Golder Associates

0570008-034-AC
PSD-FL-290

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BUREAU OF AIR REGULATION

PSD APPLICATION FOR NEW ANIMAL FEED INGREDIENT GRANULATION TRAIN CARGILL FERTILIZER, INC. RIVERVIEW, FLORIDA

Prepared For:

Cargill Fertilizer, Inc.
8813 U.S. Highway 41 South
Riverview, FL 33569

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

April 2000
9937601Y/F1

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PART A

AIR PERMIT APPLICATION

Department of
Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Cargill Fertilizer, Inc.**	
2. Site Name: **Tampa Plant**	
3. Facility Identification Number: **0570008** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **8813 U.S. Highway 41 South** City: **Riverview** County: **Hillsborough** Zip Code: **33569**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **Kathy Edgemon, Environmental Superintendent**
2. Application Contact Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **8813 Highway 41 South** City: **Riverview** State: **FL** Zip Code: **33569**
3. Application Contact Telephone Numbers: Telephone: (**813**) **671 - 6369** Fax: (**813**) **671 - 6149**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	April 21, 2000
2. Permit Number:	0570008-034-AC
3. PSD Number (if applicable):	PSD-FL-290
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: ______________________

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: ______________________

Operation permit number to be revised: ______________________

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected: ______________________

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised: ______________________

Reason for revision: ______________________

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[X] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1.	Name and Title of Owner/Authorized Representative or Responsible Official: **Kathy Edgemon, Environmental Superintendent**
2.	Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **8813 Highway 41 South** City: **Riverview** State: **FL** Zip Code: **33569**
3.	Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: **(813) 671 - 6369** Fax: **(813) 671 - 6149**
4.	Owner/Authorized Representative or Responsible Official Statement: *I, the undersigned, am the owner or authorized representative*(check here [ ], if so) or the responsible official (check here [**X**], if so) of the Title V source addressed in this application, whichever is applicable. 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. 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 any permitted emissions unit.* [signature] 4/19/2000 Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1.	Professional Engineer Name: **Scott A. McCann** Registration Number: **54172**
2.	Professional Engineer Mailing Address: Organization/Firm: **Golder Associates Inc.** Street Address: **6241 NW 23rd Street, Suite 500** City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3.	Professional Engineer Telephone Numbers: Telephone: **(352) 336 - 5600** Fax: **(352) 336 - 6603**

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(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

(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.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], 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 schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], 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.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], 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.

Signature ______________________ Date 4/17/00

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
	No. 2 Animal Feed Ingredient Granulation Train	AC1A	
078, 079, 080, 081	Existing AFI Plant	AC1A	

Application Processing Fee

Check one: [X] Attached - Amount: $: 7,500 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **Construction of a second Animal Feed Ingredient Granulation Train.**
2. Projected or Actual Date of Commencement of Construction
3. Projected Date of Completion of Construction:

Application Comment

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17**	East (km): **362.9**	North (km): **3082.5**	
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **27 / 51 / 28**		Longitude (DD/MM/SS): **82 / 23 / 15**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **28**	6. Facility SIC(s): **2874**
7. Facility Comment (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: **Kathy Edgemon, Environmental Superintendent**		
2. Facility Contact Mailing Address: Organization/Firm: **Cargill Fertilizer, Inc.** Street Address: **8813 U.S. Highway 41 South** City: **Riverview**	State: **FL**	Zip Code: **33569**
3. Facility Contact Telephone Numbers: Telephone: (**813**) **671 - 6369**	Fax: (**813**) **671 - 6149**	

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [X] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] One or More Emissions Units Subject to NSPS?	
7. [X] One or More Emission Units Subject to NESHAP?	
8. [ ] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	

List of Applicable Regulations

62-212.400 – PSD Preconstruction Review	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
PM	**A**				**Particulate Matter – Total**
PM_{10}	**A**				**Particulate Matter – PM_{10}**
SO_2	**A**				**Sulfur Dioxide**
NO_X	**A**				**Nitrogen Oxides**
CO	**A**				**Carbon Monoxide**
FL	**A**				**Fluorides**
H107	**A**				**Hydrogen Fluoride**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

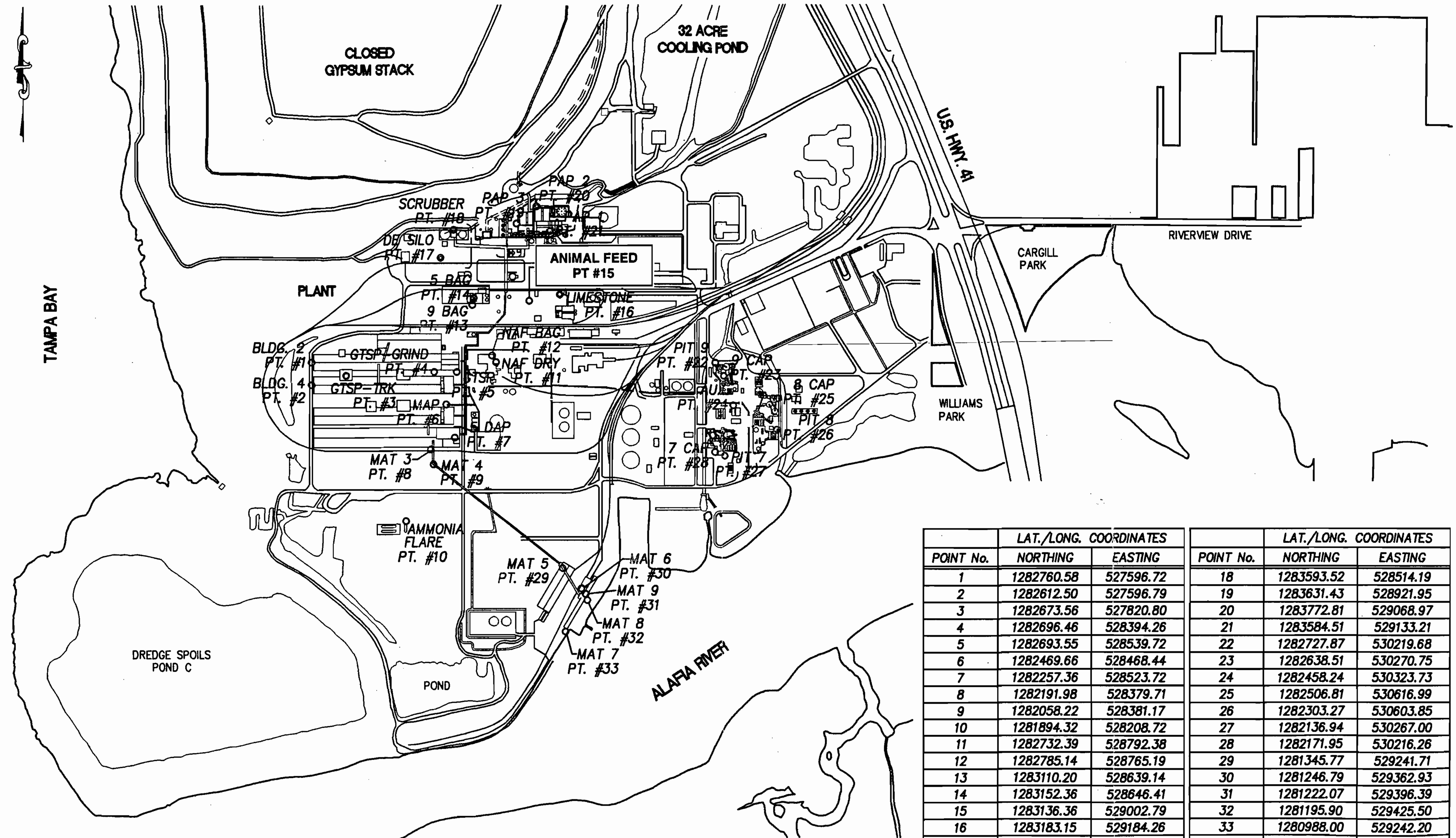
1. Area Map Showing Facility Location: [X] Attached, Document ID: See Part B [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: CF-C2 [ ] Not Applicable [ ] Waiver Requested
3. Process Flow Diagram(s): [X] Attached, Document ID: See Part B [ ] Not Applicable [ ] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [X] Attached, Document ID: See Part B [ ] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: See Part B [ ] Not Applicable
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [ ] Attached, Document ID:_______ [X] Not Applicable	
9. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:_______ [ ] Equipment/Activities On site but Not Required to be Individually Listed [X] Not Applicable	
10. Alternative Methods of Operation: [ ] Attached, Document ID:_______ [X] Not Applicable	
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:_______ [X] Not Applicable	
12. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:_______ [X] Not Applicable	
13. Risk Management Plan Verification: [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:_______) or previously submitted to DEP (Date and DEP Office:_______) [ ] Plan to be submitted to CEPPO (Date required:_______) [X] Not Applicable	
14. Compliance Report and Plan: [ ] Attached, Document ID:_______ [X] Not Applicable	
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:_______ [X] Not Applicable	

ATTACHMENT CF-C2

PLOT PLAN



	LAT./LONG. COORDINATES			LAT./LONG. COORDINATES	
POINT No.	NORTHING	EASTING	POINT No.	NORTHING	EASTING
1	1282760.58	527596.72	18	1283593.52	528514.19
2	1282612.50	527596.79	19	1283631.43	528921.95
3	1282673.56	527820.80	20	1283772.81	529068.97
4	1282696.46	528394.26	21	1283584.51	529133.21
5	1282693.55	528539.72	22	1282727.87	530219.68
6	1282469.66	528468.44	23	1282638.51	530270.75
7	1282257.36	528523.72	24	1282458.24	530323.73
8	1282191.98	528379.71	25	1282506.81	530616.99
9	1282058.22	528381.17	26	1282303.27	530603.85
10	1281894.32	528208.72	27	1282136.94	530267.00
11	1282732.39	528792.38	28	1282171.95	530216.26
12	1282785.14	528765.19	29	1281345.77	529241.71
13	1283110.20	528639.14	30	1281246.79	529362.93
14	1283152.36	528646.41	31	1281222.07	529396.39
15	1283136.36	529002.79	32	1281195.90	529425.50
16	1283183.15	529184.26	33	1280988.00	529242.20
17	1283403.11	528425.50			

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

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).

[X] 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. Regulated or Unregulated Emissions Unit? (Check one)

[X] 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.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
No. 2 Animal Feed Ingredient Granulation Train.

4. Emissions Unit Identification Number: [X] No ID
ID: [ ] ID Unknown

5. Emissions Unit Status Code: **C**	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **28**	8. Acid Rain Unit? [ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Material Handling Baghouses; Dryer Venturi Scrubber**	
2. Control Device or Method Code(s): **53, 75**	

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:	
2. Generator Nameplate Rating:	MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		**50**	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:		**770 TPD AFI**	
5. Requested Maximum Operating Schedule:			
	24 hours/day	**7**	days/week
	52 weeks/year	**8,760**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Production rate refers to maximum 24-hr (daily) animal feed ingredient production rate.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-212.400 PSD Preconstruction Review	
62-296.700(3) Phosphate Processing-RACT for PM	
62-296.700(4) Phosphate Processing-RACT for PM	
62-296.700(5) Phosphate Processing-RACT for PM	
62-296.700(6) Phosphate Processing-RACT for PM	
62-296.705(2)(a) Phosphate Processing-RACT for PM	
62-296.705(3) Test Methods	
62-296.711 Materials Handling-RACT for PM	
62-297.310 General Compliance Test Requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **AFI Plant**	2. Emission Point Type Code: **2**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code: **V**	6. Stack Height: **136** feet	7. Exit Diameter: **6.0** feet
8. Exit Temperature: **150** °F	9. Actual Volumetric Flow Rate: **100,000** acfm	10. Water Vapor: **15** %

11. Maximum Dry Standard Flow Rate: **74,000** dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

No. 2 AFI Granulation Train – Mineral Products, Phosphate Rock, Other Not Classified

2. Source Classification Code (SCC): **3-05-019-99**	3. SCC Units: **Tons Produced**	
4. Maximum Hourly Rate: **32.1**	5. Maximum Annual Rate: **281,050**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:

10. Segment Comment (limit to 200 characters):

Maximum hourly and annual production rate based on 770 TPD of AFI production.

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

AFI Dryer
In-Process Fuel Use – Natural Gas General

2. Source Classification Code (SCC): **3-90-006-99**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.050**	5. Maximum Annual Rate: **438**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,000**

10. Segment Comment (limit to 200 characters):

Represents annual average fuel usage of 50 MMBtu/hr for the rotary dryer in the granulation train.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **AFI Dryer** **In Process Fuel Use – Distillate Oil-General**		
2. Source Classification Code (SCC): **3-90-005-99**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.357**	5. Maximum Annual Rate: **143**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.5**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **140**
10. Segment Comment (limit to 200 characters): **Represents annual average fuel usage of 50 MMBtu/hr for the rotary dryer. Limited to 400 hr/yr of operation.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
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 (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	053	075	EL
PM_{10}	053	075	EL
NO_X			NS
CO			NS
SO_2			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8** lb/hour **35.04** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Table 2-2 of Part B**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission set equal to those established for the existing AFI Granulation Train.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **8** lb/hour **35.04** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 5**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT Limit**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8** lb/hour **35.04** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Table 2-2 of Part B**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission set equal to those established for the existing AFI Granulation Train.**	

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **8** lb/hour **35.04**
5. Method of Compliance (limit to 60 characters): **EPA Method 5**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Proposed BACT limit.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **25.4** lb/hour **5.2** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **71** Reference: **AP-42**	7. Emissions Method Code: **3**
8. Calculation of Emissions (limit to 600 characters): **Emissions due to firing No. 2 Fuel Oil (0.5% S) as backup fuel for 400 hours or less annually.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **AP-42 emission factor of 142 S, where S equals the sulfur content (WT%) of the fuel oil. In this case, 0.5%.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.5% S fuel**	4. Equivalent Allowable Emissions: **25.4** lb/hour **5.2** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Analysis and Fuel Usage Records**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested by Applicant**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9.**	
5. Visible Emissions Comment (limit to 200 characters): **Rule 62-296.705(2)(a) for scrubber stack.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor ______ of ______

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1.	Process Flow Diagram [X] Attached, Document ID: Fig. 2-1, Pt B [ ] Not Applicable
2.	Fuel Analysis or Specification [X] Attached, Document ID: CF-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3.	Detailed Description of Control Equipment [X] Attached, Document ID: See Part B [ ] Not Applicable [ ] Waiver Requested
4.	Description of Stack Sampling Facilities [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
5.	Compliance Test Report [ ] Attached, Document ID:______ [ ] Previously submitted, Date:______ [X] Not Applicable
6.	Procedures for Startup and Shutdown [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
7.	Operation and Maintenance Plan [ ] Attached, Document ID:______ [X] Not Applicable [ ] Waiver Requested
8.	Supplemental Information for Construction Permit Application [X] Attached, Document ID: See Part B [ ] Not Applicable
9.	Other Information Required by Rule or Statute [X] Attached, Document ID: See Part B [ ] Not Applicable
10.	Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
    [ ] Attached, Document ID:________ [X] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
    [ ] Attached, Document ID:________ [X] Not Applicable

13. Identification of Additional Applicable Requirements
    [ ] Attached, Document ID:________ [X] Not Applicable

14. Compliance Assurance Monitoring Plan
    [ ] Attached, Document ID:________ [X] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

    [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
    Attached, Document ID:________

    [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
    Attached, Document ID:________

    [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
    Attached, Document ID:________

    [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
    Attached, Document ID:________

    [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
    Attached, Document ID:________

    [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
    Attached, Document ID:________

    [X] Not Applicable

ATTACHMENT CF-EU1-J2

FUEL ANALYSIS

Attachment CF-EU1-J2

Animal Feed Plant
Fuel Analysis

Fuel	Density (lb/scf)/ (lb/gal)	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Natural Gas	0.048	<0.01	<0.001	0.62	–	1,000 Btu/scf
No. 2 Fuel Oil	6.83	<0.01	0.5	0.006	<0.01	140,000 Btu/gal

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

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).

[X] 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. Regulated or Unregulated Emissions Unit? (Check one)

[X] 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.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Existing Animal Feed Plant

4. Emissions Unit Identification Number: [ ] No ID
ID: **78, 79, 80, 81** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**28**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

Requested minor changes to permit for the Existing Animal Feed Plant

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

078 Common Stack for Acid Defluorination System – Wet Scrubber
Common Stack for No. 1 AFI Granulation Train –Venturi Scrubber

079 Diatomaceous Earth Storage and Delivery System – Baghouse

080 No. 1 Limestone Storage and Delivery System – Baghouse

081 Animal Feed Plant Loadout System – Baghouse

--- Proposed Second Limestone Storage and Delivery System Baghouse

2. Control Device or Method Code(s): **18, 53, 75**

Emissions Unit Details

1. Package Unit:
   Manufacturer: Model Number:
2. Generator Nameplate Rating: MW
3. Incinerator Information:
   Dwell Temperature: °F
   Dwell Time: seconds
   Incinerator Afterburner Temperature: °F

B. EMISSIONS UNIT CAPACITY INFORMATION

(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:			50	mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:				
4. Maximum Production Rate:			770 TPD AFI	
5. Requested Maximum Operating Schedule:				
	24	hours/day	7	days/week
	52	weeks/year	8,760	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): Production rate refers to maximum 24-hr (daily) animal feed ingredient production rate.				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

62-212.400 **PSD Preconstruction Review**	
62-296.403(1)(i) **Phosphate Processing-BACT for Fluorides**	
62-296.403(3) **Test Methods**	
62-296.700(3) **Phosphate Processing-RACT for PM**	
62-296.700(4) **Phosphate Processing-RACT for PM**	
62-296.700(5) **Phosphate Processing-RACT for PM**	
62-296.700(6) **Phosphate Processing-RACT for PM**	
62-296.705(2)(a) **Phosphate Processing-RACT for PM**	
62-296.705(3) **Test Methods**	
62-296.711 **Materials Handling-RACT for PM**	
62-297.310 **General Compliance Test Requirements**	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram?	2. Emission Point Type Code:

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Limestone Silo Baghouse, Diatomaceous Earth Silo Baghouse, AFI Product Loadout Baghouse, Acid Defluorination System, and No. 1 Granulation Train Common Stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

Acid Defluorination System and No. 1 AFI Granulation Train

5. Discharge Type Code: **V**	6. Stack Height: **136** feet	7. Exit Diameter: **6** feet
8. Exit Temperature: **150** °F	9. Actual Volumetric Flow Rate: **114,000** acfm	10. Water Vapor: **15** %

11. Maximum Dry Standard Flow Rate: **83,874** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: East (km): North (km):

14. Emission Point Comment (limit to 200 characters):

Parameters are for the common stack for the Acid-Defluorination System and No. 1 Granulation Train. See Part B, Table 2-4, for the stack parameters for other sources included in this emissions units.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **AFI-Dryer** **In-Process Fuel Use, Natural Gas: General**		
2. Source Classification Code (SCC): **3-90-006-99**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.05**	5. Maximum Annual Rate: **438**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,000**
10. Segment Comment (limit to 200 characters): **Represents annual average fuel usage of 50 MMBtu/hr for the rotary dryer in the granulation area. No change is requested for this segment.**		

Segment Description and Rate: Segment 2 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **AFI Dryer** **In-Process Fuel Use, Distillate Oil: General**		
2. Source Classification Code (SCC): **3-90-005-99**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.357**	5. Maximum Annual Rate: **143**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.5%**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **140**
10. Segment Comment (limit to 200 characters): **Represents Annual Average Fuel Usage of 50 MMBtu/hr for the Rotary Dryer. Limited to 400 hr/yr of operation. No change is requested for this segment.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Mineral Products, Phosphate Rock**		
2. Source Classification Code (SCC): **3-05-019-99**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **32.1**	5. Maximum Annual Rate: **281,050**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters): **Represents total Granular Animal Feed Phosphate Product for the existing No. 1 AFI Plant (770 TPD). Annual and hourly PM emissions from this segment will change due to requested modifications.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
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 (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO_2			EL
PM	018	075	EL
PM_{10}	018	075	EL
FL	053		EL
NO_X			NS
CO			NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **10.1** lb/hour **44.1** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **See Table 2-2, Part B**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Includes PM emissions from the existing AFI Common Stack, which remain unchanged from those currently permitted, and PM emissions from the Diatomaceous Earth Silo Baghouse, two Limestone Silo Baghouses, and AFI Product Loading Baghouse which increase on an annual basis reflecting potential 8,760 hr/yr operation. See Part B, Table 2-2.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10.1 lb/hr**	4. Equivalent Allowable Emissions: **10.1** lb/hour **44.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 5 for common stack and 5% VE limit for baghouses in lieu of testing.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **10.1** lb/hour **44.1** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Includes PM emissions from the existing AFI Common Stack, which remain unchanged from those currently permitted, and PM emissions from the Diatomaceous Earth Silo Baghouse, two Limestone Silo Baghouses, and AFI Product Loading Baghouse which increase on an annual basis reflecting potential 8,760 hr/yr operation. See Part B, Table 2-2.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10.1 lb/hr**	4. Equivalent Allowable Emissions: **10.1** lb/hour **44.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 5 for common stack and 5% VE limit for baghouses in lieu of testing.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **FL**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1** lb/hour **4.4** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: **0.5 lb/batch-hr** Reference: **BACT**	7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

Short-term emission rate remains unchanged from that currently permitted. Annual emission rate is increased from permitted rate of 4.3 TPY to 4.4 TPY to reflect 8,760 hr/yr operation.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: **1** lb/hour **4.4** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 13A or 13B

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Permitted short-term emission rate. Annual emissions increased to reflect 8,760 hr/yr operation.

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE15**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **15** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **PSD-FL-234A, Specific Condition No. 6**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **PRS**	2. Pollutant(s):
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Rules 62-4.070, 62-296.800, and 62-212.410, F.A.C.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE5**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: 5 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Permit Condition accepted in lieu of PM Stack Test per Rule 62-297.620 for all baghouse stacks.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor ______ of______

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Unchanged from current permit (PSD-FL-234A).**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: Fig. 2-1, Pt. B [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: CF-EU2-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: See Part B [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: See Part B [ ] Not Applicable
9. Other Information Required by Rule or Statute [X] Attached, Document ID: See Part B [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID: ________ [X] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

ATTACHMENT CF-EU2-J2

FUEL ANALYSIS

Attachment CF-EU2-J2

Animal Feed Plant
Fuel Analysis

Fuel	Density (lb/scf)/ (lb/gal)	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Natural Gas	0.048	<0.01	<0.001	0.62	–	1,000 Btu/scf
No. 2 Fuel Oil	6.83	<0.01	0.5	0.006	<0.01	140,000 Btu/gal

PART B
PSD REPORT

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LIST OF ACROYNMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standard
acfm	actual cubic feet per minute
AFI	animal feed ingredient
BACT	Best Available Control Technology
Cargill	Cargill Fertilizer, Inc.
CFR	Code of Federal Regulations
CO	carbon monoxide
EPA	U.S. Environmental Protection Agency's
DAP	diammonium phosphate
DCP	dicalcium phosphate
DE	diatomaceous earth
dscfm	dry standard cubic feet per minute
F	fluoride
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
gpm	gallons per minute
gr/dscf	grains per dry standard cubic foot
gr/scf	grains per standard cubic foot
GTSP	granular triple superphosphate
hr/yr	hours per year
lb/hr	pounds per hour
MAP	monoammonium phosphate
MCP	monocalcium phosphate
NO_x	nitrogen oxide
NSPS	New Source Performance Standards
PFS	phosphatic fertilizer solution
PM	particulate matter

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LIST OF ACROYNMS AND ABBREVIATIONS (Continued)

PM_{10}	particulate matter less than or equal to 10 micrometers
PSD	prevention of significant deterioration
RACT	Reasonably Available Control Technology
SO_2	sulfur dioxide
TPD	tons per day
TPH	tons per hour
TPY	tons per year
TSP	triple superphosphate
VOC	volatile organic compound

1.0 INTRODUCTION

Cargill Fertilizer, Inc. (Cargill) has constructed an animal feed ingredient (AFI) plant at its existing fertilizer manufacturing facility in Riverview, Florida (see Figure 1-1). The AFI plant was originally permitted under Air Construction Permit No. AC29-242897, issued on June 16, 1994. This permit was amended on January 12, 1996, with the issuance of Air Construction Permit No. 05700008-002-AC. The purpose of this amendment was to update the design data for the plant. The original plant capacity was 480 tons per day (TPD) and 150,000 tons per year (TPY) of AFI, based on two acid defluorination batch tanks and one granulation area. The AFI plant began operations in January 1996.

In early 1996, Cargill submitted an application to expand the AFI plant, consisting of adding a third acid defluorination batch tank and a second granulation train. This expansion, permitted under Air Construction Permit No. 0570008-013-AC issued on June 12, 1997, increased the AFI production capacity to 1,160 TPD (580 TPD for each granulation area) and 300,000 TPY. Subsequently, Cargill installed a third acid defluorination tank, but did not construct the second granulation train.

In December 1998, Cargill submitted a construction permit application to increase the production rate of the existing granulation train from 580 to 770 TPD AFI. The requested increase in production was attained through implementing minor modifications to the existing granulation train (i.e., the second granulation train was not added). Construction Permit No. 0570008-028-AC for this modification was issued on June 9, 1999. The AFI plant is currently permitted to produce 770 TPD and 281,050 TPY of granular AFI.

Cargill is now proposing to add a second AFI granulation train (dryer, pug mill, and cooler/classifier) with a production capacity of 281,050 TPY of AFI. Cargill intends to permit the proposed granulation train as a new emissions unit. Additional process support equipment will be added as part of this project. This equipment will include up to three additional product storage silos, a truck unloading station, and a second baghouse controlling particulate matter

(PM) emissions from the existing limestone silo, which will require modification of the emissions unit for the existing AFI Plant.

Due to the proposed project, maximum emissions of fluorides (F), PM, and particulate matter less than or equal to 10 micrometers (PM_{10}) will increase. Based on total potential emissions of F, PM, and PM_{10} from the existing AFI plant, the proposed project will constitute a major modification to a major stationary source and, thus, trigger new source review under the provisions of prevention of significant deterioration (PSD) regulations for these pollutants.

For each pollutant subject to PSD review, the following analyses are required:

1. Ambient monitoring analysis, unless the net increase in emissions due to the modification causes impacts which are below specified significant impact levels.
2. Application of Best Available Control Technology (BACT) for each new emissions unit.
3. Air quality impact analysis, unless the net increase in emissions due to the modification causes impacts which are below specified significant impact levels.
4. Additional impact analysis (impact on soils, vegetation, visibility), including impacts on PSD Class I areas.

