast of the proposed AMPGS site. The results of this modeling analysis show multiple exceedances of the SO_2 NAAQS for the 3-hour averaging period. However, the AMPGS does not have a significant contribution to any of the NAAQS exceedances (i.e., the predicted impact from the AMPGS does not exceed the PSD Significant Impact Increment at the receptors during the time the NAAQS exceedances occurred). A list of the 3-hr NAAQS exceedances is located in Appendix C.

Table 4-4 Interactive SO_2 Off-Site Impact 3-Hour Averaging Period			
Year	Maximum Predicted Off-Site Impact (μg/m³)	Second High Predicted Off-Site Impact (μg/m³)	NAAQS[1] (μg/m³)
1988	3,848	1,610	1,300
1989	4,021	3,961	
1990	4,148	3,881	
1991	4,861	4,540	
1992	4,197	3,381	

Note:
(1) The 3-Hour NAAQS concentration cannot be exceeded more than once per year.

As indicated in Table 4-5, the maximum predicted 24-hour average off-site concentration that results from the SO_2 emission sources modeled in this interactive analysis is 1,243 μg/m³. This concentration was predicted from meteorological data for August 28, 1991 (refer to Appendix C). The location of this peak 24-hour average SO_2 concentration is northeast of the proposed AMPGS site. The results of this modeling analysis show multiple exceedances of the SO_2 NAAQS for the 24-hour averaging period. However, the AMPGS does not have a significant contribution to any of the NAAQS exceedances (i.e., AMPGS does not exceed the PSD Significant Impact Increment at the receptors during the time the NAAQS exceedances occurred). A list of the 24-hr NAAQS exceedances is located in Appendix C.

Table 4-5 Interactive SO_2 Off-Site Impact 24-Hour Averaging Period			
Year	Maximum Predicted Off-Site Impact (μg/m³)	Second High Predicted Off-Site Impact (μg/m³)	NAAQS[1] (μg/m³)
1988	741	449	365
1989	1,039	789	
1990	823	593	
1991	1,243	782	
1992	656	632	

Note:
(1) The 24-Hour NAAQS concentration cannot be exceeded more than once per year.

As indicated in Table 4-6, the maximum predicted annual average off-site concentration that results from the SO_2 emission sources modeled in this interactive analysis is 151 μg/m³ (refer to Appendix C). The location of this peak annual average SO_2 concentration is northeast of the proposed AMPGS site. The results of this modeling analysis show multiple exceedances of the SO_2 NAAQS for the annual averaging period. However, the AMPGS does not have a significant contribution to any of the NAAQS exceedances (i.e., AMPGS does not exceed the PSD Significant Impact Increment at the receptors during the time the NAAQS exceedances occurred).

Table 4-6
Interactive SO_2 Off-Site Impact
Annual Averaging Period

Year	Maximum Predicted Off-Site Impact ($\mu g/m^3$)	NAAQS[3] ($\mu g/m^3$)
1988	116	80
1989	127	
1990	125	
1991	151	
1992	124	

The proposed AMPGS is classified as a major source of NO_x emissions (estimated maximum emissions with both boilers operating at full load for 8,760 hours of 3,184 tpy). Note: This analysis assumes that 100% of the NO_x emissions are nitrogen dioxide (NO_2). This is a conservative assumption that over-predicts the actual off-site air quality impact from the proposed facility. The actual NO_2 fraction is likely to be no more than 75% of the total NO_x. The air quality modeling analysis for NO_2/NO_x includes an assessment of the maximum predicted off-site air quality impact for an annual average period. The air quality analysis for NO_2/NO_x includes:

1. A review of the PSD Significant Impact Increments;

2. A determination if the predicted off-site impacts exceed the PSD Monitoring De Minimis Concentration rates; and

3. An assessment of Class II PSD Increment Consumption.

MAXIMUM OFF-SITE IMPACT FROM THE AMPGS

As indicated in Table 5-1, the maximum predicted annual average off-site concentration that results from the proposed maximum NO_x emissions used in this analysis is 0.99 $\mu g/m^3$. This concentration was predicted from meteorological data for 1990 (refer to Appendix D). The location of this peak annual average NO_x concentration is north of property (refer to Figure 5-1).

Table 5-1
AMPGS NO_x Off-Site Impact
Annual Averaging Period

Year	Maximum Predicted Off-Site Impact ($\mu g/m^3$)	PSD Significant Impact Increment ($\mu g/m^3$)	PSD Monitoring De Minimis Concentration ($\mu g/m^3$)	½ Class II PSD Increment ($\mu g/m^3$)
1988	0.90	1.0	14.0	12.5
1989	0.80			
1990	0.99			
1991	0.85			
1992	0.87			

Figure 5-1
Maximum Predicted NO_x Concentration Annual Average
1990 Meteorological Data

Note: Maximum Concentration = 0.99 μg/m³ located north of the property

PSD SIGNIFICANT IMPACT INCREMENT

The PSD Significant Impact Increment for NO_2 is 1.0 μg/m³ for an annual average concentration. As indicated in Table 5-1, the maximum emissions rates used in this analysis will not cause an exceedance of the PSD Significant Impact Increments for NO_2. Therefore, a NAAQS assessment with interactive modeling (i.e., modeling the emissions from the proposed facility in combination with emissions from other major sources in the surrounding area) is not required.

PSD MONITORING DE MINIMIS CONCENTRATION

The PSD Monitoring De Minimis Concentration for NO_2 is 14.0 μg/m³ for an annual average concentration. As indicated in Table 5-1, the maximum emissions rates used in this analysis will not cause an exceedance of the PSD Monitoring De Minimis Concentration for NO_2 at any off-site location. As a result, pre-construction air quality monitoring is not required to establish the existing baseline NO_2 concentration.

PSD CLASS II INCREMENT CONSUMPTION

The Class II PSD increment for NO_2 is 25.0 $\mu g/m^3$ for an annual average concentration. Ohio EPA allows a source to use ½ of the PSD increment. As indicated in Table 5-1, the maximum emissions rates used in this analysis will not cause an exceedance of the allowable Class II PSD increment for NO_2 at any off-site location.

The proposed AMPGS is classified as a major source of PM_{10} emissions (estimated maximum emissions with both boilers operating at full load for 8,760 hours of 1,132 tpy). The air quality modeling analysis for PM_{10} includes an assessment of the maximum predicted off-site air quality impact for an annual averaging period and a 24-hour averaging period. The air quality analysis for PM_{10} includes:

1. A review of the PSD Significant Impact Increments;
2. A determination if the predicted off-site impacts exceed the PSD Monitoring De Minimis Concentration rates; and
3. An assessment of Class II PSD Increment Consumption.

MAXIMUM OFF-SITE IMPACT FROM AMPGS

As indicated in Table 6-1, the maximum predicted 24-hour average off-site concentration that results from the proposed maximum PM_{10} emissions used in this analysis is 3.46 μg/m^3. This concentration was predicted from meteorological data for May 10, 1991 (refer to Appendix E). The location of this peak 24-hour average PM_{10} concentration is on Route 124 (refer to Figure 6-1).

