Rosemont Copper Company

CALPUFF Modeling Report to Assess Impacts In Class I Areas

Prepared for:
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701

Prepared by:
Applied Environmental Consultants, a JBR company
1553 W. Elna Rae, Ste. 101
Tempe, Arizona 85281
Contact: 480.829.0457

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Memorandum

To:	Bev Everson
Cc:	Tom Furgason
From:	Kathy Arnold
Doc #:	032/10 – 15.3.2
Subject:	**Transmittal of Air Quality Information Including Ambient Monitoring, Emission Inventories, and Air Impact Analyses**
Date:	July 23, 2010

Rosemont is pleased to transmit the following documents related to the air modeling and permitting work that has been undertaken by JBR:

1. *Monitoring Protocol and Quality Assurance Project Plan for Conducting Ambient PM10 and Meteorological Monitoring for the Proposed Rosemont Copper Mine, Pima County, Arizona,* July 1, 2006.

2. *Summary of Ambient Air Quality and Meteorological Data Collected From Startup Through the First Quarter 2009, Rosemont Copper Mine Monitoring Site, Pima County, Arizona,* April 8, 2009.

3. *Summary of Ambient Air Quality and Meteorological Data Collected During the Second Quarter 2009, Rosemont Copper Mine Monitoring Site, Pima County, Arizona,* July 7, 2009.

4. *Modeling Protocol to Assess Ambient Air Quality Impacts from the Rosemont Copper Project,* October 30, 2009.

5. *CALPUFF Modeling Protocol for Rosemont Copper Project to Assess Impacts in Class I Areas,* October 30, 2009.

6. *Rosemont Copper Company, Application for a Class II Permit, Rosemont Copper Project, Southeastern Arizona,* July 28, 2010.

7. *Emission Inventory Information, Years 1, 5, 10, 15, and 20, Rosemont Copper Project, Southeastern Arizona,* July 28, 2010

8. *Modeling Report to Assess Ambient Air Quality Impacts from the Rosemont Copper Project,* July 28, 2010.

9. *CALPUFF Modeling Report to Assess Ambient Air Quality and Visual Impacts in Class I Areas,* July 28, 2010.

Rosemont is providing three hardcopies and two disk copies for the Forest Service and two hardcopies and one disk copy for SWCA. Each enclosed disk contains copies of each of the above documents. Please note that the electronic files for the CALPUFF runs are limited to the output files, as the meteorological data and input files exceed 10 gigabytes and the capacity of the enclosed discs. If these are required, we can write them to a hard disk drive and forward them.

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1. INTRODUCTION

The proposed Rosemont Copper Company Project (Rosemont Project) is a new open pit copper mine that will be located in the Santa Rita Mountains approximately 30 miles southeast of Tucson, Arizona in Pima County (Figure 1.1). The *Rosemont Project, Mine Plan of Operations* was submitted to the Coronado National Forest in July 2007 (complete document available at www.rosemontcopper.com). The Coronado National Forest represents the Federal Land Manager for purposes of the Environmental Impact Statement (EIS) that will be prepared for the Rosemont Project.

The Federal Land Manager (FLM) requested an air impact analysis to be submitted as part of the EIS to demonstrate the protection of the National Ambient Air Quality Standards (NAAQS). Additionally the U.S. Forest Service evaluation requires an Air Quality Related Values (AQRV) impact analysis to ensure that Class I area resources (i.e., visibility, flora, fauna, etc.) are not adversely affected by the projected emissions. Thus, the objective of this dispersion modeling report will be to quantify the maximum predicted ambient impacts due to criteria pollutant emissions for comparison with applicable NAAQS and to evaluate the potential impact of these on the AQRVs. The Rosemont Project submitted a modeling protocol titled "CALPUFF *Modeling Protocol to Asses Ambient Air Quality Impacts from the Rosemont Copper Project*" to the FLM in October, 2009.

The modeling presented herein is based upon the modeling protocol referenced above; applicable portions of the U.S. Environmental Protection Agency (EPA) guidance document: *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report And Recommendations for Modeling Long Range Transport Impacts*, December 1998; *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report*, June 2008 and the *Western Regional Air Partnership BART protocol,* August 2006. The remaining sections of this report present the CALPUFF air dispersion modeling methodology and modeling results for the Rosemont Project.

1.1 Facility Description

The Rosemont Project will include an open-pit mine; and ore processing operations comprised of milling, a concentrator, leaching and solvent extraction/electrowinning. The production schedule developed from mining sequence plans indicates a project operating life of approximately 20-25 years using only proven and probable mineral reserves. Peak mining rates were initially estimated at approximately 378,000 tpd of total material (ore and waste) to be realized in Year 1. This mining rate included a 20% capacity factor above the average capacity. During this year of operation, however, operations would still be in development stages more typical of 316,000 tpd mining rate. Mining rates during Year 2 are estimated at 376,000 tpd and for Years 3-12 at approximately 360,000 tpd of total material. These rates include the additional 20% capacity factor. These rates will taper off toward the final years of the project.

Mining of the ore will be through conventional open-pit mining techniques including drilling, blasting, loading, hauling and unloading. Waste rock will be transported by haul truck to the waste rock storage areas. Ore will be either transported by haul truck to the leach pad (oxide ore), or crushed and loaded onto a conveyor for transport to the mill (sulfide ore). The copper and molybdenum concentrates from the milling and flotation operations will be shipped off site for further processing. Oxide ore will be placed on the lined leach pad. Pregnant leach solution (PLS) from the pad will be

collected in a solution pond and then processed through the SX/EW plant. Copper cathodes generated from the SX/EW plant will be transported off site for further processing.

1.2 Site Description and Relevant Class I Areas

The Rosemont Project will be located in Pima County, approximately 30 miles southeast of Tucson, Arizona as shown in Figure 1.1. Regionally, the facility location is in the Sonoran Desert Section of the Basin and Range Physiographic Province which is characterized by northerly trending fault block mountains separated by broad, down-faulted valleys. The site is at an elevation of approximately 5,350 feet.

Figure 1.2 shows the proposed Rosemont Mine site and all the Class I areas present in Arizona. The distance from the Rosemont Project to the center of the Saguaro National Monument East and Saguaro National Monument West are approximately 44 KM and 66 KM respectively. The Galiuro Wilderness is approximately 95 KM from the Rosemont Project site.

Figure 1.1 General location map of the Rosemont Project and surrounding area.

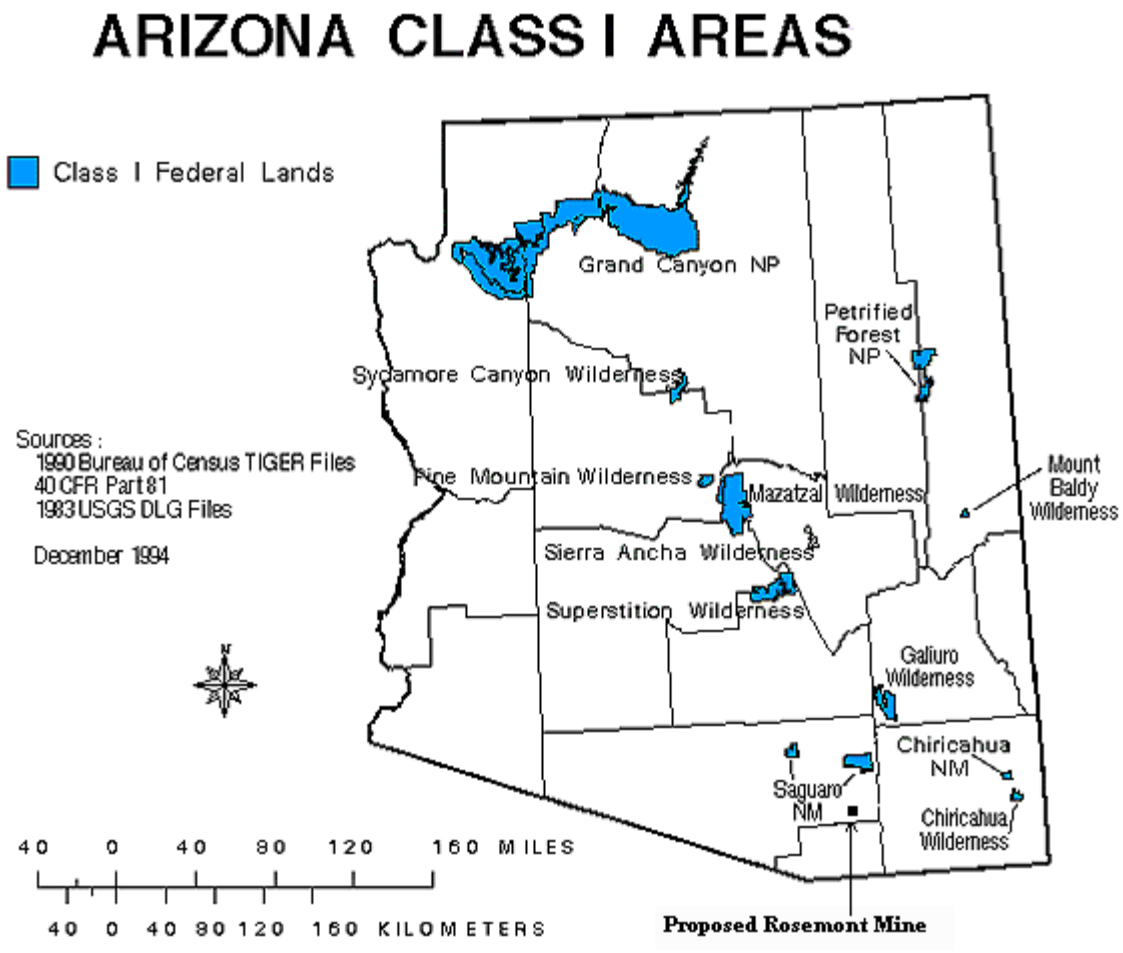

Figure 1.2 Proposed Rosemont Mine and Class I Areas.

2. REGULATORY STATUS

2.1 Source Designation

The Rosemont Project will be a non-categorical stationary source. Criteria pollutant emissions from the facility will be below the New Source Review major source threshold of 250 tons/year. Therefore, the facility will not be subject to PSD regulations. Additionally, the potential to emit hazardous air pollutants (HAPs) will be less than 10 tons/year for any individual (HAP), and less than 25 tons/year for all HAPs combined and therefore, the facility will not be a major HAP source. Point source emissions of criteria pollutants from the facility will be less than the Title V source threshold of 100 tons per year. Consequently, the facility will operate under a Class II Permit issued by the Pima County Department of Environmental Quality (PCDEQ).

2.2 Area Classifications

The Rosemont Project area is classified as "attainment" (better than national standards) or non-classifiable/attainment for total suspended particulates (TSP), particulate matter less than 10 microns nominal aerodynamic diameter (PM_{10}), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3) (see 40 CFR Part 81.303).

2.3 Baseline Area

The Rosemont Project will be located within the Pima Intrastate Air Quality Control Region (AQCR) which encompasses Pima County. This AQCR represents the "baseline area" for PSD purposes. The Rosemont Project, however, will not be subject to PSD regulations.

3. CALPUFF MODELING SYSTEM

The CALPUFF Modeling System includes three main components: CALMET, CALPUFF, and CALPOST and a large set of preprocessing programs designed to interface the model with standard, routinely available meteorological and geophysical datasets. In the simplest terms, CALMET is a meteorological model that develops hourly wind and temperature fields on a three-dimensional gridded modeling domain. Associated two-dimensional fields such as mixing heights, surface characteristics, and dispersion properties are also included in the file produced by CALMET.

CALPUFF is a transport and dispersion model that advects “puffs” of material emitted from modeled sources, simulating dispersion and transformation processes along the way. In doing so it typically uses the fields generated by CALMET, or as an option, it may use simpler non-gridded meteorological fields explicitly incorporated in the resulting distribution of puffs throughout a simulation period. The primary output files from CALPUFF contain either hourly concentrations or hourly deposition fluxes evaluated at selected receptor locations.

CALPOST is used to process these files, producing tabulations that summarize the results of the simulation, identifying the highest and second highest 3-hour average concentrations at each receptor, for example. When performing visibility related modeling, CALPOST uses concentration from CALPUFF to compute extinction coefficients and related measures of visibility, reporting these for selected averaging times and locations.