This PSD permit application addresses these requirements and is organized into six additional sections followed by the appendices. A description of the project including air emission sources and pollution control equipment is presented in Section 2.0. A regulatory applicability analysis of the proposed project is presented in Section 3.0. An ambient air monitoring analysis is presented in Section 4.0. A BACT analysis is presented in Section 5.0. The air quality impact analysis and additional impact analysis are presented in Sections 6.0 and 7.0, respectively. Supporting documentation is presented in the appendices.

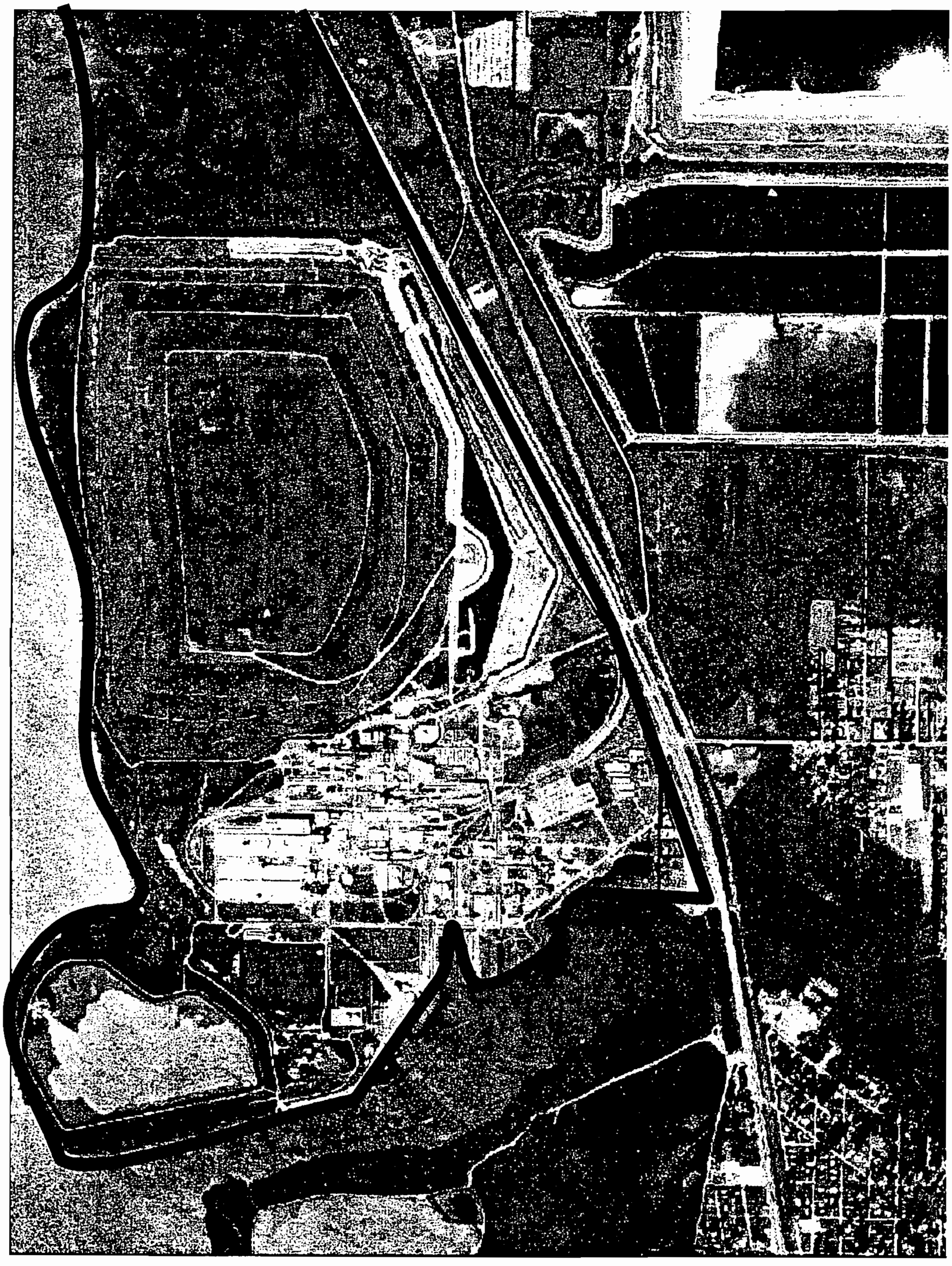

Figure 1-1 Site Location
Cargill Fertilizer, Inc.
Riverview Facility

Golder Associates

Source: Golder, 2000.

9937601Y/F1/WP (4/17/00)

2.0 PROJECT DESCRIPTION

2.1 GENERAL

Two types of animal feed phosphate are produced by the existing AFI Plant: dicalcium phosphate (DCP) and monocalcium phosphate (MCP). In the process, phosphatic fertilizer solution (PFS) from the existing phosphate fertilizer plant is defluorinated and fed to the granulation area, where it reacts with limestone to produce animal feed phosphates. The defluorination process uses diatomaceous earth (DE) and PFS and can be operated either as a batch or continuous process.

After reaction with limestone, the products are discharged to a rotary dryer, then transferred to the solids handling section of the granulation plant where the product is screened, classified, cooled, and de-dusted. Product material is then transferred to bulk storage where it is subsequently loaded into trucks or railcars. The permitted production capacity of the current AFI Plant is 770 TPD and 281,050 TPY of AFI.

Cargill is proposing to construct a second AFI granulation train with a production capacity of 281,050 TPY AFI. The proposed project will consist of a duplication of the existing process and control equipment associated with the granulation train (i.e., screens, pug mill, dryer, and cooler/classifier), but will use the existing lime and DE unloading system, and the existing AFI loadout system (i.e., silos, bins, and loading equipment). The new granulation train will be similar to the existing facilities. A flow diagram for the existing AFI Plant and the proposed AFI granulation train is presented in Figure 2-1. The project also includes installation of up to three additional AFI product silos, a second product conveyor, and an additional AFI loadout system to handle trucks, and a second limestone truck unloading station and baghouse.

2.2 PROCESS DESCRIPTION

The process operations of the existing and proposed plants are described in the following sections.

2.2.1 DIATOMACEOUS EARTH UNLOADING

DE is pneumatically unloaded from trucks or railcars and conveyed to a storage silo. The silo is fitted with a baghouse to control PM emissions from the transfer operation. The DE is then transferred to a weigh bin before it is pneumatically transferred to the acid defluorination tanks.

2.2.2 ACID DEFLUORINATION

DE is metered from the weigh bin to the acid batch tanks where it is slurried with PFS. The acid defluorination area produces PFS, which is lower in fluorine content. Currently, there are three batch defluorination tanks (designated A, B, and C). Cargill has previously made application to modify the acid defluorination system so that it can be operated as a continuous process. By operating the existing acid defluorination tanks as a continuous process, sufficient defluorinated PFS can be produced to supply both the existing and proposed AFI granulation trains.

2.2.3 GRANULATION PROCESS

In the existing AFI granulation plant, the defluorinated PFS is reacted with limestone to produce calcium phosphate. Ground limestone is pneumatically unloaded from trucks into a bulk storage silo adjacent to the granulation plant area. A baghouse controls PM emissions from the transfer operation. A second limestone silo baghouse will be added as part of this project.

Limestone is periodically transferred from the storage silo by pneumatic conveyor to the limestone day bin in the granulation plant building. PM emissions from the day bin are controlled by a baghouse. The baghouse is vented back inside the building.

The limestone is added to a high speed mixer with defluorinated PFS to form a mixture of MCP or DCP. The acid and limestone slurry is then sent to the pug mill, which produces a granular material. The material then discharges into the rotary dryer.

Heated air is supplied from a separate combustion chamber, which is normally fueled by natural gas. Provisions are made to use No. 2 fuel oil as a stand-by fuel in case of natural gas interruption. No. 2 fuel oil is used less than 400 hours per year (hr/yr). The dryer exhaust gases pass through cyclones to capture product, and then through a venturi scrubber for PM control.

The proposed AFI granulation train will use the existing limestone unloading system and storage silo. This system will be common to both AFI granulation trains. The limestone from the storage silo will be pneumatically conveyed to a new limestone day bin used to feed the proposed AFI granulation train. The proposed AFI granulation train will be similar to the AFI existing granulation train consisting of a limestone metering system, high speed mixer, pug mill, cooler/classifier, and dryer. Similar to the existing AFI granulation train dryer, the dryer for the proposed granulation train will be controlled by a cyclone followed by a wet venturi scrubber. The wet scrubber will be equivalent to the existing dryer scrubber, but may be supplied by a different manufacturer. The exhaust gases from the existing dryer scrubber are vented through the same stack as the exhaust gases from the existing acid defluorination system. Exhaust gases from the proposed AFI granulation train will be vented through a new stack.

2.2.4 SOLIDS HANDLING

The solids handling section of the existing granulation train takes the solids discharged from the dryer and screens, cools, and de-dusts the materials.

Product size material from the screening system discharges to a fluid bed classifier/cooler. This unit has a dual function; positive removal of dust and fines from the product stream by entrainment into the fluidizing air; and cooling of the product material to minimize storage and shipping problems. Cooled, on-size material is sent to the product storage silos. PM emissions from the material handling process are vented to the equipment vents cyclones and then to the dryer venturi scrubber.

The proposed AFI granulation train will use a similar system for solids handling. The existing fluid bed cooler classifier may be modified and used for both trains, or a new cooling system may be constructed. If a new cooler is constructed, PM emissions from the cooler will be vented to the same venturi scrubber. PM emissions from the proposed AFI granulation train will be vented to a cyclone and then to the same venturi scrubber controlling emissions from the proposed dryer. The finished AFI product will be sent to the finished product silos.

2.2.5 PRODUCT STORAGE

AFI product is currently transferred by belt conveyor to one of five AFI product storage silos. As part of this project, up to three additional product storage silos may be added. A second conveyor system may be installed to accommodate the proposed silos.

2.2.6 PRODUCT LOADOUT

Currently, AFI product is withdrawn from the storage silos to trucks or railcars. A new loading system will be added to accommodate trucks. The maximum loading rate through the loadout system will be 400 TPH. The existing baghouse will be used to control PM emissions from the silos and railcar/truck load-out systems.

2.3 POLLUTION CONTROL EQUIPMENT AND AIR EMISSIONS

Potential emissions from the existing process equipment and product storage and handling operations are controlled by scrubbers and baghouses. A wet scrubber is used to control fluoride emissions from the defluorination process. A wet scrubber is also used to control PM emissions from the granulation train. Baghouses are used to control potential PM emissions from product storage and handling operations. These systems will remain in place.

The pollution control equipment for the proposed project will be equivalent in design to the existing control equipment. Permitted annual emission rates for the existing facility are presented in Table 2-1. Emission rates for the proposed sources associated with this project are presented in Table 2-2.

2.3.1 DIATOMACEOUS EARTH STORAGE AND DELIVERY SYSTEM

DE powder is pneumatically conveyed from the common carrier tank to the DE hopper. A baghouse is installed on the DE hopper to remove particulates from the vented air. The DE baghouse is designed to discharge PM at less than 0.012 grain per dry standard cubic foot (gr/dscf). Design air flow rate is 600 actual cubic feet per minute (acfm), or 518 dry standard cubic feet per minute (dscfm). Maximum calculated PM emissions are 0.053 pounds per hour (lb/hr) and 0.23 TPY (see Table 2-2) for the DE Storage and Delivery System.

2.3.2 DEFLUORINATION AREA

Currently, air from the acid defluorination system is drawn into a packed cross-flow scrubber, which removes fluoride from the gas stream. The cross sectional area of the packed sections is 20 square feet. Pond water is used as the scrubber liquid then returned to the existing cooling pond. The current permit limit for the scrubber limits fluoride emissions to less than 0.5 lb/batch-hr, during batch operation and 1 lb/hr during continous operation. This equates to fluoride emissions of 1 lb/hr and 4.4 TPY. The existing acid defluorination system is already sized to accomodate the second granulation train.

Although actual F emissions will increase as a result of this project. No increase in current allowable emissions is requested.

2.3.3 GRANULATION TRAINS

Currently, exhaust gases from all the equipment associated with the existing AFI granulation train is vented to cyclones to remove product from the gas stream and then to a venturi scrubber designed to remove PM from the gas streams before venting to the atmosphere. Equivalent control equipment will be used to remove PM from the exhaust gases vented from the proposed AFI granulation train.

PM emissions from the proposed dryer will be controlled using equivalent equipment. Emissions due to fuel combustion for the proposed dryer are presented in Table 2-3. Emission rates are presented for nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and volatile organic compound (VOC). Estimated emission rates from fuel combustion were developed using factors specified in the U.S. Environmental Protection Agency's (EPA) *Compilation of Air Pollution Emission Factors* (AP-42). Estimated emission rates are presented for natural gas and No. 2 fuel oil use. Fuel oil use will be limited to 400 hr/yr. The maximum permitted PM/PM_{10} emission rates for the existing granulation scrubber (and the common stack) are 8.0 lb/hr and 35.04 TPY. Cargill is requesting the same emission limits for the proposed dryer and AFI granulation train.

2.3.4 LIMESTONE HANDLING

Limestone powder is pneumatically conveyed from trucks to the limestone silo at a transfer rate of 25 TPH. The proposed expansion of the AFI Plant will require an increase in the amount of limestone handled annually. Presently, a single baghouse is used to remove limestone powder from the air that is vented from the silo. A second baghouse will be added to the silo as part of this project. PM emissions from the new baghouse will be the same as the exisitng baghouse based on a maximum exhaust grain loading of 0.012 gr/dscf [Florida Department of Environmental Protection (FDEP) BACT Determination, June 8, 1999] and an exhaust flow of 691 dscfm. The maximum calculated PM emission rates for the new baghouse are 0.071 lb/hr and 0.31 TPY (see Table 2-2).

2.3.5 AFI PRODUCT LOADOUT SYSTEM

Currently, granular animal feed phosphate is transferred by belt conveyor from the existing AFI granulation train to one of five product storage silos. The existing belt conveyor will also be used to transfer granular animal feed phosphate from the proposed AFI granulation train to the product storage silos. As many as three additional product storage silos will be added as part of this project. A second product transfer conveyor may also be added. Cargill intends to modify the truck/railcar loading operation to allow for separate truck loading. The existing evacuation system will be modified to control PM emissions from the proposed truck loading operation.

PM/PM_{10} emissions from the existing conveyor transfer points and silos are controlled using a baghouse. This baghouse will be used to control PM/PM_{10} emissions from the existing silos and railcar loading system, as well as the proposed AFI storage silos and truck loading system. In the past, this source was expected to operate only during product loadout, a maximum of 3,500 hr/yr. Since the proposed facility expansion will nearly double the production capacity of the facility, Cargill requests that this source be permitted to operate 8,760 hr/yr. The design air flow rate of the baghouse is 21,000 acfm or 18,280 dscfm. The air discharge from the AFI silo baghouse will contain no more than 0.012 gr/dscf (FDEP BACT Determination, June 8, 1999) of PM. Based on this exhaust grain loading maximum calculated, PM emissions are 1.88 lb/hr and 8.24 TPY (see Table 2-2).

2.3.6 EMISSIONS SUMMARY

A summary of the pollution control equipment and emissions of fluorides and PM from the AFI plants are presented in Table 2-2.

2.4 STACK DATA

Stack geometry and operating data are presented in Table 2-4 for each emission source located at existing AFI Plant and proposed AFI Granulation Train. These sources include the common stack for the existing plant, a stack for the proposed granulation train, the existing DE silo baghouse, the existing and proposed limestone silo baghouses, and the existing AFI product loadout baghouse.

Table 2-1. Summary of Pollution Control Equipment and Annual Permitted PM/PM_{10} and Fluoride Emission Rates for the Existing AFI Plant

Source	Control Equipment	Permitted PM/PM_{10} Emission Rate (TPY)	Permitted Fluoride Emission Rate (TPY)	Emission Point
Existing AFI Plant				
Defluorination System	Wet Scrubber	–	4.3	AFI Common Stack
Granulation System	Venturi Scrubber	35.04	–	AFI Common Stack
AFI Support Operations				
Diatomaceous Earth Hopper	Baghouse	0.16	–	Diatomaceuos Earth Baghouse Stack
Limestone Silo	Baghouse	0.21	–	Limestone Silo Baghouse Stack
AFI Product Loadout	Baghouse	1.56	–	AFI Product Silos and Loadout Baghouse Stack
	TOTAL	36.97	4.3	

Table 2-2. Summary of Pollution Control Equipment and PM/PM_{10} and Fluoride Emission Rates

Source	Control Equipment	Design Capacity Value	Design Capacity Units	Operating Hours	PM/PM_{10} Emission Rate (gr/dscf)	PM/PM_{10} Emission Rate (lb/hr)	PM/PM_{10} Emission Rate (TPY)	Fluoride Emission Rate lb/hr	Fluoride Emission Rate (TPY)	Emission Point
Existing AFI Plant										
Defluorination System	Wet Scrubber	14,000	acfm	8,760	--	--	--	1.0	4.38	Existing AFI Common Stack
No. 1 AFI Granulation System	Venturi Scrubber	100,000	acfm	8,760	NA	8.00	35.04	--	--	Existing AFI Common Stack
Proposed AFI Plant										
No. 2 AFI Granulation System	Venturi Scrubber	100,000	acfm	8,760	NA	8.00	35.04	--	--	Proposed AFI Stack
AFI Support Operations[a]										
Diatomaceous Earth Hopper	Baghouse	518	dscfm	8,760	0.012	0.053	0.23	--	--	Existing Diatomaceuos Earth Baghouse Stack
Limestone Silo	Existing Baghouse	691	dscfm	8,760	0.012	0.071	0.31	--	--	Existing Limestone Silo Baghouse Stack
	New Baghouse[b]	691	dscfm	8,760	0.012	0.071	0.31	--	--	Second Limestone Silo Baghouse Stack
AFI Product Loadout[c] (hours of operation increased from 3,500 to 8,760 hours as part of this project and flowrate increased to account for additional dust pickups on storage silos)	Baghouse	18,280	dscfm	8,760	0.012	1.88	8.24	--	--	AFI Product Silos and Loadout Baghouse Stack
Total Emissions from the Exisiting AFI Plant with the Proposed Changes						10.08	44.13	1.0	4.4	
Total Emissions from the Proposed Granulation Train						8.00	35.04	--	--	

Footnotes:

[a] AFI support operations are common to both the existing and proposed AFI Plants, but are included with the existing AFI Emissions Unit.

[b] Second limestone silo baghouse to be installed as part of this project.

[c] Hours of operation will be increased from 3,500 to 8,760 hours as part of this project. The flow rate of the baghouse will also be increased to account for the additional dust pick ups on the storage silos.

Table 2-3. Summary of Emission Rates Due to Fuel Combustion for the Proposed Dryer

Parameter	No. 2 Fuel Oil	Natural Gas
Operating Data		
Annual Operating Hours (hr/yr)	400	8,760
Maximum Heat Input Rate (MMBtu/hr)	50	50
Fuel Data		
Hourly Fuel Oil Usage (10^3 gal/hr)[a]	0.357	NA
Annual Fuel Oil Usage (10^3 gal/yr)	143	NA
Maximum Sulfur Content (%)	0.5	NA
Hourly Natural Gas Usage (scf/hr)[b]	NA	0.050
Annual Natural Gas Usage (MMscf/yr)	NA	438

Pollutant	AP-42 Emission Factor[c]	No. 2 Fuel Oil Hourly Emission Rate (lb/hr)	No. 2 Fuel Oil Annual Emission Rate (TPY)	Natural Gas Hourly Emission Rate (lb/hr)	Natural Gas Annual Emission Rate (TPY)	Maximum Total Emission Rate Hourly Emission Rate (lb/hr)	Maximum Total Emission Rate Annual Emission Rate (TPY)
Sulfur Dioxide							
Fuel Oil	142*S lb/10^3 gal	25.36	5.07	--	--		
Natural Gas	0.6 lb/10^6 ft^3	--	--	0.030	0.13		
Worse-Case Combination of Fuels						25.36	5.20
Nitrogen Oxides							
Fuel Oil	20 lb/10^3 gal	7.14	1.43	--	--		
Natural Gas	100 lb/10^6 ft^3	--	--	5.00	21.90		
Worse-Case Combination of Fuels						7.14	22.33
Carbon Monoxide							
Fuel Oil	5 lb/10^3 gal	1.79	0.36	--	--		
Natural Gas	84 lb/10^6 ft^3	--	--	4.20	18.40		
Worse-Case Combination of Fuels						4.20	18.40
Volatile Organic Compounds							
Fuel Oil	0.2 lb/10^3 gal	0.071	0.014	--	--		
Natural Gas	5.5 lb/10^6 ft^3	--	--	0.28	1.20		
Worse-Case Combination of Fuels						0.28	1.20
Particulate Matter							
Fuel Oil		d	d	d	d	d	d
Natural Gas		d	d	d	d	d	d
Worse-Case Combination of Fuels						d	d

Footnotes:

[a] Based on a heat content of fuel oil of 140,000 Btu/gallon.
[b] Based on a heat content of natural gas of 1,000 Btu/scf.
[c] 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.
[d] The particulate matter emission rates for the dryer are included in the emissions rates presented on Table 2-1.

Table 2-4. Stack and Vent Geometry and Operating Data

Source	Stack/Vent Release Height (ft)	Stack/Vent Diameter (ft)	Exhaust Gas Flow Rate (ACFM)	(SCFM)	(DSCFM)	Exhaust Gas Exit Temperature (Deg. F)	Exhaust Gas Water Vapor Content (%)	Exhaust Gas Velocity (ft/sec)
Existing AFI Plant Common Stack for Defluorination System and Granulation System	136	6.00	114,000	98,675	83,874	150	15	67.2
Proposed No. 2 AFI Granulation Train Granulation System	136	6.00	100,000	87,000	74,000	150	15	59.0
AFI Support Operations Diatomaceous Earth Hopper Baghouse Stack	64	1.50	600	576	518	90	10	5.7
Existing Limestone Silo Baghouse Stack	85	1.50	800	768	691	90	10	7.5
Proposed Limestone Silo Baghouse Stack	85	1.50	800	768	691	90	10	7.5
AFI Product Loadout Baghouse Stack	20	3.00	21,000	20,200	18,280	90	10	49.5

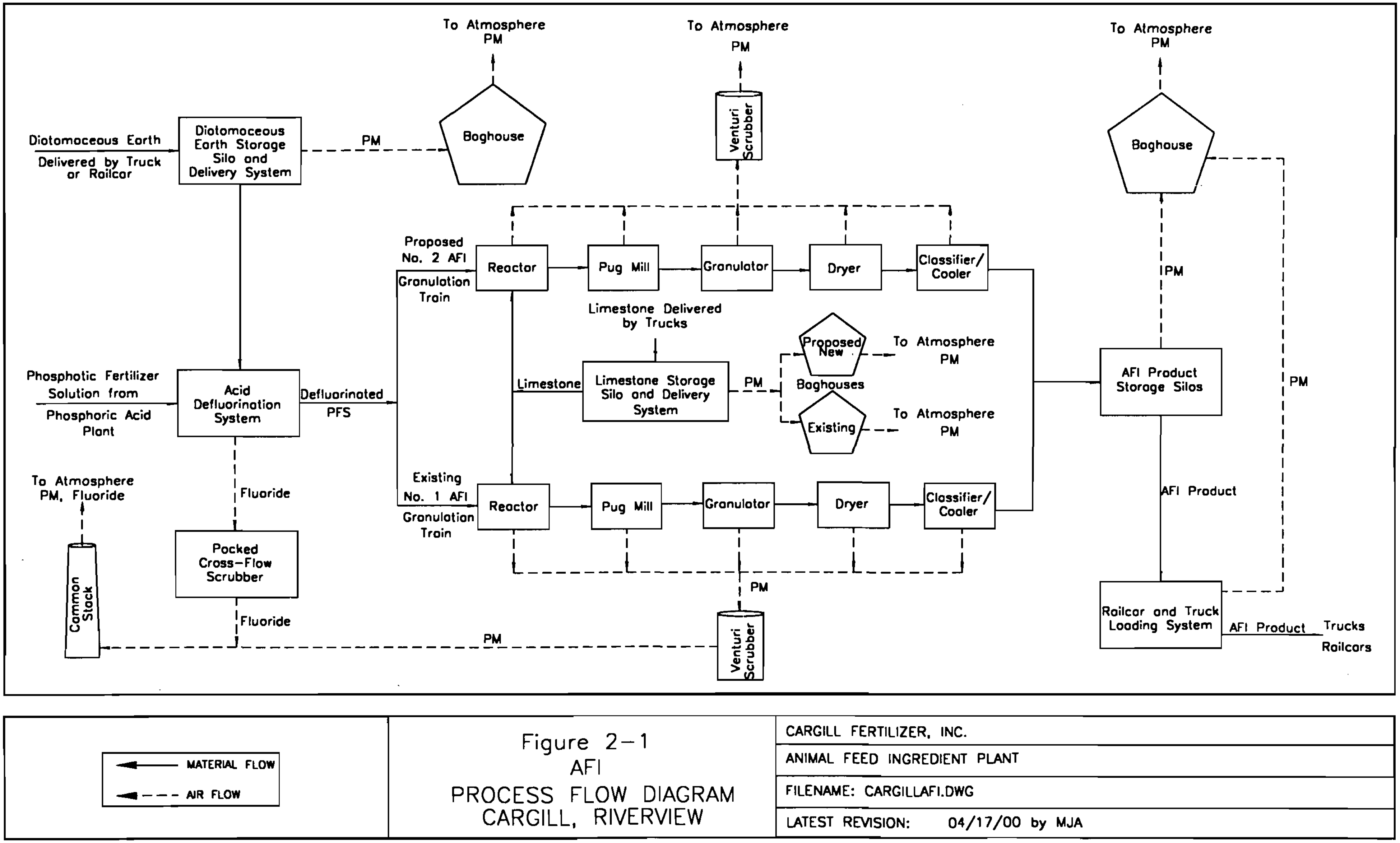

	Figure 2-1 AFI PROCESS FLOW DIAGRAM CARGILL, RIVERVIEW	CARGILL FERTILIZER, INC. ANIMAL FEED INGREDIENT PLANT FILENAME: CARGILLAFI.DWG LATEST REVISION: 04/17/00 by MJA

3.0 REGULATORY APPLICABILITY

3.1 PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The proposed project includes the addition of a second AFI granulation train and modification of some of the existing AFI sources. As a result of the proposed project, potential emissions of PM, PM_{10}, CO, VOC, NO_x, SO_2, and F will increase.