Table 6-1
AMPGS PM_{10} Off-Site Impact
24-Hour Averaging Period

Meteorological Data	Maximum Predicted Off-Site Impact (μg/m^3)	Second High Predicted Off-Site Impact (μg/m^3)	PSD Significant Impact Increment (μg/m^3)	PSD Monitoring De minimis Concentration (μg/m^3)	½ Class II PSD Increment (μg/m^3)
1988	2.77	2.38	5	10	15[1]
1989	3.04	2.62			
1990	3.27	2.93			
1991	3.46	2.43			
1992	2.57	2.27			

Note:
[1] The Class II PSD Increment can not be exceeded more than once per year.

Figure 6-1
Maximum Predicted PM_{10} Concentration 24-Hour Average
1991 Meteorological Data

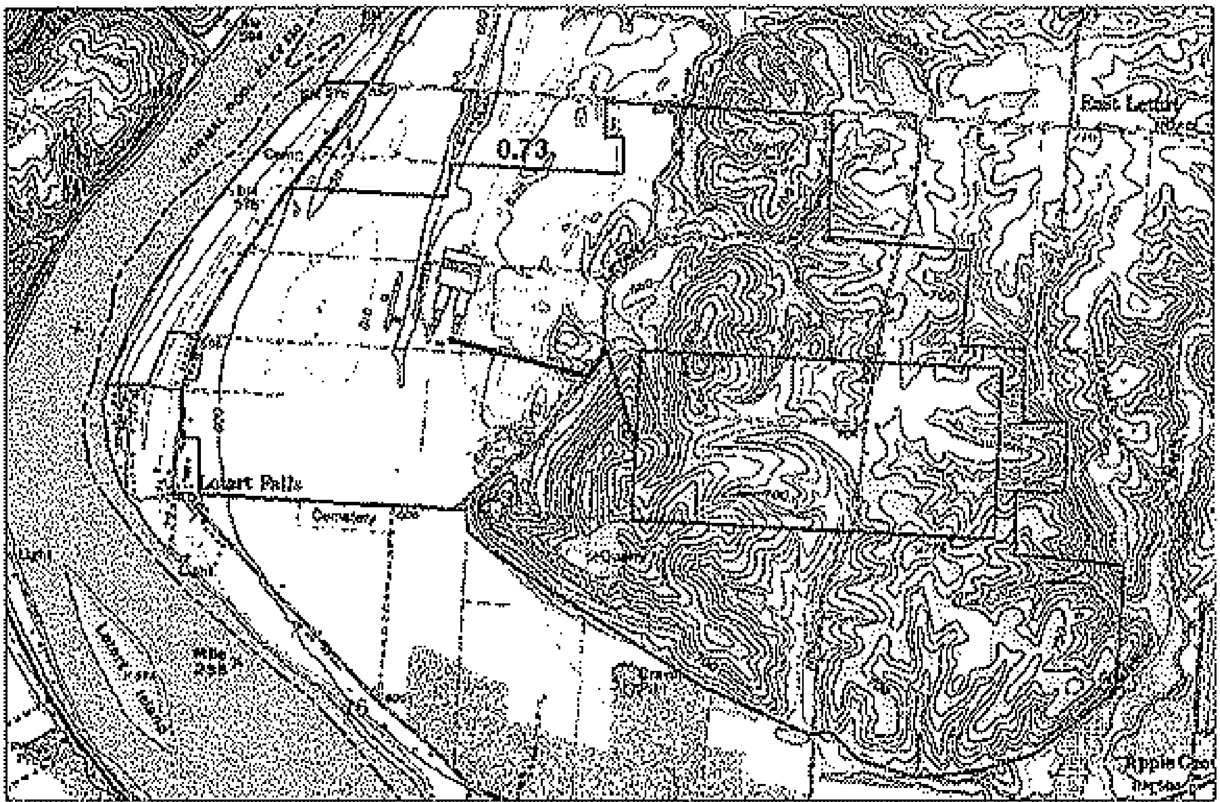
Note: Maximum Concentration = 3.46 µg/m³ located on Route 124.

As indicated in Table 6-2, the maximum predicted annual average off-site concentration that results from the proposed maximum PM_{10} emissions used in this analysis is 0.73 $\mu g/m^3$. This concentration was predicted from meteorological data for 1990 (refer to Appendix E). The location of this peak annual average PM_{10} concentration is north of the proposed project site (refer to Figure 6-2).

Table 6-2
AMPGS PM_{10} Off-Site Impact
Annual Averaging Period

Meteorological Data	Maximum Predicted Off-Site Impact ($\mu g/m^3$)	PSD Significant Impact Increment ($\mu g/m^3$)	PSD Monitoring De Minimis Concentration ($\mu g/m^3$)	½ Class II PSD Increment ($\mu g/m^3$)
1988	0.60	1.0	NA	8.5
1989	0.64			
1990	0.73			
1991	0.66			
1992	0.58			

Figure 6-2
Maximum Predicted PM_{10} Concentration Annual Average
1990 Meteorological Data



Note: Maximum Concentration = 0.73 μg/m³ located north of the property.

PSD SIGNIFICANT IMPACT INCREMENT

The PSD Significant Impact Increments for PM_{10} are 1.0 μg/m³ for an annual average concentration and 5.0 μg/m³ for a 24-hour average concentration. As indicated in Tables 6-1 and 6-2 the maximum emissions from AMPGS will not cause an exceedance of the PSD Significant Impact Increment. As a result, US EPA and Ohio EPA air quality modeling guidelines do not require that a NAAQS assessment be performed with interactive modeling (i.e., modeling the emissions from the proposed facility in combination with emissions from other major sources in the surrounding area).

PSD MONITORING DE MINIMIS CONCENTRATION

The PSD Monitoring De Minimis Concentration for PM_{10} is 10.0 μg/m³ for a 24-hour average concentration. As indicated in Table 6-1, the maximum emissions rates used in this analysis will not cause an exceedance of the PSD Monitoring De Minimis Concentration for PM_{10} at any off-site location. As a result, pre-construction air quality monitoring is not required to establish the existing baseline PM_{10} concentration.

CLASS II PSD INCREMENT

The Class II PSD increments for PM_{10} are 17.0 $\mu g/m^3$ for an annual average concentration and 30.0 $\mu g/m^3$ for a 24-hour average concentration. Ohio EPA guidelines limit the available increment for any new source to ½ of the PSD increment. As indicated in Tables 6-1 and 6-2 the maximum emissions rates used in this analysis will not cause an exceedance of the Class II PSD increments for PM_{10} at any off-site location.