4. MODELING METEOROLOGICAL DATA

According to 40 CFR Part 51 Appendix W, the length of the modeled meteorological period should be long enough to ensure that the worst-case meteorological conditions are adequately represented in the model results. The number of years of data needed to obtain a stable distribution of conditions depends on the variable of interest. U.S. EPA recommends that consecutive years from the most recent, readily available 5-year period are preferred. However, "less than five, but at least three, years of meteorological data (need not be consecutive) may be used if mesoscale meteorological fields are available. These mesoscale meteorological fields should be used in conjunction with available standard NWS or comparable meteorological observations within and near the modeling domain. Therefore this modeling analysis was conducted using 3 years of mesoscale meteorological model output data coupled with observational data from nearby surface, upper air and precipitation stations.

4.1 Prognostic Data

Prognostic data for the years 2001 (36 km EPA), 2002 (12 km WRAP) and 2003 (36 km MRPO) was used for developing the Initial Guess Wind Fields in the CALMET model. The CalMM5 extractions from the prognostic data were supplied by BEE-Line Software (now Oris-Solutions). The 2001 and 2003 data cover the conterminous United States at a spacing of 36 km. The 2002 data cover the western portion of the conterminous United States at a spacing of 12 km.

4.2 Surface Stations

Surface data for the years 2001, 2002 and 2003 was used as observations in developing the Step 2 Wind Fields in the CALMET model. The processed surface data, obtained from the National Climatic Data Center (NCDC) in Asheville, North Carolina, was provided by BEE-Line Software. Data from the following four surface stations was used:

1. Nogales Airport (WBAN – 92728)
2. Douglas Bisbee Airport (WBAN – 93026)
3. Tucson Airport (WBAN – 23160)
4. Davis Monthan Air Force Base (WBAN – 23109)

4.3 Upper Air Stations

Upper air data for the years 2001, 2002 and 2003 from the NWS Tucson Airport Station (WBAN – 23160) was used as observations in developing the Step 2 Wind Fields in the CALMET model. The processed upper air data, obtained from the National Oceanic and Atmospheric Administration (NOAA) Forecast Systems Laboratory web site, was provided by BEE-Line Software. Missing data periods were filled with data from other years for the same time period.

4.4 Precipitation Stations

Precipitation data for the years 2001, 2002 and 2003 was used as observations in developing the Step 2 Wind Fields in the CALMET model. The precipitation data, obtained from the NCDC, was provided by BEE-Line Software. Data from the following seven precipitation stations was used.

1. Bisbee 2 WNW (WBAN – 20775)
2. Cochise 4 SSE (WBAN – 21870)
3. Nogales 6 N (WBAN – 25924)
4. Oracle 2 SE (WBAN – 26119)
5. Santa Rita Experimental Range (WBAN – 27593)
6. Tucson International Airport (WBAN – 28820)
7. Vail (WBAN – 28995)

4.5 CALMET: Meteorological Data Processing

CALMET is based on the Diagnostic Wind Model (Douglass, S. and R. Kessler, 1988). It has been significantly enhanced by Earth Tech, Inc (Scire, 2000). CALMET uses a two step approach to calculate wind fields. In the first step, an initial guess field is adjusted for slope flows and terrain blocking effects, for example, to produce a step 1 wind field. In the second step, an objective analysis is performed to introduce observational data into the Step 1 wind field. The meteorological fields developed by CALMET depend on the following parameter settings:

1. R1MAX – Maximum radius of influence of the observation over land in the surface layer.
2. R2MAX – Maximum radius of influence of the observation over land in the layers aloft.
3. R3MAX – Maximum radius influence of the observation over water.
4. R1 – Controls weighting of the surface layer. For example, it is the distance from the observational station at which the observation and first guess field are equally weighted.
5. R2 - Controls weighting of the layers aloft.
6. ZIMAX – Maximum mixing height.
7. TERRAD – Radius of influence of Terrain Features.

All the above parameters, except ZIMAX are user defined. ZIMAX has an EPA default value of 3000 m AGL. This value will be set to 4500 m AGL in accordance with the CALMET inputs used by the Western Regional Air Partnership (WRAP) Regional Modeling Center (RMC) in conducting a BART CALPUFF modeling analysis for the state of Arizona. A mixing height of 3000 m AGL would be appropriate in Eastern U.S., but for Western U.S., in the summer mixing heights may exceed this value. All the other parameters are set on a case by case basis taking the terrain surrounding the observation stations into consideration. Table 4.1 lists the parameter settings that were used for the Rosemont Mine.

Table 4.1 CALMET Parameter Settings		
Parameter	**WRAP Setting**	**Proposed Setting**
R1MAX	50 KM	20 KM
R2MAX	100 KM	30 KM
R3MAX	100 KM	100 KM
R1	100 KM	18 KM
R2	200 KM	20 KM
ZIMAX	4500 m AGL	4500 m AGL
TERRAD	10 KM	10 KM

A large R1 value (100 KM, as suggested by WRAP) results in wind fields surrounding surface stations to overwrite the MM5 wind fields, which then do not have terrain influences incorporated into them. This leads to non-uniform wind fields with abrupt changes in wind directions. ENSR Corporation conducted a BART CALPUFF modeling analysis for APS Four Corners Power Plant in New Mexico and used smaller values as proposed in Table 4.1, for R1, R2 and R1MAX after guidance from the Federal Land Managers of the National Monument Services. Setting R1 and R1MAX to high values, as suggested by WRAP (see Table 4.1), is not recommended by the model developer and Federal Land Managers, especially with a MM5 data resolution of 36 km with areas of complex terrain. Typically, R1 is set to a fairly small value, generally not exceeding half of the MM5 data resolution (18 km). R3MAX is a very minor factor considering the lack of any large water bodies in the analysis domain. R3MAX was set to the WRAP value of 100 KM. TERRAD was also set to the WRAP value of 10 KM.

4.6 Analysis Domain

The modeling domain is shown in Figure 4.1. It is based on UTM coordinates and includes two Class I areas, the Saguaro National Monument and the Galiuro Wilderness. The domain is about 175KM x 165KM in the Easterly and Northerly directions respectively, with 5 KM grid cells.

4.7 Terrain

Gridded terrain elevations for the modeling domain were derived from 3 arc-second digital elevation models (DEMs) produced by the United States Geological Survey (USGS). The files cover 1-degree by 1-degree blocks of latitude and longitude. USGS 1:250,000 scale DEMs were used.

4.8 Land Use

The land use data was obtained from USGS in the form of 250K land use data files. Data for missing quads was substituted using National Land Cover Data (NLCD).

4.9 Receptors

The receptors used for the Class I areas were based on the National Park Service database of Class I receptors. Saguaro National Monument and the Galiuro Wilderness are the only Class I areas that fall within a 100 KM radius of the source. See Figure 4.1.

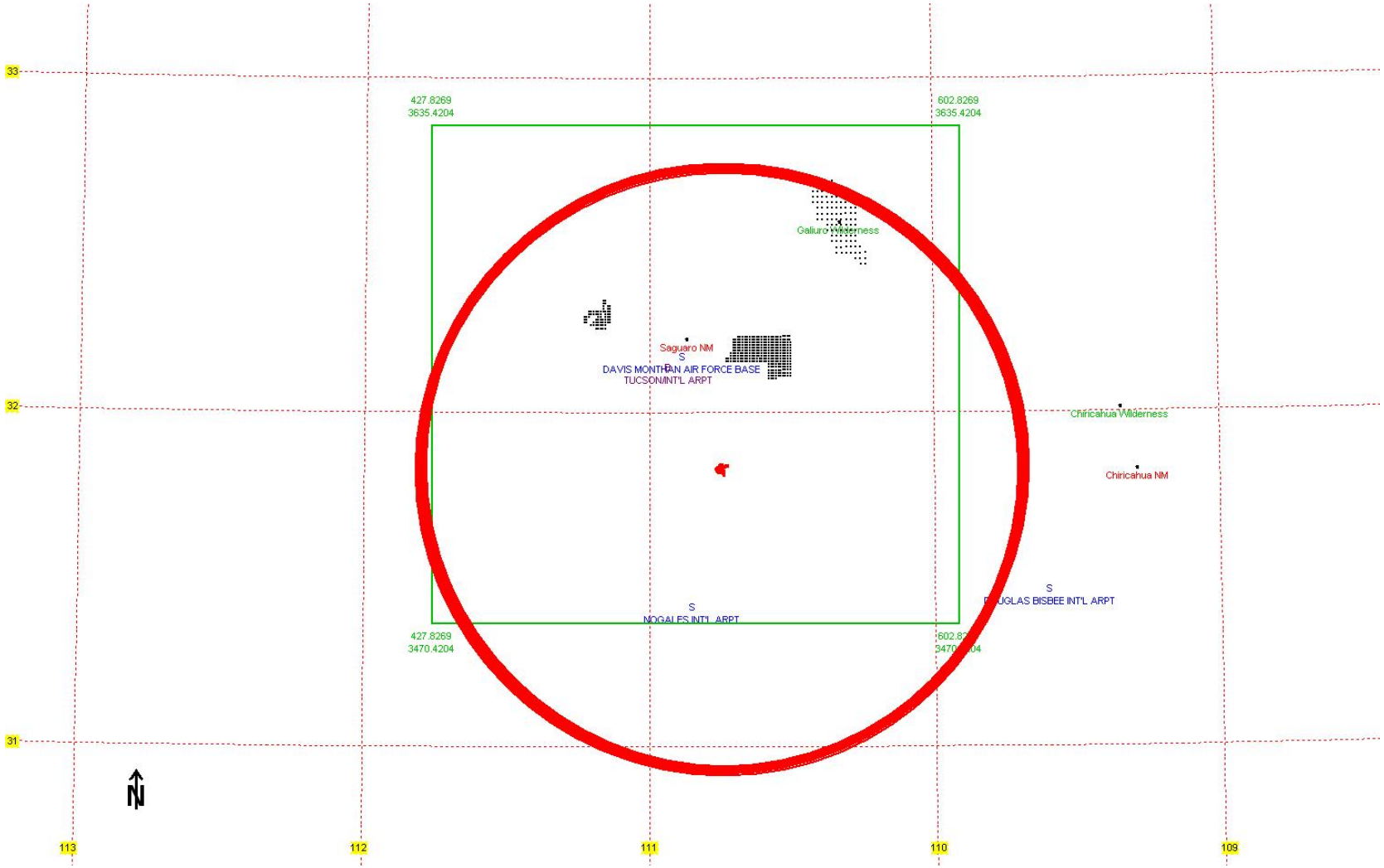

Figure 4.1 Modeling Domain Size and Class I Area Receptors.

5. CALPUFF MODELING

This section provides a summary of the modeling procedures that were used for the CALPUFF analysis conducted for the Rosemont Mine.

5.1 Model Version

Version 6 of CALPUFF was used to conduct the modeling analysis. The Federal Land Managers require the modeling to be done using the *FLAG Phase 1 Report Revised Draft* (June, 2008) guidelines which requires Version 6 of CALPUFF to be used.

5.2 Technical Options Used in Modeling

For CALPUFF model technical options, inputs and processing steps, the WRAP common BART protocol was followed. Due to the large distance to the nearest Class I area, building downwash effects were not included in the CALPUFF modeling.

5.2.1 Ozone Assumption

Monthly background ozone values were calculated using data from the Clean Air Status and Trends Network (CASTNET) station located at the Chiricahua National Monument site. The Chiricahua NM station is the closest ozone data collection station to the analysis domain. Monthly averages were calculated using the available hourly data and used as input to the CALPUFF model. The monthly averages used are listed in Table 5.1.

Table 5.1 Monthly Background Ozone Values

YEAR	2001 Ozone (ppb)	2002 Ozone (ppb)	2003 Ozone (ppb)
JAN	36.75	40.71	40.19
FEB	38.52	41.28	41.82
MAR	44.30	46.45	48.88
APR	47.65	47.21	52.04
MAY	50.01	49.30	54.32
JUN	46.36	49.04	47.69
JUL	40.18	45.49	49.14
AUG	40.61	43.15	49.69
SEP	35.76	45.30	46.51
OCT	37.34	41.34	42.83
NOV	35.46	43.94	36.71
DEC	36.81	38.63	37.98

5.2.2 Ammonia Assumption

Ammonia is not simulated by CALPUFF, but rather a background value is specified. Ammonia is important because the level of particulate nitrate (NO_3) can depend on the amount of ammonia present. The partitioning of total nitrate between gaseous HNO_3 and particulate NO_3 depends on the amount of ammonia present and other parameters (e.g., SO_4, temperature and RH). In the CALPUFF simulation, one value of background is assumed across the region and each puff uses the full background value in its equilibrium calculation. The IWAQM Phase II report contains the following recommendations for background ammonia: "typical (within a factor of 2) background values of ammonia are: 10 ppb for grasslands, 0.5 ppb for forest, and 1 ppb for arid lands at 20 C" (IWAQM, 1998). Based on the fact that the Saguaro National Monument lies in an arid region, a background ammonia value of 1 ppb was used.