A PSD applicability analysis is presented in Table 3-1. Table 3-1 shows the increase in annual emissions due to the proposed project, changes in annual emissions due to potential debottlenecking of upstream and downstream sources associated with the proposed project, and contemporaneous emission changes occurring over the last 5 years.

The debottlenecking analysis showed that one upstream source (phosphoric acid plant) and one downstream (ship loading operation) would potentially be affected by the proposed project. The proposed AFI granulation train will increase the demand for PFS from the phosphoric acid plant. Although the phosphoric acid plant is currently permitted to supply the necessary PFS, actual production could potentially increase with a corresponding increase in actual F emissions, if sufficient PFS cannot be diverted from other product lines. Actual annual F emissions from the phosphoric acid plant, presented in Table 3-1, were based on the average of F emissions reported in Cargill's *1998 and 1999 Annual Operating Reports* for the Riverview facility of 1.6 and 3.2 TPY, respectively.

Sulfuric acid is used in the production of phosphoric acid. If production of phosphoric acid increases as a result of the proposed project, additional sulfuric acid may be required. Although Cargill produces sulfuric acid in their three sulfuric acid plants, they also purchase significant amounts from outside sources. Cargill will continue to purchase sulfuric acid, therefore the sulfuric acid plants will continue to operate as in the past (i.e. , no increase actual emissions).

Actual PM/PM_{10} emissions from the existing ship loading operation may also increase due to the increased amount of AFI product produced by the proposed project. Again, actual emissions from the existing ship loading operation were based on PM/PM_{10} emission reported in Cargill's

1998 and 1999 *Annual Operating Reports* for the Riverview facility of 2.97 and 2.03 TPY, respectively.

The results of the contemporaneous emissions evaluation are presented in Table 3-1. Several projects potentially resulting in contemporaneous emission changes over the last five years are listed in the table. Two of these projects, the AFI Plant Expansion in 1996, the MAP plant expansion in 1998 triggered PSD review for one or more pollutants. Per EPA guidance, when PSD is triggered for a particular pollutant, the slate is "wiped clean" for that pollutant and there is no further consideration of past, contemporaneous emission changes for that pollutant. Thus, in the case of PM/PM_{10} and F emissions, the expansion of the MAP Plant in 1998 underwent PSD review. Therefore, any net changes in PM/PM_{10} or F emissions occurring prior to that project are not considered in the netting analysis for this project.

Based on the total emissions after modification, PSD new source review will be required for PM, PM_{10}, and F. PM_{10} is defined as PM with an aerodynamic particle size diameter of 10 micrometers or less. Under PSD new source review requirements, a proposed modification that results in a significant net emissions increase must undergo the following reviews:

1. BACT evaluation,
2. Air quality impact analysis,
3. Ambient monitoring analysis, and
4. Additional impact analysis.

These requirements are addressed in Sections 4.0 through 7.0.

3.2 NEW SOURCE PERFORMANCE STANDARDS

Federal New Source Performance Standards (NSPS) currently exist for facilities producing phosphoric acid and phosphate fertilizer products [40 Code of Federal Regulations (CFR) 60, Subparts T through X]. Specifically, these standards apply to wetprocess phosphoric acid plants, superphosphoric acid plants, granular diammonium phosphate (DAP) plants, monoammonium phosphate (MAP) plants, triple superphosphate (TSP) plants, and granular triple superphosphate (GTSP) storage facilities. Since the animal feed plant will not produce or store any of these products, the AFI plant is not subject to NSPS requirements.

3.3 STATE OF FLORIDA EMISSION STANDARDS FOR FLUORIDES

Because the proposed plant uses PFS as a raw material, potential fluoride emissions from the defluorination and granulation processes are subject to the emission limitations of Rule 62-296.403(1), Florida Administrative Code (F.A.C.) pertaining to fluoride emissions from phosphate processing plants. Since the operational nature of the proposed plant does not apply to the source categories listed in 62-296.403(1), paragraphs (a) through (h), the provisions of paragraph (i) would apply. This provision states that a BACT determination would apply to the source, as determined pursuant to Rule 62-296.330, F.A.C. Therefore, a BACT determination must be made regarding fluoride emissions from the common stack. The BACT analysis for the proposed project is presented in Section 5.0.

3.4 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT)

The animal feed plant is located in an area of Hillsborough County, which has been designated as an air quality maintenance area for PM. Therefore, the facility is subject to the RACT provisions for PM as codified in 62-296.700 F.A.C. The new animal feed plant will also be subject to these provisions.

Phosphate processing operations at phosphate fertilizer plants are subject to the provisions of 62-296.705 F.A.C. For AFI plants, the applicable PM emission limitation is 0.3 lb per ton of product and 20 percent opacity. These limitations apply to the dryer and cooler/classifier system associated with the proposed AFI Plant.

Materials handling sources vented through a stack within the existing and new facilities will be subject to the emission limitation as specified in 62-296.711, F.A.C., which limits a PM emissions to 0.03 gr/dscf.

The emissions limitations for sources within the animal feed plants will meet the RACT requirements. Maximum PM emissions from the baghouses for the materials handling systems will be 0.012 gr/dscf, which is below the RACT limitation. PM emissions from the proposed dryer and material handling scrubber stack, based on the RACT limit of 0.3 pound per ton of product, are as follows:

32.08 TPH product x 0.3 lb/ton = 9.62 lb/hr PM emissions

As presented in Table 2-1, total PM emissions from the common stack will meet the RACT emission limitation. Therefore, PM emissions from each source within the proposed AFI plant will comply with all applicable RACT emissions limitations.

Table 3-1. Contemporaneous and Debottlenecking Emissions Analysis and PSD Applicability

Source Description	Pollutant Emission Rate (TPY) SO_2	NO_x	CO	PM/PM10	VOC	TRS	Fluoride
Potential Emissions From Modified/New/Affected Sources							
A. New No. 2 AFI Granulation Train	5.20	22.30	18.40	35.04	1.20	--	--
B. New Limestone Silo Baghouse				0.071		--	
C. Existing Limestone Silo Baghouse	--	--	--	0.071	--	--	--
D. Existing Diatomaceuos Earth Silo Baghouse	--	--	--	0.053	--	--	--
E. Existing AFI Product Silo Baghouse	--	--	--	1.88	--	--	--
F. Existing Acid Defluorination System	--	--	--	--	--	--	4.38
G. Existing Phosphoric Acid Plant[a]	--	--	--	--	--	--	10.03
H. Existing AFI Product Dock Conveying and Ship Loading Operation[a]	--	--	--	22.02	--	--	--
Total Potential Emission Rates	5.20	22.30	18.40	59.14	1.20	0.00	14.41
Actual Emissions from Current Operations[b]							
A. Limestone Silo Baghouse	--	--	--	0.29	--	--	--
B. Diatomaceous Earth Silo Baghouse	--	--	--	0.21	--	--	--
C. AFI Product Silo Baghouse	--	--	--	1.11	--	--	--
D. Acid Defluorination System	--	--	--	--	--	--	1.30
E. Phosphoric Acid Plant[a]	--	--	--	--	--	--	2.40
F. Existing AFI Product Dock Conveying and Ship Loading Operation[a]	--	--	--	2.50	--	--	--
Total Actual Emission Rates	0.00	0.00	0.00	4.10	0.00	0.00	3.70
TOTAL CHANGE DUE TO PROPOSED PROJECT	5.20	22.30	18.40	55.03	1.20	0.00	10.71
Contemporaneous Emission Changes							
A. GTSP Plant Modification (September 1995)	0.00	--	0.00	--	0.00	0.00	--
B. Upgrade of Phosphate Rock Grinding System (June 1996)	2.70	--	3.99	--	0.31	0.00	--
C. AFI Plant Expansion (July 1996)	9.40	[d]	14.20	--	1.10	0.00	--
D. MAP Plant Expansion (May 1998)	0.61	2.23	0.56	[d]	0.041	0.00	[d]
E. DAP Plant Cooler Upgrade (August 1998)[c]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F. Reconstruction of Molten Sulfur Tank No. 1 (February 1999)	2.82	0.00	0.00	3.40	2.01	1.35	0.00
Total Contemporaneous Emission Changes	15.53	2.23	18.75	3.40	3.46	1.35	0.00
TOTAL NET CHANGE	20.7	24.5	37.2	58.4	4.7	1.4	10.7
PSD SIGNIFICANT EMISSION RATE	40	40	100	15	40	10	3
PSD REVIEW TRIGGERED?	No	No	No	Yes	No	No	Yes

Footnotes:

[a] Debottlenecking anlysis revealed that emissions from this sources could potenitally increase as part of this project.

[b] Based on Annual Operating Reports for 1998 and 1999.

[c] Project was determined to not result in an increase in emissions of any pollutant.

[d] Denotes that PSD review was triggered for this pollutant; therefore any previous contemporaneous increases/decreases are wiped clean.

4.0 AMBIENT MONITORING ANALYSIS

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C., any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-1).

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (1987).

An exemption from the preconstruction ambient monitoring requirements is also available if certain criteria are met. If the predicted increase in ambient concentrations, due to the proposed modification, is less than specified *de minimis* concentrations, then the modification can be exempted from the preconstruction air monitoring requirements for that pollutant.

The PSD *de minimis* monitoring concentration for PM/PM_{10} is 10 $\mu g/m^3$ (24-hour average), and for F is 0.3 $\mu g/m^3$ (24-hour average). The predicted increase in PM/PM_{10} and F concentrations due to the proposed modification only are presented in Section 6.0. Since the predicted increases of both PM/PM_{10} and F impacts due to the proposed modification are greater than the *de minimis* monitoring concentration levels, a preconstruction air monitoring analysis must be conducted for both pollutants.

4.1 PM/PM_{10} AMBIENT MONITORING ANALYSIS

The PSD ambient monitoring guidelines allow the use of existing data to satisfy preconstruction review requirements. Presented in Table 4-1 is a summary of existing ambient PM/PM_{10} data for monitors located in the vicinity of Cargill's Riverview facility. Data are presented for the last 2 years of record (1997-1998). As shown, several PM/PM_{10} monitors were operational in the vicinity of Cargill's Riverview facility during this period. One of these stations, the Gardinier Park station, is located immediately adjacent to the Riverview facility.

The monitors show that ambient PM_{10} concentrations were well below the Ambient Air Quality Standards (AAQS) of 150 $\mu g/m^3$, maximum 24-hour average, and 50 $\mu g/m^3$, annual average. For purposes of an ambient PM_{10} background concentration for use in the modeling analysis, the annual average PM_{10} concentration of 23 $\mu g/m^3$ recorded at the monitor located at Eisenhower Jr. High School on Big Bend Road during 1999 was selected. This concentration was used for both the 24-hour and annual average background PM_{10} concentrations in the air quality impact analysis since this monitor appears to be more representative of background concentrations (i.e., not impacted as greatly by point sources). However, this monitor is likely impacted by several existing point sources, such as Cargill and Tampa Electric's Big Bend power station, which are already included explicitly in the modeling dispersion analysis. As a result, this background concentration is conservatively high.

4.2 FLUORIDE AMBIENT MONITORING ANALYSIS

There are no known existing fluoride monitors in the vicinity of Cargill's Riverview facility and no AAQS for fluorides has been promulgated. Typically, preconstruction monitoring has not been required for pollutants for which no AAQS exists. However, potential effects of fluoride impacts will be addressed in Section 7.0.

Table 4-1. Summary of PM_{10} Monitoring Data Collected Near Cargill's Riverview Facility

						Reported Concentration (mg/m^3)		
County	Station ID	Monitor Location	Distance to Cargill (km)	Year	Number of Observations	Highest 24-Hour	Second-Highest 24-Hour	Annual
Hillsborough	12-057-0066	Highway 41, Gibsonton	3.69	1998	57	86	63	32
				1999[a]	29	37	36	26
Hillsborough	12-057-0085	Eisenhower Jr. HS, Big Bend Road	8.03	1998	Monitor Did Not Exist in 1998			20
				1999[a]	30	35	35	23
Hillsborough	12-057-0083	Gardinier Park, US 41	0.81	1998	Monitor Did Not Exist in 1998			
				1999[a]	30	81	63	36

Footnotes:

[a] Includes data from the first two quarters of 1999 only.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

5.1 REQUIREMENTS

The 1977 Clean Air Act Amendments established requirements for the approval of preconstruction permit applications under the PSD program. One of these requirements is that the BACT be installed for applicable pollutants. BACT determinations must be made on a case-by-case basis considering technical, economic, energy, and environmental impacts for various BACT alternatives. To bring consistency to the BACT process, the EPA developed the so called "top-down" approach to BACT determinations. As mentioned previously, this approach has been challenged in court and a settlement agreement reached, which requires EPA to initiate formal rulemaking concerning the "top-down" approach. Nonetheless, in the absence of formal rules related to this approach, the "top-down" approach is followed in the Cargill BACT analysis.

The first step in a top-down BACT analysis is to determine, for each applicable pollutant, the most stringent control alternative available for a similar source or source category. If it can be shown that this level of control is not feasible on the basis of technical, economic, energy, or environmental impacts for the source in question, then the next most stringent level of control is identified and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any technical, economic, energy, or environmental consideration.

In the case of the proposed modification at Cargill, PM/PM_{10} and F are the only pollutants requiring BACT analysis.

5.2 BACT ANALYSIS FOR PM/PM_{10}

5.2.1 MATERIAL HANDLING SOURCES

The existing animal feed plant uses a combination of baghouses, cyclones, and wet scrubbers to control PM/PM_{10} emissions. Baghouses are used to control all raw material (DE and limestone) handling operations, as well as product loadout operations. Baghouse technology represents the state of the art in control of PM/PM_{10} emissions for material handling sources. Baghouses are highly efficient and allow collected PM to be recovered as product. Although wet PM controls (i.e., scrubbers) could be employed, an additional liquid waste stream would be generated.

The current PM/PM_{10} emission limit for the material handling sources at the existing AFI Plant is 0.012 gr/dscf is based on FDEP's BACT determination presented in Construction Permit No. 0570008-28-AC issued on June 8, 1999. Given this recent BACT determination by FDEP, that the material handling sources in the previous application are identical to the proposed material handling sources in this application, and that no other technology is capable of achieving lower PM/PM_{10} levels than the proposed baghouse technology, Cargill is proposing an emission limit of 0.012 gr/dscf as BACT for these sources.

5.2.2 PROCESS EQUIPMENT

PM emissions from the existing AFI granulation train (dryer, cooler, etc.) are controlled by a wet scrubber. The wet venturi scrubber control is an efficient control device and is the most appropriate technology for gas streams that contain a significant amount of moisture or particulates that are "sticky." The exhaust gas stream from the animal feed dryers has these characteristics. This gas stream is combined with the gas stream from the material handling system prior to being scrubbed.

Cargill proposes to use equivalent technology (a wet scrubber) to control PM emissions from the proposed AFI granulation train. FDEP determined this technology to be BACT in Construction Permit No. 0570008-028-AC issued on June 8, 1999 for modifications to the existing AFI Plant. The permitted PM/PM_{10} emission limits for the existing AFI granulation train are 8 lb/hr and 35.04 TPY. Again, given this recent BACT determination by FDEP for an identical source, Cargill is proposing equivalent control equipment, capable of attaining the same emission rates, as BACT for the granulation train and dryer.

5.3 BACT ANALYSIS FOR FLUORIDE

In June 1999, FDEP issued a final Air Construction Permit allowing Cargill to make the modifications necessary to increase production of the existing AFI plant from 580 to 770 tons of AFIs per day. For that permit, FDEP determined a fluoride emission rate of 0.5 lb/batch-hr to be

BACT. Although Cargill is modifying (under a separate permit application) the existing acid defluorination system, so that it can be operated as a continuous process and production of defluorinated acid will increase, the hourly fluoride emission rate is not expected to increase above 0.5 lb/batch-hr (equivalent to 1.0 lb/hr based on a maximum production of two batches or one double-batch per hour). Continuous operation may result in an increase in annual emissions from 4.3 to 4.4 TPY. Given, this recent BACT determination by FDEP and the increase in production afforded by the proposed modification, Cargill believes that a fluoride emission limit of 0.5 lb/batch-hr or 1 lb/hr still represents BACT.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 SIGNIFICANT IMPACT ANALYSIS

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For all criteria pollutants that will be emitted in excess of the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the emission and/or stack configuration changes due to the project alone will result in predicted impacts that are in excess of the EPA significant impact levels at any location beyond the plant property boundaries.

Generally, if the facility undergoing the modification also is within 150 kilometers of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. The maximum predicted PSD Class I impacts are compared to EPAs proposed significant impact levels for PSD Class I areas. The recommended levels have not been promulgated as rules.

If the project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is performed. Current FDEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. Based on the screening modeling analysis results, additional modeling refinements with a denser receptor grid are performed, as necessary, to obtain the maximum concentration. Modeling refinements are performed with a receptor grid spacing of 100 meters (m) or less.

6.2 AAQS/PSD MODELING ANALYSIS

For each pollutant for which a significant impact is predicted, a refined impact analysis is required. This analysis must consider other nearby sources and background concentrations and predict concentrations for comparison to ambient standards. In general, when 5 years of meteorological data are used in the analysis, the highest annual and the highest, second-highest (HSH) short-term concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with air quality standards and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two modeling phases is the density of the receptor grid spacing employed when predicting concentrations. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record.

If the original screening analysis indicates that the highest concentrations are occurring in a selected area(s) of the grid and, if the area's total coverage is too vast to directly apply a refined receptor grid, then an additional screening grid(s) will be used over that area. The additional screening grid(s) will employ a greater receptor density than the original screening grid, so refinements can be performed if necessary.

Refinements of the maximum predicted concentrations are typically performed for the receptors of the screening receptor grid at which the highest and/or HSH concentrations occurred over the 5-year period. Generally, if the maximum concentration from other years in the screening analysis are within 10 percent of the overall maximum concentration, then those other concentrations are refined as well. Typically, if the highest and HSH concentrations are in different locations, concentrations in both areas are refined.

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor to be refined. The angular spacing between radials is 2 degrees and the radial distance interval between receptors is 100 m. Annual modeling refinements employ an angular spacing between radials of 2 degrees and a distance interval from 100 to 300 m, depending on the concentration gradient in the vicinity of the screening receptor to be refined. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2 degree angular interval and centered on the screening receptor. The domain of the refinement grid will extend to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to ensure that a valid HSH concentration is obtained. A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids, is presented in the following sections.

6.2.3 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 99155) dispersion model (EPA, 1997) was used to evaluate the pollutant impacts due to the proposed project in areas within 50-km of the proposed facility. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can run in the rural or urban land use mode that affects stability dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent land use within a 3-km radius around a project is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land-use within a 3-km radius of the proposed plant site (see Figure 1-1), the rural dispersion coefficients were used in the modeling analysis.

The ISCST3 model was used to provide maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times.

For predicting maximum impacts at the Chassahowitzka NWA, a PSD Class I area, the California Puff (CALPUFF) model was used. CALPUFF, Version 5.2 (11/99), is a Lagrangian puff model that is the recommended by FDEP for predicting the pollutant impacts at receptor distances beyond 50 km. For this project, CALPUFF was used in a refined mode using the FDEP's CALMET-developed wind field. A more detailed discussion of CALPUFF and the CALMET wind field is provided in Appendix B.

6.2.4 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at the Tampa International Airport in Tampa, Florida, and at Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1987 through 1991. The NWS station at Tampa is located approximately 18 km to the northwest of the Cargill Riverview plant site. The surface meteorological data from Tampa are assumed to be representative of the project site because both the project site and the weather station are located in similar topographical areas and are situated in west central Florida to experience similar weather conditions, such as frontal passages.

Meteorological data used with the CALPUFF model consisted of a CALMET wind field, developed by the FDEP. A detailed description of the CALMET wind field is provided in Appendix B.

6.2.5 EMISSION INVENTORY

Significant Impact Analysis

The PM_{10} emission rate increases and the physical and operational stack parameters for the AFI Plant are summarized in Table 6-2. This table is based on emission and stack parameter data presented in Tables 2-2 and 2-4. All sources were modeled at locations relative to the No. 9 Sulfuric Acid Plant stack, which is the modeling origin that has been used in previous PSD applications for the Cargill Riverview facility.

AAQS Analysis

An inventory of future Cargill PM_{10} sources and their locations relative to the origin is provided in Table 6-3. Non-Cargill PM emitting facilities within 100 km of the Cargill facility were considered in the air modeling analysis are provided in Table 6-4. Non-Cargill PM emitting facility data were obtained from three sources. Most of the source data were obtained from a modeling analysis performed for a PSD application for US AgriChem, a source in Polk County. Additional PM_{10} source data were obtained from the modeling analysis performed for the FPL Manatee Plant site certification application (SCA). Lastly, FDEP provided updates to the source inventory for several of the facilities.

All facilities were evaluated using the North Carolina screening technique. Based on this technique, facilities with maximum annual emissions in tons per year less than the quantity 20 x (D-SIA), where D is the distance in km from the facility to Cargill-Riverview and SIA is the proposed project's significant impact distance for PM/PM_{10}, were eliminated from the modeling analysis. The facilities that were eliminated are shown in Table 6-4.

A summary of the PM_{10} detailed source data that was used for the AAQS analysis is presented in Appendix A, Tables A-1 and A-2. For PM_{10} emission sources only, sources were combined based on EPA's method for merging sources (EPA, 1992). In general, individual PM_{10} emission sources of 100 TPY or more within a facility were modeled separately (i.e., no merging was performed). Those PM_{10} emission sources of less than 100 TPY within a facility were all merged into one source based on the following approach. For each stack, the parameter M was computed:

$$M = \frac{h_s V T_s}{Q}$$

where:

- M = merged stack parameter which accounts for the relative influence of stack height, plume rise, and emission rate on concentrations
- h_s = stack height (m)
- V = $(\pi/4)\, d_a v_s$ = stack gas volumetric flow rate (m^3/s)
  - d_s = inside stack diameter (m)
  - v_s = stack gas exit velocity (m/s)
- T_s = stack gas exit temperature (K)
- Q = pollutant emission rate (g/s)

The stack with the lowest value of M was used as the representative stack. Then, the sum of the emissions from all applicable sources was assumed to be emitted from the representative stack.

PSD Class II Analysis

A summary of Cargill's PM_{10} sources for the PSD baseline year (1974) are provided in Table 6-5. These sources were used with Cargill's future sources from Table 6-3 to determine the PSD increment consumption with the proposed project.

Non-Cargill PSD sources were obtained from the US AgriChem PSD analysis. Additional PSD increment consuming sources in the vicinity of Cargill, obtained from FDEP, were included as well. These sources include the Hillsborough Co. Resource Recovery facility, the McKay Bay Refuse-to-Energy facility, and the Tropicana plant in Bradenton. The PSD source emission inventory is presented in Appendix A.

PSD Class I Analysis

Because the proposed AFI Plant expansion's maximum air impacts do not exceed the EPA proposed significant impact levels for PM_{10} at the Chassahowitzka NWA PSD Class I area, a PSD Class I increment consumption modeling assessment is not required. However, the proposed project's emissions of PM_{10} and F were evaluated at the Class I area to support the air quality related values (AQRV) analysis, and emissions of SO_2, PM_{10}, and NO_x were evaluated at the Class I area in support of the regional haze analysis. The increase in SO_2 and NO_x emissions are presented in Table 6-6. The air quality related values (AQRV) analysis is presented in Section 7.0.

6.2.6 RECEPTOR LOCATIONS

Site Vicinity

To determine the PM_{10} significant impact area for the proposed project, concentrations were predicted for 252 regular and 119 discrete polar grid receptors located in a radial grid centered on H_2SO_4 No. 9 stack. Receptors were located in "rings" with 36 receptors per ring, spaced at 10 intervals and at distances of the fenceline 2, 2.5, 3, 4, 5, 7, and 10 km from the H_2SO_4 No. 9 stack location. Discrete receptors included 36 receptors located on the plant property boundary at 10 degree intervals, plus 83 additional off-property receptors at distances of 0.5, 0.8, 1.1 and 1.5 km from the H_2SO_4 No. 9 stack to cover the area between the property boundary and the closest regular receptor grid distance (i.e., 2.0 km). The 36 property boundary receptors used for the screening analysis are presented in Table 6-7. All receptor locations are relative to the H_2SO_4 No. 9 stack location, an origin which has been used for this site since the 1993 PSD report for H_2SO_4 No. 9. Based on the results of the significant impact analysis, a maximum receptor distance of 1.7 km was used for the screening grid for the AAQS and PSD Class II analysis. SIA

Class I Area

Maximum PM_{10} and AQRV impacts for the Chassahowitzka NWA were predicted with the CALPUFF model at 13 discrete receptors located along the border of the PSD Class I area.

CALPUFF used for increment analysis

Impacts for the proposed AFI Plant modification only were compared to the proposed EPA PSD Class I significance levels. A listing of Class I receptors is provided in Table 6-8.

6.2.7 BACKGROUND CONCENTRATIONS

To estimate total air quality concentrations in the site vicinity, a background concentration must be added to the modeling results. The background concentration is considered to be the air quality concentration contributed by sources not included in the modeling evaluation.

Have to use 35 Can't use

The derivation of the background concentration for the modeling analysis was presented in Section 4.0. Based on this analysis, the PM_{10} background concentration was determined to be 23 $\mu g/m^3$ for the 24-hour and annual averaging periods. These background levels were added to model-predicted concentrations to estimate total air quality levels for comparison to AAQS.

6.2.8 BUILDING DOWNWASH EFFECTS

All significant building structures within Cargill's existing plant area were determined by a site plot plan. The plot plan of the proposed project was presented in Section 2.0. A total of 21 building structures were evaluated. All building structures were processed in the EPA Building Input Profile (BPIP, Version 95086) program to determine direction-specific building heights and projected widths for each 10-degree azimuth direction for each source that was included in the modeling analysis. A listing of dimensions for each structure is presented in Table 6-9.

6.3 MODEL RESULTS

6.3.1 SIGNIFICANT IMPACT ANALYSIS

A summary of the predicted maximum PM_{10} concentrations for the proposed AFI expansion only for the screening analysis is presented in Table 6-10. Based on these results, refinements were performed to determine the maximum impact due to the proposed project. The refined modeling demonstrates that the maximum 24-hour refined concentration of 15.8 $\mu g/m^3$ is above the significance level of 5 $\mu g/m^3$. The maximum annual PM_{10} impact of 1.56 $\mu g/m^3$ is above the significance level of 1.0 $\mu g/m^3$. It was further determined that the significant impact area for the proposed modification extends out approximately 2.0 km from the Cargill facility, based on the maximum 24-hour impacts.