The proposed AMPGS is classified as a major source of CO emissions (estimated maximum emissions with both boilers operating at full load for 8,760 hours of 7,502 tpy). The air quality modeling analysis for CO includes an assessment of the maximum predicted off-site air quality impact for an 8-hour averaging period and a 1-hour averaging period. The air quality analysis for CO includes:

1. A review of the PSD Significant Impact Increments;
2. A determination if the predicted off-site impacts exceed the PSD Monitoring De Minimis Concentration rates; and
3. An assessment of Class II PSD Increment Consumption.

MAXIMUM OFF-SITE IMPACT FROM AMPGS

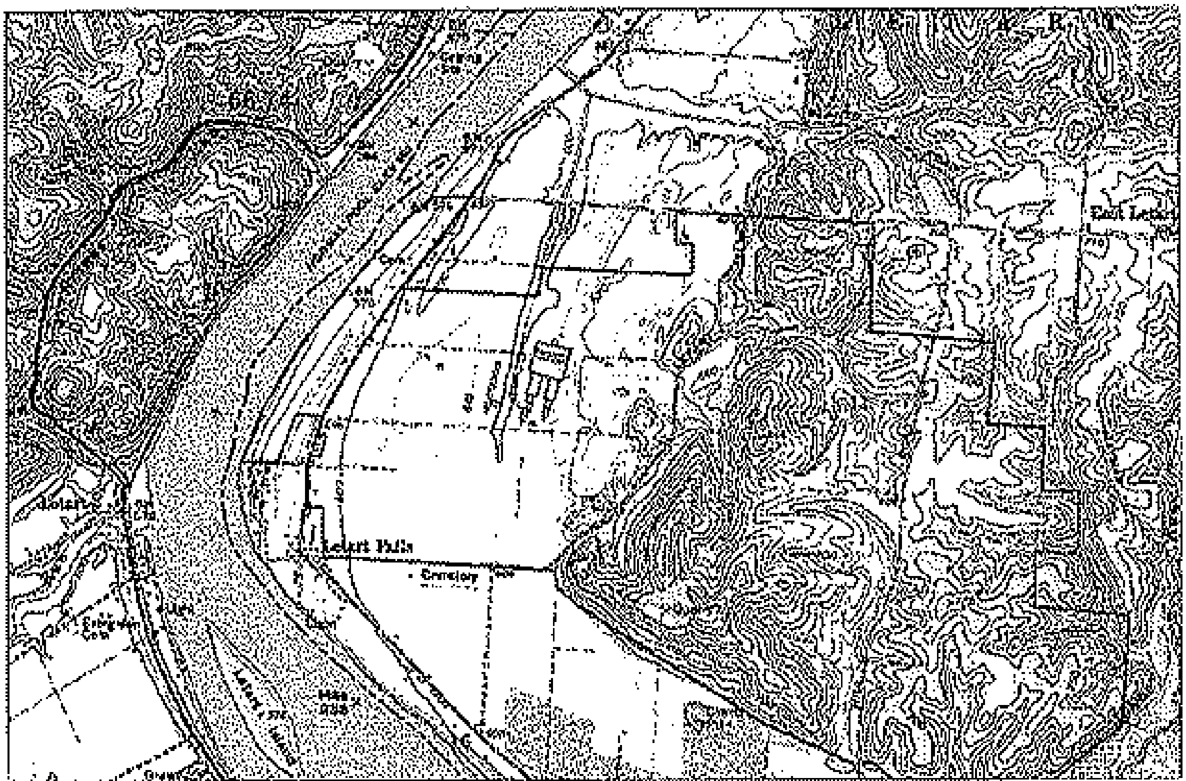
As indicated in Table 7-1, the maximum predicted 1-hour average off-site concentration is 66.74 μg/m^3. This concentration was predicted from meteorological data for October 27, 1992 (refer to Appendix F). The location of this peak 1-hour average CO concentration is located northwest of the property (refer to Figure 7-1).

Table 7-1
AMPGS CO Off-Site Impact
1-Hour Averaging Period

Meteorological Data	Maximum Predicted Off-Site Impact (μg/m^3)	Second High Predicted Off-Site Impact (μg/m^3)	PSD Significant Impact Increment (μg/m^3)	PSD Monitoring De minimis Concentration (μg/m^3)	¼ NAAQS (μg/m^3)
1988	50.10	46.99	2,000	NA	10,000[1]
1989	57.04	46.90			
1990	54.64	47.30			
1991	57.27	48.59			
1992	66.74	45.44			

Note:
[1] The Class II PSD Increment can not be exceeded more than once per year.

Figure 7-1
Maximum Predicted CO Concentration 1-Hour Average
1992 Meteorological Data



Note: Maximum Concentration = 66.74 µg/m^3 located northwest of the property.

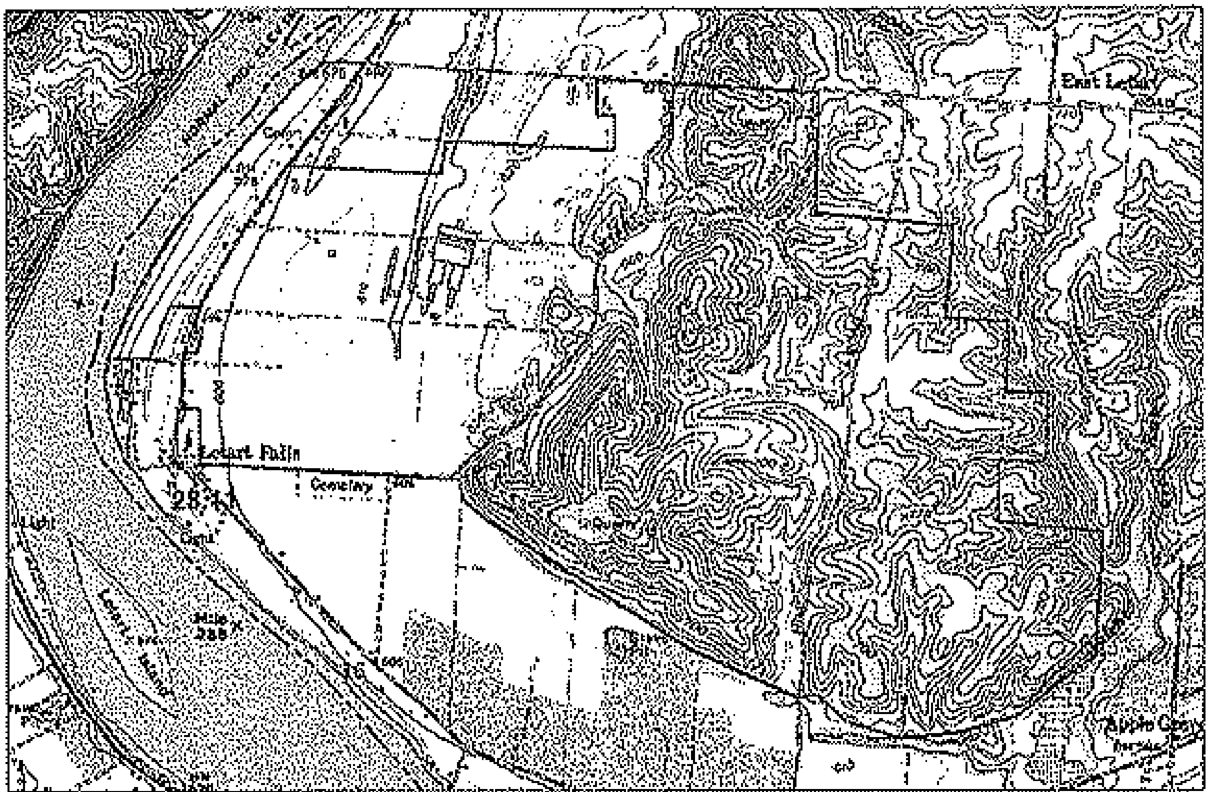
As indicated in Table 7-2, the maximum predicted 8-hour average off-site concentration is 28.11 µg/m^3. This concentration was predicted from meteorological data for June 24, 1988 (refer to Appendix F). The location of this peak 8-hour average CO concentration is located southwest of the proposed project site (refer to Figure 7-2).