5.2.3 Natural Conditions and Monthly Relative Humidity Factors f(RH) at Class I Areas

For these Class I areas, natural background conditions must be established in order to determine a change in natural conditions related to a source's emissions. The EPA lists three types of Natural Conditions (natural background conditions) in their guidance document, Annual Average, Best 20% Days and Worst 20% Days (EPA, 2003a). The Best 20% Days and Annual Average Natural Visibility Conditions were used and compared based on the recommendation of the EPA BART Guidance document (EPA, 2005). These EPA estimates were taken from the *Federal Land Managers Air Quality Related Values Workgroup (FLAG) Phase 1 Report Revised Draft Table V.1-1* (June, 2008).

The EPA, in its BART Guidelines (2005), concluded that by using monthly average Relative Humidity Adjustment Factors f(RH) the likelihood that the highest modeled visibility impacts that were caused by short-term and geographically different meteorological phenomena (e.g., weather events) would be minimized. The FLAG (2008) report agrees with the EPA, therefore the visibility analysis was conducted using monthly average f(RH) values for large hygroscopic particles, small hygroscopic particles and sea salt, rather than hourly values.

5.2.4 Light Extinction and Haze Impact Calculations

The CALPOST postprocessor was used for the calculation of the impact from the modeled source's primary and secondary particulate matter concentrations on light extinction. The formula that is used is the existing IMPROVE/EPA formula, which is applied to determine a change in light extinction due to increases in the particulate matter component concentrations. Using the notation of CALPOST, the formula is the following:

$$
\begin{aligned}
B_{ext} = {} & 2.2 \times f_S(RH) \times [\text{Small Sulfates}] + 4.8 \times f_L(RH) \times [\text{Large Sulfate}] \\
& + 2.4 \times f_S(RH) \times [\text{Small Nitrates}] + 5.1 \times f_L(RH) \times [\text{Large Nitrates}] \\
& + 2.8 \times [\text{Small Organic Mass}] + 6.1 \times [\text{Large Organic Mass}] \\
& + 10 \times [\text{Elemental Carbon}] \\
& + 1 \times [\text{Fine Soil}] \\
& + 0.6 \times [\text{Coarse Mass}] \\
& + 1.7 \times f_{SS}(RH) \times [\text{Sea Salt}]
\end{aligned}
$$

+ [Rayleigh Scattering]

+ 0.33 x [NO_2 (ppb)]

The concentrations, in square brackets, are in $\mu g/m^3$ and b_{ext} is in units of Mm^{-1}. The Rayleigh scattering term was set to the value of 10 Mm^{-1}. This value for the Saguaro National Monument was taken from the *Federal Land Managers Air Quality Related Values Workgroup (FLAG) Phase 1 Report Revised Draft Table V.1-1* (June, 2008). This value is also the default, as recommended in EPA guidance for tracking reasonable progress (EPA, 2003a). The terms $f_S(RH)$, $f_L(RH)$ and $f_{SS}(RH)$ are relative humidity adjustment factors for small particles, large particles and sea salts respectively. These values were taken from the *Federal Land Managers Air Quality Related Values Workgroup (FLAG) Phase 1 Report Revised Draft Table V.1-2, V.1-3 and V1.-4* (June, 2008) which list f(RH) values for each Class I area.

The assessment of visibility impacts at the Class I areas was conducted using CALPOST Method 6. In Method 6, each hour's source-caused extinction is calculated by first using the hygroscopic components of the source-caused concentrations, due to ammonium sulfate and nitrate, and monthly Class I area-specific f(RH) values. The contribution to the total source-caused extinction from ammonium sulfate and nitrate is then added to the other, non-hygroscopic components of the particulate concentration (from coarse and fine soil, secondary organic aerosols, and from elemental carbon) to yield the total hourly source-caused extinction.

6. SOURCE CHARACTERIZATION

A detailed listing of all emission sources and their corresponding modeling input release parameters and emission rates is listed in Appendix A1 of this report. A general description of how each source type was treated is presented below.

6.1 Point Sources

Point sources at the Rosemont Project include dust collectors, hot water heaters, and emergency generator(s). Emissions from these sources were modeled as individual point sources. The baghouses are likely to have ambient exit temperatures and therefore, were modeled using a stack temperature of 0°K per ADEQ guidance, which forces the model to use the ambient temperature as the exit temperature. Stack parameters for the point sources were based on design parameters and/or conservative estimated values. Particulate emissions from emergency generators were not included as all other operations would likely be shut down if the generators are needed.

6.2 Volume Sources

6.2.1 Road Sources

A refined road network was developed to depict the anticipated haul truck routes and truck discharge locations during the year 1 of the mine operations, since the Year 1 emissions were estimated to have the greatest impact on ambient air. Emissions due to haul road and general plant traffic on the

unpaved road network were modeled as volume sources and the modeling parameters were based on Arizona Department of Environmental Quality guidance.

6.2.2 Other Fugitive Particulate Sources

Other fugitive particulate emission sources that were modeled as volume sources include the following:

- Fugitive emissions from trucks unloading at the primary crusher were represented by a single volume source. The release height was set to 0 meters (dump pocket is at grade level).

- Fugitive emissions due to wind erosion from the sulfide ore stockpile were represented by a single volume source. The release height was set to 6 meters (half the height of the stockpile).

- Fugitive emissions from conveyor transfer points were represented by single volume sources. The release heights for these sources were set to the actual height of the conveyor transfer process.

6.2.3 Particulate and Gaseous Emissions Due to Blasting

The emissions due to blasting in the pit were modeled as volume sources. Since Blasting would occur only during day light hours (6 AM to 6 PM), the variable emission rate option was utilized.

6.2.4 Open Pit Source

Fugitive particulate emissions from the open pit at the Rosemont Project were modeled as an area source. Unlike AERMOD, CALPUFF does not have an open pit source algorithm. Therefore the emissions were modeled as an area source taking pit retention of emissions into account. Approximately 9% of the PM10 emissions are estimated to be retained in the pit due to the depth of the pit. This estimate was arrived at by comparing the annual impact of the pit emissions modeled in AERMOD first as an area source and then as an open pit source on a single receptor placed approximately 20 KM away from the source. Since the open pit source algorithm takes the depth of the pit into account during estimation of the impacts as opposed to the area source algorithm, which assumes a surface based release; this method provided a good estimate of the amount of emissions retained in the pit. The majority of the emission inside the pit will be from Haul Truck travel on the unpaved roads.

6.2.5 Tail Pipe Emissions

Tail pipe emissions from Haul Trucks and support vehicles were distributed among road emission sources and the open pit source. The amount of emissions assigned to each individual road segment and to the pit was based upon an evaluation of the vehicle miles travelled (VMT) estimates for each vehicle type along each road segment and inside the pit.

7. EMISSIONS INVENTORY

Emissions from Rosemont operations will result from process equipment and mining operations. Process equipment was modeled at maximum capacity. Emissions from mining were based upon the mining rate and haul truck travel necessary to transport the ore and waste from the pit to the primary crusher and the waste rock storage area. The emission inventories for various years of the mine are provided in Appendix H of the document titled "*Emission Inventory Information for Years 1, 5, 10, 15 and 20*" being submitted along with this report. As stated in the modeling protocol submitted in Oct 2009, Year 1 and Year 5 emission inventories were modeled. Year 5 projects the highest particulate emissions.

8. DEMONSTRATION OF PROTECTION OF NAAQS

Demonstration of protection of NAAQS is accomplished by comparison of the maximum impacts to the applicable standards. For short term averaging periods (24-hour or less), the 2nd highest modeled concentration is compared to the applicable NAAQS standard whereas for the annual averaging period, the highest modeled annual concentration is compared to the applicable NAAQS standard.

The modeling results for each of the modeled years (2001, 2002 and 2003) and for each of the modeled emission inventories (Year 1 and Year 5), are summarized in Table 8.1 and Table 8.2. These results are based on hourly emissions for both Year 1 and Year 5 of the mine operations. Predicted annual impacts using the annual emissions would be lower than those shown in these tables.

A demonstration of protection of the applicable NAAQS in the vicinity of the Rosemont Project is demonstrated in the report "*Rosemont Copper Company, Modeling Report to Asses Ambient Air Quality Impacts (*July 28, 2010*)*". The predicted impacts in the Class I Areas shown in Tables 8.1 and 8.2 are less than 5% of the predicted impacts in the vicinity of the Rosemont Project. Consequently the NAAQS will also be protected in the Class I areas.

Table 8.1 Modeled Impacts due to Year 1 Hourly Emissions

Pollutant	Averaging	Modeled Impact ($\mu g/m^3$)	UTM Northing (KM)	UTM Easting (KM)	Class I Area Impacted
		2001 Impacts			
PM10	24-hr	1.61*	531.032	3560.155	Saguaro NP East
	Annual	0.17	531.82	3559.233	Saguaro NP East
PM2.5	24-hr	0.37*	531.82	3559.233	Saguaro NP East
	Annual	0.05	531.82	3559.233	Saguaro NP East
SO2	3-hr	0.14*	535.755	3557.399	Saguaro NP East
	24-hr	0.04*	541.279	3551.878	Saguaro NP East
	Annual	0.003	542.065	3551.881	Saguaro NP East
NOX	Annual	0.26	531.82	3559.233	Saguaro NP East
		2002 Impacts			
PM10	24-hr	2.79*	531.82	3559.233	Saguaro NP East
	Annual	0.18	531.82	3559.233	Saguaro NP East
PM2.5	24-hr	0.50*	531.82	3559.233	Saguaro NP East
	Annual	0.05	531.82	3559.233	Saguaro NP East
SO2	3-hr	0.15*	535.745	3560.17	Saguaro NP East
	24-hr	0.02*	531.82	3559.233	Saguaro NP East
	Annual	0.003	542.065	3551.881	Saguaro NP East
NOX	Annual	0.27	531.82	3559.233	Saguaro NP East
		2003 Impacts			
PM10	24-hr	2.00*	534.165	3562.936	Saguaro NP East
	Annual	0.15	531.032	3560.155	Saguaro NP East
PM2.5	24-hr	0.45*	534.165	3562.936	Saguaro NP East
	Annual	0.04	531.032	3560.155	Saguaro NP East
SO2	3-hr	0.12*	541.279	3551.878	Saguaro NP East
	24-hr	0.03*	541.279	3551.878	Saguaro NP East
	Annual	0.003	542.065	3551.881	Saguaro NP East
NOX	Annual	0.21	531.032	3560.155	Saguaro NP East

* Represents the high 2nd high concentration

Table 8.2 Modeled Impacts due to Year 5 Hourly Emissions

Pollutant	Averaging	Modeled Impact ($\mu g/m^3$)	UTM Northing (KM)	UTM Easting (KM)	Class I Area Impacted
		2001 Impacts			
PM10	24-hr	2.69*	536.518	3563.868	Saguaro NP East
	Annual	0.24	531.82	3559.233	Saguaro NP East
PM2.5	24-hr	0.46*	536.518	3563.868	Saguaro NP East
	Annual	0.05	531.82	3559.233	Saguaro NP East
SO2	3-hr	0.14*	535.755	3557.399	Saguaro NP East
	24-hr	0.03*	541.279	3551.878	Saguaro NP East
	Annual	0.003	542.065	3551.881	Saguaro NP East
NOX	Annual	0.29	531.82	3559.233	Saguaro NP East
		2002 Impacts			
PM10	24-hr	5.21*	531.82	3559.233	Saguaro NP East
	Annual	0.27	531.82	3559.233	Saguaro NP East
PM2.5	24-hr	0.80*	531.82	3559.233	Saguaro NP East
	Annual	0.05	531.82	3559.233	Saguaro NP East
SO2	3-hr	0.15*	535.745	3560.17	Saguaro NP East
	24-hr	0.02*	531.82	3559.233	Saguaro NP East
	Annual	0.003	542.065	3551.881	Saguaro NP East
NOX	Annual	0.32	531.82	3559.233	Saguaro NP East
		2003 Impacts			
PM10	24-hr	3.63*	534.165	3562.936	Saguaro NP East
	Annual	0.22	531.032	3560.155	Saguaro NP East
PM2.5	24-hr	0.62*	534.165	3562.936	Saguaro NP East
	Annual	0.04	531.032	3560.155	Saguaro NP East
SO2	3-hr	0.11*	533.392	3559.239	Saguaro NP East
	24-hr	0.03*	541.279	3551.878	Saguaro NP East
	Annual	0.002	542.065	3551.881	Saguaro NP East
NOX	Annual	0.24	531.032	3560.155	Saguaro NP East