6.4 AAQS ANALYSIS

A summary of the maximum annual and sixth-highest (H6H) 24-hour PM_{10} concentrations predicted for all sources for the screening analysis is presented in Table 6-11. Based on the screening analysis results, modeling refinements were performed. The results of the refined modeling analysis are presented in Table 6-12. The maximum predicted annual and H6H 24-hour PM_{10} concentrations are 48.9 and 110.2 $\mu g/m^3$, respectively, which includes an ambient non-modeled background concentration of 23 $\mu g/m^3$. The maximum PM_{10} concentrations are less than the AAQS of 50 and 150 $\mu g/m^3$, respectively.

6.5 PM_{10} PSD CLASS II ANALYSIS

A summary of the maximum PM_{10} PSD increment consumption predicted for all sources for the screening analysis is presented in Table 6-13. Based on the screening analysis results, modeling refinements were performed. The results of the refined modeling analysis are presented in Table 6-14. The maximum predicted PM_{10} annual and HSH 24-hour PSD increment consumption of 0.52 and 10.53 $\mu g/m^3$, respectively, are less than the allowable PSD Class II increments of 17 and 30 $\mu g/m^3$, respectively.

6.6 PSD CLASS I ANALYSIS

Maximum PM_{10} concentrations predicted for the proposed project alone at the Chassahowitzka NWA PSD Class I area are compared with the EPAs proposed PSD Class I significance levels in Table 6-15. The maximum annual and 24-hour impacts are 0.00074 and 0.0165 $\mu g/m^3$, respectively. As the proposed project's maximum impacts are below the Class I significant impact levels, a full PSD Class I incremental analysis is not required.

6.7 FLUORIDE IMPACTS

Maximum fluoride concentrations due to the proposed project in the site vicinity and the Chassahowitzka Class I area are presented in Tables 6-16 and 6-17 for the annual, 24-, 8-, 3-, and 1-hour averaging times. There are no AAQS or PSD increments for fluorides. However, fluoride impacts are required for the additional impact analysis and AQRV analysis for the Class I area, presented in Section 7.0.

At the site vicinity, the maximum predicted annual and 24-, 8-, 3-, and 1-hour F concentrations are 0.33, 2.33, 7.08, 8.93, and 13.6 $\mu g/m^3$, respectively. The maximum predicted annual and 24-, 8-, 3-, and 1-hour F concentrations at the Chassahowitzka NWA are 0.001, 0.011, 0.032, 0.058, and 0.173 $\mu g/m^3$, respectively.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 m/s to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.
Source: EPA, 1995.

Table 6-2. Stack and Vent Geometry and Operating Data

Source	Stack/Vent Release Height (ft)	(m)	Stack/Vent Diameter (ft)	(m)	Exhaust Gas Exit Temperature (Deg. F)	(K)	Exhaust Gas Velocity (ft/sec)	(m/s)	PM/PM_{10} Emission Rate (lb/hr)	(g/s)	Fluoride Emission Rate (lb/hr)	(g/s)
Existing AFI Plant												
Common Stack for Defluorination System and No. 1 Granulation Train	136	41.45	6.00	1.83	150	339	67.2	20.48	8.00	1.01	1.0	0.13
Proposed AFI Plant												
Stack for No. 2 Granulation Train	136	41.45	6.00	1.83	150	339	59.0	17.98	8.00	1.01	--	--
AFI Support Operations												
Diatomaceous Earth Hopper Baghouse Stack	64	19.51	1.50	0.46	90	305	5.7	1.74	0.23	0.029	--	--
Existing Limestone Silo Baghouse Stack	85	25.91	1.50	0.46	90	305	7.5	2.29	0.31	0.039	--	--
Proposed Limestone Silo Baghouse Stack	85	25.91	1.50	0.46	90	305	7.5	2.29	0.31	0.039	--	--
AFI Product Loadout Baghouse Stack	20	6.10	3.00	0.91	90	305	0.033[a]	0.01[a]	1.88	0.24	--	--

Footnote:
[a] Exit velocity of 0.01 m/s was used to simulate horizontal discharge.

Table 6-3. Summary of Stack and Vent Geometry and Maximum PM and PM_{10} Emission Rates for Existing Cargill - Riverview Sources*

AIRS		PM Emissions		PM_{10} Emissions		Stack/Vent Release Height		Stack/Vent Diameter		Gas Flow Rate	Gas Exit Temperature		Velocity		Discharge Direction	Location [c]			
																X Coordinate		Y Coordinate	
Number	Source	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(ft)	(m)	(ft)	(m)	(acfm)	(F)	(K)	(ft/sec)	(m/sec)	(Vert./Horiz.)	(ft)	(m)	(ft)	(m)
	No. 7 Rock Mill Dust Collector	2.10	0.26	2.10	0.26	91	27.74	3.0	0.91	20,000	165	347	47.20	14.37	V	-1636	-499	487	148
22,23,24	No. 3 and No.4 MAP Plants and South Cooler	22.00	2.77	16.80	2.12	133	40.54	7.0	2.13	165,000	142	334	71.46	21.78	V	-1795	-547	-157	-48
55	No. 5 DAP Plant	12.80	1.61	12.80	1.61	133	40.54	7.0	2.13	121,732	110	316	52.72	16.07	V	-1711	-521	-133	-40
7	GTSP/DAP Manufacturing Plant	21.60	2.72	21.60	2.72	126	38.40	8.0	2.44	140,400	125	325	46.55	14.19	V	-1647	-502	27	8
70,71	Two GTSP Storage Buildings	0.00	0.00	0.00	0.00	NA	NA	NA	NA	NA	77	298	NA	NA	--	--	--	--	--
72	GTSP Truck Loading Station	0.53	0.07	0.53	0.07	38	11.58	2.7	0.81	2,200	77	298	6.55	2.00	H[a]	-2355	-718	27	8
8	GTSP Ground Rock Handling	0.95	0.12	0.95	0.12	87	26.52	1.2	0.37	4,400	138	332	64.84	19.76	H[a]	-1775	-541	67	21
	Material Handling Conveyor																		
51	West Baghouse	1.16	0.15	1.16	0.15	30	9.14	3.5	1.07	33,000	80	300	57.17	17.42	V	-879	-268	-1373	-418
52	South Baghouse	1.16	0.15	1.16	0.15	40	12.19	1.5	0.46	4,500	80	300	42.44	12.94	H[a]	-964	-294	-1601	-488
53	Tower East Baghouse	3.10	0.39	3.10	0.39	50	15.24	2.5	0.76	12,000	80	300	40.74	12.42	H[a]	-803	-245	-1425	-434
58	Building No.6 Baghouse	0.62	0.08	0.62	0.08	30	9.14	1.2	0.35	3,630	80	300	57.24	17.45	H[a]	-1820	-555	-419	-128
59	Belt 7 to 8 Baghouse	0.62	0.08	0.62	0.08	45	13.72	1.2	0.35	3,630	80	300	57.24	17.45	H[a]	-1820	-555	-522	-159
60	Belt 8 to 9 Baghouse	1.19	0.15	1.19	0.15	75	22.86	1.6	0.48	6,930	80	300	59.54	18.15	H[a]	-1188	-362	-1178	-359
	Phosphate Rock Grinding/Drying System																		
100	No. 5 Mill Dust Collector	2.59	0.33	2.59	0.33	91	27.74	2.5	0.76	19,000	165	347	64.50	19.66	V	-1636	-499	497	152
101	No. 9 Mill Dust Collector	2.59	0.33	2.59	0.33	91	27.74	2.5	0.76	19,000	165	347	64.50	19.66	V	-1610	-491	519	158
102	Ground Rock Silo Dust Collector	0.41	0.05	0.41	0.05	67	20.42	0.8	0.24	1,200	80	300	39.80	12.13	H[a]	-1640	-499	526	160
73	Phosphoric Acid Production Facility	0.00	0.00	0.00	0.00	110	33.53	4.8	1.47	57,000	100	311	51.85	15.80	--	--	--	--	--
43	Auxiliary Steam Boiler	13.00	1.64	6.50	0.82	20	6.10	4.5	1.37	39,300	420	489	41.18	12.55	V	35	11	-191	-58
6	No. 9 Sulfuric Acid Plant	0.00	0.00	0.00	0.00	150	45.72	9.0	2.74	158,000	170	350	41.39	12.62	V	0	0	0	0
5	No. 8 Sulfuric Acid Plant	0.00	0.00	0.00	0.00	150	45.72	8.0	2.44	153,700	150	339	50.96	15.53	V	255	78	-89	-27
4	No. 7 Sulfuric Acid Plant	0.00	0.00	0.00	0.00	150	45.72	7.5	2.29	109,924	152	340	41.47	12.64	V	-60	-18	-422	-129
	Sodium Silicofluoride/Sodium Fluoride Plant																		
41	Dryer Scrubber	1.00	0.13	1.00	0.13	40	12.19	1.7	0.51	5,400	120	322	41.09	12.52	V	-1272	-388	35	11
54	Material Handling Baghouse	0.69	0.09	0.69	0.09	30	9.14	1.3	0.41	4,000	90	305	47.99	14.63	V	-1350	-412	60	18
[b]	Molten Sulfur Handling																		
	Pits/Truck Loading	0.44	0.06	0.44	0.06	8	2.44	0.3	0.10	135.00	240	389	26.31	8.02	V	78	24	-238	-73
	Tanks	2.60	0.33	2.60	0.33	24	7.32	0.8	0.25	445	240	389	13.71	4.18	V	-586	-179	-362	-110

Footnotes:

[a] For modeling purposes, horizontal discharges were modeled with a velocity of 0.01 m/s.

[b] Relative to H2SO4 Plant No. 9 stack location.

[c] AIRS Nos. 063, 064, 065, 066, 067, 068, 069, 074.

* Does not include AFI Sources (refer to Table 6-2).

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

362.9 3082.5

Facility Name/Location	Facility Location UTMs E (km)	Facility Location UTMs N (km)	Relative to Cargill[a] X(m)	Relative to Cargill[a] Y(m)	Distance (km)	Q Emissions Threshold ((Dist. - SIA[b]) X 20)	PM Emissions (TPY)	Include in Modeling?
Dravo Lime Co.	362.9	3084.7	0	2,200	2.2	4	48	YES
Bay Concrete	365.0	3084.0	2,100	1,500	2.6	12	3	NO
Rinker Materials Corp	364.9	3084.4	2,000	1,900	2.8	15	8	NO
Graves Enterprises Riverview	363.1	3085.3	200	2,800	2.8	16	350	YES
Reed Minerals Division	362.2	3085.5	-700	3,000	3.1	22	70	YES
Florida Rock Industry	365.8	3085.0	2,900	2,500	3.8	37	21	NO
Sani-Med Inc.	359.8	3079.9	-3,100	-2,600	4.0	41	16	NO
Comco of America	361.4	3086.9	-1,500	4,400	4.6	53	9	NO
Lehigh Portland Cement Co	361.3	3086.9	-1,600	4,400	4.7	54	7	NO
GAF Building Materials Corp	362.2	3087.2	-700	4,700	4.8	55	57	YES
Marathon Petroleum Company	362.2	3087.2	-700	4,700	4.8	55	13	NO
Lehigh Portland Cement Co Port Sutton	360.7	3086.8	-2,200	4,300	4.8	57	18	NO
Pakhoed Dry Bulk Terminals	360.8	3087.3	-2,100	4,800	5.2	65	483	YES
IMC Port Sutton Terminal	360.1	3087.5	-2,800	5,000	5.7	75	442	YES
TECO Gannon	360.0	3087.5	-2,900	5,000	5.8	76	5,857	YES
Holman Inc.	359.3	3087.1	-3,600	4,600	5.8	77	54	NO
GNB Inc. (PAC CHL)	361.8	3088.3	-1,100	5,800	5.9	78	25	NO
Agrico Chemical Co	362.1	3076.1	-800	-6,400	6.4	89	195	YES
Nitram	362.5	3089.0	-400	6,500	6.5	90	218	YES
CSX Transportation Inc.	361.0	3089.0	-1,900	6,500	6.8	95	404	YES
Eastern Association Terminal	360.2	3088.9	-2,700	6,400	6.9	99	534	YES
City of Tampa Dept.	364.0	3089.5	1,100	7,000	7.1	102	48	NO
Florida Crushed Stone	358.9	3088.4	-4,000	5,900	7.1	103	20	NO
Commercial Metals Inc.	358.5	3088.3	-4,400	5,800	7.3	106	108	YES
Unocal Chemical Division	358.4	3088.4	-4,500	5,900	7.4	108	15	NO
TECO Big Bend	361.9	3075.0	-1,000	-7,500	7.6	111	7,897	YES
Amcon Concrete	364.0	3075.0	1,100	-7,500	7.6	112	39	NO
Tampa Bay Stevedores Inc	358.3	3088.6	-4,600	6,100	7.6	113	24	NO
MacDill AFB	355.0	3080.6	-7,900	-1,900	8.1	123	2	NO
Union Oil Company of California	358.0	3089.1	-4,900	6,600	8.2	124	14	NO
Central Phosphates Inc.	359.1	3089.8	-3,800	7,300	8.2	125	26	NO
Amcon Concrete	358.4	3090.2	-4,500	7,700	8.9	138	3	NO
Sulfur Terminals Co	358.0	3090.0	-4,900	7,500	9.0	139	9	NO
International Salt Company	358.2	3090.2	-4,700	7,700	9.0	140	21	NO
Tampa Armature Works	365.6	3091.7	2,700	9,200	9.6	152	13	NO
LaFarge Corp	357.7	3090.8	-5,200	8,300	9.8	156	1,221	YES
TECO - Hooker's Point	358.0	3091.0	-4,900	8,500	9.8	156	1,231	YES
Tampa City McKay Bay Refuse-to-Energy	360.0	3091.9	-2,900	9,400	9.8	157	344	YES
Crown Door Company	362.1	3092.5	-800	10,000	10.0	161	13	NO
Tampa Sand & Material	360.1	3092.2	-2,800	9,700	10.1	162	17	NO
Eastern Electric Apparatus Repair Co.	366.6	3092.0	3,700	9,500	10.2	164	21	NO

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

Facility Name/Location	Facility Location UTMs E (km)	Facility Location UTMs N (km)	Relative to Cargill[a] X(m)	Relative to Cargill[a] Y(m)	Distance (km)	Q Emissions Threshold ((Dist. - SIA[b]) X 20)	PM Emissions (TPY)	Include in Modeling?
General Chemical Corp	359.9	3092.3	-3,000	9,800	10.2	165	30	NO
Manna Pro Corporation	364.7	3092.6	1,800	10,100	10.3	165	16	NO
Southport Stevedore	358.5	3091.8	-4,400	9,300	10.3	166	30	NO
Gaylord Container Corp	366.3	3092.3	3,400	9,800	10.4	167	108	NO
Cargill Terminal	358.1	3091.7	-4,800	9,200	10.4	168	22	NO
Amcon Products	364.6	3092.8	1,700	10,300	10.4	169	32	NO
Florida Steel Corp	364.6	3092.8	1,700	10,300	10.4	169	144	NO
David J. Joseph Co.	364.0	3092.9	1,100	10,400	10.5	169	123	NO
Garrison Stevedoring	357.8	3091.7	-5,100	9,200	10.5	170	182	YES
R & L Metals	363.6	3093.0	700	10,500	10.5	170	5	NO
Chevron Asphalt Inc.	358.2	3092.0	-4,700	9,500	10.6	172	4	NO
Amoco Oil	357.8	3092.0	-5,100	9,500	10.8	176	9	NO
Glen-Mar Concrete Products	363.2	3093.3	300	10,800	10.8	176	22	NO
Kimmins Recycling Corporation	360.4	3093.1	-2,500	10,600	10.9	178	66	NO
Garder Asphalt Corp	360.8	3093.3	-2,100	10,800	11.0	180	5	NO
H & S Properties	360.3	3093.2	-2,600	10,700	11.0	180	9	NO
Florida Mega-Mix	364.5	3093.4	1,600	10,900	11.0	180	22	NO
Ewell Industries	367.1	3092.7	4,200	10,200	11.0	181	19	NO
Hydro Conduit Corp	363.8	3093.5	900	11,000	11.0	181	2	NO
Florida Rock Industries	363.9	3093.5	1,000	11,000	11.0	181	8	NO
Gulf Coast Lead Company	364.0	3093.5	1,100	11,000	11.1	181	17	NO
Ewell Industries	367.0	3092.8	4,100	10,300	11.1	182	13	NO
Scrapall Inc.	359.4	3093.1	-3,500	10,600	11.2	183	31	NO
Hillsborough Co. Animal Control Center	364.9	3093.5	2,000	11,000	11.2	184	16	NO
Gulf Coast Metals	364.7	3093.6	1,800	11,100	11.2	185	13	NO
Stauffer Chemical Company	365.3	3093.6	2,400	11,100	11.4	187	9	NO
Hillsborough Co Resource Recovery	368.2	3092.7	5,300	10,200	11.5	190	172	NO
Bay Concrete	365.1	3093.8	2,200	11,300	11.5	190	37	NO
Hillsborough Animal Control Center	368.5	3092.7	5,600	10,200	11.6	193	11	NO
Florida Petroleum	360.9	3094.0	-2,000	11,500	11.7	193	16	NO
Florida Precast Concrete	360.4	3094.2	-2,500	11,700	12.0	199	132	NO
LaFarge Corp.	356.3	3092.8	-6,600	10,300	12.2	205	51	NO
The Gibson-Homans	365.5	3094.8	2,600	12,300	12.6	211	21	NO
Tampa Bay Crematory	372.9	3090.7	10,000	8,200	12.9	219	10	NO
Southeastern Wire	368.3	3094.5	5,400	12,000	13.2	223	21	NO
Cast Metals Corp	368.8	3094.6	5,900	12,100	13.5	229	8	NO
Cargill/Nutrena Feed Division	360.8	3095.8	-2,100	13,300	13.5	229	21	NO
Kearney Development Company	368.7	3094.8	5,800	12,300	13.6	232	21	NO
Sulfuric Acid Trading Company	349.0	3081.5	-13,900	-1,000	13.9	239	1,204	YES
Griffin Industries	364.1	3096.4	1,200	13,900	14.0	239	4	NO
Couch Construction Company	362.1	3096.7	-800	14,200	14.2	244	26	NO

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

Facility Name/Location	Facility Location UTMs		Relative to Cargill[a]		Distance	Q Emissions Threshold	PM Emissions	Include in
	E (km)	N (km)	X(m)	Y(m)	(km)	((Dist. - SIA[b]) X 20)	(TPY)	Modeling?
Tarmac Florida Hialeah	362.8	3097.0	-100	14,500	14.5	250	36	NO
R V Shulnburg	362.5	3097.3	-400	14,800	14.8	256	6	NO
Reynolds Aluminum Recycling	362.7	3097.5	-200	15,000	15.0	260	14	NO
Florida Rock Industry	362.3	3097.5	-600	15,000	15.0	260	20	NO
Humana Hospital	373.3	3093.4	10,400	10,900	15.1	261	4	NO
Southern Mill Creek Products Inc.	362.8	3097.7	-100	15,200	15.2	264	6	NO
Chapman Contracting	356.8	3068.4	-6,100	-14,100	15.4	267	4	NO
Verlite Co	363.0	3098.1	100	15,600	15.6	272	64	NO
Gold Bond Building Products	347.3	3082.7	-15,600	200	15.6	272	117	NO
Rinker Materials Corporation	363.2	3098.1	300	15,600	15.6	272	22	NO
W R Bonasal Co	363.6	3098.1	700	15,600	15.6	272	19	NO
Couch Construction Co	364.3	3098.1	1,400	15,600	15.7	273	45	NO
Weyerhaeuser Co	362.8	3098.3	-100	15,800	15.8	276	25	NO
Tarmac Florida	362.8	3098.4	-100	15,900	15.9	278	23	NO
Royster Co	362.6	3098.4	-300	15,900	15.9	278	18	NO
Southern Prestressed	363.2	3098.4	300	15,900	15.9	278	2	NO
Westcon	375.3	3092.8	12,400	10,300	16.1	282	21	NO
Florida M & M	362.2	3066.2	-700	-16,300	16.3	286	21	NO
North American Salt Co	362.4	3065.7	-500	-16,800	16.8	296	5	NO
Driggers Concrete	360.0	3065.9	-2,900	-16,600	16.9	297	21	NO
South Bay Hospital	365.3	3065.1	2,400	-17,400	17.6	311	18	NO
Zipperer S. Agape Mortuary Services	363.0	3064.7	100	-17,800	17.8	316	21	NO
Cast-Crete Corp of Florida	371.9	3099.2	9,000	16,700	19.0	339	11	NO
Johnson Controls Battery Group, Inc.	359.9	3102.5	-3,000	20,000	20.2	364	156	NO
W R Grace & Co	380.2	3093.0	17,300	10,500	20.2	365	11	NO
Leisey Shell Corp	352.7	3064.8	-10,200	-17,700	20.4	369	20	NO
FPC-Bartow	342.4	3082.6	-20,500	100	20.5	370	9,244	YES
Treasure Isle Inc.	378.0	3096.9	15,100	14,400	20.9	377	11	NO
Speedling, Inc.	354.1	3062.2	-8,800	-20,300	22.1	403	19	NO
Delta Asphalt	372.1	3105.4	9,200	22,900	24.7	454	72	NO
Universal Waste & Transit	384.9	3093.7	22,000	11,200	24.7	454	7	NO
Florida Brick & Clay Co	384.9	3097.1	22,000	14,600	26.4	488	26	NO
FPC - Bayboro	338.8	3071.3	-24,100	-11,200	26.6	492	2,526	YES
Alumax Extrusions	385.6	3097.0	22,700	14,500	26.9	499	172	NO
R C Martin Concrete Products	388.6	3092.1	25,700	9,600	27.4	509	28	NO
Pinellas Co. Resource Recovery Facility	335.2	3084.1	-27,700	1,600	27.7	515	329	NO
Metals & Materials Recycling	386.5	3097.4	23,600	14,900	27.9	518	1	NO
C-Cure of Florida	386.0	3098.7	23,100	16,200	28.2	524	21	NO
Florida Power & Light MANATEE	367.2	3054.1	4,300	-28,400	28.7	534	40,179	YES
~~Manatee Scrap Processing~~	366.9	3053.8	4,000	-28,700	29.0	540	108	NO
Golden Triangle Asphalt	333.8	3086.1	-29,100	3,600	29.3	546	1,274	YES

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

Facility Name/Location	Facility Location UTMs E (km)	Facility Location UTMs N (km)	Relative to Cargill[a] X(m)	Relative to Cargill[a] Y(m)	Distance (km)	Q Emissions Threshold ((Dist. - SIA[b]) X 20)	PM Emissions (TPY)	Include in Modeling?
IMC - Ft. Lonesome	389.6	3067.9	26,700	-14,600	30.4	569	678	NO
Haynes Funeral Home Plant City	388.1	3100.3	25,200	17,800	30.9	577	6	NO
National Portland Cement Co. of FL	346.4	3056.4	-16,500	-26,100	30.9	578	186	NO
Southern Culvert	391.5	3095.0	28,600	12,500	31.2	584	17	NO
Stilwell Foods of Florida	389.8	3098.9	26,900	16,400	31.5	590	2	NO
Consolidated Minerals Inc. Plant City	393.8	3096.3	30,900	13,800	33.8	637	756	YES
Asgrow Florida Company	388.6	3104.6	25,700	22,100	33.9	638	5	NO
IMC Fertilizer - New Wales	396.7	3079.4	33,800	-3,100	33.9	639	1,430	YES
Rinker Materials Corp.	392.2	3100.0	29,300	17,500	34.1	643	14	NO
Mobil Mining & Minerals Big Four Mine	394.7	3069.6	31,800	-12,900	34.3	646	68	NO
Palm Harbor Homes	391.8	3101.5	28,900	19,000	34.6	652	22	NO
Mobil Mining & Minerals SR 676	398.5	3085.1	35,600	2,600	35.7	674	990	YES
Conserv Inc.	398.7	3084.2	35,800	1,700	35.8	677	1,598	YES
IMC - Kingsford	398.2	3075.7	35,300	-6,800	35.9	679	422	NO
Hull Materials, Inc.	399.4	3070.6	36,500	-11,900	38.4	728	13	NO
Resource Recovery of America Inc	401.8	3085.8	38,900	3,300	39.0	741	10	NO
Purina Mills	402.0	3087.0	39,100	4,500	39.4	747	88	NO
IMC Fertilizer Rainbow Division	402.3	3085.8	39,400	3,300	39.5	751	88	NO
IMC Fertilizer Prairie	402.9	3087.0	40,000	4,500	40.3	765	288	NO
Erly Juice Inc	399.0	3101.8	36,100	19,300	40.9	779	117	NO
Agrico Chemical Co. - Pierce	403.7	3079.0	40,800	-3,500	40.9	779	840	YES
CF Industries	388.0	3116.0	25,100	33,500	41.9	797	84	NO
TECO Polk	402.5	3067.4	39,600	-15,100	42.4	808	438	NO
C & M Products Co	405.5	3079.1	42,600	-3,400	42.7	815	162	NO
C&M Products	405.5	3079.1	42,600	-3,400	42.7	815	37	NO
Mobil-Electrophos Division	405.6	3079.4	42,700	-3,100	42.8	816	544	NO
Agrico Chemical	400.0	3061.0	37,100	-21,500	42.9	818	84	NO
Union Camp Corp	402.0	3102.0	39,100	19,500	43.7	834	47	NO
Estech-Duette Phosphate Mine	388.9	3047.2	26,000	-35,300	43.8	837	750	NO
Imperial Phosphate Ltd.	404.8	3069.5	41,900	-13,000	43.9	837	162	NO
Royster Company	406.8	3085.1	43,900	2,600	44.0	840	1,393	YES
Tropicana Products, Inc.	346.8	3040.9	-16,100	-41,600	44.6	852	969	YES
Ewell Ind S Florida Ave	406.3	3092.9	43,400	10,400	44.6	853	348	NO
Ewell Ind Bonnie Mine Rd	407.7	3080.9	44,800	-1,600	44.8	857	96	NO
Kaiser Aluminum	408.3	3085.5	45,400	3,000	45.5	870	106	NO
C F Industries Bonnie Mine Rd	408.4	3082.4	45,500	-100	45.5	870	1,319	YES
CF Industries - Bartow	408.4	3082.4	45,500	-100	45.5	870	790	NO
IMC/Uranium Recovery C F Industries	408.4	3082.8	45,500	300	45.5	870	1,071	YES
Agrico Chemical Co. - South Pierce	407.5	3071.5	44,600	-11,000	45.9	879	1,096	YES
Farmland Industries Green Bay Plant	409.5	3080.1	46,600	-2,400	46.7	893	1,486	YES
Florida Tile	405.4	3102.4	42,500	19,900	46.9	899	309	NO