Table 7-2
AMPGS CO Off-Site Impact
8-Hour Averaging Period

Meteorological Data	Maximum Predicted Off-Site Impact (µg/m^3)	Second High Predicted Off-Site Impact (µg/m^3)	PSD Significant Impact Increment (µg/m^3)	PSD Monitoring De minimis Concentration (µg/m^3)	¼ NAAQS (µg/m^3)
1988	28.11	22.03			
1989	27.97	23.16			
1990	26.72	23.02	500	575	2,500[1]
1991	26.15	23.67			
1992	27.33	23.42			

Note:
[1] The Class II PSD Increment can not be exceeded more than once per year.

Figure 7-2
Maximum Predicted CO Concentration 8-Hour Average
1988 Meteorological Data



Note: Maximum Concentration = 28.11 μg/m³ located southwest of the property.

PSD SIGNIFICANT IMPACT INCREMENT

The PSD Significant Impact Increments for CO are 2,000 μg/m³ for a 1-hour average concentration and 500 μg/m³ for an 8-hour average concentration. As indicated in Tables 7-1 and 7-2 the maximum emissions rates used in this analysis will not cause an exceedance of the PSD Significant Impact Increments for CO at any off-site location. As a result, US EPA and Ohio EPA air quality modeling guidelines do not require that a NAAQS assessment be performed with interactive modeling (i.e., modeling the emissions from the proposed facility in combination with emissions from other major sources in the surrounding area).

PSD MONITORING DE MINIMIS CONCENTRATION

The PSD Monitoring De Minimis Concentration for CO is 575 μg/m³ for an 8-hour average concentration. There is no PSD Monitoring De Minimis concentration for a 1-hour average for CO. As indicated in Table 7-2 for the maximum off-site 8-hour average, the maximum emissions rates used in this analysis will not cause an exceedance of the PSD Monitoring De Minimis Concentration for CO at any off-site location. As a result, pre-construction air quality monitoring is not required to establish the existing baseline CO concentration.

PSD CLASS II INCREMENT

There are no Class II PSD Increments for CO. In instances where there is no PSD increment, Ohio EPA Engineering Guide #69 requires a demonstration that the maximum off-site concentration will not exceed ¼ of the NAAQS. These concentrations can not be exceeded more than once per year. As indicated in Table 7-1 for the maximum off-site 1-hour average, and Table 7-2 for the maximum off-site 8-hour average, the maximum emissions rates used in this analysis will not cause an off-site CO concentration that exceeds ¼ of the NAAQS.

The proposed AMPGS will have total annual emissions greater than 1 ton per year for several air contaminants for which the American Conference of Intergovernmental Industrial Hygienists (ACGIH) has adopted Threshold Limit Values (TLVs). As a result, an air quality impact analysis must be performed pursuant to the Ohio EPA Air Toxic Policy (ATP).

OHIO EPA AIR TOXIC POLICY

The ATP uses the TLVs adopted by the ACGIH as the basis for developing a Maximum Acceptable Ground Level Concentration (MAGLC). Ohio EPA's ATP calculates the MAGLC by adjusting the 8-hour TLV adopted by the ACGIH to identify a 1-hour average concentration in the ambient air that Ohio EPA believes will not cause an adverse health effect to even the most sensitive individual.

The adjustments to define the MAGLC for continuous emissions of an air toxic include: (a) dividing the TLV for the air toxic by ten (the factor that Ohio EPA elected to use to adjust the TLV for workplace exposures to ambient air exposures for the general public); and (b) multiplying the adjusted TLV by the ratio of the 40 hour work week to the 168 hour calendar week (*i.e.*, 40/168). The combination of these two adjustments is to divide the TLV by a factor of 42 to derive the MAGLC. [Note: Ohio EPA states in the explanation of Option A of the ATP that the evaluation of the MAGLC as a maximum 1-hour average concentration results in an additional safety factor of 32% because the MAGLC is derived from an 8-hour average TLV.]

ANALYSIS FOR THE AMPGS

AERMOD modeling was performed using an assumed 1.0 gram per second (g/sec) emission rate for each of the main boilers (B001 and B002) to predict the maximum of-site 1-hour average air quality impact. This assumed emission rate resulted in a maximum 1-hour concentration (during the five-year period 1988 - 1992) of 0.65 micrograms per cubic meter ($\mu g/m^3$). Since the predicted ground level concentration is directly proportional to the emission rate, the actual g/sec emission rate for each air toxic can be multiplied by 0.65 to calculate the maximum predicted 1-hour average concentration. The predicted maximum 1-hour average concentration is then compared to the MAGLC.

Table 8-1 summarizes the ATP evaluation for the proposed AMPGS. As presented in Table 8-1, the predicted maximum 1-hour average concentration for each air toxic potentially emitted by the AMPGS is substantially less than the MAGLC. The conclusion of this analysis is that the maximum estimated air toxic emissions from the AMPGS will not have any adverse impact on local air quality.

