

**RECEIVED**

JUL 23 2009

**BUREAU OF AIR REGULATION**

**BART EXEMPTION ANALYSIS  
FOR  
CF INDUSTRIES  
PLANT CITY, FLORIDA**

**Prepared For:**

**CF Industries  
Plant City Phosphate Complex  
Plant City, Florida 32653**

**Prepared By:**

**Golder Associates Inc.  
6026 NW 1st Place  
Gainesville, Florida 32607**

**July 2009**

**063-7558**

**DISTRIBUTION:**

**4 Copies – FDEP**

**1 Copy – CF Industries**

**2 Copies – Golder Associates Inc.**

**TABLE OF CONTENTS**

<u>SECTION</u>	<u>PAGE</u>
1.0 SUMMARY .....	1-1
2.0 DESCRIPTION OF BART-ELIGIBLE EMISSIONS UNITS .....	2-1
2.1 "A" and "B" SAPs (EU002 and EU003) .....	2-1
2.2 "C" and "D" SAPs (EU007 and EU008) .....	2-2
2.3 "A" DAP/MAP Plant (EU010) .....	2-2
2.4 "Z" DAP/MAP (EU011), "X" DAP/MAP (EU012), and "Y" DAP/MAP (EU013) Plants .....	2-4
2.5 "A" Shipping Baghouse (EU015) and "B" Shipping Baghouse (EU018) .....	2-5
2.6 Emission Reduction Scenarios .....	2-5
2.6.1 Scenario A – Reduced Production Scenario .....	2-5
2.6.2 Scenario B – Converter Replacement Scenario .....	2-7
2.6.3 Scenario C – Emissions Cap Scenario .....	2-9
2.6.4 Implementation of New Emission Limits .....	2-10
2.7 PSD Applicability .....	2-11
3.0 BART EXEMPTION ANALYSIS AND RESULTS .....	3-1
3.1 Emission Rates .....	3-1
3.2 Modeling Methodology .....	3-1
3.3 BART Exemption Modeling Results .....	3-2
4.0 REFERENCES .....	4-1

## TABLE OF CONTENTS

(continued)

### LIST OF TABLES

Table 2-1	BART Eligibility Analysis for CF Industries – Plant City Facility
Table 2-2	Summary of Stack and Operating Parameters and Locations for the BART-eligible Emissions Units
Table 2-3	Summary of Maximum 24-hour Average Emission Rates for the BART-eligible Emissions Units
Table 2-4	Summary of 24-hour Average Emission Rates for the BART-eligible Emissions Units, Scenario A – Reduced Production Scenario
Table 2-5	Summary of 24-hour Average Emission Rates for the BART-eligible Emissions Units, Scenario B – Converter Modification Scenario
Table 2-6	Summary of 24-hour Average Emission Rates for the BART-eligible Emissions Units, Scenario C – Emissions Cap Scenario
Table 3-1	Summary of BART Exemption Modeling Results – 1999 IMPROVE Algorithm
Table 3-2	BART Exemption Analysis Results, Visibility Impact Rankings at Class I Areas – 1999 IMPROVE Algorithm
Table 3-3	Summary of BART Exemption Modeling Results – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario A
Table 3-4	Visibility Impact Rankings at the CNWA – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario A
Table 3-5	Summary of BART Exemption Modeling Results – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario B
Table 3-6	Visibility Impact Rankings at the CNWA – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario B
Table 3-7	Summary of BART Exemption Modeling Results – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario C
Table 3-8	Visibility Impact Rankings at the CNWA – New IMPROVE Algorithm, with Proposed 24-Hour Average Emission Limits from Scenario C

### LIST OF FIGURES

Figure 1-1 Facility Location and PSD-Class I Areas Within 300 km

### LIST OF APPENDICES

Appendix A	Air Modeling Protocol to Evaluate BART Options for the CFI Plant City Facility
Appendix B	FDEP Application Forms

**TABLE OF CONTENTS**  
(continued)

LIST OF ACRONYMS AND ABBREVIATIONS

BART	Best Available Retrofit Technology
CALMET	California Meteorological Model
CALPUFF	California Puff
CAA	Clean Air Act
CFR	Code of Federal Regulations
dv	deciview
EPA	U.S. Environmental Protection Agency
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
gr/dscf	grains per dry standard cubic foot
H <sub>2</sub> SO <sub>4</sub>	sulfuric acid
IMPROVE	Interagency Monitoring of Protected Visual Environments
km	kilometer
lb/hr	pounds per hour
lb/ton	pounds per ton
NP	National Park
NPS	National Park Service
NWA	National Wilderness Area
PM	particulate matter
PSD	prevention of significant deterioration
RHR	1999 Regional Haze Rule
SAM	sulfuric acid mist
SAP	sulfuric acid plant
SO <sub>2</sub>	sulfur dioxide
SO <sub>3</sub>	sulfur trioxide
TPD	tons per day
UTM	Universal Transverse Mercator

## 1.0 SUMMARY

Pursuant to Section 403.061(35), Florida Statutes, the Federal Clean Air Act (CAA), and the regional haze regulations contained in Title 40, Part 51 of the Code of Federal Regulations (40 CFR 51), Subpart P – Protection of Visibility, the Florida Department of Environmental Protection (FDEP) is required to ensure that certain sources of visibility-impairing pollutants in Florida use Best Available Retrofit Technology (BART) to reduce the impact of their emissions on regional haze in Federal Class I areas. Requirements for individual source BART control technology determinations and for BART exemptions are contained in Rule 62-296.340 of the Florida Administrative Code (F.A.C.).

Rule 62-296.340(5)(c), F.A.C., states that a BART-eligible source may demonstrate that it is exempt from the requirement for a BART determination for all pollutants by performing an individual source attribution analysis in accordance with the procedures contained in 40 CFR 51, Appendix Y. A BART-eligible source is exempt from BART determination requirements if its contribution to visibility impairment, as determined below, does not exceed 0.5 deciview (dv) above natural conditions in any Class I area.

FDEP has adopted the U.S. Environmental Protection Agency's (EPA's) visibility protection guidelines contained in 40 CFR 51, Subpart P. Based on the guidelines, the 98<sup>th</sup> percentile, i.e., the 8<sup>th</sup> highest 24-hour average visibility impairment value in any single year, or the 22<sup>nd</sup> highest 24-hour average visibility impairment value over 3 years combined, whichever is higher, is compared to the 0.5 dv exemption criteria in the source attribution analysis to determine if the BART-eligible source is exempt from a BART determination.

This report is submitted to FDEP to present the source attribution analysis for the CF Industries (CFI) Plant City facility, which is a BART-eligible source with multiple BART-eligible emissions units. The BART-eligible source includes the following emissions units:

- EU002 – “A” Sulfuric Acid Plant (SAP);
- EU003 – “B” SAP;
- EU007 – “C” SAP;
- EU008 – “D” SAP;
- EU010 – “A” Diammonium Phosphate/Monoammonium Phosphate (DAP/MAP) Plant;
- EU011 – “Z” DAP/MAP Plant;

- EU012 – “X” DAP/MAP Plant;
- EU013 – “Y” DAP/MAP Plant;
- EU015 – “A” Shipping Baghouse; and
- EU018 – “B” Shipping Baghouse.

CFI is proposing three emission reduction scenarios for the BART-eligible emissions units at the Plant City facility. For each of the emissions reduction scenarios, the Plant City facility is exempt from BART because its contribution to visibility impairment does not exceed 0.5 dv above natural conditions in any Class I area. The objective of this analysis is to demonstrate that the CFI Plant City facility, based on any of the emission reduction scenarios, is exempt from a BART determination. Note that CFI originally submitted a BART application to FDEP in January 2007. The January 2007 application was submitted prior to CFI's decision to reduce sulfur dioxide SO<sub>2</sub> emissions and, therefore, did not demonstrate a basis for BART exemption at that time. At the reduced emission levels proposed under the three exemption scenarios; however, CFI should be considered exempt from BART and upon FDEP's concurrence, the prior application may be considered superseded by this exemption application.

This report contains a description of the BART-eligible emissions units and proposed emission limits; the visibility modeling methodology, and the visibility modeling analysis results for the facility. The source information and methodologies used for the BART exemption analysis are presented in the document entitled “Air Modeling Protocol to Evaluate BART Options for the CFI Plant City Facility”, which is contained in Appendix A to this report. This “Modeling Protocol” is a revised version of the modeling protocol document entitled “Revised BART Modeling Protocol”, submitted to FDEP in January 2007, with the BART Determination Analysis for the CFI Plant City facility.

FDEP permit application forms are provided in Appendix B. The purpose of these forms is to request that the proposed lower emission limits for each emissions reduction scenario be incorporated into an air construction permit for the CFI Plant City facility, in order to make the limits federally enforceable, and thereby formally exempt this facility from a BART determination.

## 2.0 DESCRIPTION OF BART-ELIGIBLE EMISSIONS UNITS

The CFI Plant City facility operates four SAPs, two phosphoric acid plants (PAPs), four DAP/MAP plants, molten sulfur storage and handling operations, product storage and shipping operations, and ancillary equipment, in order to produce phosphate fertilizers. The facility is located south of Zephyrhills and north of Plant City in northeastern Hillsborough County, Florida. The CFI Plant City facility is currently operating under the Title V Permit No. 0570005-032-AV, most recently issued on December 17, 2007. An area map showing the facility location and prevention of significant deterioration (PSD) Class I areas located within 300 kilometers (km) is presented in Figure 1-1 of the BART Modeling Protocol (see Appendix A). The PSD Class I areas and their distances from the Plant City facility are as follows:

- Chassahowitzka National Wilderness Area (NWA) – 70 km;
- Everglades National Park (NP) – 261 km;
- Okefenokee NWA – 263 km, and
- Saint Marks NWA – 273 km.

The Universal Transverse Mercator (UTM) coordinates of the CFI Plant City facility are approximately 388.0 km east and 3,116.0 km north in UTM Zone 17.

Based on the BART applicability analysis contained in the Modeling Protocol, a total of 10 BART-eligible emissions units have been identified at the Plant City facility. A detailed description of these BART-eligible emissions units at the Plant City facility is presented in the following sections.

### 2.1 “A” and “B” SAPs (EU002 and EU003)

CFI operates two Dorr-Oliver single-absorption SAPs (“A” and “B” SAPs). The maximum permitted production rates of the “A” and “B” SAPs are 1,300 tons per day (TPD) and 1,600 TPD of 100-percent sulfuric acid ( $H_2SO_4$ ), respectively. In the acid making process, molten sulfur is combusted (oxidized) with dry air in the sulfur furnace. The resulting  $SO_2$  gas is catalytically converted (further oxidized) to sulfur trioxide ( $SO_3$ ) in a 4-bed converter tower.  $SO_3$  is then absorbed in an approximately 98-percent  $H_2SO_4$  stream to form a more concentrated acid in a single stage absorption tower (final stage of production). Heat generated by the chemical reactions in the sulfur furnace and the 4-bed converter tower is recovered to operate boilers, superheaters, and economizers. The process results in emissions of  $SO_2$  and sulfuric acid mist (SAM), as well as a small amount of nitrogen oxides ( $NO_x$ ).

SO<sub>2</sub> and SAM emissions at each plant are controlled by a two-stage ammonia scrubber and a high-efficiency mist eliminator (Brink's demister) and exhausted through a 110-foot stack. The ammonium sulfate solution generated in the scrubbers is consumed in the DAP/MAP plants onsite or sold to farmers. The permitted production capacity of the "B" SAP was recently increased from 1,300 TPD to 1,600 TPD.

The current 24-hour average SO<sub>2</sub> emission limit for the "A" SAP is 250 lb/hr. The current SAM emission limit for the "A" SAP is 1.43 lb/hr. There is currently no NO<sub>x</sub> emission limit for the "A" SAP. The current SO<sub>2</sub> limit for "B" SAP is 3.5 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub> (3-hr average) and 233.3 lb/hr. The SAM limit is 0.075 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub> and 5.0 lb/hr. NO<sub>x</sub> emissions from the "B" SAP are limited to 0.12 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>, equivalent to 8.0 lb/hr.

## 2.2 "C" and "D" SAPs (EU007 and EU008)

CFI operates two Monsanto double absorption sulfuric acid plants ("C" and "D" SAPs) with a maximum production capacity of 2,962 TPD of 100-percent H<sub>2</sub>SO<sub>4</sub>. At the "C" and "D" SAPs, dry air and molten sulfur are ignited in a sulfur burner. The combustion gases, primarily SO<sub>2</sub> are passed through a 3-stage catalytic converter where SO<sub>2</sub> is converted to SO<sub>3</sub>. The gases, now primarily SO<sub>3</sub>, enter the interpass tower where the SO<sub>3</sub> is absorbed into a sulfuric acid solution. The remaining gases (a mixture of SO<sub>2</sub>, SO<sub>3</sub> and other products) exit the interpass tower through a high-efficiency mist eliminator. The gas then enters the 4th stage of the catalytic converter where additional SO<sub>2</sub> is converted to SO<sub>3</sub>. This gas enters the final tower where SO<sub>3</sub> is again absorbed into a sulfuric acid solution. The remaining gases exit to the atmosphere through a high-efficiency mist eliminator. The plants also incorporate a waste heat boiler system for generating steam from the energy produced by the combustion of molten sulfur in air.

The current 3-hour average SO<sub>2</sub> emission limits for each of the "C" and "D" SAPs are 3.25 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>, equivalent to 401.1 lb/hr; the current SAM emission limits are 0.093 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>, equivalent to 11.4 lb/hr; and the current NO<sub>x</sub> emission limits are 0.11 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>, equivalent to 13.6 lb/hr.

## 2.3 "A" DAP/MAP Plant (EU010)

The operation of the A-train phosphate manufacturing plant to produce DAP or MAP consists of a reactor, granulator, dryer, product cooler, mills, and screens. The dryer is fired with natural gas, or No. 5 or better grade fuel oil, i.e., No. 2, 3 or 4 fuel oil (back-up); at a maximum heat input rate of 28.5 million British thermal units per hour (MMBtu/hr).



Emissions from the reactor and granulator are controlled by the following scrubbers:

- Fume Venturi – Venturi scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Primary Scrubber – Ducon Envir. Tech. Series 435X-RL cyclonic scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Fume system down-comer consisting of duct work with fresh water sprays using fresh water as the scrubbing liquid; and
- Abatement scrubber – Ducon Envir. Tech. scrubber using fresh water as the scrubbing liquid.

Emissions from the dryer, mills, and screens are controlled by the following cyclones and scrubbers:

- Dryer & Dust Cyclones – Fly Ash Arrestor Corp cyclones;
- Dryer & Dust Venturi – Venturi scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Primary Scrubber – Ducon Envir. Tech. cyclonic scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Dryer & Dust System down-comer consisting of duct work with fresh water sprays using fresh water as the scrubbing liquid; and
- Abatement scrubber – is the same device as the reactor and granulator abatement scrubber.

Emissions from the product cooler are controlled by the following cyclones and scrubbers:

- Cooler Cyclones – Fly Ash Arrestor Corp cyclones;
- Product Cooler Fume down-comer consisting of duct work with fresh water sprays using fresh water as the scrubbing liquid; and
- Abatement scrubber – is the same device as the reactor and granulator abatement scrubber.

All equipment gases in the A-DAP/MAP Plant pass through a single abatement scrubber and then are discharged to the atmosphere through a stack.

The maximum permitted phosphorous pentoxide ( $P_2O_5$ ) input rates for the A DAP/MAP plant are 29.53 tons per hour (TPH) of DAP and 33.30 TPH of MAP. These rates are based on a 12-hour average. Particulate matter (PM) emissions from the “A” DAP/MAP Plant is limited to 13.0 lb/hr and 56.9 TPY (permit No. 0570005-021-AC).

## 2.4 "Z" DAP/MAP (EU011), "X" DAP/MAP (EU012), and "Y" DAP/MAP (EU013) Plants

The "X", "Y", and "Z" diammonium phosphate/ monoammonium phosphate (XYZ-DAP/MAP) plants (Emissions Unit Nos. 012, 013, and 011) operate to produce DAP or MAP. The XYZ-DAP/MAP granulation trains each consist of a reactor, granulator, aging belt, dryer, product cooler, mills, and product screens. The DAP/MAP Plant dryers are fired by natural gas, with fuel oil of grade No. 5 or better as backup. The maximum heat input rates to the dryers are 49.7 MMBtu/hr for the X-DAP/MAP Plant, 49.5 MMBtu/hr for the Y-DAP/MAP Plant, and 42.75 MMBtu/hr for the Z-DAP/MAP Plant.

For each of the XYZ-DAP/MAP Plants, the current construction permit for these units (Permit No. 0570005-030-AC) specifies that the emissions from the reactor, granulator, and aging belt are to be controlled by the following scrubbers:

- Fume Venturi – Venturi scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Primary Scrubber – Ducon Envir. Tech. Series 550 cyclonic scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Secondary Scrubber – Ducon Envir. Tech. Series 550 cyclonic scrubber using partially-neutralized phosphoric acid as the scrubbing liquid; and
- Abatement scrubber – Ducon Envir. Tech. scrubber using fresh water as the scrubbing liquid.

Emissions from the dryer are controlled by the following cyclones and scrubbers:

- Dryer Cyclones – Ducon Envir. Tech. 810/175 Type VM cyclones;
- Dryer Venturi – Venturi scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Primary Scrubber – Ducon Envir. Tech. Series 555 scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Secondary Scrubber – Ducon Envir. Tech. Series 555 scrubber using partially-neutralized phosphoric acid as the scrubbing liquid; and
- Abatement scrubber – is the same device as the pre-neutralizer, granulator, and aging belt abatement scrubber.

Emissions from the mills and product screens are controlled by the following cyclones and scrubbers:

- Dust Cyclones – Ducon Envir. Tech. 810/175 Type VM cyclones;
- Dust Venturi – Venturi scrubber using partially-neutralized phosphoric acid as the scrubbing liquid;
- Primary Scrubber – Ducon Envir. Tech. Series 535 scrubber using partially-neutralized phosphoric acid as the scrubbing liquid; and

- Abatement scrubber – is the same device as the pre-neutralizer, granulator, and aging belt abatement scrubber.

Emissions from the product cooler are controlled by the following cyclones and scrubbers:

- Cooler Cyclones – Ducon Envir. Tech. 810/175 Type VM cyclones;
- Ducon Envir. Tech. Series 550 scrubber using partially-neutralized phosphoric acid as the scrubbing liquid; and
- Abatement scrubber – is the same device as the pre-neutralizer, granulator, and aging belt abatement scrubber.

For each plant, all equipment gases pass through a single abatement scrubber and then are discharged to the atmosphere through a stack. The maximum permitted  $P_2O_5$  input rates for each of the “X”, “Y”, and “Z” DAP/MAP plants are 48.7 TPH for DAP and 55.0 TPH for MAP production. The hourly maximum allowable PM emission rates for the “X”, “Y”, and “Z” plants are 13.75, 15.3, and 15.0 lb/hr, respectively (for “Z” DAP/MAP, refer to permit No. 0570005-021-AC).

## 2.5 “A” Shipping Baghouse (EU015) and “B” Shipping Baghouse (EU018)

The operations of the “A” and “B” Shipping units consist of sizing, screening, and conveying systems for transferring DAP/MAP from Storage Buildings “A” and “B” to the truck and railcar loading operations associated with these buildings. PM emissions from the transfer points and emissions from the sizing and screening are controlled by two 100,000 acfm Mikro-Pulsaire Model 1F2-48 baghouse dust collectors, one on each unit. Emissions from the truck and railcar loading operations are minimized by the use of dust suppressant. The maximum  $PM_{10}$  emissions rates for “A” and “B” Shipping baghouses is 1.71 lb/hr for each, based on manufacturer specification on dust loading and exhaust flow rates (permit No. 0570005-021-AC).

## 2.6 Emission Reduction Scenarios

CFI is proposing three emission reduction scenarios in order to meet the BART exception criteria. Each scenario is described below.

### 2.6.1 Scenario A – Reduced Production Scenario

Emission reductions proposed in Scenario A are summarized below:

- $SO_2$  emissions from the “A” SAP are reduced from the currently permitted 250.0 to 75.8 lb/hr, 24-hour average;

- SO<sub>2</sub> emissions from the "B" SAP are reduced from the currently permitted 233.3 to 93.3 lb/hr, 24-hour average;
- SO<sub>2</sub> emissions from the "C" SAP are reduced from the currently permitted 401.1 to 303.3 lb/hr, 24-hour average; and
- SO<sub>2</sub> emissions from the "D" SAP are reduced from the currently permitted 401.1 to 303.3 lb/hr, 24-hour average.

Under Scenario A, CFI is proposing to lower the permitted daily maximum production rate of "C" and "D" SAPs and the 24-hour daily average SO<sub>2</sub> emission limits for the all four SAPs, in order to meet the BART exemption criteria. In addition to the above emissions reductions, the reduced production capacities are as follows:

- "C" SAP – maximum daily production reduced from 2,962 to 2,600 TPD of H<sub>2</sub>SO<sub>4</sub>; and
- "D" SAP – maximum daily production reduced from 2,962 to 2,600 TPD of H<sub>2</sub>SO<sub>4</sub>.

The total proposed reduction in allowable SO<sub>2</sub> emissions is 510 lb/hr.

CFI has developed intended strategies for achieving the lower SO<sub>2</sub> emission rates on the SAPs. These strategies are described below:

- "A" and "B" SAPs – SO<sub>2</sub> emissions from the single-absorption "A" and "B" SAPs are currently controlled by a two-stage ammonia scrubber. CFI will increase the scrubbing rate to reduce the SO<sub>2</sub> emissions further. The equivalent lb/ton emission rate at full production rate for each of "A" and "B" SAP will be 1.4 lb/ton. The maximum daily production rates of the "A" and "B" SAPs will remain unchanged at 1,300 and 1,600 TPD, respectively.
- "C" and "D" SAPs – The maximum daily production capacity of each SAP will be reduced from the currently permitted 2,962 TPD to 2,600 TPD. The reduction in maximum production rate will allow the proposed lower SO<sub>2</sub> limit of 2.8 lb/ton 100 percent H<sub>2</sub>SO<sub>4</sub> to be achieved without further modification to the SAPs.

CFI will demonstrate compliance with the new proposed lb/hr limits by using the existing CEMS for SO<sub>2</sub>, along with monitoring of daily H<sub>2</sub>SO<sub>4</sub> production for each plant. The CEMS is already capable of providing these data.

CFI is not proposing any reduction in NO<sub>x</sub> emissions rates from the SAPs in terms of lb/ton; however, since the production rate of the "C" and "D" SAPs are decreasing, the allowable emissions will be as follows:

- "C" SAP – 11.9 lb/hr (decreasing from 13.6 lb/hr); and
- "D" SAP – 11.9 lb/hr (decreasing from 13.6 lb/hr).

CFI is also not proposing any reduction in SAM emissions rates from the SAPs in terms of lb/ton; however, since the production rate of the "C" and "D" SAPs are decreasing, the allowable emissions will be as follows:

- "C" SAP – 10.1 lb/hr (decreasing from 11.4 lb/hr); and
- "D" SAP – 10.1 lb/hr (decreasing from 11.4 lb/hr).

#### 2.6.2 Scenario B – Converter Replacement Scenario

Emission reductions proposed in Scenario B are summarized below:

- SO<sub>2</sub> emissions from the "A" SAP are reduced from the currently permitted 250.0 to 81.3 lb/hr, (24-hour average);
- SO<sub>2</sub> emissions from the "B" SAP are reduced from the currently permitted 233.3 to 100.0 lb/hr, (24-hour average);
- SO<sub>2</sub> emissions from the "C" SAP are reduced from the currently permitted 401.1 to 241.7 lb/hr, (24-hour average); and
- SO<sub>2</sub> emissions from the "D" SAP are reduced from the currently permitted 401.1 to 241.7 lb/hr, (24-hour average).

Under Scenario B, CFI is proposing to lower the permitted daily maximum production capacity of "C", and "D" SAPs and the 24-hour daily average SO<sub>2</sub> emission limits for the all four SAPs, in order to meet the BART exemption criteria. In addition to the above emissions reductions, the reduced production capacities are as follows:

- "C" SAP – maximum daily production reduced from 2,962 to 2,900 TPD of H<sub>2</sub>SO<sub>4</sub>; and
- "D" SAP – maximum daily production reduced from 2,962 to 2,900 TPD of H<sub>2</sub>SO<sub>4</sub>.

The total proposed reduction in allowable SO<sub>2</sub> emissions is 621 lb/hr.

CFI has developed intended strategies for achieving the lower SO<sub>2</sub> emission rates on the SAPs. These strategies are described below:

- “A” and “B” SAPs – SO<sub>2</sub> emissions from the single-absorption “A” and “B” SAPs are currently controlled by a two-stage ammonia scrubber. CFI will increase the scrubbing rate to reduce the SO<sub>2</sub> emissions further. The equivalent lb/ton emission rate at full production rate for each of “A” and “B” SAP will be 1.5 lb/ton. The maximum daily production rates of the “A” and “B” SAPs will remain unchanged at 1,300 and 1,600 TPD, respectively.
- “C” and “D” SAPs – The “C” and “D” SAPs are Monsanto design, double absorption plants with a four-stage catalytic converter where SO<sub>2</sub> is converted to SO<sub>3</sub>. The converter uses vanadium and cesium catalyst. CFI proposes to replace the converters of the “C” and “D” SAPs and increase the catalyst loading. In addition, CFI proposes to reduce maximum daily production capacity of each SAP from the currently permitted 2,962 TPD to 2,900 TPD.
- The equivalent lb/ton emission rate at full production rate for each of “C” and “D” SAP will be 2.0 lb/ton. The new converters and the new catalyst loadings in the “C” and “D” SAPs will be designed to meet the proposed SO<sub>2</sub> emission limits.

CFI will demonstrate compliance with the new proposed lb/hr limits by using the existing CEMS for SO<sub>2</sub>, along with monitoring of daily H<sub>2</sub>SO<sub>4</sub> production for each plant. The CEMS is already capable of providing these data.

CFI is not proposing any reduction in NO<sub>x</sub> emissions rates from the SAPs in terms of lb/ton; however, since the production rate of the “C” and “D” SAPs are decreasing, the allowable emissions are as follows:

- “C” SAP – 13.3 lb/hr (decreasing from 13.6 lb/hr); and
- “D” SAP – 13.3 lb/hr (decreasing from 13.6 lb/hr).

CFI is also not proposing any reduction in SAM emissions rates from the SAPs in terms of lb/ton; however, since the production rate of the “C” and “D” SAPs are decreasing, the allowable emissions are as follows:

- “C” SAP – 11.2 lb/hr (decreasing from 11.4 lb/hr); and
- “D” SAP – 11.2 lb/hr (decreasing from 11.4 lb/hr).

### 2.6.3 Scenario C – Emissions Cap Scenario

CFI is proposing emission caps in this scenario – one emissions cap for “A” and “B” SAPs, and one emissions cap for the “C” and “D” SAPs. Under Scenario C, CFI is proposing the following emission caps:

- “A” and “B” SAPs combined SO<sub>2</sub> emissions – 181.3 lb/hr; and
- “C” and “D” SAPs combined SO<sub>2</sub> emissions – 610.0 lb/hr.

Under this scenario, CFI is proposing production caps as follows:

- “A” and “B” SAPs combined production capacity – 2,900 TPD;
- “C” and “D” SAPs combined production capacity – 5,924 TPD.

These caps are the continued current maximum production capacities of the SAPs.