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

Facility Name/Location	Facility Location UTMs		Relative to Cargill[a]		Distance	Q Emissions Threshold	PM Emissions	Include in
	E (km)	N (km)	X(m)	Y(m)	(km)	((Dist. - SIA[b]) X 20)	(TPY)	Modeling?
Lakeland City Electric & Utilities	404.0	3105.3	41,100	22,800	47.0	900	8	NO
Cargill Fertilizer - Bartow	409.8	3086.7	46,900	4,200	47.1	902	2,760	YES
Surfacing Products of America	347.5	3037.6	-15,400	-44,900	47.5	909	153	NO
Hardee Power Station Ft. Green Springs	404.8	3057.4	41,900	-25,100	48.8	937	1,251	YES
Aristrech Chemical Corp	411.7	3085.9	48,800	3,400	48.9	938	7	NO
Estech	411.5	3074.2	48,600	-8,300	49.3	946	311	NO
Pavex Corp	413.0	3086.2	50,100	3,700	50.2	965	44	NO
US Agri-Chemicals Hwy 60	413.2	3086.3	50,300	3,800	50.4	969	443	NO
Schering Berlin Polymers	410.7	3098.9	47,800	16,400	50.5	971	30	NO
Lakeland City Power Larsen Power Station	409.3	3102.8	46,400	20,300	50.6	973	107	NO
FMC Corp/Citrus Machinery Division	409.6	3102.6	46,700	20,100	50.8	977	9	NO
Bio-Medical Service Corp of GA	413.9	3081.3	51,000	-1,200	51.0	980	46	NO
Lykes Pasco Packing	412.4	3096.5	49,500	14,000	51.4	989	48	NO
Eger Concrete Eastside Dr N	410.5	3102.5	47,600	20,000	51.6	993	11	NO
Allsun Products	413.5	3093.8	50,600	11,300	51.8	997	318	NO
IMC Noralyn Mine	414.7	3080.3	51,800	-2,200	51.8	997	NA	NO
Central Florida Hot-Mix	412.5	3097.7	49,600	15,200	51.9	998	19	NO
Lakeland City Power McIntosh Power Station	409.2	3106.1	46,300	23,600	52.0	999	NA	NO
Rinker Cencon Corp	412.4	3099.0	49,500	16,500	52.2	1,004	159	NO
Florida Institute of Phosphate Research	415.0	3085.8	52,100	3,300	52.2	1,004	4	NO
Quikrete of Florida	412.8	3099.0	49,900	16,500	52.6	1,011	253	NO
Triangle Pacific Corp	413.3	3098.8	50,400	16,300	53.0	1,019	6	NO
Pavers Incorporated	414.0	3098.2	51,100	15,700	53.5	1,029	479	NO
Florida Rock Industries	416.6	3085.8	53,700	3,300	53.8	1,036	57	NO
US Agri-Chemicals Hwy 630	416.0	3069.0	53,100	-13,500	54.8	1,056	NA	NO
Monier Roof Tile	414.0	3102.5	51,100	20,000	54.9	1,057	44	NO
Kaplan Industries	418.3	3079.3	55,400	-3,200	55.5	1,070	53	NO
Ridge Pallets Inc.	418.6	3084.1	55,700	1,600	55.7	1,074	165	NO
Gardinier	415.3	3063.3	52,400	-19,200	55.8	1,076	175	NO
Orange Co of Florida	418.7	3083.6	55,800	1,100	55.8	1,076	119	NO
Ridge Pallets Inc	419.1	3078.1	56,200	-4,400	56.4	1,087	96	NO
Ridge Cogeneration	416.7	3100.4	53,800	17,900	56.7	1,094	414	NO
APAC-Florida, Inc.	347.1	3027.3	-15,800	-55,200	57.4	1,108	163	NO
Pembroke Materials Inc	420.4	3075.2	57,500	-7,300	58.0	1,119	12	NO
ER Carpenter	397.0	3131.5	34,100	49,000	59.7	1,154	55	NO
Sun Pac Foods	422.7	3092.6	59,800	10,100	60.6	1,173	62	NO
Auburndale Cogeneration	420.8	3103.3	57,900	20,800	61.5	1,190	161	NO
Florida Mining & Materials Alabama Lane	420.8	3103.4	57,900	20,900	61.6	1,191	40	NO
Florida Distillers Company	421.4	3102.9	58,500	20,400	62.0	1,199	2	NO
Coca Cola	421.6	3103.7	58,700	21,200	62.4	1,208	387	NO
Laidlaw Environmental Services Inc	424.7	3091.9	61,800	9,400	62.5	1,210	9	NO

Table 6-4. Facility Screening Analysis for PM Emitting Facilities in the Vicinity of Cargill - Riverview

Facility Name/Location	Facility Location UTMs E (km)	Facility Location UTMs N (km)	Relative to Cargill[a] X(m)	Relative to Cargill[a] Y(m)	Distance (km)	Q Emissions Threshold ((Dist. - SIA[b]) X 20)	PM Emissions (TPY)	Include in Modeling?
Adams Packing Association	421.7	3104.2	58,800	21,700	62.7	1,214	144	NO
International Paper Company	421.7	3104.3	58,800	21,800	62.7	1,214	8	NO
Ennis Drum Service Inc	422.5	3102.5	59,600	20,000	62.9	1,217	4	NO
Florida Fence Post	409.2	3039.9	46,300	-42,600	62.9	1,218	6	NO
Macasphalt	423.1	3101.5	60,200	19,000	63.1	1,223	70	NO
Alcoa	416.8	3116.0	53,900	33,500	63.5	1,229	446	NO
Owens-Brockway Glass Container	423.4	3102.3	60,500	19,800	63.7	1,233	189	NO
Packaging Corp of America	423.4	3102.8	60,500	20,300	63.8	1,236	38	NO
The Florida Brewery	422.8	3104.7	59,900	22,200	63.9	1,238	121	NO
Florida Privitization Inc	418.3	3048.0	55,400	-34,500	65.3	1,265	281	NO
Wachula City Power	418.4	3047.0	55,500	-35,500	65.9	1,278	21	NO
Ero Industries	427.5	3095.6	64,600	13,100	65.9	1,278	33	NO
High Performance Finishers	428.0	3096.0	65,100	13,500	66.5	1,290	12	NO
Bordo Citrus Product Inc	427.8	3097.5	64,900	15,000	66.6	1,292	13	NO
Brannen Prestress Co.	353.7	3016.5	-9,200	-66,000	66.6	1,293	100	NO
Brannen Prestress Co.	353.7	3016.5	-9,200	-66,000	66.6	1,293	100	NO
Vigoro Industries Inc.	427.9	3097.4	65,000	14,900	66.7	1,294	136	NO
Hardee Memorial Hospital	419.2	3046.7	56,300	-35,800	66.7	1,294	1	NO
John Carlos Florida	426.2	3104.1	63,300	21,600	66.9	1,298	29	NO
Ott-Laughlin	427.8	3099.7	64,900	17,200	67.1	1,303	1	NO
Humana Hospital	429.9	3076.7	67,000	-5,800	67.3	1,305	1	NO
Eger Concrete Lake Ida & 5th St	428.1	3102.0	65,200	19,500	68.1	1,321	49	NO
Florida Rock Industries	428.0	3105.2	65,100	22,700	68.9	1,339	55	NO
The Mancini Packing Company	421.4	3040.8	58,500	-41,700	71.8	1,397	1	NO
American Orange Corp	429.8	3047.3	66,900	-35,200	75.6	1,472	181	NO
Citrus World	441.0	3087.3	78,100	4,800	78.2	1,525	601	NO
Earl Massey	440.4	3103.4	77,500	20,900	80.3	1,565	39	NO
Holly Hill	441.0	3115.4	78,100	32,900	84.7	1,655	145	NO
Citrus Hill Mfg	447.9	3068.3	85,000	-14,200	86.2	1,684	66	NO
Standard Sand & Silica	441.5	3118.2	78,600	35,700	86.3	1,687	286	NO
Alcoma Packing - Lake Wales	451.6	3085.5	88,700	3,000	88.8	1,735	263	NO
FPC Intercession City 7EA Turbine (#180)	446.3	3126.0	83,400	43,500	94.1	1,841	108	NO

Footnote:

[a] The Cargill Riverview facility is located at UTM Coordinates: East 362.9 km

3082.5 km

Table 6-5. Summary of Stack and Vent Geometry and Baseline (1974) Particulate Matter Emission Rates for Cargill - Riverview

Source	Particulate Matter Emissions		Stack/Vent Release Height		Stack/Vent Diameter		Gas Flow Rate		Moisture	Gas Exit Temperature			Velocity		Location[a]			
							Standard	Actual							X Coordinate		Y Coordinate	
	(lb/hr)	(g/sec)	(ft)	(m)	(ft)	(m)	(dscfm)	(acfm)	(% H20)	(C)	(F)	(K)	(ft/sec)	(m/sec)	(ft)	(m)	(ft)	(m)
Ammonia Plant	22.25	2.803	60	18.29	8.33	2.54	36,796	74,716	1	316	601	589	11.25	3.43	-2233	-681	-1028	-313
Auxiliary Steam Boiler	0.79	0.100	20	6.10	4.50	1.37	23,283	38,207	1	203	397	476	24.41	7.44	35	11	-191	-58
Sodium Silicofluoride/Sodium Fluoride Plant	2.43	0.307	28	8.53	2.50	0.76	2,337	2,594	5.3	35	95	308	7.95	2.42	-1272	-388	35	11
No. 2 and No. 3 Rock Silo Bag Filter	0.90	0.114	93	28.35	1.04	0.32	2,510	2,781	4.2	38	100	311	49.22	15.00	-1272	-388	35	11
Nos. 6, 7, and 8 Rock Mills	5.21	0.656	95	28.96	1.99	0.61	9,560	10,466	4.6	33	91	306	51.40	15.67	-1272	-388	35	11
No. 10 KVS Mill	3.67	0.462	87	26.52	1.60	0.49	6,870	8,154	7.7	48	118	321	57.25	17.45	-790	-241	664	202
No. 11 KVS Mill	3.00	0.378	70	21.34	1.60	0.49	6,075	7,364	8.5	52	126	325	50.63	15.43	-790	-241	664	202
No. 12 KVS Mill	1.33	0.168	71	21.64	1.60	0.49	5,480	6,833	9.4	58	136	331	45.67	13.92	-790	-241	664	202
No. 2 Air Slide North Bag Filter	0.58	0.072	85	25.91	0.92	0.28	1,450	1,606	4.8	36	97	309	36.62	11.16	-996	-303	1138	347
No. 2 Air Slide South Bag Filter	0.28	0.035	96	29.26	0.86	0.26	2,147	2,489	6.1	46	115	319	61.70	18.80	-996	-303	1247	380
No. 3 Air Slide North Bag Filter	0.15	0.019	82	24.99	1.24	0.38	520	623	9.4	45	113	318	7.22	2.20	-996	-303	1138	347
No. 3 Air Slide Center Bag Filter	0.50	0.063	115	35.05	1.60	0.49	1,343	1,569	6.5	47	117	320	11.19	3.41	-996	-303	1138	347
No. 3 Air Slide South Bag Filter	0.80	0.101	96	29.26	1.64	0.50	990	1,117	3.2	47	117	320	7.86	2.39	-790	-241	664	202
No. 3 Air Slide Bin Bag Filter	0.91	0.114	108	32.92	1.24	0.38	1,350	1,558	4.5	50	122	323	18.75	5.72	-996	-303	1247	380
No. 2 Phosphoric Acid System	7.46	0.940	109	33.22	4.01	1.22	19,973	28,517	20.4	60	140	333	26.42	8.05	-996	-303	1138	347
No. 3 Phosphoric Acid System	5.08	0.640	93	28.35	4.01	1.22	11,915	14,733	11.4	48	118	321	15.76	4.80	-996	-303	1247	380
No. 1 Horizontal Filter Scrubber	6.21	0.782	59	17.98	4.75	1.45	34,970	37,913	4.3	31	88	304	32.93	10.04	-1250	-381	1092	333
No. 2 Horizontal Filter Scrubber	6.00	0.756	51	15.54	4.01	1.22	31,915	34,897	4.8	32	90	305	42.22	12.87	-1250	-381	1092	333
No. 2 Horizontal Filter Vacuum System	0.02	0.003	4.5	1.37	1.13	0.34	625	833	16.8	52	126	325	10.42	3.18	-1250	-381	1092	333
No. 3 Horizontal Filter Vacuum System	0.13	0.016	4.5	1.37	1.51	0.46	1,197	1,562	15.0	52	126	325	11.08	3.38	-1250	-381	1092	333
No. 7 Oil-Fired Concentrator	7.58	0.955	78	23.77	6.00	1.83	15,680	29,152	36.3	74	165	347	9.23	2.81	-1250	-381	1092	333
No. 8 Oil-Fired Concentrator	14.42	1.816	78	23.77	6.00	1.83	16,580	28,376	31.6	70	158	343	9.76	2.98	-1250	-381	1092	333
GTSP Bag Filter	0.35	0.044	88	26.82	1.29	0.39	1,475	1,782	3.95	67	153	340	18.91	5.76	-1775	-541	67	21
GTSP Plant	18.29	2.305	126	38.40	7.99	2.44	76,000	99,905	15.1	54	129	327	25.23	7.69	-1647	-502	27	8
No. 5 and No. 9 Mills Bag Filter	10.21	1.286	66	20.12	1.99	0.61	9,445	10,802	4.8	46	115	319	50.78	15.48	-1543	-470	482	147
No. 3 Triple Reactor Belt	6.21	0.782	65	19.81	4.01	1.22	32,170	33,949	3.3	26	79	299	42.55	12.97	-1250	-381	683	208
No. 4 Triple Reactor Belt	4.75	0.598	65	19.81	4.01	1.22	34,525	36,493	4.1	24	75	297	45.67	13.92	-1250	-381	683	208
No. 3 Continuous Triple Dryer	14.42	1.816	68	20.73	3.50	1.07	20,320	24,985	10.9	48	118	321	35.28	10.75	-1250	-381	683	208
No. 4 Continuous Triple Dryer	9.00	1.134	68	20.73	3.50	1.07	28,220	32,555	7.4	40	104	313	48.99	14.93	-1250	-381	683	208
Nos. 2 & 4 Sizing Units	4.09	0.516	74	22.56	4.01	1.22	20,165	21,187	3.2	25	77	298	26.67	8.13	-1250	-381	683	208
Normal Superphosphate	0.45	0.057	73	22.25	2.50	0.76	11,820	13,694	7.5	41	106	314	40.20	12.25	-1250	-381	683	208
No. 1 Ammonium Phosphate Plant	9.38	1.181	90	27.43	4.01	1.22	26,060	37,349	20.7	60	140	333	34.47	10.51	-1696	-517	264	80
No. 2 Ammonium Phosphate Plant	11.67	1.470	90	27.43	3.50	1.07	27,190	36,608	16.6	56	133	329	47.20	14.39	-1696	-517	264	80
No. 3 Ammonium Phosphate Plant	13.08	1.648	90	27.43	3.50	1.07	24,530	35,865	21.8	62	144	335	42.59	12.98	-1660	-506	346	105
No. 4 Ammonium Phosphate Plant	6.96	0.877	90	27.43	3.50	1.07	21,290	32,834	25.2	65	149	338	36.96	11.27	-1660	-506	346	105
North Ammonium Phosphate Cooler	47.00	5.922	54	16.46	4.34	1.32	40,400	48,418	4.6	62	144	335	45.50	13.87	-1696	-517	264	80
South Ammonium Phosphate Cooler	37.17	4.683	54	16.46	4.34	1.32	42,660	49,137	3.7	52	126	325	48.04	14.64	-1660	-506	346	105
Material Handling- West Baghouse	1.16	0.150	30	9.14	3.50	1.07	--	33,000	--	--	80	300	57.17	17.42	-879	-268	-1373	-418
Material Handling- South Baghouse	1.16	0.150	40	12.19	1.50	0.46	--	4,500	--	--	80	300	42.44	12.94	-964	-294	-1601	-488
Material Handling- Tower Baghouse	3.10	0.390	50	15.24	2.50	0.76	--	12,000	--	--	80	300	40.74	12.42	-803	-245	-1425	-434
Molten Sulfur Handling- Pits	0.44	0.060	8	2.44	0.30	0.10	--	135	--	--	240	389	26.31	8.02	78	24	-238	-73
Molten Sulfur Handling- Tanks	2.43	0.310	24	7.32	0.80	0.25	--	445	--	--	240	389	13.71	4.18	-586	-179	-362	-110

[a] Relative to H2SO4 Plant No. 9 stack location.

Table 6-6. Summary of SO_2 and NO_x Emission Rates for the Proposed No. 2 AFI Granulation Train

Source	SO_2 Emissions[a]		NO_x Emissions[a]	
	(lb/hr)	(g/s)	(lb/hr)	(g/s)
Proposed No. 2 AFI Granulation Train	25.36	3.20	7.14	0.90

Footnotes:

[a] Emission rate calculations for the proposed No. 2 AFI Granulation Train are presented in Table 2-3.

Table 6-7. Cargill Property Boundary Receptors Used in the Modeling Analysis

Direction (deg)	Distance (m)	Direction (deg)	Distance (m)
10	965	190	362
20	805	200	390
30	675	210	796
40	597	220	971
50	550	230	1,296
60	525	240	1,512
70	517	250	1,494
80	524	260	1,019
90	550	270	1,064
100	596	280	1,151
110	414	290	1,296
120	338	300	1,421
130	294	310	1,623
140	285	320	1,962
150	293	330	2,000
160	311	340	1,843
170	343	350	1,759
180	347	360	1,245

Note: Distances are relative to the H_2SO_4 No. 9 stack location.
deg = degree.
m = meter.

Table 6-8. Chassahowitzka Wilderness Area Receptors Used in the Modeling Analysis

Class I Receptor	UTM Coordinates	
	East (km)	North (km)
1	340.3	3,165.7
2	340.3	3,167.7
3	340.3	3,169.8
4	340.7	3,171.9
5	342.0	3,174.0
6	343.0	3,176.2
7	343.7	3,178.3
8	342.4	3,180.6
9	341.1	3,183.4
10	339.0	3,183.4
11	336.5	3,183.4
12	334.0	3,183.4
13	331.5	3,183.4

Table 6-9. Building Dimensions Used in the Modeling Analysis

Structure	Height		Length		Width	
	(ft)	(m)	(ft)	(m)	(ft)	(m)
Phosphoric Acid Plant						
South Building	100	30.48	73	22.25	33	10.06
North Building	100	30.48	76	23.16	46	14.02
Dry Rock Processing Plant						
No 5/9 Mills Building	35	10.67	40	12.19	30	9.14
No. 7 Rock Mill Building	35	10.67	26	7.92	30	9.14
Ground Rock Silo	63	19.20	32	9.75	32	9.75
No. 5/9 Dust Collectors	84	25.60	9	2.74	9	2.74
Animal Feed Ingredient Plant						
AFI Building	158	48.16	120	36.58	70	21.34
AFI Loadout Silos	100	30.48	274	83.52	37	11.28
Material Storage Area						
Building No. 6	74	22.56	812	247.50	122	37.19
Building No. 5	54.7	16.67	879	267.92	174	53.04
Building No. 4	54.7	16.67	799	243.54	105	32.00
Building No. 2 (Bottom)	62	18.90	919	280.11	102	31.09
Building No. 2 (Top)	70.1	21.37	402	122.53	126	38.40
GTSP Building	127	38.71	127	38.71	64	19.51
DAP 5 Building Tier A	86.5	26.37	100	30.48	46	14.02
DAP 5 Building Tier B	126.5	38.56	37	11.28	27	8.23
Map 3/4 Building	90	27.43	109	33.22	54	16.46
Docks						
West Building	30	9.14	126	38.40	100	30.48
East Building Tier A	30	9.14	130	39.62	80	24.38
East Building Tier B	50	15.24	60	18.29	50	15.24
Sulfuric Acid Plant						
Auxiliary Boiler Building	18	5.49	46	14.02	45	13.72

Table 6-10. Maximum Predicted PM_{10} Impacts Due to the Proposed Project Only - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a]		Period Ending (YYMMDDHH)
		Direction (degree)	Distance (m)	
Site Vicinity				
Annual				
	1.46	260	1019	87123124
	0.88	260	1019	88123124
	1.04	220	971	89123124
	1.65[b]	260	1019	90123124
	1.58	260	1019	91123124
HSH 24-Hour				
	15.25[b]	130	294	87121124
	10.36	140	285	88050624
	8.11	200	390	89070424
	11.40	270	1064	90031224
	10.63	260	1019	91102224

Note: Impacts reported are highest predicted.
YY = Year; MM = Month; DD = Day; HH = Hour

[a] Relative to H_2SO_4 Plant No. 9 stack location. Impacts reported are highest predicted.
[b] Refined concentrations are 1.68 and 15.47 $\mu g/m^3$, respectively, for the annual and 24-hour averaging times. Significant impact distance is 2.0 km.

Source: Golder Associates Inc., 2000.

Table 6-11. Maximum Predicted PM_{10} Impacts for All Sources - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a]		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Site Vicinity				
Annual	25.2	210	796	89123124
H6H 24-Hour	87.2	200	390	89022224

Note: YY = Year; MM = Month; DD = Day; HH = Hour; H6H = Sixth highest concentration.

[a] Relative to H_2SO_4 Plant No. 9 stack location.

Source: Golder Associates Inc., 2000.

Table 6-12. Maximum Predicted PM_{10} Concentrations for All Sources Compared with AAQS- Refined Analysis

	Concentration ($\mu g/m^3$)			Receptor Location[a]			Florida
Averaging Time	Total	Modeled Sources	Background	Direction (degrees)	Distance (m)	Period Ending (YYMMDDHH)	AAQS (ug/m^3)
Annual	48.9	25.9	23	216	889	89123124	50
H6H 24-Hour	110.2	87.2	23	200	390	89022224	150

Note: YY = Year; MM = Month; DD = Day; HH = Hour; H6H = Sixth highest concentration.

[a] Relative to H_2SO_4 Plant No. 9 stack location.

Source: Golder Associates Inc., 2000.

87.2
35.0
122.2

Table 6-13. Maximum Predicted PM_{10} PSD Class II Increment Consumption - Screening Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a]		Period Ending (YYMMDDHH)
		Direction (degree)	Distance (m)	
Annual				
	<0.00	--	--	87123124
	<0.00	--	--	88123124
	0.275	120	1,700	89123124
	<0.00	--	--	90123124
	<0.00	--	--	91123124
High 24-Hour				
	11.7	150	1,494	87041324
	10.8	260	1,019	88020424
	11.1	260	1,019	89091624
	11.5	260	1,019	90083124
	10.0	260	1,019	91031224
HSH 24-Hour				
	10.5	160	1,700	87041324
	7.7	40	1,100	88082124
	10.0	200	1,700	89091624
	9.4	160	1,700	90083124
	10.0	260	1,019	91052124

Note: YY = Year; MM = Month; DD = Day; HH = Hour
HSH = Highest, second-highest.

[a] Relative to H_2SO_4 Plant No. 9 stack location.

Source: Golder Associates Inc., 2000.

Table 6-14. Maximum Predicted PM_{10} PSD Increment Consumption Compared with PSD Class II Increments - Refined Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (degree)	Receptor Location[a] Distance (m)	Period Ending (YYMMDDHH)	Allowable PSD Increment ($\mu g/m^3$)
Annual					
	0.52	116	2,000	89123124	17
HSH 24-Hour					
	10.53	150	1,700	87041324	30
	10.53	200	1,900	89091624	
	10.18	252	1,006	91072024	

Note: YY = Year; MM = Month; DD = Day; HH = Hour
HSH = Highest, second-highest.
[a] Relative to H_2SO_4 Plant No. 9 stack location.

Source: Golder Associates Inc., 2000.

Table 6-15. Maximum Predicted PM_{10} Concentrations for the Proposed AFI Modification Only at the Chassahowitzka Wilderness Area[a]

Averaging	Concentration	Receptor Location[b] UTM-E	UTM-N	Julian Day Ending	EPA Significance Levels ($\mu g/m^3$)
Annual	0.00074	340000	3165700	N/A	0.2
HSH 24-Hour	0.0165	242700	3178300	48	0.3

Note: YY = Year; MM = Month; DD = Day; HH = Hour; HSH = Highest, Second-Highest; N/A = Not Applicable

[a] All impacts predicted with CALPUFF Model (v5.2) and the FDEP Tampa Bay CALMET Wind field, 1990.
[b] All receptor coordinates are reported in Universal Transverse Mercator (UTM) Coordinates.

Source: Golder Associates Inc., 2000.

Table 6-16. Predicted Fluoride Impacts, AFI Plant Expansion - Site Vicinity

Averaging Time	Concentration[a] (ug/m^3)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)
Annual				
	0.30	270	1064	87123124
	0.21	260	1019	88123124
	0.19	200	500	89123124
	0.33	270	1064	90123124
	0.32	270	1064	91123124
High 24-Hour				
	2.15	270	1064	87060524
	1.88	120	338	88021324
	2.33	200	500	89030724
	2.13	120	338	90070724
	2.04	280	1151	91051124
High 8-Hour				
	6.68	270	1064	87060508
	3.67	130	294	88042808
	4.78	260	1019	89012908
	7.08	120	338	90070708
	5.32	260	1019	91010108
High 3-Hour				
	7.59	270	1100	87060503
	6.33	140	285	88041421
	8.93	200	390	89120303
	7.94	270	1064	90110709
	7.29	290	1296	91072406
High 1-Hour				
	13.6	200	390	87080902
	13.14	190	362	88092520
	13.17	180	347	89071523
	13.08	150	293	90051923
	13.28	190	362	91061422

[a] Based on 5-year meteorological record, West Palm Beach, 1987-91
[b] Relative to No. 9 Sulfuric Acid Plant Stack Location

YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-17. Predicted Fluoride Impacts, AFI Plant Expansion - At Chassahowitzka NWA

Averaging Time	Concentration[a] (ug/m^3)	Receptor Location[b] Easting (m)	Receptor Location[b] Northing (m)	Time Period (YYMMDDHH)
Annual				
	0	342000	3174000	87123124
	0	340300	3165700	88123124
	0.001	342000	3174000	89123124
	0	340300	3169800	90123124
	0	343000	3176200	91123124
High 24-Hour				
	0.007	340300	3165700	87011024
	0.008	340300	3165700	88072524
	0.01	342000	3174000	89062824
	0.011	343700	3178300	90021924
	0.008	342000	3174000	91071224
High 8-Hour				
	0.022	340300	3165700	87011008
	0.021	340300	3165700	88072508
	0.025	331500	3183400	89072908
	0.032	343700	3178300	90021908
	0.022	340300	3165700	91012008
High 3-Hour				
	0.058	340300	3165700	87011009
	0.041	340300	3165700	88072503
	0.05	331500	3183400	89072903
	0.051	343000	3176200	90021906
	0.045	342000	3174000	91071215
High 1-Hour				
	0.173	340300	3165700	87011008
	0.109	340700	3171900	88122824
	0.143	343000	3176200	89062806
	0.116	340300	3165700	90081802
	0.136	342000	3174000	91071214

[a] Based on 5-year meteorological record, West Palm Beach, 1987-91
[b] UTM Coordinates, Zone 17

YYMMDDHH = Year, Month, Day, Hour Ending

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

Cargill is proposing to modify its existing facility in Riverview, Florida. The facility is subject to the PSD new source review requirements for PM(TSP)/PM_{10} and fluorides. The additional impact analysis and the Class I area analysis address these pollutants.