* Represents the high 2nd high concentration

9. EVALUATION OF VISIBILITY IMPACTS

Potential visual impacts predicted by the CALPUFF Model at the nearby Class I areas, Saguaro National Monument East and Saguaro National Monument West, and Galiuro Wilderness using hourly emissions for both Year 1 and Year 5 of operations is presented in Table 9.1 and 9.2. Visibility impacts were evaluated using both, the Best 20% Natural Conditions and the Annual Average Natural Conditions. The visual impacts shown in these tables are anticipated to occur at the Saguaro National Monument East because it is the nearest area (44 KM vs 66 KM for Saguaro National Monument West and 95 KM for the Galiuro Wilderness Area) to the Rosemont Project with wind conditions more likely to direct pollutant emissions to this area. The Saguaro National Monument East is also the location with the highest predicted pollutant concentrations. The summary output of visual impacts by the CALPUFF Model provides the highest predicted impacts among all receptors in a Class I Area. Since the Saguaro National Monument East and Saguaro National Monument West are classified as a single Class I Area, the receptor locations for these predictions are not specified by the model in the summary report.

Projected visual Impacts at the Galiuro Wilderness Area are considered minimal.

The significance of visual impacts are determined by the Federal Land Manager. With regards to evaluating the significance of these impacts, it should be noted that the Tucson urban area is located at a closer proximity to the Class I Area and will have a much greater emissions. An inventory of emissions from the Tucson urban area is not available. EPA's National Emissions Inventory, however, maintains a data base of emissions for criteria pollutants on a national, state, and county basis. Table 9.3 provides annual Pima County emissions for these pollutants for Calendar Year 2005 and corresponding annual emissions predicted for Rosemont Year 5. Based upon this comparison, the effect of Rosemont emissions will be very small relative to urban impacts on the Class I Area.

Table 9.1 Visibility Impacts for Year 1 Hourly Emissions

2001				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	50	1	71	3
Number of days with Delta Deciview => 1	18	1	27	1
Largest Delta Deciview =	2.357	1.386	2.823	1.739
Number of days with Extinction Change => 5%	51	2	73	4
Number of days with Extinction Change => 10%	20	1	30	1
Largest Extinction Change =	26.58%	14.87%	32.32%	19.00%
2002				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	46	2	67	2
Number of days with Delta Deciview => 1	15	0	19	0
Largest Delta Deciview =	4.345	0.684	5.127	0.866
Number of days with Extinction Change => 5%	47	2	69	2
Number of days with Extinction Change => 10%	16	0	22	0
Largest Extinction Change =	54.42%	7.08%	66.98%	9.05%
2003				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	60	4	72	5
Number of days with Delta Deciview => 1	15	2	21	3
Largest Delta Deciview =	2.644	1.196	3.157	1.5
Number of days with Extinction Change => 5%	61	5	76	5
Number of days with Extinction Change => 10%	18	2	24	3
Largest Extinction Change =	30.27%	12.70%	37.13%	16.19%

Table 9.2 Visibility Impacts for Year 5 Hourly Emissions

2001				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	67	3	85	6
Number of days with Delta Deciview => 1	25	1	34	1
Largest Delta Deciview =	2.963	1.97	3.529	2.456
Number of days with Extinction Change => 5%	69	3	88	6
Number of days with Extinction Change => 10%	29	1	36	2
Largest Extinction Change =	34.49%	21.78%	42.32%	27.83%
2002				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	70	2	91	2
Number of days with Delta Deciview => 1	21	1	27	2
Largest Delta Deciview =	6.274	1.24	7.296	1.558
Number of days with Extinction Change => 5%	77	2	94	2
Number of days with Extinction Change => 10%	23	1	30	2
Largest Extinction Change =	87.27%	13.20%	107.43%	16.86%
2003				
Natural Conditions	Annual Average		Best 20%	
Class I Area	Saguaro	Galiuro	Saguaro	Galiuro
Number of days with Delta Deciview => 0.5	76	6	90	6
Number of days with Delta Deciview => 1	24	3	32	4
Largest Delta Deciview =	4.216	1.789	4.971	2.21
Number of days with Extinction Change => 5%	77	6	93	6
Number of days with Extinction Change => 10%	26	4	35	4
Largest Extinction Change =	52.44%	19.60%	64.39%	24.73%

Table 9.3 Comparison of Pima County Emissions Data (tons/year) per EPA's National Emissions Inventory (Calendar year 2005) and Rosemont Emissions.

Emissions Source Type	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	CO_2[a]
On-Road Vehicles	17,338	128,269	370	467	311	15,128	-
Non-Road Equipment	5,864	59,104	596	527	497	4,962	-
Industrial Processes	3,321	4,814	75	2,155	1,081	166	-
Electricity Generation	2,247	152	3,714	127	110	25	-
Fossil Fuel Combustion	1,515	726	1,359	463	112	52	-
Fires	60	2,093	26	240	204	502	-
Residential Wood Combustion	51	3,986	8	556	556	855	-
Waste Disposal	12	35	8	11	8	200	-
Miscellaneous	1	54	-	10,528	1,107	3,315	-
Road Dust	-	-	-	9,589	832	-	-
Solvent Use	-	-	-	-	-	5,939	-
TOTAL	**30,409**	**199,233**	**6,156**	**24,663**	**4,818**	**31,144**	**17,426,666**
Rosemont (Year 5)	1,506	1,388	20	992	173	105	194,843
Percent Additional (%)	4.95%	0.70%	0.32%	4.02%	3.59%	0.34%	1.12%

[a] EPA's National Emissions Inventory does not include CO_2 emissions. Data is from *Regional Greenhouse Gas Inventory,* Pima Association of Governments, November 2008, encompassing the Eastern Pima County Area comprised of a rectangular area with the northern line stopping at the Pima County Line; the southern line stopping at the southern edge of Sahuarita; the eastern line stopping at Vail; and the western line stopping at Three Points.

APPENDIX A

CALPUFF MODELING INVENTORY

Table A1.1 Point Sources Year 1 Hourly Modeling

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp. (K)	Init. Sigma-y (m)	Init. Sigma-z (m)	Momentum Flux	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PCL01	524.07638	3521.78063	12	7.3152	1540.61	1.524	4.66	316.48	0	0	1	0	0	0.8064	1.2800
PCL02	523.85538	3522.54488	12	6.096	1555.98	1.8288	6.562	316.48	0	0	1	0	0	0.9324	2.5900
PCL03	523.86213	3522.66938	12	6.096	1549.64	1.8288	3.883	316.48	0	0	1	0	0	0.3852	1.0700
PCL04	523.89869	3522.87637	12	7.3152	1542.95	1.524	5.694	316.48	0	0	1	0	0	0.6864	1.5600
PCL05	524.033	3522.99259	12	7.3152	1526.57	1.8288	8.989	316.48	0	0	1	0	0	1.2780	3.5500
PCL06	524.04375	3522.99059	12	7.3152	1526.85	1.8288	8.989	316.48	0	0	1	0	0	1.2780	3.5500
PCL07	524.114	3522.93584	12	16.764	1540.76	0.3048	3.237	533.15	0	0	1	0	0	0.0190	0.0200
PCL08	524.034	3522.99934	12	6.096	1525.3	0.3048	9.708	366.48	0	0	1	0	0	0.1066	0.1066
PCL09	523.99138	3522.56788	12	6.096	1542.52	0.509	23.204	316.48	0	0	1	0	0	0.3553	0.2369
PCL10	524.00963	3522.56638	12	6.096	1542.95	0.509	23.204	316.48	0	0	1	0	0	0.3553	0.2369
PCL11	524.02938	3522.56513	12	6.096	1543.62	0.509	23.204	316.48	0	0	1	0	0	0.3553	0.2369
FB01	524.241	3522.38634	12	3.6576	1527.49	0.0914	39.685	810.93	0	0	1	0.009328	0.875912	0.0173	0.0723
FB02	524.2415	3522.80659	12	3.9624	1513.69	0.3048	24.994	749.82	0	0	1	0.014576	13.22774	0.4409	0.4409
FB03	524.10325	3522.35909	12	3.9624	1541.42	0.3048	24.994	749.82	0	0	1	0.014576	13.22774	0.4409	0.4409
FB04	523.8485	3522.94809	12	3.9624	1552.32	0.3048	24.994	749.82	0	0	1	0.010932	9.920802	0.2000	0.3307
FB05	524.493	3522.84459	12	3.9624	1520.88	0.3048	24.994	749.82	0	0	1	0.010932	9.920802	0.3307	0.3307
FB06	524.2425	3522.36634	12	3.6576	1530.17	0.0914	39.685	810.93	0	0	1	0.000729	0.488481	0.0441	0.0441
FB07	524.05825	3521.79159	12	2.7432	1537.69	0.0914	103.022	799.82	0	0	1	0.004348	2.455021	0.1315	0.1315
FB08	524.10575	3522.39684	12	2.7432	1538.95	0.0914	103.022	799.82	0	0	1	0.004348	2.455021	0.1315	0.1315

Table A1.2 Volume Sources Year 1 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
BLST1	522.51763	3521.97863	12	10	1558	14.186	9.3023	2.8889	24.5556	0.27355	4.7415
BLST2	522.75338	3521.97863	12	10	1558	14.186	9.3	2.8889	24.5556	0.27355	4.7415
BLST3	522.51013	3521.78838	12	10	1558	14.186	9.3023	2.8889	24.5556	0.27355	4.7415
BLST5	522.51013	3521.57538	12	10	1558	14.186	9.3	2.8889	24.5556	0.27355	4.7415
BLST4	522.75125	3521.78409	12	10	1558	14.1866	9.3	2.8889	24.5556	0.27355	4.7415
BLST6	522.75125	3521.57634	12	10	1558	14.186	9.3	2.8889	24.5556	0.27355	4.7415
UNLP1	524.51438	3520.93363	12	7	1522.15	4	6.51	0.0056	2.5827	0.15164	0.3822
UNLP2	524.52388	3520.72138	12	7	1513.32	4	6.51	0.0056	2.5827	0.15164	0.3822
UNLP3	524.25513	3520.71663	12	7	1545.24	4	6.51	0.0056	2.5827	0.15164	0.3822
UNLP4	524.25038	3520.93363	12	7	1537.09	4	6.51	0.0056	2.5827	0.15164	0.3822
UNLP5	523.74088	3520.75438	12	7	1569.95	4	6.51	0.0056	2.5827	0.15164	0.3822
UNLP6	523.78338	3520.52313	12	7	1575.25	4	6.51	0.0056	2.5827	0.15164	0.3822
UNWD1	524.11363	3520.25438	12	7	1574.41	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD2	524.18888	3520.11763	12	7	1554.71	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD3	524.24088	3519.97163	12	7	1553.64	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD4	523.96738	3520.21213	12	7	1578.15	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD5	524.02863	3520.05638	12	7	1588.5	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD6	524.09463	3519.89613	12	7	1561.5	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD7	523.88238	3519.99988	12	7	1588.32	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD8	523.94838	3519.84413	12	7	1593.74	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD9	523.78813	3519.79238	12	7	1567.33	4	6.51	0.0056	2.5827	0.19633	0.6281
UNWD10	523.63713	3519.87238	12	7	1590.97	4	6.51	0.0056	2.5827	0.19633	0.6281
PITWD1	522.47238	3521.19288	12	7	1701.05	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD2	522.50538	3521.06563	12	7	1687.2	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD3	522.55738	3520.98063	12	7	1667.66	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD4	522.59988	3520.84863	12	7	1666.66	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD5	522.69888	3520.78263	12	7	1646.64	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD6	522.79313	3520.74963	12	7	1624.64	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD7	522.87813	3520.67888	12	7	1620.5	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD8	523.01938	3520.63638	12	7	1601.32	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD9	523.17513	3520.67888	12	7	1585.8	44.65	6.51	0.0056	2.5827	0.58571	4.1139