Scenario C is similar to Scenarios A and B with the only difference that in the event one SAP is shutdown or operating at reduced rate, the other SAP within the cap will have the operational flexibility of higher production and/or emissions. The current combined permitted SO<sub>2</sub> emission rate of “A” and “B” SAPs is 483.3 lb/hr. Therefore, under the cap an SO<sub>2</sub> emission reduction of 302 lb/hr (483.3 lb/hr – 181.3 lb/hr) from the “A” and “B” SAPs would occur. Similarly, under the cap an emission reduction of 192.2 lb/hr (401.1 lb/hr x 2 – 610 lb/hr) from the “C” and “D” SAPs would occur.

CFI is proposing to follow the same strategies described in Scenarios A and B for achieving the lower SO<sub>2</sub> emissions from the SAPs. These strategies are described below:

- “A” and “B” SAPs – SO<sub>2</sub> emissions from the single-absorption “A” and “B” SAPs are currently controlled by a two-stage ammonia scrubber. CFI will increase the scrubbing rate to reduce the SO<sub>2</sub> emissions further.
- “C” and “D” SAPs – The “C” and “D” SAPs are a Monsanto design, double absorption plants with a four-stage catalytic converter where SO<sub>2</sub> is converted to SO<sub>3</sub>. The converter uses vanadium and cesium catalyst. CFI could install a new converter for each of the “C” and “D” SAPs under this scenario. The new converters will be designed to meet the proposed SO<sub>2</sub> emission limits for the SAPs.
- CFI is not proposing any reduction in NO<sub>x</sub> or SAM emissions rates from the SAPs in terms of lb/ton or lb/hr. CFI proposes that the allowable NO<sub>x</sub> and SAM emission rates of each SAP remain the same as the currently permitted emissions

rates of each individual SAP in the cap. Therefore, the allowable NO<sub>x</sub> and SAM emissions within the caps are as follows:

- “A” and “B” SAPs cap – NO<sub>x</sub> – No limit for “A” SAP and 8.0 lb/hr from “B” SAP (0.12 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>); SAM – 1.43 lb/hr from “A” SAP and 5.0 lb/hr from “B” SAP; and
  - “C” and “D” SAPs cap – NO<sub>x</sub> – 13.6 lb/hr each (0.11 lb/ton of 100-percent H<sub>2</sub>SO<sub>4</sub>); SAM – 11.4 lb/hr each (0.093 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>).
- CFI also proposes to modify the stacks of “C” and “D” SAPs and reduce the exit diameter from the current 8-ft to 5-ft.

CFI will demonstrate compliance with the proposed SO<sub>2</sub> lb/hr limit for each emission cap using the existing SO<sub>2</sub> CEMS at each SAP, along with monitoring of daily H<sub>2</sub>SO<sub>4</sub> production for each plant. The CEMS is already capable of providing these data.

#### 2.6.4 Implementation of New Emission Limits

CFI has described above three emission reduction scenarios, and its tentative plans to meet the new emission limits on the BART-eligible units in order to meet the BART exemption criteria. CFI has presented alternative scenarios because CFI desires the flexibility to make a decision based on factors such as market research, future demand, economics, etc. The decision will be made no later than June 1, 2010 to implement either Scenario A, B, or C. CFI also requests the flexibility to choose strategies from both scenarios, if desired in order to meet the exemption criteria.

The BART regulations require sources to comply with any BART emission limits as expeditiously as practical, but no later than December 31, 2013. CFI intends to meet this requirement by implementing the proposed physical changes to the SAPs during the turnaround periods of each SAP before December 31, 2013. Turnarounds are the only mechanism by which CFI can implement the proposed changes on the SAPs. Due to the nature of the proposed changes, they require significant downtime. Also note that turnaround schedules can change based on changes in design/build schedules.

As discussed above, CFI may include various types of catalyst and/or different catalyst loadings and may test different ammonia scrubbing rates in order to achieve the desired SO<sub>2</sub> emissions from the SAPs. However, additional issues may arise or problems identified, requiring a modified approach. More in-depth engineering studies will be performed prior to the respective SAP turnarounds to address any such issues.

It should be recognized that even with the best planning, actual operation after the proposed changes are implemented may not immediately meet the goals of the projects. Process equipment operating rates,



flow rates, etc., may need to be optimized through actual operation to fully meet the goals, and additional equipment or catalyst may be necessary. Therefore, the new emission limits may not be fully achieved until sometime after the turnarounds. In any event CFI will meet the regulatory deadline of December 31, 2013, for compliance with the BART exemption emission limits.

## 2.7 PSD Applicability

The purpose of all the physical changes described in this BART Exemption application is to meet the BART exemption criteria. The only physical changes to the BART-eligible emissions units proposed in this application are those to the SAPs. The purpose of these changes is to meet lower SO<sub>2</sub> emission limits. CFI is proposing production rate decreases in two of the four SAPs ("C", and "D") in addition to lower daily SO<sub>2</sub> emission rates from all four SAPs in Scenarios A and B. In Scenario C, the current individual SAP maximum daily production rates are removed in lieu of the cap, however, lower daily SO<sub>2</sub> emission rates are proposed.

The proposed daily average SO<sub>2</sub> emission rates are significantly lower than the currently permitted emission rates. CFI is not requesting any increase above the current physical capacity of the plants. CFI is requesting reductions in allowable SO<sub>2</sub> emissions in order to become BART-exempt. As a result, the project will not trigger PSD review.

### **3.0 BART EXEMPTION ANALYSIS AND RESULTS**

A revised BART modeling protocol for the CFI Plant City facility is included in Appendix A to this BART Exemption Analysis. The baseline emissions and methodology used for the exemption modeling and the exemption modeling results are presented below.

#### **3.1 Emission Rates**

The emission rates used for the initial visibility modeling for the CFI Plant City facility are contained in Table 2-3 of the BART modeling protocol (Protocol), which is included as Appendix A. The initial modeling performed in January 2007 did not include any proposed emission reductions from the SAPs. The proposed emission rates for each of Scenarios A, B, and C are presented in Tables 2-4 through 2-6 of the Protocol.

#### **3.2 Modeling Methodology**

The California Puff (CALPUFF) model, Version 5.756, was used to predict the maximum visibility impairment at the PSD Class I areas located within 300 km of the CFI Plant City facility. Recent technical enhancements, including changes to the over-water boundary layer formulation and coastal effects modules (sponsored by the Minerals Management Service), are included in this version. The methods and assumptions used in the CALPUFF model are presented in the Protocol. The 4-km spacing Florida domain was used for the BART exemption. The refined California Meteorological Model (CALMET) domain used for the CFI BART modeling analysis has been provided by FDEP. The major features used in preparing these CALMET data are also described in Section 3.0 of the Protocol.

Currently, atmospheric light extinction is estimated by an algorithm developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) committee, which was adopted by the EPA under the 1999 Regional Haze Rule (RHR) and is referred to as the "1999 IMPROVE algorithm". This algorithm for estimating light extinction from particle speciation data tends to underestimate light extinction for the highest haze conditions and overestimate it for the lowest haze conditions, and does not include light extinction due to sea salt, which is important at sites near coastal areas. As a result of these limitations, the IMPROVE Steering Committee recently developed a new algorithm (the "new IMPROVE algorithm") for estimating light extinction from PM component concentrations, which provides a better correspondence between measured visibility and that calculated from PM component concentrations. A detailed description of the new IMPROVE algorithm and its implementation is presented in Section 3.4 of the Protocol.

Both the 1999 IMPROVE algorithm and the new IMPROVE algorithm were used to calculate the natural background light extinction at the Class I areas for the CFI Plant City BART modeling analysis. Visibility impacts were predicted at each PSD Class I area using receptors provided by the National Park Service (NPS), as presented in the BART protocol.

### 3.3 BART Exemption Modeling Results

Summaries of the maximum visibility impairment values for the CFI Plant City BART-eligible emissions units estimated using the 1999 IMPROVE algorithm are presented in Tables 3-1 and 3-2. These results are based upon the emission rates presented in Table 2-3 of the Protocol (prior to taking any reductions). The 98<sup>th</sup> percentile 24-hour average visibility impairment values (i.e., 8<sup>th</sup> highest) for the years 2001, 2002, and 2003, and the 22<sup>nd</sup> highest 24-hour average visibility impairment value over the 3 years, are presented in Table 3-1. This table also presents the number of days and receptors for which the visibility impairment was predicted to be greater than 0.5 dv. The eight highest visibility impairment values predicted at the PSD Class I areas for each year is presented in Table 3-2.

As shown in Tables 3-1 and 3-2, the highest, 8<sup>th</sup> highest visibility impairment values predicted over the 3-year period at the Chassahowitzka NWA Class I areas using the 1999 IMPROVE algorithm are higher than 0.5 dv.

Additional modeling was performed using the new IMPROVE algorithm and the proposed emissions rates for Scenarios A, B, and C. For Scenario C, each SAP within a cap was modeled with the total emissions of the cap in order to ensure that the visibility impact would comply with the exemption criteria even under the extreme operating condition when the total emissions for the cap are emitted by either SAP covered by the cap. This will never occur in reality.

The SAP SO<sub>2</sub> emissions rates modeled for each scenario are as follows:

#### **SCENARIO A (Reduced Production Scenario)**

“A” SAP – 75.8 lb/hr

“B” SAP – 93.3 lb/hr

“C” SAP – 303.3 lb/hr

“D” SAP – 303.3 lb/hr

**SCENARIO B (Converter Replacement Scenario)**

“A” SAP – 81.3 lb/hr

“B” SAP – 100.0 lb/hr

“C” SAP – 241.7 lb/hr

“D” SAP – 241.7 lb/hr

**SCENARIO C (Emissions Cap Scenario)**

“A” & “B” SAPs Combined – 181.3 lb/hr

“C” & “D” SAPs Combined – 610.0 lb/hr

CFI is not proposing any reduction in NO<sub>x</sub> or SAM emissions rates from the SAPs in terms of lb/ton or lb/hr. The production capacities of the “A” and “B” SAPs remain unchanged and the production capacities of the “C” and “D” SAPs are reduced or remain unchanged depending on the scenario. SAP NO<sub>x</sub> emissions rates used in the modeling are based on the currently permitted lb/ton limits, which are presented below:

**SCENARIO A (Reduced Production Scenario)**

“A” SAP – 6.5 lb/hr

“B” SAP – 8.0 lb/hr

“C” SAP – 11.9 lb/hr

“D” SAP – 11.9 lb/hr

**SCENARIO B (Converter Replacement Scenario)**

“A” SAP – 6.5 lb/hr

“B” SAP – 8.0 lb/hr

“C” SAP – 13.3 lb/hr

“D” SAP – 13.3 lb/hr

**SCENARIO C (Emissions Cap Scenario)**

“A” & “B” SAPs Combined – 14.5 lb/hr

“C” & “D” SAPs Combined – 27.2 lb/hr

CFI has stack test data available for SAM emissions, which were used in the exemption modeling. The production capacity of SAPs “A”, “B”, and “C” were recently increased to 1,600, 2,962, and 2,962 TPD, respectively. As a result, the highest stack test results (in lb/ton H<sub>2</sub>SO<sub>4</sub>) from the most recent two-years

(see Attachment B of the Modeling Protocol), which represent the increased production capacity, were used to calculate the SAM emission rates used in the modeling for these SAPs. For "A" SAP, the highest stack test data for the period 2002 to present was used. The SAM emissions rates used in the modeling are presented below:

**SCENARIO A (Reduced Production Scenario)**

"A" SAP – 0.7 lb/hr (0.012 lb/ton)

"B" SAP – 1.5 lb/hr (0.022 lb/ton)

"C" SAP – 4.2 lb/hr (0.039 lb/ton)

"D" SAP – 2.8 lb/hr (0.026 lb/ton)

**SCENARIO B (Converter Replacement Scenario)**

"A" SAP – 0.7 lb/hr (0.012 lb/ton)

"B" SAP – 1.5 lb/hr (0.022 lb/ton)

"C" SAP – 4.7 lb/hr (0.039 lb/ton)

"D" SAP – 3.1 lb/hr (0.026 lb/ton)

**SCENARIO C (Emissions Cap Scenario)**

"A" & "B" SAPs Combined – 2.7 lb/hr (0.022 lb/ton, higher of "A" or "B")

"C" & "D" SAPs Combined – 9.6 lb/hr (0.039 lb/ton, higher of "C" or "D")

The 8<sup>th</sup> highest visibility impairment values for the CFI Plant City facility BART-eligible emission units, estimated using the new IMPROVE algorithm and the proposed emissions reduction scenarios, are presented in Tables 3-3 through 3-8. As shown in Tables 3-3, 3-5, and 3-7, the 8<sup>th</sup> highest visibility impairment values for each emissions reduction scenarios, predicted for each year using the new IMPROVE algorithm, are lower than 0.5 dv. In addition, as shown in Tables 3-4, 3-6, and 3-8, the 22<sup>nd</sup> highest 24-hour average visibility impairment value over the 3 years is also less than 0.5 dv. Based on these results, which demonstrate that the maximum visibility impairment values for the Plant City facility are predicted to be less than FDEP's BART exemption criteria of 0.5 dv, an exemption from BART determination is requested for the CFI Plant City facility.

The new limits for the SAPs will be demonstrated by the use of existing continuous emission monitoring systems for SO<sub>2</sub> at each of the SAPs, and through annual stack testing for SAM using EPA Method 8. Compliance with the NO<sub>x</sub> limit will be demonstrated by stack testing once every 5 years using EPA Method 7E.

**TABLE 3-1  
SUMMARY OF BART EXEMPTION MODELING RESULTS, CFI PLANT CITY  
1999 IMPROVE ALGORITHM**

Class I Area	Distance (km) of Source to Nearest Class I Area Boundary	Number of Days and Receptors with Visibility Impact >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	
Chassahowitzka NWA	70	26	113	0.86	29	113	0.75	28	113	0.88	0.63
Everglades NP	261	0	0	0.16	3	412	0.32	0	0	0.17	0.15
Okefenokee NWA	263	0	0	0.16	0	0	0.19	0	0	0.17	0.13
Saint Marks NWA	273	3	69	0.37	1	43	0.31	2	95	0.33	0.27

**TABLE 3-2  
BART EXEMPTION ANALYSIS RESULTS FOR CFI PLANT CITY  
VISIBILITY IMPACT RANKINGS AT CLASS I AREAS  
1999 IMPROVE ALGORITHM**

Class I Area	Rank	Predicted Visibility Impacts (dv)		
		2001	2002	2003
Chassahowitzka NWA	1	1.495	1.690	1.895
	2	1.461	1.013	1.700
	3	1.379	0.948	1.331
	4	1.224	0.905	1.168
	5	1.085	0.838	1.068
	6	0.916	0.814	0.947
	7	0.888	0.771	0.887
	8	0.864	0.747	0.879
Everglades NP	1	0.297	0.661	0.347
	2	0.217	0.611	0.321
	3	0.194	0.518	0.247
	4	0.181	0.456	0.238
	5	0.173	0.443	0.218
	6	0.173	0.407	0.198
	7	0.163	0.317	0.175
	8	0.155	0.316	0.174
Okefenokee NWA	1	0.308	0.308	0.444
	2	0.221	0.280	0.269
	3	0.210	0.273	0.217
	4	0.182	0.217	0.211
	5	0.181	0.206	0.201
	6	0.169	0.197	0.197
	7	0.161	0.194	0.170
	8	0.160	0.192	0.168
St. Marks NWA	1	0.735	0.542	0.570
	2	0.604	0.475	0.543
	3	0.543	0.442	0.393
	4	0.422	0.438	0.382
	5	0.412	0.400	0.351
	6	0.386	0.385	0.341
	7	0.370	0.341	0.331
	8	0.369	0.306	0.327

**TABLE 3-3  
SUMMARY OF BART EXEMPTION MODELING RESULTS - NEW IMPROVE ALGORITHM  
EXEMPTION SCENARIO A - REDUCED PRODUCTION  
CFI PLANT CITY FACILITY**

Class I Area	Distance from Source to Nearest Class I Area Boundary (km)	Number of Days and Receptors with Visibility Impacts >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	
Chassahowitzka NWA	70	5	NA	0.445	1	NA	0.355	5	NA	0.498	0.424



**TABLE 3-4**  
**VISIBILITY IMPACT RANKINGS AT CLASS I AREAS - NEW IMPROVE ALGORITHM**  
**EXEMPTION SCENARIO A - REDUCED PRODUCTION**  
**CFI PLANT CITY FACILITY**

Class I Area	Predicted Change in Visibility Impact (dv)			
	Rank	2001	2002	2003
Chassahowitzka NWA	1	0.780	0.795	1.088
	2	0.749	0.468	0.946
	3	0.727	0.451	0.699
	4	0.617	0.423	0.660
	5	0.538	0.407	0.584
	6	0.489	0.404	0.510
	7	0.449	0.370	0.499
	8	0.445	0.355	0.498

**TABLE 3-5  
SUMMARY OF BART EXEMPTION MODELING RESULTS - NEW IMPROVE ALGORITHM  
EXEMPTION SCENARIO B - CONVERTER REPLACEMENT  
CFI PLANT CITY FACILITY**

Class I Area	Distance from Source to Nearest Class I Area Boundary (km)	Number of Days and Receptors with Visibility Impacts >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	
Chassahowitzka NWA	70	4	NA	0.402	1	NA	0.351	5	NA	0.432	0.395

**TABLE 3-6  
 VISIBILITY IMPACT RANKINGS AT CLASS I AREAS - NEW IMPROVE ALGORITHM  
 EXEMPTION SCENARIO B - CONVERTER REPLACEMENT  
 CFI PLANT CITY FACILITY**

Class I Area	Predicted Change in Visibility Impact (dv)			
	Rank	2001	2002	2003
Chassahowitzka NWA	1	0.686	0.772	0.995
	2	0.668	0.462	0.833
	3	0.653	0.437	0.643
	4	0.549	0.415	0.580
	5	0.485	0.403	0.529
	6	0.438	0.389	0.457
	7	0.405	0.368	0.439
	8	0.402	0.351	0.432

**TABLE 3-7  
SUMMARY OF BART EXEMPTION MODELING RESULTS AT CHASSHOWITZKA NWA - NEW IMPROVE ALGORITHM  
EXEMPTION SCENARIO C - EMISSIONS CAP  
CFI PLANT CITY FACILITY**

Cap Emissions Operating Scenarios (Extreme Cases)	Distance from Source to CNWA Class I Area Boundary (km)	Number of Days and Receptors with Visibility Impacts >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	No. of Days	No. of Receptors	8th Highest Impact (dv)	
"A" SAP and "C" SAP	70	7	NA	0.433	3	NA	0.421	7	NA	0.498	0.437
"A" SAP and "D" SAP	70	6	NA	0.430	3	NA	0.423	7	NA	0.492	0.452
"B" SAP and "C" SAP	70	7	NA	0.434	3	NA	0.421	7	NA	0.498	0.436
"B" SAP and "D" SAP	70	6	NA	0.431	3	NA	0.423	7	NA	0.492	0.452

Note: The cap scenario considers two emissions caps - one for SAPs "A" and "B" and another for SAPs "C" and "D". The modeling is conducted to predict the visibility impact during worst-case operating conditions. The worst-case operating conditions are based on unrealistic assumption that the total emissions of a caps is emitted by any one SAP within that cap. So all possible combinations were modeled- "A" SAP in combination with "C" or "D" SAP and then "B" SAP in combination with "C" or "D" SAP.

**TABLE 3-8  
VISIBILITY IMPACT RANKINGS AT CHASSAHOWITZKA NWA - NEW IMPROVE ALGORITHM  
EXEMPTION SCENARIO C - EMISSIONS CAP  
CFI PLANT CITY FACILITY**

Cap Emissions Operating Scenarios (Extreme Cases)	Predicted Change in Visibility Impact (dv)			
	Rank	2001	2002	2003
"A" SAP and "C" SAP	1	0.702	0.963	1.017
	2	0.672	0.632	1.010
	3	0.631	0.612	0.673
	4	0.613	0.464	0.601
	5	0.601	0.460	0.571
	6	0.524	0.437	0.561
	7	0.502	0.427	0.518
	8	0.433	0.421	0.498
"A" SAP and "D" SAP	1	0.697	0.963	1.000
	2	0.664	0.634	0.997
	3	0.623	0.631	0.670
	4	0.612	0.459	0.597
	5	0.607	0.455	0.564
	6	0.520	0.455	0.559
	7	0.496	0.435	0.514
	8	0.430	0.423	0.492
"B" SAP and "C" SAP	1	0.701	0.963	1.018
	2	0.672	0.632	1.009
	3	0.631	0.612	0.674
	4	0.613	0.463	0.607
	5	0.601	0.461	0.573
	6	0.524	0.436	0.561
	7	0.502	0.427	0.520
	8	0.434	0.421	0.498
"B" SAP and "D" SAP	1	0.695	0.963	0.999
	2	0.664	0.634	0.999
	3	0.623	0.631	0.671
	4	0.611	0.458	0.603
	5	0.608	0.456	0.567
	6	0.520	0.455	0.559
	7	0.496	0.435	0.516
	8	0.431	0.423	0.492

#### 4.0 REFERENCES

Guidelines for Best Available Retrofit Technology. Federal Register, Vol. 70, pages 39104-39172. August 1, 2005.

OAQPS Cost Control Manual, Fifth Edition, EPA-4531B-96-001. February 1996.

MANE-VU, March 2005. Assessment of Control Technology Options for BART-Eligible Sources; Northeast States for Coordinated Air Use Management, in partnership with the Mid-Atlantic/Northeast Visibility Union.

VISTAS, March 2006. Protocol for the Application of the CALPUFF Model for Analyses of Best Available Control Technology (BART), Revision 2, March 2006.

**APPENDIX A**

**AIR MODELING PROTOCOL  
TO EVALUATE BART OPTIONS  
FOR THE CFI PLANT CITY FACILITY**

**AIR MODELING PROTOCOL  
TO EVALUATE BART OPTIONS  
FOR THE CFI PLANT CITY FACILITY**

**Prepared For:  
CF Industries  
Plant City Phosphate Complex  
Plant City, Florida**

**Prepared By:  
Golder Associates Inc.  
6026 NW 1st Place  
Gainesville, Florida 32607**

**July 2009**

**063-7558**



**TABLE OF CONTENTS**

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION .....	1-1
1.1 Objectives .....	1-1
1.2 Location of Source .....	1-2
1.3 Source Impact Evaluation Criteria .....	1-3
2.0 SOURCE DESCRIPTION .....	2-1
2.1 Source Applicability .....	2-1
2.2 Stack Parameters .....	2-3
2.3 Emission Rates for Visibility Impairment Analyses .....	2-3
2.4 PM Speciation .....	2-4
2.5 Building Dimensions .....	2-5
3.0 GEOPHYSICAL AND METEOROLOGICAL DATA .....	3-1
3.1 Modeling Domain and Terrain .....	3-1
3.2 Land Use and Meteorological Database .....	3-1
3.3 Air Quality Database .....	3-1
3.3.1 Ozone Concentrations .....	3-1
3.3.2 Ammonia Concentrations .....	3-2
3.4 Natural Conditions at Class I Area .....	3-2
4.0 AIR QUALITY MODELING METHODOLOGY .....	4-1
4.1 Modeling Domain Configuration .....	4-1
4.2 CALMET Meteorological Domain .....	4-1
4.3 CALPUFF Computational Domain and Receptors .....	4-1
4.4 CALPUFF Modeling Options .....	4-2
4.5 Light Extinction and Haze Impact Calculations .....	4-2
4.6 Quality Assurance and Quality Control (QA/QC).....	4-2
4.7 Modeling Report.....	4-3

## TABLE OF CONTENTS

### LIST OF TABLES

- Table 2-1 BART Eligibility Analysis for CF Industries – Plant City Facility
- Table 2-2 Summary of Stack and Operating Parameters and Locations for the BART-Eligible Emissions Units
- Table 2-3 Summary of Maximum 24-Hour Average Emission Rates for the BART-Eligible Emissions Units

### LIST OF FIGURES

- Figure 1-1 Facility Location and Class 1 Areas within 300 km
- Figure 4-1 CALPUFF Modeling Receptors Chassahowitzka NWA
- Figure 4-2 CALPUFF Modeling Receptors Everglades NP
- Figure 4-3 CALPUFF Modeling Receptors Okefenokee NWA
- Figure 4-4 CALPUFF Modeling Receptors Saint Marks NWA

### LIST OF ATTACHMENTS

- Attachment A Maximum Emission Rates
- Attachment B Summary of Recent Emission Tests
- Attachment C Example CALPUFF Input File

## 1.0 INTRODUCTION

### 1.1 Objectives

Under the regional haze regulations, which are contained in Title 40, Part 51 of the Code of Federal Regulations (40 CFR 51), Subpart P – Protection of Visibility, the U.S. Environmental Protection Agency (EPA) has issued final rules and guidelines dated July 6, 2005 for Best Available Retrofit Technology (BART) determinations [Federal Register (FR), Volume 70, pages 39104-39172]. BART applies to certain large stationary sources known as BART-eligible sources. Sources are BART-eligible if they meet the following three criteria:

- Contains emissions units that were put in place between August 7, 1962 and August 7, 1977;
- Contains emissions units that are one of the 26 listed source categories in the guidance; and
- Potential emissions from these emissions units of at least 250 tons per year (TPY) of a visibility-impairing pollutant [sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and direct particulate matter equal to or less than 10 microns (PM<sub>10</sub>)].

The Florida Department of Environmental Protection (FDEP) has proposed to adopt EPA's visibility protection rules and guidelines contained in 40 CFR 51, Subpart P. FDEP's BART Rules are described in 62-296.340 of the Florida Administrative Code (F.A.C.), effective January 31, 2007.

The basic tenet of the regional haze program is the achievement of natural visibility conditions in Prevention of Significant Deterioration (PSD) Class I areas by the year 2064. Florida has four Class I areas while Georgia has two Class I areas that can be affected by Florida sources [i.e., located in Florida or within 300 kilometers (km) of Florida].

BART is required for any BART-eligible source that FDEP determines emits any air pollutant that may "reasonably be anticipated to cause or contribute to any impairment of visibility in any Class I area." The BART guidelines establish a threshold value of 0.5 deciview (dv) for any single source for determining whether the source contributes to visibility impairment.

FDEP has identified CF Industries (CFI) Plant City facility (Facility ID 0570005) as a BART-eligible source with multiple BART-eligible emissions units.

Throughout this protocol the terms “source” and “facility” have the same meanings. The term “BART-eligible emissions unit” is defined as any single emissions unit that meets the criteria described above, except for the 250 TPY criterion, which applies to the entire BART-eligible source. A “BART-eligible source” is defined as the collection of all BART-eligible emissions units at a single facility. If a source has several emissions units, only those that meet the BART-eligible criteria are included in the definition of “BART-eligible source.”

The FDEP requires that the California Puff (CALPUFF) modeling system be used to determine visibility impacts from BART-eligible sources at the Class I areas. A source-specific modeling protocol is required to be submitted by the affected sources to FDEP for review and approval.

The BART application for CFI Plant City facility, which was submitted to FDEP in January 2007, included a source-specific modeling and also a modeling protocol for the BART-eligible facility. The protocol described the modeling procedures for performing the air modeling and included site specific data for the BART-eligible emissions units. The site-specific data includes emissions unit locations, stack parameters, emission rates, and PM<sub>10</sub> speciation information.

This revised protocol is for the purpose of demonstrating that the CFI Plant City facility meets the BART facility exemption criteria. The protocol reflects proposed new production capacity and lower emission limits for the Sulfuric Acid Plants (SAPs A, B, C, and D) at the facility.

