ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

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MEMORANDUM

RECEIVED
FEB 07 2000
BUREAU OF AIR REGULATION

DATE: February 4, 2000

TO: Cleve Holladay, DEP

FROM: Noel Morera NM THRU: Richard C. Kirby IV, P.E RK

SUBJECT: Big Bend Transfer Co., LLC

Big Bend Transfer Co., LLC (BBTC) has submitted an application for a solid and molten sulfur handling facility. The facility will be minor by PSD standards. Some modeling was included with the application per Rule 62-212.600 FAC. Freeport McMoRan a competitor of BBTC has submitted some modeling of their own indicating that the National Ambient Air Quality Standards will be exceeded if this facility is built. Please check the modeling done by each of these facilities to determine if it was done correctly. Is there any state policy regarding doing PSD applicability on a minor source such as BBTC. Any assistance you can give will be greatly appreciated.

Modeling From Big Bend Transfer Company permit application

5.0 GENERAL

5.1 AIR QUALITY IMPACT ANALYSIS

F.A.C. Rule 62-212.600, sulfur storage and handling facilities, requires that the owner or operator of any proposed new or modified sulfur storage and handling facility that is within 5 km of either an air quality maintenance area for PM or a PSD Class I area provide the Department with an analysis of probable PM ambient air quality impacts that could result from operation of the facility. Rule 62-212.600 further requires that the owner or operator of a proposed new or modified sulfur storage and handling facility to provide the department with an analysis of the probable annual and maximum monthly sulfur particulate deposition rates. The proposed BBTC facility will be within 5 km of an air quality maintenance area. As such, BBTC is providing the following air dispersion modeling analysis to FDEP.

5.2 METHODOLOGY

5.2.1 PROJECT AMBIENT IMPACT ANALYSIS

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. Current FDEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be determined for a proposed project. 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.

A deposition analysis was performed to determine the maximum monthly and annual deposition rates that would result from the proposed solid sulfur process. The maximum monthly and annual rates were based on emissions from the proposed process, and were predicted in the vicinity of the proposed facility.

In general, when 5 years of meteorological data are used, the highest annual and the highest, second-highest (HSH) short-term concentrations are to be compared to the applicable AAQS and allowable PSD increments. The HSH 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 AAQS 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 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 screening analysis indicates that the highest concentrations are occurring in a selected area(s) of the grid and 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, 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 used, along with the emission inventory, meteorological data, and screening receptor grids used in the analysis, are presented in the following sections.

5.2.2 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 99155) dispersion model (EPA, 1995) was used to evaluate the maximum pollutant concentrations and deposition rate due to BBTC's proposed project. This model is maintained on the EPA's Technical Transfer Network (TTN) bulletin board service. A listing of ISCST3 model features is presented in Table 5-1. The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). In this analysis, the EPA regulatory default options were used to predict all maximum impacts. Based on the land-use within a 3-km radius of the proposed BBTC facility, the rural dispersion coefficients were used in the modeling analysis. The ISCST3 model was used to provide maximum PM_{10} concentrations for the annual and 24-hour averaging times.

5.2.3 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 Tampa International Airport and Ruskin, respectively. The 5-year period of meteorological data was from 1987 through 1991. The NWS station at Tampa International Airport, located approximately 23 km to the northwest of the proposed BBTC facility, was selected for use in the study because it is the closest primary weather station to the study area which is representative of the plant site.

The surface and upper air data were preprocessed into ISCST3 modeling format using the EPA PCRAMMET meteorological preprocessor. The processed variables include for each hour: the date, time, wind flow vector, wind speed, temperature, atmospheric stability class, and mixing height. For calculating maximum dry deposition rates, PCRAMMET was used to calculate additional meteorological parameters required for deposition analysis. The additional parameters included are the friction velocity, the Monin-Obukhov length, the roughness length, the global horizontal radiation, and the relative humidity. The global horizontal radiation and relative humidity were obtained from the Solar and Meteorological Surface Observations Network (SAMSON) data.

5.2.4 EMISSION INVENTORY

Source parameter data and emission rates for BBTC's proposed solid and molten sulfur operations are presented in Table 3-6. Sources with stacks were input to the ISCST3 model as point sources, while the fugitive sources were input to the ISCST3 model as volume sources. For the deposition analysis, particle-sizing information for each source was determined from the calculation procedures described in Rule 62.212.600. A summary of the particle sizing data for each source is included in Appendix I.

5.2.5 RECEPTOR LOCATIONS

For predicting maximum PM_{10} concentrations in the vicinity of the plant, a polar receptor grid comprised of 154 discrete and 252 regular grid receptors was used for the screening analysis. These receptors included 36 receptors located on the plant property boundary at 10 degree intervals, plus 134 additional off-property receptors at distances of 0.2, 0.3, 0.4, 0.7, 1.0, 1.3, 1.5, 2.0, 2.5, 3.0, 4.0, and 5.0 km from the location of the proposed package boiler stack which is the origin of the air modeling coordinate system. The 36 property boundary receptors used for the screening analysis are presented in Table 5-2.

Modeling refinements were performed by employing a polar receptor grid with a maximum spacing of 100 m along each radial and an angular spacing between radials of 2 degrees.

5.2.6 BUILDING DOWNWASH EFFECTS

All significant existing and proposed building structures located at the proposed BBTC facility and IMC-Agrico's adjacent facility were included in the air modeling analysis. The primary structure for the proposed solid/molten sulfur process is the 75-ft-tall sulfur storage building. The primary structure for the IMC-Agrico facility is the 100-ft-tall GTSP storage building. All existing IMC-Agrico building and proposed BBTC building structure information was 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. The dimensions for the structures are presented in Table 5-3.

5.3 MODELING RESULTS

5.3.1 AMBIENT AIR PM_{10} IMPACTS

The screening modeling analysis results for the vicinity of the plant are summarized in Table 5-4. Based on the screening modeling results (close to the property boundaries where the screening grid already provides less than 100-m receptor spacing), no refined receptor grid analysis was performed. The maximum predicted PM_{10} impacts are 4.2 and 22.8 $\mu g/m^3$ for the annual and 24-hour averaging period, respectively. This maximum annual impact is predicted to occur at a receptor located at 340°, 204 m from the modeling origin. The maximum 24-hour average impact is predicted to occur at a receptor located at 340°, 204 m.

5.3.2 DEPOSITION RATES

The maximum monthly and annual predicted PM deposition rates due to the proposed solid sulfur process only are summarized in Table 5-5. The maximum predicted monthly and annual PM deposition rates are 45.6 and 302 g/m^2, respectively.

Table 5-1. 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, 1998.

Table 5-2. Property Boundary Receptors Used in the Air Modeling Analysis

Relative Location[a]		Relative Location[a]	
Direction (degrees)	Distance (meters)	Direction (degrees)	Distance (meters)
10	194	190	396
20	201	200	415
30	220	210	450
40	235	220	503
50	301	230	504
60	414	240	449
70	584	250	410
80	1369	260	383
90	1353	270	370
100	1134	280	358
110	1141	290	348
120	780	300	323
130	607	310	257
140	509	320	211
150	450	330	220
160	415	340	204
170	396	350	194
180	390	360	192

[a] With respect to the boiler stack location

Table 5-3. Building Dimensions for Big Bend Transfer Co., LLC and IMC Agrico Plant Structures Used in the Modeling Analysis

	Actual Building Dimensions					
	Height		Length		Width	
Structure	ft	m	ft	m	ft	m
IMC-Agrico						
GTSP Storage Building	100	30.48	370	112.78	216	65.84
Big Bend Transfer Co., LLC						
Sulfur Storage Building	75	22.86	678	206.7	240	73.1
Melter Area Building	75	22.86	132	40.2	87	26.5

Table 5-4. Maximum Predicted PM_{10} Concentrations Due to the Proposed Solid Sulfur Process in the Vicinity of the Big Bend Transfer Co., LLC Facility - Screening Analyses

Averaging Time	Concentration (μg/m³)	Receptor Location[a]		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual				
1987	3.5	320	211	87123124
1988	3.1	340	204	88123124
1989	4.3	340	204	89123124
1990	3.6	320	211	90123124
1991	3.7	320	211	91123124
High 24-Hour				
1987	16.1	320	300	87032624
1988	18.1	340	204	88090724
1989	33.4	340	204	89091624
1990	21.6	340	204	90071524
1991	15.7	320	300	91071524

Note:
YYMMDDHH = Year, Month, Day, Hour Ending

Footnote:
[a] All receptor coordinates are reported with respect to the boiler stack location.