The analysis addresses the potential impacts on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area due to Cargill's proposed modification. The nearest Class I area is the Chassahowitzka National Wilderness Area (NWA), located approximately 86 kilometers (km) north-northwest of the Cargill Riverview plant. In addition, potential impacts upon visibility resulting from the proposal modification are assessed.

The analysis will demonstrate that the increase in impacts due to the proposed increase in emissions is extremely low. Regardless of the existing conditions in the vicinity of the site or in the Class I areas, the proposed project will not cause any significant adverse effects due to the predicted low impacts upon these areas.

7.2 SOIL, VEGETATION, AND AQRV ANALYSIS METHODOLOGY

In the foregoing analysis, the maximum air quality impacts predicted to occur in the vicinity of the Cargill plant and in the Class I area due to the increase in emissions are used. The analysis involved predicting worst-case maximum short- and long-term concentrations of pollutants in the vicinity of the plant and in the Class I areas and comparing the maximum predicted concentrations to lowest observed effect levels for AQRVs or analogous organisms. In conducting the assessment, several assumptions were made as to how pollutants interact with the different matrices, i.e., vegetation, soils, wildlife, and aquatic environment.

A screening approach was used to evaluate potential effects by comparison of the maximum predicted ambient concentrations of air pollutants of concern with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted which specifically addressed the effects of air contaminants on plant species reported to occur in the vicinity of the plant and the Class I area. It was recognized that effects threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species which can be used as models.

7.3 IMPACTS TO SOILS AND VEGETATION IN THE VICINITY OF THE CARGILL PLANT

Because the Project's impacts on the local air quality are predicted to be less than the significant impact levels for PSD Class II, the project's impacts on soils, vegetation, and wildlife in the Project's vicinity are also not expected to be significant. According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Project are predicted to be well below the PSD Class II significant impact levels, PSD Class II Increments, and AAQS. In addition, no visibility impairment in the Project's vicinity is expected due to the types and quantities of emissions proposed for the Project.

Soils in the vicinity of the Cargill site consist primarily of tidal lands and poorly drained sands with organic pans. The tidal lands, found along the coast between the tidal swamps and the flatwoods, consist of mucky fine sand to dark-gray fine sand overlying gray fine sand, mixed with broken and whole shells. The poorly drained sands are strongly acidic, requiring liming for agricultural uses. Many of the soils in the region and a large portion of the site have been disturbed and altered by industrial activities.

Since both the underlying substrate and sea spray from the nearby Hillsborough bay are neutral to alkaline, any acidifying effects of NO_x deposition on soils in the vicinity of the project would be buffered. In addition, liming practices currently used on soils in the vicinity of Cargill by agricultural interests will effectively mitigate the small effects of any increased NO_x deposition resulting from emissions from the proposed expansion. The PM/PM10 emissions are composed primarily of limestone, which is a naturally occurring substance in the area. The additional PM/PM_{10} concentrations resulting from the proposed modification will not affect soils in the vicinity of the Project site.

The vegetative communities in the vicinity of the Cargill site include pine flatwoods and mixed forest. Mangrove trees and salt-tolerant plants are found near the coast. Winter vegetables and pasture grasses are cultivated inland from the facility. No sensitive species are common within the vicinity of the plant.

Maximum predicted concentrations of PM_{10} in the vicinity of the project site are at least an order of magnitude lower than the EPA Class II significant impact levels (see Table 6-6); therefore, no significant impacts associated with facility operations are expected. The predicted concentrations are less than 1 percent of the AAQS. Since the AAQS are designed to protect the public welfare, including effects on soils and vegetation, no detrimental effects on soils or vegetation should occur in this area.

The sensitivity of plants to fluorides varies widely, from 16 $\mu g/m^3$ of fluoride in sensitive plants to 500 $\mu g/m^3$ of fluoride in tolerant plants for 3-hour exposures. As fluoride accumulates in plants, it causes an inhibition of plant metabolism and chlorosis (yellowing of the leaf). With further increases in accumulation of fluoride, the cells die and necrosis is observed. Leaf tips and margins accumulate the highest concentrations of fluoride and are the sites of initial visible injury. Gaseous fluoride is taken up primarily through the stomata of transpiring plants. There is negligible contribution to leaf fluoride content by uptake through the roots (Applied Sciences Associates, Inc., 1978).

The predicted maximum increase in 3-hour, 8-hour, 24-hour, and annual fluoride concentrations in the vicinity of the Cargill plant due to the proposed AFI plant expansion are 8.93, 7.08, 2.33, and 0.33 $\mu g/m^3$, respectively (see Table 6-16). These concentrations are less than those that caused injury to sensitive species, therefore no significant effects are expected to occur as a result of fluoride exposure.

7.4 IMPACTS UPON VISIBILITY IN THE VICINITY OF CARGILL

Several new emission sources will be created by the proposed AFI plant expansion. These sources will be controlled by wet scrubbers or baghouses; therefore, a visible emission plume from this source may occur at times. However, Cargill has a number of similar type sources already in operation. All these sources are in compliance with opacity regulations and should remain in compliance after the modification. As a result, no adverse impacts upon visibility are expected.

7.5 IMPACTS DUE TO ASSOCIATED POPULATION GROWTH

There will be a small, temporary increase in the number of workers during the construction period. There will be no significant increase in permanent employment at Cargill as a result of the proposed project. Therefore, there will be no anticipated permanent impacts on air quality caused by associated population growth.

7.6 CLASS I AREA IMPACT ANALYSIS

7.6.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed increase from the Cargill Riverview facility. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.
>
> Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register 1978).

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the

Chassahowitzka NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined as:

Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass

Marsh Islands - cabbage palm and eastern red cedar

Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle

Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm

Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto

Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

A screening approach was used that compared the maximum predicted ambient concentration of air pollutants of concern in the Chassahowitzka NWA (Table 7-1) with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species that can be used as indicators of effects.

7.6.2 VEGETATION

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants such as fluoride, chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

The response of vegetation and wildlife to atmospheric pollutants is influenced by the concentration of the pollutant, duration of exposure, and frequency of exposures. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

Particulate Matter

Although information pertaining to the effects of particulate matter on plants is scarce, some threshold concentrations are available. Mandoli and Dubey (1998) exposed ten species of native Indian plants to levels of particulate matter ranging from 210 to 366 $\mu g/m^3$ for an 8-

hour averaging period. Damage in the form of a higher leaf area/dry weight ratio was observed at varying degrees for most plants tested. Concentrations of particulate matter lower than 163 $\mu g/m^3$ did not appear to be injurious to the tested plants.

By comparison of these published toxicity values for particulate matter exposure (i.e., concentrations for an 8-hour averaging time), the possibility of plant damage in the Chassahowitzka NWA can be determined. The maximum predicted cumulative 8-hour PM_{10} concentration in the Class I area due to the project only is 0.036 $\mu g/m^3$ (Table 7-1). This concentration only 0.02% of the lower threshold value that reportedly affects plant foliage.

Fluoride

Fluoride is an inhibitor of plant metabolism. As fluoride accumulates in plants, it causes an inhibition of plant metabolism and chlorosis (a yellowing of the leaf). With further increases in accumulation of fluoride, the cells die and necrosis is observed. Leaf tips and margins accumulate the highest concentrations of fluoride and are the sites of initial visible injury. Gaseous fluoride is taken up primarily through the stomata of transpiring plants. There is negligible contribution to leaf fluoride content by uptake through the roots (Applied Sciences Associates, Inc., 1978).

Plant sensitivities can range from 16 $\mu g/m^3$ of fluoride in sensitive plants to 500 $\mu g/m^3$ of fluoride in tolerant plants for 3-hour exposures. The lowest observed effect levels for sensitive plants are reported to be as follows (Applied Sciences Associates, Inc., 1978):

- <50 $\mu g/m^3$ for 1-hour exposures
- <16 $\mu g/m^3$ for 3-hour exposures
- <1.6 $\mu g/m^3$ for 24-hour exposures

Gladiolus is considered the plant species most sensitive to flouride. Visible symptoms are reported to occur when gladiolus have been exposed to concentrations >0.5 $\mu g/m^3$ for 5 to 10 days. More tolerant fruit tree species and conifers displayed symptoms at around 1 $\mu g/m^3$ at 10-day exposures (Treshow and Anderson, 1989).

The predicted maximum fluoride concentrations in the Chassahowitzka NWA due to the modified AFI plant are 0.173 μg/m3 and 0.011 μg/m3 for 1-hr and 24-hr averaging times, respectively (Table 7-1). These concentrations are less than 1% of those that cause injury to the most sensitive plant species. No significant adverse effects are predicted to occur to the vegetative AQRVs of Chassahowitzka NWA. Since the predicted annual concentration is very low, no measurable accumulation of fluoride will occur in vegetation that would be the prime forage of wildlife. Therefore, no significant adverse effects to wildlife AQRVs will occur.

7.6.3 WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National AAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary ambient air quality standards. Physiological and behavioral effects have been observed in experimental animals at or below these standards. The ingestion of excessive amounts of fluoride can lead to an animal disease called fluorosis. Fluorosis is a skeletal and dental disease resulting in softening of bone and dental tissue that can lead to injury and other health problems. In general, forage plants with over 30 ppm of fluoride which are regularly ingested by animals such as cattle and deer can result in mild fluorosis. A number of states (excluding Florida) have fluoride standards. These range from 25 to 40 parts per million (ppm) of fluoride as a maximum annual average (Newman, 1984).

For impacts on wildlife, the lowest threshold values of PM_{10}, which are reported to cause physiological changes are shown in Table 7-2. These values are up to orders of magnitude larger than maximum concentrations predicted from the Cargill project in the Class I area. No effects on wildlife AQRVs from PM_{10} or flouride are expected. The proposed project's contribution to cumulative impacts is negligible.

7.6.4 SOILS

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification,
- Alteration in cation exchange,
- Loss of base cations, and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

According to the USDA Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the Chassahowitzka NWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacooche, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the NWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the NWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and therefore have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of contaminants projected for the Chassahowitzka NWA from the proposed project's emissions precludes any significant impact on soils.

Particulate Matter

The majority of the soil in the Class I area is characterized by high levels of sulfur and organic matter. This soil is flooded daily with the advent of high tide and the pH ranges between 6.1 and 7.8. The upper level of this soil may contain as much as 4 percent sulfur (USDA, 1991).

Any particulate deposition from the proposed project would be neutral or alkaline in nature. Although ground deposition was not calculated, it is evident that the effect of any dust deposited would be inconsequential in light of the existing soil pH. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity.

7.7 IMPACTS UPON VISIBILITY

7.7.1 INTRODUCTION

A change in visibility is characterized by either a change in the visual range, defined as the greatest distance that a large dark object can be seen, or by a change in the light-extinction coefficient (b_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change that is measured by a visibility index called the deciview. The deciview (dv) is defined as:

$$dv = 10 \ln (1 + b_{exts} / b_{extb})$$

where

b_{exts} is the extinction coefficient calculated for the source, and

b_{extb} is the background extinction coefficient

The source extinction coefficient is determined from NOx, SO_2, and PM_{10} emission's increase from the proposed project. The background extinction coefficient s for each area evaluated are based on existing ambient monitoring data. Based on predicted SO_4, NO_3, and PM_{10} concentrations, the increase in the project's emissions were compared a 5 percent change in light extinction of the background levels. This is equivalent to a change in deciview of 0.5.

7.7.2 ANALYSIS METHODOLOGY

Following the recommendations of the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II report, a level II refined analysis was performed using the CALPUFF long-range transport model, along with a CALMET wind field developed by the FDEP. A more detail description of the CALPUFF model and the CALMET wind field used for this project is provided Appendix B. The CALPUFF postprocessor model CALPOST was used to summarize the maximum concentrations of SO_4, NO_3, and PM_{10} that were predicted with the CALPUFF model.

CALPUFF used in a manner recommended by the IWAQM Phase 2 Summary Report (EPA, December 1998). A summary of the parameter settings that were used in the CALPUFF model is presented in Table A-1 along with the IWAQM Phase 2 recommended parameter settings. The recommended parameter settings are presented in Appendix B of the IWAQM Phase II Summary Report.

The following CALPUFF settings/values were implemented in the Level II refined analysis:

- Use of six pollutant species of SO_2, SO_4, NO_x, HNO_3, NO_3, and PM_{10}.
- Use of MESOPUFF II scheme for chemical transformation with CALPUFF default background concentrations

- Include both dry and wet deposition and plume depletion
- Use Agricultural, unirrigated land use; minimum mixing height of 50 m
- Use transitional plume rise, stack-tip downwash, and partial plume penetration
- Use puff plume element dispersion, PG /MP coefficients, rural mode, and ISC building downwash scheme
- Use of partial plume path adjustment terrain effects
- Use highest predicted 24-hour species concentrations in 1990, the year of the CALMET wind field, for comparison to the maximum percent change in extinction

7.7.3 EMISSION INVENTORY

Based on recommendations of the IWAQM Phase II Report, the regional haze analysis considered only the maximum 24-hour increase in emissions due to the proposed Cargill AFI Plant expansion. The emission rates and source parameters for the affected sources are presented in Chapter 2.0.

7.7.4 BUILDING WAKE EFFECTS

The air modeling analysis included the same building structure dimensions to account for the effects of building-induced downwash as was used in the ISCST3 modeling analysis. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model.

7.7.5 RECEPTOR LOCATIONS

Receptors for the refined analysis included 13 discrete receptors located at the Chassahowitzka PSD Class I area. Because the area's terrain is flat, all receptors were assumed to be at zero elevation.

7.7.6 BACKGROUND VISUAL RANGES AND RELATIVE HUMIDY FACTORS

The background extinction coefficient was based on data representative of the mean of the top 20-percentile air quality days. For the Chassahowitzka NWA, a background extinction coefficient of 0.0602 km^{-1} was used, equating to a background visual range of 65 km. This background value was provided by the U.S. Fish and Wildlife Service/National Park Service Air Modeling Branch.

7.7.7 METEOROLOGICAL DATA

A CALMET wind field for the Tampa Bay domain was used for the analysis. The year of data is 1990. A detailed description of the data used to develop the wind field is presented in Appendix B.

7.7.8 CHEMICAL TRANSFORMATION

The air modeling analysis included all chemical transformation processes that occur for the emitted species.

7.8 RESULTS

The highest predicted 24-hour species concentrations are summarized in Table 7-3. The maximum predicted SO_4 and NO_3 concentrations occurred on Julian day 24, and the maximum predicted PM_{10} concentration occurred on Julian day 48. The highest 24-hour species' concentrations for each day are presented in Table 7-3. The average daily relative humidity factors for these days and the predicted change in visibility for these three days is also summarized in Table 7-3. The maximum predicted change in visibility is due to the proposed project is predicted to be 0.86 perceent. As this percentage is below the criteria value of 5 percent, it is concluded that the proposed project will not adversely impact the background visibility levels at the Chassahowitzka NWA PSD Class I area.

Table 7-1. Maximum Predicted Concentrations Due To Project Only at Chassahowitzka NWA

Pollutant	Concentrations[a] (ug/m3) for Averaging Times				
	Annual	24-Hour	8-Hour	3-Hour	1-Hour
Particulates (PM_{10})	0.00074	0.0165	0.036	0.063	0.076
Fluoride	0.001	0.011	0.032	0.058	0.173

[a] Highest Predicted with CALPUFF model and FDEP CALMET Tampa Bay Domain, 1990. Refer to Tables 6-15 and 6-17.

Table 7-2. Examples of Reported Effects of Air Pollutants at Concentrations Below National Secondary Ambient Air Quality Standards

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Particulates[1]	Respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	Decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Source: [1]Newman and Schreiber, 1988.
[2]Gardner and Graham, 1976.
[3]Trzeciak et al., 1977.

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Source: [1]Newman and Schreiber, 1988.
[2]Gardner and Graham, 1976.
[3]Trzeciak et al., 1977.

Table 7-3. Refined Regional Haze Analyses Results, CALPUFF Model, Cargill AFI Expansion

Item	Units	Predicted Worst Days	
		24 (1/24)	48 (2/17)
Maximum Predicted Concentration	ug/m^3		
SO_4		0.004800	0.003523
NO_3		0.016867	0.001305
PM_{10}		0.013000	0.016500
Computed Concentrations	ug/m^3		
$(NH_4)_2SO_4$		0.006600	0.004844
NH_4NO_3		0.0218	0.0017
Average Relative Humidity Factor(a)		5.65	3.99
Background Visual Range(b), Vr		65	65
Background Extinction Coeff.(bext)	km^{-1}	0.0602	0.0602
Source Extinction Coeff (bexts)	km^{-1}		
$(NH_4)_2SO_4$		0.000112	0.000058
NH_4NO_3		0.000369	0.000020
PM_{10}		0.000039	0.000050
Total bexts	km^{-1}	0.000520	0.000128
Deciview Change		0.086	0.021
Percent Change (%)		0.86	0.21
Allowable Criteria (%)		5.0	5.0

a. Computed from Tampa RH data
b. Provided by U.S. Fish and Wildlife Service

8.0 REFERENCES

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APPENDIX A

SUMMARY OF SOURCE PARAMETER DATA FOR OTHER SOURCES IN THE VICINITY OF CARGILL RIVERVIEW

Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
Sources From US Agri-Chem PSD Application									
Agri1	40800	-3500	4.46	24.4	316.3	5.76	3.05	42.1	72763
Agri2	40800	-3500	5.04	24.4	320.8	21.25	2.44	99.4	154193
Agri3	40800	-3500	3.92	29.0	683.0	14.75	1.77	36.3	183131
Agri4	40800	-3500	1.9	10.4	298.0	5.92	0.70	2.3	3702
Agri5	40800	-3500	1.9	27.4	298.0	3.60	0.98	2.7	11682
Agri6	40800	-3500	1.9	27.4	298.0	4.79	0.70	1.8	7931
Agri7	40800	-3500	1.9	24.7	298.0	4.15	2.13	14.8	57264
Agri8	40800	-3500	3.17	24.7	298.0	3.69	2.13	13.1	30518
AGRIA	40800	-3500	24.19	10.4	298.0	5.92	0.70		
Agri9	44600	-11000	3.02	38.1	327.4	14.55	3.05	106.3	439086
Agri10	44600	-11000	4.12	30.5	306.3	6.87	1.22	8.0	18198
Agri11	44600	-11000	0.55	26.8	307.4	9.24	0.91	6.0	90083
Agri12	44600	-11000	0.43	38.1	319.1	15.84	1.07	14.2	402713
Agri13	44600	-11000	0.03	29.3	298.0	1.15	0.40	0.1	42003
Agri14	44600	-11000	0.03	20.7	298.0	2.87	0.46	0.5	98216
Agri15	44600	-11000	0.03	16.2	298.0	1.72	0.46	0.3	45857
Agri16	44600	-11000	0.26	19.8	310.2	5.48	0.49	1.0	24424
Agri17	44600	-11000	0.23	19.8	300.2	88.45	0.49	16.7	431268
Agri18	44600	-11000	4	3.1	344.1	20.69	0.55	4.9	1290
Agri19	44600	-11000	4.4	42.7	304.7	10.66	2.74	62.9	185734
Agri20	44600	-11000	5.07	24.4	296.9	7.80	3.35	68.8	98154
Agri21	44600	-11000	5.07	24.4	295.2	7.23	3.35	63.7	90461
Agri22	44600	-11000	4.32	18.3	323.0	9.70	0.30	0.7	938
AGRIB	44600	-11000	31.56	18.3	323.0	9.70	0.30		
CFIn23	45500	-100	15.27	42.7	298.0	21.60	0.80	10.9	9048
CFIn24	45500	-100	5.1	42.7	298.0	21.73	0.76	9.9	24578
CFIn25	45500	-100	0.83	62.8	338.6	6.51	2.13	23.2	594196
CFIn26	45500	-100	1.5	62.8	333.0	6.69	2.13	23.8	332291
CFIn27	45500	-100	5.1	36.9	338.6	18.76	1.83	49.3	120818
CFIn28	45500	-100	5.44	35.7	338.6	11.31	2.44	52.9	117382
CFIn29	45500	-100	2.45	36.6	333.0	17.17	2.29	70.7	351603
CFIn30	45500	-100	1.27	16.8	298.0	9.01	1.37	13.3	52233
CFIn31	45500	-100	4.95	41.5	333.0	18.05	2.83	113.5	316595
CFIn32	45500	-100	1.38	11.0	588.6	13.45	0.76	6.1	28549
CFIn33	45500	-100	5.12	41.2	298.0	7.92	1.52	14.4	34421
CFIn34	45500	-100	1.76	19.8	298.0	15.36	1.22	18.0	60227
CFIn35	45500	-100	0.12	30.5	299.7	5.95	0.76	2.7	205473
CFINDA	45500	-100	50.29	42.7	298.0	21.60	0.80		
Cons36	35800	1700	4.43	24.7	327.4	3.77	2.29	15.5	28333
Cons37	35800	1700	0.29	8.2	533.0	13.74	0.61	4.0	60739
Cons38	35800	1700	0.43	11.9	533.0	8.91	0.98	6.7	99051
Cons39	35800	1700	28.91	45.7	349.7	10.31	2.29	42.5	23484
Cons40	35800	1700	4.92	12.8	310.8	10.60	1.22	12.4	10019
Cons41	35800	1700	1.18	15.9	321.9	20.18	0.76	9.2	39583
Cons42	35800	1700	1.18	24.4	327.4	23.81	1.07	21.4	144826
Cons43	35800	1700	1.18	22.0	360.8	31.08	0.98	23.4	157341
Cons44	35800	1700	0.63	63.1	330.2	21.12	0.43	3.1	101419
Cons45	35800	1700	0.63	63.1	330.2	21.12	0.43	3.1	101419
Cons46	35800	1700	0.63	54.6	338.6	14.37	0.18	0.4	10723
Cons47	35800	1700	0.2	55.5	310.8	2.97	0.43	0.4	37179
Cons48	35800	1700	1.38	63.1	333.0	51.22	0.27	2.9	44646
CONSA	35800	1700	45.99	54.6	338.6	14.37	0.18		

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Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
Cons49	30900	13800	0.12	16.5	298.0	19.14	0.43	2.8	113614
Cons50	30900	13800	0.06	3.1	338.6	18.19	0.24	0.8	14164
Cons51	30900	13800	0.03	15.2	294.1	20.70	0.15	0.4	54651
Cons52	30900	13800	1.76	46.3	299.7	12.14	1.77	29.9	235663
Cons53	30900	13800	0.03	21.3	298.0	12.58	0.18	0.3	67859
Cons54	30900	13800	2.1	46.3	298.0	13.17	1.77	32.4	213050
Cons55	30900	13800	1.67	30.5	338.0	11.98	1.37	17.7	108944
Cons56	30900	13800	1.76	24.4	319.1	6.20	1.68	13.7	60750
Cons57	30900	13800	1.64	46.3	300.2	9.61	1.77	23.6	200534
Cons58	30900	13800	1.9	45.7	313.0	18.34	1.77	45.1	339886
Cons59	30900	13800	0.26	24.7	315.2	9.05	0.82	4.8	143054
Cons60	30900	13800	0.17	32.6	298.0	33.69	0.37	3.6	207068
Cons61	30900	13800	0.86	30.5	319.1	0.01	0.91	0.0	74
Cons62	30900	13800	0.06	29.6	298.0	13.58	0.30	1.0	140977
Cons63	30900	13800	0.12	15.9	298.0	19.14	0.43	2.8	109404
Cons64	30900	13800	0.09	14.0	298.0	17.97	0.18	0.5	21228
Cons65	30900	13800	0.26	18.9	298.0	24.95	0.55	5.9	128408
Cons66	30900	13800	0.14	20.4	298.0	11.50	0.46	1.9	83071
Cons67	30900	13800	0.09	21.3	298.0	31.89	0.37	3.4	242279
Cons68	30900	13800	0.89	10.4	327.4	19.16	0.82	10.1	38562
Cons69	30900	13800	0.2	17.4	298.0	28.75	0.46	4.8	123660
Cons70	30900	13800	0.2	16.5	298.0	19.96	0.55	4.7	116303
Cons71	30900	13800	0.2	13.7	349.7	14.17	0.55	3.4	80762
Cons72	30900	13800	0.12	6.1	605.2	20.21	0.37	2.2	66851
Cons73	30900	13800	4.4	24.4	308.0	79.21	1.37	116.8	199270
Cons74	30900	13800	0.66	9.8	295.8	10.76	0.46	1.8	7814
Cons75	30900	13800	1.76	46.3	295.2	11.16	1.77	27.5	213386
CONSB	30900	13800	21.55	30.5	319.1	0.01	0.91		
Farm84	46600	-2400	0.09	12.2	366.3	0.03	0.61	0.0	435
Farm85	46600	-2400	0.09	12.2	366.3	2.67	0.61	0.8	38713
Farm86	46600	-2400	0.66	30.5	349.7	8.70	2.29	35.8	578691
Farm87	46600	-2400	0.66	30.5	351.9	9.74	2.29	40.1	651944
Farm88	46600	-2400	2.94	39.3	326.9	12.41	2.29	51.1	223467
Farm89	46600	-2400	4.46	27.4	305.2	5.48	0.91	3.6	6690
Farm90	46600	-2400	3.31	50.3	298.0	8.86	0.70	3.4	15438
Farm91	46600	-2400	3.43	26.8	349.7	19.09	0.73	8.0	21848
Farm92	46600	-2400	3.22	39.6	311.9	5.66	1.22	6.6	25392
Farm93	46600	-2400	3.8	39.3	319.1	10.66	2.13	38.0	125419
Farm94	46600	-2400	3.8	39.9	298.0	9.92	2.44	46.4	145249
Farm95	46600	-2400	3.22	39.3	327.4	7.47	2.29	30.8	123004
Farm96	46600	-2400	2.94	56.4	338.0	5.17	1.52	9.4	60819
Farm97	46600	-2400	6.62	35.1	349.7	22.72	0.67	8.0	14831
Farm98	46600	-2400	3.4	39.3	327.4	6.84	2.29	28.2	106667
Farm99	46600	-2400	0.06	12.2	366.3	0.03	0.61	0.0	652
Farm100	46600	-2400	0.09	12.2	366.3	0.03	0.61	0.0	435
FARM	46600	-2400	42.79	12.2	366.3	0.03	0.61		
Flor101	4300	-28400	108.93	152.1	425.8	23.61	7.99	1183.8	703828
Flor102	4300	-28400	108.93	152.1	425.8	23.98	7.92	1181.4	702388
Hard106	41900	-25000	1.89	22.9	389.0	23.90	4.88	447.0	2103253
IMCF107	26700	-14600	3.17	38.1	339.1	15.16	2.44	70.9	288910
IMCF108	26700	-14600	3.14	38.1	339.1	16.80	2.44	78.6	323223
IMCF109	26700	-14600	6.45	45.7	316.3	8.43	0.82	4.5	9981
IMCF110	26700	-14600	6.77	22.9	314.7	17.33	0.85	9.8	10450

