STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit

Mr. Robert Stewart Sr., VP O&A
Piney Point Phosphates, Inc.
13300 US 41 North
Palmetto, Florida 34221

DEP File No. 0810002-004-AC
Permit No. PSD-FL-242
Manatee County

Enclosed is the FINAL Permit Number PSD-FL-242 to repair and restore to previous capacity, the existing sulfuric acid plant at Piney Point Phosphates fertilizer facility located at 13300 US Highway 41, near Palmetto, Manatee County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accordance with Rules 62-212.400 and 410., F.A.C., Prevention of Significant Deterioration and Best Available Control Technology.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by US Mail before the close of business on 2-17-98 to the person(s) listed:

Robert Steward Sr., PPPI *
Ivan Nance, PPPI
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Jeffrey Brown, Esq., DEP OGC
John Koogler, P.E.
Karen Collins, Manatee Co.
Richard Moore, Esq., Amundsen & Moore
David Dee, Esq., Landers & Parson

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 2-17-98
(Date)

FINAL DETERMINATION
PINEY POINT PHOSPHATE
SULFURIC ACID PLANT PROJECT

The Department distributed a public notice package on January 8, 1998 for the project to repair and restore to its previous capacity, the Piney Point Sulfuric Acid Plant located on US 41 near Palmetto, Manatee County to its previous capacity. The Public Notice of Intent to Issue was published in the Bradenton Herald on January 13. No comments were received by the Department from the public, the EPA or the National Park Service.

Both Manatee County and the Applicant filed requests to extend the time requirement for filing petitions for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. These have since been withdrawn. Comments were received from the Applicant by letter dated January 23, 1998. These and the Department's responses follow.

COMMENTS FROM APPLICANT

General

The Applicant made a statement regarding Draft Permit Specific Condition 31. This is addressed with the other comments regarding SC 31 in Item 16 below. The Applicant made two other general comments which are addressed as Items 1 and 2 below, after which the Numeration corresponds to that used in Applicant's letter.

1. *Applicant tried to put SO_2 emissions from sulfuric acid plants and the Department's review into perspective. Applicant stated that the SO_2 emission rate of a plant is unique to that plant and cited 12 or more factors upon which sulfuric acid plant performance is based. Applicant maintains that "to cite the performance of one plant and state that another plant can operate similarly is fallacious."*

   The Department appreciates the points and believes that its own evaluation of the reductions achievable at the Piney Point Plant, after repair and restoration to previous capacity, is cautious and conservative. The plants cited in the evaluation (General Chemical, Mississippi Phosphates, and PCS at White Springs), represent a diverse set of process variations and operating modes. The Department set a Best Available Control Technology (BACT) Determination higher than the rates achieved in practice by any of these plants. It is during major modifications or new construction that significant opportunities arise for achieving cost-effective emission reductions. The Department believes that it is not fallacious to cite from what is achieved in practice, what is available from vendors, the comments of other agencies, information provided by the Applicant, published literature, and the Department's own resources to make conclusions therefrom. The BACT Determination is a regulatory responsibility of the Department and not the Applicant.

2. *Applicant commented that its Agreement with Manatee County was to achieve a limit of 3.5 pounds of sulfur dioxide per ton of sulfuric acid (lb SO_2/ton) and that as a good faith effort Applicant agreed to use cesium catalyst in the final bed of the converter. Applicant asserts this was not based on a cost-effectiveness analysis and that the emission limit and catalyst use are independent points of the agreement.*

   The Department independently concluded that SO_2 emission levels equal to or lower than 3.5 lb/ton are achievable in a cost-effective manner by use of cesium-promoted catalyst. This was discussed with the Applicant prior to its Agreement with the County. The Department approves of the technology chosen by the Applicant to achieve lower emissions of SO_2.

Public Notice

Applicant had no comment. The Department notes that the nitrogen oxides limit given as 0.15 pounds per ton of 100 percent sulfuric acid (lb/ton) should have been 0.12 lb/ton. All other documents gave the correct figure and it is noticed here for the record.

Technical Evaluation and Preliminary Determination

3. *Applicant pointed out that Figure 1 was revised by the Department to specify the type of catalyst and requests any references to Piney Point as the source of the drawing be removed.*

   Figure 1 accurately reflects the process at Piney Point. The Department acknowledges that references to location of vanadium catalyst, cesium vanadium catalyst, the reaction equations and the title of the figure were added by the Department. A version of the Figure 1 without Piney Point's name on it is attached.

4. *Applicant states that the following sentence from Section 4, Process Description, regarding the effectiveness of cesium catalyst, is based on claims by suppliers and marketing literature aimed at "boosting sales." The Department's statement is "this catalyst is more effective than other ringed vanadium catalyst at lower temperatures, thus favoring more complete conversion of the reactants and possibly lower emissions of SO_2." The Applicant states that "the lower temperature at which the cesium enhanced catalyst becomes active also results in a slower reaction rate. Unless contact time is increased, the cesium enhanced catalyst might result in no change in SO_2 emissions or even an increase in emissions."*

   The Department also relied on various published papers, including several presented at industry conferences. The "marketing" information appears more for the purpose of letting clients know that certain products are available rather than for "boosting sales." The reader is referred to the attachments to both the Draft and Final Best Available Control Technology (BACT) Determination. One attachment describes the "landmark developments and contributions to the industry" by Monsanto Enviro-Chem, the full service vendor for the Piney Point project. All of the other claims contained therein are readily acknowledged by the industry and the Department and, in view of the supporting technical papers, there seems to be no reason to doubt the claim regarding cesium catalyst. If the lower temperature impedes the reaction, it is noted that Haldor-Topsoe offers a cesium-promoted catalyst whose activity at 760 degrees is actually higher than its non-cesium counterpart at 800 degrees. Refer to the attachment on VK-69 in the Draft and Final BACT determinations. Further technical details are in the mentioned published papers.

5. *The applicant correctly pointed out and the Department acknowledges that the PSD-significant level for sulfuric acid mist (SAM) emissions should be 7 tons per year.*

6. *The applicant requested clarification that the Department and not the applicant or equipment supplier expects SAM emissions to be less than 0.1 lb/ton.*

   Besides the information given in the documents referenced by the Department, the information submitted by the National Park Service and provided to the Applicant corroborates the Department's projection. According to the application, the Applicant originally expected to meet the NSPS limit of 0.15 lb SAM while using Monsanto Model CPII-P mist eliminators. The Applicant then agreed to install the higher efficiency, Model ES eliminators. According to the attachments to the Draft and Final BACT determination, the ES line incorporates the principle of Brownian Diffusion and extends high efficiency collection to the sub-micron particle size range.

The equipment supplier's information on its line of high efficiency mist eliminators indicates collection efficiency is approximately 100% for particles greater than 3 micron. For particles less than 3 microns, the collection efficiency ranges from 92-99.95%. For all particle sizes combined, the collection efficiency (on a mass basis) is on the order of 99.9%.

If emissions as high as 0.1 lb SAM/ton actually occur, the implication, based on collection efficiency, is that approximately 100 lb SAM/ton are removed by the mist eliminators servicing the final tower. This amount is equal to 5% of sulfuric acid production - a seemingly very large amount. A value of 5% is on the order of the sulfuric acid recovered by the final tower and it would be illogical to expect SAM from the final tower to the mist eliminator system to be that high. Therefore the Department's estimate of emissions, assuming 99.9% efficiency is the high side. Even at 99% efficiency, it would appear rather high.

Draft Permit

7. *Subsection A. The applicant requests that the last sentence in the Facility Description be eliminated to reflect that after one turnover or two years (whichever is longer), the Agreement with Manatee County does not require the Applicant to use cesium-promoted catalyst.*

   See comment 2 above. The Department believes that the facility description reflects the project and is accurate. Minimum requirements from the Manatee County Agreement were included in the Department's specific conditions with the consent of both the County and the applicant. A change to non-cesium catalyst and switch to another SO2 control strategy shall not occur without the Department's review and approval and shall require submittal of a permit modification request to revise the BACT determination.

   The Applicant has not provided reasonable assurance as required by Rule 62-4.070, F.A.C. that any other technology or measure it would consider implementing will meet the BACT SO_2 emission limit.

8. *Subsection D. The applicant requests that the Agreement with Manatee County, (as one of several documents which are the basis of the permit and specifically related to this permitting action) take precedence if there is any conflict in wording with the permit.*

   The Department was not a party to the Agreement and cannot allow it to take precedence over permit conditions, particularly those that are more stringent than the Agreement. The fact that the Agreement and other documents were mentioned as the basis for and are specifically related to the permit does not accord them precedence. Department Rules and Consent Agreements, Florida Statutes, Court Orders, etc. are accorded such status. For example, the Department does not accord precedence to the comments of EPA and the National Park Service which are also listed as documents which are the basis of the permit. The comments of these agencies suggest some conditions that are more stringent that either the Applicant or the Department have proposed.

9. *Section II, General and Administrative Requirement No. 6. The applicant requests that the construction permit expiration date be December 31, 2001, rather than December 31, 1999.*

   The requested date is more representative of development of a greenfield site. The Application listed December 1, 1997 as the date of commencement of construction and December 1, 1999 as the projected date for completion of construction. The Department is not aware of any unforeseen delays since the application was received and understands the company is eager to complete the construction. The expiration date will be extended until June 30, 2000 to account for the time taken to process this application. The Applicant may submit an amendment request to extend the permit after the need becomes evident. [Rule 62-4.080(3), F.A.C].

10. *Section III, Specific Condition No. 3. The Applicant requests that the 3-hour SO_2 limit of 4 lb/ton, the SAM limit of 0.15 lb/ton, and the NO_X emission limit be referenced as BACT.*

The Department's BACT determination was 3.5 lb SO_2/ton on a 48-hr basis. The Department did not make a BACT determination for SO_2 on a short-term basis for this permit. The higher, short-term NSPS limit also applies, but the Department does not consider it as a BACT limit for this project. Similarly, the Department does not consider 0.15 lb SAM to represent BACT, but rather a limit satisfying the NSPS requirement. The Department believes the choice made by the Applicant to install mist eliminators exhibiting high collection efficiency in the small particle range represents BACT as discussed in comment 6 above. The NO_X limit is not a BACT limit. If any credit is given for past emissions from the plant, the NO_x emissions increase from the project will not be significant with respect to PSD (based on emission factors in the application).

11. *Specific Condition 6. The Applicant requests that the sulfuric acid production rate be measured on a 48-hour basis to make it consistent with the 48-hour SO_2 emission limit.*

    By the same logic, it could be concluded that past daily production limits should have been based on the three-hour SO_2 limit for consistency. The limit included in the permit is on the same basis as the past operation and is based on the Department's understanding of the project. This is also consistent with the Agreement that indicates the capacity of the plant will not be increased to levels that are greater than 2000 tons per day.

12. *Specific Condition 7. The applicant requests that no changes be made in the present molten sulfur throughput limit contained in a separate permit.*

    Based on the original 1990 application for the molten sulfur plant signed by Robert Mayko, PE for Royster, the hourly utilization rate for sulfur was given as 55,500 lb/hr. This equates to 666 short tons per day (TPD), not long TPD (LTPD). A letter dated November 6, 1990 from Suzanne Neupauer of Royster states that "based upon the maximum permitted production capacity of the sulfuric acid plant at 2000 TPD, daily throughput would be 666 tons (of sulfur)."

    The front page of the molten sulfur system permit AC 41-176524 indicates a *throughput* rate of 667 TPD consistent with the application. The Department will change the sulfuric acid plant permit to reflect *utilization* by the sulfuric acid plant of 667 TPD as intended by the original molten sulfur system application. Additionally, the Department will adopt by reference the molten sulfur system permit, *including the more stringent visible emissions limit contained therein*, into the present permit with the correction of 667 LTPD *throughput* to 667 TPD *utilization*. This allows for inventory fluctuation, impurities, inaccuracies, wastage, etc.

13. *Specific Conditions 9 - 29. The Applicant requests removal from the permit of all Specific Conditions taken from the Agreement with Manatee County and contends the entire document is (automatically) part of the permit.*

    Refer to comment 8 above. The Department cannot allow future changes by other parties to be automatically and perpetually incorporated into its permits. The Department clearly listed on the front page of the permit which documents comprise the permit. The Agreement is not one of them. Clearly the Department did not "approve" the Agreement, but relied on certain elements of it with the consent, if not at the specific request, of the parties.

14. *Specific Condition 11. Applicant requests deletion of reference to "Brownian Diffusion" as overprescriptive and irrelevant.*

    The reference is very appropriate and relevant, because it describes a defining feature of the Best Available Control Technology for mist eliminators servicing a final absorption tower. Brownian Diffusion greatly increases the collection efficiency of mist eliminators for the smallest particle sizes. Together with "impaction" and "interception" it describes the mechanism by which the proposed eliminators operate. This should cause the applicant no problem because the Monsanto "ES" line chosen for the final tower meets the specification. The "CS" line, for example, does not. Specification by the Department of the collection phenomenon is a better practice than specifying a manufacturer and its line.

15. *Specific Condition 12. The Applicant requests that the documents specified by the Agreement to be given to Manatee County, not also be submitted to the Southwest District.*

The information represents compliance data. At this time the local program does not represent the Department on compliance matters. It should also be supplied to the Department.

16. *Specific Condition 31. Applicant disagrees with Draft Permit Specific Condition 31 requirement to include emissions during shutdown, malfunction, and load change in calculating daily emission averages. Applicant stated that the requirement is in conflict with the December 18 Agreement it has with Manatee County and with the Department's rule for excess emissions.*

The applicant is partly correct in that the provisions for excess emissions applies to the 40 CFR 60.84 (Subpart K) monitoring for excess emissions. The compliance method in Subpart K is an annual stack test (Method 8) and continuous monitoring of SO_2 emissions is required in this Subpart to assure proper maintenance and operation of the acid plant throughout the rest of the year. The SO_2 standard under Subpart K is 4.0 lb/ton with a 3 hour averaging time. Excess emissions are authorized during startup for a period no longer than 3 hours provided the operators followed best operational practices in accordance with the industry's Best Operational Startup Practices for Acid Plants. Excess emissions during shutdown and malfunction may also be authorized in 62-210.700 F.A.C. with certain restrictions. Note that these provisions for excess emissions do not necessarily apply in cases where the compliance method is the CEMS as discussed in the following paragraph.

A second emission standard for SO_2 has been determined by the Best Available Control Technology (BACT) process. The Department has determined that a lower limit (3.5 lb/ton) is achievable and has specified compliance by CEM based on a 48 hour averaging time. The Department acknowledges that startup conditions may cause emissions above the BACT standard and has allowed the exclusion of emissions data which is above 3.5 lb/ton during the startup period for purposes of the 48 hour average calculation. Provided best operational practices are employed, these periods of high SO_2 emissions during startup are not considered out-of-compliance periods and are limited to no more than 3 hours for each startup. No exceptions to the BACT standard are authorized for malfunction or shutdown since the longer averaging time (16 times longer than the Subpart H averaging time) is sufficient to offset any short term excursions. The Department also expects that the worst case emissions of SO_2, i.e. full load operation, will be lower than the 3.5 lb/ton standard on a short term basis. The acid plant is more efficient in conversion of the process SO_2 gases to acid and therefore SO_2 emissions (lb/ton) are lower during reduced load operation. This means (reduced load operation following a malfunction) can be used to avoid emissions above the BACT standard during malfunction periods. The Department expects the acid plant operators to reduce load during periods of malfunctions in order to minimize emissions during these episodes. Shutdown periods should not result in SO_2 violations of the 48 hour standard since lower load operations, and therefore lower emissions rates, are part of the shut down procedure. Note that Rule 62-210.700 requires the use of best operational practices to minimize the extent and duration of emissions during upset periods.

The Department agrees Performance Specification 1 and 3 are not relevant on the condition that the applicant will conduct the Reich Test 3 times per day pursuant to 40CFR60.84.

17. *Table 1. Refer to comments 10 - 12 above.*

Best Available Control Technology Determination

18. *Emission Limits and BACT Determinations by EPA and States. Applicants recommends inclusion of term indicating that gas strength at General Chemical's sulfuric acid plants is less than gas strength at the Piney Point Plant.*

According to Department records, (General Chemical's PSD application), the gas strength at General Chemical varies from 8 to 12%. The Department's understanding is that the strength at the Piney Point plant is a little less than 12%. Therefore the statement requested by the applicant is not strictly correct and the Department's statement that the gas strength at the General Chemical plant is more variable than at the Piney Point plant is correct.

19. *Emission Limits and BACT Determinations by EPA and States. Applicant recommends inclusion of a statement that information on the Mississippi Phosphate Corporation plant design or operating parameters is not available.*

    Sufficient information about the plant and the project is available to allow the Department to make the comments which it made. The Department did not state that the Mississippi Phosphates proposed limit is a BACT limit, but rather a limit to avoid PSD/BACT review.

20. *Determination by DEP. Applicant recommends indicating a dual SO_2 as 4 lb/ton on a 3-hour basis and 3.5 lb/ton on a 48-hr basis.*

    The Applicant may have reviewed an earlier draft BACT Determination which was provided in advance as a courtesy prior to public distribution. According to the official version distributed, the Department made only a 48-hour BACT determination and did not make a 3-hour BACT determination. The 4 lb/ton limit is an NSPS requirement with which all sulfuric acid plants built since 1971 must comply. The Department will include both limits in the Final BACT Determination and specify them as BACT or NSPS limits as applicable.

21. *Determination Rationale, No. 1. Applicant may have reviewed an earlier version. Applicant recommends inclusion of a statement indicating that information on the Mississippi Phosphate Corporation plant design or operating parameters is not available.*

    See 19 above.

22. *Determination Rationale, No. 2. The Applicant states "we do not agree with the Department's conclusion that PPPI will produce 2000 TPD of acid comfortably with lower emissions than in the past simply by screening and replacing the catalyst." Applicant states that "the amount of catalyst and hence the conversion activity associated with the catalyst will not change. Therefore, neither SO_2 emissions nor production are expected to change."*

    The Department's precise statement was that the plant "will produce 2000 TPD of acid *more* comfortably than in the past simply by its plan to replace screened, *pelletized vanadium* catalyst in Converter 1 and *all catalyst* in Converter 2 with *low pressure drop, ring-shaped, vanadium* catalyst." The Department's statement has a much different meaning than the one ascribed to the Department by the Applicant The official version contained no reference to SO_2. The Department reaffirms its statement.

According to Monsanto Enviro-Chem information attached to the Draft and Final BACT Determination, Type LP-120 and LP-110 ring catalyst produced converter pressure drops of 30-50% less than pellet. The implications are obvious. The Mississippi Phosphates project to replace the *pelletized* catalyst with *low pressure drop* ringed catalyst is their stated reason the plants can *increase* production. Obviously if Mississippi Phosphates did not increase production, it could continue to produce at the previous rate "*more* comfortably."

23. *Determination Rationale No. 4. Applicant states that evidence was also presented by PPPI experts in meetings with the Department that cesium catalyst does not reduce SO_2 emissions.*

See comment 4 above. The Department has no documented evidence obtained from meetings with PPPI experts. Mr. Friedman, an industry expert, expressed his doubts about cesium catalyst, but provided no evidence to the Department. The Department notes that Monsanto Enviro-Chem, Haldor-Topsoe, and BASF market cesium-promoted catalyst for various purposes, including reducing emissions of SO_2.

It is possible to imagine situations where an erroneous use of such a catalyst might accomplish nothing. However, in the opinion of the Department, the Piney Point project fits squarely into the category where the cesium-promoted catalyst should have a beneficial effect according to the suppliers, including the full service vendor for the project - Monsanto Enviro-Chem.

24. *Determination Rationale Nos. 6-11. Applicant asserts that the Department's "optimistic assumptions and projections regarding performance, costs and cost benefits are largely based on information provided by catalyst suppliers whose primary objective is boosting sales." Applicant states that "although PPPI has agreed with Manatee County to an SO_2 emission rate of 3.5 lb/ton (48-hr average) and to use cesium enhanced catalyst in the final converter bed, there was never a claim made by PPPI that the 3.5 lb/ton emission rate was the result of using the cesium enhanced catalyst. Therefore there is no foundation for the Department to perform a cost analysis attributing the SO_2 reduction to the cesium enhanced catalyst."*

The logic of this comment implies that emissions of SO_2 can be reduced by "agreement" with no specification of how the reduction will be effected. The Department would be interested to know the cost of the reduction agreed to by the Applicant and the County with or without use of cesium-promoted catalyst. The Department's rationale for estimating the costs of achieving the lower emissions is more logical. In fact, cost estimates were made before PPPI's Agreement with the County and discussed in general terms with the Applicant on December 1, 1997.

Much of the background information, including expert papers, came from the full-service vendor for the project - Monsanto Enviro-Chem. The additional cost of cesium-promoted vanadium catalyst ($3.15/liter) was provided to the Department by Monsanto Enviro-Chem. The Department does not know the actual price charged to Piney Point Phosphates. The amount of catalyst required was given in the application. The typical replacement frequency and amount screened and replaced during turn-arounds for last pass catalyst, was derived from on a paper by Mr. Friedman - PPPI's expert consultant. Estimates of possible emission reductions came from or were inferred from Monsanto Enviro-Chem and Haldor-Topsoe papers. The Department made a reasonable cost estimate based on a modest reduction goal of 12.5%. If the most optimistic reductions inferred from the Monsanto Enviro-Chem and Haldor-Topsoe papers (up to 50%) had been relied upon, the cost-effectiveness figures would be even more compelling.

25. *Determination Rational No. 12. The Applicant recommends inclusion of a statement that information on the General Chemical plant design or operating parameters is not available.*

The Department has sufficient information about the plant to make the cautious statement which it made.

26. *Determination Rationale Nos. 15 and 16. The Applicant states that the Centaur process is not cost-effective for a 2000 TPD and larger plant, that the technology is not commercially demonstrated, and that the SO_2 emissions guarantee is identical to that of a double absorption plant.*

    The Department already found good reasons to recommend against the Centaur process at this time. However the Department has no information regarding the cost-effectiveness of the Centaur process for plants of capacity greater than or equal to 2000 TPD and does not necessarily concur with the Applicant's statement. The Department has no written documentation in the present file on the guarantee for either process. We would appreciate any documents that the Applicants or its consultants have regarding the guarantees and conditions applicable to the Centaur Process, the Double Absorption Process, and the variation of the Double Absorption Process utilizing cesium catalyst in the final pass..