For guidance in preparing the air modeling protocol, the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) has developed a “common” modeling protocol outline that describes the recommended procedures for performing a visibility impairment analysis under the BART regulations [see *Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)*, December 22, 2005 (Revision 3.2 – August 6, 2006)]. The proposed modeling protocol for the CFI Plant City facility follows the general procedures recommended by VISTAS.

## 1.2 Location of Source

The CFI Plant City facility is located south of Zephyrhills and north of Plant City in northeastern Hillsborough County. An area map showing the facility location and Class I areas located within 300 km of the facility is presented in Figure 1-1. The Class I areas and their distances from CFI are as follows:

- Chassahowitzka National Wilderness Area (NWA) - 70 km
- Everglades National Park (NP) - 261 km

- Okefenokee NWA - 263 km, and
- Saint Marks NWA - 273 km.

The Universal Transverse Mercator (UTM) coordinates of the CFI facility are approximately 388.0 km East and 3,116.0 km North in UTM Zone 17.

### 1.3 Source Impact Evaluation Criteria

The common BART modeling protocol describes the application of the CALPUFF modeling system for two purposes:

- Air quality modeling to determine whether a BART-eligible source is “subject to BART” – to evaluate whether a BART-eligible source is exempt from BART controls because it is not reasonably expected to cause or contribute to impairment of visibility in Class I areas, and
- Air quality modeling of emissions from sources that have been found to be subject to BART – to evaluate regional haze benefits of alternative control options and to document the benefits of the preferred option.

The common BART protocol identifies the first activity as the “BART exemption analysis” and the second activity as the “BART control analysis.”

The final BART rule (70 FR 39118) states that the proposed threshold at which a source may “contribute” to visibility impairment should not be higher than 0.5 dv, and has also been adopted by FDEP (Rule 62-196.340, F.A.C.).

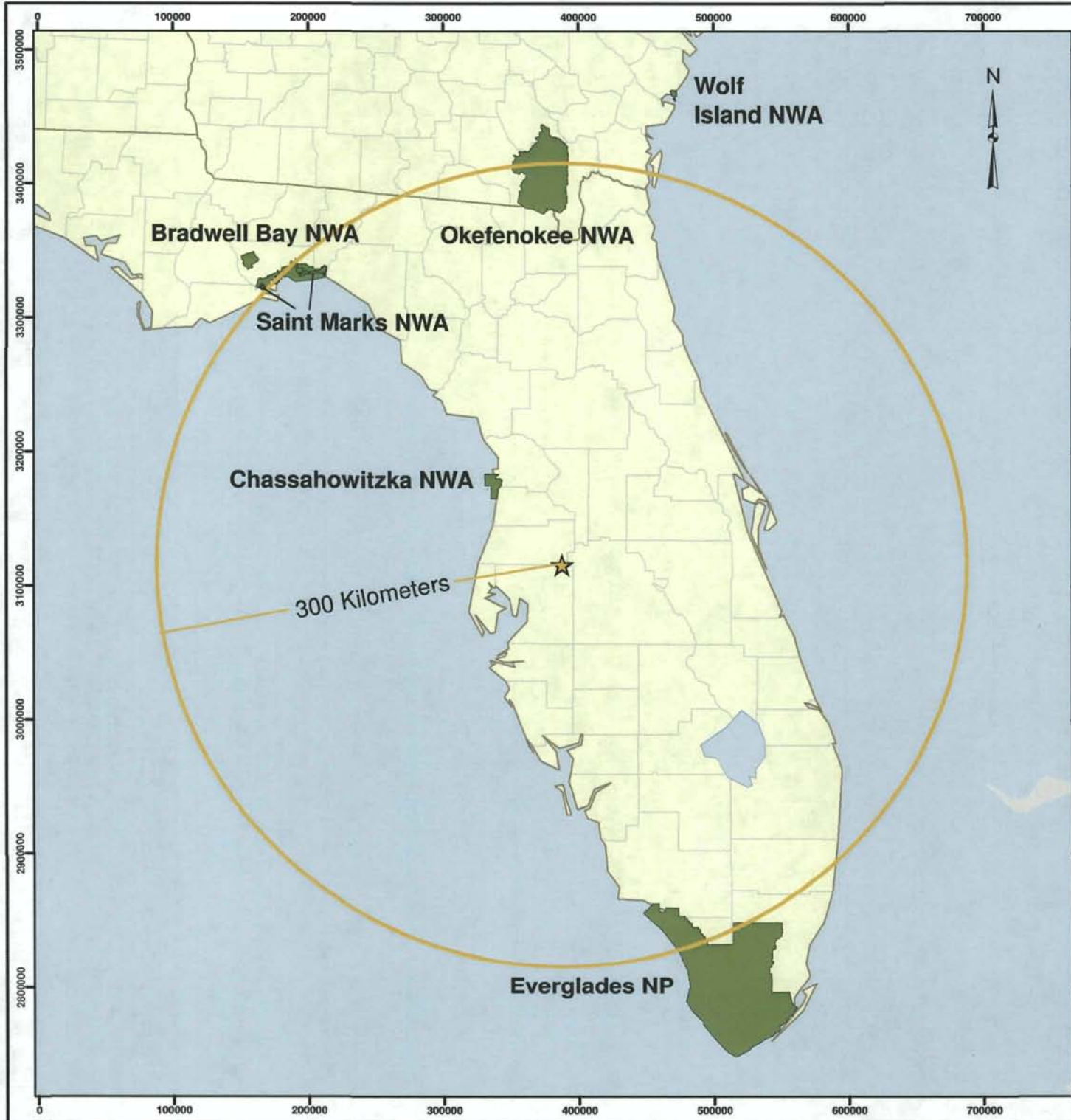
Based on VISTAS recommendations regarding BART exemption analysis, “initial screening” and “refined” analyses can be performed to determine whether a BART-eligible source is subject to or exempt from BART. The initial screening analysis, which is based on a coarse scale 12-km regional VISTAS domain, is optional and answers two questions – whether (a) a particular source may be exempted from further BART analyses and (b) if refined (finer grid) CALPUFF analyses were to be undertaken, which Class I areas should be included.

For the screening analysis, the highest predicted 24-hour impairment value is compared to the 0.5 dv criterion. If the highest predicted impacts are found to be less than 0.5 dv, no further analysis is required. But if the highest impact is predicted to be greater than 0.5 dv, then a refined, finer grid, analysis may be performed.

The refined analysis, which is based on a finer grid subregional California Meteorological Model (CALMET) domain, is the definitive test for whether a source is subject to BART. In the refined analysis, the 98<sup>th</sup> percentile, i.e., the 8<sup>th</sup> highest 24-hour average visibility impairment value in 1 year or the 22<sup>nd</sup> highest 24-hour average visibility impairment value over 3 years combined, whichever is higher, is compared to 0.5 dv.

The screening analysis is optional for large sources that will clearly exceed the initial screening thresholds or sources that are very close to the Class I areas, which will be better analyzed using a finer grid resolution. For the CFI BART analyses, only the refined analysis will be performed to determine whether the source is exempt from BART. All Class I areas within 300 km of CFI will be included in the refined modeling analysis and modeling results will be presented for each evaluated Class I area.

If the BART exemption analysis reveals that the BART-eligible source is subject to BART control analysis, part of the BART review process involves evaluating the visibility benefits of different BART control measures. These benefits will be determined by the refined analysis, where CALPUFF will be executed with the baseline emission rates and again with emission rates reflective of BART control options.



**LEGEND**

- ★ Facility Location
- Class I Areas

**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



PROJECT  
CFI PLANT CITY FACILITY  
BART MODELING PROTOCOL

TITLE  
**Facility Location and  
PSD Class I Areas Within 300 km**

<p>Golder Associates Gainesville, Florida</p>	PROJECT No.	SCALE AS SHOWN	REV. 0
	DESIGN AB 25 Apr. 2006		
	GIS AB 25 Apr. 2006		
	CHECK AB 25 Apr. 2006		
	REVIEW AB 25 Apr. 2006		

**FIGURE 1-1**

## 2.0 SOURCE DESCRIPTION

### 2.1 Source Applicability

CFI operates four sulfuric acid plants (SAP), two phosphoric acid plants (PAP), four diammonium phosphate/monoammonium phosphate (DAP/MAP) plants, molten sulfur storage and handling operations, product storage and shipping operations, and ancillary equipment at the Plant City facility in order to produce phosphate fertilizers. The FDEP published a list of potential BART-eligible sources (updated January 10, 2006), which is based on a survey questionnaire sent by FDEP to selected facilities in Florida on November 4, 2002 and April 18, 2003. The FDEP's list contains a total of twenty potential BART-eligible emissions units located at the CFI Plant City facility. The CFI Plant City facility is on the FDEP list since it is one of the 26 major source categories identified in the BART regulation (phosphate rock processing plants) and has potential emissions of visibility impairment pollutants (i.e., SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub>) from the BART-eligible emissions units that are greater than 250 TPY.

From detailed information obtained from CFI, a BART-eligibility analysis was performed to verify the applicability of the BART rule to the facility as well as the list of BART-eligible units at the facility. This analysis consisted of a three-step procedure.

First, the facility is classified under the source category of "phosphate rock processing plants," which includes fertilizer production plants (the facility is also classified by FDEP as a "Chemical Process Plant").

Second, each emissions unit at the facility was reviewed to determine which units met the date requirements for a BART-eligible unit. For each emissions unit, it was determined which units began operation after August 7, 1962, and also were in existence on August 7, 1977.

Third, if an emissions unit met the date requirements for BART eligibility, the potential emissions of visibility impairing pollutants from each unit were identified. At present, the visibility impairing pollutants include SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub>. Other potential visibility impairing pollutants, such as volatile organic compounds (VOCs) and ammonia, have been determined by FDEP to have no significant effect on regional haze in Florida.

The results of this analysis are summarized in Table 2-1, which shows a total of twenty BART-eligible emission units at this facility. As shown in Table 2-1, the potential annual SO<sub>2</sub>, NO<sub>x</sub>, and



PM<sub>10</sub> emissions from the BART-eligible emissions units total more than 250 TPY for each pollutant. Because the emissions of one or more pollutants are greater than the 250 TPY threshold, all of these pollutants will be included in the visibility impairment assessment for the facility. Since PM<sub>10</sub> emissions from the non-fugitive emissions units are greater than 250 TPY, it is not necessary to quantify fugitive particulate matter (PM) emissions from the BART-eligible emissions units for source applicability under the BART regulation. Only the visibility impairing pollutants of SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub> are required to be included in the visibility modeling analysis. Therefore, BART-eligible emission units that do not emit these pollutants will not be included in the modeling analysis. In addition, FDEP is not requiring fugitive emissions to be included in the modeling unless the source is relatively close to a Class I area (i.e.: 50 km). The final list of BART-eligible, non-fugitive emissions units for CFI that emit SO<sub>2</sub>, NO<sub>x</sub>, or PM<sub>10</sub> are as follows:

- EU002 "A" SAP
- EU003 "B" SAP
- EU007 "C" SAP
- EU008 "D" SAP
- EU010 "A" DAP/MAP Plant
- EU011 "Z" DAP/MAP Plant
- EU012 "X" DAP/MAP Plant
- EU013 "Y" DAP/MAP Plant
- EU015 "A" Shipping Baghouse
- EU018 "B" Shipping Baghouse

The Johnson Boiler (EU001) is excluded from the BART-eligible list as it has a maximum heat input rate less than 250 million British thermal units per hour (MMBtu/hr) and is not an integral part of any process in the BART source category of "phosphate rock processing plants" or "chemical process plants." EPA has ruled that any boiler that supplies only heat or steam to a process is not integral to that process.

Based on discussions with FDEP, if a BART-eligible emission unit does not emit SO<sub>2</sub>, NO<sub>x</sub>, or PM<sub>10</sub>, the emission unit is not required to undergo a BART control technology determination. Also, if a facility is more than 50 km from the nearest Class I area, fugitive PM emissions from BART-eligible emissions units are not required to undergo BART control evaluation.

## 2.2 Stack Parameters

The stack height above ground, stack diameter, exit velocity, and exit temperature for the BART-eligible emissions units at the Plant City facility are presented in Table 2-2. For the modeling analysis, all the emissions units will be collocated in the VISTAS domain Lambert Conformal Conic (LCC) coordinate system at  $(X, Y) = (1,467.3, -1,195.3)$  km. CFI is proposing reduced stack diameters for "C" and "D" SAPs in one of the three emissions reduction scenarios, which are also presented in Table 2-2.

## 2.3 Emission Rates for Visibility Impairment Analyses

The EPA BART guidelines indicate that the emission rate to be used for BART modeling is the highest 24-hour actual emission rate representative of normal operations for the modeling period. Depending on the availability of the source data, the source emissions information should be based on the following in order of priority, based on the BART common protocol:

- 24-hour maximum emissions based on continuous emission monitoring system (CEMS) data for the period 2001-2003,
- Facility stack test emissions,
- Potential to emit,
- Allowable permit limits, and
- AP-42 emission factors.

Emission rates for each emissions unit based on this hierarchy are presented in Table 2-3. These rates were used in the BART determination analysis submitted in January, 2007. Among the BART-eligible emissions units at CFI, the SAPs (EUs 002, 003, 007, and 008) have CEMS for SO<sub>2</sub> emissions. The SO<sub>2</sub> emission rates for the "C" and "D" SAPs were obtained from the CEMS data for the period 2001-2003. For the "B" SAP, which was undergoing PSD review in January 2007 for a production rate increase, the proposed Best Available Control Technology (BACT) emission limit was used in the modeling analysis. For the "A" SAP, a 24-hour average SO<sub>2</sub> emission limit of 250.0 pounds per hour (lb/hr) was used, which was a new emission limit proposed in the "B" SAP production increase PSD application. NO<sub>x</sub> emission rates for "C" and "D" SAPs were from the Title V Permit No. 0570005-017-AV. NO<sub>x</sub> emission rates for "A" and "B" SAPs were based on the proposed BACT limit for "B" SAP in the PSD permit application dated April 2006.

CFI is now proposing three scenarios (Scenarios A, B, and C) for lowering the 24-hour average SO<sub>2</sub> emission rates from the SAPs in order to reduce the visibility impact. These scenarios are described in detail in Section 2.6 of the BART Exemption Report. The lower SO<sub>2</sub> emission rates are based on lower SO<sub>2</sub> pound per hour (lb/hr) limits and lower production capacity (Scenarios A and B).

The emission rates used in the visibility impairment analyses, which include the proposed 24-hour average SO<sub>2</sub> emission limits for the SAPs, are presented in Tables 2-4, 2-5, and 2-6 for Scenarios A, B, and C, respectively. CFI is not proposing any reduction in NO<sub>x</sub> or SAM emissions rates from the SAPs in terms of lb/hr. The production capacities of the "A" and "B" SAPs remain unchanged and the production capacities of the "C" and "D" SAPs are reduced or remain unchanged depending on the scenario. SAP NO<sub>x</sub> emissions rates used in the modeling are based on the currently permitted pound per ton of sulfuric acid production (lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>) limits.

CFI has stack test available for SAM emissions, which were used in modeling. The production capacity of SAPs "B", "C", and "D" were recently increased to 1,600 TPD, 2,962, and 2,962 TPD, respectively. As a result, the highest stack test results (in lb/ton H<sub>2</sub>SO<sub>4</sub>) from the most recent two-years (see Attachment B), which represent the increased production capacity, are used to calculate the SAM emission rates used in the modeling for these SAPs. For "A" SAP, the highest stack test data for the period 2002 to present is used.

PM<sub>10</sub> emission rates for the "A", "X", "Y", and "Z" DAP/MAP plants and the "A" and "B" shipping baghouses are same as those used in the BART Determination Report submitted in January 2007. NO<sub>x</sub> and SO<sub>2</sub> emission rates for the DAP/MAP plants are based on AP-42 emission factors for oil-firing since these emission rates are higher than for gas-firing.

## 2.4 PM Speciation

Based on the latest regulatory guidance, PM emissions by size category need to be considered in the appropriate species for the visibility analysis. The effect that each species has on visibility impairment is related to a parameter called the extinction coefficient. The higher the extinction coefficient, the greater the species' affect on visibility. Filterable PM is speciated into coarse (PMC), fine (PMF), and elemental carbon (EC), with default extinction efficiencies of 0.6, 1.0, and 10.0, respectively. PMC is PM with aerodynamic diameter between 10 microns and 2.5 microns. Both EC and PMF have aerodynamic diameters equal to or less than 2.5 microns. Condensable PM is comprised of inorganic PM such as sulfate (SO<sub>4</sub>) and organic PM such as secondary organic aerosols

(SOA). The extinction efficiencies for these species are  $3 \cdot f(\text{RH})$  and 4, respectively, where  $f(\text{RH})$  is the relative humidity factor.

As shown in Table 2-1, total  $\text{PM}_{10}$  emissions from the BART-eligible emissions units at CFI are approximately 400 TPY, compared to approximately 5,500 TPY of  $\text{SO}_2$ . Since  $\text{PM}_{10}$  emissions are much lower than  $\text{SO}_2$  emissions and the PM speciation profile for the DAP/MAP plants is not known; as a conservative approach, all  $\text{PM}_{10}$  emissions will be considered as organic PM with extinction efficiency of 4.0. Sulfuric acid ( $\text{H}_2\text{SO}_4$ ) mist emissions from the SAPs will be considered as condensable inorganic PM and will be modeled as  $\text{SO}_4$ , with extinction efficiency of  $3 \cdot f(\text{RH})$ .

## 2.5 Building Dimensions

Based on discussions with FDEP, building downwash effects will not be considered in the modeling because these effects are considered to be minimal in assessing impacts as the distance of the nearest Class I area is more than 50 km from the CFI Plant City facility.

**TABLE 2-1  
BART ELIGIBILITY ANALYSIS FOR CF INDUSTRIES - PLANT CITY FACILITY  
(FACILITY ID 0570005)**

EU ID	Emission Unit	BART Category <sup>a</sup>	Dates			Meets BART Date Criteria? (Yes/No)	SO <sub>2</sub> , NO <sub>x</sub> , or PM Source? (Yes/No)	BART Eligible? (Yes/No)	Potential Emissions			Comments
			Start-Up	Initial Construction	In Existence on 8/7/1977? (Yes/No)				Began Operation After 8/7/1962? (Yes/No)	SO <sub>2</sub> (TPY)	NO <sub>x</sub> (TPY)	
001	Johnston Scotch Marine Type Boiler	None	--	--	--	--	--	No	--	--	--	< 250 MMBtu/hr and not integral to process
002	"A" Sulfuric Acid Plant	13	12/1/1965	1964	Yes	Yes	Yes	Yes	1003	28.5	--	
003	"B" Sulfuric Acid Plant	13	12/1/1965	1964	Yes	Yes	Yes	Yes	1003	28.5	--	Only fluoride emissions
004	"A" PAP <sup>b</sup>	13	12/1/1965	1964	Yes	Yes	Yes	No	--	--	--	
007	"C" Sulfuric Acid Plant	13	1/8/1975	1974	Yes	Yes	Yes	Yes	1757	60.0	--	Only fluoride emissions
008	"D" Sulfuric Acid Plant	13	1/8/1975	1974	Yes	Yes	Yes	Yes	1757	60.0	--	
009	"B" PAP <sup>b</sup>	13	1/8/1975	1974	Yes	Yes	Yes	No	--	--	--	Only fluoride emissions
010	"A" DAP/MAP Plant	13	12/1/1965	1964	Yes	Yes	Yes	Yes	6.3	17.8	143.1	
011	"Z" DAP/MAP Plant	13	1/8/1975	1974	Yes	Yes	Yes	Yes	9.5	26.7	99	Fugitive emissions only
012	"X" DAP/MAP Plant	13	1/8/1975	1974	Yes	Yes	Yes	Yes	9.9	28	41.9	
013	"Y" DAP/MAP Plant	13	1/8/1975	1974	Yes	Yes	Yes	Yes	11	31	67	Fugitive emissions only
014	"A" and "B" Storage Building <sup>c</sup>	13	1/8/1975	1974	Yes	Yes	Yes	Yes	--	--	--	
015	"A" Shipping Baghouse	13	12/1/1965	1964	Yes	Yes	Yes	Yes	--	--	21.9	Fugitive emissions only
018	"B" Shipping Baghouse	13	1/8/1975	1974	Yes	Yes	Yes	Yes	--	--	21.9	
019	"B" Truck/Railcar Loading	13	1/8/1975	1974	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
020	"A" Railcar/Truck Loading	13	12/1/1965	1964	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
032	Phosphoric Acid Cleanup System	13	5/1/1980	1979	No	Yes	No	--	--	--	--	Did not exist on 8/7/77
022	Molten Sulfur Handling --Storage Tank (022)	13	1/8/1975	1974	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
023	Molten Sulfur Handling --Truck Pit A	13	12/1/1965	1964	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
024	Molten Sulfur Handling --Truck Pit B	13	12/1/1965	1964	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
033	Molten Sulfur Handling --Storage Tank (033)	13	1/1/1992	1991	No	Yes	No	--	--	--	--	Did not exist on 8/7/77
099	Unregulated Units and Facility Fugitives	13	12/1/1965	1964	Yes	Yes	Yes	Yes	--	--	--	Fugitive emissions only
100	Phosphogypsum Stack <sup>b</sup>	13	12/1/1965	1964	Yes	Yes	Yes	No	--	--	--	Only fluoride emissions
<b>Total TPY =</b>									5,556.7	280.4	394.8	

<sup>a</sup> BART category 13 is "Phosphate Rock Processing Plants".

<sup>b</sup> Not a SO<sub>2</sub>, NO<sub>x</sub>, or PM<sub>10</sub> source and therefore, will not be included in any modeling and a BART determination will not be required.

<sup>c</sup> A & B Storage building scrubber has been removed and this is a fugitive emissions source only.

**TABLE 2-2**  
**SUMMARY OF STACK AND OPERATING PARAMETERS AND LOCATIONS FOR THE BART-ELIGIBLE EMISSIONS UNITS**  
**CFI PLANT CITY FACILITY**

Emission Unit	Model ID	Stack Parameters				Operating Parameters					
		Height		Diameter		Flow Rate (acfm)	Exit Temperature		Velocity		
		ft	m	ft	m		°F	K	ft/s	m/s	
"A" SAP	SAPA	110	33.53	5.0	1.52	80,950	83	301.5	68.7	20.94	
"B" SAP	SAPB	110	33.53	5.0	1.52	88,140	83	301.5	74.8	22.80	
"C" SAP	SAPC	199	60.66	8.0	2.44	140,700	158	343.2	46.7	14.22	
"C" SAP (cap) <sup>a</sup>	SAPC	199	60.66	5.0	1.52	140,700	158	343.2	119.4	36.40	
"D" SAP	SAPD	199	60.66	8.0	2.44	145,600	161	344.8	48.3	14.71	
"D" SAP (cap) <sup>a</sup>	SAPD	199	60.66	5.0	1.52	145,600	161	344.8	123.6	37.67	
"A" DAP/MAP Plant	ADMP	99	30.18	10.0	3.05	173,300	137	331.5	36.8	11.21	
"Z" DAP/MAP Plant	ZDMP	180	54.86	9.0	2.74	169,800	140	333.2	44.5	13.56	
"X" DAP/MAP Plant	XDMP	180	54.86	9.0	2.74	193,700	134	329.8	50.7	15.47	
"Y" DAP/MAP Plant	YDMP	180	54.86	9.0	2.74	203,400	135	330.4	53.3	16.24	
"A" Shipping Baghouse	ASBAG	90	27.43	1.7	0.52	8,500	110	316.5	62.4	19.02	
"B" Shipping Baghouse	BSBAG	35	10.67	2.0	0.61	10,000	120	322.0	53.1	16.17	

<sup>a</sup> Parameters used in Scenario C (Cap Scenario) modeling.

Note: All emissions units will be collocated for the purpose of modeling. The facility coordinates are as follows:

UTM Zone 17: 388.0 km East, 3,116.0 km North.

Lambert Conformal Conic (LCC) coordinate, VISTAS Domain: 1,467.3 km, -1,195.3 km.

**TABLE 2-3**  
**SUMMARY OF MAXIMUM 24-HOUR AVERAGE EMISSION RATES FOR THE BART-ELIGIBLE**  
**EMISSIONS UNITS, CFI PLANT CITY FACILITY**

Source	EU ID	Model ID	PM <sub>10</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	H <sub>2</sub> SO <sub>4</sub> <sup>j</sup> (lb/hr)
"A" SAP	002	SAPA	--	6.5 <sup>a</sup>	250.0 <sup>b</sup>	0.46 <sup>c</sup>
"B" SAP	003	SAPB	--	8.0 <sup>d</sup>	233.3 <sup>d</sup>	5.00 <sup>d</sup>
"C" SAP	007	SAPC	--	14.0 <sup>e</sup>	373.1 <sup>f</sup>	4.80 <sup>e</sup>
"D" SAP	008	SAPD	--	14.0 <sup>e</sup>	377.9 <sup>g</sup>	3.86 <sup>e</sup>
"A" DAP/MAP Plant	010	ADMP	7.87 <sup>c</sup>	4.1 <sup>h</sup>	1.45 <sup>h</sup>	<0.1
"Z" DAP/MAP Plant	011	ZDMP	6.75 <sup>c</sup>	6.1 <sup>h</sup>	2.17 <sup>h</sup>	<0.1
"X" DAP/MAP Plant	012	XDMP	6.23 <sup>c</sup>	7.1 <sup>h</sup>	2.52 <sup>h</sup>	<0.1
"Y" DAP/MAP Plant	013	YDMP	8.06 <sup>c</sup>	7.1 <sup>h</sup>	2.51 <sup>h</sup>	<0.1
"A" Shipping Baghouse	015	ASBAG	1.7 <sup>i</sup>	--	--	--
"B" Shipping Baghouse	018	BSBAG	1.7 <sup>i</sup>	--	--	--

<sup>a</sup> Based on proposed BACT limit of 0.12 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> produced for the "B" SAP from PSD application dated April 2006 and permitted maximum production rate of 1,300 tons/day of 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>b</sup> Based on the proposed 24-hour average emissions limit, January 2007.

<sup>c</sup> Based on the maximum of test data. See Appendix B.

<sup>d</sup> Proposed BACT limit, PSD permit application dated April 2006.

<sup>e</sup> Based on limit in Permit No. 0570005-017-AV.

<sup>f</sup> Based on the maximum 24-hour average emissions from CEM data dated 3/02/05.

<sup>g</sup> Based on the maximum 24-hour average emissions from CEM data dated 1/31/05.

<sup>h</sup> Based on AP-42 emission factors. See Appendix A for calculations.

<sup>i</sup> Proposed emission limit, PSD permit application dated April 2006.

<sup>j</sup> Emission rates less than 0.1 lb/hr will not be included in modeling.