ISCST ID	Relative Coord (m) X	Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
IMCFA	26700	-14600	19.53	45.7	316.3	8.43	0.82		
IMCF116	33600	-3500	3.6	40.5	313.6	15.18	2.13	54.1	191020
IMCF117	33600	-3200	2.53	40.5	313.6	1.01	0.91	0.7	3301
IMCF118	33800	-3100	0.43	18.3	313.6	9.70	0.30	0.7	9146
IMCF119	33800	-3100	0.43	13.7	313.6	9.70	0.30	0.7	6861
IMCF120	33800	-3100	0.43	26.5	438.6	86.24	0.46	14.3	387693
IMCF121	33800	-3100	1.78	52.1	316.3	17.97	1.83	47.3	437748
IMCF122	33800	-3100	0.43	26.5	438.6	86.24	0.46	14.3	387693
IMCF123	33800	-3100	0.43	5.2	380.2	38.27	0.40	4.8	22026
IMCF124	33800	-3100	0.43	17.4	352.4	22.96	0.40	2.9	41072
IMCF125	33800	-3100	3.34	52.4	313.6	15.97	1.37	23.5	115890
IMCF126	33800	-3100	0.43	32.6	313.6	20.96	0.55	5.0	118431
IMCF127	33800	-3100	0.43	19.8	352.4	14.37	0.46	2.4	38772
IMCF128	33800	-3100	2.13	21.6	299.7	10.35	0.30	0.7	2228
IMCF129	33800	-3100	0.12	30.5	299.7	54.62	0.46	9.1	690999
IMCF130	33800	-3100	0.43	31.7	313.6	21.48	0.49	4.1	93645
IMCF131	33800	-3100	0.6	12.2	315.2	20.12	0.91	13.1	83799
IMCF132	33800	-3100	1.78	52.1	316.3	17.97	1.83	47.3	437748
IMCF133	33800	-3100	0.17	33.5	316.3	13.86	0.43	2.0	125567
IMCF134	33800	-3100	0.58	28.7	352.4	10.78	1.83	28.4	493564
IMCF135	33600	-3400	4.26	40.5	316.3	20.66	1.83	54.3	163567
IMCF136	33800	-3100	0.06	30.5	311.9	12.58	0.55	3.0	473560
IMCF137	33600	-3500	1.93	40.5	333.0	21.43	1.22	25.1	175228
IMCF138	33800	-3100	0.2	26.2	299.7	16.50	0.21	0.6	22446
IMCF139	33600	-3300	3.63	40.5	315.2	18.87	1.83	49.6	174714
IMCF140	33800	-3100	0.43	36.0	313.6	10.35	0.30	0.7	19192
IMCF141	33800	-3100	0.46	19.8	313.6	51.75	0.30	3.7	49402
IMCF142	33800	-3100	0.35	32.6	338.6	15.84	1.07	14.2	449347
IMCF143	33800	-3100	0.43	18.3	313.6	16.17	0.30	1.1	15246
IMCF144	33800	-3100	0.66	7.6	333.0	10.49	1.31	14.1	54358
IMCF145	33800	-3100	0.43	34.1	313.6	10.35	0.30	0.7	18216
IMCF146	33800	-3100	0.78	51.8	316.3	1.97	1.52	3.6	75118
IMCF147	33800	-3100	0.43	32.0	313.6	42.69	0.30	3.0	70423
IMCF148	33800	-3100	0.81	12.2	299.7	9.39	0.27	0.5	2425
IMCF149	33800	-3100	0.43	35.7	313.6	38.81	0.30	2.7	71345
IMCF150	33800	-3100	0.2	5.5	313.6	9.70	0.30	0.7	5902
IMCF151	33900	-3100	4.64	52.4	321.9	13.14	2.44	61.4	223485
IMCF152	33800	-3100	0.43	34.1	313.6	10.35	0.30	0.7	18216
IMCFB	33800	-3100	41.06	21.6	299.7	10.35	0.30		
IMCU168	45500	300	2.42	27.4	299.7	16.50	0.21	0.6	1941
IMCU169	45500	300	5.82	18.3	302.4	9.50	1.07	8.5	8118
IMCU170	45500	300	1.47	30.5	321.9	12.98	0.55	3.1	20583
IMCU171	45500	300	0.12	30.5	299.7	5.95	0.76	2.7	205473
IMCU172	45500	300	23.9	25.9	296.9	11.64	0.15	0.2	66
IMCU173	45500	300	0.63	25.9	296.9	11.64	0.15	0.2	2512
IMCU174	45500	300	0.4	27.4	299.7	16.50	0.21	0.6	11745
IMCU175	45500	300	0.12	15.2	313.6	8.09	0.61	2.4	94162
IMCU	45500	300	34.88	25.9	296.9	11.64	0.15		
Mobi182	35600	2600	4.55	24.4	344.1	12.65	2.29	52.1	96063
Mobi183	35600	2600	5.5	24.4	344.1	12.65	2.29	52.1	79471
Mobi184	35500	2700	1.12	30.5	338.6	19.02	1.10	18.1	166560
Mobi185	35300	2500	3.11	25.9	338.6	16.10	2.29	66.3	187060
Mobi186	35500	2700	1.41	24.4	326.9	11.68	0.49	2.2	12450
Mobi187	35500	2700	1.55	24.4	326.9	11.68	0.49	2.2	11325

Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
Mobi188	35500	2600	0.14	4.6	312.4	16.50	0.43	2.4	24435
Mobi189	35500	2800	0.72	4.0	521.9	2.12	0.76	1.0	2761
Mobi190	35500	2800	1.96	25.9	299.7	14.54	1.68	32.2	127694
Mobi191	35400	2600	7	25.9	296.9	19.40	1.52	35.2	38686
Mobi192	35500	2800	1.38	12.2	344.1	11.83	1.07	10.6	32333
Mobi193	35500	2800	0.06	24.1	349.7	14.64	0.24	0.7	92951
MOBIL	35500	2800	28.5	4.0	521.9	2.12	0.76		
Roys202	43900	2600	1.93	22.6	308.0	3.80	1.07	3.4	12302
Semi203	46900	4200	1.38	24.4	299.7	17.90	0.52	3.8	20128
Semi204	46900	4200	0.12	10.7	305.2	9.98	0.55	2.4	64345
Semi205	46900	4200	1.27	15.2	294.1	8.02	0.34	0.7	2570
Semi206	46900	3500	3.77	15.2	333.0	17.29	2.04	56.5	76073
Semi207	46900	4200	0.58	20.7	294.1	2.46	0.52	0.5	5492
Semi208	46900	4200	0.43	30.5	300.2	9.70	0.61	2.8	60322
Semi209	47000	4500	1.73	45.7	304.1	9.32	2.04	30.5	244818
Semi210	46900	4200	0.46	30.5	324.7	9.70	0.61	2.8	60990
Semi211	46900	4200	1.93	16.8	294.1	17.42	1.07	15.7	40005
Semi213	47000	4500	1.35	61.0	341.3	24.58	1.52	44.6	687395
Semi214	46900	4200	0.06	6.1	366.3	17.46	0.30	1.2	45961
Semi215	46900	4200	33.6	30.5	324.7	13.40	2.04	43.8	12901
Semi216	46900	4200	0.06	10.4	366.3	0.12	0.30	0.0	536
Semi217	46900	4200	0.43	16.2	301.9	4.19	0.67	1.5	16750
Semi218	46900	4200	0.06	9.5	366.3	0.03	0.61	0.0	506
Semi219	46900	4200	0.26	12.8	307.4	9.41	1.16	9.9	150500
Semi220	46900	4200	0.06	7.9	366.3	0.12	0.30	0.0	410
Semi221	46900	4200	0.63	30.5	294.1	13.20	2.13	47.0	669256
Semi222	46900	4200	0.06	7.9	366.3	0.12	0.30	0.008	410
Semi223	46900	4200	0.63	27.4	296.9	11.37	0.98	8.6	110866
Semi224	46900	4200	0.52	14.0	296.9	8.09	0.61	2.4	18926
Semi225	47000	4500	2.82	40.2	316.3	26.40	2.13	94.1	424476
Semi226	46900	4200	0.75	21.3	299.7	21.27	1.28	27.4	233398
Semi227	46900	4200	1.38	22.6	305.2	9.98	0.55	2.4	11830
Semi228	46900	4200	1.93	16.8	298.0	17.42	1.07	15.7	40536
Semi229	46900	4200	1.93	16.8	294.1	17.42	1.07	15.7	40005
Semi230	46900	4200	0.58	14.0	298.0	15.16	0.24	0.7	4940
Semi231	46900	4200	0.58	16.2	294.1	20.21	0.12	0.2	1872
Semi232	46900	4200	0.81	16.2	299.7	7.68	0.67	2.7	16180
Semi233	46900	4200	3.17	24.4	313.6	16.63	2.01	52.8	127270
Semi234	46900	3500	3.77	15.2	333.0	17.29	2.04	56.5	76073
Semi235	46900	4200	3.77	30.2	330.2	16.21	2.29	66.8	176481
Semi236	47000	4500	1.3	61.0	346.9	28.46	1.52	51.6	840075
Semi237	46900	4200	0.09	30.5	260.8	15.52	1.52	28.2	2487418
Semi238	47000	4500	3.34	61.0	346.9	28.46	1.52	51.6	326975
Semi239	46900	4200	0.09	18.0	317.4	9.70	0.61	2.8	179753
Semi240	46900	4200	0.12	10.7	305.2	9.98	0.55	2.4	64345
Semi241	46900	4200	3.22	24.4	294.1	8.38	0.76	3.8	8465
Semi242	46900	4200	0.12	10.7	305.2	9.98	0.55	2.4	64345
SEMINOL	46900	4200	79.16	7.9	366.3	0.12	0.30		
TECO243	-1000	-7500	50.96	149.4	404.7	13.74	7.32	578.2	685816
TECO244	-1000	-7500	50.44	149.4	404.7	13.02	7.32	547.9	656578
TECO245	-900	-7500	51.97	149.4	410.2	14.47	7.32	608.9	717842
TECO246	-1200	-7000	4.17	22.9	770.8	18.74	4.27	268.4	1133958

Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
TECO247	-1200	-7300	4.17	22.9	770.8	18.74	4.27	268.4	1133958
TECO248	-1000	-7500	4.17	10.7	816.3	15.17	4.57	248.8	519740
TECO249	-1000	-7500	54.61	149.4	341.9	18.21	7.32	766.3	716563
TECO250	-1000	-7500	0.66	31.1	394.1	16.04	0.76	7.3	135084
TECO251	-1000	-7500	2.1	34.4	394.1	123.77	0.27	7.1	45802
TECO252	-1000	-7500	0.03	42.4	333.0	18.19	0.49	3.4	1613230
TECO253	-1000	-7500	0.06	54.6	298.6	21.04	0.52	4.5	1213264
TECO254	-1000	-7500	0.06	54.6	298.6	21.04	0.52	4.5	1213264
TECO255	-1000	-7500	0.06	54.6	298.6	21.04	0.52	4.5	1213264
TECOBBA	-1000	-7500	0.21	54.6	298.6	21.04	0.52		
TECO256	-2900	5000	15.89	93.3	415.8	28.90	3.05	211.1	515335
TECO257	-2900	5000	15.89	93.3	420.8	30.85	3.05	225.4	556722
TECO258	-2900	5000	20.18	93.3	419.7	38.64	3.23	316.6	614175
TECO259	-2900	5000	23.69	93.3	426.9	22.97	3.05	167.8	282068
TECO260	-2900	5000	28.76	93.3	423.6	23.18	4.45	360.5	495259
TECO261	-2900	5000	47.91	93.3	433.0	24.74	5.36	558.2	470569
TECO262	-2900	5000	15.4	10.7	816.3	136.61	1.52	247.9	140202
TECO263	-2900	5000	0.03	22.0	449.7	10.96	0.21	0.4	124904
TECO264	-2900	5000	0.14	32.6	449.7	30.37	0.30	2.1	224866
TECO265	-2900	5000	0.37	31.7	449.7	18.27	0.61	5.3	205716
TECO267	-2900	5000	0.06	53.3	298.6	21.49	0.52	4.6	1211503
TECO268	-2900	5000	0.03	54.0	298.6	15.52	0.61	4.5	2435574
TECO269	-2900	5000	0.03	53.3	298.6	21.49	0.52	4.6	2423006
TECO270	-2900	5000	0.03	53.0	298.6	24.26	0.37	2.6	1377071
TECO271	-2900	5000	0.03	53.3	298.6	21.49	0.52	4.6	2423006
TECOGANA	-2900	5000	0.72	22.0	449.7	10.96	0.21		
FPCB292	-24100	-11200	8.14	12.2	755.4	6.54	6.98	250.3	283329
FPC-296	-20500	100	31.96	91.4	424.8	31.09	2.74	183.3	222708
FPC-297	-20500	100	27.9	91.4	408.2	34.44	3.35	303.6	405936
FPC-298	-20500	100	0.04	9.1	541.5	5.18	0.91	3.4	415033
FPC-299	-20500	100	12.8	13.7	772.0	22.25	5.27	485.3	401023
FPC-300	-20500	100	0.01	7.6	298.1	0.04	0.27	0.0	519
FPCBART	-20500	100	72.71	7.6	298.1	0.04	0.27		
Sources Obtained from FDEP									
GAF1	-700	4700	0.43	10.7	298.0	0.06	14.30	9.6	71457
GAF2	-700	4700	0.18	6.1	298.0	15.16	0.49	2.9	28871
GAF3	-700	4700	0.03	6.1	298.0	2.87	0.46	0.5	28901
GAF4	-700	4700	0.29	10.1	700.0	8.53	0.70	3.3	80031
GAF4	-700	4700	0.24	11.6	464.0	18.59	0.49	3.5	78619
GAF4	-700	4700	0.02	13.7	298.0	1.22	0.61	0.4	72781
GAF4	-700	4700	0.03	13.7	298.0	1.22	0.61	0.4	48520
GAF4	-700	4700	0.03	13.7	298.0	1.22	0.61	0.4	48520
GAF	-700	4700	1.25	6.1	298.0	15.16	0.49		
BayConc1	2200	11300	0.62	3.0	299.0	0.61	0.61	0.2	258
BayConc2	2200	11300	0.45	18.3	298.0	4.57	0.61	1.3	16185
Pakhoed1	-2100	4800	0.2	9.1	299.0	39.32	0.30	2.8	37812

Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
Pakhoed2	-2100	4800	0.08	4.9	299.0	13.72	0.34	1.2	22813
Pakhoed3	-2100	4800	0.13	14.3	299.0	8.84	0.52	1.9	61747
IMC_Ag1	-800	-6400	0.4	11.0	298.0	12.80	0.46	2.1	17433
IMC_Ag2	-800	-6400	0.19	7.6	298.0	10.36	0.40	1.3	15518
IMC_Ag3	-800	-6400	0.19	7.6	298.0	10.36	0.40	1.3	15518
IMC_Ag4	-800	-6400	1.42	9.1	298.0	26.52	0.67	9.4	17856
IMC_Ag5	-800	-6400	1.16	13.7	314.0	12.19	0.85	6.9	25652
IMC_Ag6	-800	-6400	1.93	22.9	314.0	12.80	1.52	23.2	86536
IMCAGCH	-800	-6400	5.29	7.6	298.0	10.36	0.40		
DravLim1 (Pt 4)	0	2200	0.04	5.5	298.0	7.01	0.15	0.1	5076
DravLim2 (Pt 2,3,5)	0	2200	0.12	5.5	298.0	11.28	0.12	0.1	1742
DravLim3 (Pt 1)	0	2200	0.08	5.5	298.0	1.83	0.61	0.5	10957
DravLim4 (Pt 6)	0	2200	0.05	5.5	299.0	11.28	0.12	0.1	4196
DRAVLIME			0.13	5.5	299.0	1.83	0.61		
GarrStv1	-5100	9200	0.5	18.3	298.0	0.30	1.37	0.4	4823
GarrStv2	-5100	9200	4.71	6.1	298.0	0.30	3.05	2.2	846
ReedMin1	-700	3000	0.43	9.1	329.0	9.75	1.19	10.8	75502
ReedMin2	-700	3000	1.45	9.1	306.0	9.75	1.68	21.6	41506
ReedMin3	-700	3000	0.06	11.0	300.0	0.30	3.35	2.6	145433
ReedMin4	-700	3000	0.06	10.4	300.0	0.30	3.35	2.6	137500
REEDMIN	-700	3000	2.00	9.1	306.0	9.75	1.68		
RinkerM	2000	1900	0.25	6.7	298.0	18.90	0.40	2.4	18968
FlRock	2900	2500	0.63	6.7	298.0	8.53	0.70	3.3	10404
CommMet1	-4400	5800	1.3	15.2	298.0	16.15	1.22	18.9	65781
CommMet1	-4400	5800	1.78	15.2	298.0	22.25	1.22	26.0	66188
Combined PM Sources from FPL Manatee SCA									
CSX Corporation									
CSXTR01	-1900	6500	3.88	13.7	298.1	13.2	2.38		
CSXTR11	-1900	6500	3.53	18.3	298.7	3.05	2.74		
CSXTRC9	-1900	6500	3.76	0.9	298.1	194.04	0.15		
Eastern Association Terminal									
EASTAT03	-2700	6400	3.5	4.3	298.7	194.04	0.61		
EASTATBA	-2700	6400	2.1	3.4	298.1	24.05	0.34		
EASTATBB	-2700	6400	9.2	4.6	298.1	81.76	0.76		
Golden Triangle Asphalt									
GLDTRI01	-29100	3600	123.48	12.2	410.9	20.74	1.22		
Graves Enterprises									
GRAVES01	200	2800	10.08	4.3	1144.3	3.05	3.66		
Hillsborough Co Resource Recovery									
HILRFC3	5300	10200	2.65	67.1	494.3	16.76	3.51		
TECO Hookers Point									
TECHKC6	-4900	8500	35.44	85.3	448.2	10.48	3.44		
IMC Port Sutton Terminal									
IACPTS01	-2800	5000	5.52	19.8	338.7	12.63	2.44		
IACPTSBA	-2800	5000	3.58	2.1	322	32.07	0.34		
Lafarge Corp.									
LAFRG29	-5200	8100	11.98	44.5	494.8	40.24	2.44		
LAFRG30	-5200	8100	5.67	30.8	401.9	6.09	3.81		

Table A-1. PM Source Screening Analysis Using the EPA 'M' Factor

ISCST ID	Relative Coord (m) X	Relative Coord (m) Y	QS (g/s)	HS (m)	TS (K)	VS (m/s)	DS (m)	Flowrate (m^3/s)	Merged Stack Parameter "M"
LAFRGMM	-5200	8100	17.06	1.5	310.8	17.92	0.58		
Nitram									
NITRM06	-400	6500	3.55	52.7	310.9	5.84	4.57		
NITRMBA	-400	6500	2.32	11.9	298.1	4.48	0.58		
Sulfuric Acid Trading Co.									
SULFTC3	-13900	-1000	0.4	7.6	480.4	4.56	0.52		
Tampa City McKay Bay Refuse-to-Energy									
MCKBAYC5	-2900	9400	3.57	45.7	500	21.3	1.3		
Tropicana									
TROPNC3	-16100	-41600	11.99	29	333.1	21.56	0.91		
TROPNC8	-16100	-41600	14.01	15.2	305.4	3.23	0.3		

Table A-2 . PM Emission Inventory of AAQS Sources Taken from FPL Manatee SCA

APIS Number	Facility/Source	Facility Relative Location Coordinate (in meters) X	Y	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diameter (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum PM Emissions (lb/hr)	(TPY)	(g/s)	Merged Stack Parameter M Test (a)	
40HIL2900	LaFarge Corp.	-5200	8100	LAFRG29	29	146.0	44.5	8.0	2.44	132.0	40.24	431	494.8	95.1	416	11.98		
				LAFRG30	30	101.0	30.8	12.5	3.81	20.0	6.09	264	401.9	45.0	197	5.67		
					01	98.0	29.9	1.6	0.49	39.8	12.13	77	298.0	1.1	5	0.14	145434	
					02	98.0	29.9	1.6	0.49	39.8	12.13	77	298.0	1.1	5	0.14	145434	
					03	102.0	31.1	1.9	0.58	64.7	19.71	77	298.0	2.8	12	0.35	137848	
					05	100.0	30.5	2.5	0.76	40.7	12.42	77	298.0	3.2	14	0.40	127941	
					06	147.0	44.8	1.7	0.52	44.1	13.43	77	298.0	1.6	7	0.20	190429	
					07	147.0	44.8	1.7	0.52	44.1	13.43	77	298.0	1.6	7	0.20	190429	
					08	147.0	44.8	1.7	0.52	44.1	13.43	77	298.0	1.6	7	0.20	190429	
					09	171.0	52.1	1.1	0.34	84.2	25.66	77	298.0	1.1	5	0.14	258462	
					11	47.0	14.3	1.3	0.40	62.8	19.14	77	298.0	1.3	6	0.17	60418	
					12	83.0	25.3	2.3	0.70	80.2	24.45	77	298.0	5.0	22	0.63	112606	
					13	83.0	25.3	3.4	1.04	62.4	19.02	77	298.0	8.7	38	1.09	111758	
					14	57.0	17.4	2.2	0.67	57.0	17.37	157	342.4	1.6	7	0.20	182114	
					15	30.0	9.1	2.4	0.73	55.2	16.84	77	298.0	3.9	17	0.49	39178	
					16	83.0	25.3	3.4	1.04	62.4	19.02	77	298.0	8.7	38	1.09	111758	
					17	90.0	27.4	1.1	0.34	87.7	26.73	77	298.0	3.2	14	0.40	49594	
					18	16.0	4.9	2.4	0.73	55.2	16.84	77	298.0	3.9	17	0.49	20918	
					19	83.0	25.3	3.4	1.04	62.4	19.02	77	298.0	8.7	38	1.09	111758	
					20	57.0	17.4	2.2	0.67	57.0	17.37	77	298.0	3.2	14	0.40	79249	
					21	30.0	9.1	2.4	0.73	55.2	16.84	77	298.0	3.9	17	0.49	39178	
					23	49.0	14.9	2.2	0.67	35.1	10.69	77	298.0	2.1	9	0.26	64537	
					24	49.0	14.9	2.2	0.67	35.1	10.69	77	298.0	2.1	9	0.26	64537	
					25	72.0	22.0	0.8	0.24	265.3	80.85	77	298.0	2.1	9	0.26	92017	
					27	20.0	6.1	2.2	0.67	78.9	24.06	100	310.8	4.6	20	0.58	27728	
					31	49.0	14.9	2.0	0.61	63.6	19.40	77	298.0	2.9	13	0.37	68221	
					42	174.0	53.0	1.5	0.46	75.5	23.00	77	298.0	20.1	88	2.53	23880	
					43	174.0	53.0	1.5	0.46	94.3	28.75	77	298.0	2.3	10	0.29	260415	
					44	60.0	18.3	1.0	0.30	112.0	34.15	77	298.0	1.3	6	0.17	77393	
					45	60.0	18.3	1.0	0.30	112.0	34.15	77	298.0	1.3	6	0.17	77393	
					50	123.0	37.5	1.0	0.30	84.9	25.87	77	298.0	1.1	5	0.14	145926	
					--	33.0	10.1	2.4	0.73	55.2	16.84	196	364.1	2.9	13	0.37	69774	
					--	5.0	1.5	1.9	0.58	58.8	17.92	100	310.8	2.5	11	0.32	6990	Lowest
					--	95.0	29.0	1.5	0.46	37.7	11.50	77	298.0	1.1	5	0.14	117812	
					--	57.0	17.4	2.2	0.67	57.0	17.37	77	298.0	3.2	14	0.40	79249	
					--	73.0	22.3	1.9	0.58	76.4	23.29	77	298.0	2.9	13	0.37	110271	
					--	115.0	35.1	1.9	0.58	70.5	21.50	100	310.8	2.9	13	0.37	167244	
					--	33.0	10.1	2.4	0.73	55.2	16.84	196	364.1	1.6	7	0.20	129082	
					--	90.0	27.4	1.0	0.30	106.1	32.34	77	298.0	1.3	6	0.17	109917	
					--	34.0	10.4	1.1	0.34	107.0	32.61	77	298.0	1.6	7	0.20	45703	
					--	83.0	25.3	3.4	1.04	62.4	19.02	180	355.2	2.1	9	0.26	558454	
					--	57.0	17.4	2.2	0.67	57.0	17.37	157	342.4	2.1	9	0.26	140088	
					--	83.0	25.3	3.4	1.04	62.4	19.02	180	355.2	1.6	7	0.20	725990	
					--	83.0	25.3	1.3	0.40	80.3	24.49	77	298.0	1.6	7	0.20	116013	
					--	33.0	10.1	2.4	0.73	55.2	16.84	196	364.1	2.1	9	0.26	99294	
				LAFRGMM		5.0	1.5	1.9	0.58	58.8	17.92	100	310.8	2.5	11.1	17.06		
40HIL2900	Eastern Association Te	-2700	6400	EASTAT03	3	14	4.3	2.0	0.61	636.6	194.04	78	298.7	27.8	122	3.50	20810	