27. *Determination Rationale No. 17. Basically the same comment as in Comment 1 above.*

28. *Determination Rationale No. 18. Applicant suggests changing the wording in a statement from "the option of more frequent turn-arounds has a certain appeal" to "the option of more frequent turn-arounds has been reviewed."*

    The Department appreciates the suggestion. The sentence will be revised to read "the option of more frequent turn-arounds was considered."

29. *Determination Rationale Nos. 19 through 21. Applicant points out that the discussion of sulfuric acid mist (SAM) in a section about the underpinnings of the SO_2 limit is not relevant. The Applicant states that the items are "overly prescriptive (relative to control equipment) and speculative (with regards to SAM emissions)" and requests they be deleted.*

    The Department will separate the discussion of SAM from the discussion of SO_2. The Department does not believe the items on SAM control and emissions are overly prescriptive or speculative and directs the reader to Comment 6 above. *A comment on NO_X emissions will be added as Determination Rationale No. 22*, consistent with the response to Comment 10 above.

CONCLUSION

The Final action of the Department is to issue the permit with the minor changes described upon withdrawal by the County and the Applicant of their requests for extension of time to file for a petition.

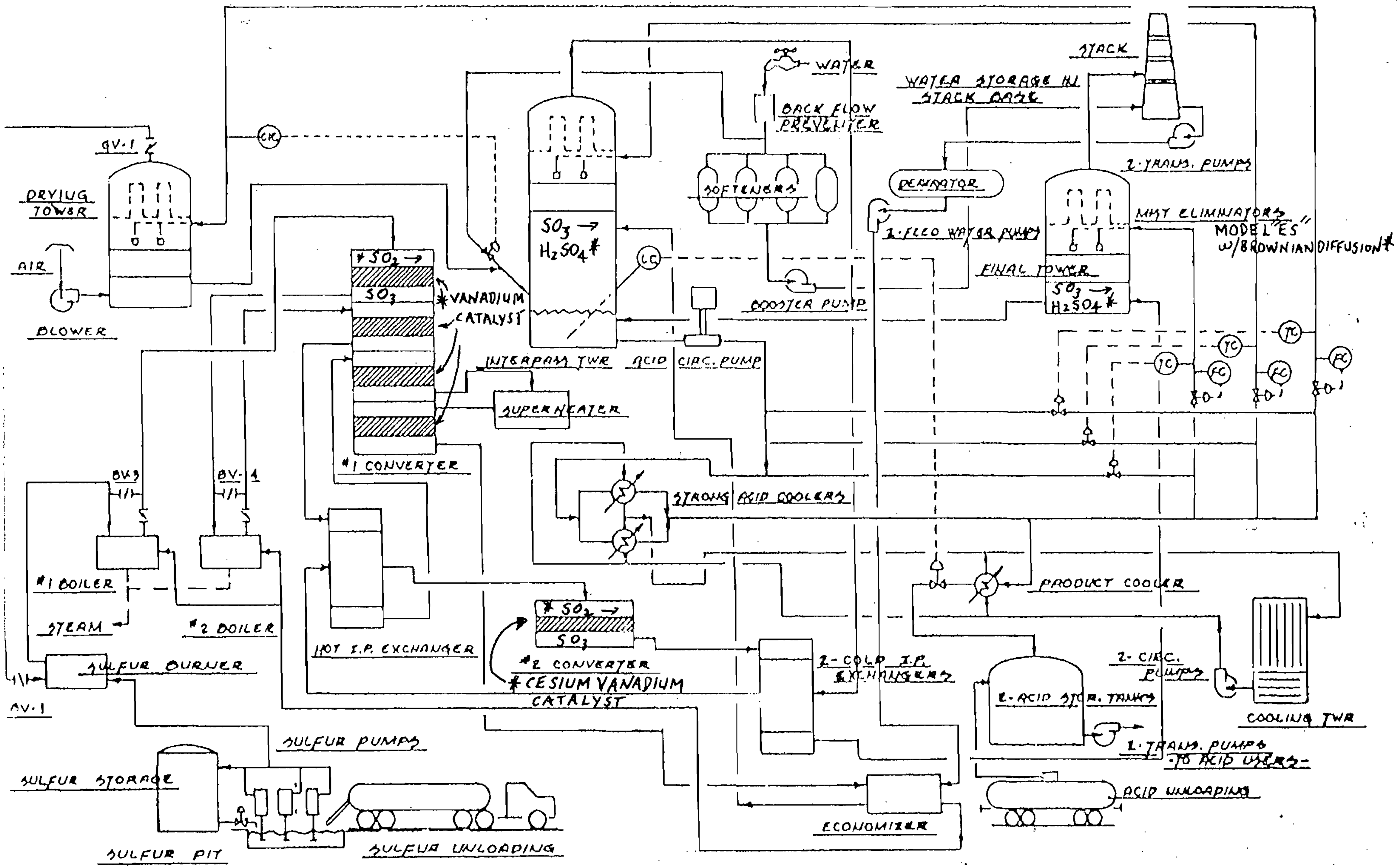

FIGURE 1 SULFURIC ACID PROCESS AT PINEY POINT
DOUBLE ABSORPTION ~ SULFUR BURNING

* DIAGRAM AMENDED
2/3/98 BY DEP
[illegible], P.E.

Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:

Piney Point Phosphates, Inc.
13300 US Highway 41 North
Palmetto, Florida 34221

File No.	0810002-004-AC
FID No.	0810002
SIC No.	2819
Permit No.	PSD-FL-242
Expires:	June 30, 2000

Authorized Representative:
Robert C. Stewart
Vice-President, Operations and Administration

PROJECT AND LOCATION:

Permit for the repair and restoration to previous capacity of a 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated sulfur storage and handling equipment serving a phosphoric acid and diammonium phosphate fertilizer facility located nine miles north of Palmetto on US Highway 41 North, Manatee County. UTM coordinates are Zone 17; 348.5 km E ; 3057.3 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Appendices and attachments made a part of this permit:

Table 1	Air Pollutant Standards and Terms
Appendix A	Best Operational Start-up Procedures for Sulfuric Acid Plants
Appendix BD	Best Available Control Technology Determination
Appendix CSC	Emission Unit(s) Common Specific Conditions
Appendix GC	Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

SECTION I. FACILITY INFORMATION

SUBSECTION A. FACILITY DESCRIPTION

The existing facility consists of a sulfuric acid plant and associated molten sulfur storage and handling equipment, a phosphoric acid plant, a diammonium phosphate fertilizer plant, a gypsum stack and process cooling ponds, rail and truck shipping and receiving facilities. This permit is for the repair and restoration to previous permitted capacity of the 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated molten sulfur handling equipment. The project includes replacement of process towers, converter catalyst, heat transfer and other process equipment as well as repair of the sulfur burner, air compressor, the converters, and other key process equipment. Air pollution control equipment consists of the double absorption process, use of cesium-vanadium catalyst in the final converter, and high efficiency mist eliminators on the final tower.

EMISSION UNITS

This permit addresses the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

SUBSECTION B. REGULATORY CLASSIFICATION

The Piney Point Phosphates Inc. (PPPI) fertilizer facility is classified as a "Major or Title V Source" per Rule 62-210.200, F.A.C., Definitions, because emissions of at least one regulated air pollutant exceed 100 tons per year (TPY).

Sulfuric acid plants are listed as a Major Facility Category in Table 62-212.400-1, F.A.C., "Major Facility Categories." Therefore, stack and fugitive emissions of over 100 TPY of sulfur dioxide are sufficient to classify the installation as a "Major Facility" per the definitions in **Rule 62-210.200, F.A.C.,** subject to the Significant Emission Rates for sulfuric acid mist and nitrogen oxides given in Table 62-212.400-2, F.A.C. and the requirements of **Rules 62-212.400 and 410, F.A.C.,** Prevention of Significant Deterioration (PSD) and Best Available Control Technology (BACT).

The molten sulfur storage and handling equipment is subject to **Rule 62-212.600, F.A.C..** The sulfuric acid plant is also subject to 40 CFR Subpart H, New Source Performance Standards (NSPS) for Sulfuric Acid Plants, incorporated by reference in **Rule 62-204.800, F.A.C.**

SECTION I. FACILITY INFORMATION

SUBSECTION C. PERMIT SCHEDULE:

- 01/23/98 Received Time Extension Request from Manatee County to file Petition
- 01/22/98 Received Time Extension Request from Applicant to file Petition
- 01/13/98 Notice of Intent published in The Bradenton Herald
- 01/08/98 Distributed Intent to Issue Permit
- 01/07//98 Application deemed complete
- 10/31/97 Received Application

SUBSECTION D. RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action but do not supersede the conditions given in the permit. These documents are on file with the Department.

- Application received October 31, 1997
- Department's letters dated November 7, November 17, and November 26, 1997
- Comments from Manatee County's consultant, RTP Associates, dated November 21, 1997
- Comments from the National Park Service dated November 20 and December 15, 1997
- EPA's letter dated December 15, 1997
- Agreement between Manatee County and PPPI dated December 18, 1997
- Applicant's completeness responses dated December 26 and 30, 1997 and January 6, 1998
- Department's Intent to Issue dated January 8, 1998 and associated documents
- Applicant's comments dated January 23, 1998 on Department documents issued January 8, 1998
- Department's Final Determination accompanying permit

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department of Environmental Protection, Southwest District Office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218 (phone number: 813/744-6100). All applications for permits to construct or modify an emissions unit(s) *subject to the Prevention of Significant Deterioration or Nonattainment (NA) review requirements* should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), 2600 Blairstone Road, Tallahassee, Florida 32399-2400 (phone number 850/488-1344).

2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in *Appendix GC* of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. **[Rule 62-4.160, F.A.C.]**

3. Emission Unit(s) Common Specific Conditions: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.

4. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

5. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. **[Rule 62-210.900, F.A.C.]**

6. Expiration: This air construction permit shall expire on June 30, 2000 **[Rule 62-210.300(1), F.A.C.]**. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the Department's Southwest District Office of any delays in completion of the project which would affect the startup day by more than 90 days. **[Rule 62-4.090, F.A.C]**

7. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the Department's Southwest District Office. **[Chapter 62-213, F.A.C.]**

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SPECIFIC CONDITIONS - SULFURIC ACID PLANT AND MOLTEN SULFUR STORAGE AND HANDLING:

The following Specific Conditions apply to the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

1. Emissions unit 001 shall comply with all applicable provisions of the 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart H, Sulfuric Acid Plants. **[Rule 62-204.800(7)(b)10., F.A.C]**

2. Emissions unit 001 shall also comply with all applicable requirements of 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart A, General Provisions. These include:

    - 40 CFR 60.7, Notification and record keeping
    - 40 CFR 60.8, Performance tests
    - 40 CFR 60.11, Compliance with standards and maintenance requirements
    - 40 CFR 60.12, Circumvention
    - 40 CFR 60.13, Monitoring requirements
    - 40 CFR 60.19, General notification and reporting requirements

3. Emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), visible emissions (VE), and nitrogen oxides (NO_X) from the sulfuric acid plant shall not exceed the following limits: **[Rules 62-204.800(7)(b)10; 62-210.200; 62-212.410, F.A.C.]**

Pollutant	Pounds per Hour	Tons per Year	Limit Basis
SO_2	291.7 [1]	1,277.5	3.5 lb/ton 100% H_2SO_4 produced (BACT) [1]
SO_2	333.3		4.0 lb/ton 100% H_2SO_4 produced (NSPS)
SAM	12.5	54.8	0.15 lb/ton 100% H_2SO_4 produced (NSPS)
VE	10% opacity		NSPS
NO_X	10.0 [2]	43.8	0.12 lb/ton 100% H_2SO_4 produced [2]

1. 48-hour rolling average based on CEMS data.
2. Applicant's estimate. Required for initial compliance test only.

4. The Specific Conditions given in in the construction permit for the Piney Point Terminal/Molten Sulfur Storage & Handling System, are adopted by reference into this permit, except that: Specific Condition 2 of the subject permit is replaced by Specific Condition 7 below. **[Permit AC 41-176524, dated March 21, 1991]**

5. The design production capacity of the refurbished plant shall not exceed 2,000 tons per day (TPD) of 100 percent (%) sulfuric acid. **[December 18, 1997 Agreement]**

6. The production rate shall not exceed 2000 TPD as 100% sulfuric acid on a 24-hour basis. **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

7. The maximum molten sulfur utilization rate in the sulfuric acid plant shall neither exceed 667 TPD nor 243,100 tons per year. (Based on the maximum permitted sulfuric acid production rate of 2000 TPD of 100% sulfuric acid) **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

8. These emissions units are allowed to operate continuously (8760 hours/year) **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

9. The existing sulfuric acid plant shall cease operation and be permanently shut down when a new sulfuric acid plant commences commercial operations. **[December 18, 1997 Agreement]**

10. Prior to the initial plant startup, the permittee shall install approximately 115,000 liters of cesium-promoted catalyst in the final converter pass. The cesium catalyst shall be used for at least one plant turnaround cycle, or approximately two years, whichever is longer. **[December 18, 1997 Agreement]** A change to non-cesium catalyst and switch to another SO_2 control strategy shall not occur without the Department's review and approval and shall require submittal of a permit modification request to revise the Best Available Control Technology Determination. **[Rules 62-4.070 and 62-212.410, F.A.C.]**

11. The permittee shall install high efficiency mist eliminators incorporating "Brownian Diffusion" to minimize emissions of fine sulfuric acid mist from the final tower. **[Rule 62-212.410, F.A.C.]**

12. The permittee shall prepare and submit to the Department's Southwest District and Manatee County each calendar quarter: (a) compliance calculation worksheets for SO_2 emissions; (b) the hourly CEMS data; and (c) supporting information necessary to demonstrate compliance with the emission limitations. **[December 18, 1997 Agreement]**

13. The permittee shall implement and carry out at all times the safety program referred to in the agreement between Manatee County and the permittee. **[December 18, 1997 Agreement]**

14. The permittee shall implement and carry out at all times a risk management program that complies with 40 CFR Part 68 for Program 3. The permittee shall modify its analyses, if necessary, when pending EPA litigation of certain issues is resolved. **[December 18, 1997 Agreement]**

15. Before resuming operation of the sulfuric acid plant, the permittee shall meet with representatives of Manatee County's Emergency Response and Emergency Services Department to review the plans for complying with Specific Condition No. 8 above. If Manatee County recommends installation of a public alarm system around the perimeter of the permittee's facility, the permittee will work diligently to comply with the County recommendation. Any such alarm shall be controlled exclusively by the permittee. **[December 18, 1997 Agreement]**

16. The permittee shall inspect, operate and maintain all process and support equipment in accordance with the best management practices required under all applicable federal, state and local regulations. Any major deficiencies shall be reported to the Manatee County Emergency Response and Emergency Services Department and corrected immediately to ensure the safe operations of the facility. **[December 18, 1997 Agreement]**

17. Manatee County's building inspectors and/or environmental compliance officials shall have access to the facility, following reasonable notice, to confirm that the permittee is in compliance with all applicable codes, ordinances, laws and regulations. **[December 18, 1997 Agreement]**

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

18. Manatee County shall be advised by the permittee as soon as the permittee has any knowledge of any scheduled or unscheduled visit by a representative of the Department, EPA, or the Occupational Health and Safety Administration, and the County shall be allowed to have one or two qualified observers accompany the agency inspectors during their visit to the facility. **[December 18, 1997 Agreement]**

19. Manatee County shall provide the permittee with a list of qualified County representatives for the plant visits mentioned above. The list may be updated from time to time. Unless requested by the inspecting agency, no other persons are authorized by this Agreement to accompany the agencies during their inspections of the facility. **[December 18, 1997 Agreement]**

20. Whenever a Manatee County representative visits the facility, such representative shall comply with the permittee's safety regulations and shall follow all reasonable instructions provided by the permittee to ensure his or her safety. The permittee shall provide a copy of its safety regulations to the County so that the County's representatives may review the safety regulations before visiting the facility. **[December 18, 1997 Agreement]**

21. The permittee and Manatee County promptly shall provide each other with any report, test result or other information that is received from any agency concerning an inspection of the facility. **[December 18, 1997 Agreement]**

22. If Manatee County wishes to collect any samples at the facility, Manatee County shall split the samples with the permittee, if requested, and promptly shall provide the permittee with the results of any tests performed on the samples. **[December 18, 1997 Agreement]**

23. During inspections of the facility, Manatee County's representatives shall notify the permittee's escort before they take any photographs of the facility. In this fashion, the County's representative shall give the permittee's representative an opportunity to view the conditions or area at the facility that is the subject of the photograph. If Manatee County takes any photograph of the facility, Manatee County promptly shall provide a copy of the photograph to the permittee. However, Manatee County shall not take photographs or any equipment or processes reasonably designated by the permittee as proprietary and confidential. Photographs shall be taken only for authorized regulatory purposes. **[December 18, 1997 Agreement]**

24. The permittee and Manatee County shall work together in a cooperative manner to ensure and confirm that the permittee is complying with all local, state, and federal regulations. If requested, the permittee shall provide a tour of the facility once each year for the Manatee Board of County Commissioners or the Board's designees. **[December 18, 1997 Agreement]**

25. The permittee shall provide Manatee County with a copy of any report or document that the permittee is required to provide to any state or federal agency, (unless such documents are confidential under state or federal law), including but not limited: (a) routine reports to agencies concerning the facility's stack tests, air emissions, surface water discharges, or other discharges; (b) reports concerning excess emissions, upset conditions or emergencies at the facility; (c) reports and other information required under the provisions of 40 CFR Part 68 or Paragraph 14, above; and (d) reports or other information that must be submitted to the Department pursuant to Paragraph 1, above. These reports and other materials shall be provided to Manatee County at the same time that they are provided to the state or federal agency. Should the permittee determine that a report or portion thereof is confidential, the permittee shall take steps to redact the confidential information, or if this is not possible, notify the County of the report and the permittee's reasons for not providing it to the County. These reports and other materials

submitted to the Director of the Manatee County Department of Environmental Management, P.O. Box 1000, Bradenton, Florida 34206-1000. **[December 18, 1997 Agreement]**

26. The permittee shall immediately notify Manatee County if there is an accident, malfunction or other event at the facility that poses a threat to human health or the environment in the areas located adjacent to the permittee's facility. Manatee County recognizes that, under such circumstances, the permittee may be required by law to provide notice to certain local, state, or federal agencies before the permittee provides notice to Manatee County. Minor exceedances authorized under Rule 62-210.700, F.A.C., are not subject to the notification requirements contained in this paragraph. **[December 18, 1997 Agreement]**

27. The permittee shall comply with all applicable requirements of the Department's sulfur storage and handling rule. **[Rule 62-296.411, F.A.C.]**

28. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. **[Rule 62-296.320, F.A.C.]**

29. In order to minimize excess emissions during startup/shutdown/malfunction these emissions units shall adhere to best operational practices. The provisions of the Memorandum of Understanding issued by the Department on November 21, 1989, are hereby added to this permit as **Appendix A** and shall be added to the Title V permit. **[Rule 62-210.700, F.A.C., 40 CFR 60.7 and December 18, 1997 Agreement]**

30. Plant and emission control equipment operating parameters determined during compliance testing and/or inspection that will establish the proper operation of each emissions unit shall be included in the Title V permit. **[Rule 62-297.310, F.A.C. and 62-4.070(3), F.A.C.]**

31. A continuous emissions monitoring system (CEMS) shall be installed, calibrated, maintained, operated, and used to determine compliance with the 48-hour emissions limit for SO_2. The CEMS shall be installed and certified before the initial performance test and operated in compliance with 40 CFR 60, Appendix F, Quality Assurance Procedures (1996 version) or other Department-approved QA plan; 40 CFR 60, Appendix B, Performance Specification 2 (1996 version).

    The CEMS shall calculate and record emission rates in units of pounds of SO_2 per hour. Sulfuric acid production rate and sulfur feed rate shall be recorded continually. Each operating day, the average SO_2 emission rate for the previous 48 hours shall be calculated and recorded. Emissions shall be calculated in units of pounds per hour and pounds per ton of 100% acid produced using the method specified in 40 CFR 60.84 (b). Averages are to be calculated as the arithmetic mean of each monitored operating hour from the previous 48 monitored operating hours. A monitored operating hour is each hour in which sulfur is burned in the unit and at least two emission measurements are recorded at least 15 minutes apart. Data taken during periods of startup, or when sulfur is not burned in the unit, or when the CEMS is out of control as defined in 40 CFR 60, Appendix F, Section 5.2 shall be excluded from the 48-hour average.

    For compliance with the emission limits, the 48-hour average shall not include data from periods of startup, or when no sulfuric acid is being produced. Data recorded during periods of shutdown, malfunction, load change, and continuous operating periods shall be included in the daily calculation of the 48-hour average.

    To the extent the monitoring system is available to record emissions data, the CEMS shall be operated and shall record data at all operating hours when sulfur is burned in the unit, including periods of startup, shutdown, load change, continuous operation and malfunction. Monitor downtimes and excess emissions based on 3-hour averages, which include startup emissions, shall be reported on a quarterly basis using the

SUMMARY REPORT in 40 CFR 60.7. A detailed report of the cause, duration, magnitude, and corrective action taken or preventative measures adopted for each excess emission occurrence, and a listing of monitor downtime occurrences shall accompany the SUMMARY REPORT when the total duration of excess emissions is 1% or greater or if the monitoring system downtime is 5% or greater of the total monitored operating hours.

The monitoring device shall meet the applicable requirements of Chapter 62-204, F.A.C., 40 CFR 60, Appendix F, and 40 CFR 60.13, including certification of each CEMS in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) Notification Requirements. Data on monitoring equipment specifications, manufacturer, type calibration and maintenance requirements, and the proposed location of each stack probe shall be provided to the Department for review at least 90 days prior to installation of a new CEMS. **[Rule 62-4.070 (3) F.A.C and Rule 62-204.800, F.A.C.]**

32. Compliance with the emission limits for SO_2, SAM, and NO_X shall be determined using the following reference methods as described in 40 CFR 60, Appendix A (1996, version), adopted by reference in Chapter 62-204, F.A.C.