**TABLE 2-4**  
**SUMMARY OF 24-HOUR AVERAGE EMISSION RATES FOR THE BART-ELIGIBLE EMISSIONS UNITS**  
**SCENARIO A - REDUCED PRODUCTION SCENARIO**  
**CFI PLANT CITY FACILITY**

Source	EU ID	Model ID	PM <sub>10</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	H <sub>2</sub> SO <sub>4</sub> (lb/hr)
"A" SAP	002	SAPA	--	6.5 <sup>a</sup>	75.8 <sup>b</sup>	0.7 <sup>c</sup>
"B" SAP	003	SAPB	--	8.0 <sup>a</sup>	93.3 <sup>b</sup>	1.5 <sup>d</sup>
"C" SAP	007	SAPC	--	11.9 <sup>e</sup>	303.3 <sup>f</sup>	4.2 <sup>g</sup>
"D" SAP	008	SAPD	--	11.9 <sup>e</sup>	303.3 <sup>f</sup>	2.8 <sup>h</sup>
"A" DAP/MAP Plant	010	ADMP	7.87 <sup>i</sup>	4.1 <sup>i</sup>	1.45 <sup>i</sup>	<0.1
"Z" DAP/MAP Plant	011	ZDMP	6.75 <sup>i</sup>	6.1 <sup>i</sup>	2.17 <sup>i</sup>	<0.1
"X" DAP/MAP Plant	012	XDMP	6.23 <sup>i</sup>	7.1 <sup>i</sup>	2.52 <sup>i</sup>	<0.1
"Y" DAP/MAP Plant	013	YDMP	8.06 <sup>i</sup>	7.1 <sup>i</sup>	2.51 <sup>i</sup>	<0.1
"A" Shipping Baghouse	015	ASBAG	1.7 <sup>i</sup>	--	--	--
"B" Shipping Baghouse	018	BSBAG	1.7 <sup>i</sup>	--	--	--

<sup>a</sup> Based on currently permitted production capacity and BACT limit of 0.12 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> produced (for the "B" SAP).

<sup>b</sup> Based on currently permitted production capacity and emission rate of 1.4 lb/ton 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>c</sup> Based on the maximum of test results, 0.012 lb/ton. 1300 TPD x 0.012 lb/ton x (day/24 hrs) = 0.7 lb/hr.

<sup>d</sup> Based on the maximum of test results for the period 2008-present, 0.022 lb/ton. 1600 TPD x 0.022 lb/ton x (day/24 hrs) = 1.5 lb/hr.

<sup>e</sup> Based on production capacity of 2,600 TPD and BACT limit of 0.11 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>f</sup> Based on production capacity of 2,600 TPD and emission rate of 2.8 lb/ton 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>g</sup> Based on the maximum of test results for the period 2008-present, 0.039 lb/ton. 2600 TPD x 0.039 lb/ton x (day/24 hrs) = 4.2 lb/hr.

<sup>h</sup> Based on the maximum of test results for the period 2008-present, 0.026 lb/ton. 2600 TPD x 0.026 lb/ton x (day/24 hrs) = 2.8 lb/hr.

<sup>i</sup> See Table 2-3.



**TABLE 2-5**  
**SUMMARY OF 24-HOUR AVERAGE EMISSION RATES FOR THE BART-ELIGIBLE EMISSIONS UNITS**  
**SCENARIO B - CONVERTER REPLACEMENT SCENARIO**  
**CFI-PLANT CITY FACILITY**

Source	EU ID	Model ID	PM <sub>10</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	H <sub>2</sub> SO <sub>4</sub> (lb/hr)
"A" SAP	002	SAPA	--	6.5 <sup>a</sup>	81.3 <sup>b</sup>	0.7 <sup>c</sup>
"B" SAP	003	SAPB	--	8.0 <sup>a</sup>	100.0 <sup>b</sup>	1.5 <sup>d</sup>
"C" SAP	007	SAPC	--	13.3 <sup>e</sup>	241.7 <sup>f</sup>	4.7 <sup>g</sup>
"D" SAP	008	SAPD	--	13.3 <sup>e</sup>	241.7 <sup>f</sup>	3.1 <sup>h</sup>
"A" DAP/MAP Plant	010	ADMP	7.87 <sup>i</sup>	4.1 <sup>i</sup>	1.45 <sup>i</sup>	<0.1
"Z" DAP/MAP Plant	011	ZDMP	6.75 <sup>i</sup>	6.1 <sup>i</sup>	2.17 <sup>i</sup>	<0.1
"X" DAP/MAP Plant	012	XDMP	6.23 <sup>i</sup>	7.1 <sup>i</sup>	2.52 <sup>i</sup>	<0.1
"Y" DAP/MAP Plant	013	YDMP	8.06 <sup>i</sup>	7.1 <sup>i</sup>	2.51 <sup>i</sup>	<0.1
"A" Shipping Baghouse	015	ASBAG	1.7 <sup>i</sup>	--	--	--
"B" Shipping Baghouse	018	BSBAG	1.7 <sup>i</sup>	--	--	--

<sup>a</sup> Based on currently permitted production capacity and BACT limit of 0.12 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> produced (for the "B" SAP).

<sup>b</sup> Based on currently permitted production capacity and emission rate of 1.5 lb/ton 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>c</sup> Based on the maximum of test results, 0.012 lb/ton. 1300 TPD x 0.012 lb/ton x (day/24 hrs) = 0.7 lb/hr.

<sup>d</sup> Based on the maximum of test results for the period 2008-present, 0.022 lb/ton. 1600 TPD x 0.022 lb/ton x (day/24 hrs) = 1.5 lb/hr.

<sup>e</sup> Based on production capacity of 2,900 TPD and BACT limit of 0.11 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>f</sup> Based on production capacity of 2,900 TPD and emission rate of 2.0 lb/ton 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>g</sup> Based on the maximum of test results for the period 2008-present, 0.039 lb/ton. 2900 TPD x 0.039 lb/ton x (day/24 hrs) = 4.7 lb/hr.

<sup>h</sup> Based on the maximum of test results for the period 2008-present, 0.026 lb/ton. 2900 TPD x 0.026 lb/ton x (day/24 hrs) = 3.1 lb/hr.

<sup>i</sup> See Table 2-3.

**TABLE 2-6**  
**SUMMARY OF 24-HOUR AVERAGE EMISSION RATES FOR THE BART-ELIGIBLE EMISSIONS UNITS**  
**SCENARIO C - EMISSIONS CAP SCENARIO**  
**CFI PLANT CITY FACILITY**

Source	EU ID	Model ID	PM <sub>10</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	H <sub>2</sub> SO <sub>4</sub> (lb/hr)
"A" & "B" SAPs	002 & 003	--	--	14.5 <sup>a</sup>	181.3 <sup>b</sup>	2.7 <sup>c</sup>
"C" & "D" SAPs	007 & 008	--	--	27.2 <sup>d</sup>	610.0 <sup>e</sup>	9.6 <sup>f</sup>
"A" DAP/MAP Plant	010	ADMP	7.87 <sup>g</sup>	4.1 <sup>g</sup>	1.45 <sup>g</sup>	<0.1
"Z" DAP/MAP Plant	011	ZDMP	6.75 <sup>g</sup>	6.1 <sup>g</sup>	2.17 <sup>g</sup>	<0.1
"X" DAP/MAP Plant	012	XDMP	6.23 <sup>g</sup>	7.1 <sup>g</sup>	2.52 <sup>g</sup>	<0.1
"Y" DAP/MAP Plant	013	YDMP	8.06 <sup>g</sup>	7.1 <sup>g</sup>	2.51 <sup>g</sup>	<0.1
"A" Shipping Baghouse	015	ASBAG	1.7 <sup>g</sup>	--	--	--
"B" Shipping Baghouse	018	BSBAG	1.7 <sup>g</sup>	--	--	--

<sup>a</sup> Based on currently total permitted production capacity of 2,900 TPD and BACT limit of 0.12 lb/ton 100% H<sub>2</sub>SO<sub>4</sub> (for the "B" SAP).

<sup>b</sup> Proposed BART limit for the "A" and "B" SAP cap.

<sup>c</sup> Based on the maximum of test results for "A" & "B" SAPs, 0.022 lb/ton. 2900 TPD x 0.022 lb/ton x (day/24 hrs) = 2.7 lb/hr.

<sup>d</sup> Based on currently total permitted production capacity of 5,924 TPD and BACT limit of 0.11 lb/ton 100% H<sub>2</sub>SO<sub>4</sub>.

<sup>e</sup> Proposed BART limit for the "C" and "D" SAP cap.

<sup>f</sup> Based on the maximum of test results for "C" & "D" SAPs, 0.039 lb/ton. 5924 TPD x 0.039 lb/ton x (day/24 hrs) = 9.6 lb/hr.

<sup>g</sup> See Table 2-3.

## 3.0 GEOPHYSICAL AND METEOROLOGICAL DATA

### 3.1 Modeling Domain and Terrain

CALMET data sets have been developed by EarthTech, Inc. that are based on the following 3 years of Fifth Generation Mesoscale Model (MM5) meteorological data assembled by VISTAS:

- 2001 MM5 data set at 12 km grid (developed by EPA),
- 2002 MM5 data set at 12 km grid (developed by VISTAS), and
- 2003 MM5 data set at 36 km grid (developed by Midwest Regional Planning Organization).

For the finer grid modeling analysis (refined analysis), the 4-km spacing Florida CALMET domain will be used. VISTAS has prepared a total of five sub-regional 4-km spacing CALMET domains. Domain 2 covers all Florida sources and Class I areas that can be potentially affected by the Florida sources.

Golder Associates Inc. (Golder) obtained these data sets from FDEP. As indicated in Section 1.3, for this protocol, the exemption modeling will be based on the finer grid modeling since the CFI Plant City facility is a large source that is likely to exceed the initial screening thresholds.

### 3.2 Land Use and Meteorological Database

The CALMET domains to be used in the exemption modeling have been supplied by VISTAS. The CALMET data sets contain meteorological data and land use parameters for the three-dimensional modeling domain.

### 3.3 Air Quality Database

#### 3.3.1 Ozone Concentrations

For these analyses, observed ozone data for 2001-2003 from CASTNet and Aerometric Information Retrieval System (AIRS) stations will be used. These data sets have been obtained from EarthTech's website as recommended by FDEP.

### 3.3.2 Ammonia Concentrations

A fixed monthly background ammonia concentration of 0.5 parts per billion (ppb) will be used based on FDEP's recommendation.

### 3.4 Natural Conditions at Class I Area

Based on VISTAS' recommendation, Visibility Method 6 will be used in all BART-related modeling, which will compute extinction coefficients for hygroscopic species (modeled and background) using a monthly  $f(\text{RH})$  in lieu of calculating hourly RH factors. Monthly RH values from Table A-3 of EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule (Haze Guideline)* will be used. Monthly RH factors for the Class I areas within 300 km of the CFI facility are as follows:

Month	Chassahowitzka NWA	Everglades NP	Okefenokee NWA	Saint Marks NWA
January	3.8	2.7	3.5	3.7
February	3.5	2.6	3.2	3.4
March	3.4	2.6	3.1	3.4
April	3.2	2.4	3.0	3.4
May	3.3	2.4	3.6	3.5
June	3.9	2.7	3.7	4.0
July	3.9	2.6	3.7	4.1
August	4.2	2.9	4.1	4.4
September	4.1	3.0	4.0	4.2
October	3.9	2.8	3.8	3.8
November	3.7	2.6	3.5	3.7
December	3.9	2.7	3.6	3.8

Method 6 requires input of natural background (BK) concentrations of ammonium sulfate ( $\text{BKSO}_4$ ), ammonium nitrate ( $\text{BKNO}_3$ ), coarse particulates ( $\text{BKPMC}$ ), organic carbon ( $\text{BKOC}$ ), soil ( $\text{BKSOIL}$ ), and elemental carbon ( $\text{BKEC}$ ) in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The model then calculates the natural background light extinction and haze index based on these values.

According to FDEP recommendations, the natural background light extinction may be based on haze index (HI) values (in dv) for either the annual average or the 20-percent best visibility days provided by EPA in Appendix B of the Haze Guideline document (using the 10<sup>th</sup> percentile HI value). For CFI's BART analysis, the annual average HI values will be used to determine natural background light extinction of the Class I areas. The light extinction coefficient in inverse megameters ( $Mm^{-1}$ ) is based on the concentration of the visibility impairing components and the extinction efficiency, in square meters per gram ( $m^2/g$ ), for each component.

Per VISTAS and FDEP recommendations, the natural background light extinction that is equivalent to EPA-provided background HI values for each Class I area, based on the annual average, will be estimated using the following background values:

- Rayleigh scattering =  $10 Mm^{-1}$ ;
- Concentrations of  $BKSO_4$ ,  $BKNO_3$ ,  $BKPMC$ ,  $BKEC$ , and  $BKEC$  = 0.0; and
- $BKSOIL$  concentration, which is estimated from the extinction coefficient that corresponds to EPA's HI value (corresponding to annual average) and then subtracting the Rayleigh scattering of  $10 Mm^{-1}$  (assumes that the extinction efficiency of soil is  $1 m^2/g$ ).

According to Appendix B of the Haze Guideline document, the annual average background light extinction coefficient for each Class I area and corresponding calculated  $BKSOIL$  concentrations are as follows:

- Chassahowitzka NWA –  $21.45 Mm^{-1}$  (equivalent to 7.63 dv);  $11.45 \mu g/m^3$
- Everglades NP –  $20.77 Mm^{-1}$  (equivalent to 7.31 dv);  $10.77 \mu g/m^3$
- Okefenokee NWA –  $21.40 Mm^{-1}$  (equivalent to 7.61 dv);  $11.40 \mu g/m^3$
- Saint Marks NWA –  $21.53 Mm^{-1}$  (equivalent to 7.67 dv);  $11.53 \mu g/m^3$

Currently, the atmospheric light extinction is estimated by an algorithm developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) committee, which was adopted by the EPA under the 1999 Regional Haze Rule (RHR). This algorithm for estimating light extinction from particle speciation data tends to underestimate light extinction for the highest haze conditions and overestimate it for the lowest haze conditions and does not include light extinction due to sea salt, which is important at sites near the sea coasts. As a result of these limitations, the IMPROVE Steering Committee recently developed a new algorithm (the "new IMPROVE algorithm") for estimating light extinction from

particulate matter component concentrations, which provides a better correspondence between measured visibility and that calculated from particulate matter component concentrations.

The new algorithm splits the total sulfate, nitrate, and organic carbon compound concentrations into two fractions, representing small and large size distributions of those compounds. New terms added to the algorithm are light absorption by  $\text{NO}_2$  gas and light scattering due to fine sea salt accompanied by its own hygroscopic scattering enhancement factor and Class I area-specific Rayleigh scattering values rounded off to the nearest whole number. The U.S. Environmental Protection Agency (EPA) and the Federal Land Managers (FLMs) from the National Park Service and the U.S. Fish and Wildlife Service have determined that adding site-specific data (e.g., sea salt and site-specific Rayleigh scattering) to the old IMPROVE algorithm, for a hybrid approach, is not recommended and is allowing the optional use of the new IMPROVE algorithm.

Because one or more of the Class I areas within 300 km of the CFI's Plant City facility are located near the sea coast, the new IMPROVE algorithm may additionally be used to calculate the natural background at these Class I areas. The new IMPROVE algorithm accounts for the background sea salt concentrations and site-specific Rayleigh scattering. Since the new IMPROVE equation cannot be directly implemented using the existing version of the CALPUFF model without additional post-processing or model revision, VISTAS has developed a methodology for implementing the new IMPROVE equation using existing CALPUFF/CALPOST output in a spreadsheet. This spreadsheet, known as the CALPOST-IMPROVE processor will be used to re-calculate visibility impacts due to CFI's BART-eligible units in addition to the visibility impacts determined using the old IMPROVE equation.

Light absorption by  $\text{NO}_2$  gas, which is a new term added to the new IMPROVE algorithm, will also be considered for CFI's BART modeling analysis. The following Class I area-specific Rayleigh scattering (in  $\text{Mm}^{-1}$ ) and sea salt concentrations (in  $\mu\text{g}/\text{m}^3$ ) values will be used to evaluate the visibility impacts using the new CALPOST-IMPROVE processor:

- Chassahowitzka NWA –  $11 \text{ Mm}^{-1}$  ;  $0.08 \mu\text{g}/\text{m}^3$
- Everglades NP –  $11 \text{ Mm}^{-1}$  ;  $0.31 \mu\text{g}/\text{m}^3$
- Okefenokee NWA –  $11 \text{ Mm}^{-1}$  ;  $0.09 \mu\text{g}/\text{m}^3$
- Saint Marks NWA –  $11 \text{ Mm}^{-1}$  ;  $0.03 \mu\text{g}/\text{m}^3$

## **4.0 AIR QUALITY MODELING METHODOLOGY**

For predicting maximum visibility impairment at the Class I area, the CALPUFF modeling system will be used. For BART-related visibility impact assessments, the CALPUFF model, Version 5.756 (060725), is recommended for use by EPA and VISTAS. Recent technical enhancements, including changes to the over-water boundary layer formulation and coastal effects modules (sponsored by the Minerals Management Service), are included in this version. The CALPUFF model is a non-steady-state long-range transport Lagrangian puff dispersion model applicable for estimating visibility impacts. The methods and assumptions used in the CALPUFF model will be based on the latest recommendations for CALPUFF analysis as presented in the VISTAS modeling protocol, Interagency Workgroup on Air Quality Models (IWAQM) Phase 2 Summary Report and the FLMs' Air Quality Related Values Work Group (FLAG) document. This model is also maintained by EPA on the Support Center for Regulatory Air Models (SCRAM) website.

### **4.1 Modeling Domain Configuration**

The 4-km spacing Florida domain will be used for the BART exemption modeling and if required, modeling to evaluate visibility benefits of different BART control measures. VISTAS has prepared five sub-regional 4-km spacing CALMET domains. Domain 2 of these domains cover sources in Florida and Class I areas that are affected by the sources in Florida.

### **4.2 CALMET Meteorological Domain**

The refined CALMET domain, to be used for CFI's BART modeling has been provided by FDEP. The major features used in preparing these CALMET data have been described in Section 4.0 of the VISTAS BART modeling protocol.

### **4.3 CALPUFF Computational Domain and Receptors**

The computational domain to be used for the refined modeling will be equal to the full extent of the meteorological domain. Visibility impacts will be predicted at each Class I area using receptor locations provided by the FLMs. Because the Everglades NP and the Okefenokee NWA have such a large number of receptors, a smaller set of receptors consisting of the boundary and some intermediate points in each of these Class I areas will be modeled. The receptors to be used for each of the Class I areas are presented in Figures 4-1 through 4-4.

#### 4.4 CALPUFF Modeling Options

The major CALPUFF modeling options recommended in the IWAQM guidance (EPA, 1988; Pages B-1 through B-8) will be used in addition to the recommendations in Section 4.3.3 of the VISTAS BART modeling protocol. An example CALPUFF input file showing the default modeling options and modeling options to be used for CFI's BART analysis is presented in Attachment C.

#### 4.5 Light Extinction and Haze Impact Calculations

The CALPOST program will be used to calculate the light extinction and the haze impact. The Method 6 technique, which is recommended by the BART guidance, will be used to compute change in light extinction.

#### 4.6 Quality Assurance and Quality Control (QA/QC)

Quality assurance procedures will be established to ensure that the setup and execution of the CALPUFF model and processing of the modeling results satisfy the regulatory objectives of the BART program. The meteorological datasets to be used in the modeling were developed and provided by VISTAS and therefore, no further QA will be required for these.

The CALPUFF modeling options are described in Section 4.4. The site-specific source data will be independently confirmed by an independent modeler not involved in the initial setup of the modeling files. The verification will include:

- Units of measure;
- Verification of the correct source and receptor locations, including datum and projection;
- Confirmation of the switch selections relative to modeling guidance;
- Checks of the program switches and file names of the various processing steps; and
- Confirmation of the use of the proper version and level of each model program.

In addition, all the data and program files needed to reproduce the modeling results will be supplied with the modeling report.

The source and emission data will be independently verified by Golder and CFI. The source coordinates and related projection/datum parameters will be checked using the CALPUFF GUI's



COORDS software and other comparable coordinate translation software such as CORPSCON and National Park Services Conversion Utilities software.

The POSTUTIL and CALPOST post-processor input files will be carefully checked to make sure of the following:

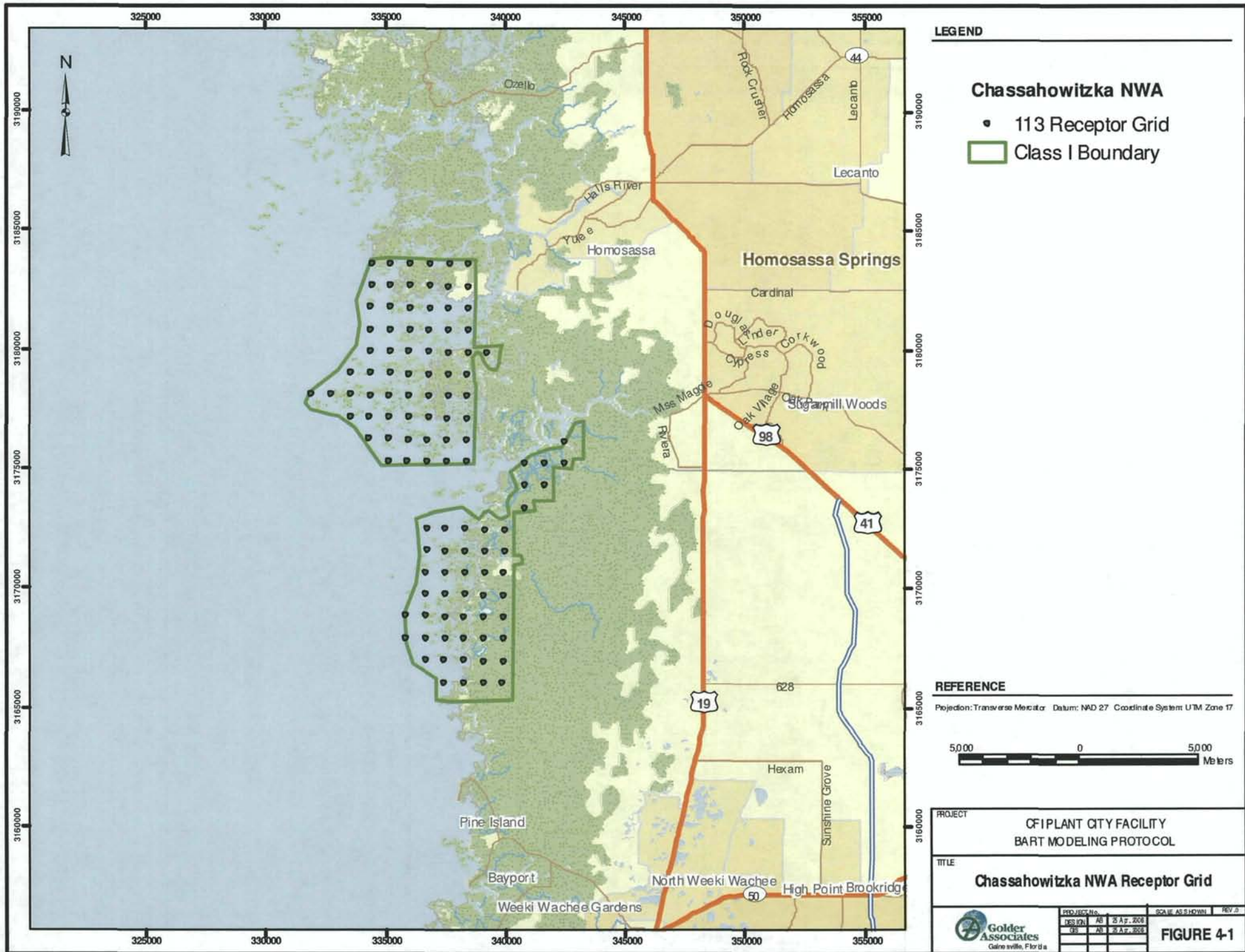
- Appropriate CALPUFF concentrations files are used in the POSTUTIL run;
- The PM species categories are computed using the appropriate fractions;
- Background light extinction computation method selected as Method 6;
- Correct monthly relative humidity adjustment factors used for the appropriate Class I area;
- Background light extinction values as described in Section 3.4 of this protocol;
- Appropriate species names for coarse and fine PM;
- Appropriate Rayleigh scattering term used; and
- Appropriate Class I receptors selected for each Class I area-specific CALPOST run.

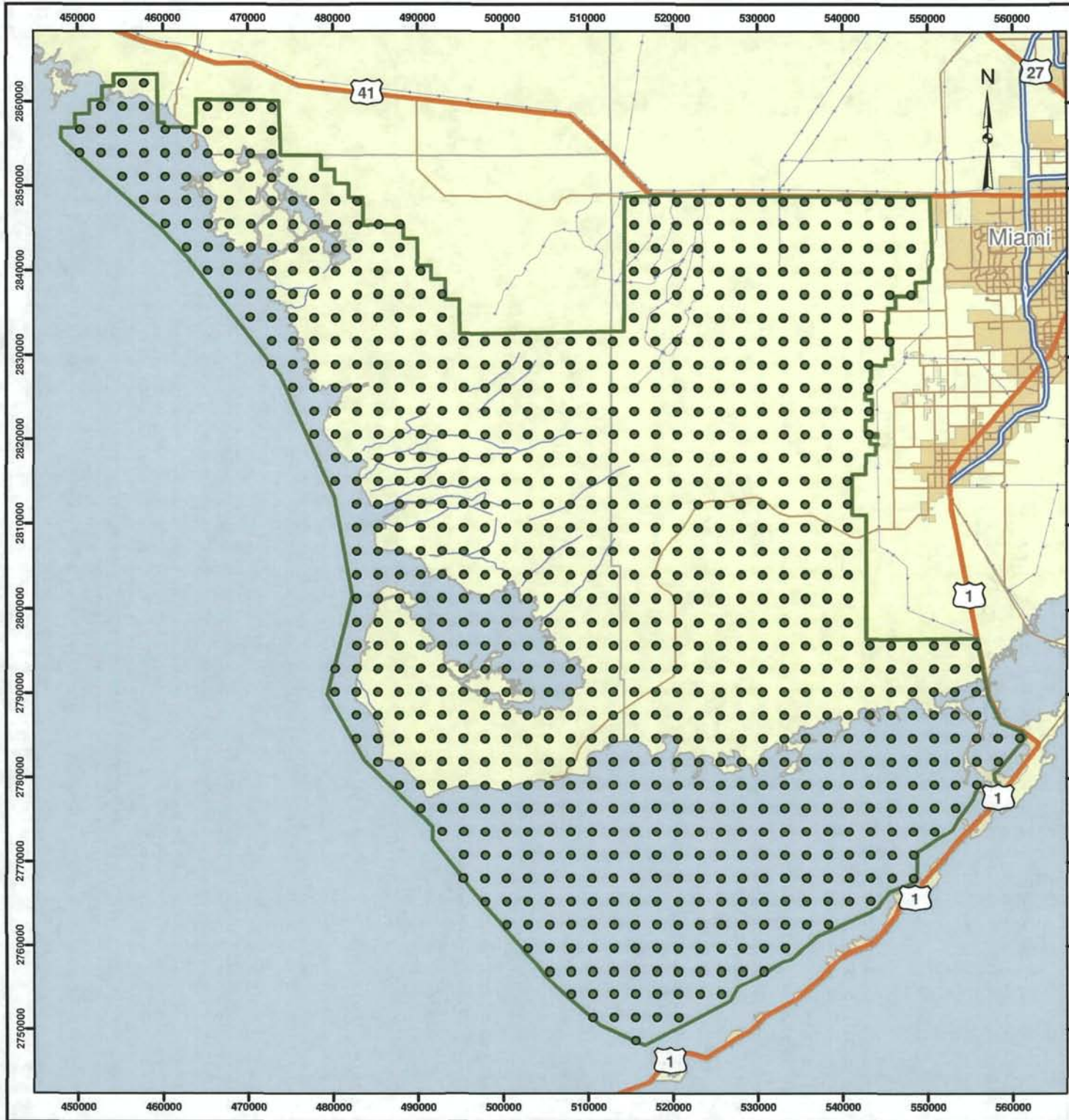
#### 4.7 Modeling Report

A modeling report will be submitted containing the following information:

- Map of source location and Class I areas within 300 km of the source;
- Table showing visibility impacts at each Class I area within 300 km of the source; and
- For the refined modeling analysis, a table showing the eight highest visibility impairment values ranked in a descending order for the prime Class I area(s) of interest.