Table 5-5. Maximum Monthly and Annual PM Deposition Due to the Proposed Project

Averaging Time	Deposition[a] (g/m^2)	Receptor Location[b]		Time Period (YYMMDDHH)
		Direction (degree)	Distance (m)	
Annual				
	132	340	204	87123124
	203	340	204	88123124
	302	340	204	89123124
	167	340	204	90123124
	140	340	204	91123124
Monthly				
	20.7	340	204	87053124
	40.2	340	204	88013124
	45.6	340	204	89093024
	43.5	340	204	90103124
	22.5	340	204	91053124

Notes:
YYMMDDHH = Year, Month, Day, Hour Ending

Footnotes:
[a] Based on 5-year meteorological record, Tampa, 1987-91
[b] Relative to the boiler stack location

Freeport McMoRan

EARL, BLANK, KAVANAUGH & STOTTS
PROFESSIONAL ASSOCIATION
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February 1, 2000

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EPC of HC
AIR MANAGEMENT

Mr. Richard C. Kirby, IV, P.E.
Air Management Division
Hillsborough County -
Environmental Protection Commission
1410 North 21st Street
Tampa, FL 33605

RE: Big Bend Transfer Company Solid Sulphur Handling Air Pollution Construction Permit Application -
<u>Information and Request for Notice of Proposed Agency Action</u>

Dear Mr. Kirby:

This letter provides information on the above referenced air pollution construction permit application recently filed by Big Bend Transfer Co. ("BBTC") to construct Florida's first solid sulphur handling facility. As proposed, the facility would import more than 2,000,000 tons per year of solid sulphur into Big Bend, Florida where it would be melted into liquid form and trucked to plants in Polk and Hillsborough counties. This letter is written on behalf of our clients, Freeport McMoRan Sulphur, L.L.C. and Freeport McMoRan Development Company, L.L.C.

Freeport McMoRan Sulphur, L.L.C. and its predecessor companies have been environmentally responsible corporate citizens and taxpayers of Hillsborough County and Florida for almost 50 years. Starting in the 1950s, Freeport McMoRan Sulphur converted from solid sulphur to liquid sulphur handling in Florida. They have subsequently invested many millions of dollars in what they believe to be environmentally superior liquid sulphur handling technology minimizing environmental and safety impacts in Hillsborough County and elsewhere in Florida.

The unique nature of solid sulphur dust which is explosive, corrosive and biologically active make it difficult to effectively contain and control. In addition, unlike most other materials regulated by the EPC, the particulate generated by solid sulphur handling is biologically active and thus has other impacts on structures, soils, water and vegetation.

A review of the Big Bend air permit application by our clients and their engineering consultants (who have special expertise in sulphur regulatory matters and/or long experience in handling sulphur) reveals several issues of which the EPC should be aware:

1. The application does not present sufficient information to determine whether the proposed facility will meet applicable local, state and federal air pollution requirements;

2. The permit application omits several significant sources of emissions at the proposed facility;

3. Air quality modeling by Enviroplan Consultants of emissions indicates the proposed facility will result in violations of both the ambient PM_{10} standard and the PSD increment; and

4. Permit issuance will result in significant, cumulative adverse environmental impacts.

1. INCOMPLETENESS OF PERMIT APPLICATION

As noted above, our clients and their engineering consultants, with special expertise and experience in sulphur matters, do not believe the application presents sufficient information to determine whether or not the facility at issue will meet applicable local, state, and federal air pollution control requirements. Enclosed please find a review of the BBTC application prepared at my request by Steve Smallwood, P. E. As you know, Steve has considerable knowledge of sulphur as the lead author of both FDEP's Sulfur Study and FDEP's Sulfur Rule. Attached to Steve's memo you will find a list of questions he has on the permit application. It should also be noted that the application references wastewater treatment for the scrubber effluents (attachment BB-F1-C3-Process Flow Diagram), but provides no indication of the nature or location of such treatment system or the manner in which stormwater at the facility is being handled. These potential water pollution issues may need to be addressed in separate industrial or stormwater permits.

2. OMITTED EMISSIONS SOURCES

Enviroplan Consultants, which did much of the emissions work now incorporated into Florida's Sulphur Rule, reviewed the BBTC permit application and determined that at least two, and possibly more, sources of emissions were omitted from the application. These included emissions from movement of materials in the ship's hold and fugitive emissions from truck traffic within the Big Bend facility resulting from operation of the new sulphur handling facility. Both Steve Smallwood and Enviroplan have also noted the application's failure to use the best available data, including sulphur specific emission factors. One such sulphur specific emission factor was developed by Dr. Lundgren at the University of Florida for enclosed five foot drops of sulphur\[1] such as are planned

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[1] Please see DER Sulphur Report at page 8-10.

at the proposed Big Bend facility. Such a sulphur specific emissions factor would more accurately estimate sulphur emissions than does the non-sulphur specific AP-42 factor utilized by the applicants. It has also been noted by Freeport's consultants that use of the sulphur specific Lundgren emission factor results in substantially higher emissions than are reported in the permit application.

3. VIOLATIONS OF PM_{10} AMBIENT STANDARD AND PSD INCREMENT

Modeling performed by Enviroplan Consultants demonstrates that the proposed facility will result in violations of the 24 hour ambient standard for PM_{10}, as well as the PSD increment applicable to minor sources under Rule 62-212.300(1)(c), Florida Administrative Code. Please see attached tables with emissions and modeling results calculated by Enviroplan Consultants.

4. SIGNIFICANT, CUMULATIVE ENVIRONMENTAL IMPACTS ON TAMPA BAY REGION

In addition to the foregoing incompleteness and modeled violations of air quality standards, our clients believe it is also important that EPC understands the potential cumulative environmental impacts issuance of this permit may have due to:

a. Unique Properties and Impacts of Solid Sulphur: Solid sulphur emissions have unique environmental and safety impacts due to the explosive, corrosive, and biologically active nature of sulphur dust. These are discussed in detail in the Sulphur Report prepared by the Department of Environmental Regulation after an 18 month study in 1984.\[2] Thus, the offloading, handling, controls for, and enclosure of solid sulphur is not directly comparable to normal materials handling processes or controls with which EPC normally deals. Because it is biologically active and due to its corrosive nature, sulphur particulate also has secondary impacts on property, vegetation, soils and waters of the State.

b: Solid Sulphur Handling Is a Regressive Technology: Although there have been major strides in reducing the adverse environmental impacts of solid sulphur handling in recent years, it is still a regressive handling technology which is not the technology of choice for the regular offloading of sulphur in developed, environmentally concerned areas of the world. The regressive nature of solid sulphur technology appears to be confirmed by the permit applicants who note that the proposed facility is based upon sulphur ship offloading facilities located in such areas of the world as Brazil, Mexico and Jordan.

c. Proposed Solid Sulphur Throughput in Tampa May Result in Cumulative Impacts and Conversion to Solid Sulphur by Others: The applicants state that the proposed Big Bend facility will be the first of its kind to employ state of the art technology for offloading and handling solid sulphur. Nevertheless, the applicants seek to import more than 2,000,000 tons per year of solid sulphur into

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[2] We understand your office has received a copy of this report from Mr. Smallwood.

this untested facility. This is almost 50% of the total sulphur now entering Tampa Bay annually. If the assertions of the permit applicants are correct, granting the requested permit may compel our clients and other sulphur suppliers to convert existing Florida facilities to solid sulphur importation.\[3] This, of course, would result in primary and secondary cumulative environmental impacts on the air, soil and waters of the Tampa Bay region beyond those created by emissions from the proposed facility at issue.