Table A1.2 Volume Sources Year 1 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITWD10	523.32613	3520.72613	12	7	1586.6	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD11	523.45338	3520.78263	12	7	1586.6	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD12	523.58063	3520.84863	12	7	1568.45	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD13	523.68913	3520.92888	12	7	1564.73	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD14	523.83538	3520.99963	12	7	1547.77	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD15	523.95313	3520.91938	12	7	1548.22	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD16	523.97213	3520.78738	12	7	1551.38	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD17	524.01463	3520.67413	12	7	1562.08	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD18	524.06638	3520.54213	12	7	1573.36	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD19	524.12763	3520.43363	12	7	1560.06	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITWD20	524.19363	3520.30638	12	7	1558.34	44.65	6.51	0.0056	2.5827	0.58571	4.1139
PITLP1	522.48413	3521.15913	12	7	1711.23	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP2	522.53488	3521.04688	12	7	1672.2	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP3	522.57663	3520.93613	12	7	1674.88	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP4	522.62463	3520.81488	12	7	1660.47	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP5	522.72763	3520.77163	12	7	1638.82	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP6	522.81888	3520.73263	12	7	1623	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP7	522.91463	3520.65938	12	7	1619.66	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP8	523.05513	3520.63713	12	7	1596.6	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP9	523.21688	3520.69088	12	7	1584.34	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP10	523.36488	3520.74013	12	7	1587.31	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP11	523.49038	3520.80013	12	7	1583.2	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP12	523.61463	3520.87188	12	7	1565.2	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP13	523.72513	3520.95263	12	7	1563.81	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP14	523.87338	3521.01388	12	7	1544.98	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP15	523.91813	3521.01538	12	7	1541.17	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP16	523.93763	3520.96913	12	7	1543.5	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP17	523.96163	3520.88538	12	7	1548.76	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP18	523.96888	3520.84188	12	7	1551.68	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP19	523.98238	3520.75663	12	7	1551.67	44.65	6.51	0.0056	2.5827	0.19920	0.8929
PITLP20	523.99738	3520.71938	12	7	1558.74	44.65	6.51	0.0056	2.5827	0.19920	0.8929

Table A1.2 Volume Sources Year 1 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITCR1	522.49888	3521.12463	12	7	1703.86	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR2	522.54538	3521.01838	12	7	1671.75	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR3	522.58713	3520.89863	12	7	1674.88	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR4	522.65888	3520.79713	12	7	1654.97	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR5	522.75763	3520.76413	12	7	1632.87	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR6	522.84438	3520.70738	12	7	1621.51	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR7	522.95963	3520.64588	12	7	1612.18	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR8	523.10463	3520.64738	12	7	1590.12	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR9	523.14188	3520.66088	12	7	1586.58	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR10	523.26013	3520.70438	12	7	1584	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR11	523.41113	3520.76038	12	7	1588.86	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR12	523.53538	3520.82163	12	7	1575.68	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR13	523.65188	3520.89788	12	7	1564.44	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR14	523.76413	3520.97863	12	7	1551.92	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR15	523.80888	3521.01438	12	7	1549.19	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR16	523.85538	3521.06013	12	7	1546.64	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR17	523.89413	3521.10338	12	7	1551.77	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR18	523.91963	3521.15863	12	7	1558.57	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR19	523.94513	3521.22313	12	7	1568.16	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR20	523.96888	3521.29488	12	7	1551.5	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR21	523.98838	3521.36963	12	7	1530.84	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR22	524.00188	3521.43538	12	7	1525.18	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR23	524.01538	3521.50263	12	7	1528.81	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR24	524.03338	3521.56563	12	7	1544.55	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR25	524.04088	3521.64788	12	7	1549.84	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PITCR26	524.04538	3521.70763	12	7	1542.79	44.65	6.51	0.0056	2.5827	0.18188	0.7486
PLNT1	524.30538	3521.88338	12	2	1530.34	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT2	524.28738	3521.85563	12	2	1518.56	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT3	524.27388	3521.83038	12	2	1510.89	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT4	524.25588	3521.80038	12	2	1507.7	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT5	524.23488	3521.76588	12	2	1516.48	44.65	1.86	0.0034	0.3412	0.15659	0.5454

Table A1.2 Volume Sources Year 1 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PLNT6	524.20063	3521.74063	12	2	1526.04	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT7	524.16613	3521.72113	12	2	1528.73	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT8	524.11988	3521.70163	12	2	1529.58	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT9	524.07638	3521.68663	12	2	1534.94	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT10	524.03613	3521.60438	12	2	1550.75	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT11	524.02413	3521.53563	12	2	1537.38	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT12	524.00763	3521.46538	12	2	1524.62	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT13	523.99263	3521.39663	12	2	1527.01	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT14	523.98063	3521.33063	12	2	1540.6	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT15	523.95688	3521.26188	12	2	1562.98	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT16	523.93138	3521.19163	12	2	1566.1	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT17	523.90738	3521.12738	12	2	1551.82	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT18	523.87463	3521.07788	12	2	1545.87	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT19	523.83413	3521.03613	12	2	1549.72	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT20	524.02713	3521.35913	12	2	1528	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT21	524.04963	3521.32913	12	2	1543.31	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT22	524.07338	3521.30388	12	2	1549.94	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT23	524.10038	3521.27688	12	2	1544.63	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT24	524.12588	3521.24388	12	2	1537.89	44.65	1.86	0.0034	0.3412	0.15659	0.5454
PLNT25	524.15113	3521.21863	12	2	1537.24	44.65	1.86	0.0034	0.3412	0.15659	0.5454
UNSUL1	523.94588	3521.70988	12	7	1560.13	4	6.51	0.0056	2.5827	0.17398	0.5051
UNSUL2	523.87813	3521.73013	12	7	1549.18	4	6.51	0.0056	2.5827	0.17398	0.5051
UNSUL3	523.90613	3521.80588	12	7	1549.02	4	6.51	0.0056	2.5827	0.17398	0.5051
UNSUL4	523.96338	3521.78863	12	7	1545.06	4	6.51	0.0056	2.5827	0.17398	0.5051
PC01	523.92413	3521.76013	12	6	1552.65	74	5.6	0.0000	0.0000	0.40736	0.6200
PC02	524.07788	3521.77388	12	0	1540.82	2.79	0.47	0.0000	0.0000	0.10352	0.6836
MD04	524.03375	3522.98234	12	3	1528.46	0.47	0.7	0.0000	0.0000	0.00004	0.0003
TDS04	524.603	3522.35009	12	3	1515.35	0.47	0.7	0.0000	0.0000	0.05825	0.1241
TDS05	524.80125	3522.46509	12	3	1546.06	0.47	0.7	0.0000	0.0000	0.05825	0.1241
TDS06	524.82438	3522.47588	12	3	1540.2	0.47	0.7	0.0000	0.0000	0.05825	0.1241
TDS07	524.90388	3522.51163	12	3	1526.18	0.47	0.7	0.0000	0.0000	0.05825	0.9471

Table A1.2 Volume Sources Year 1 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
TDS08	524.97313	3522.54538	12	3	1506.61	0.47	0.7	0.0000	0.0000	0.05825	0.9471
TDS09	525.05388	3522.58113	12	3	1486.08	0.47	0.7	0.0000	0.0000	0.05825	0.9471
TDS10	525.0982	3522.63125	12	6	1478.37	573	5.6	0.0000	0.0000	2.26721	3.4508
MS01	523.8915	3522.88584	12	3	1542.03	0.47	0.7	0.0000	0.0000	0.32902	0.3159
MS03	524.05075	3522.87134	12	3	1539.53	0.47	0.7	0.0000	0.0000	0.00320	0.0203
MS04	524.07869	3522.86162	12	3	1534.11	0.47	0.7	0.0000	0.0000	0.16451	0.1579
MS05-06	524.12338	3522.86938	12	3	1530.9	0.47	0.7	0.0000	0.0000	0.00012	0.0008
MS0708	524.198	3522.36809	12	3	1536.94	0.47	0.7	0.0000	0.0000	0.00001	0.0001

Table A1.3 Area Sources Year 1 Hourly Emissions

Source ID	Source Height (m)	Base Elevation (m)	Init. Sigma-z (m)	UTM Easting (X1) (km)	UTM Northing (Y1) (km)	UTM Easting (X2) (km)	UTM Northing (Y2) (km)	UTM Easting (X3) (km)	UTM Northing (Y3) (km)	UTM Easting (X4) (km)	UTM Northing (Y4) (km)	Zone	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
Pit	0	1667.61	0	522.3199	3521.271	523.0199	3521.271	523.0199	3522.271	522.3199	3522.271	12	6.55E-07	0.000142	1.55E-05	8.74E-05

Table A1.4 Point Sources Year 1 Annual Modeling

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp. (K)	Init. Sigma-y (m)	Init. Sigma-z (m)	Momentum Flux	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PCL01	524.07638	3521.78063	12	7.3152	1540.61	1.524	4.66	316.48	0	0	1	0.0000	0.0000	0.8064	1.2800
PCL02	523.85538	3522.54488	12	6.096	1555.98	1.8288	6.562	316.48	0	0	1	0.0000	0.0000	0.9324	2.5900
PCL03	523.86213	3522.66938	12	6.096	1549.64	1.8288	3.883	316.48	0	0	1	0.0000	0.0000	0.3852	1.0700
PCL04	523.89869	3522.87637	12	7.3152	1542.95	1.524	5.694	316.48	0	0	1	0.0000	0.0000	0.6864	1.5600
PCL05	524.033	3522.99259	12	7.3152	1526.57	1.8288	8.989	316.48	0	0	1	0.0000	0.0000	1.2780	3.5500
PCL06	524.04375	3522.99059	12	7.3152	1526.85	1.8288	8.989	316.48	0	0	1	0.0000	0.0000	1.2780	3.5500
PCL07	524.114	3522.93584	12	16.764	1540.76	0.3048	3.237	533.15	0	0	1	0.0000	0.0000	0.0190	0.0200
PCL08	524.034	3522.99934	12	6.096	1525.3	0.3048	9.708	366.48	0	0	1	0.0000	0.0000	0.0160	0.1066
PCL09	523.99138	3522.56788	12	6.096	1542.52	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
PCL10	524.00963	3522.56638	12	6.096	1542.95	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
PCL11	524.02938	3522.56513	12	6.096	1543.62	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
FB01	524.241	3522.38634	12	3.6576	1527.49	0.0914	39.685	810.93	0	0	1	0.0093	0.8759	0.0173	0.0723
FB02	524.2415	3522.80659	12	3.9624	1513.69	0.3048	24.994	749.82	0	0	1	0.0008	0.7550	0.0252	0.0252
FB03	524.10325	3522.35909	12	3.9624	1541.42	0.3048	24.994	749.82	0	0	1	0.0008	0.7550	0.0252	0.0252
FB04	523.8485	3522.94809	12	3.9624	1552.32	0.3048	24.994	749.82	0	0	1	0.0006	0.5663	0.0189	0.0189
FB05	524.493	3522.84459	12	3.9624	1520.88	0.3048	24.994	749.82	0	0	1	0.0006	0.5663	0.0189	0.0189
FB06	524.2425	3522.36634	12	3.6576	1530.17	0.0914	39.685	810.93	0	0	1	0.00004	0.0279	0.0025	0.0025
FB07	524.05825	3521.79159	12	2.7432	1537.69	0.0914	103.022	799.82	0	0	1	0.0002	0.1401	0.0075	0.0075
FB08	524.10575	3522.39684	12	2.7432	1538.95	0.0914	103.022	799.82	0	0	1	0.0002	0.1401	0.0075	0.0075