The predicted visibility impairment results for the base emission case and all evaluated BART emission scenarios will be included in the report to show the affect on visibility for each proposed control technology. Final recommendations for BART will also be presented, based on the analysis results of the five evaluation criteria presented in the regulation.






**LEGEND**

- Everglades NP**
- 901 Receptor Grid
  - Class I Boundary

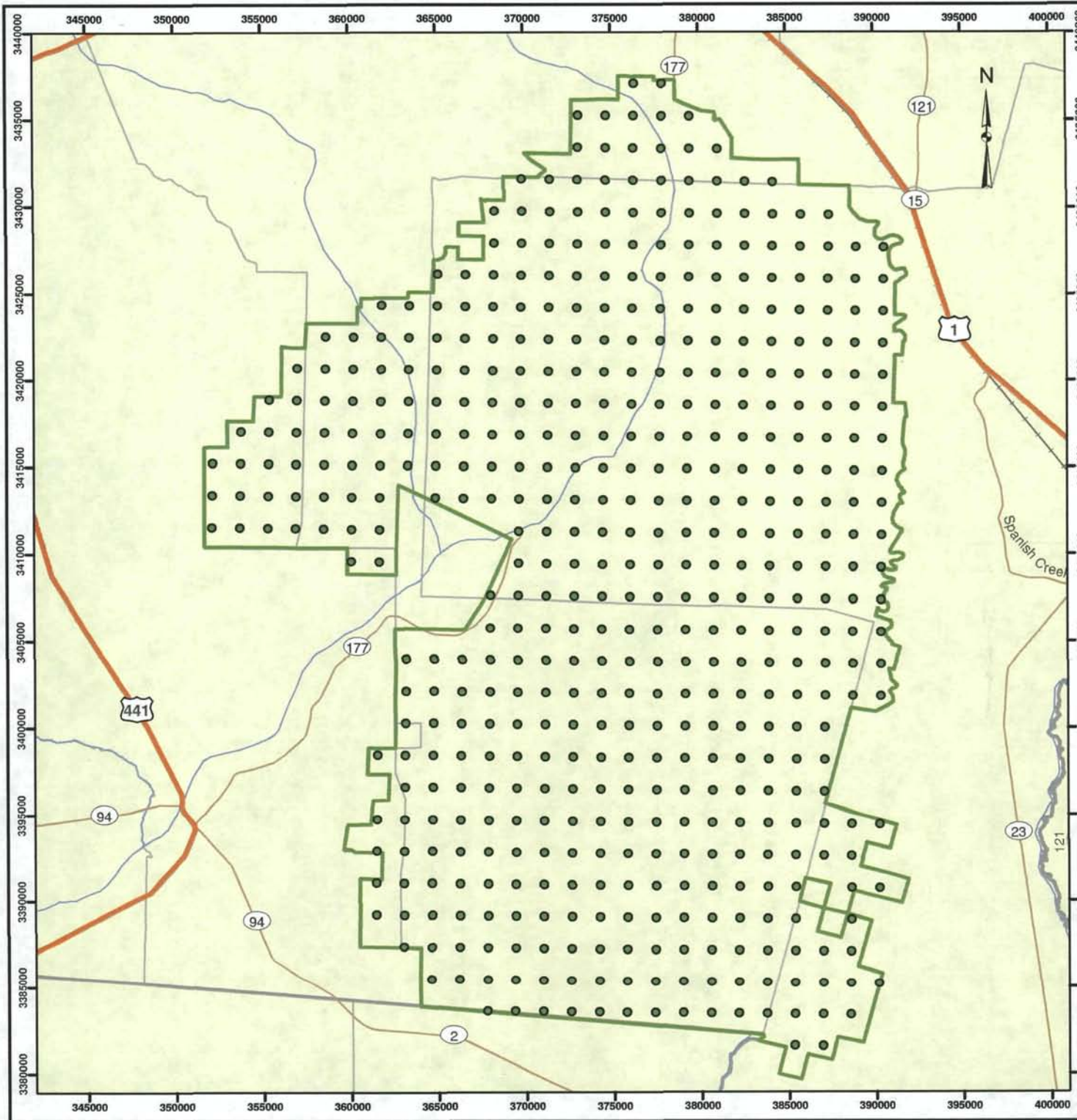
**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



PROJECT	CFI PLANT CITY FACILITY BART MODELING PROTOCOL		
	TITLE		
<b>Everglades NP Receptor Grid</b>			
 Golder Associates Gainesville, Florida	PROJECT No.	SCALE AS SHOWN	REV. 0
	DESIGN AB 25 Apr. 2008 GIS AB 25 Apr. 2008		

**FIGURE 4-2**

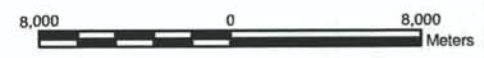


**LEGEND**

- Okefenokee NWA**
- 500 Receptor Grid
  - Class I Boundary

**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



<b>PROJECT</b>	CFI PLANT CITY FACILITY BART MODELING PROTOCOL		
<b>TITLE</b>	<b>Okefenokee NWA Receptor Grid</b>		
 Golder Associates Gainesville, Florida	PROJECT No.	SCALE AS SHOWN	REV. 0
	DESIGN AB 28 Apr. 2006		
GIS AB 29 Apr. 2006	FIGURE 4-3		



**LEGEND**

- Saint Marks NWA**
- 100 Receptor Grid
  - Class I Boundary

**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



PROJECT  
CFI PLANT CITY FACILITY  
BART MODELING PROTOCOL

TITLE  
**Saint Marks NWA Receptor Grid**



PROJECT No.	AB	25 Apr. 2006	SCALE AS SHOWN	REV. 0
DESIGN	AB	25 Apr. 2006	<b>FIGURE 4-4</b>	
GIS	AB	25 Apr. 2006		

**PROTOCOL ATTACHMENT A**

**MAXIMUM EMISSION RATES**

**TABLE A-1  
MAXIMUM EMISSION RATES DUE TO FUEL COMBUSTION FOR THE DRYER AT THE "A" DAP/MAP PLANT**

Parameter	Units	No. 2 Fuel Oil	Natural Gas																																																																																																																																																																								
<u>Operating Data</u>																																																																																																																																																																											
Annual Operating Hours	hr/yr	8,760	8,760																																																																																																																																																																								
Maximum Heat Input Rate	10 <sup>6</sup> Btu/hr	28.5	28.5																																																																																																																																																																								
Hourly Fuel Oil Usage <sup>a</sup>	10 <sup>3</sup> gal/hr	0.20	N/A																																																																																																																																																																								
Annual Fuel Oil Usage	10 <sup>3</sup> gal/yr	1,783	N/A																																																																																																																																																																								
Maximum Sulfur Content	Weight %	0.05	N/A																																																																																																																																																																								
Hourly Natural Gas Usage <sup>b</sup>	10 <sup>6</sup> scf/hr	N/A	0.029																																																																																																																																																																								
Annual Natural Gas Usage	10 <sup>6</sup> scf/yr	N/A	249.7																																																																																																																																																																								
Maximum Sulfur Content	gr/100-ft <sup>3</sup>	N/A	N/A																																																																																																																																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="3">Pollutant</th> <th rowspan="3">AP-42 Emissions Factor<sup>c</sup></th> <th colspan="2">No. 2 Fuel Oil</th> <th colspan="2">Natural gas</th> <th colspan="2">Maximum Emission Rate</th> </tr> <tr> <th>Hourly Emission Rate</th> <th>Annual Emission Rate</th> <th>Hourly Emission Rate</th> <th>Annual Emission Rate</th> <th>Hourly Emission Rate</th> <th>Annual Emission Rate</th> </tr> <tr> <th>(lb/hr)</th> <th>(TPY)</th> <th>(lb/hr)</th> <th>(TPY)</th> <th>(lb/hr)</th> <th>(TPY)</th> </tr> </thead> <tbody> <tr> <td colspan="8"><u>Sulfur Dioxide</u></td> </tr> <tr> <td>Fuel oil</td> <td>142 *(S) lb/10<sup>3</sup>gal<sup>d</sup></td> <td>1.45</td> <td>6.33</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Natural gas</td> <td>0.6 lb/10<sup>6</sup>ft<sup>3</sup></td> <td>--</td> <td>--</td> <td>0.02</td> <td>0.07</td> <td>--</td> <td>--</td> </tr> <tr> <td>Worse-Case Combination of Fuels</td> <td></td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>1.45</td> <td>6.33</td> </tr> <tr> <td colspan="8"><u>Sulfuric Acid Mist</u></td> </tr> <tr> <td>Fuel oil</td> <td>2.4 *(S) lb/10<sup>3</sup>gal<sup>d,e</sup></td> <td>0.02</td> <td>0.11</td> <td>--</td> <td>--</td> <td>0.024</td> <td>0.107</td> </tr> <tr> <td colspan="8"><u>Nitrogen Oxides</u></td> </tr> <tr> <td>Fuel oil</td> <td>20 lb/10<sup>3</sup>gal</td> <td>4.07</td> <td>17.83</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Natural gas</td> <td>100 lb/10<sup>6</sup>ft<sup>3</sup></td> <td>--</td> <td>--</td> <td>2.85</td> <td>12.48</td> <td>--</td> <td>--</td> </tr> <tr> <td>Worse-Case Combination of Fuels</td> <td></td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>4.07</td> <td>17.83</td> </tr> <tr> <td colspan="8"><u>Carbon Monoxide</u></td> </tr> <tr> <td>Fuel oil</td> <td>5 lb/10<sup>3</sup>gal</td> <td>1.02</td> <td>4.46</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Natural gas</td> <td>84 lb/10<sup>6</sup>ft<sup>3</sup></td> <td>--</td> <td>--</td> <td>2.39</td> <td>10.49</td> <td>--</td> <td>--</td> </tr> <tr> <td>Worse-Case Combination of Fuels</td> <td></td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>2.39</td> <td>10.49</td> </tr> <tr> <td colspan="8"><u>Volatile Organic Compounds</u></td> </tr> <tr> <td>Fuel oil</td> <td>0.052 lb/10<sup>3</sup>gal</td> <td>0.01</td> <td>0.05</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Natural gas</td> <td>5.5 lb/10<sup>6</sup>ft<sup>3</sup></td> <td>--</td> <td>--</td> <td>0.16</td> <td>0.69</td> <td>--</td> <td>--</td> </tr> <tr> <td>Worse-Case Combination of Fuels</td> <td></td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>0.16</td> <td>0.69</td> </tr> </tbody> </table>								Pollutant	AP-42 Emissions Factor <sup>c</sup>	No. 2 Fuel Oil		Natural gas		Maximum Emission Rate		Hourly Emission Rate	Annual Emission Rate	Hourly Emission Rate	Annual Emission Rate	Hourly Emission Rate	Annual Emission Rate	(lb/hr)	(TPY)	(lb/hr)	(TPY)	(lb/hr)	(TPY)	<u>Sulfur Dioxide</u>								Fuel oil	142 *(S) lb/10 <sup>3</sup> gal <sup>d</sup>	1.45	6.33	--	--	--	--	Natural gas	0.6 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.02	0.07	--	--	Worse-Case Combination of Fuels		--	--	--	--	1.45	6.33	<u>Sulfuric Acid Mist</u>								Fuel oil	2.4 *(S) lb/10 <sup>3</sup> gal <sup>d,e</sup>	0.02	0.11	--	--	0.024	0.107	<u>Nitrogen Oxides</u>								Fuel oil	20 lb/10 <sup>3</sup> gal	4.07	17.83	--	--	--	--	Natural gas	100 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	2.85	12.48	--	--	Worse-Case Combination of Fuels		--	--	--	--	4.07	17.83	<u>Carbon Monoxide</u>								Fuel oil	5 lb/10 <sup>3</sup> gal	1.02	4.46	--	--	--	--	Natural gas	84 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	2.39	10.49	--	--	Worse-Case Combination of Fuels		--	--	--	--	2.39	10.49	<u>Volatile Organic Compounds</u>								Fuel oil	0.052 lb/10 <sup>3</sup> gal	0.01	0.05	--	--	--	--	Natural gas	5.5 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.16	0.69	--	--	Worse-Case Combination of Fuels		--	--	--	--	0.16	0.69
Pollutant	AP-42 Emissions Factor <sup>c</sup>	No. 2 Fuel Oil		Natural gas		Maximum Emission Rate																																																																																																																																																																					
		Hourly Emission Rate	Annual Emission Rate	Hourly Emission Rate	Annual Emission Rate	Hourly Emission Rate	Annual Emission Rate																																																																																																																																																																				
		(lb/hr)	(TPY)	(lb/hr)	(TPY)	(lb/hr)	(TPY)																																																																																																																																																																				
<u>Sulfur Dioxide</u>																																																																																																																																																																											
Fuel oil	142 *(S) lb/10 <sup>3</sup> gal <sup>d</sup>	1.45	6.33	--	--	--	--																																																																																																																																																																				
Natural gas	0.6 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.02	0.07	--	--																																																																																																																																																																				
Worse-Case Combination of Fuels		--	--	--	--	1.45	6.33																																																																																																																																																																				
<u>Sulfuric Acid Mist</u>																																																																																																																																																																											
Fuel oil	2.4 *(S) lb/10 <sup>3</sup> gal <sup>d,e</sup>	0.02	0.11	--	--	0.024	0.107																																																																																																																																																																				
<u>Nitrogen Oxides</u>																																																																																																																																																																											
Fuel oil	20 lb/10 <sup>3</sup> gal	4.07	17.83	--	--	--	--																																																																																																																																																																				
Natural gas	100 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	2.85	12.48	--	--																																																																																																																																																																				
Worse-Case Combination of Fuels		--	--	--	--	4.07	17.83																																																																																																																																																																				
<u>Carbon Monoxide</u>																																																																																																																																																																											
Fuel oil	5 lb/10 <sup>3</sup> gal	1.02	4.46	--	--	--	--																																																																																																																																																																				
Natural gas	84 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	2.39	10.49	--	--																																																																																																																																																																				
Worse-Case Combination of Fuels		--	--	--	--	2.39	10.49																																																																																																																																																																				
<u>Volatile Organic Compounds</u>																																																																																																																																																																											
Fuel oil	0.052 lb/10 <sup>3</sup> gal	0.01	0.05	--	--	--	--																																																																																																																																																																				
Natural gas	5.5 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.16	0.69	--	--																																																																																																																																																																				
Worse-Case Combination of Fuels		--	--	--	--	0.16	0.69																																																																																																																																																																				

Footnotes:

<sup>a</sup> Based on the heat content of fuel oil of 146,000 Btu/gallon.

<sup>b</sup> Based on the heat content of natural gas of 1,000 Btu/scf.

<sup>c</sup> Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998.

<sup>d</sup> S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.05%.

<sup>e</sup> Sulfuric acid mist emission factor based on emission factor for SO<sub>3</sub> (AP-42, Section 1.3) converted to H<sub>2</sub>SO<sub>4</sub> using molecular weight.

**TABLE A-2  
MAXIMUM EMISSION RATES DUE TO FUEL COMBUSTION FOR THE DRYER AT THE "Z" DAP/MAP PLANT**

Parameter	Units	Natural Gas					
		No. 2 Fuel Oil	Natural Gas				
<u>Operating Data</u>							
Annual Operating Hours	hr/yr	8,760	8,760				
Maximum Heat Input Rate	10 <sup>6</sup> Btu/hr	42.75	42.75				
Hourly Fuel Oil Usage <sup>a</sup>	10 <sup>3</sup> gal/hr	0.31	N/A				
Annual Fuel Oil Usage	10 <sup>3</sup> gal/yr	2,675	N/A				
Maximum Sulfur Content	Weight %	0.05	N/A				
Hourly Natural Gas Usage <sup>b</sup>	10 <sup>6</sup> scf/hr	N/A	0.043				
Annual Natural Gas Usage	10 <sup>6</sup> scf/yr	N/A	374.5				
Maximum Sulfur Content	gr/100 ft <sup>3</sup>	N/A	N/A				
Pollutant	AP-42 Emissions Factor <sup>c</sup>	No. 2 Fuel Oil		Natural gas		Maximum Emission Rate	
		Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)
<u>Sulfur Dioxide</u>							
Fuel oil	142 *(S)-lb/10 <sup>3</sup> gal <sup>d</sup>	2.17	9.50	--	--	--	--
Natural gas	0.6 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.03	0.11	--	--
Worse-Case Combination of Fuels		--	--	--	--	2.17	9.50
<u>Sulfuric Acid Mist</u>							
Fuel oil	2.4 *(S) lb/10 <sup>3</sup> gal <sup>d,e</sup>	0.04	0.16	--	--	0.037	0.160
<u>Nitrogen Oxides</u>							
Fuel oil	20 lb/10 <sup>3</sup> gal	6.11	26.75	--	--	--	--
Natural gas	100 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	4.28	18.72	--	--
Worse-Case Combination of Fuels		--	--	--	--	6.11	26.75
<u>Carbon Monoxide</u>							
Fuel oil	5 lb/10 <sup>3</sup> gal	1.53	6.69	--	--	--	--
Natural gas	84 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	3.59	15.73	--	--
Worse-Case Combination of Fuels		--	--	--	--	3.59	15.73
<u>Volatile Organic Compounds</u>							
Fuel oil	0.052 lb/10 <sup>3</sup> gal	0.02	0.07	--	--	--	--
Natural gas	5.5 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.24	1.03	--	--
Worse-Case Combination of Fuels		--	--	--	--	0.24	1.03

Footnotes:

<sup>a</sup> Based on the heat content of fuel oil of 140,000 Btu/gallon.

<sup>b</sup> Based on the heat content of natural gas of 1,000 Btu/scf.

<sup>c</sup> Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998.

<sup>d</sup> S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.05%.

<sup>e</sup> Sulfuric acid mist emission factor based on emission factor for SO<sub>3</sub> (AP-42, Section 1.3) converted to H<sub>2</sub>SO<sub>4</sub> using molecular weight.



**TABLE A-3  
MAXIMUM EMISSION RATES DUE TO FUEL COMBUSTION FOR THE DRYER AT THE "X" DAP/MAP PLANT**

Parameter	Units	Natural Gas					
		No. 2 Fuel Oil	Natural Gas				
<u>Operating Data</u>							
Annual Operating Hours	hr/yr	7,884	7,884				
Maximum Heat Input Rate	10 <sup>6</sup> Btu/hr	49.7	49.7				
Hourly Fuel Oil Usage <sup>a</sup>	10 <sup>3</sup> gal/hr	0.36	N/A				
Annual Fuel Oil Usage	10 <sup>3</sup> gal/yr	2,799	N/A				
Maximum Sulfur Content	Weight %	0.05	N/A				
Hourly Natural Gas Usage <sup>b</sup>	10 <sup>6</sup> scf/hr	N/A	0.050				
Annual Natural Gas Usage	10 <sup>6</sup> scf/yr	N/A	391.8				
Maximum Sulfur Content	gr/100 ft <sup>3</sup>	N/A	N/A				
<hr/>							
Pollutant	AP-42 Emissions Factor <sup>c</sup>	No. 2 Fuel Oil		Natural gas		Maximum Emission Rate	
		Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)
<u>Sulfur Dioxide</u>							
Fuel oil	142 *(S) lb/10 <sup>3</sup> gal <sup>d</sup>	2.52	9.94	--	--	--	--
Natural gas	0.6 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.03	0.12	--	--
Worse-Case Combination of Fuels		--	--	--	--	2.52	9.94
<u>Sulfuric Acid Mist</u>							
Fuel oil	2.4 *(S) lb/10 <sup>3</sup> gal <sup>d,e</sup>	0.04	0.17	--	--	0.043	0.168
<u>Nitrogen Oxides</u>							
Fuel oil	20 lb/10 <sup>3</sup> gal	7.10	27.99	--	--	--	--
Natural gas	100 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	4.97	19.59	--	--
Worse-Case Combination of Fuels		--	--	--	--	7.10	27.99
<u>Carbon Monoxide</u>							
Fuel oil	5 lb/10 <sup>3</sup> gal	1.78	7.00	--	--	--	--
Natural gas	84 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	4.17	16.46	--	--
Worse-Case Combination of Fuels		--	--	--	--	4.17	16.46
<u>Volatile Organic Compounds</u>							
Fuel oil	0.052 lb/10 <sup>3</sup> gal	0.02	0.07	--	--	--	--
Natural gas	5.5 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.27	1.08	--	--
Worse-Case Combination of Fuels		--	--	--	--	0.27	1.08

Footnotes:

<sup>a</sup> Based on the heat content of fuel oil of 140,000 Btu/gallon.

<sup>b</sup> Based on the heat content of natural gas of 1,000 Btu/scf.

<sup>c</sup> Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998.

<sup>d</sup> S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.05%.

<sup>e</sup> Sulfuric acid mist emission factor based on emission factor for SO<sub>3</sub> (AP-42, Section 1.3) converted to H<sub>2</sub>SO<sub>4</sub> using molecular weight.

**TABLE A-4**  
**MAXIMUM EMISSION RATES DUE TO FUEL COMBUSTION FOR THE DRYER AT THE "Y" DAP/MAP PLANT**

Parameter	Units	Natural Gas					
		No. 2 Fuel Oil	Natural Gas				
<u>Operating Data</u>							
Annual Operating Hours	hr/yr	8,760	8,760				
Maximum Heat Input Rate	10 <sup>6</sup> Btu/hr	49.5	49.5				
Hourly Fuel Oil Usage <sup>a</sup>	10 <sup>3</sup> gal/hr	0.35	N/A				
Annual Fuel Oil Usage	10 <sup>3</sup> gal/yr	3,097	N/A				
Maximum Sulfur Content	Weight %	0.05	N/A				
Hourly Natural Gas Usage <sup>b</sup>	10 <sup>6</sup> scf/hr	N/A	0.050				
Annual Natural Gas Usage	10 <sup>6</sup> scf/yr	N/A	433.6				
Maximum Sulfur Content	gr/100 ft <sup>3</sup>	N/A	N/A				
Pollutant	AP-42 Emissions Factor <sup>c</sup>	No. 2 Fuel Oil		Natural gas		Maximum Emission Rate	
		Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (TPY)
<u>Sulfur Dioxide</u>							
Fuel oil:	142 *(S) lb/10 <sup>3</sup> gal <sup>d</sup>	2.51	11.00	--	--	--	--
Natural gas	0.6 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.03	0.13	--	--
Worse-Case Combination of Fuels		--	--	--	--	2.51	11.00
<u>Sulfuric Acid Mist</u>							
Fuel oil	2.4 *(S) lb/10 <sup>3</sup> gal <sup>d,e</sup>	0.04	0.19	--	--	0.042	0.186
<u>Nitrogen Oxides</u>							
Fuel oil:	20 lb/10 <sup>3</sup> gal	7.07	30.97	--	--	--	--
Natural gas	100 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	4.95	21.68	--	--
Worse-Case Combination of Fuels		--	--	--	--	7.07	30.97
<u>Carbon Monoxide</u>							
Fuel oil	5 lb/10 <sup>3</sup> gal	1.77	7.74	--	--	--	--
Natural gas	84 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	4.16	18.21	--	--
Worse-Case Combination of Fuels		--	--	--	--	4.16	18.21
<u>Volatile Organic Compounds</u>							
Fuel oil	0.052 lb/10 <sup>3</sup> gal	0.02	0.08	--	--	--	--
Natural gas	5.5 lb/10 <sup>6</sup> ft <sup>3</sup>	--	--	0.27	1.19	--	--
Worse-Case Combination of Fuels		--	--	--	--	0.27	1.19

## Footnotes:

<sup>a</sup> Based on the heat content of fuel oil of 140,000 Btu/gallon.

<sup>b</sup> Based on the heat content of natural gas of 1,000 Btu/scf.

<sup>c</sup> Emission factors for fuel oil are based on AP-42, Section 1.3, September 1998. Emission factors for natural gas are based on AP-42, Section 1.4, July 1998.

<sup>d</sup> S denotes the weight-percent of Sulfur in fuel oil; Maximum sulfur content = 0.05%.

<sup>e</sup> Sulfuric acid mist emission factor based on emission factor for SO<sub>2</sub> (AP-42, Section 1.3) converted to H<sub>2</sub>SO<sub>4</sub> using molecular weight.

**PROTOCOL ATTACHMENT B**

**SUMMARY OF RECENT EMISSION TESTS**

**Table B-1**  
**Summary of Recent Emission Tests at the MAP/DAP Plants, CF Industries, Plant City Facility**

Test Date	Unit	Average Process Rate (TPH P <sub>2</sub> O <sub>5</sub> )	Particulate Matter		Fluoride	
			avg lb/hr	avg lb/ton P <sub>2</sub> O <sub>5</sub> <sup>a</sup>	avg lb/hr	avg lb/ton P <sub>2</sub> O <sub>5</sub> <sup>a</sup>
<u>A DAP/MAP</u>						
11/12/2005	A DAP/MAP	NA	3.35	NA	0.23	NA
11/11/2005	A DAP/MAP	NA	4.20	NA	0.28	NA
8/7/2000	A DAP/MAP	28.8	7.87	0.273	0.17	0.0059
<u>X DAP</u>						
3/22/2005	X DAP	45.0	1.76	0.0391	0.35	0.0078
4/20/2004	X DAP	NA	3.63	NA	0.79	NA
8/26/2003	X DAP	NA	NA	NA	0.53	NA
3/25/2003	X DAP	NA	2.51	NA	0.33	NA
4/9/2002	X DAP	44.8	6.23	0.139	0.39	0.0087
3/22/2001	X DAP	NA	3.06	NA	1.11	NA
<u>Y DAP</u>						
4/14/2005	Y DAP	45.1	1.55	0.0343	0.53	0.0118
5/5/2004	Y DAP	NA	4.08	NA	0.35	NA
7/1/2003	Y DAP	NA	5.98	NA	0.70	NA
5/8/2002	Y DAP	48.1	7.22	0.150	0.69	0.014
4/26/2001	Y DAP	NA	5.13	NA	2.11	NA
<u>Y MAP</u>						
4/5/2005	Y MAP	44.9	3.54	0.0788	0.81	0.0181
4/27/2004	Y MAP	42.4	8.06	0.1902	0.75	0.0176
9/16/2003	Y MAP	NA	NA	NA	0.44	NA
4/29/2003	Y MAP	NA	3.00	NA	1.05	NA
4/2/2002	Y MAP	46.0	5.37	0.117	1.13	0.025
4/3/2001	Y MAP	NA	5.19	NA	1.58	NA
<u>Z DAP</u>						
3/10/2005	Z DAP	44.9	6.75	0.1503	0.37	0.0082
3/2/2004	Z DAP	44.6	3.70	0.0829	0.69	0.0156
9/4/2003	Z DAP	NA	NA	NA	0.95	NA
3/11/2003	Z DAP	NA	4.99	NA	1.30	NA
3/12/2002	Z DAP	46.0	2.99	0.0650	0.30	0.0065
3/8/2001	Z DAP	NA	4.95	NA	0.57	NA

<sup>a</sup> As calculated.