REQUEST FOR NOTICE OF PROPOSED AGENCY ACTION

Pursuant to Chapters 120 and 403, Florida Statutes, please provide notice to our clients of any proposed action by EPC on this permit application. This request is made on behalf of our clients as citizens of Florida and/or as persons whose substantial environmental and economic interests may be adversely affected by any proposed action on this permit. This is to further request that we also be notified of any proposed action on Baghouse #4 at the adjacent IMC-Agrico facility which, as Mr. Smallwood's attached analysis notes, may be related to the present sulphur permit application. Please send notice to the undersigned at the above address.

Thank you for your consideration of the information set forth in this letter and the technical information provided by Enviroplan Consulting and Steve Smallwood, P.E. Please call if you have any questions or we can provide additional information.

Very truly yours,

EARL, BLANK,
KAVANAUGH & STOTTS, P.A.

William L. Earl
For the Firm

/mws
Encl.

cc: Mr. Roger Stewart
Executive Director
Hillsborough County
Environmental Protection Commission

[3] Freeport McMoRan has historically, and still occasionally does, handle solid sulphur forms outside of Florida. It is, therefore, acutely aware of and experienced in its environmental impacts and drawbacks, and the practical difficulty and dangers of controlling solid sulphur emissions.

Mr. Jerry Campbell
Director, Air Management
Hillsborough County
Environmental Protection Commission

Mr. Howard L. Rhodes, Director
Division of Air Resource Management
Florida Department of Environmental Protection

Deborah Getzoff, Esq.
Director of District Management
Southwest District
Department of Environmental Protection

Mr. James L. McDonald
Engineer IV - Air Program
Department of Environmental Protection

Mr. Larry George
Policy Analysis and Program Manager
Air Resources Management
Department of Environmental Protection

Ms. Suzanne Cooper
Agency on Bay Management

Mr. Richard M. Eckenrod,
Director
Tampa Bay National Estuary Program

Freeport McMoRan

COMPLETENESS ASSESSMENT

Big Bend Transfer Company's

Application for Air Construction Permit
2.24 Million Tons per Year
Solid Sulfur Storage and Handling Terminal

Gibsonton, Florida

Prepared by:

Stephen Smallwood, PE
Air Quality Services

Tallahassee, Florida

January 31, 2000

INTRODUCTION

The Big Bend Transfer Co. LLC filed a state air construction permit application on January 11, 2000, with the Air Management Division of the Hillsborough County Environmental Protection Commission (EPCHC) to construct a source of air pollution in Hillsborough County. The Specific Air Program Operating Agreement between the Florida Department of Environmental Protection (FDEP) and the EPCHC delegates authority to the EPCHC to process and act on this type of permit application on behalf of the State.

The first step in processing such an application is to determine if the application is complete -- that is, does the application provide all of the information the permitting office needs to:

1) Identify the applicable air pollution control and general FDEP permitting rules, and

2) Determine if the information in the application provides "reasonable assurance" that the proposed project will comply with those applicable rules and standards.

This report provides a preliminary assessment of the BBTC application. The assessment concludes that the application as filed is not complete, which is the case with most initial air permit applications. The report provides an analysis of the application in the order in which the information is presented in the state air permit application forms. Following the analysis and comments on each section of the application, the report lists the specific questions related to that section which need to be answered to provide reasonable assurance under the State's permitting rules. At the end of the technical analysis part of the report, all of the specific questions identified in the technical analysis part of the report are re-listed in an Appendix.

Although the proposed solid sulfur facility is technically a minor source for the purposes of the air permitting rules, the proposed facility would be the first solid sulfur facility operated in Florida since the early 1960s. Because Tampa is the largest sulfur importation port in the world, it is reasonable to expect that, if this permit is granted, other entities and brokers will also seek the opportunity to import solid sulfur into the Tampa Bay area. Most of the existing facilities offloading solid sulfur, in other parts of the world, as referenced by the permit applicant, can generally be described as located in third world countries.

Therefore, it is important and appropriate for the regulatory agencies charged with protecting the air and water quality of the Tampa Bay area to consider the regressive nature and cumulative impacts of a shift from liquid to solid sulfur storage and handling in the area. This report does not address the need, location, or permit which may be required for waste water treatment for scrubber effluent, as indicated on Attachment BB-F1-C3 of the permit application.

Author's Experience in Air Permitting and Sulfur Regulation

Stephen Smallwood, PE, is the former Director of the Florida Department of Environmental Protection's Air Resources Management Division. He currently lives in Tallahassee and works as an independent consultant, specializing in major air source permitting and the resolution of air enforcement cases.

During the early 1980s, when he served as the FDEP air program manager, he was responsible for conducting the Department's two year technical study of liquid and solid sulfur storage and handling technologies, which resulted in the Department's adoption of the Sulfur Storage and Handling rule (17-215 FAC), which applies to the proposed project.

During that same period of time he was also responsible for developing the State's Prevention of Significant Deterioration (PSD) new and modified source air permitting rules, obtaining delegation of the PSD program from the U.S. EPA, and implementing the State's PSD permitting program. Some aspects of the State's PSD program also apply to the proposed project.

TECHNICAL ANALYSIS OF PERMIT APPLICATION

PART I - APPLICATION FOR PERMIT

New or Modified Source

Part B - Report, Section 1.0, Introduction says the BBTC is proposing to construct a solid sulfur handling and storage facility adjacent to IMC-Agrico's existing phosphate materials storage and handling terminal, located in Gibsonton, FL. The use of a common dock and other existing IMC-Agrico facilities (See Attachment BB-F1-C2: Facility Plot Plan), and the listing of the existing permitted PM emissions in Table 3-7, Existing Source Inventory, suggests that the application is for a modification of an existing minor facility (the existing IMC-Agrico phosphate materials storage and handling terminal).

Questions:

(1). New or Modified Source.

(a) *Is this application for a modification to an existing facility?*

(b) *If BBTC is not proposing the new sulfur terminal as a modification of the existing facility, explain why the agency should conclude that the existing terminal and the proposed new terminal will not be "under common control," as that phase is used in the state and federal air rules defining a facility?*

(c) *Do the ambient air modeling results, reported in Part B, Section 5.3.1, Ambient Air PM_{10} Impacts, reflect the emissions from the existing and the new facility, or just the new sulfur terminal?*

(d) *Will recent requested changes proposed for the existing facility (Dust Collector No. 4) in the December 28, 1999 letter to Richard Kirby be considered in this or another proceeding?*

(e) *What SIC codes are currently used to classify the IMC-Agrico phosphate materials storage and handling terminal?*

PART II - FACILITY INFORMATION

Synthetic Minor / NSPS

A synthetic minor source or facility is one that would be a major source if certain federally enforceable permit conditions were not included in the permit for the source / facility. The EPA has adopted a series of technology-based emissions standards for various types of sources. These emission limits are usually referred to as New Source Performance Standards (NSPS). They have been adopted by reference by the FDEP as State rules.

Questions:

(2) Synthetic Minor / NSPS

(a) *Item 3: Which emissions units are synthetically limited and why?*

(b) *Item 5: Which emissions units at the new and the existing facility are subject to NSPS, other than the new package boiler and the new fuel tank for the new boiler?*

(c) *Part B- Report, Table 3-7, Existing Facility Emissions: Why is the existing emission rate from emission point No. 04 at the existing IMC-Agrico terminal being reduced from 11.27 lbs per hour to 5.0 lbs per hour?*

RULE APPLICABILITY
(See Part B, Section 4.0 of Application)

<u>**Tampa Bay PM AQMA**</u>

The application presents conflicting descriptions of whether the proposed site is within the area of influence of a Particulate Matter Air Quality Maintenance Area (PM AQMA). Part B - Report, Section 4.4, says the proposed site is within the area of influence of the PM AQMA and as such is subject to 62-296.700 (PM RACT). Section 5.1, Air Quality Impact Analysis, says the site <u>is</u> within 5 kilometers of an AQMA. In Table 4-2, Summary of Rule Requirements, under Compliance Measures, the Notes say in several places that the site is <u>not</u> within 5 kilometers of the PM AQMA.