Table A1.5 Volume Sources Year 1 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
BLST1	522.51763	3521.97863	12	10	1558	14.186	9.3023	1.4444	12.2778	0.13677	2.3707
BLST2	522.75338	3521.97863	12	10	1558	14.186	9.3	1.4444	12.2778	0.13677	2.3707
BLST3	522.51013	3521.78838	12	10	1558	14.186	9.3023	1.4444	12.2778	0.13677	2.3707
BLST5	522.51013	3521.57538	12	10	1558	14.186	9.3	1.4444	12.2778	0.13677	2.3707
BLST4	522.75125	3521.78409	12	10	1558	14.1866	9.3	1.4444	12.2778	0.13677	2.3707
BLST6	522.75125	3521.57634	12	10	1558	14.186	9.3	1.4444	12.2778	0.13677	2.3707
UNLP1	524.51438	3520.93363	12	7	1522.15	4	6.51	0.0025	2.5693	0.07639	0.3722
UNLP2	524.52388	3520.72138	12	7	1513.32	4	6.51	0.0025	2.5693	0.07639	0.3722
UNLP3	524.25513	3520.71663	12	7	1545.24	4	6.51	0.0025	2.5693	0.07639	0.3722
UNLP4	524.25038	3520.93363	12	7	1537.09	4	6.51	0.0025	2.5693	0.07639	0.3722
UNLP5	523.74088	3520.75438	12	7	1569.95	4	6.51	0.0025	2.5693	0.07639	0.3722
UNLP6	523.78338	3520.52313	12	7	1575.25	4	6.51	0.0025	2.5693	0.07639	0.3722
UNWD1	524.11363	3520.25438	12	7	1574.41	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD2	524.18888	3520.11763	12	7	1554.71	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD3	524.24088	3519.97163	12	7	1553.64	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD4	523.96738	3520.21213	12	7	1578.15	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD5	524.02863	3520.05638	12	7	1588.5	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD6	524.09463	3519.89613	12	7	1561.5	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD7	523.88238	3519.99988	12	7	1588.32	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD8	523.94838	3519.84413	12	7	1593.74	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD9	523.78813	3519.79238	12	7	1567.33	4	6.51	0.0025	2.5693	0.11362	0.6181
UNWD10	523.63713	3519.87238	12	7	1590.97	4	6.51	0.0025	2.5693	0.11362	0.6181
PITWD1	522.47238	3521.19288	12	7	1701.05	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD2	522.50538	3521.06563	12	7	1687.2	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD3	522.55738	3520.98063	12	7	1667.66	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD4	522.59988	3520.84863	12	7	1666.66	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD5	522.69888	3520.78263	12	7	1646.64	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD6	522.79313	3520.74963	12	7	1624.64	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD7	522.87813	3520.67888	12	7	1620.5	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD8	523.01938	3520.63638	12	7	1601.32	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD9	523.17513	3520.67888	12	7	1585.8	44.65	6.51	0.0025	2.5693	0.37203	3.4430

Table A1.5 Volume Sources Year 1 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITWD10	523.32613	3520.72613	12	7	1586.6	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD11	523.45338	3520.78263	12	7	1586.6	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD12	523.58063	3520.84863	12	7	1568.45	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD13	523.68913	3520.92888	12	7	1564.73	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD14	523.83538	3520.99963	12	7	1547.77	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD15	523.95313	3520.91938	12	7	1548.22	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD16	523.97213	3520.78738	12	7	1551.38	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD17	524.01463	3520.67413	12	7	1562.08	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD18	524.06638	3520.54213	12	7	1573.36	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD19	524.12763	3520.43363	12	7	1560.06	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITWD20	524.19363	3520.30638	12	7	1558.34	44.65	6.51	0.0025	2.5693	0.37203	3.4430
PITLP1	522.48413	3521.15913	12	7	1711.23	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP2	522.53488	3521.04688	12	7	1672.2	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP3	522.57663	3520.93613	12	7	1674.88	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP4	522.62463	3520.81488	12	7	1660.47	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP5	522.72763	3520.77163	12	7	1638.82	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP6	522.81888	3520.73263	12	7	1623	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP7	522.91463	3520.65938	12	7	1619.66	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP8	523.05513	3520.63713	12	7	1596.6	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP9	523.21688	3520.69088	12	7	1584.34	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP10	523.36488	3520.74013	12	7	1587.31	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP11	523.49038	3520.80013	12	7	1583.2	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP12	523.61463	3520.87188	12	7	1565.2	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP13	523.72513	3520.95263	12	7	1563.81	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP14	523.87338	3521.01388	12	7	1544.98	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP15	523.91813	3521.01538	12	7	1541.17	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP16	523.93763	3520.96913	12	7	1543.5	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP17	523.96163	3520.88538	12	7	1548.76	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP18	523.96888	3520.84188	12	7	1551.68	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP19	523.98238	3520.75663	12	7	1551.67	44.65	6.51	0.0025	2.5693	0.10377	0.7604
PITLP20	523.99738	3520.71938	12	7	1558.74	44.65	6.51	0.0025	2.5693	0.10377	0.7604

Table A1.5 Volume Sources Year 1 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITCR1	522.49888	3521.12463	12	7	1703.86	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR2	522.54538	3521.01838	12	7	1671.75	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR3	522.58713	3520.89863	12	7	1674.88	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR4	522.65888	3520.79713	12	7	1654.97	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR5	522.75763	3520.76413	12	7	1632.87	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR6	522.84438	3520.70738	12	7	1621.51	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR7	522.95963	3520.64588	12	7	1612.18	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR8	523.10463	3520.64738	12	7	1590.12	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR9	523.14188	3520.66088	12	7	1586.58	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR10	523.26013	3520.70438	12	7	1584	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR11	523.41113	3520.76038	12	7	1588.86	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR12	523.53538	3520.82163	12	7	1575.68	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR13	523.65188	3520.89788	12	7	1564.44	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR14	523.76413	3520.97863	12	7	1551.92	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR15	523.80888	3521.01438	12	7	1549.19	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR16	523.85538	3521.06013	12	7	1546.64	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR17	523.89413	3521.10338	12	7	1551.77	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR18	523.91963	3521.15863	12	7	1558.57	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR19	523.94513	3521.22313	12	7	1568.16	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR20	523.96888	3521.29488	12	7	1551.5	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR21	523.98838	3521.36963	12	7	1530.84	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR22	524.00188	3521.43538	12	7	1525.18	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR23	524.01538	3521.50263	12	7	1528.81	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR24	524.03338	3521.56563	12	7	1544.55	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR25	524.04088	3521.64788	12	7	1549.84	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PITCR26	524.04538	3521.70763	12	7	1542.79	44.65	6.51	0.0025	2.5693	0.09174	0.6401
PLNT1	524.30538	3521.88338	12	2	1530.34	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT2	524.28738	3521.85563	12	2	1518.56	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT3	524.27388	3521.83038	12	2	1510.89	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT4	524.25588	3521.80038	12	2	1507.7	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT5	524.23488	3521.76588	12	2	1516.48	44.65	1.86	0.0005	0.5071	0.06495	0.4601

Table A1.5 Volume Sources Year 1 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PLNT6	524.20063	3521.74063	12	2	1526.04	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT7	524.16613	3521.72113	12	2	1528.73	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT8	524.11988	3521.70163	12	2	1529.58	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT9	524.07638	3521.68663	12	2	1534.94	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT10	524.03613	3521.60438	12	2	1550.75	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT11	524.02413	3521.53563	12	2	1537.38	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT12	524.00763	3521.46538	12	2	1524.62	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT13	523.99263	3521.39663	12	2	1527.01	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT14	523.98063	3521.33063	12	2	1540.6	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT15	523.95688	3521.26188	12	2	1562.98	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT16	523.93138	3521.19163	12	2	1566.1	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT17	523.90738	3521.12738	12	2	1551.82	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT18	523.87463	3521.07788	12	2	1545.87	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT19	523.83413	3521.03613	12	2	1549.72	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT20	524.02713	3521.35913	12	2	1528	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT21	524.04963	3521.32913	12	2	1543.31	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT22	524.07338	3521.30388	12	2	1549.94	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT23	524.10038	3521.27688	12	2	1544.63	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT24	524.12588	3521.24388	12	2	1537.89	44.65	1.86	0.0005	0.5071	0.06495	0.4601
PLNT25	524.15113	3521.21863	12	2	1537.24	44.65	1.86	0.0005	0.5071	0.06495	0.4601
UNSUL1	523.94588	3521.70988	12	7	1560.13	4	6.51	0.0025	2.5693	0.04678	0.1766
UNSUL2	523.87813	3521.73013	12	7	1549.18	4	6.51	0.0025	2.5693	0.04678	0.1766
UNSUL3	523.90613	3521.80588	12	7	1549.02	4	6.51	0.0025	2.5693	0.04678	0.1766
UNSUL4	523.96338	3521.78863	12	7	1545.06	4	6.51	0.0025	2.5693	0.04678	0.1766
PC01	523.92413	3521.76013	12	6	1552.65	74	5.6	0.0000	0.0000	0.09300	0.6200
PC02	524.07788	3521.77388	12	0	1540.82	2.79	0.47	0.0000	0.0000	0.03662	0.2418
MD04	524.03375	3522.98234	12	3	1528.46	0.47	0.7	0.0000	0.0000	0.00001	0.0001
TDS04	524.603	3522.35009	12	3	1515.35	0.47	0.7	0.0000	0.0000	0.00532	0.0352
TDS05	524.80125	3522.46509	12	3	1546.06	0.47	0.7	0.0000	0.0000	0.00532	0.0352
TDS06	524.82438	3522.47588	12	3	1540.2	0.47	0.7	0.0000	0.0000	0.00532	0.0352
TDS07	524.90388	3522.51163	12	3	1526.18	0.47	0.7	0.0000	0.0000	0.04062	0.2682

Table A1.5 Volume Sources Year 1 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
TDS08	524.97313	3522.54538	12	3	1506.61	0.47	0.7	0.0000	0.0000	0.04062	0.2682
TDS09	525.05388	3522.58113	12	3	1486.08	0.47	0.7	0.0000	0.0000	0.04062	0.2682
TDS10	525.0982	3522.63125	12	6	1478.37	573	5.6	0.0000	0.0000	0.51763	3.4508
MS01	523.8915	3522.88584	12	3	1542.03	0.47	0.7	0.0000	0.0000	0.26322	0.2632
MS03	524.05075	3522.87134	12	3	1539.53	0.47	0.7	0.0000	0.0000	0.00256	0.0169
MS04	524.07869	3522.86162	12	3	1534.11	0.47	0.7	0.0000	0.0000	0.13161	0.1316
MS05-06	524.12338	3522.86938	12	3	1530.9	0.47	0.7	0.0000	0.0000	0.00009	0.0006
MS0708	524.198	3522.36809	12	3	1536.94	0.47	0.7	0.0000	0.0000	0.00001	0.0001

Table A1.6 Area Sources Year 1 Annual Emissions

Source ID	Source Height (m)	Base Elevation (m)	Init. Sigma-z (m)	UTM Easting (X1) (km)	UTM Northing (Y1) (km)	UTM Easting (X2) (km)	UTM Northing (Y2) (km)	UTM Easting (X3) (km)	UTM Northing (Y3) (km)	UTM Easting (X4) (km)	UTM Northing (Y4) (km)	Zone	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
Pit	0	1667.61	0	522.3199	3521.271	523.0199	3521.271	523.0199	3522.271	522.3199	3522.271	12	1.71E-07	1.62E-04	1.23E-05	6.77E-05