Method 7E	Determination of Nitrogen Oxides from Stationary Sources.
Method 8	Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources. (for demonstrating compliance with 40 CFR 60, Subpart H)
Method 9	Visual Determination of the Opacity of Emissions from Stationary Sources.

These emissions units shall comply with all applicable requirements of Rule 62-297.310, F.A.C. General Test Requirements and 40 CFR 60.8 Performance Tests.

Testing of emissions shall be conducted with the emissions units operating at permitted capacity, which is defined as 90-100% of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the unit may be tested at less than 90% of the maximum operating rate allowed by the permit; in this case, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C., and 40 CFR 60 Appendix A and 40 CFR 60.8, Subpart A].**

33. This facility shall maintain a central file containing all measurements, records, and other data that are required to be collected pursuant to this permit. Operators shall keep a daily operation and maintenance log to include, at a minimum, calibration logs for all instruments, maintenance/repair logs for any work performed on equipment or instruments, all measurements, records, and any other data required to be maintained by the permittee shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded. These data shall be made available to Department staff upon request. The Department shall be notified in writing at least 15 days prior to any emissions testing or auditing of any instrument required to be operated by these specific conditions in order to allow witnessing by authorized personnel. **[Rule 62-4.070(3), F.A.C.]**

Table 1 Air Pollutant Standards and Terms.

FACILITY ID NUMBER: 0810002

Permittee:

Piney Point Phosphates, Inc.

Permit No.: 0810002-004-AC

Sulfuric Acid Plant and Molten Sulfur Handling and Storage Repair and Restoration Project

Emission Units - Sulfuric Acid Plant, Molten Sulfur Handling/Storage

				Allowable Emissions [2]		Equivalent Emissions [3]	
E.U. ID#	Description	Pollutant ID	Fuel(s) [2]	Permit limits	lb/hr [1]	TPY	Basis
1	Sulfuric Acid Plant	SO_2	molten sulfur	4 lb/ton acid (3-hr)	333		NSPS
1	Sulfuric Acid plant	SO_2	molten sulfur	3.5 lb/ton acid (48-hr)	292	1278	BACT
1	Sulfuric Acid plant	SAM	molten sulfur	0.15 lb/ton acid	12.5	55	NSPS
1	Sulfuric Acid plant	NOX	molten sulfur	0.12 lb/ton acid	10	44	Application
1	Sulfuric Acid plant	VE	molten sulfur	10 % opacity			NSPS
2	Molten Sulfur Handling	VE		10 % opacity			AC 41-176524

ALLOWABLE OPERATING RATES

Hours of operation per year	8760
Molten Sulfur Utilization	667 tons per day [4]
Sulfuric Acid Production	2000 tons per day [4]

NOTES

(1) At a maximum sulfuric acid production rate of 2000 TPD as 100 percent sulfuric acid.
(2) Compliance Units. This facility shall demonstrate compliance based on these standards.
(3) "Equivalent Emissions" are based on annual emissions at 8760 hrs/yr. The "Equivalent Emissions" are also listed for informational purpose and for PSD and recordkeeping tracking purposes.
(4) Ton = 2000 pounds. Any data reported as Long Tons (1000 kg) must be converted to Tons to determine compliance.

APPENDIX A
BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS

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1. Only one sulfuric acid plant at a facility should be started up and burning sulfur at a time. There are times when it will be acceptable for more than one sulfuric acid plant to be in the start-up mode at the same time, provided the following condition is met. It is not acceptable to initiate sulfur burning at one sulfuric acid plant when another plant at the same facility is emitting SO_2 at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEMs emission rates for the immediately preceding 20 minutes.

2. A plant start-up must be at the lowest practicable operating rate, not to exceed 70 percent of the designated operating rate, until the SO_2 monitor indicates compliance. Because production rate is difficult to measure during start-up, if a more appropriate indicator (such as blower pressure, furnace temperature, gas strength, blower speed, number of sulfur guns operating, etc.) can be documented, tested and validated, the Department will accept this in lieu of directly documenting of the suitable list of surrogate parameters to demonstrate and document the reduced operating rate on a plant-by-plant basis. Documentation that the plant is conducting start-up at the reduced rate is the responsibility of the owner or operator.

3. Sulfuric acid plants are authorized to emit excess emissions from start-up for a period of three consecutive hours provided best operational practices, in accordance with this agreement, to minimize emissions are followed. No plant shall be operated (with sulfur as fuel) out of compliance for more than three consecutive hours. Thereafter, the plant shall be shut down. the plant shall be shut down (cease burning sulfur) if, as indicated by the continuous emission monitoring system, the plant is not in compliance within three hours of startup. Restart may occur as soon as practicable following any needed repairs or adjustments, provided the corrective action is taken and properly documented.

4. Cold Start-Up Procedures.

   a. Converter.

      (1) The inlet and outlet temperature at the first two masses of catalyst shall be sufficiently high to provide immediate ignition when SO_2 enters the masses. In no event shall the inlet temperature to the first mass be less than 800°F or the outlet temperature to the first two masses be less than 700°F. These temperatures are the desired temperatures at the time the use of auxiliary fuel is terminated

      (2) The gas stream entering the converter shall contain SO_2 at a level less than normal, and sufficiently low to promote catalytic conversion to SO_3.

   b. Absorbing Towers.

      The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

5. Warm Restart.

   a. Converter

      The inlet and outlet temperatures of the first two catalyst masses should be sufficiently high to ensure conversion. One of the following three conditions must be met:

      (1) The first two catalyst masses inlet and outlet temperatures must be at a minimum of 700°F; or.

      (2) Two of the four inlet and outlet temperatures must be greater than or equal to 800°F; or.

      (3) The inlet temperature of the first catalyst must be greater than or equal to 600°F and the outlet temperature greater than or equal to 800°F. Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to 700°F.

      Failure to meet one of the above conditions, requires use of cold start-up procedures.

      To allow for technologies improvements or individual plant conditions, alternative conditions will be considered by the Department in appropriate cases.

   b. Absorbing Towers.

      The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Sulfuric Acid Plant
Piney Point Phosphates Inc.
PSD-FL-242 and 0810002-004-AC
Palmetto, Manatee County

BACKGROUND

The applicant, Piney Point Phosphates Inc., proposes to repair, restore, and restart its existing 2000 ton per day (TPD) sulfuric acid plant (SAP) at its fertilizer manufacturing facility on US Highway 41 North at Piney Point, Palmetto, Manatee County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), and nitrogen oxides (NO_X). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400 and 410, F.A.C.

Descriptions of the process, project, ambient air quality effects, and rule applicability are given in the separate Technical Evaluation and Preliminary Determination issued with the Department's Intent and Public Notice package.

DATE OF RECEIPT OF A BACT APPLICATION:

The application received on October 31, 1997 included a proposed BACT determination prepared by the applicant's consultant, Koogler and Associates.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Sulfur Dioxide	Double Absorption	4 pounds per ton 100% H_2SO_4 (3-hr)
Sulfuric Acid Mist	Fiber Mist Eliminators	0.15 pounds per ton 100% H_2SO_4
Visibility	As Above and Process Controls	10 percent
Nitrogen Oxides	None - Low Fuel Nitrogen, Combustion Temperature	0.12 pounds per ton 100% H_2SO_4

The plant with the originally proposed controls and limits will emit approximately 1460 tons per year (TPY) of SO_2, 55 TPY of SAM, and 44 TPY of NO_X. The applicant initially proposed to use the same process and control technology as used in the past to achieve the proposed limits. These limits will be met by converting 99.7 percent of SO_2 produced into sulfur trioxide (SO_3), absorbing the SO_3 in circulating streams of sulfuric acid, and minimizing SAM formation and losses by process controls and high efficiency mist eliminators.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is the New Source Performance Standard (NSPS) for sulfuric acid plants built since 1971. This NSPS, promulgated by EPA as 40 CFR 60, Subpart H, was adopted by the Department by reference in Rule 62-204.800, F.A.C. It was re-affirmed in 1985 by EPA. The emission limits required by Subpart H are 4 pounds SO_2 per ton acid (lb SO_2/ton), 0.15 lb SAM/ton acid, and 10 percent visibility. Therefore the BACT proposed by the applicant is consistent with the NSPS. No National Emission Standard for Hazardous Air Pollutants exists for sulfuric acid plants.

EMISSION LIMITS AND BACT DETERMINATIONS BY EPA AND STATES:

Most sulfuric acid plant BACT determinations made to-date by EPA and the states, including the State of Florida, have been identical to the NSPS. Among the exceptions is General Chemical in Anacortes, Washington. In that case, Plant 3 undergoing a modification, was limited to the NSPS values for both SO_2 and SAM subject to subsequent testing. However, existing Plants 1 and 2 at the same facility and exhausting through the same stack, were limited to 1.159 lb SO_2/ton. An initial "BACT" limit was set for the combined stack emissions for the three units at 2.54 lb SO_2 /ton and 0.105 lb SAM/ton.

The General Chemical plants are double absorption plants like the Piney Point plant. The feedstock at General Chemical is spent sulfuric acid and hydrogen sulfide whereas the feed at Piney Point is elemental sulfur. Following scrubbing, cleaning, and drying, the gas stream introduced to the first pass at the General Chemical plant is similar to that entering the first pass at the Piney Point plant. The main distinction related to possible conversion and emissions control is that the gas strength of SO_2 going into the first pass at the General Chemical plants (8-12%) is more variable than the strength of SO_2 going into the first pass at Piney Point. Also the General Chemical plants are much smaller than the Piney Point plant. However no distinction was drawn or separate limits set in the preparation of the Subpart H standards which are equally applicable to both types of plants.

Recently, Mississippi Phosphates Corporation submitted an application to the State of Mississippi to increase production from 1650 TPD to 1786 TPD of acid at each of two plants. The increase will be attained by replacing pelletized vanadium (actually vanadium-containing) catalyst in the converters with low pressure drop, ring-shaped, vanadium catalyst. This will effectively debottleneck the plants with no other substantial changes. Mississippi Phosphates requested a limit of 3.25 lb SO_2/ton acid to avoid PSD review for SO_2. They proposed 0.15 lb SAM/ton acid and 10 percent opacity as BACT emission limits in satisfaction of PSD requirements. As of this date, the matter is under review by the State of Mississippi and EPA. These two plants use the same process as Piney Point. One of them is the oldest double absorption process plant in the country.

OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the National Park Service received on November 24, and December 8, 1997
- Comments from EPA Region IV received on December 24, 1997
- Evaluation by RTP Associates on behalf of Manatee county received on November 24, 1997
- Further comments from RTP Associates received on November 26, 1997
- Papers written by Monsanto Enviro-Chem on sulfur dioxide emissions control
- Papers written by Monsanto Enviro-Chem on sulfuric acid processes
- Monsanto Enviro-Chem website information on technologies, catalysts, and pollution control
- Calgon Carbon/Monsanto Enviro-Chem joint press release on new SO_2 control technology
- Papers written by Haldor Topsoe on cesium catalysts and additional product information
- BASF website information on catalysts
- EPA background documents in support of NSPS and AP-42, Compilation of Emission Factors
- AWMA Air Pollution Control Manual
- Site visits to plants by Department staff

DETERMINATION BY DEP:

POLLUTANT	CONTROL TECHNOLOGY	EMISSION LIMIT
Sulfur Dioxide	Double Absorption	3.5 lb/ton 100% H_2SO_4 (BACT, 48-hr) 4.0 lb/ton 100% H_2SO_4 (NSPS, 3-hr)
Sulfuric Acid Mist	High Efficiency Mist Eliminators Including Brownian Diffusion	0.15 pounds per ton 100% H_2SO_4 (NSPS)
Visibility	As Above and Process Controls	10 percent (NSPS)
Nitrogen Oxides	None - Low Fuel Nitrogen, Combustion Temperature	0.12 lb/ton 100% H_2SO_4 Applicant Estimate

DETERMINATION RATIONALE:

A "Top-Down" BACT determination rapidly converges to variations of the established double absorption technology wherein the production process and the BACT are identical, thus eliminating the need for add-on control equipment. The applicant's BACT proposal for SO_2 is equivalent to the NSPS value and applies as a 3-hour standard notwithstanding the Department's BACT determination. The Department's BACT determination requires compliance with a 48-hour limit of 3.5 lb SO_2/ton acid. The 48-hour average SO_2 removal efficiency required by the Department is approximately 99.74 percent (%) versus the applicant's proposed value of 99.70%. The underpinnings for the Department's lower SO_2 values are:

1. The Department reviewed the application submitted by Mississippi Phosphates to the State of Mississippi. The scope of the project by Piney Point is greater than the project by Mississippi Phosphates, which proposed an emissions limit of 3.25 lb SO_2/ton acid to avoid PSD and BACT.
2. The Department believes that the applicant's plant will produce 2000 TPD of acid more comfortably than in the past simply by its plan to replace screened, pelletized, vanadium catalyst in Converter 1 and all catalyst in Converter 2 with low pressure drop, ring-shaped, vanadium catalyst. Information from Monsanto indicates that pressure drop across ring-shaped catalyst is 30-50% lower than across pelletized catalyst. The implications are obvious and present the opportunity for sustaining production capacity over a longer period of time during a turn-around cycle. The more modern towers and heat transfer equipment also provide opportunities for lower pressure drop across the plant.
3. The applicant expected the plant to emit 4 lb/ton SO_2 at 2000 TPD after the proposed project and considered all operational or add-on pollution control options to be unfeasible.
4. In the opinion of the Department, use of "cesium-promoted" vanadium catalyst in the fifth and final pass (Converter 2) can reduce SO_2 emissions by 20 to 40 percent (to between 3.2 and 2.4 lb/ton acid or 99.76 to 99.82% conversion efficiency) in a cost-effective manner. Attached are manufacturer summaries claiming even greater reductions under particular situations. This option provides a benchmark against which the applicant can weigh all the options available for SO_2 emissions reduction. The applicant and Manatee County recently agreed that cesium-vanadium catalyst will be installed in the final pass.

5. The Department's proposed SO_2 limit reflects a 12.5 percent reduction in average SO_2 emissions while still allowing a reasonable margin for compliance. The emission limit of 3.5 lb SO_2/ton acid can be achieved over an averaging time of 48 hours. This will allow the applicant to correct and compensate for 3-hour SO_2 emissions greater than 3.5 (but less than 4 lb/ton) by achieving emissions lower than 3.5 lb/ton during the rest of the 48-hour period.

6. Cesium-promoted vanadium ringed catalyst costs $3.15 per liter (per Monsanto) more than standard vanadium ringed catalyst. Therefore 117,000 liters of cesium/vanadium catalyst will cost an additional $370,000 over the cost of replacing the pelletized catalyst with non-cesium vanadium ringed catalyst as originally proposed by the applicant. The amortized cost over a period of 10 years is approximately $50,000 per year.

7. Replacement of 10 percent of the catalyst every other turn-around cycle (i.e. every 3 years) over an extended period of time, results in additional annual costs of roughly $12,300. Thus total additional annual costs are approximately $62,300.

8. At 12.5 percent, SO_2 emissions reductions are about 180 TPY (0.125x1,460 TPY) for a Title V fee credit (@ $25/ton SO_2) of approximately $4,500. This amount of SO_2 recovered is equivalent to about 280 TPY of acid produced for a credit (@ $35/ton of acid) of approximately $9,800. Therefore the marginal cost efficiency between 3.5 and 4 lb/ton acid is approximately $265 per ton of SO_2 removed [($62,300 - 4,500 - 9,800)/300 tons]. At the expected emission reduction between 20 and 40 percent, the marginal costs will be even lower.

9. In 1997 dollars, the above value is lower than the historical double absorption technology marginal cost effectiveness compared with single absorption technology, which was $245 in 1985. It is lower than any add-on process analyzed by the applicant or reviewers. Therefore, it is not necessary to present a detailed cost-effectiveness analysis of add-on control options. The reader can refer to the application and comments by reviewers for those analyses.

10. The above estimate is conservatively high because a converter full of catalyst remains after all of the screenings and replacements over the period of amortization. Cesium-promoted catalyst achieves equivalent conversions at lower temperatures than the standard type. The reduction in heating requirements after the interpass absorption tower results in an energy benefit that the Department has not quantified.

11. Similar calculations can be performed using the most recent cesium/vanadium catalyst introduced by Haldor Topsoe in 1996. Though it is more expensive, it is more active than Topsoe's non-cesium line over the entire range of operating temperatures in the final pass. The Monsanto product, introduced in 1989, offers advantages over its own non-cesium line only at relatively low temperatures. The additional activity, daisy ring shape, and possibility of using less cesium catalyst indicate that the cost effectiveness of Haldor Topsoe's VK-69 catalyst would probably be at least as good as the comparable Monsanto product. BASF also makes a cesium/vanadium catalyst, but the Department has little information about it at this time.

12. Cesium/vanadium catalyst (Haldor Topsoe VK-58) was used in the upper portion of the first passes at the three previously-mentioned General Chemical plants in Anacortes. While the purpose was to

increase production, save startup time, and extend heat exchanger lifetime, the lower historical emissions encountered may have been partially due to the cesium/vanadium catalyst.

13. Control options involving production of by-products or wastes are not advisable at Piney Point. These needlessly require storage and handling of additional materials which unnecessarily complicates operations at a site of concern to and under close scrutiny by the public. Some of these processes were competitive prior to the development of the double absorption process. They have been phased out at many plants and are not seriously considered at any new or existing plants except where there is a market for the by-product (such as sodium sulfites used by to pulp and paper mills).

14. There is no indication that add-on control methods are competitive with those which result in production of additional sulfuric acid when all costs are considered. The cost estimates available to the Department indicate they are generally more expensive than the cesium/vanadium catalyst alternative. They remain available at the discretion of Piney Point (particularly if there is a use for the by-products) as alternatives to achieve the Department's BACT SO_2 limits.

15. The Centaur process, which uses low temperature wet carbon catalysis/adsorption in place of the standard final pass and absorption tower, is viable and was (according to Monsanto and Calgon Carbon statements) demonstrated on a pilot scale at a sulfur burning plant. A commercial sale incorporating Centaur for a 1000 TPD plant was made to Philippines Phosphate Fertilizer Corporation. It is licensed by Calgon Carbon and Monsanto Enviro-Chem. Emissions as low as 1 lb SO_2/ton acid are theoretically possible. However, the process has not yet been optimized and might result in a separate excess weak sulfuric acid stream (beyond plant water makeup needs) which might require treatment and disposal. Process optimization and building contingency treatment facilities would delay start up of the plant.

16. The Department does not recommend the Centaur process at Piney Point at this time. It remains an option that Piney Point can choose if it prefers it over other alternatives. The process may actually gain appeal in future plants and modifications for economic reasons once the potential problems are determined and minimized.

17. Department records indicate that emissions less than 4 lb SO_2/ton are commonly achieved throughout the entire turn-around cycle by several plants in Florida. In some cases, the lower levels may reflect existence of process bottlenecks, production permit limits, low production rates, or other considerations. Lower emissions may also be the result of progressive replacement of degraded pelletized vanadium catalyst with ringed vanadium catalyst without production increases over many turn-around cycles. For example, two plants at White Springs, Florida, typically emit 3.3 lb SO_2/ton throughout their entire turn-around cycles even after increasing production at each plant from 2000 to 2500 TPD several years ago.

18. The option of more frequent turn-arounds was considered. Estimates of cost-effectiveness ranged from over \$25,000/ton SO_2 reviewed (by applicant) to a substantial increase in revenues (by Manatee County's consultant). Nine month turn-arounds were the norm some years ago. However, plants are capable of running longer between turn-arounds and it is the conclusion of the Department that the operator is in the best position to judge the appropriateness of shutdowns. More frequent turn-arounds make a theoretical difference in SO_2 emissions at some plants but not at others. This and any other operational option remains available at the discretion of the applicant in achieving the BACT limit.

The rationale for the other pollutants is as follows:

19. All mist eliminators at the SAP will be replaced with the most appropriate devices (Monsanto Enviro-Chem CS-IP Co-Knit, ES, and CSII-P mist eliminators) based on the required duty. Per the original application, the Model CSII-P ("Cost Saver"), which relies only on impaction to remove SAM, was to be used in the final tower (see attached manufacturer description). The applicant has since agreed to include 36 of the high efficiency Model ES ("Energy Saver") mist eliminators in the final tower. This design incorporates "Brownian Diffusion" which enhances collection of smaller particles. This replacement constitutes BACT for this project, which is to return an existing plant to its previous capacity.

20. According to the referenced EPA NSPS documents, SAM emissions ranged from a low of 0.004 to a high of 0.15 lb/ton at tested plants. The NSPS standard and Monsanto guarantee of 0.15 lb/ton together with replacement of the mist eliminators in the final tower with high efficiency models will likely result in SAM emissions less than 0.10 lb/ton.

21. The NSPS visibility limit of 10 percent opacity is consistent with the above discussion. There was no need to set a BACT opacity limit.

22. If any credit is given for NO_X emissions during past operation, the increase will not be significant with respect to PSD. The NO_X limit is based on information provided by the applicant and should insure that the increase will be small and not significant.

COMPLIANCE METHODOLOGY:

Demonstration of compliance with the NSPS limits shall be as required by Subpart H. These are EPA Reference Method 8 for SO_2 and SAM. EPA Methods 1, 2, and 3 shall be used to determine stack and flue gas properties. An initial compliance test for NO_X using EPA Method 7 or 7E is required to verify the low emission rate projected in the application.

SO_2 emissions must be continuously monitored as required by Subpart H. The monitoring shall also be used to demonstrate compliance with the Department BACT emission limit for SO_2 on a 48 hour rolling average.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E., Administrator, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

2-12-98
Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

2/16/98
Date:

SUBSECTION 1.0 CONSTRUCTION REQUIREMENTS

1.1 Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation **[Rule 62-204.800 F.A.C.]**. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. **[Rule 62-210.300, F.A.C.]**

SUBSECTION 2.0 EMISSION LIMITING STANDARDS

2.1 General Particulate Emission Limiting Standards. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). **[Rule 62-296-320(4)(b)1, F.A.C.]**

2.2 Unconfined Emissions of Particulate Matter **[Rule 62-296.320(4)(c), F.A.C.]**

(a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.