Questions / Needed Information:

(3) **Updated Site Location Map.** *Provide a site location map that shows the location of the proposed construction site with respect to the closest boundary of the Tampa Bay Particulate Matter Air Quality Maintenance Area (PM AQMA), and show the distance in kilometers from the site to the nearest PM AQMA boundary.*

(4) **Correct Text / Table (Re: AQMA).** *Correct the Table and/or text to reflect whether the site is or is not within 5 kilometers of the PM AQMA.*

(5) **Property Boundary Map.** *Provide an updated plot plan that shows the property boundary of the new or modified facility.*

<u>**PSD Increment Consumption**</u>

In addition to the rules cited in the application, the General Prohibitions of Section 62-212.300 FAC prohibit the issuance of an air permit for any increase in emissions that would cause or contribute to a violation of any ambient air quality standard or PSD increment, regardless of whether the emissions are from a major or a minor source.

The application states that the proposed project is not subject to PSD new-source review requirements, but fails to address whether and to what extent the project would consume remaining available PSD increment, as required by the FDEP air rules. Nor does the application present modeling results that are adequate to show whether the PSD increments would or would not be violated.

Note: Ambient PM_{10} Modeling. *After identifying all PM emissions generating activities, an appropriate emissions factor for each, and the use of documented PM collection efficiencies, the ambient air modeling needs to be redone to reflect the use of the best available data to determine if the PM emissions from the proposed new sulfur terminal will cause or contribute to a violation of any PM_{10} ambient standard or PSD increment.* **See Questions / Needed Information No. 17, 18, 19 & 20 under Part III - Emissions Unit Information, Ambient Air Quality / PSD Modeling.**

Solid Sulfur Unloading, Transfer, & Storage

Solid Sulfur Pellets

The Florida Sulfur Storage & Handling rule only allows solid sulfur to be stored and handled at a facility of the type proposed, in the form of "standard sulfur pellets," as defined in the FDEP air rules, Section 62-210.200 (274) FAC. The definition requires the type of pellets to be used to not have an increase in bulk silt content of more than six percent after being subject to a SUDIC Stress Test II. The bulk silt content of a batch of sulfur pellets increases significantly as it moves from the production unit to the customer's plant.

An increase in the silt content of a bulk shipment generally results in increased dust emissions when the material is handled. The permit application uses silt and moisture data for a specific type of sulfur pellet. It is not clear that the silt content used is for the pellets as formed or after a SUDIC Stress Test II. It also is not clear whether the applicant is proposing to use just the type of pellet referenced in the application or any type of sulfur pellets that would meet the Florida definition of "standard sulfur pellets."

The application appears to rely heavily on a promise to utilize solid sulfur pellets with specific moisture and silt levels. However, the application provides no information to demonstrate the silt or moisture content upon offloading in Tampa or that sufficient quantities of solid sulfur pellets meeting the specifications will be available for processing.

Sulfur Storage & Handling Design and Work Practices

The Florida Sulfur Storage & Handling rule establishes a series of solid sulfur storage and Handling design and work practices in 62-296.411 FAC. The application does not describe what will be done to comply with each of these requirements.

Sulfur Ship Emissions

The application does not address the solid sulfur delivery ship's non-cargo emissions.

Questions / Needed Information:

(6) **Design & Work Practice Standards.** *Describe what will be done to comply with each applicable solid sulfur design and work practice standard in 62-296.411 FAC.*

(7) **Ship Emissions.** *What are the non-cargo emissions from the solid sulfur ship while docked at the terminal?*

(8) Solid Sulfur Pellets Characteristics / Availability

(a) The application states that the facility will unload and process 2,240,000 tons of solid sulphur. *Provide supporting information to demonstrate that sufficient quantities of solid sulphur pellets meeting the specifications detailed in the application will be available for processing.*

(b) On page 3-1, the application states that moisture and silt contents of the solid sulphur pellets are presented in Appendix B. That appendix appears to include only moisture content. *Please provide supporting documentation for the silt content stated in the application, and confirm that this is the silt content expected upon arrival in Tampa, as opposed to a manufacturing plant or marine loading terminal in Canada.*

(c) Appendix B appears to include specifications for solid sulphur as it is loaded onto ships in Canada prior to transport to the proposed facility. *Please provide documentation supporting solid sulphur specifications, including moisture and silt content, as the material is offloaded at the proposed Big Bend facility.*

(d) *Provide the results of the SUDIC Stress Test II for the type of sulfur pellet referenced in the application, as required by the FDEP's sulfur rule, Section 62-210.200 (274) FAC.*

Particulate Matter (PM) Emissions Estimates

There appear to be a number of deficiencies in the emissions estimates:

1) Table 3-1 does not account for the drop transfer from the last conveyor link to the pellet storage pile inside the storage building.

2) No estimate is provided for the use of a bobcat or other equipment to move sulfur to the bucket reclaimer when the sulfur level is low in the ship's hold or to maintain the pile within the storage building.

3) The application states that the storage building emissions will meet the regulatory limit without any supporting documentation that shows how the limit will be achieved.

The AP-42 emission factors referenced in the sulfur rule are not sulfur specific and are for fugitive emissions from paved and unpaved roads, construction activities, and outdoor stockpiles of materials such as shale, coal, and gravel. None of those emission factors are applicable to enclosed drop transfer points. Those activities were referenced in the rule because they can be significant sources of PM emissions at some sulfur storage and handling facilities. The intent of the sulfur rule, when adopted, was to allow the use of the referenced AP-42 emission factors as default estimates, if a sulfur-specific emission factor was not available for the type of activity being evaluated.

The Lundgren sulfur specific drop transfer emission factor (EF) was developed as part of the sulfur rule making by the University of Florida for Agrico Chemical Company. Information on the method used to develop the EF equation and the data on which it is based is in Chapter 8 of the 1984 Sulfur Report, which is part of the FDEP sulfur rule making file in Tallahassee.

The sulfur rule requires that each sulfur pellet drop transfer be no more than a five-foot drop. The Lundgren EF was developed to quantify the probable maximum particulate matter emissions that would result from such a sulfur pellet transfer for standard sulfur pellets with a bulk moisture content ranging from zero to four percent.

The original sulfur rule included a standard particle size distribution graph for uncontrolled standard sulfur pellet dust emissions, which is to be used in estimating the emission or deposition rates for various sulfur particulate particle size ranges, if better source specific data is not available. The PM_{30} & PM_{10} emissions factor multipliers used with the Lundgren EF are based on the data presented in that graph.

The application provides insufficient supporting documentation for the treatment efficiencies proposed for the enclosures, scrubbers, and water sprays.

Questions / Needed Information:

(9) Solid Sulfur Emissions.

(a) *Recalculate the solid sulfur PM_{30} & PM_{10} emissions for all solid sulfur drop transfer points, using the Lundgren emission factor as best available data:*

$$PM_{75} = 0.37\, k\, e^{-1.124\,(\%M)} \quad ; \quad k = 1.00$$

PM_{75} = lbs PM / Ton of sulfur pellets transferred for particles < 75 microns in diameter

%M = Weight percent moisture content of sulfur pellets

k = Particle size distribution multiplier

k = 0.74 for PM_{30}

k = 0.35 for PM_{10}

(b) *Account for all drop transfer points.*

(c) *If a bobcat or some other type of equipment will be needed to move the sulfur pellets to the bucket reclaimer, as the pellet level reaches the bottom of the ship's hold, account for the PM emissions due to that operation.*

(d) *If similar equipment is to be used to maintain the pellet storage pile inside the storage building, account for the PM emissions due to that operation.*

(e) *How will BBTC document that no more than 78,400 tons of solid sulfur are in the solid sulfur storage building at one time? Will there be a physical limitation that prevents more than this amount from being in the building at one time?*

(f) *In all cases, first calculate the uncontrolled PM_{30} & PM_{10} emissions based on the as-received bulk moisture content of the sulfur pellets. Then apply the documented fractional PM collection efficiencies for the type of control devices or measures to be used (i.e. scrubber, water sprays, partially enclosed building or ductwork, etc.) to the uncontrolled weight emission rates for each particle size interval listed in Appendix I of the application for the minus PM_{30} & minus PM_{10} size fractions to calculate the probable controlled PM_{30} & PM_{10} emissions.*

(g) *Provide documentation to support the fractional PM collection efficiencies for the type of control devices or measures to be used (enclosures, water sprays at transfer points and within the storage building, wet scrubbers, etc) as those efficiencies relate to control of solid sulphur particulate.*

(h) *Identify each transfer point and solid sulfur handling operation for which BBTC is proposing to conduct a DEP Method 9 visible emissions test twice during each shift in order to determine the effectiveness of the water spray system?*

Sulfur Fires and Explosions

Solid sulfur and in particular sulfur dust is flammable and explosive. A fire or explosion could interfere with the facility's ability to control emissions of particulate matter. The application fails to describe measures to be taken to minimize the potential for sparks, fires and explosions from handling solid sulfur, including the bucket unloader and ship hold activities, enclosed conveyors, and handling within the solid sulfur storage building.