**Table B-2**  
**Summary of Recent Emission Tests at the SAP Plants, CF Industries, Plant City Facility**

Test Date	Unit	Average Process Rate (TPD H <sub>2</sub> SO <sub>4</sub> )	SO <sub>2</sub>		H <sub>2</sub> SO <sub>4</sub>	
			avg lb/hr	avg lb/ton H <sub>2</sub> SO <sub>4</sub> <sup>a</sup>	avg lb/hr	avg lb/ton H <sub>2</sub> SO <sub>4</sub> <sup>a</sup>
<u>A SAP</u>						
3/31/2009	A SAP	1217.0	133.6	2.63	0.56	0.011
2/26/2008	A SAP	1171.0	164.8	3.38	0.54	0.011
3/21/2007	A SAP	1227.0	174.0	3.40	0.29	0.006
1/31/2006	A SAP	1224.6	182.7	3.58	0.55	0.011
2/1/2005	A SAP	1198.9	154.4	3.09	0.55	0.011
1/22/2004	A SAP	1260.3	157.3	3.00	0.64	0.012
2/5/2003	A SAP	1079.7	153.8	3.42	0.46	0.010
1/29/2002	A SAP	1143.7	151.3	3.18	0.30	0.006
<u>B SAP</u>						
3/24/2009	B SAP	1034.4	137.2	3.18	0.52	0.012
2/28/2008	B SAP	1207.0	171.2	3.40	1.10	0.022
3/7/2007	B SAP	1093.0	166.8	3.66	0.36	0.008
2/22/2006	B SAP	1140.0	169.4	3.57	0.47	0.010
3/1/2005	B SAP	1118.3	149.0	3.20	0.39	0.008
1/13/2004	B SAP	1126.8	194.7	4.15	0.46	0.010
2/11/2003	B SAP	1090.6	178.1	3.92	0.43	0.009
2/5/2002	B SAP	1071.0	181.6	4.07	0.58	0.013
<u>C SAP</u>						
3/5/2009	C SAP	2849.0	363.3	3.06	4.61	0.039
4/8/2008	C SAP	2726.4	223.3	1.97	2.20	0.019
5/1/2007	C SAP	2630.0	367.5	3.35	2.74	0.025
1/17/2006	C SAP	2658.0	367.6	3.32	3.33	0.030
1/25/2005	C SAP	2671.0	371.2	3.34	2.62	0.024
7/16/2004	C SAP	2678.0	338.7	3.04	2.96	0.027
3/8/2004	C SAP	2286.3	327.1	3.43	3.70	0.039
1/14/2003	C SAP	2384.5	384.5	3.87	2.70	0.027
1/7/2002	C SAP	2433.0	359.2	3.54	4.15	0.041
1/9/2001	C SAP	2477.0	358.7	3.48	4.80	0.046
<u>D SAP</u>						
3/17/2009	D SAP	2671.0	330.6	2.97	2.93	0.026
4/2/2008	D SAP	2807.0	312.7	2.67	2.67	0.023
1/10/2008	D SAP	2467.2	285.0	2.77	7.30	0.071
1/30/2007	D SAP	2613.1	367.3	3.37	5.61	0.052
1/24/2006	D SAP	2528.2	356.8	3.39	4.40	0.042
4/20/2005	D SAP	2593.7	369.7	3.42	2.69	0.025
1/18/2005	D SAP	2415.0	337.1	3.35	3.36	0.033
2/10/2004	D SAP	2339.4	292.4	3.00	4.67	0.048
1/28/2003	D SAP	2282.2	378.3	3.98	3.86	0.041
1/21/2002	D SAP	2296.1	363.5	3.80	3.19	0.033
1/16/2001	D SAP	2329.9	372.8	3.84	3.86	0.040

<sup>a</sup> As calculated.

**PROTOCOL ATTACHMENT C**

**EXAMPLE CALPUFF INPUT FILE**

EXAMPLE FACILITY XYZ - CALPUFF  
 IMPACTS AT SOURCE-SPECIFIC CLASS I AREAS  
 4-km FLORIDA DOMAIN (VISTAS REFINED DOMAIN 2), 2001  
 ----- Run title (3 lines) -----

CALPUFF MODEL CONTROL FILE  
 -----

INPUT GROUP: 0 -- Input and Output File Names

Default Name	Type	File Name
CALMET.DAT	input	* METDAT = *
or		
ISCMET.DAT	input	* ISCDAT = *
or		
PLMMET.DAT	input	* PLMDAT = *
or		
PROFILE.DAT	input	* PRFDAT = *
SURFACE.DAT	input	* SFCDAT = *
RESTARTB.DAT	input	* RSTARTB= *
-----		
CALPUFF.LST	output	! PUFLST = PUFFEXP.LST !
CONC.DAT	output	! CONDAT = PUFFEXP.CON !
DFLX.DAT	output	* DFDAT = *
WFLX.DAT	output	* WFDAT = *
-----		
VISB.DAT	output	* VISDAT = *
TK2D.DAT	output	* T2DDAT = *
RHO2D.DAT	output	* RHODAT = *
RESTARTE.DAT	output	* RSTARTE= *

Emission Files

PTEMARB.DAT	input	* PTDAT = *
VOLEMARB.DAT	input	* VOLDAT = *
BAEMARB.DAT	input	* ARDAT = *
LNEMARB.DAT	input	* LNDAT = *

Other Files

OZONE.DAT	input	! OZDAT =C:\BARTHRO3\2001FLOz.DAT !
VD.DAT	input	* VDDAT = *
CHEM.DAT	input	* CHEMDAT= *
H2O2.DAT	input	* H2O2DAT= *
HILL.DAT	input	* HILDAT= *
HILLRCT.DAT	input	* RCTDAT= *
COASTLN.DAT	input	* CSTDAT= *
FLUXBDY.DAT	input	* BDYDAT= *
BCON.DAT	input	* BCNDAT= *
DEBUG.DAT	output	* DEBUG = *
MASSFLX.DAT	output	* FLXDAT= *
MASSBAL.DAT	output	* BALDAT= *
FOG.DAT	output	* FOGDAT= *

All file names will be converted to lower case if LCFILES = T  
 Otherwise, if LCFILES = F, file names will be converted to UPPER CASE  
 T = lower case ! LCFILES = T !  
 F = UPPER CASE

NOTE: (1) file/path names can be up to 70 characters in length

Provision for multiple input files

Number of CALMET.DAT files for run (NMETDAT)  
 Default: 1 ! NMETDAT = 36 !

Number of PTEMARB.DAT files for run (NPTDAT)  
 Default: 0 ! NPTDAT = 0 !

Number of BAEMARB.DAT files for run (NARDAT)

Default: 0 ! NARDAT = 0 !

Number of VOLEMARB.DAT files for run (NVOLDAT)

Default: 0 ! NVOLDAT = 0 !

!END!

-----  
Subgroup (0a)  
-----

The following CALMET.DAT filenames are processed in sequence if NMETDAT>1

Default Name	Type	File Name
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-09A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-09B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-09C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12C.DAT ! !END!

-----  
INPUT GROUP: 1 -- General run control parameters  
-----

Option to run all periods found

in the met. file (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below

METRUN = 1 - Run all periods in met. file

Starting date: Year (IBYR) -- No default ! IBYR = 2001 !  
(used only if Month (IBMO) -- No default ! IBMO = 1 !  
METRUN = 0) Day (IBDY) -- No default ! IBDY = 1 !  
Hour (IBHR) -- No default ! IBHR = 1 !

Base time zone (XBTZ) -- No default ! XBTZ = 5.0 !  
PST = 8., MST = 7.  
CST = 6., EST = 5.

Length of run (hours) (IRLG) -- No default ! IRLG = 8760 !

Number of chemical species (NSPEC)

Default: 5 ! NSPEC = 11 !



Number of chemical species  
to be emitted (NSE)                    Default: 3            ! NSE = 9 !

Flag to stop run after  
SETUP phase (ITEST)                    Default: 2            ! ITEST = 2 !  
(Used to allow checking  
of the model inputs, files, etc.)  
ITEST = 1 - STOPS program after SETUP phase  
ITEST = 2 - Continues with execution of program  
          after SETUP

Restart Configuration:

Control flag (MRESTART)                Default: 0            ! MRESTART = 0 !

- 0 = Do not read or write a restart file
- 1 = Read a restart file at the beginning of  
the run
- 2 = Write a restart file during run
- 3 = Read a restart file at beginning of run  
and write a restart file during run

Number of periods in Restart  
output cycle (NRESPD)                 Default: 0            ! NRESPD = 0 !

- 0 = File written only at last period
- >0 = File updated every NRESPD periods

Meteorological Data Format (METFM)  
  Default: 1            ! METFM = 1 !

- METFM = 1 - CALMET binary file (CALMET.MET)
- METFM = 2 - ISC ASCII file (ISCMET.MET)
- METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
- METFM = 4 - CTDM plus tower file (PROFILE.DAT) and  
          surface parameters file (SURFACE.DAT)

PG sigma-y is adjusted by the factor (AVET/PGTIME)\*\*0.2  
Averaging Time (minutes) (AVET)  
  Default: 60.0        ! AVET = 60. !

PG Averaging Time (minutes) (PGTIME)  
  Default: 60.0        ! PGTIME = 60. !

!END!

-----  
INPUT GROUP: 2 -- Technical options  
-----

Vertical distribution used in the  
near field (MGAUSS)                    Default: 1            ! MGAUSS = 1 !  
0 = uniform  
1 = Gaussian

Terrain adjustment method  
(MCTADJ)                                Default: 3            ! MCTADJ = 3 !  
0 = no adjustment  
1 = ISC-type of terrain adjustment  
2 = simple, CALPUFF-type of terrain  
adjustment  
3 = partial plume path adjustment

Subgrid-scale complex terrain  
flag (MCTSG)                            Default: 0            ! MCTSG = 0 !  
0 = not modeled  
1 = modeled

Near-field puffs modeled as  
elongated 0 (MSLUG)                    Default: 0            ! MSLUG = 0 !  
0 = no

1 = yes (slug model used)

Transitional plume rise modeled ?  
(MTRANS) Default: 1 ! MTRANS = 1 !  
0 = no (i.e., final rise only)  
1 = yes (i.e., transitional rise computed)

Stack tip downwash? (MTIP) Default: 1 ! MTIP = 1 !  
0 = no (i.e., no stack tip downwash)  
1 = yes (i.e., use stack tip downwash)

Vertical wind shear modeled above  
stack top? (MSHEAR) Default: 0 ! MSHEAR = 0 !  
0 = no (i.e., vertical wind shear not modeled)  
1 = yes (i.e., vertical wind shear modeled)

Puff splitting allowed? (MSPLIT) Default: 0 ! MSPLIT = 0 !  
0 = no (i.e., puffs not split)  
1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM) Default: 1 ! MCHEM = 1 !  
0 = chemical transformation not modeled  
1 = transformation rates computed internally (MESOPUFF II scheme)  
2 = user-specified transformation rates used  
3 = transformation rates computed internally (RIVAD/ARM3 scheme)  
4 = secondary organic aerosol formation computed (MESOPUFF II scheme for OH)

Aqueous phase transformation flag (MAQCHEM)  
(Used only if MCHEM = 1, or 3) Default: 0 ! MAQCHEM = 0 !  
0 = aqueous phase transformation not modeled  
1 = transformation rates adjusted for aqueous phase reactions

Wet removal modeled ? (MWET) Default: 1 ! MWET = 1 !  
0 = no  
1 = yes

Dry deposition modeled ? (MDRY) Default: 1 ! MDRY = 1 !  
0 = no  
1 = yes  
(dry deposition method specified for each species in Input Group 3)

Method used to compute dispersion coefficients (MDISP) Default: 3 ! MDISP = 3 !  
1 = dispersion coefficients computed from measured values of turbulence, sigma v, sigma w  
2 = dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u\*, w\*, L, etc.)  
3 = PG dispersion coefficients for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas  
4 = same as 3 except PG coefficients computed using the MESOPUFF II eqns.  
5 = CTDM sigmas used for stable and neutral conditions. For unstable conditions, sigmas are computed as in MDISP = 3, described above. MDISP = 5 assumes that measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)  
(Used only if MDISP = 1 or 5) Default: 3 ! MTURBVW = 3 !  
1 = use sigma-v or sigma-theta measurements from PROFILE.DAT to compute sigma-y (valid for METFM = 1, 2, 3, 4)  
2 = use sigma-w measurements from PROFILE.DAT to compute sigma-z (valid for METFM = 1, 2, 3, 4)

- 3 = use both sigma-(v/theta) and sigma-w from PROFILE.DAT to compute sigma-y and sigma-z (valid for METFM = 1, 2, 3, 4)
- 4 = use sigma-theta measurements from PLMMET.DAT to compute sigma-y (valid only if METFM = 3)

Back-up method used to compute dispersion when measured turbulence data are missing (MDISP2)

- Default: 3 ! MDISP2 = 3 !  
 (used only if MDISP = 1 or 5)
- 2 = dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u\*, w\*, L, etc.)
  - 3 = PG dispersion coefficients for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas
  - 4 = same as 3 except PG coefficients computed using the MESOPUFF II eqns.

PG sigma-y,z adj. for roughness? Default: 0 ! MROUGH = 0 !  
 (MROUGH)  
 0 = no  
 1 = yes

Partial plume penetration of elevated inversion? Default: 1 ! MPARTL = 1 !  
 (MPARTL)  
 0 = no  
 1 = yes

Strength of temperature inversion provided in PROFILE.DAT extended records? Default: 0 ! MTINV = 0 !  
 (MTINV)  
 0 = no (computed from measured/default gradients)  
 1 = yes

PDF used for dispersion under convective conditions? Default: 0 ! MPDF = 0 !  
 (MPDF)  
 0 = no  
 1 = yes

Sub-Grid TIBL module used for shore line? Default: 0 ! MSGTIBL = 0 !  
 (MSGTIBL)  
 0 = no  
 1 = yes

Boundary conditions (concentration) modeled? Default: 0 ! MBCON = 0 !  
 (MBCON)  
 0 = no  
 1 = yes

Analyses of fogging and icing impacts due to emissions from arrays of mechanically-forced cooling towers can be performed using CALPUFF in conjunction with a cooling tower emissions processor (CTEMISS) and its associated postprocessors. Hourly emissions of water vapor and temperature from each cooling tower cell are computed for the current cell configuration and ambient conditions by CTEMISS. CALPUFF models the dispersion of these emissions and provides cloud information in a specialized format for further analysis. Output to FOG.DAT is provided in either 'plume mode' or 'receptor mode' format.

Configure for FOG Model output? Default: 0 ! MFOG = 0 !  
 (MFOG)  
 0 = no  
 1 = yes - report results in PLUME Mode format  
 2 = yes - report results in RECEPTOR Mode format

Test options specified to see if  
they conform to regulatory  
values? (MREG)

Default: 1 ! MREG = 1 !

0 = NO checks are made  
1 = Technical options must conform to USEPA  
Long Range Transport (LRT) guidance

METFM	1 or 2
AVET	60. (min)
PGTIME	60. (min)
MGAUSS	1
MCTADJ	3
MTRANS	1
MTIP	1
MCHEM	1 or 3 (if modeling SOx, NOx)
MWET	1
MDRY	1
MDISP	2 or 3
MPDF	0 if MDISP=3 1 if MDISP=2
MROUGH	0
MPARTL	1
SYTDEP	550. (m)
MHFTSZ	0

!END!

-----  
INPUT GROUP: 3a, 3b -- Species list  
-----

-----  
Subgroup (3a)  
-----

The following species are modeled:

```
! CSPEC =      SO2 !      !END!
! CSPEC =      SO4 !      !END!
! CSPEC =      NOX !      !END!
! CSPEC =      HNO3 !     !END!
! CSPEC =      NO3 !      !END!
! CSPEC =      PM0063 !    !END!
! CSPEC =      PM0100 !    !END!
! CSPEC =      PM0125 !    !END!
! CSPEC =      PM0250 !    !END!
! CSPEC =      PM0600 !    !END!
! CSPEC =      PM1000 !    !END!
```

SPECIES NAME (Limit: 12 Characters in length)	MODELED (0=NO, 1=YES)	EMITTED (0=NO, 1=YES)	Dry DEPOSITED (0=NO, 1=COMPUTED-GAS 2=COMPUTED-PARTICLE 3=USER-SPECIFIED)	OUTPUT GROUP NUMBER (0=NONE, 1=1st CGRUP, 2=2nd CGRUP, 3= etc.)
! SO2 =	1,	1,	1,	0 !
! SO4 =	1,	1,	2,	0 !
! NOX =	1,	1,	1,	0 !
! HNO3 =	1,	0,	1,	0 !
! NO3 =	1,	0,	2,	0 !
! PM0063 =	1,	1,	2,	1 !
! PM0100 =	1,	1,	2,	1 !
! PM0125 =	1,	1,	2,	1 !
! PM0250 =	1,	1,	2,	1 !
! PM0600 =	1,	1,	2,	1 !
! PM1000 =	1,	1,	2,	1 !

!END!

-----  
Subgroup (3b)  
-----

-----  
The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above.

! CGRUP = PM10 ! !END!

INPUT GROUP: 4 -- Map Projection and Grid control parameters

-----  
Projection for all (X,Y):  
-----

Map projection  
(PMAP)

Default: UTM ! PMAP = LCC !

UTM : Universal Transverse Mercator  
TTM : Tangential Transverse Mercator  
LCC : Lambert Conformal Conic  
PS : Polar Stereographic  
EM : Equatorial Mercator  
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin

(Used only if PMAP= TTM, LCC, or LAZA)

(FEAST) Default=0.0 ! FEAST = 0.000 !  
(FNORTH) Default=0.0 ! FNORTH = 0.000 !

UTM zone (1 to 60)

(Used only if PMAP=UTM)

(IUTMZN) No Default ! IUTMZN = 0 !

Hemisphere for UTM projection?

(Used only if PMAP=UTM)

(UTMHM) Default: N ! UTMHEM = N !

N : Northern hemisphere projection  
S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin

(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)

(RLAT0) No Default ! RLAT0 = 40N !  
(RLON0) No Default ! RLON0 = 97W !

TTM : RLON0 identifies central (true N/S) meridian of projection  
RLAT0 selected for convenience  
LCC : RLON0 identifies central (true N/S) meridian of projection  
RLAT0 selected for convenience  
PS : RLON0 identifies central (grid N/S) meridian of projection  
RLAT0 selected for convenience  
EM : RLON0 identifies central meridian of projection  
RLAT0 is REPLACED by 0.0N (Equator)  
LAZA: RLON0 identifies longitude of tangent-point of mapping plane  
RLAT0 identifies latitude of tangent-point of mapping plane

Matching parallel(s) of latitude (decimal degrees) for projection

(Used only if PMAP= LCC or PS)

(XLAT1) No Default ! XLAT1 = 33N !  
(XLAT2) No Default ! XLAT2 = 45N !

LCC : Projection cone slices through Earth's surface at XLAT1 and XLAT2  
PS : Projection plane slices through Earth at XLAT1  
(XLAT2 is not used)

-----  
Note: Latitudes and longitudes should be positive, and include a letter N,S,E, or W indicating north or south latitude, and east or west longitude. For example,  
35.9 N Latitude = 35.9N  
118.7 E Longitude = 118.7E

Datum-region

-----

The Datum-Region for the coordinates is identified by a character string. Many mapping products currently available use the model of the Earth known as the World Geodetic System 1984 (WGS-84). Other local models may be in use, and their selection in CALMET will make its output consistent with local mapping products. The list of Datum-Regions with official transformation parameters is provided by the National Imagery and Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)

-----

WGS-84	WGS-84 Reference Ellipsoid and Geoid, Global coverage (WGS84)
NAS-C	NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS (NAD27)
NAR-C	NORTH AMERICAN 1983 GRS 80 Spheroid, MEAN FOR CONUS (NAD83)
NWS-84	NWS 6370KM Radius, Sphere
ESR-S	ESRI REFERENCE 6371KM Radius, Sphere

Datum-region for output coordinates  
 (DATUM) Default: WGS-G ! DATUM = NWS-84 !

METEOROLOGICAL Grid:

Rectangular grid defined for projection PMAP,  
 with X the Easting and Y the Northing coordinate

No. X grid cells (NX)	No default	! NX = 263 !
No. Y grid cells (NY)	No default	! NY = 206 !
No. vertical layers (NZ)	No default	! NZ = 10 !
Grid spacing (DGRIDKM)	No default	! DGRIDKM = 4. !
	Units: km	

Cell face heights (ZFACE(nz+1))	No defaults	
	Units: m	
! ZFACE = 0.,20.,40.,80.,160.,320.,640.,1200.,2000.,3000.,4000. !		

Reference Coordinates  
 of SOUTHWEST corner of  
 grid cell(1, 1):

X coordinate (XORIGKM)	No default	! XORIGKM = 721.995 !
Y coordinate (YORIGKM)	No default	! YORIGKM = -1598.000 !
	Units: km	

COMPUTATIONAL Grid:

The computational grid is identical to or a subset of the MET. grid.  
 The lower left (LL) corner of the computational grid is at grid point  
 (IBCOMP, JBCOMP) of the MET. grid. The upper right (UR) corner of the  
 computational grid is at grid point (IECOMP, JECOMP) of the MET. grid.  
 The grid spacing of the computational grid is the same as the MET. grid.

X index of LL corner (IBCOMP) (1 <= IBCOMP <= NX)	No default	! IBCOMP = 1 !
Y index of LL corner (JBCOMP) (1 <= JBCOMP <= NY)	No default	! JBCOMP = 1 !
X index of UR corner (IECOMP) (1 <= IECOMP <= NX)	No default	! IECOMP = 263 !
Y index of UR corner (JECOMP) (1 <= JECOMP <= NY)	No default	! JECOMP = 206 !

SAMPLING Grid (GRIDDED RECEPTORS):

The lower left (LL) corner of the sampling grid is at grid point  
 (IBSAMP, JBSAMP) of the MET. grid. The upper right (UR) corner of the

sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.  
 The sampling grid must be identical to or a subset of the computational  
 grid. It may be a nested grid inside the computational grid.  
 The grid spacing of the sampling grid is DGRIDKM/MESH DN.

Logical flag indicating if gridded receptors are used (LSAMP) (T=yes, F=no)	Default: T	! LSAMP = F !
X index of LL corner (IBSAMP) (IBCOMP <= IBSAMP <= IECOMP)	No default	! IBSAMP = 1 !
Y index of LL corner (JBSAMP) (JBCOMP <= JBSAMP <= JECOMP)	No default	! JBSAMP = 1 !
X index of UR corner (IESAMP) (IBCOMP <= IESAMP <= IECOMP)	No default	! IESAMP = 263 !
Y index of UR corner (JESAMP) (JBCOMP <= JESAMP <= JECOMP)	No default	! JESAMP = 206 !
Nesting factor of the sampling grid (MESH DN) (MESH DN is an integer >= 1)	Default: 1	! MESH DN = 1 !

!END!

-----  
 INPUT GROUP: 5 -- Output Options  
 -----

FILE	DEFAULT VALUE	VALUE THIS RUN
Concentrations (ICON)	1	! ICON = 1 !
Dry Fluxes (IDRY)	1	! IDRY = 0 !
Wet Fluxes (IWET)	1	! IWET = 0 !
Relative Humidity (IVIS) (relative humidity file is required for visibility analysis)	1	! IVIS = 0 !
Use data compression option in output file? (LCOMP RS)	Default: T	! LCOMP RS = T !

\*  
 0 = Do not create file, 1 = create file

DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

Mass flux across specified boundaries for selected species reported hourly? (IMFLX)	Default: 0	! IMFLX = 0 !
0 = no 1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames are specified in Input Group 0)		

Mass balance for each species reported hourly? (IMBAL)	Default: 0	! IMBAL = 0 !
0 = no 1 = yes (MASSBAL.DAT filename is specified in Input Group 0)		

LINE PRINTER OUTPUT OPTIONS:

Print concentrations (ICPRT)	Default: 0	! ICPRT = 0 !
Print dry fluxes (IDPRT)	Default: 0	! IDPRT = 0 !
Print wet fluxes (IWPRT)	Default: 0	! IWPRT = 0 !

(0 = Do not print, 1 = Print)

Concentration print interval  
(ICFRQ) in hours Default: 1 ! ICFRQ = 24 !  
Dry flux print interval  
(IDFRQ) in hours Default: 1 ! IDFRQ = 1 !  
Wet flux print interval  
(IWFRQ) in hours Default: 1 ! IWFRQ = 1 !

Units for Line Printer Output  
(IPRTU) Default: 1 ! IPRTU = 3 !  
for for  
Concentration Deposition  
1 = g/m\*\*3 g/m\*\*2/s  
2 = mg/m\*\*3 mg/m\*\*2/s  
3 = ug/m\*\*3 ug/m\*\*2/s  
4 = ng/m\*\*3 ng/m\*\*2/s  
5 = Odour Units

Messages tracking progress of run  
written to the screen ?  
(IMESG) Default: 2 ! IMESG = 2. !  
0 = no  
1 = yes (advection step, puff ID)  
2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)

SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

MASS FLUX -- SPECIES /GROUP ON DISK?	---- CONCENTRATIONS ----		----- DRY FLUXES -----		----- WET FLUXES -----		-- SAVED
	PRINTED?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?	
! SO2 =	0,	1,	0,	1,	0,	1,	0 !
! SO4 =	0,	1,	0,	1,	0,	1,	0 !
! NOX =	0,	1,	0,	1,	0,	1,	0 !
! HNO3 =	0,	1,	0,	1,	0,	1,	0 !
! NO3 =	0,	1,	0,	1,	0,	1,	0 !
! PM10 =	0,	1,	0,	1,	0,	1,	0 !

OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

Logical for debug output  
(LDEBUG) Default: F ! LDEBUG = F !  
First puff to track  
(IPFDEB) Default: 1 ! IPFDEB = 1 !  
Number of puffs to track  
(NPFDEB) Default: 1 ! NPFDEB = 1 !  
Met. period to start output  
(NN1) Default: 1 ! NN1 = 1 !  
Met. period to end output  
(NN2) Default: 10 ! NN2 = 10 !

!END!

-----  
INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs  
-----

-----  
Subgroup (6a)  
-----

Number of terrain features (NHILL) Default: 0 ! NHILL = 0 !

Number of special complex terrain



```

receptors (NCTREC)                Default: 0      ! NCTREC = 0  !

Terrain and CTSG Receptor data for
CTSG hills input in CTDM format ?
(MHILL)                            No Default    ! MHILL = 2  !
1 = Hill and Receptor data created
  by CTDM processors & read from
  HILL.DAT and HILLRCT.DAT files
2 = Hill data created by OPTHILL &
  input below in Subgroup (6b);
  Receptor data in Subgroup (6c)

Factor to convert horizontal dimensions Default: 1.0    ! XHILL2M = 1. !
to meters (MHILL=1)

Factor to convert vertical dimensions  Default: 1.0    ! ZHILL2M = 1. !
to meters (MHILL=1)

X-origin of CTDM system relative to   No Default    ! XCTDMKM = 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

Y-origin of CTDM system relative to   No Default    ! YCTDMKM = 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

```

! END !