Table A1.7 Point Sources Year 5 Hourly Modeling

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp. (K)	Init. Sigma-y (m)	Init. Sigma-z (m)	Momentum Flux	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PCL01	524.07638	3521.78063	12	7.3152	1540.61	1.524	4.66	316.48	0	0	1	0.0000	0.0000	0.8064	1.2800
PCL02	523.85538	3522.54488	12	6.096	1555.98	1.8288	6.562	316.48	0	0	1	0.0000	0.0000	0.9324	2.5900
PCL03	523.86213	3522.66938	12	6.096	1549.64	1.8288	3.883	316.48	0	0	1	0.0000	0.0000	0.3852	1.0700
PCL04	523.89869	3522.87637	12	7.3152	1542.95	1.524	5.694	316.48	0	0	1	0.0000	0.0000	0.6864	1.5600
PCL05	524.033	3522.99259	12	7.3152	1526.57	1.8288	8.989	316.48	0	0	1	0.0000	0.0000	1.2780	3.5500
PCL06	524.04375	3522.99059	12	7.3152	1526.85	1.8288	8.989	316.48	0	0	1	0.0000	0.0000	1.2780	3.5500
PCL07	524.114	3522.93584	12	16.764	1540.76	0.3048	3.237	533.15	0	0	1	0.0000	0.0000	0.0190	0.0200
PCL08	524.034	3522.99934	12	6.096	1525.3	0.3048	9.708	366.48	0	0	1	0.0000	0.0000	0.0160	0.1066
PCL09	523.99138	3522.56788	12	6.096	1542.52	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
PCL10	524.00963	3522.56638	12	6.096	1542.95	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
PCL11	524.02938	3522.56513	12	6.096	1543.62	0.509	23.204	316.48	0	0	1	0.0000	0.0000	0.1563	0.2369
FB01	524.241	3522.38634	12	3.6576	1527.49	0.0914	39.685	810.93	0	0	1	0.0093	0.8759	0.0173	0.0723
FB02	524.2415	3522.80659	12	3.9624	1513.69	0.3048	24.994	749.82	0	0	1	0.0146	13.2277	0.4409	0.4409
FB03	524.10325	3522.35909	12	3.9624	1541.42	0.3048	24.994	749.82	0	0	1	0.0146	13.2277	0.4409	0.4409
FB04	523.8485	3522.94809	12	3.9624	1552.32	0.3048	24.994	749.82	0	0	1	0.0109	9.9208	0.3307	0.3307
FB05	524.493	3522.84459	12	3.9624	1520.88	0.3048	24.994	749.82	0	0	1	0.0109	9.9208	0.3307	0.3307
FB06	524.2425	3522.36634	12	3.6576	1530.17	0.0914	39.685	810.93	0	0	1	0.0007	0.4885	0.0441	0.0441
FB07	524.05825	3521.79159	12	2.7432	1537.69	0.0914	103.022	799.82	0	0	1	0.0043	2.4550	0.1315	0.1315
FB08	524.10575	3522.39684	12	2.7432	1538.95	0.0914	103.022	799.82	0	0	1	0.0043	2.4550	0.1315	0.1315

Table A1.8 Volume Sources Year 5 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
BLST1	522.51763	3521.97863	12	10	1558	14.186	9.3023	2.89	24.56	0.2735	4.7415
BLST2	522.75338	3521.97863	12	10	1558	14.186	9.3	2.89	24.56	0.2735	4.7415
BLST3	522.51013	3521.78838	12	10	1558	14.186	9.3023	2.89	24.56	0.2735	4.7415
BLST5	522.51013	3521.57538	12	10	1558	14.186	9.3	2.89	24.56	0.2735	4.7415
BLST4	522.75125	3521.78409	12	10	1558	14.1866	9.3	2.89	24.56	0.2735	4.7415
BLST6	522.75125	3521.57634	12	10	1558	14.186	9.3	2.89	24.56	0.2735	4.7415
PITWD1	522.47238	3521.19288	12	7	1701.05	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD2	522.50538	3521.06563	12	7	1687.2	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD3	522.55738	3520.98063	12	7	1667.66	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD4	522.59988	3520.84863	12	7	1666.66	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD5	522.69888	3520.78263	12	7	1646.64	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD6	522.79313	3520.74963	12	7	1624.64	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD7	522.87813	3520.67888	12	7	1620.5	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD8	523.01938	3520.63638	12	7	1601.32	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD9	523.17513	3520.67888	12	7	1585.8	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD10	523.32613	3520.72613	12	7	1586.6	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD11	523.45338	3520.78263	12	7	1586.6	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD12	523.58063	3520.84863	12	7	1568.45	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD13	523.68913	3520.92888	12	7	1564.73	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITWD14	523.83538	3520.99963	12	7	1547.77	44.65	6.51	0.0048	2.0114	0.5560	4.8571
PITLP1	522.48413	3521.15913	12	7	1711.23	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP2	522.53488	3521.04688	12	7	1672.2	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP3	522.57663	3520.93613	12	7	1674.88	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP4	522.62463	3520.81488	12	7	1660.47	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP5	522.72763	3520.77163	12	7	1638.82	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP6	522.81888	3520.73263	12	7	1623	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP7	522.91463	3520.65938	12	7	1619.66	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP8	523.05513	3520.63713	12	7	1596.6	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP9	523.21688	3520.69088	12	7	1584.34	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP10	523.36488	3520.74013	12	7	1587.31	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP11	523.49038	3520.80013	12	7	1583.2	44.65	6.51	0.0048	2.0114	0.0899	0.1965

Table A1.8 Volume Sources Year 5 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITLP12	523.61463	3520.87188	12	7	1565.2	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP13	523.72513	3520.95263	12	7	1563.81	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP14	523.87338	3521.01388	12	7	1544.98	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITLP15	523.91813	3521.01538	12	7	1541.17	44.65	6.51	0.0048	2.0114	0.0899	0.1965
PITCR1	522.49888	3521.12463	12	7	1703.86	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR2	522.54538	3521.01838	12	7	1671.75	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR3	522.58713	3520.89863	12	7	1674.88	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR4	522.65888	3520.79713	12	7	1654.97	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR5	522.75763	3520.76413	12	7	1632.87	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR6	522.84438	3520.70738	12	7	1621.51	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR7	522.95963	3520.64588	12	7	1612.18	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR8	523.10463	3520.64738	12	7	1590.12	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR9	523.14188	3520.66088	12	7	1586.58	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR10	523.26013	3520.70438	12	7	1584	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR11	523.41113	3520.76038	12	7	1588.86	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR12	523.53538	3520.82163	12	7	1575.68	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR13	523.65188	3520.89788	12	7	1564.44	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR14	523.76413	3520.97863	12	7	1551.92	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR15	523.80888	3521.01438	12	7	1549.19	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR16	523.85538	3521.06013	12	7	1546.64	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR17	523.89413	3521.10338	12	7	1551.77	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR18	523.91963	3521.15863	12	7	1558.57	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR19	523.94513	3521.22313	12	7	1568.16	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR20	523.96888	3521.29488	12	7	1551.5	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR21	523.98838	3521.36963	12	7	1530.84	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR22	524.00188	3521.43538	12	7	1525.18	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR23	524.01538	3521.50263	12	7	1528.81	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR24	524.03338	3521.56563	12	7	1544.55	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR25	524.04088	3521.64788	12	7	1549.84	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PITCR26	524.04538	3521.70763	12	7	1542.79	44.65	6.51	0.0048	2.0114	0.1819	1.1160
PLNT1	524.30538	3521.88338	12	2	1530.34	44.65	1.86	0.0032	0.3446	0.0754	0.5498

Table A1.8 Volume Sources Year 5 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PLNT2	524.28738	3521.85563	12	2	1518.56	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT3	524.27388	3521.83038	12	2	1510.89	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT4	524.25588	3521.80038	12	2	1507.7	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT5	524.23488	3521.76588	12	2	1516.48	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT6	524.20063	3521.74063	12	2	1526.04	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT7	524.16613	3521.72113	12	2	1528.73	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT8	524.11988	3521.70163	12	2	1529.58	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT9	524.07638	3521.68663	12	2	1534.94	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT10	524.03613	3521.60438	12	2	1550.75	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT11	524.02413	3521.53563	12	2	1537.38	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT12	524.00763	3521.46538	12	2	1524.62	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT13	523.99263	3521.39663	12	2	1527.01	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT14	523.98063	3521.33063	12	2	1540.6	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT15	523.95688	3521.26188	12	2	1562.98	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT16	523.93138	3521.19163	12	2	1566.1	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT17	523.90738	3521.12738	12	2	1551.82	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT18	523.87463	3521.07788	12	2	1545.87	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT19	523.83413	3521.03613	12	2	1549.72	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT20	524.02713	3521.35913	12	2	1528	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT21	524.04963	3521.32913	12	2	1543.31	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT22	524.07338	3521.30388	12	2	1549.94	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT23	524.10038	3521.27688	12	2	1544.63	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT24	524.12588	3521.24388	12	2	1537.89	44.65	1.86	0.0032	0.3446	0.0754	0.5498
PLNT25	524.15113	3521.21863	12	2	1537.24	44.65	1.86	0.0032	0.3446	0.0754	0.5498
UNSUL1	523.94588	3521.70988	12	7	1560.13	4	6.51	0.0048	2.0114	0.1634	0.6601
UNSUL2	523.87813	3521.73013	12	7	1549.18	4	6.51	0.0048	2.0114	0.1634	0.6601
UNSUL3	523.90613	3521.80588	12	7	1549.02	4	6.51	0.0048	2.0114	0.1634	0.6601
UNSUL4	523.96338	3521.78863	12	7	1545.06	4	6.51	0.0048	2.0114	0.1634	0.6601
PC01	523.92413	3521.76013	12	6	1552.65	74	5.6	0.0000	0.0000	0.0930	0.6200
PC02	524.07788	3521.77388	12	0	1540.82	2.79	0.47	0.0000	0.0000	0.1035	0.6836
MD04	524.03375	3522.98234	12	3	1528.46	0.47	0.7	0.0000	0.0000	0.0000	0.0003

Table A1.8 Volume Sources Year 5 Hourly Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
TDS04	524.603	3522.35009	12	3	1515.35	0.47	0.7	0.0000	0.0000	0.0188	0.1241
TDS05	524.80125	3522.46509	12	3	1546.06	0.47	0.7	0.0000	0.0000	0.0188	0.1241
TDS06	524.82438	3522.47588	12	3	1540.2	0.47	0.7	0.0000	0.0000	0.0188	0.1241
TDS07	524.90388	3522.51163	12	3	1526.18	0.47	0.7	0.0000	0.0000	0.1434	0.9471
TDS08	524.97313	3522.54538	12	3	1506.61	0.47	0.7	0.0000	0.0000	0.1434	0.9471
TDS09	525.05388	3522.58113	12	3	1486.08	0.47	0.7	0.0000	0.0000	0.1434	0.9471
TDS10	525.0982	3522.63125	12	6	1478.37	573	5.6	0.0000	0.0000	0.5176	3.4508
MS01	523.8915	3522.88584	12	3	1542.03	0.47	0.7	0.0000	0.0000	0.3159	0.3159
MS03	524.05075	3522.87134	12	3	1539.53	0.47	0.7	0.0000	0.0000	0.0031	0.0203
MS04	524.07869	3522.86162	12	3	1534.11	0.47	0.7	0.0000	0.0000	0.1579	0.1579
MS05-06	524.12338	3522.86938	12	3	1530.9	0.47	0.7	0.0000	0.0000	0.0001	0.0008
MS0708	524.198	3522.36809	12	3	1536.94	0.47	0.7	0.0000	0.0000	0.00001	0.0001

Table A1.9 Area Sources Year 5 Hourly Emissions

Source ID	Source Height (m)	Base Elevation (m)	Init. Sigma-z (m)	UTM Easting (X1) (km)	UTM Northing (Y1) (km)	UTM Easting (X2) (km)	UTM Northing (Y2) (km)	UTM Easting (X3) (km)	UTM Northing (Y3) (km)	UTM Easting (X4) (km)	UTM Northing (Y4) (km)	Zone	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PIT	0	1665.93	0	522.31988	3521.27113	523.01988	3521.27113	523.01988	3522.27113	522.31988	3522.27113	12	7.00E-07	2.13E-04	2.37E-05	1.56E-04
PIT2	0	1645.92	0	523.1614374	3520.551622	524.37433	3521.25232	524.97359	3520.2108	523.762	3519.51288	12	7.71E-08	3.23E-05	3.30E-06	2.09E-05