(b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

(c) Reasonable precautions include the following:

- Paving and maintenance of roads, parking areas and yards.
- Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
- Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
- Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.

- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

NOTE: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

2.3 General Pollutant Emission Limiting Standards: **[Rule 62-296.320, F.A.C.]**

(a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.

(b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

NOTE: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.200(198)]

SUBSECTION 3.0 OPERATION AND MAINTENANCE

3.1 Changes/Modifications: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. *Routine maintenance of equipment will not constitute a modification of this permit.* **[Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]**

3.2 Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. **[Rule 62-4.130, F.A.C.]**

3.3 Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. **[Rules 62-210.650, F.A.C.]**

3.4 Excess Emissions Requirements **[Rule 62-210.700, F.A.C.]**

(a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24 hour period unless specifically authorized by the Permitting Authority office for longer duration. **[Rule 62-210.700(1), F.A.C.]**

(b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. **[Rule 62-210.700(4), F.A.C.]**

(c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. **[Rule 62-210.700(6), F.A.C.]**

3.5 Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. **[Rule 62-4.070(3), F.A.C.]**

SUBSECTION 4.0 MONITORING OF OPERATIONS

4.1 Determination of Process Variables

(a) The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. **[Rule 62-297.310(5), F.A.C]**

SUBSECTION 5.0 TEST REQUIREMENTS

5.1 Test Performance Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]**

5.2 Test Procedures shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. **[Rule 62-297.310, F.A.C.]**

5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least *(30) days* (initial) and *15 days* (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. **[Rule 62-297.310 and 40 CFR 60.8, F.A.C.]**

5.4 Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62 -212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. **[Rule 62-297.310(7)(b), F.A.C.]**

5.5 Stack Testing Facilities: The owner or operator shall install stack testing facilities in accordance with **Rule 62-297.310(6), F.A.C.**.

5.6 Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in **Rule 62-297.620, F.A.C.**

5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. **[Rule 62-297.310(2) and (3), F.A.C.]**

SUBSECTION 6.0 REPORTS AND RECORDS

6.1 Duration: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. **[Rule 62-4.160(14)(b), F.A.C.]**

6.2 Emission Compliance Stack Test Reports:

(a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, but no later than 45 days after the last sampling run is completed. **[Rule 62-297.310(8), F.A.C.]**

b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in **Rule 62-297.310(8), F.A.C.**

6.3 Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. **[Rules 62-4.130 and 62-210.700(6), F.A.C.]**

6.4 Annual Operating Report for Air Pollutant Emitting Facility: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. **[Rule 62-210.370(3), F.A.C.]**

SUBSECTION 7.0 OTHER REQUIREMENTS

7.1 Waste Disposal: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance; and
(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology *(X)*;
(b) Determination of Prevention of Significant Deterioration *(X)*; and
(c) Compliance with New Source Performance Standards *(X)*

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

BEST AVAILABLE COPY

Refer to Comment 4 of Final Determination and Rationale II of BACT.

Sulphuric Acid Catalyst VK69

New Options for Double-Absorption Plants

Activity of Cesium Catalyst (VK-69) at 760°F is greater than non-cesium catalyst (VK38) at 800°F.

Since the introduction of the first VK38 catalyst more than 50 years ago, the VK Series has represented Topsøe's heritage and commitment to quality and innovation.

The introduction of the first caesium-promoted vanadium catalyst, VK58, in the late 1980's meant a tremendous step forward in reducing tail-gas emissions from single-absorption sulphuric acid plants through operation at hitherto unseen low temperatures.

Other application areas of caesium-promoted catalysts include:

- Handling of strong, oxygen-rich SO_2 gases
- Significant reduction in SO_2 emissions during start-up
- Savings in start-up time and extended autothermal restart time limits
- Overcoming plant constraints

VK69

In 1996 Topsøe introduced VK69, a newly developed caesium-promoted catalyst, optimized for operation in the last pass of *double*-absorption sulphuric acid plants. At these conditions VK69 shows a very significant activity advantage compared to regular catalysts.

Features and Benefits

The improvement in activity has been brought about through physical as well as chemical changes compared to Topsøe's well-known VK58 caesium- promoted catalyst.

Support

VK69 is manufactured by a special extrusion process resulting in a highly porous catalyst.

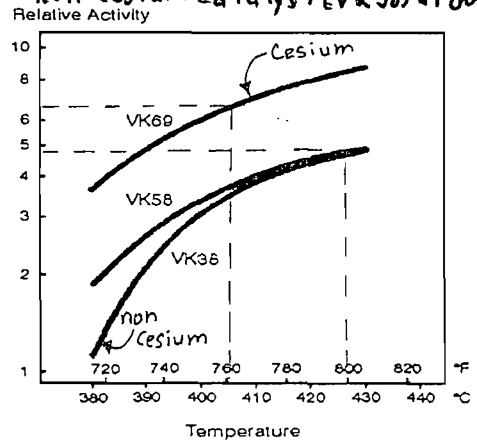
Shape

In gases with low concentrations of sulphur dioxide the rate of oxidation of sulphur dioxide is impeded by intra-particle diffusion. The size and shape of the catalyst particles are hence important for the efficiency of the catalyst.

Topsøe's new 9-mm mini-Daisy shape proves 20 % more efficient compared with smooth 10-mm rings without compromising a low pressure drop.

Chemical Composition

VK69 combines an increased vanadium content with a revised composition of the active phase. Caesium is used to stabilize the vanadium in its active state at low operating temperatures.



Outstanding Activity

The revised support material, the optimum chemical composition, and the mini-Daisy shape together result in a 2-3 times higher activity for VK69 compared to other vanadium catalysts.

Improved Performance

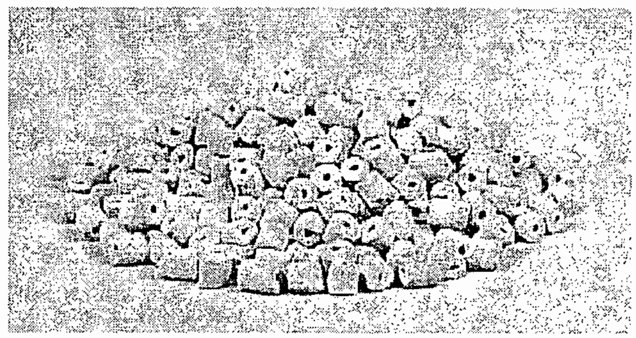
The very high activity of VK69 offers significant performance improvements in terms of:

- Emissions from existing plants can be cut in half without increasing the catalyst volume
- Increased production rate by using higher-strength SO_2 gas without increasing emissions or plant pressure drop

VK69, 9-mm mini-Daisy alongside 10-mm rings and 12-mm Daisy

Enviro-Chem Systems

MONSANTO ENVIRO-CHEM SULFURIC ACID CATALYST



Monsanto has been manufacturing and marketing sulfuric acid catalyst since 1925. The catalyst is sold worldwide and Enviro-Chem provides high quality technical and commercial support before and after the sale. The vanadium-based catalyst is an extremely important "cog" in the many sulfuric acid technologies provided by Monsanto Enviro-Chem.

The sulfuric acid catalyst is used in the oxidation of sulfur dioxide (SO_2) as follows:

$$SO_2 + 1/2O_2 = SO_3$$

The sulfur trioxide (SO_3) is then reacted with water to form sulfuric acid (H_2SO_4). The main components of the Enviro-Chem catalyst include: SiO_2 (silica; as a support), vanadium (V), potassium (K) and/or cesium (Cs), and various binders and additives. The reaction shown above actually occurs within a molten salt consisting of potassium/cesium sulfates and vanadium sulfates, coated on the solid silica support. This unique catalyst has proven to be very stable and long-lived in the sulfuric acid production industry. Because of the unique chemistry of this molten salt system, the vanadium is present as a complex sulfated salt mixture and NOT as vanadium pentoxide (V_2O_5). Therefore, the catalyst is more correctly called a "vanadium-containing" catalyst rather than the commonly-used "vanadium pentoxide" catalyst.

Monsanto Enviro-Chem provides a wide variety of sulfuric acid catalyst products:

Rings	**LP-120**	**LP-110**	**LP-220**
Application	First/Second Beds	Third/Fourth Beds	First/Second Beds
Outside Diameter (mm)	12.7	9.5	9.5
Inside Diameter (mm)	5.0	4.0	4.0
Average Ring Length (mm)	14.0	13.0	13.0
Pellets	**T-210**	**T-11**	
Application	First/Second Beds	Third/Fourth Beds	
Diameter (mm)	5.5	5.5	
Crush Strength (kg)	12.0	12.0	
Cesium-Promoted	**Cs-120**	**Cs-110**	**Cs-210**
Shape	Ring	Ring	Pellet
Application	First/Second Beds	Lower Beds	All Beds
Outside Diameter (mm)	12.7	9.5	5.5
Inside Diameter (mm)	5.0	4.0	

The **cesium-promoted catalyst** was developed specifically for lower temperature operations which can lead to greater SO_2 conversion and hence lower emissions to the atmosphere. The cesium salt promoter reduces the required operating temperature for the sulfuric acid catalyst by as much as 40

°C (70°F). Higher SO_2 conversion is possible at lower temperatures as long as the catalyst is "active"; the cesium-promoted catalysts are sufficiently active at these lower temperatures (390-410 °C/735-770°F) to take advantage of this conversion "opportunity." The cesium/vanadium catalyst can be used in the first bed to reduce the bed inlet temperature (saving energy and start-up time). The Cs-110 or Cs-210 catalyst can be used in the final catalyst bed (at a low inlet temperature) to maximize the SO_2 conversion and reduce emissions. This unique catalyst was introduced in the late 1980's and has been applied in a variety of situations with significant SO_2 emissions reductions. Although the cesium catalyst is more costly than the standard potassium/vanadium catalysts, many customers have justified the added expense by increased production, higher steam production, and reduced emissions.

Technical service is also a major part of the overall sulfuric acid catalyst story. Enviro-Chem provides catalyst engineering studies to assist the customer in determining the catalyst needs in a specific plant, activity analysis and hardness determinations for used catalyst samples, and on-site converter-heat exchanger testing (called *PeGASyS*) to fully characterize the sulfuric acid plant operations which assist the customer in maintenance planning. Enviro-Chem has a variety of commercial and inventory locations throughout the world. Technical service functions are centered in St. Louis, MO (U.S.A.) and in Brussels, Belgium.

*Intro

Enviro-Chem Systems

Some of our landmark developments and contributions to the industry include:

1920s -

Introduction in the US of a sulfuric acid **catalyst** based on vanadium, a superior catalyst to platinum in the contact sulfuric acid process.

1930 -

Monsanto process and plant engineering packages made available to industry through **Leonard Construction Company**

1960s -

Development of fiber bed mist eliminator to reduce mist emissions from phosphoric and sulfuric acid plants.

1963 -

Introduced Type 11 catalyst tailored for higher activity in lower converter passes.

1970 -

First US interpass absorption plant designed by Enviro-Chem goes on stream.

1978 -

Designed first stainless steel converter for 12% gas and introduced Monsanto's stainless steel anodically protected acid coolers to replace cast iron.

1980s -

Introduction of modern energy efficient design concepts which increased steam production by 20-25%.

1980 -

Developed low pressure drop ring catalyst.

1984 -

Patented the Heat Recovery System which produces steam for process or power generation from heat previously lost in acid cooling systems which increases net heat recovery on sulfur burning plants up to 90%.

1986 -

Introduced Sandvik SX™ stainless steel material to the marketplace to replace steel and brick and cast iron in acid systems, leading to greater safety for operators and longer on-stream times.

1987 -

Introduced DynaWave® gas scrubbers to replace venturis and open humidifiers for improved gas cleaning efficiency.

1988 -

Obtained NO_x and Nitric acid plant process technologies.

1989 -

Introduced Cesium catalyst for lower temperature operation in new and existing plants, allowing increased capacity and conversion in existing plants, and lower capital cost of new plants which require exit emissions down to 100 ppm SO_2.

1990 -

Introduced the patented wet catalytic Monarch™ process further improving the energy recovery from acid plants

1992 -

Acquired technology for radial flow gas/gas heat exchanger which offers better layout and reduced

Intro

Enviro-Chem Systems

HISTORY

Today, Monsanto Enviro-Chem is a wholly-owned subsidiary of Monsanto Company. Monsanto Company has about Eight Billion Dollars per year sales.

Over 85 years ago Monsanto Company was a major user of sulfuric acid and built its first sulfuric acid plant in 1917.

The Contact process began to replace the Chamber process at that time and Monsanto commenced making vanadium catalyst in 1925, not only for its own use but for sale. Vanadium catalyst was recognized then as a quality product with low first cost, low replacement, good activity and long life.

Monsanto began to supply design services for the catalyst such as design of the converter vessel, and eventually expanded this to providing basic engineering to an engineering company in the USA who designed and constructed complete acid plants in 1930.

Eventually Monsanto bought the engineering and construction company in 1957, and has constructed all its own designed plants in the U.S.A. since that time. The engineering company name was changed finally to Enviro-Chem.

Companies outside the U.S.A. were also licensed to design sulfuric acid plants using Monsanto technology starting with an English company in 1939. Since then a network of licensees has been established around the world.

Monsanto has contracted with licensees, clients, and local contractors to provide engineering and construction services using the latest available sulfuric acid technology which combines the most effective energy saving techniques with low cost, high quality design.

Significant developments that Monsanto has made in the industry include the following:

1925 - Manufacture of Type 210 catalyst.

1930 - Complete plant design and construction of sulfuric acid plants began.

1961 - Development of Brink®. Fiber Bed Mist Eliminator to reduce mist emissions from phosphoric and sulfuric acid plants.

1963 - Type 11 catalyst tailored for higher activity in lower passes was introduced.

1970 - Built the first U.S.A. interpass plant.

1978 - Designed first stainless steel converter for 12% gas.

1978 - Introduced Monsanto anodically-protected shell and tube coolers to replace cast iron.

1980 - Introduced modern energy efficient design concepts which increased steam production by 20-25%.

1980 - Type LP-120 and LP-110 ring catalyst produced converter pressure drops of 30-50% lower than pellet.

1984 - Patented the Heat Recovery System which produces steam for process or power generation from heat previously lost in acid cooling systems. This increases heat recovery on sulfur burning plants up to 90%.

1986 - Introduced Sandvik SX™ stainless steel material to the marketplace to replace steel and brick and cast iron in acid systems, leading to greater safety for operators and longer on-stream times.

1987 - Introduced DynaWave® Gas Scrubbers to the industry, to replace venturis and open humidifiers with high efficiency reverse jets and froth columns. In Spent plants these replace mist precipitators, for lower maintenance and cost. They are now used in major industrial applications such as metallurgical sites, namely INCO, Metaleurop, Kennecott Copper, and Magma. Other applications include sulfuric acid plants, titanium dioxide, and phosphoric acid recovery.

* 1989 - Introduced Cesium catalyst for lower temperature operation in new and existing plants. This allows increased capacity and conversion in existing plants, and lowers the capital cost of new plants which require exit emissions down to 100 ppm SO_2.

1991 - Made agreement on Russian Reverse Process for future introduction with weak gases. This process needs less equipment and has less operating cost than the conventional plant.

1992 - Sold first 8 radial flow gas/gas exchangers on 4 plant modifications to IPA in Tunisia. These exchangers offer better layout and reduced pressure drop.

1992 - Licensed DynaCycle® Regenerative Catalytic Oxidizer for the destruction of volatile organic compounds (VOCs).

1993 - Sold first radial flow SS converter using Cameron concept with internal radial flow heat exchanger to Outokumpu for new 2400 MTPD metallurgical plant.

1993 - Developed DynaZyme Biofilter for the removal of odorous compounds and VOCs.

1994 - Acquired Calvert technologies: Collision Scrubber to augment DynaWave Wet Scrubber business, Calvert Mist Scrubber for odor removal in municipal and industrial applications.

1994 - Developed Exosite Odor Control Chemicals.

1995 - Started up first major metallurgical smelter off gas acid plant guaranteed to emit no more than 100 ppm SO_2, and incorporating dual boiler HRS.

1995 - Licenced Odorgard technology.

1996 - Licenced ECA (Electrochemical Activation) Technology.

Performance Summary

Model	Brownian Products			Impaction Products			
	ES Energy Saver	HE High Efficiency	HE "Plus" High Efficiency	CS-IP Cost Saver I	CS-IIP Cost Saver II	HP High Performance	HV High Velocity
Mist Collection Mechanisms	Impaction, Interception + Brownian Movement			Impaction, Interception Only			
Reentrainment Control	Yes	No	Yes	Yes	Yes	No	No
Efficiency on Mist & Particles >3 Micron	Approximately Equal to 100%						
Efficiency on Mist & Particles <3 Micron	92 to 99.95%			50 - 95%* (0.5μ -3μ)	70 - 99%* (0.5μ - 3μ)	70 to 99%* (0.5μ - 3μ)	50 - 97%* (0.5μ - 3μ)
Pressure Drop (inches w.c.)	4 to 20			4 to 5	7 to 9	10	8 to 12

* At 1.8 Particle Specific Gravity

Performance Comparison

Collection Efficiency vs Particle Size

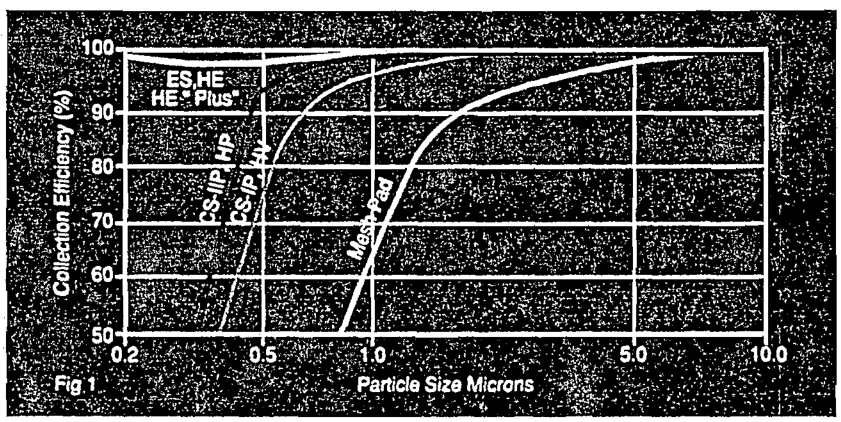


Fig 1

Turndown

Flow Rate vs Efficiency

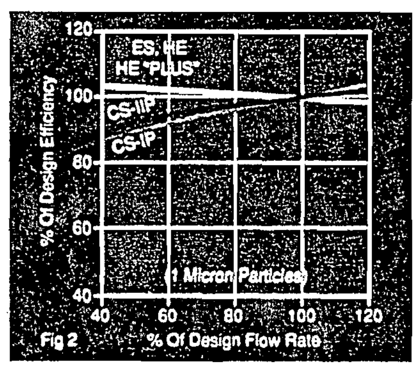


Fig 2

Flow Rate vs Pressure Drop

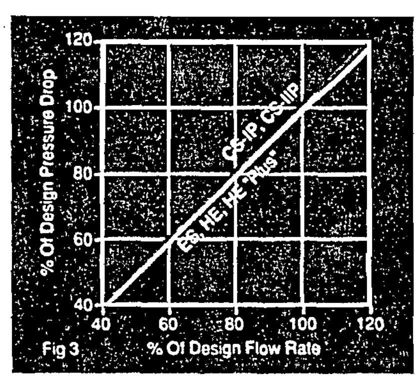


Fig 3

For the high efficiency Brownian Movement based products, (**HE, HE "PLUS"**, and **ES**), collection efficiency actually increases with reduced flow rate.

For the impaction based products, (**CS-IP, CS-IIP, HV**), collection efficiency especially on small particles decreases with reduced flow rate. (Fig 2)

For all element types, pressure drop is linearly proportional to flow rate. (Fig 3)

Note: Data shown is expected performance based on particle specific gravity of 1.8.

Memorandum

Florida Department of Environmental Protection

TO: Howard L. Rhodes

FROM: Clair H. Fancy

DATE: February 12, 1998

SUBJECT: Piney Point Phosphates Sulfuric Acid Plant
PSD-FL-242

Attached is the final permit package for the modification of Piney Point Phosphates' existing sulfuric acid plant. The project will restore the plant to its previous capacity of 2000 TPD. We have made a BACT determination of 3.5 lb SO_2/ton acid. The applicant has agreed to achieve that limit by using cesium-vanadium catalyst in the final pass per a separate agreement with Manatee County.

The Applicant had four main issues in its comments. These are addressed in detail in the Final Determination. The first and most important is to allow startups, etc. to be excluded from the 48-hour BACT SO_2 emission calculation. We have accommodated their request. The second is to allow them to take out the cesium catalyst after two years or one turnaround per their interpretation of the Agreement with the County. This is unacceptable for the reason that use of cesium-promoted catalyst is the only option for which we have reasonable assurance that the plant will meet the BACT SO_2 limit as required by Rule 62-4.070, F.A.C. The third is that the Agreement between Piney Point and Manatee County should take precedence over the Department's permit and that changes should be automatically and perpetually incorporated into the permit. This one is also unacceptable. The fourth is a request to average plant production over 48 hours. This one was denied as explained in the comments. The other issues are criticisms of our work and do not affect Piney Point.

I recommend your approval and signature.

AAl/aal

cc: Jeff Brown, OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

FEB 12 1998

RECEIVED
FEB 16 1998
BUREAU OF
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental
Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJ: Piney Point Phosphates, Inc., Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of the preliminary determination and draft Prevention of Significant Deterioration (PSD) permit for the above referenced facility submitted by a letter dated January 8, 1998, from your office. The permit is for the repair and restoration of an existing double absorption sulfuric acid plant and associated molten sulfur handling equipment. The permitted capacity of the plant will be equivalent to the previous production rate of 2,000 tons/day of 100 percent sulfuric acid. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

As indicated in the State's best available control technology (BACT) analysis, SO_2 emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. Piney Point Phosphates will replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. As indicated in the draft permit, cesium-promoted VC catalyst will be installed in the final converter pass (Converter 2), and it will be used for at least one plant turnaround cycle, or approximately two years, whichever is longer. This will be the first required use of the catalyst to reduce SO_2 emissions. Since cesium-promoted catalyst is more effective than other ringed catalyst at lower temperatures, emissions of SO_2 should be reduced. The proposed BACT SO_2 emission limit is 3.5 lb per ton of 100 percent sulfuric acid produced (48 hour rolling average based on CEMS data). The Subpart H emission limit of 4.0 lb SO_2 per ton of 100 percent sulfuric acid produced (3 hour rolling average based on CEMS data) must also be met, and an annual

EPA Method 8 test will be required. The proposed sulfuric acid mist emission limit is 0.15 lb per ton of 100 percent sulfuric acid produced. We have reviewed the preliminary determination and draft permit and do not have any adverse comments.