Question:

(10) Solid Sulfur Handling Procedures. *Since sulfur dust is highly explosive (16 times more explosive than coal dust), and the application proposes an enclosed handling system, what measures will be taken to minimize the potential for sparks, fires, and explosions from handling solid sulphur, including the bucket unloader and ship hold activities, enclosed conveyors, and handling within the sulphur storage building?*

Sulfur Melter Emissions

Table 3-2 identifies the equivalent of three drop transfer points involved in moving solid sulfur pellets from the storage building to the sulfur melter. The PM emission factor used in the table is for the PM displaced from the vapor space of a liquid sulfur storage tank during the period the tank is being loaded. The emission factor used does not account for the PM generated by moving the pellets from the storage building to the melter.

Also, due to the water added to the sulfur pellets to suppress dust emissions, the PM emissions from the melter will include solid sulfur fines blown into the off-gasses from the melter by the steam generated in the melter. Due to the greater turbulence in the melter, the PM emissions from the melter would be significantly greater than from a liquid sulfur storage tank.

Questions / Needed Information:

(11) Sulfur Melter Emissions.

(a) *Use the Lundgren drop transfer EF to calculate the maximum annual and 24-hour uncontrolled PM emissions generated by this transfer operation.*

(b) *Provide a revised estimate of the uncontrolled PM_{30} & PM_{10} emissions from the melter that accounts for the additional PM emissions generated by the steam and melter turbulence.*

(c) *If the scrubber will control the PM emissions from the transfer of sulfur pellets to the melter, as well as the PM emissions generated in the melter, add the two streams together to estimate the total uncontrolled PM_{30} & PM_{10} emissions to the scrubber. Use documented fractional collection efficiencies for the intervals listed in Table I-1 thru 6, for the scrubber to be used, to calculate the probable maximum annual and 24-hour PM_{30} & PM_{10} controlled emissions from the scrubber stack.*

(d) *Provide design calculations for the scrubber to be used that demonstrate that the scrubber design can handle the high heat load so the scrubber water will not boil, that the fan design can handle the pressure drop needed to maintain the scrubber's design collection efficiency, and that adequate scrubber water blowdown has been provided.*

(e) *Provide documentation to support the fractional PM collection efficiencies for the type of control devices or measures to be used (enclosures, water sprays at transfer points, or the wet scrubber for the melter, etc, as those efficiencies relate to control of solid sulphur particulate.*

(f) *The Facility plot plan in the application shows a process purge storage tank. What is its function? What emissions are associated with its use?*

(g) *What emissions occur from the mixing of lime with the sulfur prior to melting?*

(h) *Since the worst case visible emissions from the Lime and the Diatomaceous Earth Silos should occur during the transfer of material from the trucks to the silos, what will be the maximum materials loading rate to each silo?*

Liquid Sulfur Storage, Handling, & Truck Loading

Sulfur Storage & Handling Design and Work Practices

The Florida Sulfur Storage & Handling rule establishes a series of liquid sulfur storage and Handling design and work practices in 62-296.411 FAC. The application does not describe what will be done to comply with each of these requirements.

Liquid Sulfur Storage Tanks

Several questions arise regarding the emissions calculations for liquid sulfur storage, handling, and truck loading. For example, the application fails to provide an explanation of the basis of the ventilation rates used to calculate the liquid sulfur storage tank emissions.

Questions / Needed Information:

(12) Design & Work Practice Standards. *Describe what will be done to comply with each applicable liquid sulfur design and work practice standard in 62-296.411 FAC.*

(13) Liquid Sulfur Storage Tanks.

(a) *Explain and document how the "ventilation rates" used in calculating the emission rates for the tanks were determined.*

(b) *Why was an estimate of the PM emissions from the tanks not provided for the time during which the tanks were not being loaded?*

(c) *Provide an estimate of the uncontrolled PM_{10} emissions for the storage tanks and the liquid sulfur tanker trucks for both loading and idle time.*

(d) *Use documented collection efficiencies for the 0-10 micron range of the intervals listed in Table I -1 thru 6, for the scrubber to be used, to calculate the probable controlled emission rate of PM_{10} emissions from the scrubber stack.*

(e) *If the liquid storage tanks are to be sealed, when they are not being loaded or unloaded, does this create any explosion, fire, or other hazard? If so, what measures will be used to prevent a fire, explosion or other hazard?*

Liquid Sulfur Truck Vapor Capture System

Page 2-3 of the application states that vapor from the truck loading station will be controlled using a wet scrubber, but fails to describe how those emissions will be captured and routed to the scrubber.

Question:

(14) Liquid Sulfur Truck Loading. *How will the emissions from truck loading be captured and routed to the scrubber?*

Liquid Sulfur Tanker Truck Traffic

The liquid sulfur tanker trucks that would deliver the re-melted sulfur to the Terminal's customers would generate a significant amount of fugitive particulate emissions within the facility due to on-site truck traffic. The application does not address this source of particulate emission.

Question:

(15) Liquid Sulfur Tanker Truck Traffic. *What is the estimated amount of the fugitive PM_{30} & PM_{10} emissions that will occur as a result of the truck traffic involved in distributing the re-melted (liquid) sulfur to the new terminal's customers?* Use the estimating procedures in AP-42, Section 13.2, most recent edition.

Deposition Modeling

After the particulate emissions estimates have been corrected, the deposition modeling needs to be redone to reflect the revised emissions data.

Question / Needed Information:

(16) Sulfur Particulate Deposition Modeling. *Based on the revised particulate emissions estimates and the appropriate documented fractional collection efficiencies for the particle size intervals listed in Table I-1 thru 6, recalculate the controlled emission rate for each particle size interval for each source of sulfur particulate emission (point and fugitive, annual and 24-hour maximum), and then recalculate the maximum 24-hour, monthly, and annual deposition rates based on this updated data.*

Ambient Air Quality/PSD Modeling

After the particulate emissions estimates have been corrected, the PM_{10} ambient air modeling needs to be redone to reflect the revised emissions data. Since the application does not address the PSD increments, there is no information on how much of the increment has been consumed within the baseline area since 1977's baseline concentration, nor does the application address how much of the PSD increment would be consumed by the proposed facility. Typically, an air quality modeling protocol, outlining methods and assumptions to be included in the modeling, is submitted to the permitting agency for approval prior to doing the modeling.