-----  
Subgroup (6b)  
-----

1 \*\*  
HILL information

HILL AMAX1 NO. (m)	XC AMAX2 (km)	YC (km)	THETAH (deg.)	ZGRID (m)	RELIEF (m)	EXPO 1 (m)	EXPO 2 (m)	SCALE 1 (m)	SCALE 2 (m)	(m)
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

-----  
Subgroup (6c)  
-----

COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH
-----	-----	-----	-----

1

Description of Complex Terrain Variables:

XC, YC = Coordinates of center of hill  
THETAH = Orientation of major axis of hill (clockwise from North)  
ZGRID = Height of the 0 of the grid above mean sea level  
RELIEF = Height of the crest of the hill above the grid elevation  
EXPO 1 = Hill-shape exponent for the major axis  
EXPO 2 = Hill-shape exponent for the minor axis  
SCALE 1 = Horizontal length scale along the major axis  
SCALE 2 = Horizontal length scale along the minor axis  
AMAX = Maximum allowed axis length for the major axis  
BMAX = Maximum allowed axis length for the minor axis

XRCT, YRCT = Coordinates of the complex terrain receptors  
ZRCT = Height of the ground (MSL) at the complex terrain Receptor  
XHH = Hill number associated with each complex terrain receptor  
(NOTE: MUST BE ENTERED AS A REAL NUMBER)

\*\*

NOTE: DATA for each hill and CTSG receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
 INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases  
 -----

SPECIES COEFFICIENT NAME (dimensionless)	DIFFUSIVITY (cm**2/s)	ALPHA STAR	REACTIVITY	MESOPHYLL RESISTANCE (s/cm)	HENRY'S LAW
! SO2 =	0.1509,	1000,	8,	0,	0.04 !
! NOX =	0.1656,	1,	8,	5,	3.5 !
! HNO3 =	0.1628,	1,	18,	0,	0.0000008 !

!END!

-----  
 INPUT GROUP: 8 -- Size parameters for dry deposition of particles  
 -----

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

SPECIES NAME	GEOMETRIC MASS MEAN DIAMETER (microns)	GEOMETRIC STANDARD DEVIATION (microns)
! SO4 =	0.48,	2. !
! NO3 =	0.48,	2. !
! PM0063 =	0.63,	0. !
! PM0100 =	1.00,	0. !
! PM0125 =	1.25,	0. !
! PM0250 =	2.50,	0. !
! PM0600 =	6.00,	0. !
! PM1000 =	10.00,	0. !

!END!

-----  
 INPUT GROUP: 9 -- Miscellaneous dry deposition parameters  
 -----

Reference cuticle resistance (s/cm)  
 (RCUTR) Default: 30 ! RCUTR = 30.0 !  
 Reference ground resistance (s/cm)  
 (RGR) Default: 10 ! RGR = 10.0 !  
 Reference pollutant reactivity  
 (REACTR) Default: 8 ! REACTR = 8.0 !

Number of particle-size intervals used to  
 evaluate effective particle deposition velocity  
 (NINT) Default: 9 ! NINT = 9 !

Vegetation state in unirrigated areas  
 (IVEG) Default: 1 ! IVEG = 1 !  
 IVEG=1 for active and unstressed vegetation  
 IVEG=2 for active and stressed vegetation

IVEG=3 for inactive vegetation

!END!

-----  
INPUT GROUP: 10 -- Wet Deposition Parameters  
-----

Scavenging Coefficient -- Units: (sec)\*\*(-1)

Pollutant	Liquid Precip.	Frozen Precip.
! SO2 =	3.0E-05,	0.0E00 !
! SO4 =	1.0E-04,	3.0E-05 !
! HNO3 =	6.0E-05,	0.0E00 !
! NO3 =	1.0E-04,	3.0E-05 !
! PM0063 =	1.0E-04,	3.0E-05 !
! PM0100 =	1.0E-04,	3.0E-05 !
! PM0125 =	1.0E-04,	3.0E-05 !
! PM0250 =	1.0E-04,	3.0E-05 !
! PM0600 =	1.0E-04,	3.0E-05 !
! PM1000 =	1.0E-04,	3.0E-05 !

!END!

-----  
INPUT GROUP: 11 -- Chemistry Parameters  
-----

Ozone data input option (MOZ) Default: 1 ! MOZ = 1 !  
(Used only if MCHEM = 1, 3, or 4)  
0 = use a monthly background ozone value  
1 = read hourly ozone concentrations from  
the OZONE.DAT data file

Monthly ozone concentrations  
(Used only if MCHEM = 1, 3, or 4 and  
MOZ = 0 or MOZ = 1 and all hourly O3 data missing)  
(BCKO3) in ppb Default: 12\*80.  
! BCKO3 = 12\*50. !

Monthly ammonia concentrations  
(Used only if MCHEM = 1, or 3)  
(BCKNH3) in ppb Default: 12\*10.  
! BCKNH3 = 12\*0.5 !

Nighttime SO2 loss rate (RNITE1)  
in percent/hour Default: 0.2 ! RNITE1 = .2 !

Nighttime NOx loss rate (RNITE2)  
in percent/hour Default: 2.0 ! RNITE2 = 2.0 !

Nighttime HNO3 formation rate (RNITE3)  
in percent/hour Default: 2.0 ! RNITE3 = 2.0 !

H2O2 data input option (MH2O2) Default: 1 ! MH2O2 = 1 !  
(Used only if MAQCHEM = 1)  
0 = use a monthly background H2O2 value  
1 = read hourly H2O2 concentrations from  
the H2O2.DAT data file

Monthly H2O2 concentrations  
(Used only if MAQCHEM = 1 and  
MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)  
(BCKH2O2) in ppb Default: 12\*1.  
! BCKH2O2 = 12\*1 !

--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option  
(used only if MCHM = 4)

The SOA module uses monthly values of:  
 Fine particulate concentration in ug/m<sup>3</sup> (BCKPMF)  
 Organic fraction of fine particulate (OFRAC)  
 VOC / NOX ratio (after reaction) (VCNX)

to characterize the air mass when computing  
 the formation of SOA from VOC emissions.

Typical values for several distinct air mass types are:

Month	1	2	3	4	5	6	7	8	9	10	11	12
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clean Continental												
BCKPMF	1.	1.	.1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
OFRAC	.15	.15	.20	.20	.20	.20	.20	.20	.20	.20	.20	.15
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Clean Marine (surface)												
BCKPMF	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
OFRAC	.25	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.25
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Urban - low biogenic (controls present)												
BCKPMF	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.
OFRAC	.20	.20	.25	.25	.25	.25	.25	.25	.20	.20	.20	.20
VCNX	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Urban - high biogenic (controls present)												
BCKPMF	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.
OFRAC	.25	.25	.30	.30	.30	.55	.55	.55	.35	.35	.35	.25
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Regional Plume												
BCKPMF	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
OFRAC	.20	.20	.25	.35	.25	.40	.40	.40	.30	.30	.30	.20
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Urban - no controls present												
BCKPMF	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
OFRAC	.30	.30	.35	.35	.35	.55	.55	.55	.35	.35	.35	.30
VCNX	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

Default: Clean Continental

! BCKPMF = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !  
 ! OFRAC = 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.15 !  
 ! VCNX = 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00 !

!END!

-----  
 INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters  
 -----

Horizontal size of puff (m) beyond which  
 time-dependent dispersion equations (Heffter)  
 are used to determine sigma-y and  
 sigma-z (SYTDEP) Default: 550. ! SYTDEP = 5.5E02 !

Switch for using Heffter equation for sigma z  
 as above (0 = Not use Heffter; 1 = use Heffter  
 (MHFTSZ) Default: 0 ! MHFTSZ = 0 !

Stability class used to determine plume  
 growth rates for puffs above the boundary  
 layer (JSUP) Default: 5 ! JSUP = 5 !

Vertical dispersion constant for stable  
 conditions (k1 in Eqn. 2.7-3) (CONK1) Default: 0.01 ! CONK1 = .01 !

Vertical dispersion constant for neutral/  
unstable conditions (k2 in Eqn. 2.7-4)  
(CONK2) Default: 0.1 ! CONK2 = .1 !

Factor for determining Transition-point from  
Schulman-Scire to Huber-Snyder Building Downwash  
scheme (SS used for Hs < Hb + TBD \* HL)  
(TBD) Default: 0.5 ! TBD = .5 !  
TBD < 0 ==> always use Huber-Snyder  
TBD = 1.5 ==> always use Schulman-Scire  
TBD = 0.5 ==> ISC Transition-point

Range of land use categories for which  
urban dispersion is assumed  
(IURB1, IURB2) Default: 10 ! IURB1 = 10 !  
19 ! IURB2 = 19 !

Site characterization parameters for single-point Met data files -----  
(needed for METFM = 2,3,4)

Land use category for modeling domain  
(ILANDUIN) Default: 20 ! ILANDUIN = 20 !

Roughness length (m) for modeling domain  
(Z0IN) Default: 0.25 ! Z0IN = .25 !

Leaf area index for modeling domain  
(XLAIIN) Default: 3.0 ! XLAIIN = 3.0 !

Elevation above sea level (m)  
(ELEVIN) Default: 0.0 ! ELEVIN = .0 !

Latitude (degrees) for met location  
(XLATIN) Default: -999. ! XLATIN = -999.0 !

Longitude (degrees) for met location  
(XLONIN) Default: -999. ! XLONIN = -999.0 !

Specialized information for interpreting single-point Met data files -----

Anemometer height (m) (Used only if METFM = 2,3)  
(ANEMHT) Default: 10. ! ANEMHT = 10.0 !

Form of lateral turbulence data in PROFILE.DAT file  
(Used only if METFM = 4 or MTURBVW = 1 or 3)  
(ISIGMAV) Default: 1 ! ISIGMAV = 1 !  
0 = read sigma-theta  
1 = read sigma-v

Choice of mixing heights (Used only if METFM = 4)  
(IMIXCTDM) Default: 0 ! IMIXCTDM = 0 !  
0 = read PREDICTED mixing heights  
1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)  
(XMXLEN) Default: 1.0 ! XMXLEN = 1.0 !

Maximum travel distance of a puff/slug (in  
grid units) during one sampling step  
(XSAMLEN) Default: 1.0 ! XSAMLEN = 1.0 !

Maximum Number of slugs/puffs release from  
one source during one time step  
(MXNEW) Default: 99 ! MXNEW = 99 !

Maximum Number of sampling steps for  
one puff/slug during one time step  
(MXSAM) Default: 99 ! MXSAM = 99 !

Number of iterations used when computing  
the transport wind for a sampling step  
that includes gradual rise (for CALMET  
and PROFILE winds)  
(NCOUNT) Default: 2 ! NCOUNT = 2 !

Minimum sigma y for a new puff/slug (m)  
(SYMIN) Default: 1.0 ! SYMIN = 1.0 !

Minimum sigma z for a new puff/slug (m)  
(SZMIN) Default: 1.0 ! SZMIN = 1.0 !

Default minimum turbulence velocities sigma-v and sigma-w  
for each stability class over land and over water (m/s)  
(SVMIN(12) and SWMIN(12)):

Stab Class :	LAND						WATER					
	A	B	C	D	E	F	A	B	C	D	E	F
Default SVMIN :	.50	.50	.50	.50	.50	.50	.37	.37	.37	.37	.37	.37
Default SWMIN :	.20	.12	.08	.06	.03	.016	.20	.12	.08	.06	.03	.016

! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.370, 0.370, 0.370, 0.370, 0.370, 0.370!  
! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120, 0.080, 0.060, 0.030, 0.016!

Divergence criterion for dw/dz across puff  
used to initiate adjustment for horizontal  
convergence (1/s)  
Partial adjustment starts at CDIV(1), and  
full adjustment is reached at CDIV(2)  
(CDIV(2)) Default: 0.0,0.0 ! CDIV = .0, .0 !

Minimum wind speed (m/s) allowed for  
non-calm conditions. Also used as minimum  
speed returned when using power-law  
extrapolation toward surface  
(WSCALM) Default: 0.5 ! WSCALM = .5 !

Maximum mixing height (m)  
(XMAXZI) Default: 3000. ! XMAXZI = 3000.0 !

Minimum mixing height (m)  
(XMINZI) Default: 50. ! XMINZI = 50.0 !

Default wind speed classes --  
5 upper bounds (m/s) are entered;  
the 6th class has no upper limit  
(WSCAT(5)) Default :  
ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8 (10.8+)

Wind Speed Class :	1	2	3	4	5
	---	---	---	---	---
! WSCAT =	1.54,	3.09,	5.14,	8.23,	10.80 !

Default wind speed profile power-law  
exponents for stabilities 1-6  
(PLX0(6)) Default : ISC RURAL values  
ISC RURAL : .07, .07, .10, .15, .35, .55  
ISC URBAN : .15, .15, .20, .25, .30, .30

Stability Class :	A	B	C	D	E	F
	---	---	---	---	---	---
! PLX0 =	0.07,	0.07,	0.10,	0.15,	0.35,	0.55 !

Default potential temperature gradient  
for stable classes E, F (degK/m)  
(PTG0(2)) Default: 0.020, 0.035  
! PTG0 = 0.020, 0.035 !

Default plume path coefficients for  
each stability class (used when option  
for partial plume height terrain adjustment  
is selected -- MCTADJ=3)  
(PPC(6)) Stability Class : A B C D E F  
Default PPC : .50, .50, .50, .50, .35, .35  
! PPC = 0.50, 0.50, 0.50, 0.50, 0.35, 0.35 !

Slug-to-puff transition criterion factor  
equal to sigma-y/length of slug  
(SL2PF) Default: 10. ! SL2PF = 10.0 !

Puff-splitting control variables -----

VERTICAL SPLIT  
-----

Number of puffs that result every time a puff  
is split - nsplit=2 means that 1 puff splits  
into 2

(NSPLIT) Default: 3 ! NSPLIT = 3 !

Time(s) of a day when split puffs are eligible to  
be split once again; this is typically set once  
per day, around sunset before nocturnal shear develops.

24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)

0=do not re-split 1=eligible for re-split

(IRESPLIT(24)) Default: Hour 17 = 1

! IRESPLIT = 0,0 !

Split is allowed only if last hour's mixing  
height (m) exceeds a minimum value

(ZISPLIT) Default: 100. ! ZISPLIT = 100.0 !

Split is allowed only if ratio of last hour's  
mixing ht to the maximum mixing ht experienced  
by the puff is less than a maximum value (this  
postpones a split until a nocturnal layer develops)

(ROLDMAX) Default: 0.25 ! ROLDMAX = 0.25 !

HORIZONTAL SPLIT  
-----

Number of puffs that result every time a puff  
is split - nsplith=5 means that 1 puff splits  
into 5

(NSPLITH) Default: 5 ! NSPLITH = 5 !

Minimum sigma-y (Grid Cells Units) of puff  
before it may be split

(SYSPLITH) Default: 1.0 ! SYSPLITH = 1.0 !

Minimum puff elongation rate (SYSPLITH/hr) due to  
wind shear, before it may be split

(SHSPLITH) Default: 2. ! SHSPLITH = 2.0 !

Minimum concentration (g/m<sup>3</sup>) of each  
species in puff before it may be split  
Enter array of NSPEC values; if a single value is  
entered, it will be used for ALL species

(CNSPLITH) Default: 1.0E-07 ! CNSPLITH = 1.0E-07 !

Integration control variables -----

Fractional convergence criterion for numerical SLUG  
sampling integration

(EPSSLUG) Default: 1.0e-04 ! EPSSLUG = 1.0E-04 !

Fractional convergence criterion for numerical AREA  
source integration

(EPSAREA) Default: 1.0e-06 ! EPSAREA = 1.0E-06 !

Trajectory step-length (m) used for numerical rise  
integration

(DSRISE) Default: 1.0 ! DSRISE = 1.0 !

!END!

-----  
INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters  
-----

-----  
Subgroup (13a)  
-----

Number of point sources with  
parameters provided below (NPT1) No default ! NPT1 = 1 !

Units used for point source  
emissions below (IPTU) Default: 1 ! IPTU = 3 !

- 1 = g/s
- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr
- 5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)
- 6 = Odour Unit \* m\*\*3/min
- 7 = metric tons/yr

Number of source-species  
combinations with variable  
emissions scaling factors  
provided below in (13d) (NSPT1) Default: 0 ! NSPT1 = 0 !

Number of point sources with  
variable emission parameters  
provided in external file (NPT2) No default ! NPT2 = 0 !

(If NPT2 > 0, these point  
source emissions are read from  
the file: PTEMARB.DAT)

!END!

-----  
Subgroup (13b)  
-----

a  
POINT SOURCE: CONSTANT DATA  
-----

Source No.	X Coordinate (km)	Y Coordinate (km)	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Vel. (m/s)	Exit Temp. (deg. K)	Bldg. Dwash	Emission Rates	b			c		
										SO2	SO4	NOX	HNO3	NO3	PM10
***** EMISSION RATES ARE IN LB/HR *****															

Project-Specific Source Input  
-----

a  
Data for each source are treated as a separate input subgroup  
and therefore must end with an input group terminator.

- SRCNAM is a 12-character name for a source  
(No default)
- X is an array holding the source data listed by the column headings  
(No default)
- SIGYZI is an array holding the initial sigma-y and sigma-z (m)  
(Default: 0.,0.)
- FMFAC is a vertical momentum flux factor (0. or 1.0) used to represent  
the effect of rain-caps or other physical configurations that  
reduce momentum rise associated with the actual exit velocity.  
(Default: 1.0 -- full momentum used)

b  
0. = No building downwash modeled, 1. = downwash modeled  
NOTE: must be entered as a REAL number (i.e., with decimal point)

c  
An emission rate must be entered for every pollutant modeled.  
Enter emission rate of zero for secondary pollutants that are  
modeled, but not emitted. Units are specified by IPTU  
(e.g. 1 for g/s).

-----  
Subgroup (13c)  
-----



-----  
BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH  
-----

Source No. Effective building width and height (in meters) every 10 degrees <sup>a</sup>  
-----

<sup>a</sup>  
Each pair of width and height values is treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
Subgroup (13d)  
-----

-----  
POINT SOURCE: VARIABLE EMISSIONS DATA <sup>a</sup>  
-----

Use this subgroup to describe temporal variations in the emission rates given in 13b. Factors entered multiply the rates in 13b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

0 = Constant  
1 = Diurnal cycle (24 scaling factors: hours 1-24)  
2 = Monthly cycle (12 scaling factors: months 1-12)  
3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)  
4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)  
5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

<sup>a</sup>  
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters  
-----

-----  
Subgroup (14a)  
-----

Number of polygon area sources with parameters specified below (NAR1) No default ! NAR1 = 0 !

Units used for area source emissions below (IARU) Default: 1 ! IARU = 1 !

1 = g/m\*\*2/s  
2 = kg/m\*\*2/hr  
3 = lb/m\*\*2/hr  
4 = tons/m\*\*2/yr  
5 = Odour Unit \* m/s (vol. flux/m\*\*2 of odour compound)  
6 = Odour Unit \* m/min  
7 = metric tons/m\*\*2/yr

Number of source-species

combinations with variable  
emissions scaling factors  
provided below in (14d) (NSAR1) .Default: 0 ! NSAR1 = 0 !

Number of buoyant polygon area sources  
with variable location and emission  
parameters (NAR2) No default ! NAR2 = 0 !  
(If NAR2 > 0, ALL parameter data for  
these sources are read from the file: BAEMARB.DAT)

!END!

-----  
Subgroup (14b)  
-----

a  
AREA SOURCE: CONSTANT DATA  
-----

Source No.	Effect. Height (m)	Base Elevation (m)	Initial Sigma z (m)	Emission Rates
---------------	--------------------------	--------------------------	---------------------------	-------------------

b

a  
Data for each source are treated as a separate input subgroup  
and therefore must end with an input group terminator.

b  
An emission rate must be entered for every pollutant modeled.  
Enter emission rate of zero for secondary pollutants that are  
modeled, but not emitted. Units are specified by IARU  
(e.g. 1 for g/m\*\*2/s).

-----  
Subgroup (14c)  
-----

a  
COORDINATES (UTM-km) FOR EACH VERTEX(4) OF EACH POLYGON  
-----

Source No.	Ordered list of X followed by list of Y, grouped by source
---------------	--

a

a  
Data for each source are treated as a separate input subgroup  
and therefore must end with an input group terminator.

-----  
Subgroup (14d)  
-----

a  
AREA SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission  
rates given in 14b. Factors entered multiply the rates in 14b.  
Skip sources here that have constant emissions. For more elaborate  
variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

IVARY determines the type of variation, and is source-specific:

(IVARY) Default: 0

0 =	Constant
1 =	Diurnal cycle (24 scaling factors: hours 1-24)
2 =	Monthly cycle (12 scaling factors: months 1-12)
3 =	Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12

5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a  
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 15a, 15b, 15c -- Line source parameters  
-----

-----  
Subgroup (15a)  
-----

Number of buoyant line sources with variable location and emission parameters (NLN2) No default ! NLN2 = 0 !

(If NLN2 > 0, ALL parameter data for these sources are read from the file: LNEARB.DAT)

Number of buoyant line sources (NLINES) No default ! NLINES = 0 !

Units used for line source emissions below (ILNU) Default: 1 ! ILNU = 1 !

1 = g/s  
2 = kg/hr  
3 = lb/hr  
4 = tons/yr  
5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)  
6 = Odour Unit \* m\*\*3/min  
7 = metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (15c) (NSLN1) Default: 0 ! NSLN1 = 0 !

Maximum number of segments used to model each line (MXNSEG) Default: 7 ! MXNSEG = 7 !

The following variables are required only if NLINES > 0. They are used in the buoyant line source plume rise calculations.

Number of distances at which transitional rise is computed Default: 6 ! NLRISE = 6 !

Average building length (XL) No default ! XL = .0 ! (in meters)

Average building height (HBL) No default ! HBL = .0 ! (in meters)

Average building width (WBL) No default ! WBL = .0 ! (in meters)

Average line source width (WML) No default ! WML = .0 ! (in meters)

Average separation between buildings (DXL) No default ! DXL = .0 ! (in meters)

Average buoyancy parameter (FPRIMEL) No default ! FPRIMEL = .0 ! (in m\*\*4/s\*\*3)

!END!

-----  
Subgroup (15b)  
-----

BUOYANT LINE SOURCE: CONSTANT DATA  
-----

Source No.	Beg. X Coordinate (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height (m)	Base Elevation (m)	Emission Rates
------------	------------------------	------------------------	------------------------	------------------------	--------------------	--------------------	----------------

-----

a  
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b  
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by ILNTU (e.g. 1 for g/s).

-----  
Subgroup (15c)  
-----

BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission rates given in 15b. Factors entered multiply the rates in 15b. Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

0 =	Constant
1 =	Diurnal cycle (24 scaling factors: hours 1-24)
2 =	Monthly cycle (12 scaling factors: months 1-12)
3 =	Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
5 =	Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a  
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters  
-----

-----  
Subgroup (16a)  
-----

Number of volume sources with parameters provided in 16b,c (NVL1)	No default ! NVL1 = 0 !
Units used for volume source emissions below in 16b (IVLU)	Default: 1 ! IVLU = 1 !
1 = g/s	

- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr
- 5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)
- 6 = Odour Unit \* m\*\*3/min
- 7 = metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (16c) (NSVL1) Default: 0 ! NSVL1 = 0 !

Number of volume sources with variable location and emission parameters (NVL2) No default ! NVL2 = 0 !

(If NVL2 > 0, ALL parameter data for these sources are read from the VOLEMARB.DAT file(s) )

!END!

-----  
Subgroup (16b)  
-----

a  
VOLUME SOURCE: CONSTANT DATA  
-----

X UTM Coordinate (km)	Y UTM Coordinate (km)	Effect. Height (m)	Base Elevation (m)	Initial Sigma y (m)	Initial Sigma z (m)	Emission Rates
-----	-----	-----	-----	-----	-----	-----

a  
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b  
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IVLU (e.g. 1 for g/s).

-----  
Subgroup (16c)  
-----

a  
VOLUME SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission rates given in 16b. Factors entered multiply the rates in 16b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

-----  
a  
Data for each species are treated as a separate input subgroup  
and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information  
-----

-----  
Subgroup (17a)  
-----

Number of non-gridded receptors (NREC) No default ! NREC = 744 !  
!END!

-----  
Subgroup (17b)  
-----

-----  
NON-GRIDDED (DISCRETE) RECEPTOR DATA<sup>a</sup>  
-----

Receptor No.	X Coordinate (km)	Y Coordinate (km)	Ground Elevation (m)	Height <sup>b</sup> Above Ground (m)
-----------------	-------------------------	-------------------------	----------------------------	--

-----  
RECEPTORS OBTAINED FROM THE NPS/FWS EXTRACTION PROGRAM  
ALL RECEPTORS ARE LCC (KM)

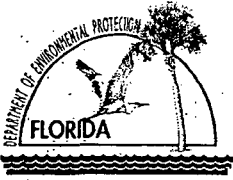
PROJECT-SPECIFIC CLASS I AREA RECEPTORS

a  
Data for each receptor are treated as a separate input subgroup  
and therefore must end with an input group terminator.

b  
Receptor height above ground is optional. If no value is entered,  
the receptor is placed on the ground.

**APPENDIX B**

**FDEP APPLICATION FORMS**



# Department of Environmental Protection

Division of Air Resource Management

RECEIVED

APPLICATION FOR AIR PERMIT - LONG FORM JUL 23 2009

## I. APPLICATION INFORMATION

**Air Construction Permit** – Use this form to apply for an air construction permit at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air permit. Also use this form to apply for an air construction permit:

- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- Where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- Where the applicant proposes to establish, revise, or renew a plantwide applicability limit (PAL).

**Air Operation Permit** – Use this form to apply for:

- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

**Air Construction Permit & Title V Air Operation Permit (Concurrent Processing Option)** – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

### Identification of Facility

1. Facility Owner/Company Name: <b>CF Industries, Inc.</b>	
2. Site Name: <b>Plant City Phosphate Complex</b>	
3. Facility Identification Number: <b>0570005</b>	
4. Facility Location...: Street Address or Other Locator: <b>10608 Paul Buchman Highway</b> City: <b>Plant City</b> County: <b>Hillsborough</b> Zip Code: <b>33564</b>	
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Existing Title V Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

### Application Contact

1. Application Contact Name: <b>Ron Brunk</b>	
2. Application Contact Mailing Address... Organization/Firm: <b>CF Industries, Inc.</b> Street Address: <b>P.O. Box Drawer L</b> City: <b>Plant City</b> State: <b>FL</b> Zip Code: <b>33564</b>	
3. Application Contact Telephone Numbers... Telephone: <b>(813) 364-5753</b> ext.                      Fax: <b>(813) 788-9126</b>	
4. Application Contact Email Address: <b>rbrunk@cfifl.com</b>	

### Application Processing Information (DEP Use)

1. Date of Receipt of Application: <b>7/23/09</b> PSD Number (if applicable):
2. Project Number(s): <b>0570005-03942</b> Siting Number (if applicable):



## FACILITY INFORMATION

### Purpose of Application

**This application for air permit is submitted to obtain: (Check one)**

#### **Air Construction Permit**

- Air construction permit.
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

#### **Air Operation Permit**

- Initial Title V air operation permit.
- Title V air operation permit revision.
- Title V air operation permit renewal.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

#### **Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)**

- Air construction permit and Title V permit revision, incorporating the proposed project.
- Air construction permit and Title V permit renewal, incorporating the proposed project.

**Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C.**

**In such case, you must also check the following box:**

- I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

### Application Comment

This application is to implement lower emission limits for the "A", "B", "C", and "D" Sulfuric Acid Plants (SAPs) at Plant City Phosphate Complex for the purpose of obtaining a BART exemption.