Thank you for the opportunity to review and comment on the draft permit and supporting information. If you have any questions regarding our review, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology
Branch
Air, Pesticides, and Toxics
Management Division

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart Sr, VP
Piney Point Phosphates
13300 US 41 North
Palmetto, Fl
34221

4a. Article Number
P 265 659 298

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
2/19/95

5. Received By: *(Print Name)*
Lisa Crane

6. Signature: *(Addressee or Agent)*
X L. Crane

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811**, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 298

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Robert Stewart
Street & Number	Piney Point
Post Office, State, & ZIP Code	Palmetto, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 081CC02-004-AC PSD-Fl-242	2-17-95

PS Form **3800**, April 1995

LANDERS & PARSONS, P.A.
Attorneys at law
310 West College Avenue
Tallahassee, Florida 32301
(850) 681-0311
(850) 224-5595 FAX

FAX COVER SHEET

DATE: **May 17, 2000**

NUMBER OF PAGES (INCLUDING COVER SHEET): 4

PLEASE DELIVER FAX TO:	FAX NO.
Al Linero	922-6979

FROM: DAVID S. DEE
IF ANY PROBLEMS, please contact Nanci at: (850) 681-0311.

MESSAGE:

RTP Memos
Manatee /
Piney Phos

TELEPHONE CALL REPORT

Firm/Office: RTPNJ
Date: 02-22-99
Proj. ID: LPPPP

Description: Piney Point Phosphates

Distribution: J. Steinsnyder
D. Dee
W. Corbin
Proj. File: LPPPP

Made by/Received By: Donald F. Elias
Talked With: Gerald J. Kissel - FDEP
Phone #: (813) 744-6100 x 107

I finally caught up with Gerry today, after several calls to obtain an update on the Piney Point Phosphate case. He had just called Ivan Nance, at our prodding, and indicated that Piney Point would prefer not to do anything with the permit at the current time and is waiting until they are ready to work on the plant to modify it. I reminded Gerry of the conflict between the construction permit and the Title V permit, and that this required resolution. In addition, I reminded him that there is an August 17, 1999 expiration date. Gerry stated that, "off the top of his head", that perhaps the Title V Operating Permit had eliminated the need to begin construction by August 17, 1998 and that this had resolved the primary concern. I assured him that indeed the PSD permit had not been superseded by the Operating Permit, and in fact, the State had gotten ahead of themselves in issuing an Operating Permit for a facility that has not yet been modified in accordance with the construction permit. He agreed that the State had gotten ahead of themselves on this issue, but felt that he was in the middle and suggested that perhaps we try to contact Piney Point Phosphate ourselves. I doubt that this would produce much in the way of results. I then reminded him again that USEPA had expressed concern about the permit as well, and that it still needed to be resolved as soon as possible.

Please give me a call at (732) 968-9600 to discuss future direction.

FAX to Al Linero

F.Y.I.
D. Dee
5/17/00

TELEPHONE CALL REPORT

Firm/Office: RTPNJ
Date: 01-05-99
Proj. ID: LPPPP

Description: Piney Point Phosphates

Distribution: J. Steinsnyder
D. Dee
W. Corbin

Made by/Received By: Donald F. Elias
Talked With: Roger Cawkwell, FDEP
Phone #: (813) 744-6100 x 117

I called Roger to determine the status of the Piney Point Phosphates Title V Permit revision. Roger indicated that they still have not processed the modification to the Title V Permit and that Gerry Kissel had not wanted to "push" Piney Point. I explained that this was a bit confusing, in that the modification was designed simply to make the Title V Permit match the Preconstruction Permit. Roger agreed that this should not have been a problem and concurred that Piney Point had agreed to the change. He indicated that he will call Piney Point and attempt to process the modification.

However, Roger did inform me that this is his last month with the agency. He has resigned and will be leaving for Las Vegas next month. (As a sideline, his wife is a doctor and is accepting a position in Las Vegas.) I told him that I would also attempt to follow up with Gerry Kissel. Roger was unaware as to whether any construction activity had yet occurred on-site. The permit was issued on February 17, 1998, hence construction needs to start before August 17, 1999 or the permit would have to be reissued.

Please give me a call if you wish to discuss this issue further.

TELEPHONE CALL REPORT

Firm/Office: RTPNJ
Date: 01-06-99
Proj. ID: LPPPP

Description: Piney Point Phosphates

Distribution: J. Steinsnyder
D. Dee
W. Corbin

Made by/Received By: Donald F. Elias
Talked With: Gerald J. Kissell - FDEP
Phone #: (813) 744-6100 x 107

I spoke with Gerry Kissell today about the status of the Piney Point Phosphates Title V permit revisions. Gerry got Roger Cawkwell, brought him into his office and put the conversation on speaker. Roger had called Ivan Nance yesterday, but described the conversation as "evasive". To the District's knowledge, the project is currently on the back burner and no construction activities have occurred. I reminded Gerry that it would be advantageous if this could be wrapped up before Roger left at the end of the month. Additionally, EPA is still expressing interest in the revision. Gerry promised that he would call Ivan Nance on or before January 15th in an attempt to move the process forward. There has been no change since the August 21, 1998 letter with the proposed changes, which had been sent to Piney Point from the District. We are in agreement with the language proposed by the Department. Piney Point has not yet responded to this letter.

Finally, I reminded Gerry that the PSD Permit will expire or will need to be renewed before August 17, 1999. I asked him to remind Piney Point Phosphates of this date in order to avoid the County from having to go through the expense of the permitting process a second time.

Should you wish to discuss this call further, please give me a call at (732) 968-9600.

Al, These issues never got resolved, to my knowledge.

FLORIDA

Jeb Bush
Governor

Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

May 8, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
Post Office Drawer 797
Mulberry, Florida 33860

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant

Dear Mr. Stewart:

We received a request dated April 28 from Amundsen, Moore & Torpy requesting extension of the expiration date for the subject permit from June 30, 2000 to June 30, 2001.

The permit for this project to refurbish the existing sulfuric acid plant was issued over two years ago. Please advise if construction has commenced. Also provide an updated schedule with milestones for completing this project based on accomplishment of each task listed in your original application for that project.

We would also like to know of your plans, if any, to construct the new plant for which an application was submitted in 1989. An administrative hearing was held in abeyance as part of your settlement with Manatee County regarding refurbishment of the existing plant.

If you have any other questions regarding this matter, please call me at 850/921-9503 or Mr. Linero at 850/921-9523

Sincerely,

C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/aal

Cc: Paul Amundsen, Esq.
Doug Beason, DEP OGC
Pat Comer, DEP OGC

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

May 4, 2000

Mr. Paul H. Amundsen
Amundsen, Moore & Torpy
502 East Park Avenue
Tallahassee, Florida 32301

Dear Mr. Amundsen:

RE: PSD Permit No. PSD-FL-242
Piney Point Phosphates, Inc.

On April 28, 2000, the Bureau of Air Regulation received your letter requesting an extension of time for the above referenced permit. We have determined that no processing fee is required for this request and are returning your check number 3004 for $50.00 with this letter.

Sincerely,

A A Linero 5/4

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/pa

Enclosure

AMUNDSEN, MOORE & TORPY
ATTORNEYS AT LAW

PAUL H. AMUNDSEN
RICHARD W. MOORE
RICHARD E. TORPY
RODOLFO NUÑEZ
JULIA E. SMITH
ROBERT M. LYERLY

OF COUNSEL:
BYRON B. MATHEWS, JR.

502 EAST PARK AVENUE
TALLAHASSEE, FLORIDA 32301
(850) 425-2444
FACSIMILE: (850) 425-2447
EMAIL: ammolaw@nettally.com

PLEASE REPLY TO:
POST OFFICE DRAWER 1759
TALLAHASSEE, FLORIDA 32302-1759

BREVARD COUNTY OFFICE
202 NORTH HARBOR CITY BLVD.
SUITE 300
MELBOURNE, FL 32935
(407) 255-2332
FACSIMILE: (407) 253-2546

April 28, 2000

Hand Delivery on this Date

C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Division of Air Resources Management
Department of Environmental Protection
2600 Blairstone Road
Tallahassee, FL 32399 - 2400

Re: **PSD Permit No. PSD-FL-242**
Piney Point Phosphates, Inc.
Request for One Year Permit Extension

Dear Mr. Fancy:

This firm represents Piney Point Phosphates, Inc. The purpose this letter is to request the Department to extend the June 30, 2000 expiration date by one (1) year. The new expiration date would therefore be June 30, 2001.

Enclosed is a check for the permit extension fee of fifty dollars ($50.00).

The reason for the requested extension is the general market downturn for phosphate fertilizer, which has resulted in the Piney Point Plant temporarily curtailing operations.

Please let me know if you require any additional information. Thank you very much.

Sincerely,

Paul H. Amundsen

Enclosure
PHA/mw

cc: (Without Enclosure/U.S. Mail)

DEP Southwest District Office
3804 Coconut Palm Drive
Tampa, FL 33619-8218

Director
Manatee County Environmental Management
P.O. Box 1000
Bradenton, FL 24206-1000

AMUNDSEN & MOORE
PH 850-425-2444
P. O. BOX 1759
TALLAHASSEE, FL 32302

3004

63-992/631
BRANCH 002

DATE 4-28-00

PAY TO THE ORDER OF Florida Department of Environmental Protection $ 50.00

Fifty and no/100 DOLLARS

Security features included. Details on back.

Tallahassee State Bank
MONROE OFFICE
601 N. MONROE STREET
TALLAHASSEE, FL 32301
An Affiliate of Synovus Financial Corp.

FOR PERMIT EXTENSION FEE

MP

[redacted]

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- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Robert Stewart, Sr. V.P.
Operations + Admin.
Piney Point Phosphates
P O Drawer 797
Mulberry, Fl
33860

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*   B. Date of Delivery

C. Signature
X [signature]   ☐ Agent ☐ Addressee

USPS MAY 2000 MULBERRY FL 33860

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)* Z 341 355 285

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 285

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Sent to	Robert Stewart
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Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5-10-00 0810002 004-AC PSD-FI-242

PS Form **3800**, April 1995

Check Sheet

Company Name: Piney Point Phosphates
Permit Number: 0810602-004-AC
PSD Number: PSD-FL-242
Permit Engineer: Al Linero

Application:

- [x] Initial Application
  - [x] Incompleteness Letters
  - [x] Responses
  - [ ] Waiver of Department Action
  - [ ] Department Response
  - [ ] Other

Cross References:

- [ ]
- [ ]
- [ ]

Intent:

- [x] Intent to Issue
- [x] Notice of Intent to Issue
- [x] Technical Evaluation
- [x] BACT Determination
- [x] Unsigned Permit

Correspondence with:

- [x] EPA
- [x] Park Services
- [ ] Other

- [x] Proof of Publication
  - [ ] Petitions - (Related to extensions, hearings, etc.)
  - [ ] Waiver of Department Action
  - [ ] Other

Final Determination:

- [x] Final Determination
- [x] Signed Permit
- [x] BACT Determination
- [ ] Other

Post Permit Correspondence:

- [ ] Extensions/Amendments/Modifications
- [ ] Other

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Fig. 2--Mississippi Phosphate Sulfuric Acid Emissions

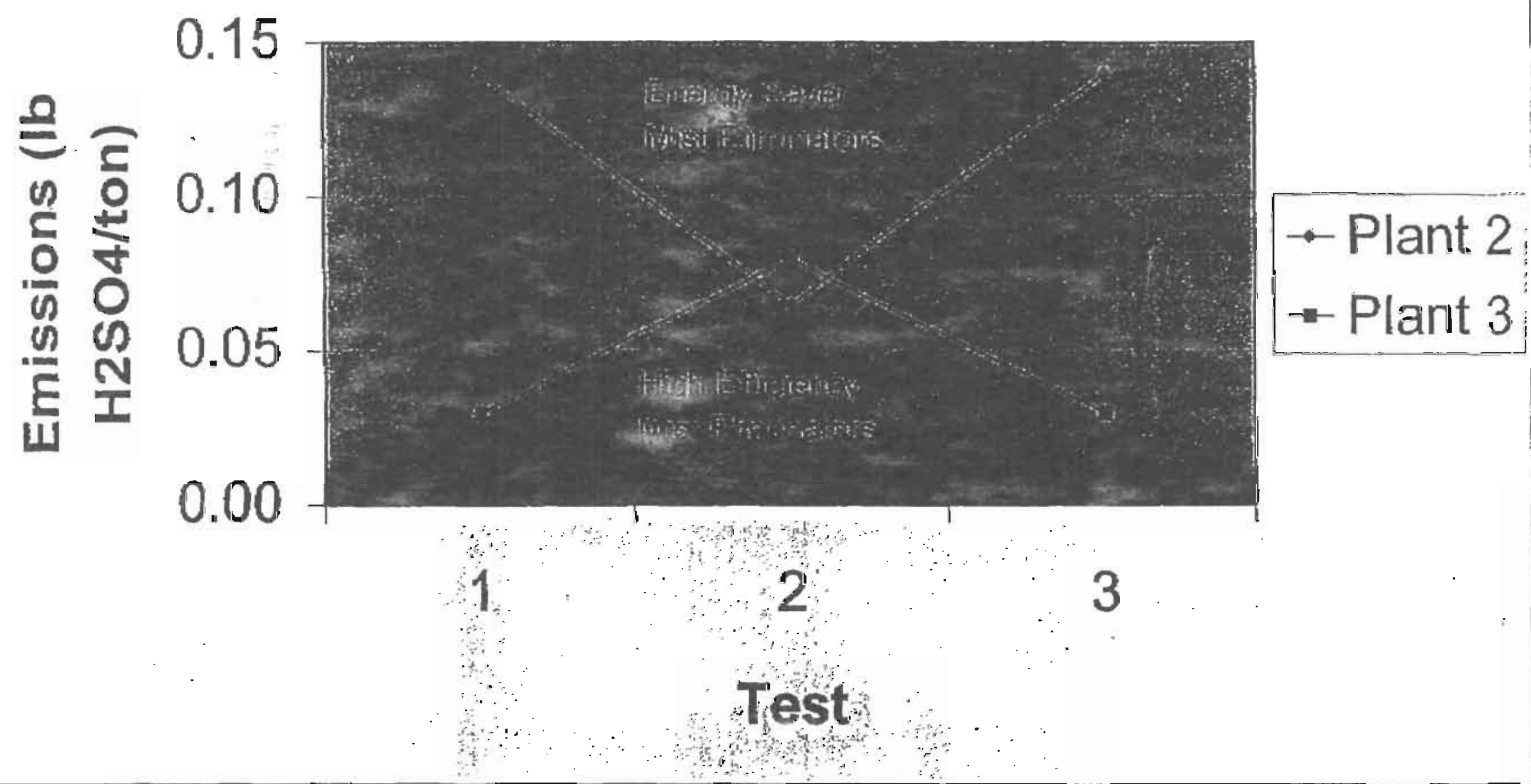

Table 1.b.

H2SO4 Test Results Minus Outliers

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.028
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008

Count = 52
Average = 0.061
Median = 0.034
Mode = 0.014
S.D. = 0.057
95% CI = 0.015 +/- 0.061

Emission Factor @ 95% 0.045 <EF< 0.076

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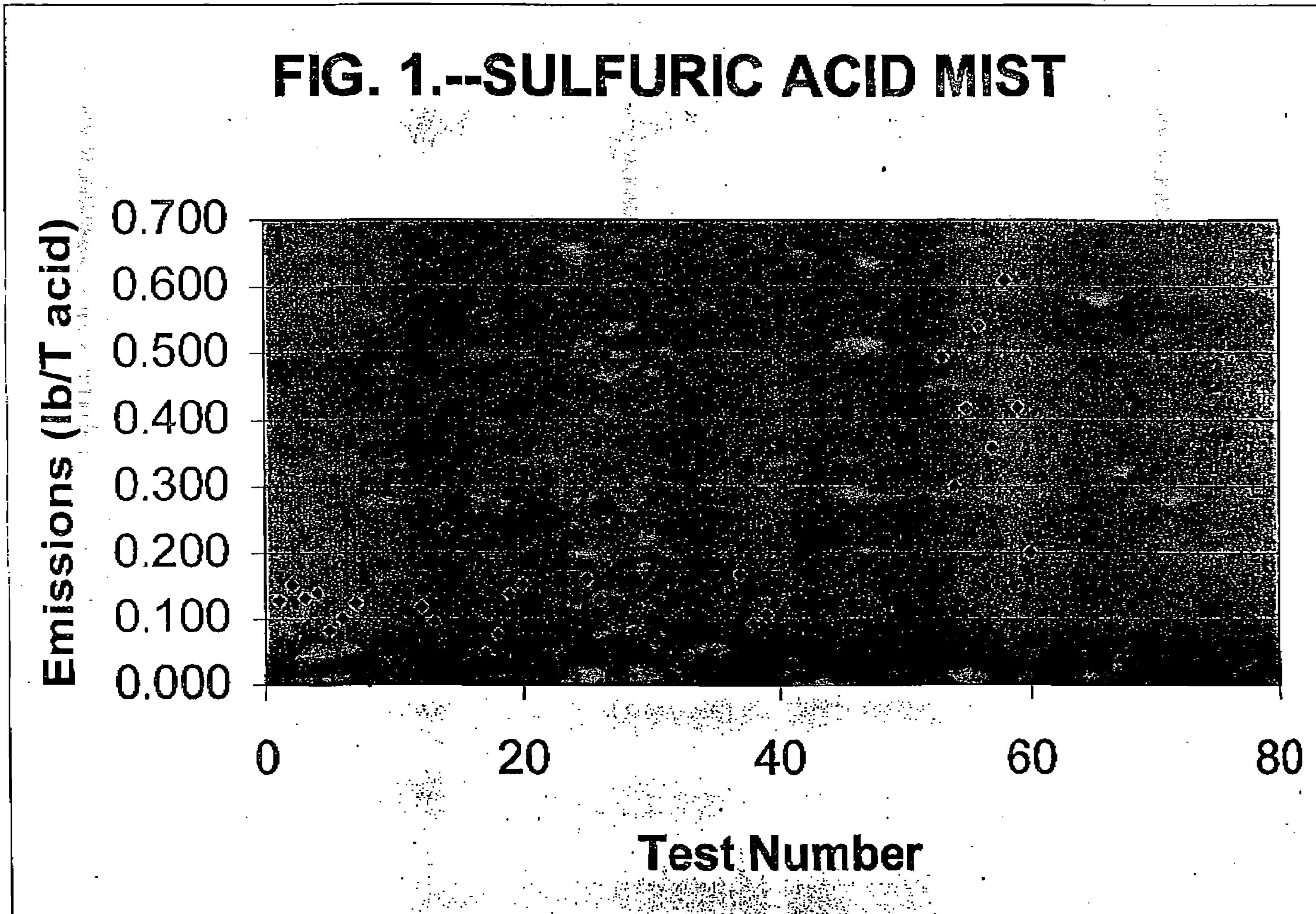

Table 1.a.

H2SO4 Test Results

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.006
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008
53	16	1	0.494
54		2	0.301
55		3	0.417
56		4	0.541
57		5	0.358
58		6	0.609
59		7	0.419
60		8	0.201

Count = 60
Average = 0.108
Median = 0.045
Mode = 0.014
S.D. = 0.141
95% CI = 0.036 +/- 0.108

Emission Factor @ 95% 0.073 <EF< 0.144

one of the "high efficiency Brink Mist Eliminators" described in the BACT portion of the original permit. Plant 3 uses type HE (High Efficiency) mist eliminators from the same manufacturer. Even at its worst, the high efficiency mist eliminator can achieve 0.08 lb/ton. Therefore, we recommend that BACT represent a limit of not more than 0.08 lb/ton.

Finally, because FDEP has compiled extensive stack test data on emissions of SO_2, H_2SO_4 mist, and NO_x from various sulfuric acid plants, we suggest that FDEP perform a statistical analysis of that data to provide additional information regarding the emissions from these plants.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

worth \$28-\$42 per ton and is in short supply in Florida, as stated in the application, this represents a gross loss of \$1.5-2.3 million, and a net loss of over \$1 million (at PPP's \$20/ton production cost).

3. Table 4-1, Cost Analysis of an Interim Plant Turnaround for Catalyst Screening and Partial Replacement:

- Since catalyst replacement and waste disposal costs after a 9-month turnaround should be half of the same costs after an 18-month turnaround, there should be no additional annual cost for these items associated with the shorter turnaround.
- If PPP is willing to allow acid production to be limited by emissions such that it loses 54,000 tons production and over \$1 million during an 18-month period, why is it necessary to spend almost \$0.5 million to supply 17,000 tons of acid during an 8.5 day turnaround?

4. Table 4-2, Cost Analysis of Ammonia Scrubbing to reduce SO_2 Emissions from a 2000 TPD Sulfuric Acid Plant:

- Capital costs are totally unsubstantiated. Indirect Costs were incorrectly estimated as a percentage of total Direct Costs, rather than Purchased Equipment Costs (as recommended by the EPA Control Cost Manual).
- Operating Labor time appears excessive (2 hr/day vs. EPA recommended 1.5 hr/day). Other Direct Annual Costs are totally unsubstantiated. Inclusion of downtime costs is not typically allowed.
- The Capital Recovery Factor is inflated due to use of short (10 year vs. EPA recommended 15 year) equipment life and excessive interest rate (11% vs. EPA recommended 7%). This alone results in a 55% overestimation of annualized control costs.