Questions / Needed Information:

(17) *Determine the amount of the PM_{10} PSD increments and the amount of the PM_{10} ambient air quality standards that will be consumed by the proposed project.*

(18) *Determine the amount of the PM_{10} PSD increments and the amount of the PM_{10} ambient air quality standards that will be consumed by the proposed project and all other PM_{10} emissions sources that have a significant impact on the receptor points for which the proposed project would have a significant impact.*

(19) *Prior to redoing the ambient air quality modeling, submit a proposed air modeling protocol to the permitting office, and obtain agency approval of the protocol, prior to redoing the modeling. Identify the closest point(s) of public access to the proposed facility.*

(20) *Submit the detailed results of the ambient air quality modeling to the air permitting office, or to the FDEP New Source Review Section in Tallahassee, as requested by the permitting office, for review and approval.*

Stephen Smallwood, PE
Air Quality Services

January 31, 2000

APPENDIX: ADDITIONAL INFORMATION NEEDED

Big Bend Transfer Company's

Application for Air Construction Permit
2.24 Million Tons per Year
Solid Sulfur Storage and Handling Terminal

Prepared by:

Stephen Smallwood, PE
Air Quality Services

January 31, 2000

PART I - APPLICATION FOR PERMIT

(1) **New or Modified Source.**

(a) *Is this application for a modification to an existing facility?*

(b) *If BBTC is not proposing the new sulfur terminal as a modification of the existing facility, explain why the agency should conclude that the existing terminal and the proposed new terminal will not be "under common control," as that phase is used in the state and federal air rules defining a facility?*

(c) *Do the ambient air modeling results, reported in Part B, Section 5.3.1, Ambient Air PM_{10} Impacts, reflect the emissions from the existing and the new facility, or just the new sulfur terminal?*

(d) *Will recent requested changes proposed for the existing facility (Dust Collector No. 4) in the December 28, 1999 letter to Richard Kirby be considered in this or another proceeding?*

(e) *What SIC codes are currently used to classify the IMC-Agrico phosphate materials storage and handling terminal?*

PART II - FACILITY INFORMATION

RULE APPLICABILITY
(See Part B, Section 4.0 of Application)

(2) Synthetic Minor / NSPS

(a) *Item 3: Which emissions units are synthetically limited and why?*

(b) *Item 5: Which emissions units at the new and the existing facility are subject to NSPS, other than the new package boiler and the new fuel tank for the new boiler?*

(c) *Part B- Report, Table 3-7, Existing Facility Emissions: Why is the existing emission rate from emission point No. 04 at the existing IMC-Agrico terminal being reduced from 11.27 lbs per hour to 5.0 lbs per hour?*

(3) Updated Site Location Map. *Provide a site location map that shows the location of the proposed construction site with respect to the closest boundary of the Tampa Bay Particulate Matter Air Quality Maintenance Area (PM AQMA), and show the distance in kilometers from the site to the nearest PM AQMA boundary.*

(4) Correct Text / Table (Re: AQMA). *Correct the Table and/or text to reflect whether the site is or is not within 5 kilometers of the PM AQMA.*

(5) Property Boundary Map. *Provide an updated plot plan that shows the property boundary of the new or modified facility.*

PART III - EMISSIONS UNIT INFORMATION

Solid Sulfur Unloading, Transfer, & Storage

(6) Design & Work Practice Standards. *Describe what will be done to comply with each applicable solid sulfur design and work practice standard in 62-296.411 FAC.*

(7) Ship Emissions. *What are the non-cargo emissions from the solid sulfur ship while docked at the terminal?*

(8) Solid Sulfur Pellets Characteristics / Availability

(a) The application states that the facility will unload and process 2,240,000 tons of solid sulphur. *Provide supporting information to demonstrate that sufficient quantities of solid sulphur pellets meeting the specifications detailed in the application will be available for processing.*

(b) On page 3-1, the application states that moisture and silt contents of the solid sulphur pellets are presented in Appendix B. That appendix appears to include only moisture content. *Please provide supporting documentation for the silt content stated in the application, and confirm that this is the silt content expected upon arrival in Tampa, as opposed to a manufacturing plant or marine loading terminal in Canada.*

(c) Appendix B appears to include specifications for solid sulphur as it is loaded onto ships in Canada prior to transport to the proposed facility. *Please provide documentation supporting solid sulphur specifications, including moisture and silt content, as the material is offloaded at the proposed Big Bend facility.*

(d) *Provide the results of the SUDIC Stress Test II for the type of sulfur pellet referenced in the application, as required by the FDEP's sulfur rule, Section 62-210.200 (274) FAC.*

(9) Solid Sulfur Emissions.

(a) *Recalculate the solid sulfur PM_{30} & PM_{10} emissions for all solid sulfur drop transfer points, using the Lundgren emission factor as best available data:*

$$PM_{75} = 0.37\,k\,e^{-1.124\,(\%M)} \quad ; \quad k = 1.00$$

PM_{75} = lbs PM / Ton of sulfur pellets transferred for particles < 75 microns in diameter

%M = Weight percent moisture content of sulfur pellets

k = Particle size distribution multiplier

k = 0.74 for PM_{30}

k = 0.35 for PM_{10}

(b) *Account for all drop transfer points.*

(c) *If a bobcat or some other type of equipment will be needed to move the sulfur pellets to the bucket reclaimer, as the pellet level reaches the bottom of the ship's hold, account for the PM emissions due to that operation.*

(d) *If similar equipment is to be used to maintain the pellet storage pile inside the storage building, account for the PM emissions due to that operation.*

(e) *How will BBTC document that no more than 78,400 tons of solid sulfur are in the solid sulfur storage building at one time? Will there be a physical limitation that prevents more than this amount from being in the building at one time?*

(f) *In all cases, first calculate the uncontrolled PM_{30} & PM_{10} emissions based on the as-received bulk moisture content of the sulfur pellets. Then apply the documented fractional PM collection efficiencies for the type of control devices or measures to be used (i.e. scrubber, water sprays, partially enclosed building or ductwork, etc.) to the uncontrolled weight emission rates for each particle size interval listed in Appendix I of the application for the minus PM_{30} & minus PM_{10} size fractions to calculate the probable controlled PM_{30} & PM_{10} emissions.*

(g) *Provide documentation to support the fractional PM collection efficiencies for the type of control devices or measures to be used (enclosures, water sprays at transfer points and within the storage building, wet scrubbers, etc) as those efficiencies relate to control of solid sulphur particulate.*

(h) *Identify each transfer point and solid sulfur handling operation for which BBTC is proposing to conduct a DEP Method 9 visible emissions test twice during each shift in order to determine the effectiveness of the water spray system?*

(10) Solid Sulfur Handling Procedures. *Since sulfur dust is highly explosive (16 times more explosive than coal dust), and the application proposes an enclosed handling system, what measures will be taken to minimize the potential for sparks, fires, and explosions from handling solid sulphur, including the bucket unloader and ship hold activities, enclosed conveyors, and handling within the sulphur storage building?*

(11) Sulfur Melter Emissions.

(a) *Use the Lundgren drop transfer EF to calculate the maximum annual and 24-hour uncontrolled PM emissions generated by this transfer operation.*

(b) *Provide a revised estimate of the uncontrolled PM_{30} & PM_{10} emissions from the melter that accounts for the additional PM emissions generated by the steam and melter turbulence.*

(c) *If the scrubber will control the PM emissions from the transfer of sulfur pellets to the melter, as well as the PM emissions generated in the melter, add the two streams together to estimate the total uncontrolled PM_{30} & PM_{10} emissions to the scrubber. Use documented fractional collection efficiencies for the intervals listed in Table I-1 thru 6, for the scrubber to be used, to calculate the probable maximum annual and 24-hour PM_{30} & PM_{10} controlled emissions from the scrubber stack.*

(d) *Provide design calculations for the scrubber to be used that demonstrate that the scrubber design can handle the high heat load so the scrubber water will not boil, that the fan design can handle the pressure drop needed to maintain the scrubber's design collection efficiency, and that adequate scrubber water blowdown has been provided.*

(e) *Provide documentation to support the fractional PM collection efficiencies for the type of control devices or measures to be used (enclosures, water sprays at transfer points, or the wet scrubber for the melter, etc, as those efficiencies relate to control of solid sulphur particulate.*

(f) *The Facility plot plan in the application shows a process purge storage tank. What is its function? What emissions are associated with its use?*

(g) *What emissions occur from the mixing of lime with the sulfur prior to melting?*

(h) *Since the worst case visible emissions from the Lime and the Diatomaceous Earth Silos should occur during the transfer of material from the trucks to the silos, what will be the maximum materials loading rate to each silo?*

Liquid Sulfur Storage, Handling, & Truck Loading

(12) Design & Work Practice Standards. *Describe what will be done to comply with each applicable liquid sulfur design and work practice standard in 62-296.411 FAC.*

(13) Liquid Sulfur Storage Tanks.