**FACILITY INFORMATION**

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
002	"A" SAP	AC1F	
003	"B" SAP	AC1F	
008	"C" SAP	AC1F	
009	"D" SAP	AC1F	

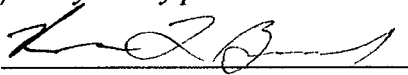
Application Processing Fee

Check one:  Attached - Amount: \$ \_\_\_\_\_  Not Applicable

**FACILITY INFORMATION**

**Owner/Authorized Representative Statement**

**Complete if applying for an air construction permit or an initial FESOP.**

1. Owner/Authorized Representative Name : <b>Ronald L. Brunk, Superintendent Env Affairs</b>
2. Owner/Authorized Representative Mailing Address... Organization/Firm: <b>CF Industries, Inc.</b> Street Address: <b>P.O. Box Drawer L</b> City: <b>Plant City</b> State: <b>FL</b> Zip Code: <b>33564</b>
3. Owner/Authorized Representative Telephone Numbers... Telephone: <b>(813) 364-5753</b> ext. Fax: <b>( 813) 788- 9126</b>
4. Owner/Authorized Representative Email Address: <b>rbrunk@cffl.com</b>
5. Owner/Authorized Representative Statement:  <i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.</i>   Signature  <u>21 JUL 09</u> Date

## FACILITY INFORMATION

### Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:			
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):			
<input type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.			
<input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively.			
<input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.			
<input type="checkbox"/> The designated representative at an Acid Rain source.			
3. Application Responsible Official Mailing Address...			
Organization/Firm:			
Street Address:			
City:		State:	Zip Code:
4. Application Responsible Official Telephone Numbers...			
Telephone: ( ) -		ext.	Fax: ( ) -
5. Application Responsible Official Email Address:			
6. Application Responsible Official Certification:			
<i>I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.</i>			
_____ Signature		_____ Date	

**FACILITY INFORMATION**

**Professional Engineer Certification**

1. Professional Engineer Name: <b>David A. Buff</b> Registration Number: <b>19011</b>
2. Professional Engineer Mailing Address... Organization/Firm: <b>Golder Associates Inc.**</b> Street Address: <b>6241 NW 23<sup>rd</sup> Street, Suite 500</b> City: <b>Gainesville</b> State: <b>FL</b> Zip Code: <b>32653</b>
3. Professional Engineer Telephone Numbers... Telephone: <b>(352) 336-5600</b> ext. <b>545</b> Fax: <b>(352) 336-6603</b>
4. Professional Engineer Email Address: <b>dbuff@golder.com</b>
5. Professional Engineer Statement:  <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i>  <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and</i>  <i>(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.</i>  <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/> if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.</i>  <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/> if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/> if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.</i>  <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/> if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.</i>  Signature: <u>David A. Buff</u> Date: <u>7/21/09</u>  (seal)

\* Attach any exception to certification statement.

\*\* Board of Professional Engineers Certificate of Authorization #00001670

**SCENARIO A**

## EMISSIONS UNIT INFORMATION

Section [1]

"A" SAP

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]

"A" SAP

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.
2. Description of Emissions Unit Addressed in this Section:  
**"A" Sulfuric Acid Plant (SAP)**
3. Emissions Unit Identification Number: **002**
- |  |                                |                          |   |
|--|--------------------------------|--------------------------|---|
| 4. Emissions Unit Status Code:<br><b>A</b> | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: <b>28</b> |
|--|--------------------------------|--------------------------|---|
8. Federal Program Applicability: (Check all that apply)
- Acid Rain Unit
- CAIR Unit
- Hg Budget Unit
9. Package Unit:  
Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_
10. Generator Nameplate Rating: \_\_\_\_\_
11. Emissions Unit Comment:  
**Proposed emissions limits for "A" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.**



**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" SAP

Page [1] of [1]  
Sulfur Dioxide - SO2

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

**(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO2</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>75.8 lb/hour                      332.2 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>1.4 lb/ton of 100% H2SO4, 24-Hr average</b> Reference: <b>Requested limit for BART</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 1.4 lb/ton x 1,300 tons/day x day/24 hr = 75.8 lb/hr</b> <b>Annual Emissions = 75.8 lb/hr x 8,760 hrs/yr /2,000 lb/ton = 332.2 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

Section [1]  
"A" SAP

**POLLUTANT DETAIL INFORMATION**

Page [1] of [1]  
Sulfur Dioxide - SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>75.8 lb/hr</b>	4. Equivalent Allowable Emissions: <b>75.8 lb/hour      332.2 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions based on 24-hour daily average, in order to meet BART exemption criteria.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

## EMISSIONS UNIT INFORMATION

Section [1]  
"B" SAP

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]

"B" SAP

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.
2. Description of Emissions Unit Addressed in this Section:  
**"B" Sulfuric Acid Plant (SAP)**
3. Emissions Unit Identification Number: **003**
- |  |                                |                          |   |
|--|--------------------------------|--------------------------|---|
| 4. Emissions Unit Status Code:<br><b>A</b> | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: <b>28</b> |
|--|--------------------------------|--------------------------|---|
8. Federal Program Applicability: (Check all that apply)
- Acid Rain Unit
- CAIR Unit
- Hg Budget Unit
9. Package Unit:  
Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_
10. Generator Nameplate Rating: \_\_\_\_\_
11. Emissions Unit Comment:  
**Proposed emissions limits for "B" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.**

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"B" SAP

Page [1] of [1]  
Sulfur Dioxide - SO2

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS  
(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO2</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>93.3 lb/hour                      408.8 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>1.4 lb/ton of 100% H2SO4, 24-Hr average</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Requested limit for BART</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 1.4 lb/ton x 1,600 tons/day x day/24 hr = 93.3 lb/hr</b> <b>Annual Emissions = 93.3 lb/hr x 8,760 hrs/yr /2,000 lb/ton =.408.8 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

Section [1]  
"B" SAP

**POLLUTANT DETAIL INFORMATION**

Page [1] of [1]  
Sulfur Dioxide - SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>93.3 lb/r</b>	4. Equivalent Allowable Emissions: <b>93.3 lb/hour      408.8 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions based on 24-hour daily average, in order to meet BART exemption criteria.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

## EMISSIONS UNIT INFORMATION

Section [1]  
"C" & "D" SAPs

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**A. GENERAL EMISSIONS UNIT INFORMATION**

**Title V Air Operation Permit Emissions Unit Classification**

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

**Emissions Unit Description and Status**

1. Type of Emissions Unit Addressed in this Section: (Check one)

This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:  
**"C" and "D" Sulfuric Acid Plants (SAPs)**

3. Emissions Unit Identification Number: **007 and 008**

4. Emissions Unit Status Code: <b>A</b>	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: <b>28</b>
--	--------------------------------	--------------------------	---

8. Federal Program Applicability: (Check all that apply)

Acid Rain Unit

CAIR Unit

Hg Budget Unit

9. Package Unit:  
Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_

10. Generator Nameplate Rating: \_\_\_\_\_

11. Emissions Unit Comment:  
**Proposed emissions limits for each of "C" and "D" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.**



**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**B. EMISSIONS UNIT CAPACITY INFORMATION**

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:	<b>5,200 TPD of 100% H<sub>2</sub>SO<sub>4</sub></b>	
3. Maximum Heat Input Rate:	million Btu/hr	
4. Maximum Incineration Rate:	pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	<b>24 hours/day</b>	<b>7 days/week</b>
	<b>52 weeks/year</b>	<b>8,760 hours/year</b>
6. Operating Capacity/Schedule Comment:	<b>Maximum production rate for each SAP is 2,600 TPD of 100% H<sub>2</sub>SO<sub>4</sub>.</b>	

**EMISSIONS UNIT INFORMATION**

Section [1]  
 "C" and "D" SAPs

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

**Segment Description and Rate:** Segment 1 of 1

1. Segment Description (Process/Fuel Type): <b>Chemical Manufacturing; Sulfuric Acid (Contact Process); Absorber @ 99.9% Conversion</b>		
2. Source Classification Code (SCC): <b>3-01-023-01</b>	3. SCC Units: <b>Tons 100% H<sub>2</sub>SO<sub>4</sub> Produced</b>	
4. Maximum Hourly Rate: <b>216.7</b>	5. Maximum Annual Rate: <b>1,898,000</b>	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: <b>Maximum rates based on 2,600 TPD 100% H<sub>2</sub>SO<sub>4</sub> for each SAP.</b>		

**Segment Description and Rate:** Segment \_\_\_\_ of \_\_\_\_

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [1] of [3]  
Sulfur Dioxide - SO<sub>2</sub>

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>606.7 lb/hour                      2,657.2 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>2.8 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>, 24-Hr average</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Requested limit for BART</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 2.8 lb/ton x 2,600 tons/day x day/24 hr = 303.3 lb/hr each SAP</b> <b>Annual Emissions = 303.3 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 1,328.6 TPY each SAP</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**POLLUTANT DETAIL INFORMATION**

Page [1] of [3]  
Sulfur Dioxide – SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>606.6 lb/hr</b>	4. Equivalent Allowable Emissions: <b>606.6 lb/hour      2,657.2 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [2] of [3]  
Sulfuric Acid Mist - SAM

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

**(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SAM</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>20.2 lb/hour                      88.2 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.093 lb/ton of 100% H2SO4</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Title V Permit No. 0570005-032-AV</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 0.093 lb/ton x 2,600 tons/day x day/24 hr = 10.1 lb/hr each SAP</b> <b>Annual Emissions = 10.1 lb/hr x 8,760 hrs/yr /2,000 lb/ton = 44.1 TPY each SAP</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [2] of [3]  
Sulfuric Acid Mist – SAM

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.093 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>20.2 lb/hour      88.2 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 8</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides - NOx

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>NOx</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>23.8 lb/hour                      104.4 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.11 lb/ton of 100% H2SO4</b>  Reference: <b>Title V Permit No. 0570005-032-AV</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 0.11 lb/ton x 2,600 tons/day x day/24 hr = 11.9 lb/hr each SAP</b> <b>Annual Emissions = 11.9 lb/hr x 8,760 hrs/yr /2,000 lb/ton = 52.2 TPY each SAP</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides - NOx

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.11 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>23.8 lb/hour      104.4 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 7E</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	



**SCENARIO B**

## EMISSIONS UNIT INFORMATION

Section [1]

"A" SAP

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]

"A" SAP

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)			
<input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).			
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.			
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.			
2. Description of Emissions Unit Addressed in this Section: <b>"A" Sulfuric Acid Plant (SAP)</b>			
3. Emissions Unit Identification Number: <b>002</b>			
4. Emissions Unit Status Code: <b>A</b>	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: <b>28</b>
8. Federal Program Applicability: (Check all that apply)			
<input type="checkbox"/> Acid Rain Unit			
<input type="checkbox"/> CAIR Unit			
<input type="checkbox"/> Hg Budget Unit			
9. Package Unit: Manufacturer:		Model Number:	
10. Generator Nameplate Rating:			
11. Emissions Unit Comment: <b>Proposed emissions limits for "A" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.</b>			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" SAP

Page [1] of [1]  
Sulfur Dioxide - SO2

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO2</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>81.3 lb/hour                      356.1 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>1.5 lb/ton of 100% H2SO4, 24-Hr average</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Requested limit for BART</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 1.5 lb/ton x 1,300 tons/day x day/24 hr = 81.3 lb/hr</b> <b>Annual Emissions = 81.3 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 356.1 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" SAP

Page [1] of [1]  
Sulfur Dioxide - SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>81.3 lb/hr</b>	4. Equivalent Allowable Emissions: <b>81.3 lb/hour      356.1 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Equivalent allowable emissions based on 24-hour daily average, in order to meet BART exemption criteria.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

## EMISSIONS UNIT INFORMATION

Section [1]  
"B" SAP

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]

"B" SAP

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:  
**"B" Sulfuric Acid Plant (SAP)**

3. Emissions Unit Identification Number: **003**

4. Emissions Unit  
Status Code:  
**A**

5. Commence  
Construction  
Date:

6. Initial Startup  
Date:

7. Emissions Unit  
Major Group  
SIC Code: **28**

8. Federal Program Applicability: (Check all that apply)

- Acid Rain Unit
- CAIR Unit
- Hg Budget Unit

9. Package Unit:  
Manufacturer:

Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:

**Proposed emissions limits for "B" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.**

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"B" SAP

Page [1] of [1]  
Sulfur Dioxide – SO2

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO2</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>100.0 lb/hour                      438.0 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>1.5 lb/ton of 100% H2SO4, 24-Hr average</b> Reference: <b>Requested limit for BART</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 1.5 lb/ton x 1,600 tons/day x day/24 hr = 100.0 lb/hr</b> <b>Annual Emissions = 100.0 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 438.0 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			



**EMISSIONS UNIT INFORMATION**

Section [1]  
"B" SAP

**POLLUTANT DETAIL INFORMATION**

Page [1] of [1]  
Sulfur Dioxide – SO<sub>2</sub>

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>100.0 lb/hr</b>	4. Equivalent Allowable Emissions: <b>100.0 lb/hour      438.0 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Equivalent allowable emissions based on 24-hour daily average, in order to meet BART exemption criteria.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

## EMISSIONS UNIT INFORMATION

Section [1]  
"C" & "D" SAPs

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]  
"C" and "D" SAPs

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
<input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
<input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)			
<input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).			
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.			
<input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.			
2. Description of Emissions Unit Addressed in this Section: "C" and "D" Sulfuric Acid Plants (SAPs)			
3. Emissions Unit Identification Number: <b>007 and 008</b>			
4. Emissions Unit Status Code: <b>A</b>	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: <b>28</b>
8. Federal Program Applicability: (Check all that apply)			
<input type="checkbox"/> Acid Rain Unit			
<input type="checkbox"/> CAIR Unit			
<input type="checkbox"/> Hg Budget Unit			
9. Package Unit: Manufacturer:		Model Number:	
10. Generator Nameplate Rating:			
11. Emissions Unit Comment: <b>Proposed emissions limits for each of "C" and "D" SAP in order to meet Best Available Retrofit Technology (BART) exemption criteria.</b>			

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**B. EMISSIONS UNIT CAPACITY INFORMATION**  
(Optional for unregulated emissions units.)

**Emissions Unit Operating Capacity and Schedule**

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate: <b>5,800 TPD of 100% H<sub>2</sub>SO<sub>4</sub></b>		
3. Maximum Heat Input Rate:	million Btu/hr	
4. Maximum Incineration Rate:	pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	24 hours/day	7 days/week
	52 weeks/year	8,760 hours/year
6. Operating Capacity/Schedule Comment: Production rate for each SAP is 2,900 TPD of 100% H <sub>2</sub> SO <sub>4</sub> .		

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

**Segment Description and Rate:** Segment 1 of 1

1. Segment Description (Process/Fuel Type): <b>Chemical Manufacturing; Sulfuric Acid (Contact Process); Absorber @ 99.9% Conversion</b>		
2. Source Classification Code (SCC): <b>3-01-023-01</b>		3. SCC Units: <b>Tons 100% H<sub>2</sub>SO<sub>4</sub> Produced</b>
4. Maximum Hourly Rate: <b>241.7</b>	5. Maximum Annual Rate: <b>2,117,000</b>	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: <b>Maximum rates based on 2,900 TPD 100% H<sub>2</sub>SO<sub>4</sub> for each SAP</b>		

**Segment Description and Rate:** Segment \_\_\_\_\_ of \_\_\_\_\_

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [1] of [3]  
Sulfur Dioxide – SO<sub>2</sub>

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>483.4 lb/hour                      2,117.0 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>2.0 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>, 24-Hr average</b> Reference: <b>Requested limit for BART</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 2.0 lb/ton x 2,900 tons/day x day/24 hr = 241.7 lb/hr each SAP</b> <b>Annual Emissions = 241.7 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 1,058.5 TPY each SAP</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [1] of [3]  
Sulfur Dioxide - SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>483.4 lb/hr</b>	4. Equivalent Allowable Emissions: <b>483.4 lb/hour 2,117.0 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [2] of [3]  
Sulfuric Acid Mist – SAM

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

**(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SAM</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>22.4 lb/hour                      98.4 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.093 lb/ton of 100% H2SO4</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Title V Permit No. 0570005-032-AV</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 0.093 lb/ton x 2,900 tons/day x day/24 hr = 11.2 lb/hr each SAP</b> <b>Annual Emissions = 11.2 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 49.2 TPY each SAP</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			



**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [2] of [3]  
Sulfuric Acid Mist – SAM

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.093 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>22.4 lb/hour      98.4 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 8</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides – NOx

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

**(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: NOx		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 26.6 lb/hour                      116.4 tons/year		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: 0.11 lb/ton of 100% H2SO4 Reference: Title V Permit No. 0570005-032-AV		7. Emissions Method Code: 0	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: Hourly Emissions = 0.11 lb/ton x 2,900 tons/day x day/24 hr = 13.3 lb/hr each SAP Annual Emissions = 13.3 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 58.2 TPY each SAP			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides - NOx

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.11 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>26.6 lb/hour      116.4 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 7E</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for both SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**SCENARIO C**

## EMISSIONS UNIT INFORMATION

Section [1]  
"A" & "B" SAPs

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

# EMISSIONS UNIT INFORMATION

Section [1]  
"A" & "B" SAPs

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:  
**"A" and "B" Sulfuric Acid Plants (SAPs)**

3. Emissions Unit Identification Number: **002 and 003**

4. Emissions Unit  
Status Code:  
**A**

5. Commence  
Construction  
Date:

6. Initial Startup  
Date:

7. Emissions Unit  
Major Group  
SIC Code: **28**

8. Federal Program Applicability: (Check all that apply)

- Acid Rain Unit
- CAIR Unit
- Hg Budget Unit

9. Package Unit:  
Manufacturer:

Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:

**Proposed emissions limits for "A" and "B" SAPs combined in order to meet Best Available Retrofit Technology (BART) exemption criteria.**

**EMISSIONS UNIT INFORMATION**

Section [1]  
"A" & "B" SAPs

**B. EMISSIONS UNIT CAPACITY INFORMATION**  
(Optional for unregulated emissions units.)

**Emissions Unit Operating Capacity and Schedule**

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:	<b>2,900 TPD of 100% H2SO4</b>	
3. Maximum Heat Input Rate:	million Btu/hr	
4. Maximum Incineration Rate:	pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	<b>24 hours/day</b> <b>52 weeks/year</b>	<b>7 days/week</b> <b>8,760 hours/year</b>
6. Operating Capacity/Schedule Comment:	<b>Production rate for both SAPs</b>	

**EMISSIONS UNIT INFORMATION**

Section [1]  
 "A" & "B" SAPs

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

**Segment Description and Rate:** Segment 1 of 1

1. Segment Description (Process/Fuel Type): <b>Chemical Manufacturing; Sulfuric Acid (Contact Process); Absorber @ 99.9% Conversion</b>		
2. Source Classification Code (SCC): <b>3-01-023-01</b>		3. SCC Units: <b>Tons 100% H<sub>2</sub>SO<sub>4</sub> Produced</b>
4. Maximum Hourly Rate: <b>120.8</b>	5. Maximum Annual Rate: <b>1,058,500</b>	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: <b>Maximum rates based on 2,900 TPD 100% H<sub>2</sub>SO<sub>4</sub>                  Maximum rate for both SAPs</b>		

**Segment Description and Rate:** Segment \_\_\_\_ of \_\_\_\_

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):		3. SCC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		



**EMISSIONS UNIT INFORMATION**

Section [1]  
"A" and "B" SAPs

**POLLUTANT DETAIL INFORMATION**

Page [1] of [3]  
Sulfur Dioxide – SO<sub>2</sub>

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>181.3 lb/hour                      794.1 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>181.3 lb/hr, 24-Hr average</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Requested limit for BART</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions:  <b>Annual Emissions = 181.3 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 794.1 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment: <b>Combined emissions from both SAPs.</b>			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" and "B" SAPs

Page [1] of [3]  
Sulfur Dioxide - SO2

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

**Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>181.3 lb/hr</b>	4. Equivalent Allowable Emissions: <b>181.3 lb/hour 794.1 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for "A" and "B" SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" and "B" SAPs

Page [2] of [3]  
Sulfuric Acid Mist – SAM

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SAM</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 9.1 lb/hour                      39.9 tons/year		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.075 lb/ton of 100% H2SO4</b>  Reference: <b>Title V Permit No. 0570005-021-AC</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years.	
10. Calculation of Emissions: <b>Hourly Emissions = 0.075 lb/ton x 2,900 tons/day x day/24 hr = 9.1 lb/hr</b> <b>Annual Emissions = 9.1 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 39.9 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" and "B" SAPs

Page [2] of [3]  
Sulfuric Acid Mist - SAM

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.075 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>9.1 lb/hour      39.9 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 8.</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for SAPs "A" and "B" combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" and "B" SAPs

Page [3] of [3]  
Nitrogen Oxides – NOx

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>NOx</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>14.5 lb/hour                      63.5 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.12 lb/ton of 100% H2SO4</b> Reference: <b>Title V Permit No. 0570005-021-AC</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 0.12 lb/ton x 2,900 tons/day x day/24 hr = 14.5 lb/hr</b> <b>Annual Emissions = 14.5 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 63.5 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"A" and "B" SAPs

Page [3] of [3]  
Nitrogen Oxides - NOx

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.12 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>14.5 lb/hour      63.5 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 7E</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for SAPs "A" and "B" combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_\_ of \_\_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

## EMISSIONS UNIT INFORMATION

Section [1]  
"C" & "D" SAPs

### III. EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Application** - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

**Air Construction Permit or FESOP Application** - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application** - Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**A. GENERAL EMISSIONS UNIT INFORMATION**

**Title V Air Operation Permit Emissions Unit Classification**

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

**Emissions Unit Description and Status**

1. Type of Emissions Unit Addressed in this Section: (Check one)

This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:  
"C" and "D" Sulfuric Acid Plants (SAPs)

3. Emissions Unit Identification Number: **007 and 008**

4. Emissions Unit Status Code: <b>A</b>	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: <b>28</b>
--	--------------------------------	--------------------------	---

8. Federal Program Applicability: (Check all that apply)

Acid Rain Unit

CAIR Unit

Hg Budget Unit

9. Package Unit:  
Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_

10. Generator Nameplate Rating: \_\_\_\_\_

11. Emissions Unit Comment:  
**Proposed emissions limits for "C" and "D" SAPs combined in order to meet Best Available Retrofit Technology (BART) exemption criteria.**



**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**B. EMISSIONS UNIT CAPACITY INFORMATION**  
(Optional for unregulated emissions units.)

**Emissions Unit Operating Capacity and Schedule**

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:	<b>5,800 TPD of 100% H2SO4</b>	
3. Maximum Heat Input Rate:	million Btu/hr	
4. Maximum Incineration Rate:	pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment:	<b>Production rate for both SAPs combined.</b>	

**EMISSIONS UNIT INFORMATION**

Section [1]  
 "C" and "D" SAPs

**C. EMISSION POINT (STACK/VENT) INFORMATION**  
 (Optional for unregulated emissions units.)

**Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram: "C" SAP, "D" SAP		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
5. Discharge Type Code: V	6. Stack Height: 199 feet	7. Exit Diameter: 5 Feet	
8. Exit Temperature: 158°F	9. Actual Volumetric Flow Rate: 140,700 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: <b>Exhaust temperature and flow rate based on January 2007 BART determination application.</b>  Exhaust temperature and flow rate are for SAP "C". SAP "D" exhaust temperature and flow rate are 161 deg. F and 145,600 acfm, respectively.			

**EMISSIONS UNIT INFORMATION**

Section [1]  
 "C" and "D" SAPs

**D. SEGMENT (PROCESS/FUEL) INFORMATION**

**Segment Description and Rate:** Segment 1 of 1

1. Segment Description (Process/Fuel Type): <b>Chemical Manufacturing; Sulfuric Acid (Contact Process); Absorber @ 99.9% Conversion</b>		
2. Source Classification Code (SCC): <b>3-01-023-01</b>	3. SCC Units: <b>Tons 100% H<sub>2</sub>SO<sub>4</sub> Produced</b>	
4. Maximum Hourly Rate: <b>241.7</b>	5. Maximum Annual Rate: <b>2,117,000</b>	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: <b>Maximum rates based on 5,800 TPD 100% H<sub>2</sub>SO<sub>4</sub>                  Maximum rate for both SAPs</b>		

**Segment Description and Rate:** Segment \_\_\_\_\_ of \_\_\_\_\_

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [1] of [3]  
Sulfur Dioxide – SO<sub>2</sub>

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS  
(Optional for unregulated emissions units.)**

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SO<sub>2</sub></b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>610.0 lb/hour                      2,671.8 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>610 lb/hr, 24-Hr average</b> Reference: <b>Requested limit for BART</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions:  <b>Annual Emissions = 610.0 lb/hr x 8,760 hrs/yr / 2,000 lb/ton = 2,671.8 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [1] of [3]  
Sulfur Dioxide – SO<sub>2</sub>

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>610.0 lb/hr</b>	4. Equivalent Allowable Emissions: <b>610.0 lb/hour 2,671.8 tons/year</b>
5. Method of Compliance: <b>SO2 CEMS</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for "C" and "D" SAPs combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [2] of [3]  
Sulfuric Acid Mist – SAM

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>SAM</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>22.5 lb/hour                      98.6 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.093 lb/ton of 100% H2SO4</b>		7. Emissions Method Code: <b>0</b>	
Reference: <b>Title V Permit No. 0570005-032-AV</b>			
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: Hourly Emissions = $0.093 \text{ lb/ton} \times 5,800 \text{ tons/day} \times \text{day}/24 \text{ hr} = 22.5 \text{ lb/hr}$ Annual Emissions = $22.5 \text{ lb/hr} \times 8,760 \text{ hrs/yr} / 2,000 \text{ lb/ton} = 98.6 \text{ TPY}$			
11. Potential, Fugitive, and Actual Emissions Comment:			

**EMISSIONS UNIT INFORMATION**

Section [1]  
"C" and "D" SAPs

**POLLUTANT DETAIL INFORMATION**

Page [2] of [3]  
Sulfuric Acid Mist - SAM

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.093 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>22.5 lb/hour      98.6 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 8</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for SAPs "C" and "D" combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides – NOx

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –  
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

**Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions**

1. Pollutant Emitted: <b>NOx</b>		2. Total Percent Efficiency of Control:	
3. Potential Emissions: <b>26.6 lb/hour                      116.4 tons/year</b>		4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive Emissions (as applicable): to                      tons/year			
6. Emission Factor: <b>0.11 lb/ton of 100% H2SO4</b>  Reference: <b>Title V Permit No. 0570005-032-AV</b>		7. Emissions Method Code: <b>0</b>	
8.a. Baseline Actual Emissions (if required): tons/year		8.b. Baseline 24-month Period: From:                      To:	
9.a. Projected Actual Emissions (if required): tons/year		9.b. Projected Monitoring Period: <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years	
10. Calculation of Emissions: <b>Hourly Emissions = 0.11 lb/ton x 5,800 tons/day x day/24 hr = 26.6 lb/hr</b> <b>Annual Emissions = 26.6 lb/hr x 8,760 hrs/yr /2,000 lb/ton = 116.4 TPY</b>			
11. Potential, Fugitive, and Actual Emissions Comment:			



**EMISSIONS UNIT INFORMATION**

**POLLUTANT DETAIL INFORMATION**

Section [1]  
"C" and "D" SAPs

Page [3] of [3]  
Nitrogen Oxides - NOx

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -  
ALLOWABLE EMISSIONS**

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: <b>OTHER</b>	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: <b>0.11 lb/ton 100% H2SO4</b>	4. Equivalent Allowable Emissions: <b>26.6 lb/hour      116.4 tons/year</b>
5. Method of Compliance: <b>Annual stack testing using EPA Method 7E</b>	
6. Allowable Emissions Comment (Description of Operating Method):  <b>Allowable emissions for SAPs "C" and "D" combined.</b>	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions \_\_\_\_ of \_\_\_\_

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour      tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	