Sulfuric Acid Mist: PPP proposes to control H_2SO_4 emissions from the acid plant by using high efficiency mist eliminators. The use of high efficiency acid mist eliminators is the predominant control strategy chosen for new or modified sulfuric acid plants regulated under the NSPS and we agree that this control strategy represents BACT for the PPP plant. The mist eliminators will control H_2SO_4 mist emissions to a level below 0.15 lb/ton of 100 percent acid produced. This level is the NSPS for H_2SO_4 emissions from new or modified sulfuric acid plants. However, as with the NSPS for SO_2 emissions from sulfuric acid plants (see above), not only is the NSPS for H_2SO_4 out-of-date, it is also unsupported by existing test data. Analysis of the data contained in the EPA's 1992 Sulfuric Acid Background Report (for its *AP-42, Compilation of Air Pollutant Emission Factors*) shows a mean of 0.108 lb H_2SO_4 emitted per ton of acid produced (Table 1.a). (Note: The AP-42 controlled emission factor is 0.128 lb H_2SO_4 /ton of acid produced.) Furthermore, the average is unduly influenced by a few very high values (see Figure 1). This results in a mean that is more than twice the median. If the eight high "outlier" values from one plant are eliminated, the average emission rate drops to 0.061 lb/ton, and there is 95% likelihood that emissions will not exceed 0.076 lb/ton (Table 1.b).

The feasibility of lower acid mist limits is further supported by a look at tests conducted at MPC (Figure 2). An inspection of the data clearly shows the difference in the two types of mist eliminators used there. Plant 2 uses a Brink type ES (Energy Saver) mist eliminator marketed by the Enviro-Chem Systems division of Monsanto. It must be noted that this is not increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts.

We agree that the potential for impacts to Class I AQRVs other than visibility is low.

Best Available Control Technology (BACT) Analysis

Sulfur Dioxide: PPP proposes to control SO_2 emissions from the acid plant by the dual absorption process to a level of 4.0 pounds SO_2 per ton (lb SO_2/ton) of 100 percent acid produced. This emission level is equal to that adopted by the Environmental Protection Agency (EPA) in 1971 as the New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H). However, it should be noted that more than 12 years have elapsed since the NSPS was last reviewed, and 26 years since it was promulgated. Furthermore, according to EPA policy, the NSPS is merely the minimum level of control that is acceptable as a floor for a proper, "top-down" BACT analysis; the top, or beginning point of the BACT analysis should represent the most stringent level of control feasible. And, recent permit actions indicate that levels of control more stringent than the NSPS are feasible. For example, a recent permit drafted for Mississippi Phosphates Corporation (MPC) by the State of Mississippi Department of Environmental Quality (MDEQ) proposes a limit of 3.25 lb SO_2/ton. In developing that draft permit, MDEQ relied upon letters from MPC to MDEQ (dated 9/26/97) in which MPC stated that use of 1995 and 1996 test data "results in a calculated SO_2 emission limit of 3.02 lbs/ton." In an August 28, 1997, letter to MDEQ, MPC requested a permit limit of 3.16 lb SO_2/ton. Subsequently, MPC proposed meeting a limit of 3.25 lb SO_2/ton. Unless it can be shown that there are extenuating circumstances that make PPP unable to meet the same limit as MPC, it is reasonable to expect that PPP perform at least as well.

Following are specific comments concerning the application:

1. The data presented in Figure 4-1for SO_2 emissions per ton of sulfuric acid produced does not match presumably similar data presented in Appendix D. While the graph shown in Figure 4-1 indicates a rapid, steady increase in emissions per ton, the tabulated data in Appendix D shows a steady, low emission rate until a plant shutdown. After the shutdown, emissions jump by over 50% and climb to double the pre-shutdown level. In addition to the apparent discrepancy in data sets, the radical increase in SO_2 emissions following the plant shutdown raises a question as whether the shutdown and the emissions increase are related. Please explain the discrepancy in the data sets and the emissions increase after shutdown.

2. PPP notes that acid production is constrained by permit limits either on production or emissions. Figures 4-1 and 4-2 illustrate that, as SO_2 emissions approach their limit, production is curtailed by as much as 200 tons per day (TPD), and 100 TPD on the average over the 18 month operating cycle (equivalent to a 54,000 ton loss). If sulfuric acid is

Technical Review of Prevention of Significant Deterioration Permit Application for Piney Point Phosphates, Inc.'s Proposed Refurbishment of a Sulfuric Acid Plant Manatee County, Florida

by

Air Quality Branch, Fish and Wildlife Service - Denver

Piney Point Phosphates, Inc. (PPP) is proposing to refurbish its sulfuric acid plant in Manatee County, Florida. The plant, which has not been in operation since 1992, is located 109 km south of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The refurbished plant will emit significant amounts (see table below) of sulfur dioxide (SO_2), sulfuric acid (H_2SO_4) mist, and nitrogen oxides (NO_x).

POLLUTANT	EMISSIONS INCREASE (TPY)
SO_2	1460
H_2SO_4 Mist	54.8
NO_x	43.8

We find the application to be incomplete. Specifically, the Class I increment analysis, the air quality related values analysis, and the best available control technology analysis are incomplete. Our reasons are stated below.

Class I Increment Analysis

PPP predicted that the maximum impact to the Class I SO_2 and NO_x increments from this project would be zero. This result is unlikely if PPP had modeled their proposed emissions increases (see table above). We ask that PPP explain what emissions values were used in the modeling analysis and that PPP provide their rationale for using those values.

Air Quality Related Values (AQRV) Analysis

PPP did not perform an analysis to assess potential impacts to visibility in Chassahowitzka Wilderness, stating that because the maximum predicted impacts were less than significant, no impacts on Class I AQRVs would be expected. This is incorrect. As we have stated in the past, the AQRV analysis is independent of the Class I increment analysis. A source may have an adverse impact on AQRVs even though its predicted impacts are less than the significant impact levels used to assess increment contribution. We therefore ask that PPP conduct a regional haze analysis, considering both their SO_2 and H_2SO_4 emissions from the project. A background visual range of 65 km should be used in the analysis. The applicant may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including proposed emissions and all other

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- Print your name and address on the reverse of this form so that we can return this card to you.
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- The Return Receipt will show to whom the article was delivered and the date delivered.

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Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart, VP
Operations & Administration
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P 339 251 199

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/12/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan Eyck

PS Form **3811**, December 1994

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Restricted Delivery Fee	
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Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 12-10-97	

0810002-004-AC
SAP

PS Form **3800**, April 1995

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 9, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 US Highway North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

Attached is are some additional comments from the National Park Service which they sent for our consideration. Our modeling expert has discussed the new items with Mr. Raval at Koogler and Associates. Some of the technology questions are similar to the previous comments submitted by the NPS. Feel free to submit any comments regarding this material.

If you have any questions, please call me at (850)488-1344.

Sincerely,

A A Linero 12/9

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/aal

Enclosures

cc: John Koogler, P.E.
Bill Thomas, SWD
Karen Collins, Manatee County

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH

P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: 12/8

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Cleve Holladay

From: Ellen Porter

Subject: Piney Point - we decided to formalize our comments. See "AQRV Analysis" for reg haze guidance. Signed copy will come from Reg. Office later.

Number of Pages:
(Including this cover sheet) 10

Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235

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July 28, 1998

Greg Worley, Air and Waste Management Division
Environmental Protection Agency, Region IV
61 Forsythe Street SW
Atlanta, GA 30303

RECEIVED

AUG 03 1998

BUREAU OF
AIR REGULATION

P. Roger Cawkwell
Division of Air Resource Management
Southwest District, Dept. of Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619-8218

Re: Proposed Title V Operating Permit for Piney Point Phosphates, Inc. Facility in Manatee County, Florida (No. 0810002-003-AV)

Gentlemen:

We have been requested by Manatee County to send you the following comments on the Draft Title V Operating Permit for the Sulfuric Acid Plant portion of the Piney Point Phosphate, Inc. Facility in Manatee County. Our concerns relate to revisions between the Draft Operating Permit (which is now at Region IV for EPA review) and the Final PSD Construction Permit which was issued earlier this year (DEP File No. 0810002-004-AC and PSD No. PSD-FL-242). Most of the conditions in the Draft Operating Permit are nearly identical to the Construction Permit conditions. However, some conditions have been revised or replaced with requirements that are less stringent than those given in the Construction Permit. Since the role of the Operating Permit is to gather all applicable requirements (e.g., Construction Permit requirements) into one concise document, the conditions of the Operating Permit should be no less stringent than the Construction Permit.

First, the second and third paragraphs of Construction Permit Condition III.31 have been revised when included as Operating Permit Condition A.29 by deleting the <u>underlined</u> text:

> *The CEMS shall calculate and record emission rates in units of pounds of SO_2 per hour. <u>Sulfuric acid production rate and sulfur feed rate shall be recorded continually.</u> Each operating day, the average SO_2 emission rate for the previous 48 hours shall be calculated and recorded. <u>Emissions shall be calculated in units of pounds per hour and pounds per ton of 100% acid produced using the method specified in 40 CFR 60.84 (b).</u> Averages are to be calculated as the arithmetic mean of each monitored operating hour from the previous 48 monitored operating hours. A monitored operating hour is each hour in which sulfur is burned in the unit and at least two emission measurements are recorded at least 15 minutes apart. Data taken during periods of startup, or when sulfur is not burned in the unit, or when the CEMS is out of control as defined in 40 CFR 60, Appendix F, Section 5.2 shall be excluded from the 48-hour average.*

> *For compliance with the emission limits, the 48-hour average shall not include data from periods of startup, or when no sulfuric acid is being produced. Data recorded during periods of shutdown, malfunction, load change, and continuous operating periods shall be included in the daily calculation of the 48-hour average.*

Without the second paragraph above, the Operating Permit is less stringent than the Construction Permit because the Operating Permit no longer includes shutdown and malfunction emissions when determining compliance with the 48-hour permit limits. Therefore, the missing paragraph from Condition III.31 of the Construction Permit should be added to Condition A.29 in the Operating Permit.[a]

The Operating Permit also failed to include two sentences from the Construction Permit as shown in the first paragraph above. The first sentence dropped requires sulfuric acid production and sulfur feed rate to be recorded continually. The second sentence dropped requires emissions to be calculated in units of lb/hour and lb/ton using the method specified in 40 CFR 60.84(b). This NSPS provision requires the conversion of the ppm CEMS values to lb/ton emissions. With continuous sulfuric acid production data, hourly lb/hour emissions can then be calculated from the lb/ton emissions. Thus, as written, Construction Permit Conditions III.12 and III.31 require hourly CEMS emissions to be calculated, recorded, and maintained and averaged for determining compliance with the 48-hour limit by determining hourly values of both lb/hour and lb/ton emissions and averaging each separately in order to determine compliance with the 48-hour lb/hour and lb/ton permit limits.

A new condition (Condition A.35) has been added to the Operating Permit, presumably in lieu of the missing sentences, which states:

> *In order to document ongoing compliance with the emission limitations of Conditions A.2 and A.3, the permittee shall maintain daily records of Sulfuric Acid Plant sulfur dioxide (SO_2) emissions. The records shall include the following:*
>
> a. *daily acid production (in tons as 100% H_2SO_4)*
> b. *hours operated;*
> c. *average pounds/hour SO_2 emission rate for the previous 48 hours;*
> d. *average pounds/hour SO_2 emission rate for the previous 3 hours; and*
> e. *a calculation of the SO_2 emissions in tons/last 12 consecutive month period;*
>
> *The daily records shall also show the sulfuric acid mist emission limits from Condition A.3. These records shall be recorded in a permanent form suitable for inspection by the Department upon request.*

This new condition conflicts with the Construction Permit (as well as Conditions A.34 and A.29 of the Operating Permit) because the new condition:

---

[a]Since shutdown and malfunction emissions must be included in the 48-hour average (i.e., these "excess" emissions are not excluded from the 48-hour permit limits), the first sentence in Condition A.22 of the Operating Permit should be changed to (revisions are underlined):

> *Excess emissions resulting from startup, shutdown, or malfunction are permitted providing: (1) best operational practices are adhered to; (2) the duration of excess emissions are minimized; and (3) excess emissions do not cause a violation of the 48-hour SO_2 emission limitations of Condition A.2.*

- Only requires that daily production rates be recorded (Condition III.31 of the Construction Permit requires continuous monitoring of production). If production rates vary significantly during the course of a day, the daily average production rate may not be sufficient to accurately estimate emissions during shorter averaging times.
- Only requires average lb/hour SO_2 emissions to be recorded daily for the previous 3-hour and 48-hour periods when determining compliance with the permit limitations. This conflicts with several other permit conditions as follows:
  - Construction Permit Conditions III.12 (Operating Permit Condition A.34) and III.31 require the permittee to record and maintain the hourly CEMS lb/hour and lb/ton data and any necessary supporting information.
  - Construction Permit Condition III.31 indicates that compliance is to be based on separate averages of hourly lb/hour and lb/ton emissions.
- Implies that compliance with the lb/ton permit limit will be determined from daily averages of lb/hour emission rates and ton/day production rates and not determined from the hourly lb/ton averages as indicated by the Construction Permit as described above. Daily average lb/hour emissions divided by daily average tons/hour of production and averaged over two days may be significantly different than 48-hour averages of hourly lb/ton emissions. On the other hand, this new condition could be construed to mean that compliance is only required for the lb/hour permit limits and not the lb/ton permit limits. The lb/hour limits are less restrictive than the lb/ton limits at production rates less than the permitted capacity.
- Does not clearly define the manner in which hourly lb/hour or lb/ton emissions are to be determined from the hourly CEMS ppm data (like the second sentence dropped from Construction Permit Condition III.31 as described earlier).
- Implies that compliance with the 3-hour NSPS permit limit is to be demonstrated only for the final 3-hour period in each day (i.e., "for the previous 3 hours").
- Effectively changes the rolling 48-hour emission limit as given in Operating Permit Condition A.2 to a block-averaged, or 2-day, limit by requiring only daily emission records and compliance demonstration "for the previous 48 hours."

For these reasons, Condition A.35 should be removed from the Operating Permit and Condition A.29 should include the two missing sentences from Condition III.31 of the Construction Permit. Operating Permit Condition A.34 should be reworded to clearly state that recorded hourly CEMS data at Condition A.34.b should include hourly averages of ppm, lb/ton, and lb/hour and supporting information at Condition A.34.c should include the NSPS test data given by 40 CFR 60.84(b) (to convert ppm to lb/ton) and hourly averages of the recorded continuous production rates (to convert lb/ton to lb/hour).

Operating Permit Condition A.2 states that both the 3-hour and 48-hour SO_2 permit limits are rolling averages based on CEMS data (not block averages as implied by new Condition A.35). However, the Operating Permit conditions only require annual stack tests for determining compliance with the 3-hour permit limits (Conditions A.24 and A.26 only require annual EPA Tests under NSPS requirements for applicable emission limitations and Conditions A.28 and A.29 state that CEMS data are to be used for 48-hour averages). Conditions A.28 and A.29 of the Operating Permit should be reworded to require the permittee to document compliance with the 3-hour and 48-hour SO_2 permit limits as rolling averages and to clearly state that hourly CEMS data are to be used for determining compliance with both 3-hour and 48-hour SO_2 permit limits. As noted above, the new Operating Permit condition (A.35) should be deleted since it conflicts with other existing conditions.

Since the Title V Operating Permit should include all current Construction Permit requirements, the three following Construction Permit conditions missing from the Operating Permit should be added:

- Condition III.1 of the Construction Permit which explicitly states that the sulfuric acid plant is subject to all applicable requirements of NSPS Subpart H;
- Condition III.5 of the Construction Permit which restricts the design capacity of the sulfuric acid plant to 2,000 tons per day; and
- Condition III.30 of the Construction Permit which requires that plant and control equipment parameters used to establish the proper operation of the source be included in the Title V permit.

It is very important to include the third missing condition in the Operating Permit since malfunctions or poor operation of the facility can result in significant emissions of sulfuric acid mist (SAM). While the sulfuric acid plant may not be required to comply with the CAM rule at this time, it will most likely be subject in the future to CAM requirements because SAM emissions are subject to an NSPS emissions limitation (i.e., regulated pollutant under Section 111 of the CAA), the plant uses high efficiency mist eliminators as the primary control device for reducing SAM emissions, and the plant has potential pre-control emissions greater than 100 tons/year. Since compliance with the SAM permit limit is only demonstrated once each year based on stack tests, it is important that some measures of plant performance or work place standards be required as necessary to insure continuous compliance with the NSPS limit.

If you have any questions, please feel free to contact me at 732/968-9600.

Sincerely,
RTP ENVIRONMENTAL ASSOCIATES, INC.®

Donald F. Elias

Donald F. Elias
Principal

cc: J. Steinsnyder, Esq
D. Dee, Esq.
R. Moore, Esq.
G. Danois
A. Linero

Kim
ORIGINAL FOR FILE

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 527-97-02

February 12, 1998

VIA FAX and U.S. MAIL

Mr. C.H. Fancy
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED
FEB 16 1998
BUREAU OF
AIR REGULATION

Subject:: Manatee County-AP
Piney Point Phosphate, Inc.
Sulfuric Acid Plant Repairs
Draft Permit 0810002-004-AC

Dear Clair:

I appreciated the opportunity to discuss the referenced draft construction permit with you and John Reynolds during my visit to Tallahassee on February 10, 1998. Based upon our discussion, it is my understanding that the third paragraph of Specific Condition 31 (page 8 of 9 of the draft permit) will be changed as follows:

> For compliance with emission limits, the 48-hour average shall not include data from periods from startup, or when no sulfuric acid is being produced. ~~However, emissions during startup periods shall not exceed the pound-per-hour limits.~~ Data recorded during periods of shutdown ....
>
> (Strike-throughs indicate material to be deleted and underlines indicate material to be added.)

As long as these changes are made, Piney Point Phosphates has no objection to the permit being issued. It is our understanding the permit will be issued soon; perhaps by February 13, 1998.

If I have misinterpreted our conversation, please contact me as soon as possible. Otherwise, I appreciate your attention to our concerns regarding this specific condition of the permit.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:wa

c: Robert Stewart, Piney Point Phosphates, Inc.
Ivan Nance, Piney Point Phosphates, Inc.
Richard Moore, Amundsen & Moore

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347

Lawton Chiles, Governor 813-620-6100 Carol M. Browner, Secretary

NOTICE OF PERMIT ISSUANCE

CERTIFIED MAIL

In the Matter of an Application for permit by:

DER File No.: AO41-206854
County: Manatee

Mr. Daniel D. Harris
Plant Manager
Royster Phosphates, Inc.
13300 U.S. Highway 41 N.
Palmetto, Florida 34221-8662

Enclosed is Permit Number AO41-206854 to operate the molten sulfur handling and storage System at your facility located at your Piney Point facility in Palmetto, issued pursuant to Section 403, Florida Statutes.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of receipt of this permit. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under section 120.57 Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and the telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by petitioner, if any;

Post-it® Fax Note 7671	Date 1/29/98	# of pages ▸ 14
To Al Linero NSR	From D. Zell	
Co./Dept. Air DARM	Co. SWD Air	
Phone # Molten Sulfur	Phone # A041-206854	
Fax # Storage System Permits	Fax # AC41-176524	

(e) A statement of facts which petitioner contends warrants reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice, in the Office of General Counsel at the above address of the Department. Failure to petition within the allotted time frame constitutes a waiver of any rights such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Street Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

BEST AVAILABLE COPY

Executed in Tampa, Florida

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

David R. Zell

David R. Zell
Air Permitting Engineer
Phone (813) 620-6100 Ext. 412

DRZ/
Attachment

cc: Manatee County Environmental Action Commission

P 149 931 756

RECEIPT FOR CERTIFIED MAIL
(See Reverse)

MR DANIEL D HARRIS
PLANT MANAGER

CERTIFICATE OF SERVICE

I duly designated deputy agency clerk hereby
NOTICE OF PERMIT ISSUANCE and all copies were
mail before the close of business on FEB 04 1992
s.

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge)
2. ☐ Restricted Delivery (Extra charge)

3. Article Addressed to: A041-206854 DZ

MR DANIEL D HARRIS
PLANT MANAGER
ROYSTER PHOSPHATES INC
13300 US HIGHWAY 41 NORTH
PALMETTO FL 34221 8662

4. Article Number
P 149 931 756

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee

6. Signature — Agent
R. K. Kaufman

7. Date of Delivery
2/5/92

8. Addressee's Address (ONLY if requested and fee paid)

FEB 06 1992
SOUTHWEST DISTRICT
TAMPA

Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

...NOWLEDGEMENT FILED, on
...suant to Section
...orida Statutes, with the
...artment Clerk, receipt
...reby acknowledged.

(signature) FEB 04 1992
Date

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347

Lawton Chiles, Governor 813-620-6100 Carol M. Browner, Secretary

PERMITTEE:
Royster Phosphates, Inc.
13300 U.S. Highway 41 N.
Palmetto, FL 34221-8662

PERMIT/CERTIFICATION:
Permit No: AO41-206854
County: Manatee
Expiration Date: 2/07/97
Project: Molten Sulfur Storage and Handling System

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of the molten sulfur storage and handling system consisting of the following:

- one truck and railcar unloading system;
- one molten sulfur receiving pit;
- one 800 ton capacity molten sulfur storage tank;
- all of the associated transfer pumps and piping.

The molten sulfur receiving and storage system is designed unload a maximum of 34 trucks per day (at approximately 20 tons per truck) while simultaneously unloading up to 7 railcars per day (at approximately 100 tons per railcar). The sulfuric acid plant which this molten sulfur system supplies consumes up to 667 tons per day of molten sulfur (based on a permitted production rate of 2,000 tons per day of 100% basis sulfuric acid).

Location: Piney Point, 13300 U.S. Highway 41 North.

UTM: 17-348.5 E 3057.3 N **NEDS No:** 0002 **Point ID No:** 02

Replaces Permit No.: AC41-176524

PERMITTEE
Royster Phosphates, Inc.
13300 U.S. Hwy. 41 N.
Palmetto, FL

PERMIT/EXPIRATION
Permit No.: AO41-206854
County: Manatee
Expiration Date: 2/07/97
Project: Molten Sulfur Storage and Handling System

Specific Conditions:

1. A part of this permit is the attached 15 General Conditions.

2. Visible emissions from any emission point in the molten sulfur handling and storage system shall not exceed 10% opacity (six minute average).
[Rule 17-2.600(11)(a)7., F.A.C.]