Table 8-1
Maximum Acceptable Ground Level Concentration (MAGLC)
Assessment Pursuant to the Ohio EPA Air Toxics Policy

The maximum predicted off-site impact with each boiler (B001 and B002) at @ 1.0 g/sec = 0.650 ug/m^3

Air Toxic	CAS Number	Molecular Weight	ACGIH TLV		MAGLC TLV/42	Proposed Emission Rate Per Boiler		Maximum Predicted Impact	Is the MAGLC Exceeded?
			(ppm)	(ug/m^3)	(ug/m^3)	(lb/hr)	(g/sec)	(ug/m^3)	(Y/N)
Acetaldehyde[1]	75-07-0	44.05	18.425	33,127	788.7	0.18	0.023	0.015	N
Ammonia (NH_3)	7664-41-7	17.03	25	17,378	413.8	5.10	0.643	0.418	N
Benzene	71-43-2	78.11	0.5	1,594	38.0	0.41	0.052	0.034	N
Benzyl Chloride	100-44-7	126.58	1	5,167	123.0	0.22	0.028	0.018	N
Hydrogen Chloride (HCl)[1]	7647-01-0	36.47	1.474	2,194	52.2	41.20	5.191	3.374	N
Hydrogen Cyanide	74-90-8	27.03	3.4639	3,822	91.0	0.79	0.100	0.065	N
Hydrogen Fluoride (HF)[1]	7664-39-3	20.01	2.211	1,806	43.0	5.30	0.668	0.434	N
Isophorone[1]	67-63-0	138.21	3.685	20,788	495.0	0.18	0.023	0.015	N
Methyl Ethyl Ketone	78-93-3	72.1	200	588,571	14,013.6	0.12	0.015	0.010	N
Methyl Chloride	74-87-3	50.49	50	103,041	2,453.4	0.17	0.021	0.014	N
Mercury (Hg)[2]	7439-97-6	200.59	0.025	205	4.9	0.02	0.003	0.002	N
Nitrous Oxide (N_2O)	10024-97-2	44.02	50	89,837	2,139.0	26.00	3.276	2.129	N
Propionaldehyde	123-38-6	58.1	20	47,429	1,129.3	0.12	0.015	0.010	N
Sulfuric Acid (H_2SO_4)	7664-93-9	98.08	0.05	200	4.8	38.90	4.901	3.186	N

Notes:

(1) The published threshold is a ceiling value. The ACGIH ceiling value is multiplied by 0.737 to calculate the equivalent 8-hour TLV.

(2) The maximum annual emissions of mercury will be significantly less than 1.0 tpy. Nonetheless, the AMPGS has included Hg in this analysis.

The "worst case" possible air quality impact is typically based on the maximum operating rate associated with the emissions unit being evaluated. There are some circumstances, however, where conditions at less than the maximum rates could produce greater predicted air quality impact than is predicted at the maximum operating conditions. For that reason, Ohio EPA requested that the modeling protocol for the AMPGS include an alternative load analysis to determine if the "worst case" conditions for air quality impact from the AMPGS were based on the maximum operating rates.

The objective of the alternative load analysis is to identify the combination of operating scenarios for the two main boilers at the AMPGS (B001 and B002) that will result in the "worst case" predicted off-site impact. The following alternative boiler operating scenarios were evaluated for each short-term NAAQS to predict the off-site impact and identify the "worst case" operating scenario for the Class II air quality impact analysis:

- Both B001 and B002 operating at 100% load, 75% load and 50% load; and
- B001 or B002 operating at 100% load, 75% load and 50% load.

The load scenario of each boiler operating at a 50% load for the entire year is economically infeasible. As a result, the annual analysis excludes that scenario and the following alternative boiler operating scenarios were evaluated for each annual average NAAQS:

- Both B001 and B002 operating at 100% load and 75% load; and
- B001 or B002 operating at 100% load and 75% load.

The stack parameters for the alternative loads for B001 and B002 are presented in Table 9-1.

Table 9-1
B001 and B002 Stack Parameters
(Values for Each Stack)

Parameter	100% Load	75% Load	50% Load	Notes
Stack Height (ft)	625	625	625	GEP Stack Height
Stack Diameter (ft)	24.76	24.76	24.76	NA
Flow Rate (ACFM)	1,528,423	1,084,820	762,132	Minimum flow rate, which will cause highest off-site impact
Velocity (fps)	52.9	37.5	26.4	Minimum flow rate, which will result in lowest velocity
Stack Temperature (F)	135	135	135	NA
SO_2 (lb/hr) 3-Hr	1,246	935	623	Maximum 3-hour average emissions rate
SO_2 (lb/hr) 24-Hr	955	716	478	Maximum 24-hour average emissions rate
SO_2 (lb/hr) Annual	779	584	390	Maximum annual average emissions rate
NO_x (lb/hr) Annual	363	272	182	Maximum hourly emissions rate
PM_{10} (lb/hr)	129	97	65	Maximum hourly emissions rate
CO (lb/hr) 1-Hr	799	567	399	Maximum hourly emissions rate

SULFUR DIOXIDE

The results of the alternative load analysis for impact on the SO_2 NAAQS are presented in Table 9-2, Table 9-3 and Table 9-4. Operating both boilers at 100% load results in the maximum predicted off-site impact for the 3-hour, 24-hour and annual NAAQS averaging periods for each year during the five-year period.

Table 9-2
Predicted Off Site SO_2 Impact for Alternative Operating Scenarios for B001 and B002
3-hour Averaging Period
µg/m³ (High Value for Each Year in Bold Font)

Year	B001 and B002 100%	B001 and B002 75%	B001 and B002 50%	B001 100%	B001 75%	B001 50%	B002 100%	B002 75%	B002 50%
1988	**60.63**	53.17	41.94	30.82	26.77	21.19	30.71	26.73	21.12
1989	**63.61**	56.19	43.51	32.09	28.40	22.09	31.87	28.31	21.98
1990	**62.00**	53.66	42.18	31.35	27.24	21.29	30.65	26.69	21.20
1991	**62.91**	55.62	44.39	31.61	27.87	22.18	31.37	27.75	22.21
1992	**58.11**	51.44	40.91	29.41	26.05	20.64	29.68	26.22	20.73

Table 9-3
Predicted Off Site SO_2 Impact for Alternative Operating Scenarios for B001 and B002
24-hour Averaging Period
µg/m³ (High Value for Each Year in Bold Font)

Year	B001 and B002 100%	B001 and B002 75%	B001 and B002 50%	B001 100%	B001 75%	B001 50%	B002 100%	B002 75%	B002 50%
1988	**14.73**	13.40	11.01	7.37	6.78	5.54	7.40	6.74	5.52
1989	**13.43**	12.41	10.08	6.75	6.22	5.05	6.81	6.26	5.05
1990	**15.31**	13.63	10.84	7.70	6.84	5.46	7.71	6.84	5.41
1991	**14.62**	12.52	9.42	7.23	6.18	4.87	7.44	6.41	4.85
1992	**15.79**	14.27	11.22	7.96	7.14	5.64	7.83	7.13	5.62

Table 9-4
Predicted Off Site SO_2 Impact for Alternative Operating Scenarios for B001 and B002
Annual Averaging Period
µg/m³ (High Value for Each Year in Bold Font)

Year	B001 and B002 100%	B001 and B002 75%	B001 100%	B001 75%	B002 100%	B002 75%
1988	**1.53**	1.46	0.79	0.77	0.74	0.69
1989	**1.39**	1.31	0.71	0.68	0.69	0.64
1990	**1.72**	1.61	0.88	0.84	0.84	0.77
1991	**1.49**	1.37	0.75	0.70	0.74	0.68
1992	**1.53**	1.42	0.79	0.75	0.75	0.68

NITROGEN OXIDES

The results of the alternative load analysis for impact on the annual NO_2 NAAQS are presented in Table 9-5. The maximum predicted concentration occurs when both boilers are operating at 100% load.