(a) *Explain and document how the "ventilation rates" used in calculating the emission rates for the tanks were determined.*

(b) *Why was an estimate of the PM emissions from the tanks not provided for the time during which the tanks were not being loaded?*

(c) *Provide an estimate of the uncontrolled PM_{10} emissions for the storage tanks and the liquid sulfur tanker trucks for both loading and idle time.*

(d) *Use documented collection efficiencies for the 0-10 micron range of the intervals listed in Table I-1 thru 6, for the scrubber to be used, to calculate the probable controlled emission rate of PM_{10} emissions from the scrubber stack.*

(e) *If the liquid storage tanks are to be sealed, when they are not being loaded or unloaded, does this create any explosion, fire, or other hazard? If so, what measures will be used to prevent a fire, explosion or other hazard?*

(14) **Liquid Sulfur Truck Loading.** *How will the emissions from truck loading be captured and routed to the scrubber?*

(15) **Liquid Sulfur Tanker Truck Traffic.** *What is the estimated amount of the fugitive PM_{30} & PM_{10} emissions that will occur as a result of the truck traffic involved in distributing the re-melted (liquid) sulfur to the new terminal's customers?* Use the estimating procedures in AP-42, Section 13.2, most recent edition.

Deposition Modeling

(16) **Sulfur Particulate Deposition Modeling.** *Based on the revised particulate emissions estimates and the appropriate documented fractional collection efficiencies for the particle size intervals listed in Table I-1 thru 6, recalculate the controlled emission rate for each particle size interval for each source of sulfur particulate emission (point and fugitive, annual and 24-hour maximum), and then recalculate the maximum 24-hour, monthly, and annual deposition rates based on this updated data*

Ambient Standards / PSD Increment Consumption

(17) *Determine the amount of the PM_{10} PSD increments and the amount of the PM_{10} ambient air quality standards that will be consumed by the proposed project.*

(18) *Determine the amount of the PM_{10} PSD increments and the amount of the PM_{10} ambient air quality standards that will be consumed by the proposed project and all other PM_{10} emissions sources that have a significant impact on the receptor points for which the proposed project would have a significant impact.*

(19) *Prior to redoing the ambient air quality modeling, submit a proposed air modeling protocol to the permitting office, and obtain agency approval of the protocol, prior to redoing the modeling. Identify the closest point(s) of public access to the proposed facility.*

(20) *Submit the detailed results of the ambient air quality modeling to the air permitting office, or to the FDEP New Source Review Section in Tallahassee, as requested by the permitting office, for review and approval.*

Freeport McMoRan

Emissions Inventory (Annual PM10) for the BBTC Facility

Source	Annual PM10 Emissions (TPY)	
	Existing BBTC Applic.	BBTC Applic. with Omitted Sources
Ship Unloading		
Bucket reclaimer	0.18	0.18
Ship unloader 2101	0.18	0.18
Conveyor 2101 to 2102	0.18	0.18
Conveyor 2102 to 2110	0.18	0.18
Pile maintenance & transport	-	0.20
Solid Sulfur Storage and Reclaim System Conveyor 2110 to stacker Stacker to storage pile Storage pile to conveyor 2106 Conveyor 2106 to 2107 Pile maintenance	10.29	10.29
Solid Sulfur Melting	12.35	12.35
Molten Sulfur Storage & Handling	0.54	0.54
Lime & Diatomaceous Earth Transfer & Storage	0.96	0.96
Package Boiler	2.19	2.19
Vehicle Traffic on Facility Paved Roads	-	22.24
TOTAL	**27.05**	**49.49**

Modeling Results for BBTC and BBTC With Omitted Sources

Scenario	BBTC Emission Inventory Without Inclusion of Existing IMC-Agrico Dust Collectors			BBTC Emission Inventory With Inclusion of the Existing IMC-Agrico Dust Collectors, Pile Maintenance and Transport in the Ship Unloading Operation, and Vehicle Traffic on Facility Paved Roads		
	Highest Second-High Predicted 24-Hour PM10 Concentration (μg/m³)	Highest 4th-High Predicted 24-Hour PM10 Concentration Per Rolling 3-Year Period (μg/m³)	Highest Predicted Annual Average PM10 Concentration (μg/m³)	Highest Second-High Predicted 24-Hour PM10 Concentration (μg/m³)	Highest 4th-High Predicted 24-Hour PM10 Concentration Per Rolling 3-Year Period (μg/m³)	Highest Predicted Annual Average PM10 Concentration (μg/m³)
Maximum Predicted Concentrations	25.0	25.0	5.8	218.9	218.9	30.0
PSD Class II Increments	30	-	17	30	-	17
National Ambient Air Quality Standards	-	150[a]	50	-	150[a]	50
Location(x,y) [b]	(-69.77, 191.70) [c]	(-69.77, 191.70) [c]	(-69.77, 191.70) [c]	(1270.40, -60.80) [d]	(1270.40, -60.80) [d]	(1270.40, -60.80) [d]

Notes:

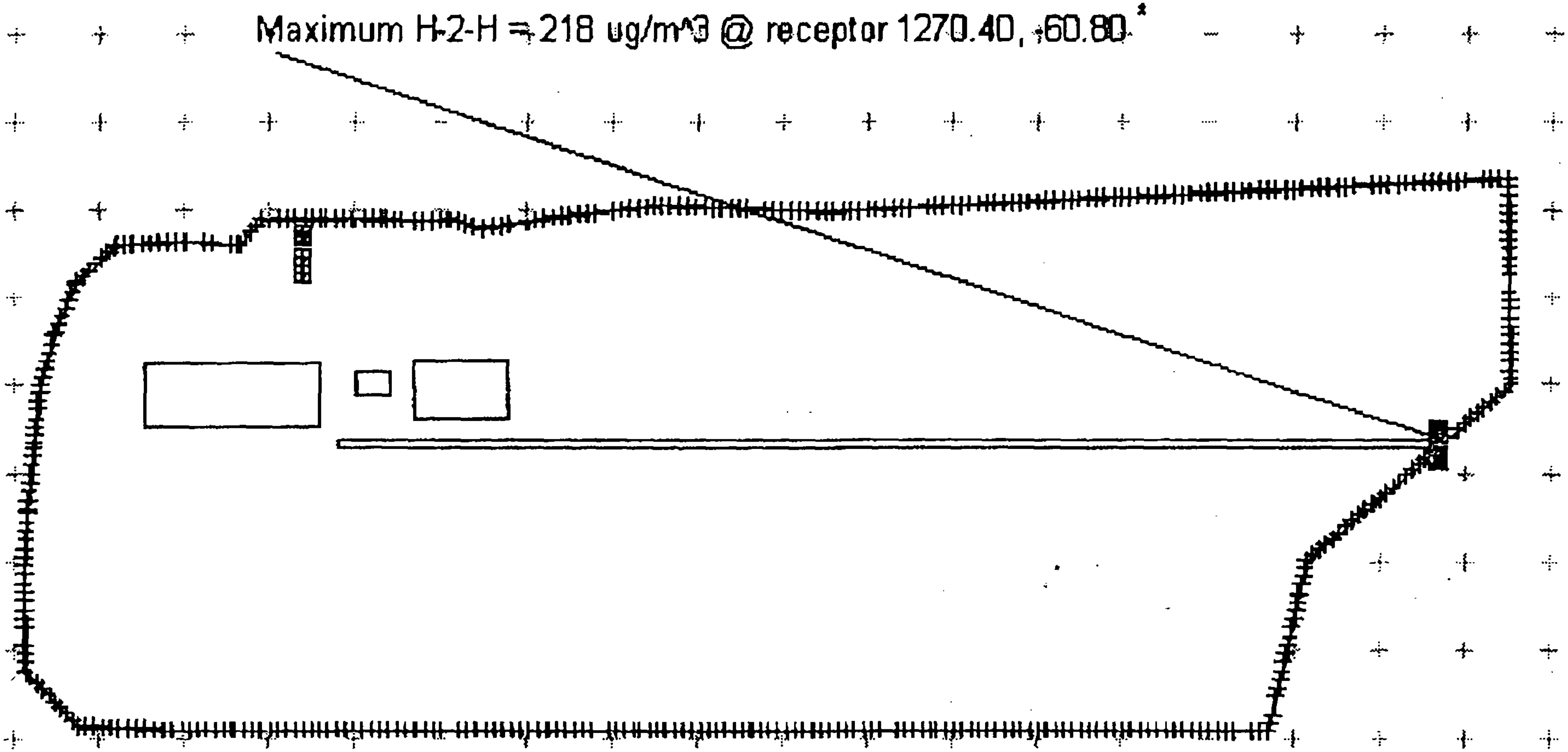
(a) The 24-hour National Ambient Air Quality Standard is based on the fourth highest concentration in any three rolling calendar years.