3. These sources are allowed to operate continuously (8760 hrs/yr).
[Construction Permit No. AC41-176524].

4. The maximum molten sulfur utilization rate in the sulfuric acid plant shall neither exceed 667 long tons per day, nor 243,100 long tons per year. (Based on the sulfuric acid plant capacity of approximately 2,000 tons per day of 100% sulfuric acid.)

5. The permittee shall not cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.
[Rule 17-2.620(2), F.A.C.].

6. For emission inventory and PSD purposes, the estimated maximum emissions from the sources in the molten sulfur storage and handling system are:

Pollutant	pounds/hr	tons/yr
PM/PM10	0.14	0.61
SO2		1.2
H2S		0.28
TRS		0.79

[Construction Permit No. AC41-176524].

7. The molten sulfur handling and storage system shall be tested for visible emissions within 120 days prior to applying for a renewed operating permit. A copy of the test report shall be submitted to the Air Section of the Southwest District Office of the Department within 45 days of the testing, or with the operating permit application, whichever is earlier.
[Rules 17-2.700(2) and 17-2.700(7), F.A.C.].

PERMITTEE
Royster Phosphates, Inc.
13300 U.S. Hwy. 41 N.
Palmetto, FL

PERMIT/EXPIRATION
Permit No.: AO41-206854
County: Manatee
Expiration Date: 2/07/97
Project: Molten Sulfur Storage and Handling System

Specific Conditions:

8. Compliance with the visible emission limitation of Specific Condition No. 2 shall be determined using DER Method 9 and shall be conducted by a certified observer. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

9. The visible emissions tests shall be conducted during simultaneous unloading of at least one truck and one railcar, or for at least 60 minutes, whichever is greater. Simultaneous visible emissions tests shall be conducted at the sulfur receiving pit and at each vent of the sulfur storage tank. The unloading rate and a description of the unloading operations during the test shall be included with the test results. Failure to submit the actual operating conditions may invalidate the test and fail to provide reasonable assurance of compliance.
[Construction Permit No. AC41-176524 and Rule 17-4.070(3), F.A.C.].

10. The permittee shall notify the Southwest District Office of the Department at least 15 days prior to the date on which each formal compliance test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted.
[Rule 17-2.700(2)(a)9., F.A.C.].

11. The permittee shall implement the necessary recordkeeping, maintenance, and procedures to minimize emissions from the molten sulfur system pursuant to the applicable requirements of Rule 17-2.600(11)(a), F.A.C., "Molten Sulfur Storage and Handling Facilities".

12. In order to document compliance with the requirements of Specific Condition No. 4, the permittee shall maintain the following records and make them available to the Department upon request:

A. Daily molten sulfur receiving rate (tons/day);
b. Monthly total sulfur receiving rate (tons/month) and cumulative total for the most recent 12 consecutive month period (tons/yr) (including sulfur loaded out to trucks);
C. Sulfuric acid plant daily molten sulfur utilization rate (long tons/day);
D. Sulfuric acid plant monthly total molten sulfur utilization rate (long tons/month) and cumulative total for the most recent 12 consecutive month period (long tons/yr).

PERMITTEE
Royster Phosphates, Inc.
13300 U.S. Hwy. 41 N.
Palmetto, FL

PERMIT/EXPIRATION
Permit No.: A041-206854
County: Manatee
Expiration Date: 2/07/97
Project: Molten Sulfur Storage and Handling System

Specific Conditions:

14. Submit to the Southwest District Office of the Department each calendar year on or before March 1, an emission report for this source for the preceding calendar year containing the following information pursuant to Subsection 403.061(13), F.S.:

A. Annual amount of materials and/or fuels utilized;
B. Annual emissions (note calculation basis);
C. Any changes in the information contained in the permit application.

15. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provisions in Rule 17-2.610(3), F.A.C. These provisions are applicable to any source, including but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

16. Any change in the method of operation or equipment which will cause an increase in the actual emissions may be considered a modification and must be reported to the Southwest District Office of the Department for proper processing prior to implementing the change.

17. Issuance of this permit does not relieve the permittee from complying with applicable emission limiting standards or other requirements of Chapter 17-2, or any other requirements under federal, state or local law.
[Rule 17-2.210, F.A.C.].

18. Two applications to renew this operating permit shall be submitted to the Southwest District Office of the Department no later than December 9, 1996 (60 days prior to the expiration date of this permit).
[Rule 17-4.090(1), F.A.C.].

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Richard D. Garrity, Ph.D.
Director of District Management
Southwest District

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

Mr. Gary L. Dahms
Vice President & General Manager
Royster Phosphates
Post Office Box 1329
Palmetto, Florida 34220

March 20, 1991

Enclosed is construction permit AC 41-176524 to construct the existing Piney Point molten sulfur storage and handling terminal. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copy furnished to:

B. Thomas, SW District
J. Bruens, Manatee County
R. Mayko, P.E.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of buisness on 3-20-91.

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kim Tober
Clerk

3-20-91
Date

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Royster Phosphates, Inc.
Piney Point Terminal
Post Office Box 1329
Palmetto, FL 34220

Permit Number: AC 41-176524
Expiration Date: Feb. 28, 1992
County: Manatee
Latitude/Longitude: 27°37'58"N 82°32'08"W
Project: Piney Point Terminal/ Molten Sulfur Storage & Handling System

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the permitting of an existing Piney Point molten sulfur storage and handling facility consisting of a railcar and truck unloading system, one molten sulfur receiving "pit," and one molten sulfur storage tank having a capacity of 800 tons. The sulfuric acid plant at this facility has a permitted capacity of 2000 tons/day.

The molten sulfur receiving and storage system is designed to handle a maximum of 667 tons/day. This facility can unload a maximum of 34 trucks per day (each truck has a capacity of 20 tons) and simultaneously unload 7 railcars per day (each railcar has a capacity of 100 tons). The maximum annual throughput at this facility is 243,100 tons of molten sulfur. The Piney Point Terminal is located on U.S. Highway 41 North, 10 miles North of Palmetto, in Manatee County, Florida.

The latitude/longitude of this facility is 27° 37' 58" N/82° 32' 08"W.

The source was constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

PERMITTEE:
Royster Phosphates, Inc.

Permit Number: AC 41-176524
Expiration Date: February 28, 1992

Attachments are as follows:

1. Royster Phosphates, Inc., application received February 20, 1990.
2. DER's letter dated March 19, 1990.
3. RPI's response received June 11, 1990.
4. DER's letter dated June 21, 1990.
5. RPI's response received November 13, 1990.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

PERMITTEE:
Royster Phosphates, Inc.

Permit Number: AC 41-176524
Expiration Date: February 28, 1992

GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Royster Phosphates, Inc.'s Piney Point molten sulfur storage and handling terminal shall be allowed to operate continuously (i.e. 8760 hours/year).

2. The maximum molten sulfur throughput rate shall neither exceed 667 long tons per day (LTPD), nor 243,100 long tons per year (LTPY).

3. Visible emissions (VE) shall not exceed 10% opacity from any source in the molten sulfur system, including the truck and railcar unloading operations.

4. The permittee shall employ procedures to minimize emissions from the molten sulfur system pursuant to the applicable requirements of F.A.C. Rule 17-2.600(11)(a) [Molten Sulfur Storage and Handling Facilities]. The permittee shall also comply with other applicable provisions of F.A.C. Chapters 17-2 and 17-4.

5. No objectionable odors shall be allowed, in accordance with F.A.C. Rule 17-2.620(2) [Objectionable Odor Prohibited].

6. Initial compliance tests for visible emissions shall be conducted within 90 days of issuance of this permit in accordance with the July 1, 1988, version of 40 CFR 60 Appendix A, using EPA Method 9. The visible emissions tests shall be conducted during

PERMITTEE:
Royster Phosphates, Inc.

Permit Number: AC 41-176524
Expiration Date: February 28, 1992

SPECIFIC CONDITIONS:

entire unloading of at least one truck and one railcar, or for at least 60 minutes, whichever is greater, along with (simultaneous) visible emissions test to be conducted at the sulfur receiving "pit" and at each vent of the sulfur storage tank. The minimum requirements for stack sampling facilities, source sampling and reporting shall be in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A. The Department may require a retest annually, if deemed necessary, or at the time of permit renewal.

7. Any change in the method of operation, equipment or operating hours, shall be submitted to the Department's Bureau of Air Regulation (BAR) for approval.

8. For emission inventory and PSD purposes, the estimated maximum emissions from the sources in the molten sulfur storage and handling system are:

PM/PM_{10}	SO_2	H_2S	TRS
0.14 lbs/hr and 0.61 tons/yr	1.2 tons/yr	0.28 tons/yr	0.79 tons/yr

9. A minimum of 15 days prior written notification of the compliance tests shall be given to the Department's Southwest District office. The compliance test results shall be submitted to the Department's Southwest District office within 45 days of test completion.

10. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

11. An application for an operation permit must be submitted to the Department's Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant

PERMITTEE:
Royster Phosphates, Inc.

Permit Number: AC 41-176524
Expiration Date: February 28, 1992

SPECIFIC CONDITIONS:

shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this 20th day
of March, 1991

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Steve Smallwood

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

Best Available Copy

PINEY POINT PHOSPHATES, INC.

RECEIVED

JUN 12 2000

BUREAU OF AIR REGULATION

CERTIFIED/RETURN RECEIPT
NO. 7099 3400 0005 0933 8680

8 June 2000

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant

Dear Sir:

On 12 May 2000 Piney Point Phosphates, Inc. (PPP) received your letter concerning the above-referenced permit for construction/modification of the existing sulfuric acid plant at our Manatee County facility. In that letter you requested information concerning completion of this project and information pertaining to our plans to construct a new plant at that location. Our response is as follows:

Repairs on this project were originally commenced in December 1996. That effort was slowed, then halted by the Department's review, and then determination that an air construction permit was needed to complete the planned repairs. Halting the project in 1997 caused a loss of financing that was in place at that time. That air construction permit was issued in 1998.

During 1998 PPP subsequently renegotiated with the lending institutions and constructors associated with the project. Activities were resumed in April 1999 with significant progress being made. Absorption towers (2) have been constructed; a cooling tower and a drying tower are also complete. Removal of all replaced equipment also has been completed. Approximately $13.2 million have been expended in this effort.

13300 U.S. Hwy. 41 N., Palmetto, FL 34221 · Phone 941-722-4555 · Fax 941-729-3589

Mr. C. H. Fancy, P.E., Chief
Florida Department of Environmental Protection
8 June 2000
Page 2

PPP halted permitted activities in January 2000 due to an unanticipated downturn in fertilizer market conditions. Attached find a listing of tasks to be completed to bring the project to culmination. At this time PPP is only forecasting that resumption of permitted activities will resume in October 2000 and be completed by July 2001.

PPP does still have interest in permit application to construct a new sulfuric acid plant at that location. However, as you may recall, certain emissions control equipment capability for the proposed plant was to be determined by operation of the repaired plant. At this time PPP requests to continue that methodology to determine if design criteria for the proposed plant will change.

Please consider the foregoing information related to this request for extension of the expiration date; then if further information is required, please contact our offices.

Very truly yours,

Ivan Nance

Ivan Nance
Corporate Environmental Manager

/rmm

Attachments

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Robert Stewart, Sr. V.P.
Piney Point Phosphates, Inc.
P. O. Drawer 797
Mulberry, FL 33860

2. Article Number *(Copy from service label)*
Z 341 355 321

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery

C. Signature
X
☐ Agent
☒ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 321

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Mr. Robert Stewart, Piney Pt.	
Street & Number P. O. Drawer 797	
Post Office, State, & ZIP Code Mulberry, FL 33860	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0810002-004-AC PSD-FL-242 Mailed: 6-29-00	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart Sr, VP
Piney Point Phosphates
13300 US 41 North
Palmetto, Fl
34221

4a. Article Number
P 265 659 298

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
2/19/98

5. Received By: *(Print Name)*
Lisa Crane

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X L. Crane

PS Form **3811,** December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 298

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Robert Stewart
Street & Number	Piney Point
Post Office, State, & ZIP Code	Palmetto, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	0810002-004-AC 2-17-98 PSD-Fl-242

PS Form **3800**, April 1995

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Mr. Robert Stewart, Sr. V.P.
Operations + Admin.
Piney Point Phosphates
P O Drawer 797
Mulberry, Fl
33860

2. Article Number *(Copy from service label)* Z 341 355 285

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery

C. Signature
X [signature] ☐ Agent ☐ Addressee

USPS MULBERRY FL 33860 MAY 12 2000

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 285

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Robert Stewart
Street & Number	Piney Point Phosp
Post Office, State, & ZIP Code	Mulberry Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5-10-00 0810C02-D04-AC PSD-FI-242

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart, VP
Operations & Administration
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P339 251 199

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/12/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan Ecck

PS Form **3811**, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 339 251 199

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Robert Stewart
Street & Number	Piney Point
Post Office, State, & ZIP Code	Palmetto, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	12-10-97

0810002004-AC
SAP

PS Form **3800**, April 1995

Bradenton Herald

102 MANATEE AVE. WEST, P.O. BOX 921
BRADENTON, FLORIDA 34206
TELEPHONE (813) 748-0411

Bradenton Herald
Published Daily
Bradenton, Manatee, Florida

STATE OF FLORIDA
COUNTY OF MANATEE:

Before the undersigned authority personally appeared Jill Headings, who on oath says that she is Legal Advertising Representative of the Bradenton Herald, a daily newspaper published at Bradenton in Manatee County, Florida; that the attached copy of the advertisement, being a Legal Advertisement in the matter of

Notice of Intent

________ in the ________ Court,

was published in said newspaper in the issues of

1/13/98

Affiant further says that the said publication is a newspaper published at Bradenton, in said Manatee County, Florida, and that the said newspaper has heretofore been continuously published in said Manatee County, Florida, each day and has been entered as second-class mail matter at the post office in Bradenton, in said Manatee County, Florida, for a period of 1 year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Jill Headings
(Signature of Affiant)

Sworn to and subscribed before me this
13 day of January, 1998.

SEAL & Notary Public

STATE OF FLORIDA NOTARY PUBLIC

Personally Known ________ or Produced Identification ________

Type of Identification Produced ________

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0810002-004-AC (PSD-FL-242)

Piney Point Phosphates Sulfuric Acid Plant and Sulfur Storage and Handling Manatee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Piney Point Phosphates, Inc. to repair and restore to previous capacity, the existing sulfuric acid plant located at on U.S. Highway 41 at Piney Point, near Palmetto, Manatee County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO2), sulfuric acid mist, and nitrogen oxides (NOx) pursuant to Rules 62-212.400 and 410, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's name and address are: Piney Point Phosphates, Inc., 13300 U.S. Highway 41, Palmetto, Florida 33476.

The sulfuric acid plant produces the reagent used to acidulate phosphate rock to make fertilizers. Molten sulfur is the necessary raw material for sulfuric acid production. The project consists of replacement of certain heat recovery and transfer equipment, boiler feedwater heater/deaerator, process towers and associated mist eliminators, gas ducts, certain foundations and structural steel, electrical components, insulation, instrumentation, certain tanks and umps, and portions of conversion catalyst. The work also includes testing, repair, maintenance, or recommissioning of the sulfur burner, main compressor, reaction vessels; other heat recovery and transfer equipment, other tanks and pumps, the plant stack, sulfur pit, molten sulfur storage tank, and the SO2 monitor.

The project will restore the plant to its previous capacity of 2000 tons per day of sulfuric acid. Control of SO2 emissions is accomplished by the process itself which is based on the conversion of SO2 to SO3 and subsequent recovery as sulfuric acid product. The efficiency of the conversion and recovery is over 99.7 percent. The BACT emission limit for SO2 was determined by the Department to be 3.5 pounds per ton of sulfuric acid produced. Maximum annual SO2 emissions will be 1279 tons per year (TPY). The sulfuric acid mist BACT for this project was determined to be replacement of all mist eliminators with new ones capable of providing optimum collection efficiency over a wide range of particle sizes. In particular the applicant will add 36 more high efficiency mist eliminators in the final tower than originally planned. This will meet the sulfuric acid mist emission limit of 0.15 points per ton of acid produced which is equal to 55 TPY. NOx emissions of 0.15 pounds per ton of acid produced and 44 TPY are inherently low and the increased is marginally significant. No cost effective methods are available to further reduce them.

The draft permit incorporates parts of the Agreement dated December 18, 1997 between Piney Point Phosphates and Manatee County which contains various conditions related to inspections, compliance assurance, reporting, safety, and technological requirements. It requries installation of 115,000 liters of cesium-vanadium catalyst in the final pass. This is the first specifically required use in this country of cesium-vanadium catalyst to reduce SO2. Plans to build a 2,700 TPD plant have been deferred. The Agreement and the terms of the draft permit require the existing plant to be permanently shut down if and when a new plant is built.

PSD increment consumption for ambient NO2 is insignificant in both PSD Class I Chassahowitzka National Wilderness Area and the PSD Class II area near the plant. The project does not consume SO2 increment in either the Class I or Class II areas because the source existed during the SO2 major source baseline year of 1975 and had much higher emissions than expected following construction of the proposed project.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit unless a response received in accordance with the following procedures results in a difference decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of this Notice. Written comments and requests for public meetings shold be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

The Department will issue FINAL Permit with the conditions of the DRAFT Permit unless a timely petition for an administrative hearing is filed pursuant to Sections 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Section 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 851/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition withint he appropriate time period shall constitue a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: **(a)** The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; **(b)** A statement of how and when each petitioner received notice of the Department's action or proposed action; **(c)** A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; **(d)** A statement of the material facts disputed by petitioner, if any; **(e)** A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; **(f)** A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and **(g)** A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the Department's action or proposed action addressed in this notice of intent.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice of intent. Persons whose substantial interests will be afected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, Except legal holidays, at:

Department of Environmental Protection, Bureau of Air Regulation, 111 S. Magnolia Drive, Suite 4, Tallahassee, FL 32301. Telephone: 850-488-1344. Fax: 850-922-6979.

Department of Environmental Protection, Southwest District Office, 3804 Coconut Palm Drive, Tampa, FL 33619-8218. Telephone: 813-744-6100. Fax: 813-744-6084.

Manatee County Environmental Management Department, 202 Sixth Avenue East, Bradenton, FL 34208. Telephone: 941-742-5980. Fax: 941-7[illegible]-5996.

The complete project file includes the Draft Permit, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850-588-1344, for additional information.

1/13/98

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart, S. V.P.
Piney Point Phosphates
13300 US Hwy 41 North
Palmetto, Fl 34221

4a. Article Number
P 265 659 278

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
1/12/98

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan A Jeck

PS Form **3811**, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 278

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1-9-98 0810002-004-AC PSO-C1-242	

PS Form **3800**, April 1995

Fold at line over top of envelope to address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P 265 659 270

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/23/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X [illegible] Peck

PS Form **3811**, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 270

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 12-19-97 0310002-004AC	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P265 659 258

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/4/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X D. Susan Myck

PS Form **3811**, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 258

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to R. Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	12-2-97

PS Form **3800**, April 1995

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Operations & Administrator
Pinei Point Phosphates
13300 US Hwy N.
Palmetto Fl 34221

4a. Article Number
~~Z 963 903 84~~
P 265 659 257

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/1/97

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811**, December 1994

Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

P 265 659 257

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	0810002-004-AC

PS Form **3800**, April 1995

Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl
34221

4a. Article Number
P 265 659 490

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
11/19/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. S

PS

Receipt

Thank you for using Return Receipt Service.

P 265 659 490

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
~~Do not~~ use for International Mail *(See reverse)*

Sent to	Robert Stewart
Street & Number	Piney Point Phos
Post Office, State, & ZIP Code	Palmetto, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	11-17-97

0810002-004-AC
SAP Plant

PS Form **3800**, April 1995

Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to: Ivan Nance, CEM Piney Point Phosphates 13300 US Hwy 41 N. Palmetto, Fl 34221	4a. Article Number P 265 659 484
	4b. Service Type ☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ Return Receipt for Merchandise ☐ COD
	7. Date of Delivery 11/14/97
5. Received By: (*Print Name*)	8. Addressee's Address (*Only if requested and fee is paid*)
6. Signature: (*Addressee or Agent*) X Susan Fick	

PS Form **3811**, December 1994 — Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 484

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (*See reverse*)

Sent to Ivan Nance	
Street & Number Piney Pt.	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-12-97 0810002-004AC PSD-Fl-242	

PS Form **3800**, April 1995

External Affairs Communications

FOR IMMEDIATE RELEASE February 1, 2001
CONTACT: Joe Bakker (850) 488-8217 or Lucia Ross (850) 488-1073

DEP takes swift action to prevent serious problems

-- Environmental security to be maintained at troubled phosphate plants –

TALLAHASSEE – The Department of Environmental Protection has announced that it is moving swiftly to prevent potentially serious environmental problems at two phosphate and chemical plants in Southwest Florida. This action became necessary when the Mulberry Corporation informed the Department that financial difficulties would prevent it from providing the necessary environmental security at two of its affiliated plants, Mulberry Phosphates and Piney Point Phosphates.

Following Mulberry's January 30, 2001 notification to DEP, the Department made the decision to retain a contractor with significant expertise to assist in developing an action plan that would involve both the short-term and long-term management of the sites.

"The difficulties facing the Mulberry Corporation must not be allowed to create difficulties for the residents of the affected areas," said Department of Environmental Protection Secretary David B. Struhs. "We are not acting to study the problem, but will instead work with all concerned to take action and keep this as a story for the business and financial section rather than becoming environmental news."

The Department's action plan, with input from a qualified engineering firm, will quickly determine what is required to secure the sites environmentally, and identify the funding needed to maintain adequate on-site personnel in order to ensure environmental security.

Mulberry Phosphates is located on State Road 60 in Polk County and Piney Point is located in Manatee County, just south of Tampa.