Table 9-5
Predicted Off Site NO_x Impact for Alternative Operating Scenarios for B001 and B002
Annual Averaging Period
$\mu g/m^3$ (High Value for Each Year in Bold Font)

Year	B001 and B002 100%	B001 and B002 75%	B001 100%	B001 75%	B002 100%	B002 75%
1988	**0.71**	0.68	0.37	0.36	0.35	0.32
1989	**0.65**	0.61	0.33	0.32	0.32	0.30
1990	**0.80**	0.75	0.41	0.39	0.39	0.36
1991	**0.69**	0.64	0.35	0.33	0.35	0.32
1992	**0.71**	0.66	0.37	0.35	0.35	0.32

PARTICULATE MATTER

The results of the alternative load analysis for impact on the PM_{10} NAAQS are presented in Table 9-6 and Table 9-7. Operating both boilers at 100% load results in the maximum predicted off-site impact for the 24-hour and annual NAAQS averaging periods.

Table 9-6
Predicted Off Site PM_{10} Impact for Alternative Operating Scenarios for B001 and B002
24-hour Averaging Period
$\mu g/m^3$ (High Value for Each Year in Bold Font)

Year	B001 and B002 100%	B001 and B002 75%	B001 and B002 50%	B001 100%	B001 75%	B001 50%	B002 100%	B002 75%	B002 50%
1988	**1.99**	1.82	1.50	0.99	0.92	0.75	1.00	0.91	0.75
1989	**1.81**	1.68	1.37	0.91	0.84	0.69	0.92	0.85	0.68
1990	**2.07**	1.85	1.47	1.04	0.93	0.74	1.04	0.93	0.74
1991	**1.98**	1.70	1.28	0.98	0.84	0.66	1.00	0.87	0.66
1992	**2.13**	1.93	1.53	1.07	0.97	0.77	1.06	0.97	0.76

Table 9-7 Predicted Off Site PM_{10} Impact for Alternative Operating Scenarios for B001 and B002 Annual Averaging Period $\mu g/m^3$ (High Value for Each Year in Bold Font)						
	B001 and B002		B001	B001	B002	B002
Year	100%	75%	100%	75%	100%	75%
1988	**0.25**	0.24	0.13	0.13	0.12	0.11
1989	**0.23**	0.21	0.12	0.11	0.11	0.11
1990	**0.28**	0.27	0.14	0.14	0.14	0.14
1991	**0.25**	0.23	0.12	0.12	0.12	0.11
1992	**0.25**	0.23	0.13	0.12	0.12	0.11

CARBON MONOXIDE

The results of the alternative load analysis for impact on the CO NAAQS are presented in Table 9-8, and Table 9-9. Operating both boilers at 100% load results in the maximum predicted off-site impact for the 1-hour and 8-hour NAAQS averaging periods.

Table 9-8 Predicted Off Site CO Impact for Alternative Operating Scenarios for B001 and B002 1-hour Averaging Period $\mu g/m^3$ (High Value for Each Year in Bold Font)									
	B001 and B002			B001	B001	B001	B002	B002	B002
Year	100%	75%	50%	100%	75%	50%	100%	75%	50%
1988	**47.92**	40.05	33.27	24.24	20.14	16.57	24.00	20.25	16.76
1989	**56.15**	42.43	32.90	28.13	21.26	16.50	28.02	21.17	16.50
1990	**53.70**	43.78	34.81	26.85	21.89	17.36	26.86	21.90	16.17
1991	**56.35**	45.62	36.17	28.19	22.80	18.13	28.21	22.85	18.07
1992	**65.54**	51.47	40.54	32.78	25.82	20.37	32.75	25.74	20.26

Table 9-9 Predicted Off Site CO Impact for Alternative Operating Scenarios for B001 and B002 8-hour Averaging Period $\mu g/m^3$ (High Value for Each Year in Bold Font)									
	B001 and B002			B001	B001	B001	B002	B002	B002
Year	100%	75%	50%	100%	75%	50%	100%	75%	50%
1988	**27.31**	23.08	19.81	13.60	11.56	9.98	13.71	11.61	9.83
1989	**26.91**	23.25	19.83	13.50	11.68	9.99	13.54	11.60	9.92
1990	**26.09**	22.38	19.00	13.02	11.32	9.56	13.18	11.23	9.56
1991	**24.68**	20.69	17.36	12.35	10.35	8.69	12.33	10.36	8.67
1992	**26.19**	22.00	18.23	13.28	11.04	9.20	13.14	11.00	9.11

APPENDIX A

AMPGS Source Parameters
Interactive SO_2 Analysis Source Parameters

AMPGS Point Source Input Variables																		
									Emission Rate (lb/hr)									
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temperature (°F)	Exit Velocity (fps)	Stack Diameter (ft)	24-hr PM10	Annual PM10	3-hr SO2	24-hr SO2	Annual SO2	H2SO4	CO	NOx	Toxics
B001_S	Boiler #1	420,863.0	4,305,760.0	605.31	825.0	135	52.91	24.78	129	129	1266	956	779	38.8	799	455	1
B002_S	Boiler #2	420,940.0	4,305,724.0	609.68	825.0	135	52.81	24.78	128	128	1249	955	778	38.9	792	455	1
B003_S	Auxiliary Boiler	420,874.0	4,305,955.5	595.14	277.0	300	59.68	4.00							12.61	2.85	
P003_S1	Fertilizer Plant - rotary dryer wet scrubber	420,705.3	4,305,793.5	613.09	213.3	125	50.93	0.83	0.258	0.259					0.216	0.855	
P003_S2	Fertilizer Plant - rotary cooler wet scrubber	420,717.0	4,305,790.5	613.09	213.3	125	51.64	3.33	3.5	3.6							
P003_S3	Fertilizer Plant - baghouse	420,729.1	4,305,788.0	617.78	213.3	70	69.66	1.82	0.35	0.35							
P002_S2	Coal Conveying Handling & Storage - reclaim tunnel	420,656.3	4,305,739.0	624.34	12.0	70	18.86	3.00	0.06	0.06							
P002_S3	Coal Conveying Handling & Storage - exhaust #1	420,887.1	4,305,883.0	609.25	155.0	70	35.37	3.00	0.08	0.08							
P002_S4	Coal Conveying Handling & Storage - exhaust #2	420,879.7	4,305,888.0	613.52	155.0	70	35.37	3.00	0.08	0.09							
P002_S5	Coal Conveying Handling & Storage - surge bin #1	420,885.1	4,305,875.0	610.89	125.0	70	4.71	2.00	0.09	0.09							
P002_S6	Coal Conveying Handling & Storage - surge bin #2	420,880.7	4,305,874.5	618.14	125.0	70	4.71	3.00	0.09	0.09							
P002_S7	Coal Conveying Handling & Storage - baghouse #1	420,827.8	4,306,024.5	594.49	210.0	70	47.19	3.00	0.89	0.86							
P002_S8	Coal Conveying Handling & Storage - baghouse #2	421,009.3	4,306,003.5	595.78	210.0	70	47.19	3.00	0.89	0.86							
P003_S1	Limestone/Urea Conveying Handling & Storage - insertable dust collector	420,718.7	4,305,792.0	520.41	106.0	70	29.29	1.50	0.13	0.13							
P003_S2	Limestone/Urea Conveying Handling & Storage - bin vent floor 1	420,707.3	4,305,801.0	520.41	120.0	70	14.15	1.50	0.061	0.061							
P003_S3	Limestone/Urea Conveying Handling & Storage - bin vent floor 2	420,731.5	4,305,795.5	518.00	120.0	70	14.15	1.50	0.061	0.061							