(b) All receptor locations are in (x.y) coordinates in meters relative to the location of the BBTC Package Boiler Source #8.

(c) This location is over the water next to the ship along the northern property boundary.

(d) This location is at ground level at the plant paved road entrance gate to the BBTC facility

Big Bend with baghouses on Agrico property, Additional Batch Drop in Ship Unloading Operation and Paved Road.



* (x,y) coordinates in meters relative to the location of the Big Bend Package Boiler source #8

Emissions Inventory (Annual PM10) and Modeling Results for the BBTC Facility Using Sulfur-Specific Emission Factor

Source	Annual PM10 Emissions (TPY) BBTC Applic. with Omitted Sources and Sulfur-Specific Emission Factor
Ship Unloading	
Bucket reclaimer	9.52
Ship unloader 2101	9.52
Conveyor 2101 to 2102	9.52
Conveyor 2102 to 2110	9.52
Pile maintenance & transport	0.20
Solid Sulfur Storage and Reclaim System	-
Conveyor 2110 to stacker	9.52
Stacker to storage pile	9.52
Storage pile to conveyor 2106	9.52
Conveyor 2106 to 2107	9.52
Pile maintenance	0.09
Solid Sulfur Melting	12.35
Molten Sulfur Storage & Handling	0.54
Lime & Diatomaceous Earth Transfer & Storage	0.96
Package Boiler	2.19
Vehicle Traffic on Facility Paved Roads	22.24
TOTAL	114.73

SCENARIO: BBTC Emission Inventory with the AP-42 Batch Drop Emission Factor Replaced by Sulfur-Specific Batch Drop Emission Factor and Inclusion of the Existing IMC-Agrico Dust Collectors, Pile Maintenance and Transport in the Ship Unloading Operation, Additional Batch Drop and Pile Maintenance Within the Sulfur Storage Building, and Vehicle Traffic on Facility Paved Roads

	Highest Second High Predicted 24-Hour PM10 Concentration (µg/m³)	Highest 4th-High Predicted 24-Hour PM10 Concentration Per Rolling 3-Year Period (µg/m³)	Highest Predicted Annual Average PM10 Concentration (µg/m³)
Maximum Predicted Concentrations	610.8	552.3	102.9
PSD Class II Increments	30	-	17
National Ambient Air Quality Standards	-	150[a]	50
Location(x,y) [b]	(-59.77, 191.52) [c]	(-59.77, 191.52) [c]	(-128.99, 169.12) [c]

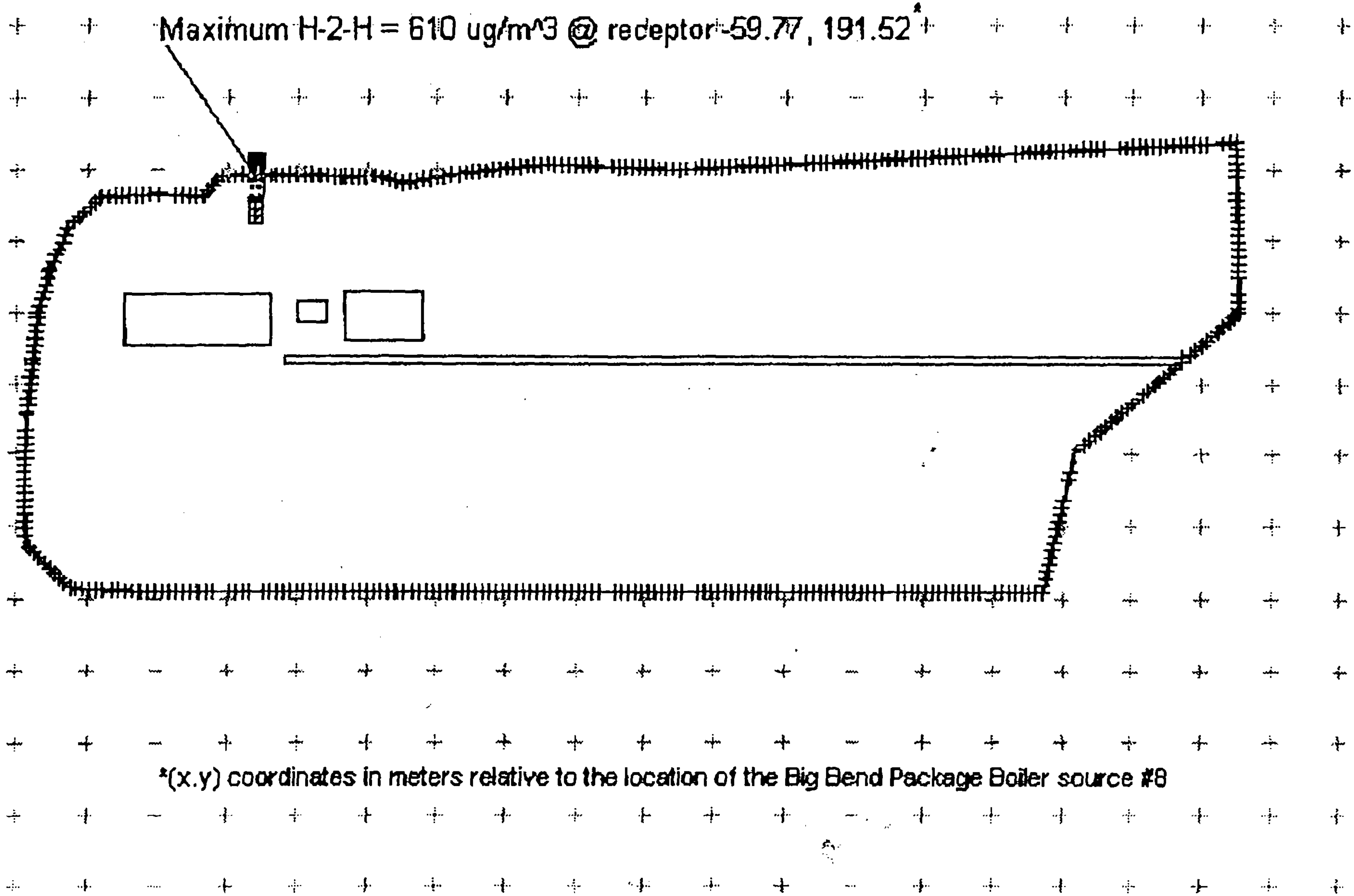
Notes:

(a) The 24-hour National Ambient Air Quality Standard is based on the fourth highest concentration in any three rolling calendar years.

(b) All receptor locations are in (x,y) coordinates in meters relative to the location of the BBTC Package Boiler Source #8.

(c) This location is over the water next to the ship along the northern property boundary.

Big Bend with Sulfur Specific Batch Drop Emission Factor, Additional Batch Drop in Ship Unloading Operation, Paved Road, and Additional Material Transfer Operation and Pile Maintenance in Solid Sulfur Storage Building.



*(x,y) coordinates in meters relative to the location of the Big Bend Package Boiler source #8