Table A1.10 Point Sources Year 5 Annual Modeling

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp. (K)	Init. Sigma-y (m)	Init. Sigma-z (m)	Momentum Flux	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PCL01	524.07638	3521.78063	12	7.3152	1540.61	1.524	4.66	316.48	0	0	1	0.00000	0.00000	0.8064	1.2800
PCL02	523.85538	3522.54488	12	6.096	1555.98	1.8288	6.562	316.48	0	0	1	0.00000	0.00000	0.9324	2.5900
PCL03	523.86213	3522.66938	12	6.096	1549.64	1.8288	3.883	316.48	0	0	1	0.00000	0.00000	0.3852	1.0700
PCL04	523.89869	3522.87637	12	7.3152	1542.95	1.524	5.694	316.48	0	0	1	0.00000	0.00000	0.6864	1.5600
PCL05	524.033	3522.99259	12	7.3152	1526.57	1.8288	8.989	316.48	0	0	1	0.00000	0.00000	1.2780	3.5500
PCL06	524.04375	3522.99059	12	7.3152	1526.85	1.8288	8.989	316.48	0	0	1	0.00000	0.00000	1.2780	3.5500
PCL07	524.114	3522.93584	12	16.764	1540.76	0.3048	3.237	533.15	0	0	1	0.00000	0.00000	0.0190	0.0200
PCL08	524.034	3522.99934	12	6.096	1525.3	0.3048	9.708	366.48	0	0	1	0.00000	0.00000	0.0160	0.1066
PCL09	523.99138	3522.56788	12	6.096	1542.52	0.509	23.204	316.48	0	0	1	0.00000	0.00000	0.1563	0.2369
PCL10	524.00963	3522.56638	12	6.096	1542.95	0.509	23.204	316.48	0	0	1	0.00000	0.00000	0.1563	0.2369
PCL11	524.02938	3522.56513	12	6.096	1543.62	0.509	23.204	316.48	0	0	1	0.00000	0.00000	0.1563	0.2369
FB01	524.241	3522.38634	12	3.6576	1527.49	0.0914	39.685	810.93	0	0	1	0.00933	0.87591	0.0173	0.0723
FB02	524.2415	3522.80659	12	3.9624	1513.69	0.3048	24.994	749.82	0	0	1	0.00083	0.75501	0.2517	0.0252
FB03	524.10325	3522.35909	12	3.9624	1541.42	0.3048	24.994	749.82	0	0	1	0.00083	0.75501	0.2517	0.0252
FB04	523.8485	3522.94809	12	3.9624	1552.32	0.3048	24.994	749.82	0	0	1	0.00062	0.56626	0.1888	0.0189
FB05	524.493	3522.84459	12	3.9624	1520.88	0.3048	24.994	749.82	0	0	1	0.00062	0.56626	0.1888	0.0189
FB06	524.2425	3522.36634	12	3.6576	1530.17	0.0914	39.685	810.93	0	0	1	0.00004	0.02788	0.0252	0.0025
FB07	524.05825	3521.79159	12	2.7432	1537.69	0.0914	103.022	799.82	0	0	1	0.00025	0.14013	0.0751	0.0075
FB08	524.10575	3522.39684	12	2.7432	1538.95	0.0914	103.022	799.82	0	0	1	0.00025	0.14013	0.0751	0.0075

Table A1.11 Volume Sources Year 5 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
BLST1	522.51763	3521.97863	12	10	1558	14.186	9.3023	1.3772	11.7059	0.1304	2.2603
BLST2	522.75338	3521.97863	12	10	1558	14.186	9.3	1.3772	11.7059	0.1304	2.2603
BLST3	522.51013	3521.78838	12	10	1558	14.186	9.3023	1.3772	11.7059	0.1304	2.2603
BLST5	522.51013	3521.57538	12	10	1558	14.186	9.3	1.3772	11.7059	0.1304	2.2603
BLST4	522.75125	3521.78409	12	10	1558	14.1866	9.3	1.3772	11.7059	0.1304	2.2603
BLST6	522.75125	3521.57634	12	10	1558	14.186	9.3	1.3772	11.7059	0.1304	2.2603
PITWD1	522.47238	3521.19288	12	7	1701.05	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD2	522.50538	3521.06563	12	7	1687.2	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD3	522.55738	3520.98063	12	7	1667.66	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD4	522.59988	3520.84863	12	7	1666.66	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD5	522.69888	3520.78263	12	7	1646.64	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD6	522.79313	3520.74963	12	7	1624.64	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD7	522.87813	3520.67888	12	7	1620.5	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD8	523.01938	3520.63638	12	7	1601.32	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD9	523.17513	3520.67888	12	7	1585.8	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD10	523.32613	3520.72613	12	7	1586.6	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD11	523.45338	3520.78263	12	7	1586.6	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD12	523.58063	3520.84863	12	7	1568.45	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD13	523.68913	3520.92888	12	7	1564.73	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITWD14	523.83538	3520.99963	12	7	1547.77	44.65	6.51	0.0020	1.8509	0.3655	3.4513
PITLP1	522.48413	3521.15913	12	7	1711.23	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP2	522.53488	3521.04688	12	7	1672.2	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP3	522.57663	3520.93613	12	7	1674.88	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP4	522.62463	3520.81488	12	7	1660.47	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP5	522.72763	3520.77163	12	7	1638.82	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP6	522.81888	3520.73263	12	7	1623	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP7	522.91463	3520.65938	12	7	1619.66	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP8	523.05513	3520.63713	12	7	1596.6	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP9	523.21688	3520.69088	12	7	1584.34	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP10	523.36488	3520.74013	12	7	1587.31	44.65	6.51	0.0020	1.8509	0.0421	0.2166

Table A1.11 Volume Sources Year 5 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PITLP11	523.49038	3520.80013	12	7	1583.2	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP12	523.61463	3520.87188	12	7	1565.2	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP13	523.72513	3520.95263	12	7	1563.81	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP14	523.87338	3521.01388	12	7	1544.98	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITLP15	523.91813	3521.01538	12	7	1541.17	44.65	6.51	0.0020	1.8509	0.0421	0.2166
PITCR1	522.49888	3521.12463	12	7	1703.86	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR2	522.54538	3521.01838	12	7	1671.75	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR3	522.58713	3520.89863	12	7	1674.88	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR4	522.65888	3520.79713	12	7	1654.97	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR5	522.75763	3520.76413	12	7	1632.87	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR6	522.84438	3520.70738	12	7	1621.51	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR7	522.95963	3520.64588	12	7	1612.18	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR8	523.10463	3520.64738	12	7	1590.12	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR9	523.14188	3520.66088	12	7	1586.58	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR10	523.26013	3520.70438	12	7	1584	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR11	523.41113	3520.76038	12	7	1588.86	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR12	523.53538	3520.82163	12	7	1575.68	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR13	523.65188	3520.89788	12	7	1564.44	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR14	523.76413	3520.97863	12	7	1551.92	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR15	523.80888	3521.01438	12	7	1549.19	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR16	523.85538	3521.06013	12	7	1546.64	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR17	523.89413	3521.10338	12	7	1551.77	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR18	523.91963	3521.15863	12	7	1558.57	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR19	523.94513	3521.22313	12	7	1568.16	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR20	523.96888	3521.29488	12	7	1551.5	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR21	523.98838	3521.36963	12	7	1530.84	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR22	524.00188	3521.43538	12	7	1525.18	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR23	524.01538	3521.50263	12	7	1528.81	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR24	524.03338	3521.56563	12	7	1544.55	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR25	524.04088	3521.64788	12	7	1549.84	44.65	6.51	0.0020	1.8509	0.1059	0.8548
PITCR26	524.04538	3521.70763	12	7	1542.79	44.65	6.51	0.0020	1.8509	0.1059	0.8548

Table A1.11 Volume Sources Year 5 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PLNT1	524.30538	3521.88338	12	2	1530.34	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT2	524.28738	3521.85563	12	2	1518.56	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT3	524.27388	3521.83038	12	2	1510.89	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT4	524.25588	3521.80038	12	2	1507.7	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT5	524.23488	3521.76588	12	2	1516.48	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT6	524.20063	3521.74063	12	2	1526.04	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT7	524.16613	3521.72113	12	2	1528.73	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT8	524.11988	3521.70163	12	2	1529.58	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT9	524.07638	3521.68663	12	2	1534.94	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT10	524.03613	3521.60438	12	2	1550.75	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT11	524.02413	3521.53563	12	2	1537.38	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT12	524.00763	3521.46538	12	2	1524.62	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT13	523.99263	3521.39663	12	2	1527.01	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT14	523.98063	3521.33063	12	2	1540.6	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT15	523.95688	3521.26188	12	2	1562.98	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT16	523.93138	3521.19163	12	2	1566.1	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT17	523.90738	3521.12738	12	2	1551.82	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT18	523.87463	3521.07788	12	2	1545.87	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT19	523.83413	3521.03613	12	2	1549.72	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT20	524.02713	3521.35913	12	2	1528	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT21	524.04963	3521.32913	12	2	1543.31	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT22	524.07338	3521.30388	12	2	1549.94	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT23	524.10038	3521.27688	12	2	1544.63	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT24	524.12588	3521.24388	12	2	1537.89	44.65	1.86	0.0005	0.3175	0.0649	0.5104
PLNT25	524.15113	3521.21863	12	2	1537.24	44.65	1.86	0.0005	0.3175	0.0649	0.5104
UNSUL1	523.94588	3521.70988	12	7	1560.13	4	6.51	0.0020	1.8509	0.0415	0.1980
UNSUL2	523.87813	3521.73013	12	7	1549.18	4	6.51	0.0020	1.8509	0.0415	0.1980
UNSUL3	523.90613	3521.80588	12	7	1549.02	4	6.51	0.0020	1.8509	0.0415	0.1980
UNSUL4	523.96338	3521.78863	12	7	1545.06	4	6.51	0.0020	1.8509	0.0415	0.1980
PC01	523.92413	3521.76013	12	6	1552.65	74	5.6	0.0000	0.0000	0.0930	0.6200
PC02	524.07788	3521.77388	12	0	1540.82	2.79	0.47	0.0000	0.0000	0.0465	0.3074

Table A1.11 Volume Sources Year 5 Annual Emissions

Source ID	UTM Easting (X) (km)	UTM Northing (Y) (km)	Zone	Source Height (m)	Base Elevation (m)	Init. Sigma-y (m)	Init. Sigma-z (m)	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
MD04	524.03375	3522.98234	12	3	1528.46	0.47	0.7	0.0000	0.0000	0.0000	0.0001
TDS04	524.603	3522.35009	12	3	1515.35	0.47	0.7	0.0000	0.0000	0.0068	0.0447
TDS05	524.80125	3522.46509	12	3	1546.06	0.47	0.7	0.0000	0.0000	0.0068	0.0447
TDS06	524.82438	3522.47588	12	3	1540.2	0.47	0.7	0.0000	0.0000	0.0068	0.0447
TDS07	524.90388	3522.51163	12	3	1526.18	0.47	0.7	0.0000	0.0000	0.0516	0.3410
TDS08	524.97313	3522.54538	12	3	1506.61	0.47	0.7	0.0000	0.0000	0.0516	0.3410
TDS09	525.05388	3522.58113	12	3	1486.08	0.47	0.7	0.0000	0.0000	0.0516	0.3410
TDS10	525.0982	3522.63125	12	6	1478.37	573	5.6	0.0000	0.0000	0.5176	3.4508
MS01	523.8915	3522.88584	12	3	1542.03	0.47	0.7	0.0000	0.0000	0.2632	0.2632
MS03	524.05075	3522.87134	12	3	1539.53	0.47	0.7	0.0000	0.0000	0.0026	0.0169
MS04	524.07869	3522.86162	12	3	1534.11	0.47	0.7	0.0000	0.0000	0.1316	0.1316
MS05-06	524.12338	3522.86938	12	3	1530.9	0.47	0.7	0.0000	0.0000	0.0001	0.0006
MS0708	524.198	3522.36809	12	3	1536.94	0.47	0.7	0.0000	0.0000	0.00001	0.0001

Table A1.9 Area Sources Year 5 Annual Emissions

Source ID	Source Height (m)	Base Elevation (m)	Init. Sigma-z (m)	UTM Easting (X1) (km)	UTM Northing (Y1) (km)	UTM Easting (X2) (km)	UTM Northing (Y2) (km)	UTM Easting (X3) (km)	UTM Northing (Y3) (km)	UTM Easting (X4) (km)	UTM Northing (Y4) (km)	Zone	SO2 (lb/hr)	NOX (lb/hr)	PM25 (lb/hr)	PM10 (lb/hr)
PIT	0	1665.93	0	522.31988	3521.27113	523.01988	3521.27113	523.01988	3522.27113	522.31988	3522.27113	12	2.33E-07	1.97E-04	1.87E-05	1.21E-04
PIT2	0	1645.92	0	523.1614374	3520.551622	524.37433	3521.25232	524.97359	3520.2108	523.762	3519.51288	12	3.17E-08	2.97E-05	2.07E-06	1.62E-05