AMPGS Area Source Input Variables										
									Emission Rate (lb/hr)	
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Easterly Length (ft)	Northerly Length (ft)	Angle from North	24-hr PM10	Annual PM10
F001_F	Landfill	421,845.5	4,305,004.5	841.5	3	4103	2200	3	0.42	0.42
F002_F1A	Paved Roadways	420,925.6	4,305,712.5	665.4	3	1359	24	15	0.224	0.224
F002_F1B	Paved Roadways - segment 2	421,471.0	4,305,573.0	679.4	3	24	420	55	0.224	0.226
F002_F1C	Paved Roadways - segment 3	421,553.5	4,305,675.0	672.4	3	24	1230	153	0.224	0.224

AMPGS Volume Source Input Variables									
								Emission Rate (lb/hr)	
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	24-hr PM10	Annual PM10
P003_F	Limestone Conveying Handling & Storage - Limestone Prep Building	420,432.91	4,305,872.00	623.46	15	38	15	0.08	0.009

AMPGS

Interactive SO_2 Modeling - Input Variables

Source ID	Source Description	Easting (X) (km)	Northing (Y) (km)	Base Elevation (ft)	Stack Height (ft)	Temperature (°F)	Exit Velocity (fps)	Stack Diameter (ft)	SO_2 Emission Rate 3-Hour (lb/hr)	24-Hour (lb/hr)	Annual (lb/hr)
AMPB001	Boiler#1	429.95	4,305.75	605.62	625	135	52.9	24.8	1,246.0	955.0	779.0
AMPB002	Boiler#2	429.94	4,305.73	610.24	625	135	52.9	24.8	1,246.0	955.0	779.0
OU	Ohio University Leucha Heating Plant	403.99	4,351.29	857.39	150	350	20.5	8.7	1,357.1	1,357.1	1,357.1
GAVB001	Gavin Power Plant B001 & B002	403.00	4,310.00	625.80	300	300	68.9	11.0	1,920.0	1,920.0	1,920.0
GAVB003	Gavin Power Plant B003	403.26	4,309.91	559.47	830	125	53.1	42.0	88,445.8	88,445.8	88,445.8
GAVB004	Gavin Power Plant B004	403.33	4,310.04	583.89	830	125	53.1	42.0	88,445.8	88,445.8	88,445.8
OHVAL	Ohio Valley Electric Corp. Kyger Creek Station	402.24	4,305.95	570.97	1000	350	109.9	29.3	75,850.0	75,850.0	75,850.0
AEPMUS1	Muskingum River Plant AEP B001	441.64	4,382.37	651.97	134	550	35.9	7.0	597.6	597.6	597.6
AEPMUS2	Muskingum River Plant AEP B002-5	441.64	4,382.37	649.61	828	335	113.1	25.0	63,840.0	63,840.0	63,840.0
AEPMUS3	Muskingum River Plant AEP B006	441.09	4,382.12	758.96	828	290	71.3	25.0	42,180.0	42,180.0	42,180.0
CAWV1	Century Aluminum of West Virginia (SI74)	428.39	4,308.60	635.49	40	100	21.6	0.8	14.0	14.0	14.0
CAWV2	Century Aluminum of West Virginia (SI94)	428.39	4,309.60	636.46	36	68	27.0	4.2	459.3	459.3	459.3
CAWV3	Century Aluminum of West Virginia (SI112)	428.30	4,308.60	635.48	20	160	8.5	0.5	34.1	34.1	34.1
CAWV4	Century Aluminum of West Virginia (SI144)	428.30	4,309.60	635.48	53	150	57.6	1.9	199.7	199.7	189.7
APKAN	Appalachian Power Kanawha River Plant	463.00	4,225.60	616.21	326	316	47.1	19.7	5,240.0	6,240.0	5,240.0
APMTN	Appalachian Power Mountaineer Plant	419.00	4,314.70	656.27	1109	315	101.7	30.2	18,024.0	18,024.0	18,024.0
APSP1	Appalachian Power Philip Sporn Plant (unit5)	420.00	4,313.50	566.50	502	325	147.7	15.1	15,844.0	15,844.0	15,844.0
APSP2	Appalachian Power Philip Sporn Plant (units1-4)	420.00	4,313.50	566.50	500	292	93.7	21.5	20,976.0	20,976.0	20,976.0
PLEAS1	Monongahela Power Co. Pleasants Power Station (stack1)	488.80	4,357.40	854.69	1003	150	55.5	20.0	7,494.0	7,494.0	7,494.0
PLEAS2	Monongahela Power Co. Pleasants Power Station (stack2)	488.80	4,357.40	854.69	1000	150	29.0	35.3	7,494.0	7,494.0	7,494.0
WILL1	Monongahela Power Co. Willow Island (stack1)	474.10	4,357.40	667.19	150	385	29.7	13.9	1,671.3	1,671.3	1,671.3
WILL2	Monongahela Power Co. Willow Island (stack2)	474.10	4,357.40	667.19	216	375	89.6	15.0	4,333.5	4,333.5	4,333.5
AMOS	Appalachian Power John E Amos Plant	428.20	4,258.40	580.71	505	312	107.6	33.0	41,561.8	41,551.6	41,551.5
DUWW1	Dupont Washington Works (stack 149)	442.20	4,346.70	520.08	150	429	34.7	6.0	497.6	497.6	497.6
DUWW2	Dupont Washington Works (stack 475)	442.20	4,346.70	520.08	150	332	32.5	7.5	848.6	848.6	848.6
DUWW3	Dupont Washington Works (stack 477)	442.20	4,346.70	520.08	150	364	44.5	9.0	1,635.3	1,635.3	1,635.3
DUWW4	Dupont Washington Works (stack 325)	442.20	4,346.70	520.08	90	180	4.6	5.0	170.5	170.5	170.5