APIS Number	Facility/Source	Facility Relative Location Coordinate (in meters) X	Y	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diameter (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum PM Emissions (lb/hr)	(TPY)	(g/s)	Merged Stack Parameter M Test (a)	
					1	55	16.8	4.2	1.28	62.6	19.07	77	298.1	12.0	53	1.52	80852	
					2	70	21.3	0.5	0.15	25.5	7.76	77	298.1	0.1	0	0.01	87071	
					4	11	3.4	1.6	0.49	93.3	28.42	78	298.7	2.5	11	0.31	17557	
					6	11	3.4	1.1	0.34	78.9	24.05	77	298.1	1.0	5	0.13	17024	Lowest
					9	11	3.4	1.1	0.34	78.9	24.05	78	298.7	1.0	5	0.13	17058	
				EASTATB	1,2,4,6,9	11	3.4	1.1	0.34	78.9	24.05	77	298.1	16.6	73	2.10		
					11	15	4.6	2.5	0.76	268.2	81.76	77	298.1	18.3	80	2.30	22113	
					12	15	4.6	2.5	0.76	268.2	81.76	77	298.1	18.3	80	2.30	22113	
					13	15	4.6	2.5	0.76	268.2	81.76	77	298.1	18.3	80	2.30	22113	
					14	15	4.6	2.5	0.76	268.2	81.76	77	298.1	18.3	80	2.30	22113	
				EASTATB	,12,13,14	15	4.6	2.5	0.76	268.2	81.76	77	298.1	73.1	320	9.20		
40HIL2900	IMC-Agrico Co. (Port Su	-2800	5000	IACPTS01	1	65	19.8	8.0	2.44	41.4	12.63	150	338.7	43.8	192	5.52		
					2	68	20.7	6.0	1.83	55.1	16.80	79	299.3	11.1	49	1.40	195547	
					3	45	13.7	1.5	0.46	113.2	34.50	90	305.4	3.09	14	0.39	61511	
					4	7	2.1	1.1	0.34	105.2	32.07	120	322.0	1.54	7	0.19	10363	Lowest
					5	32	9.8	1.7	0.52	51.4	15.67	120	322.0	1.8	8	0.23	45658	
					6	18	5.5	1.1	0.34	105.2	32.07	120	322.0	1.54	7	0.19	27140	
					7	39	11.9	1.1	0.34	105.2	32.07	120	322.0	1.54	7	0.19	58721	
					8	97	29.6	1.1	0.34	61.4	18.71	77	298.1	0.9	4	0.11	136264	
					9	101	30.8	1.3	0.4	43.9	13.40	120	322.0	1.05	5	0.13	128463	
					12	10	3	2.0	0.61	132.6	40.43	100	310.9	5.94	26	0.75	14694	
				IACPTSBA	ALL	7	2.1	1.1	0.34	105.2	32.07	120	322.0	28.5	125	3.58		
40HIL2900	Nitram	-400	6500	NITRM06	6	173	52.7	15.0	4.57	19.1	5.84	100	310.9	28.2	124	3.55		
					3	90	27.4	4.5	1.37	35.3	10.76	260	399.8	4.1	18	0.52	334144	
					4	30	9.1	4.5	1.37	35.3	10.76	450	505.4	2.04	9	0.26	280573	
					8	36	11	1.9	0.58	47	14.33	77	298.1	0.6	3	0.08	155187	
					9	39	11.9	1.9	0.58	14.7	4.48	77	298.1	2.1	9	0.26	16150	Lowest
					10	63	19.2	0.3	0.09	106.1	32.34	77	298.1	0.12	1	0.02	58877	
					11	35	10.7	0.3	0.09	129.7	39.53	77	298.1	0.14	1	0.02	40107	
					12	35	10.7	5.0	1.52	35.4	10.79	101	311.5	9.24	40	1.16	56258	
				NITRMBA	3-12	39	11.9	1.9	0.58	14.7	4.48	77	298.1	18.3	80	2.32		
40HIL2900	CSX Transportation Inc	-1900	6500	CSXTR01	1	45	13.7	7.8	2.38	43.3	13.20	77	298.1	30.8	135	3.88		
				CSXTR11	11	60	18.3	9.0	2.74	10	3.05	78	298.7	28	123	3.53		
					2	3	0.9	0.5	0.15	636.6	194.04	77	298.1	1.9	8	0.24	3833	Lowest
					3	40	12.2	6.7	2.04	47.5	14.49	77	298.1	17.9	78	2.26	76214	
					4	40	12.2	2.2	0.67	63.6	19.38	77	298.1	1.9	8	0.24	103539	
					5	40	12.2	1.8	0.55	59.6	18.17	77	298.1	1.2	5	0.15	104665	
					6	4	1.2	0.5	0.15	360.8	109.96	77	298.1	1.1	5	0.14	4965	

APIS Number	Facility/Source	Facility Relative Location Coordinate (in meters) X	Y	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diameter (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum PM Emissions (lb/hr)	(TPY)	(g/s)	Merged Stack Parameter M Test (a)	
					7	3	0.9	0.5	0.15	275.9	84.08	77	298.1	0.8	4	0.10	3986	
					8	3	0.9	0.5	0.15	275.9	84.08	77	298.1	0.8	4	0.10	3986	
					9	36	11	3.3	1.01	37.2	11.34	77	298.1	3.93	17	0.50	59584	
					10	54	16.5	6.0	1.83	12.4	3.77	77	298.1	0.27	1	0.03	///////	
				CSXTRC9	2-10	3	0.9	0.5	0.15	636.6	194.04	77	298.1	29.8	131	3.76		
40HIL2900	Sulfuric Acid Trading C	-13900	-1000		1	25	7.6	1.7	0.52	15	4.56	405	480.4	1.38	6	0.17		
					2	25	7.6	1.7	0.52	15	4.56	405	480.4	1.38	6	0.17		
					3	0	0	0.0	0	0	0.00	0	255.4	0.51	2	0.06		
				SULFTC3	1,2,3	25	7.6	1.7	0.52	15	4.56	405	480.4	3.27	14	0.40		
40HIL2901	Tampa City McKay Bay	-2900	9400		1	160	45.7	4.3	1.30	70.0	21.30	440	500.0	7.0	31	0.88		
					2	160	45.7	4.3	1.30	70.0	21.30	440	500.0	7.0	31	0.88		
					3	160	45.7	4.3	1.30	70.0	21.30	440	500.0	7.0	31	0.88		
					4	160	45.7	4.3	1.30	70.0	21.30	440	500.0	7.0	31	0.88		
					5	57	17.4	2.0	0.61	11.2	3.41	200	366.5	0.4	2	0.05		
				MCKBAYC	1-5	160	45.7	4.3	1.30	70.0	21.30	440	500.0	28.36	124	3.57		
40MAN410	Tropicana Products, In	-16100	-41600		1	95	29	3.0	0.91	70.7	21.56	140	333.1	31.8	139	4.01	33779	Lowest
					2	95	29	3.0	0.91	70.7	21.56	140	333.1	31.8	139	4.01	33779	Lowest
					3	95	29	3.2	0.98	62.2	18.95	140	333.1	31.5	138	3.97	34780	
				TROPNC3	01-03	95	29	3.0	0.91	70.7	21.56	140	333.1	95.2	417	11.99		
					10	30	9.1	2.5	0.76	1.4	0.41	600	588.7	2.2	10	0.28	3559	
					11	71	21.6	6.3	1.92	25.2	7.69	441	500.4	17.39	76	2.19	109887	
					12	71	21.6	6.3	1.92	39.2	11.95	536	553.2	18.2	80	2.29	180535	
					14	103	31.4	6.3	1.92	22.4	6.83	489	527.0	21.5	94	2.71	120749	
					15	80	24.4	7.0	2.13	24.8	7.55	540	555.4	7.87	34	0.99	368262	
					16	80	24.4	12.0	3.66	54.3	16.55	268	404.3	1.75	8	0.22	///////	
					18	50	15.2	1.0	0.3	10.6	3.23	90	305.4	26.4	116	3.33	318	
					20	65	19.8	6.7	2.04	18.9	5.76	90	305.4	15.9	70	2.00	56922	
				TROPNC8	10-20	50	15.2	1.0	0.3	10.6	3.23	90	305.4	111.2	487	14.01		
40PNL5200	Golden Triangle Asphal	-29100	3600	GLDTRI01	1	40	12.2	4.0	1.22	68	20.74	280	410.9	980	4292	123.48		
40HIL2902	Hillsborough County R	5300	10200	HILRFC3	–	220	67.1	11.5	3.51	55.0	16.76	430	494.3	21.0	92	2.65		
40HIL2903	Graves Enterprises	200	2800	GRAVES0	1	14	4.3	12.0	3.66	10	3.05	1600	1144.3	80.0	350	10.08		
40HIL2900	TECO Hooker's Point	-4900	8500		1	280.0	85.3	11.3	3.44	20.0	6.10	295	419.3	29.9	11	3.77	538137	
					2	280.0	85.3	11.3	3.44	18.0	5.49	315	430.2	29.9	11	3.77	496914	
					3	280.0	85.3	12.0	3.66	26.0	7.93	322	434.3	41.1	16	5.18	596978	

Table A-2 . PM Emission Inventory of AAQS Sources Taken from FPL Manatee SCA

APIS Number	Facility/Source	Facility Relative Location Coordinate (in meters) X	Y	ISCST ID	APIS Src #	Stack Height (ft)	Stack Height (m)	Stack Diameter (ft)	Stack Diameter (m)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Temperature (°F)	Temperature (K)	Maximum PM Emissions (lb/hr)	(TPY)	(g/s)	Merged Stack Parameter M Test (a)	
					4	280.0	85.3	12.0	3.66	24.7	7.52	300	422.0	41.1	16	5.18	550080	
					5	280.0	85.3	11.3	3.44	34.4	10.48	347	448.2	61.0	23	7.69	484492	Lowest
					6	280.0	85.3	9.4	2.87	73.0	22.26	320	433.3	78.2	30	9.85	540635	
				TECHKC6	01-06	280.0	85.3	11.3	3.44	34.4	10.48	347	448.2	281.3	106.9	35.44		

Notes:

Some point sources provided by TECO PPS data were identifed with an APIS source number.

(a) M parameter used for merging multiple stacks at a single facility. Where M = (Stack ht (m) x Airflow (m³/s) x Exit Temperature (K)) / Maximum emissions (g/s), based on Screening Procedures for Estimating Air Quality Impacts From Stationary Sources (EP

UTM Coordinates of the Cargill Riverview F 362.9 3082.5

PM-10 CLASS II AREA
PSD INCREMENT INVENTORY

Facility	UTM East	UTM North	PM* (g/s)	Height+ (m)	Temperature (K)	Velocity** (m/s)	Diameter (m)
054 Agrico Chemical Pierce Shutdown 1987 P	403.7	3,079.0	5.04	24.38	320.8	21.25	2.44
054 Agrico Chemical Pierce P	403.7	3,079.0	3.92	~~28.96~~	683.0	14.75	1.77
055 Agrico South Pierce P	407.5	3,071.3	49.10	45.70	350.0	39.06	1.60
CF Industries Bonnie Mine Road P	408.4	3,082.4	15.27	42.70	298.0	21.60	0.80
CF Industries Bonnie Mine Road P	408.4	3,082.4	2.45	36.58	333.0	17.17	2.29
CF Industries Bonnie Mine Road P	408.4	3,082.4	4.95	41.45	333.0	18.05	2.83
Conserv Inc. P	398.7	3,084.2	28.91	45.72	349.7	10.31	2.29
Conserv Inc. P	398.7	3,084.2	4.92	12.80	310.8	10.60	1.22
FPC Bayboro C4	338.8	3071.3	8.14	12.2	755.4	6.54	6.98
FPC-Bartow TC2	342.4	3082.6	31.96	91.4	424.8	31.09	2.74
FPC-Bartow TD4	342.4	3082.6	12.8	13.7	772	22.25	5.27
FPC-Bartow TO3	342.4	3082.6	27.9	91.4	408.2	34.44	3.35
FPC-Bartow TO4	342.4	3082.6	0.04	9.1	541.5	5.18	0.91
FPC-Bartow TO9	342.4	3082.6	0.01	7.6	298.1	0.04	0.27
Farmland Industries Green Bay Plant	409.5	3,080.1	28.09	30.50	308.0	18.30	1.40
Florida Power & Light	367.2	3054.1	218	152.1	425.8	23.61	7.99
Hardee Power Station	404.8	3,057.4	1.89	22.90	389.0	23.90	4.88
IMC Ft. Lonesome	389.6	3,067.9	3.17	38.10	339.1	15.16	2.44
IMC Ft. Lonesome	389.6	3,067.9	3.14	38.10	339.1	16.80	2.44
IMC Ft. Lonesome	359.6	3,067.9	6.45	45.72	316.3	8.43	0.82
IMC Fertilizer Noralyn Mine	414.7	3,080.3	28.00	11.58	333.0	7.17	0.58
IMC/Uranium Recovery CF Industries	408.4	3,082.8	23.90	25.90	297.0	11.60	0.20
Lakeland City Power CT (Larsen)	409.2	3,102.8	1.89	30.48	783.0	28.22	5.79
Lakeland McIntosh	409.5	3,105.8	40.82	76.20	350.0	32.60	4.90
Lakeland McIntosh	409.5	3,105.8	14.00	45.70	419.0	23.77	2.74
Mobil-Electrophos Division Shut Down	405.6	3,079.4	15.95	30.48	319.1	12.34	1.31
TECO Big Bend	361.9	3,079.4	167.30	149.40	342.0	20.00	7.32
TECO Big Bend	361.9	3,057.0	54.61	149.35	341.9	18.21	7.32
TECO Polk KBA	402.5	3067.4	2.02	6.1	533	13.1	0.9
TECO Polk KBB	402.5	3067.4	7.43	45.7	400	16.79	5.8
TECO Polk KBC	402.5	3067.4	3.15	60.7	1033	9.14	1.07
WR Grace/Seminole	409.8	3,087.0	13.61	15.24	333.0	17.10	2.00
WR Grace/Seminole	409.8	3,087.0	4.68	60.96	347.0	25.10	1.52

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Additional PM/PM_{10} PSD Class II Increment-Consuming Sources

	UTM Coordinates		PM	Height	Temperature	Velocity	Diameter
	East	North	(g/s)	(m)	(K)	(m/s)	(m)
Hillsborough Co. Resource Recovery Facility	368.2	3092.7	2.65	67.1	494.3	16.76	3.51
Tampa City McKay Bay Refuse to Energy	360.0	3091.9	3.57	45.7	500.0	21.3	1.3
Tropicana	346.8	3040.9	11.99	29.0	333.1	21.56	0.91
Tropicana	346.8	3040.9	14.01	15.2	305.4	3.23	0.3

PINELLAS RRF 335.2 3084.1 9.46 No

APPENDIX B

CALPUFF MODEL ASSUMPTIONS AND APPROACHES

B.0 CALPUFF MODEL ASSUMPTIONS AND APPROACHES

B.1 INTRODUCTION

As part of the new source review requirements under Prevention of Significant Deterioration (PSD) regulations, new sources are required to address air quality impacts at PSD Class I areas. As part of the PSD analysis report submitted to the Florida Department of Environmental Protection (DEP), the air quality impacts due to the potential emissions of the Constellation North Pond facility are required to be addressed at the PSD Class I area of the Chassahowitzka National Wildlife Area (NWA). The Chassahowitzka NWA is located approximately 86 km north-northwest of Cargill Riverview and is the nearest Class I area to the project. The next closest PSD Class I area, the Everglades National Park is located approximately 237 km from the project.

The evaluation of air quality impacts are not only concerned with determining compliance with PSD Class I increments but also assessing a source's impact on Air Quality Related Values (AQRVs), such as regional haze. Further, compliance with PSD Class I increments can be evaluated by determining if the source's impacts are less than the proposed U.S. Environmental Protection Agency (EPA) Class I significant impact levels. The significant impact levels are threshold levels that are used to determine the type of air impact analyses needed for the project. If the new source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse affect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with Class I increments.

Currently there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and Federal Land Managers (FLM) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM) Phase 1 Report: Interim Recommendations for Modeling Long Range Transport and Impacts on Regional Visibility*

(EPA, 1993), referred to as the Phase 1 report; and

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the Phase 2 report.

The recommended modeling approaches from these documents are as follows:

- Phase 1 report: screening analysis (Level 1)
- Phase 2 report: screening analysis
- Phase 2 report: refined analysis

For the proposed Cargill AFI Plant expansion, air quality analyses were performed that assess the Project's impacts in the PSD Class I area of the Chassahowitzka NWA using the refined approach from the Phase 2 report for:

- Significant impact analysis; and
- Regional haze analysis.

The refined analysis approach was used instead of the screening analysis approach since the air quality impacts are based on generally more realistic assumptions, include more detailed meteorological data, and are estimated at locations at the Class I area.

B.2 GENERAL AIR MODELING APPROACH

The general modeling approach was based on using the Industrial Source Complex Short-term model (ISCST3, Version 99155) and the long-range transport model, California Puff model (CALPUFF, Version 5.2). The ISCST3 model is applicable for estimating the air quality impacts in areas that are within 50 km from a source. At distances beyond 50 km, the ISCST3 model is considered to overpredict air quality impacts because it is a steady-state model. At those distances, the CALPUFF model is recommended for use. Recently, the FLM have requested that air quality impacts, such as for regional haze, for a source located more than 50 km from a Class I area be predicted using the CALPUFF model. The Florida DEP has also recommended that the CALPUFF model be used to assess if the source has a significant impact at a Class I area located beyond 50 km from the source. As a result, a significant impact and regional haze analyses were performed using the CALPUFF model to assess the Project's impacts at the Chassahowitzka NWA.

The methods and assumptions used in the CALPUFF model were based on the latest recommendations for a screening analysis as presented in the *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998).

Based on discussions with DEP, the ISCST3 model can be used to determine the "worst-case" operating load and ambient temperature that produces a source's maximum impact at a Class I area. Based on that analysis, air quality impacts can then be predicted with the CALPUFF model using the "worst-case" operating scenario to compare the source's impacts to Class I significant impact levels and potential contribution to regional haze. For this Project, the ISCST3 model was used to determine the "worst-case" operating scenario that was then considered in the CALPUFF model. The methods and assumptions used in the ISCST3 were based on those presented in Section 6.0 of the PSD report.

A regional haze analysis was performed to determine the affect that the Project's emissions will have on background regional haze levels at the Chassahowitzka NWA. In the regional haze analysis, the change in visual range, as calculated by a deciview change, was estimated for the Project in accordance with the IWAQM recommendations. Based on those recommendations, the CALPUFF model is used to predict the maximum 24-hour average sulfate (SO_4), nitrate (NO_3), and fine particulate (PM_{10}) concentrations as well as ammonium sulfate ($(NH_4)_2SO_4$) and ammonium nitrate (NH_4NO_3) concentrations. The change in visibility due to a source, estimated as a percentage, is then calculated based on the change from background data .

The following sections present the methods and assumptions used to assess the refined significant impact and regional haze analyses performed for the Constellation North POnd Project. The results of these analyses are presented in Sections 6.0 and 7.0 of the PSD report.

B.3 MODEL SELECTION AND SETTINGS

The California Puff (CALPUFF, version 5.0) air modeling system was used to model to assess the project's impacts at the PSD Class I area for comparison to the PSD Class I significant impact levels and to the regional haze visibility criteria. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALPUFF meteorological and geophysical data preprocessor (CALMET, Version 5), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. CALMET was designed to process raw meteorological, terrain and land-use databases to be used in the air modeling analysis. The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. The processed data produced from CALMET was input to CALPUFF to assess the pollutant specific impact. Both CALMET and CALPUFF were used in a manner that is recommended by the IWAQM Phase 2 Report (EPA, 1998).

B.3.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing a Phase 2 refined modeling analyses that are presented in Table B-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table B-2.

B.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the Project's emission, stack, and operating data as well as building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model input. The PSD Analysis Report presents a listing of the Project's emissions and structures included in the analysis.

B.4 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted in an array of 13 discrete receptors located at the CNWR area. These receptors are the same as those used in the PSD Class I analysis performed for the PSD Analysis Report.

B.5 METEOROLOGICAL DATA

B.5.1 REFINED ANALYSIS

CALMET was used to develop the gridded parameter fields required for the refined modeling analyses. The follow sections discuss the specific data used and processed in the CALMET model.

B.5.2 CALMET SETTINGS

The CALMET settings contained in Table B-3 were used for the refined modeling analysis. With the exception of hourly precipitation data files, all input data files needed for CALMET were developed by the FDEP staff.

B.5.3 MODELING DOMAIN

A rectangular modeling domain extending 250 km in the east-west (x) direction and 280 km in the north-south (y) direction was used for the refined modeling analysis. The extent of the modeling domain was selected by the Florida DEP staff for predicting impacts at the Chassahowitzka NWA. The southwest corner of the domain is the origin and is located at 27 degrees north latitude and 83.5 degrees west longitude. This location is in the Gulf of Mexico approximately 110 km west of Venice, Florida. For the processing of meteorological and geophysical data, the domain contains 25 grid cells in the x-direction and 28 grid cells in the y-direction. The domain grid resolution is 10-km. The air modeling analysis was performed in the UTM coordinate system.

B.5.4 MESOSCALE MODEL – GENERATION 4 (MM4) DATA

Pennsylvania State University in conjunction with the NCAR Assessment Laboratory developed the MM4 data set, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create this data set (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and only allow for one data base set for the year 1990. The analysis used the MM4 data to initialize the CALMET wind field. The MM4 data have a horizontal spacing of 80 km and are used to simulate atmospheric variables within the modeling domain.

The MM4 subset domain was provided by FDEP and consisted of a 6 x 6- cell rectangle, with 80 km grid resolution, extending from the MM4 grid points (49,10) to (54, 15). These data were processed to create a MM4.DAT file, for input to the CALMET model.

The MM4 data set used in the CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

B.5.5 SURFACE DATA STATIONS AND PROCESSING

The surface station data processed for the CALPUFF analyses consisted of data from five NWS stations or Federal Aviation Administration (FAA) Flight Service stations for Gainesville, Tampa, Daytona Beach, Vero Beach, Fort Myers and Orlando. A summary of the surface station information and locations are presented in Table B-4. The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions. The surface station data were processed by FDEP into a SURF.DAT file format for CALMET input.

Because the modeling domain extends largely over water, C-Man station data from Venice was obtained. These data were processed by Florida DEP into an over-water surface station format (i.e., SEA*.DAT) for input to CALMET. The over-water station data include wind direction, wind speed and air temperature.

B.5.6 UPPER AIR DATA STATIONS AND PROCESSING

The analysis included three upper air NWS stations located in Ruskin, Apalachicola, and West Palm Beach. Data for each station were obtained from the Florida DEP in a format for CALMET input.

The data and locations for the upper air stations are presented in Table B-4.

B.5.7 PRECIPITATION DATA STATIONS AND PROCESSING

Precipitation data were processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation-recording stations located within the latitude and longitudinal limits of the modeling domain. Data for 14 stations were obtained in NCDC TD-3240 variable format and converted into a fixed-length format. The utility programs PXTRACT and PMERGE were then used to process the data into the format for the PRECIP.DAT file that is used by CALMET. A listing of the precipitation stations used for the modeling analysis is presented in Table B-5.

B.5.8 GEOPHYSICAL DATA PROCESSING

The land-use and terrain information data were developed by the FDEP for the modeling domain and were provided in a GEO.DAT file format for input to CALMET. Terrain elevations for each grid cell of the modeling domain were obtained from Digital Elevation Model (DEM) files obtained from US Geographical Survey (USGS). The DEM data was extracted for the modeling domain grid using the utility extraction program LCELEV. Land-use data were obtained from the USGS GIS.DAT which is based on the ARM3 data. The resolution of the GIS.DAT file is one-eighth of a degree in the east-west direction and one-twelfth of a degree in the north-south direction. Land-use values for the domain grid were obtained with the utility program CAL-LAND. Other parameters processed for the modeling domain by CAL-LAND include surface roughness, surface Albedo, Bowen ratio, soil heat flux, and leaf index field. The land-use parameter values were based on annual averaged values.

Table B-1. IWAQM Phase 2 Refined Modeling Analyses Recommendations [a]

Model Input/Output	Description
Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition. 3. Define background values for ozone and ammonia for area.
Processing	1. For PSD increments: Use highest, second highest 3-hour and 24-hour average SO_2 concentrations; highest, second highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10} and NO_2 concentrations. 2. For haze: process the 24-hour average SO_4, NO_3 and HNO_3 values; compute a 24-hour average relative humidity factor (f(RH)) for the day during which the highest concentration was predicted for each species; calculate extinction coefficients for each species; and compute percent change in extinction using the FLM supplied background extinction.

[a] *IWAQM Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998)

Table B-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, and NO_3, and PM_{10}
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	PCRAMMET (enhanced) for the screening analysis; CALMET for the refined analysis
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3 and PM_{10}
Model Processing	Highest predicted 24-hour SO_4, NO_3 and PM_{10} concentrations for year
Background Values [a]	Ozone: 80 ppb; Ammonia: 10 ppb

[a] Recommended values by the Florida DEP.

Table B-3. CALMET Settings

Parameter	Setting
Horizontal Grid Dimensions	250 by 280 km, 10 km grid resolution
Vertical Grid	9 layers
Weather Station Data Inputs	6 surface, 3 upper air, 14 precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	MM4 data, 80 km resolution, 6 x 6 grid, used for wind field initialization
Output	Binary hourly gridded meteorological data file for CALPUFF input

Table B-4. Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates Easting (km)	UTM Coordinates Northing (km)	Zone	Anemometer Height (m)
Surface Stations						
Tampa	TPA	12842	349.20	3094.25	17	6.7
Daytona Beach	DAB	12834	495.14	3228.05	17	9.1
Orlando	ORL	12815	468.96	3146.88	17	10.1
Gainesville	GNV	12816	377.40	3284.12	17	6.7
Vero Beach	VER	12843	557.52	3058.36	17	6.7
Fort Myers	FMY	12835	413.65	2940.38	17	6.1
Upper Air Stations						
Ruskin	TBW	12842	349.20	3094.28	17	NA
West Palm Beach	PBI	12844	587.87	2951.42	17	NA
Apalachicola	AQQ	12832	110.00[a]	3296.00	16	NA

[a] Equivalent coordinate for Zone 17; Zone 16 coordinate is 690.22 km.

Table B-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name (Florida)	Station Number	UTM Coordinates Easting (km)	Northing (km)	Zone
Brooksville 7 SSW	81048	358.03	3149.55	17
Daytona Beach WSO AP	82158	495.14	3228.09	17
Deland 1 SSE	82229	470.78	3209.66	17
Inglis 3 E	84273	342.63	3211.65	17
Lakeland	84797	409.87	3099.18	17
Lisbon	85076	423.59	3193.26	17
Lynne	85237	409.26	3230.30	17
Orlando WSO McCoy	86628	468.99	3146.88	17
Parrish	86880	366.99	3054.39	17
Saint Leo	87851	376.48	3135.09	17
St. Petersburg	87886	339.04	3072.21	17
Tampa WSCMO AP	88788	349.17	3094.25	17
Venice	89176	357.59	2998.18	17
Venus	89184	466.756	2996.09	17