Proposed New AMP-Ohio Power Plant
Interactive SO_2 NAAQS Air Quality Modeling Inventory

Facility ID	Facility Name	Unit ID	County	UTM Zone	UTM Horizontal	UTM Vertical	Egress Height (ft)	Egress Diameter (ft)	Maximum Operation		Allowable Emissions Rate (Tons/Year)	Allowable Emissions Rate (lbs/hr)
									Exit Temperature (F)	Exit Flowrate (ACFM)		
Not Assigned	AMP-Ohio New Plant	Units 1 & 2	Meigs	17	420.97	4,306.08						
0905010018	Ohio University Lausche Heating Plant	8041	Athens	17	403.99	4,351.29	150	8.75	350	75,000	1,881.49	452.33
		8042									1,881.49	452.33
		8043									1,881.49	452.33
0627010056	Gavin Power Plant	8001	Gallia	17	403.00	4,318.00	300	11.00	300	401,775	4,204.80	960.00
		8002									4,204.80	960.00
		8003		17	403.26	4,309.91	830	42.00	125	4,418,000	387,392.40	88,445.76
		8004		17	403.33	4,310.04	830	42.00	125	4,418,000	387,392.40	88,445.76
0627000003	Ohio Valley Electric Corp. Kyger Creek Station	8001	Gallia	17	402.24	4,305.06	1,000	29.33	350	4,455,000	66,444.60	15,170.00
		8002									66,444.60	15,170.00
		8003									66,444.60	15,170.00
		8004									66,444.60	15,170.00
		8005									66,444.60	15,170.00
0684000000	Muskingum River Plant AEP	B001	Washington	17	441.84	4,382.37	134	7.00	650	218,352	2,617.49	597.60
		B002		17	441.84	4,382.37	828	25.00	335	3,331,000	68,240.40	15,580.00
		B003									68,240.40	15,580.00
		B004									71,569.20	16,340.00
		B005									71,569.20	16,340.00
		B006		17	441.05	4,382.12	828	29.00	299	2,100,000	184,748.40	42,180.00

Compiled by GT Environmental, Inc.
Revised April 10, 2009

Proposed New AMP-Ohio Power Plant
Interactive SO_2 NAAQS Air Quality Modeling Inventory

Facility ID	Facility Name	Unit ID	County	UTM Zone	UTM Horizontal	UTM Vertical	Egress Height (ft)	Egress Diameter (ft)	Maximum Operation Exit Temperature (F)	Maximum Operation Exit Flowrate (ACFM)	Allowable Emissions Rate (Tons/Year)	Allowable Emissions Rate (lbs/hr)
Sources in West Virginia												
5403500002	Century Aluminum of West Virginia	003S104 C03P103? Stack ID 747	Jackson	17	428.30	4,308.60	43	9.85	100	700	61.23	13.98
		003S304 C03P311 3 SAF's Stack ID 94		17	428.30	4,308.60	33	4.25	69	23,000	2,011.71	459.29
		004S112 C04P115 Ore Bucket Line 28 Stack ID 112		17	428.30	4,308.60	20	0.59	100	100	149.44 (actual reported 2003)	34.12
		034S301 C04P101-034P284 Reduction Cells Potroom 1A-4B Stack ID 144		17	428.30	4,308.60	53	1.92	159	10,000	674.65	159.59
5403900006	Appalachian Power Kanawha River Plant	Unit 1 & Unit 2 (CS012)	Kanawha	17	453.00	4,228.69	326	19.67	316	858,042	27,331.20	6,240.00
5405300009	Appalachian Power Mountaineer Plant	Unit 1 Stack MT1	Mason	17	419.00	4,314.70	1,100	30.25	316	4,385,424	78,945.00	18,024.00
5405300001	Appalachian Power Philip Sporn Plant	Unit 5 SP51	Mason	17	428.00	4,313.50	602	15.07	328	1,581,233	69,356.72	15,844.00
		Units 1-4 CS014		17	428.00	4,313.50	600	21.50	292	2,840,717	91,874.88	20,976.00
5407300005	Monongahela Power Co. Pleasants Power Station	Boiler 1 (Stack 1)	Pleasants	17	458.80	4,357.40	1,000	20.00	150	1,600,000	32,823.72	7,494.00
		Boiler 2 (Stack 2)		17	458.80	4,357.40	1,000	39.30	150	1,500,000	32,823.72	7,494.00
5407300035	Monongahela Power Co. Willow Island	Boiler 1 (Stack 1)	Pleasants	17	474.10	4,357.40	160	13.50	356	210,000	7,320.28	1,671.30
		Boiler 2 (Stack 2)		17	474.10	4,357.40	215	15.00	375	550,000	18,980.73	4,333.50
5407900006	Appalachian Power John E Amos Plant	Unit 1 (CS012)	Putnam	17	425.20	4,259.40	903	33.03	312	5,521,302	182,039.81	41,561.50
		Unit 2 (CS012)										
		Unit 3 (AM3)		[illegible]	425.20	4,259.?0	900	30.25	325	2,801,174		
5410700001	Dupont Washington Works	Boilers 1 & 2 (Stack 475)	Wood	17	442.20	4,346.70	150	6.00	429	58,819	2,179.27	497.55
		Boilers 3 & 4 (Stack 476)		17	442.20	4,346.70	150	7.50	332	66,223	3,717.00	848.65
		Boilers 5 & 6 (Stack 477)		17	442.20	4,346.70	150	9.00	354	170,270	7,162.49	1,635.25
		Waste Disposal Furnace (Stack 328)		17	442.20	4,346.70	93	5.00	180	5,420	745.78	170.50

Compiled by GT Environmental, Inc
Revised April 18, 2006

62.03% deciduous forest
6.89% coniferous forest
16.40% urban
14.68% cultivated land

surface roughness				
	spring	summer	autumn	winter
deciduous forest	1.00	1.30	0.80	0.50
coniferous forest	1.30	1.30	1.30	1.30
urban	1.00	1.00	1.00	1.00
cultivated land	0.03	0.20	0.05	0.01
	0.878	**1.089**	**0.757**	**0.565**

albedo				
	spring	summer	autumn	winter
deciduous forest	0.12	0.12	0.12	0.50
coniferous forest	0.12	0.12	0.12	0.35
urban	0.14	0.16	0.18	0.35
cultivated land	0.14	0.20	0.18	0.60
	0.126	**0.138**	**0.139**	**0.480**

bowen ratio (avg moisture conditions)				
	spring	summer	autumn	winter
deciduous forest	0.70	0.30	1.00	1.50
coniferous forest	0.70	0.30	0.80	1.50
urban	1.00	2.00	2.00	1.50
cultivated land	0.30	0.50	0.70	1.50
	0.690	**0.608**	**1.106**	**1.500**

Notes

Cabell County Soil Survey states that 10% of the trees are coniferous.
Land use determined by using geoprocessing in CALPUFF.

[illegible]

[illegible]