FOR IMMEDIATE RELEASE May 21, 2001

CONTACT: Lucia Ross, DEP (850) 488-1073
John Joyce, Phosphate Council (850) 224-8238
Gray Gordon, Cargill (813) 671-6145
Diana Youmans, IMC (863) 428-2613

DEP PARTNERS WITH CARGILL, IMC TO MAINTAIN ENVIRONMENTAL SECURITY AT MULBERRY

-- Over 350 million gallons of acidic process water to be transferred --

MULBERRY -- The Florida Department of Environmental Protection, in an effort to prevent potentially serious environmental problems at the Mulberry Corporation plant in Polk County, announced today that Cargill Fertilizer and IMC Phosphates have volunteered to receive and recycle over 350 million gallons of fertilizer process water currently retained in the Mulberry's phosphogypsum system. Cargill will take 82 percent of the water to its Bartow facility through a pipeline to be constructed, while the remainder of the water will be hauled by truck to IMC facilities.

"We are pleased to have reached this agreement with Cargill and IMC to devise a feasible solution to this problem," said Department of Environmental Protection Secretary David B. Struhs. "DEP believes in being proactive in situations like this, where so many Florida residents would potentially be affected, and we are grateful to Cargill and IMC for acting so responsibly from an industry standpoint."

Following Mulberry's January 31, 2001 bankruptcy notification to DEP, the Department made the decision to retain a contractor with significant expertise to assist in developing an action plan that would involve both the short-term and long-term management of the sites.

The DEP approached the Florida Phosphate Council to help minimize the risk of an overflow of acidic process water from the phosphogypsum system, which is no longer being maintained by the Mulberry Corporation. DEP officials have been concerned that future heavy rains would pose an environmental risk should the process water overflow from the full phosphogypsum system.

The agreement sets a new standard for competing companies within the same industry to work together for environmental within the same industry to work together for environmental protection, as well as for the DEP, which initiated and negotiated the agreement.

"The Council member companies were at the table with DEP early in the process working to find a solution to this environmental challenge," said Mary Lou Rajchel, President of the Florida Phosphate Council. "The fact that Cargill and IMC have agreed to take this action is a strong example of this industry's commitment to the environmental integrity of the communities where we live and work."

In addition, through efforts by The Florida Phosphate Council, costs for this project will be paid by an industry mining severance tax trust fund at no expense to taxpayers.

Last updated:
May 21, 2001

AMUNDSEN, MOORE & TORPY
ATTORNEYS AT LAW

PAUL H. AMUNDSEN
RICHARD W. MOORE
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PLEASE REPLY TO:
POST OFFICE DRAWER 1759
TALLAHASSEE, FLORIDA 32302-1759

BREVARD COUNTY OFFICE
202 NORTH HARBOR CITY BLVD.
SUITE 300
MELBOURNE, FL 32935
(321) 255-2332
FACSIMILE: (321) 253-2546

June 29, 2001

RECEIVED

JUN 29 2001

BUREAU OF AIR REGULATION

Hand Delivery on this Date

C.H. Fancy, P.E.
Chief, Bureau of Air Regulation
Division of Air Resources Management
Department of Environmental Protection
2600 Blairstone Road
Tallahassee, FL 32399-2400

Re: <u>PSD Permit No. PSD-FL-242</u>
Piney Point Phosphates, Inc.
Request for Six Month Extension

Dear Mr. Fancy:

This firm represents Piney Point Phosphates, Inc. The purpose of this letter is to request the Department to extend the June 30, 2001, expiration date for the above referenced permit by six months. The new expiration date would be December 31, 2001.

Enclosed is a check for the permit extension fee of fifty dollars ($50.00).

The reason for the requested extension is that Piney Point Phosphates is currently involved in a Chapter 11 Bankruptcy proceeding. In this proceeding Piney Point Phosphates is seeking to reorganize the company. A valid PSD permit will make the reorganization of the company more likely to succeed.

Please let me know if you require any additional information. Thank you very much.

Sincerely,

Richard W. Moore

Enclosure

cc: (Without Enclosure/U.S. Mail)
DEP Southwest District Office
3804 Coconut Palm Drive
Tampa, FL 33619-8218

Director
Manatee County Environmental Management
P. O. Box 1000
Bradenton, FL 24206-1000

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

June 28, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
Post Office Drawer 797
Mulberry, Florida 33860

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant
Permit Extension Request

Dear Mr. Stewart:

The Department reviewed your request dated April 28, 2000 to extend the expiration date of the construction permit as well as your letter (attached) dated June 8. The expiration date is hereby extended from June 30, 2000 to June 30, 2001. This action is limited to the construction activities at the existing plant and not to the status of the separate permit application (PSD-FL-144) for a new plant which is still under litigation as a result of a petition filed by Manatee County.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

This permitting decision is final and effective on the date filed with the clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition pursuant to Rule 62-110.106, F.A.C., and the petition conforms to the content requirements of Rules 28-106.201 and 28-106.301, F.A.C. Upon timely filing of a petition or a request for extension of time, this order will not be effective until further order of the Department.

Any party to this permitting decision (order) has the right to seek judicial review of it under section 120.68 of the Florida Statutes, by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this order was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 6/29/00 to the person(s) listed:

Robert Stewart, PPP*
Ivan Nance, PPP
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Doug Beason, DEP OGC
Chair, Manatee County Commission
Paul Amundsen, Esq.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Barbara J-Boutwell 6/29/00
(Clerk) (Date)

Copied
AL 6/12/00
CGIT

PINEY POINT PHOSPHATES, INC.

RECEIVED

JUN 12 2000

BUREAU OF AIR REGULATION

CERTIFIED/RETURN RECEIPT
NO. 7099 3400 0005 0933 8680

8 June 2000

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant

Dear Sir:

On 12 May 2000 Piney Point Phosphates, Inc. (PPP) received your letter concerning the above-referenced permit for construction/modification of the existing sulfuric acid plant at our Manatee County facility. In that letter you requested information concerning completion of this project and information pertaining to our plans to construct a new plant at that location. Our response is as follows:

Repairs on this project were originally commenced in December 1996. That effort was slowed, then halted by the Department's review, and then determination that an air construction permit was needed to complete the planned repairs. Halting the project in 1997 caused a loss of financing that was in place at that time. That air construction permit was issued in 1998.

During 1998 PPP subsequently renegotiated with the lending institutions and constructors associated with the project. Activities were resumed in April 1999 with significant progress being made. Absorption towers (2) have been constructed; a cooling tower and a drying tower are also complete. Removal of all replaced equipment also has been completed. Approximately $13.2 million have been expended in this effort.

13300 U.S. Hwy. 41 N., Palmetto, FL 34221 • *Phone* 941-722-4555 • *Fax* 941-729-3589

PPP halted permitted activities in January 2000 due to an unanticipated downturn in fertilizer market conditions. Attached find a listing of tasks to be completed to bring the project to culmination. At this time PPP is only forecasting that resumption of permitted activities will resume in October 2000 and be completed by July 2001.

PPP does still have interest in permit application to construct a new sulfuric acid plant at that location. However, as you may recall, certain emissions control equipment capability for the proposed plant was to be determined by operation of the repaired plant. At this time PPP requests to continue that methodology to determine if design criteria for the proposed plant will change.

Please consider the foregoing information related to this request for extension of the expiration date; then if further information is required, please contact our offices.

Very truly yours,

Ivan Nance

Ivan Nance
Corporate Environmental Manager

/rmm

Attachments

--- MEMORANDUM ---

TO: Ivan Nance

FROM: G. W. Hartman, P.E.

DATE: May 25, 2000

SUBJECT: PPP Sulfuric Acid Plant / Construction Status

COPY: Al Castle / Leon Willis

Dear Mr. Nance:

The final project status issued at the end of 1999 by Monsanto Enviro-Chem (MEC) still stands as there has been no activity this year:

Engineering:	**97% complete**
Procurement:	**76% committed**
Construction:	**27% complete**
Project:	**68% complete**

Assuming favorable market indications and approval for a project re-start by September 2000, approximately 2 months will be required for re-mobilization (on the parts of both PPP and MEC) during which time the engineering and procurement efforts should be completed. With clement weather and no unforseen circumstances being encountered during construction, a plant start up can be anticipated as early as June 2001.

The following is a re-cap of the task list submitted with the original permit application as "APPENDIX A: List of Proposed Repairs."

1. **Sulfur Burner (existing): No activity**

2. **BFW Heater (deaerator / new): Procured, installation pending**

PINEY POINT PHOSPHATES, INC.
13300 U.S. Hwy. 41 N., Palmetto, FL 34221 • *Phone* 941-722-4555 • *Fax* 941-729-3589

3. Waste Heat Boilers (existing): Inspection complete, repairs pending

4. Economizer (new): Procured, installation pending
5. Main Compressor (existing): Repairs complete, installation pending

6. No. 1 Converter (existing): Inspection complete, repairs pending

7. No. 2 Converter (existing): Inspection complete, repairs pending

8. Drying Tower (new): Vessel complete w/ brick lining installed, acid distribution procured, installation pending

Interpass Tower (new): Vessel complete, brick lining, acid distribution procured, installation pending

Final Tower (new): Vessel complete, brick lining, acid distribution procured, installation pending

9. Drying Tower Mist Eliminators (new): Procured, installation pending

Interpass Tower Mist Eliminators (new): Procured, installation pending

Final Tower Mist Eliminators (new): Procured, installation pending

10. Cold Interpass Heat Exchanger (cold shell / new): Procured, foundation complete, installation pending

Cold Interpass Heat Exchanger (hot shell / existing): Cleaned

Hot Interpass Heat Exchanger (cold shell / new): Cleaned

11. No. 1 Superheater (existing): Inspection not complete

12. Condensate Storage Tank (new): Procured, installation pending

13. Cooling Tower (new): Installed

14. Combination Acid Coolers (new): Procured, installation pending

Product Acid Cooler (new): Procured, installation pending

15. Acid Pump Tank (new): Part of interpass tower (#8 above)

16. Sulfuric Acid Tanks (existing): Repairs complete

17. Plant Stack (existing): Repairs complete, repainting pending

18. Sulfur Pumps (new): Procured, installation pending

    Common Acid Circulation Pump (new): Procured, installation pending

    Acid Drain Pump (new): Procured, installation pending

    Cooling Water Pumps (new): Procured, installation pending

    Condensate Transfer Pump (new): Procured, installation pending

19. Gas Ducts (new and existing): Procurement and installation pending

20. Strong Acid Piping: Procurement and installation pending

    Miscellaneous Piping: Procurement and installation pending

    Valves: Procurement and installation pending

21. SO_2 Monitor (existing): Repairs pending

22. Office - Control Room (existing): Clean-up complete, rebuild pending

23. Structural Steel: Repairs to existing pending, new procured w/ 25% installed

    Insulation: Procurement and installation pending

    Painting: Pending

    Electrical: Pending

    Pilings and Foundations: Complete

24. Instrumentation: Procurement and installation pending

25. Molten Storage Tank (existing): Repair complete, reinstallation and piping pending

26. Auxiliary Boiler (new): Complete

27. Miscellaneous: Most items pending

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Robert Stewart, Sr. V.P.
Piney Point Phosphates, Inc.
P. O. Drawer 797
Mulberry, FL 33860

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery

C. Signature

X ☐ Agent ☒ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
Z 341 355 321

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 321

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Mr. Robert Stewart, Piney Pt.	
Street & Number P. O. Drawer 797	
Post Office, State, & ZIP Code Mulberry, FL 33860	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0810002-004-AC PSD-FL-242 Mailed: 6-29-00	

PS Form **3800**, April 1995

LANDERS & PARSONS, P.A.

ATTORNEYS AT LAW

DAVID S. DEE
DIANE K. KIESLING
JOSEPH W. LANDERS, JR.
JOHN T. LAVIA, III
FRED A. McCORMACK
PHILIP S. PARSONS
LESLIE J. PAUGH
ROBERT SCHEFFEL WRIGHT

VICTORIA J. TSCHINKEL
SENIOR CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

RECEIVED

MAR 22 2001

BUREAU OF AIR REGULATION

MAILING ADDRESS:
POST OFFICE BOX 271
TALLAHASSEE, FL 32302-0271

310 WEST COLLEGE AVENUE
TALLAHASSEE, FL 32301

TELEPHONE (850) 681-0311
TELECOPY (850) 224-5595
www.landersandparsons.com

March 21, 2001

Mr. Al Linero
Administrator of New Source Review
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road, Mail Station 5500
Tallahassee, FL 32399-2400

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant

Dear Al:

The purpose of this letter is to request that the Department provide written notice to us, on behalf of Manatee County, of any agency action or proposed agency action with regard to DEP File No. 0810002-004-AC (PSD-FL-242), the construction permit for Piney Point Phosphate's existing sulfuric acid plant. Please provide the written notice to:

David S. Dee
Landers & Parsons
Post Office Box 271
Tallahassee, FL 32302

Thank you for your assistance in this matter.

Sincerely,

John T. LaVia, III

cc: Jeff Steinsnyder

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 527-97-02

January 23, 1998

RECEIVED
JAN 27 1998
BUREAU OF
AIR REGULATION

VIA FAX AND U.S. MAIL

Mr. A. A. Linero
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Manatee County - AP
Piney Point Phosphates, Inc.
Comments on Draft Intent to Issue Permit
For Existing Sulfuric Acid Plant

Dear Mr. Linero:

We have reviewed FDEP's Technical Evaluation and Draft Permit on the above referenced project. Your prompt evaluation is appreciated. Our comments on the package are discussed below.

First, a statement regarding one particularly troublesome Specific Condition and two general statements to put sulfur dioxide (SO_2) emissions from sulfuric acid plants into perspective.

The Specific Condition (SC) that PPPI, and any other H_2SO_4 plant operator, would have difficulty in complying with is in the third paragraph of SC 31 (page 8 of 9) which states:

> ".... Data recorded during periods of shutdown, malfunction, load change, ... shall be included in the daily average."

This condition is in conflict with the PPPI/Manatee County Agreement (Agreement) (See top of page 3 of the Agreement) and in conflict with Department Rule 62-210.700, F.A.C. Both the Agreement and Rule 62-210.700, F.A.C., exclude emissions occurring during shutdown, malfunction and load change from the 3-hour and 48-hour average emission rate calculations.

The Agreement (page 2, paragraph 1(a)) states:

> "These emission limits [3.5 lb SO_2/ton of 100% acid or 291.7 lb/hr, 48-hr average, and 4.0 lb SO_2/ton 100% acid, 3-hr average] may be

> exceeded only under conditions provided in DEP Rule 62-210.700, F.A.C. Exceedances that meet the requirements of DEP Rule 62-210.700, F.A.C., and are caused by temporary operational upsets, plant start-ups or other conditions, shall not be used when calculating the 48-hour rolling average or 3-hour average." [Emphasis and comment added]

Department Rule 62-210.700, F.A.C., which is included as Common Specific Condition (CSC) 3.4 of the permit, authorizes excess emissions during start-up, shutdown or malfunction provided, among other conditions, best operational practices are adhered to. The best operational practices for H_2SO_4 plant start-up are set forth in the Best Operational Start-up Practices for Sulfuric Acid Plants Memorandum of Understanding (MOU) adopted by the Department and industry. This MOU is included in the permit as Appendix A.

Based on Department rule and the Agreement, it is requested that the third paragraph of SC 31 be worded:

> "Emission data from periods that meet the requirements of Rule 62-210.700, F.A.C., shall not be included in the calculation of the 3-hour average and 48-hour rolling average emission rates."

The first general statement is meant to put SO_2 emissions from sulfuric acid plants, in general, and several related statements in the draft technical evaluation into perspective. The emissions rate of SO_2 from a sulfuric acid plant is a rate unique to that plant. This is a case where a control technology evaluation is truly on a case by case basis. Therefore, for one to cite the performance of one plant and state that another plant can operate similarly is fallacious.

The performance of sulfuric acid plants depend on many factors, including but not limited to:

(1) Whether the plant is a sulfur burning plant, a plant operating on smelter gas or regenerated acid gas or an air pollution control device designed to control and recover SO_2 emitted from another industrial activity,

(2) The SO_2 concentration (gas strength) entering the converter,

(3) The O_2/SO_2 ratio,

(4) The number of catalyst beds,

(5) The catalyst loading in each bed and the total catalyst loading,

(6) The type and geometry of the catalyst,

(7) Heat recovery efficiency,

(8) The demand for steam produced in heat recovery boilers; either for electric power generation or other use,

(9) The demand for acid,

(10) The cost of purchased acid,

(11) The general operating philosophy of the operator,

(12) and others.

When evaluating a feasible emissions limit for a plant, and in particular an existing sulfuric acid plant, factors such as these must be taken into consideration. Likewise when comparing the performance of one plant with another, these factors must be considered.

The final general comment is that PPPI agreed with Manatee County to the SO_2 emissions limits of 4.0 lb/ton 100% H_2SO_4 (3-hr average) and 3.5 lb/ton 100% H_2SO_4 (48-hr average) and agreed to use a cesium enhanced catalyst in the final bed of the converter as a good faith effort to reach a settlement with the County. The agreed upon SO_2 emissions limits were not based on a cost-effectiveness analysis and they are not contingent upon the use of the cesium enhanced catalyst. The emission limits and the catalyst type are independent points of the agreement.

PUBLIC NOTICE

No Comment

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

3. Figure 1:

The drawing submitted by PPPI and identified as Figure 1 in the TE & PD has been revised by FDEP to specify the type of catalyst in the converters and to add other notes. PPPI does not object to the Department using the drawing but requests any reference to PPPI being the source of the drawing be removed because of the revisions. More specifically, it is not necessary to indicate catalyst type, which can change (see the Agreement), in a drawing which was provided to show process/material flow, which is not subject to change without review.

4. Page 4, Paragraph 3:

It should be noted that the last sentence, "This catalyst is more effective than other ringed vanadium catalyst at lower temperatures, thus favoring more complete conversion of the reactants and possibly lower emissions of SO_2", is based on claims made by the suppliers. It should be recognized that marketing literature is aimed at boosting sales and, therefore, the claims have to be considered in that context. The lower temperature at which the cesium enhanced catalyst becomes active also results in a slower reaction rate. Unless contact time is increased, the cesium enhanced catalyst might result in no change in SO_2 emissions or even an increase in emissions.

5. Page 5, Item 6.2, Emissions Summary:

The PSD significant level for SAM should be 7.0 tons per year.

6. Page 6, Paragraph 5, Last Sentence:

It should be clarified that FDEP expects SAM emissions less than 0.1 pound per ton. No such claims have been made by either PPPI or the equipment supplier.

DRAFT PERMIT

7. Page 2, Section A, Facility Description:

In the last sentence, the reference to cesium enhanced catalyst should be eliminated. After one turnover or two years, whichever is longer (See S.C. No. 10), PPPI is no longer required by the PPPI/Manatee County agreement to use cesium enhanced catalyst. As long as the permitted SO_2 emission limits are met, PPPI can convert to conventional vanadium catalyst if they elect.

8. Page 3, Section D, Relevant Documents:

FDEP has indicated several documents which are the basis of the permit and which have been specifically related to this permit, including the agreement between PPPI and Manatee County. Accordingly, for any perceived conflict between the permit and the Agreement, due to wording or interpretation of the requirements, the agreement shall take precedence.

It is also requested that the Agreement be referenced as that dated December 18, 1997, or any amendment thereto. This will take into account changes in the Agreement which could occur.

9. Page 4, SC 6:

It is requested that the construction permit expiration date be December 31, 2001, rather than December 31, 1999.

10. Page 5, SC 3:

The 4.0 lb SO_2/ton 100% H_2SO_4 limit and the 0.15 lb SAM/ton 100% H_2SO_4 limit should both be referenced BACT/NSPS. The NOx limit of 0.12 lb/ton 100% H_2SO_4 should be referenced BACT.

11. Page 5, SC 6:

The H_2SO_4 production rate should be measured on a 48-hour basis to make it consistent with the 48-hour based SO_2 emissions limit of 3.5 lb/ton of acid produced.

12. Page 6, SC 7:

The existing permit for the molten sulfur is not being revised. The proposed permit should reflect the currently permitted molten sulfur throughput rates of 667 long tons (747 short tons) per day and 243,100 long tons (272,272 short tons) per year.

13. Page 6-8, Several SCs:

This is a general comment regarding the inclusion of parts of the PPPI/Manatee County Agreement as Specific Conditions in the Air Construction Permit. First, there are parts of the Agreement which are not appropriate in the Air Construction Permit and secondly, the Agreement is subject to change. Such a change would necessitate a change in the Federally Enforceable conditions of the construction permit.

PPPI has no objection to the Agreement being referenced as a Relevant Document and General Permit Condition G2 states:

> ".... Any unauthorized deviation from ... exhibits [Relevant Documents] ... of this permit may constitute grounds for revocation and enforcement by the Department." [Comment Added]

Thus, the terms of the Agreement automatically become part of the permit by reference. Because of this, and the possibility that the Agreement could change, PPPI requests that SCs 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 and 26 be deleted from the permit.

14. Page 6, SC 11:

Please delete the reference to "Brownian Diffusion" from this condition, as it is overly prescriptive and irrelevant.

15. Page 6, SC 12:

The Agreement requires that the referenced documents be submitted only to Manatee County (Agreement, page 4, paragraph 1(f)). Department rules require only the submittal of an excess emission report. It is therefore requested that the requirement to submit the referenced material to the Department's Southwest District Office be deleted.

16. Page 8, SC 31:

Paragraph 1: Only Performance Specification (PS) 2, from 40 CFR 60 Appendix B is relevant to the proposed project. PS 1 is for Opacity monitors and PS 3 is for CO_2/O_2 monitors. PPPI will have none of these continuous monitors. Therefore, please delete PS 1 and PS 3.

Paragraph 2: It is not necessary to monitor and continually record both the sulfuric acid production rate and the molten sulfur feed rate. The requirement for continuously monitoring and recording the molten sulfur feed rate should be deleted.

SO_2 averages will be calculated based on an average of three operating hours in order to demonstrate compliance with the emission limit. Averages calculated as the arithmetic mean of each monitored operating hour, are not required. The requirement that a monitored operating hour reflect at least two emissions measurements at least 15 minutes apart in which sulfur is burned, is both overly prescriptive and unnecessary. If such a condition is deemed necessary, it should state a monitored operating hour is one in which the CEM operated 30 minutes or more out of the 60-minute period.

Paragraph 3: Comments were provided on this paragraph in the introduction to this letter.

17. Table 1, Air Pollutant Standards and Terms:

The "Basis" column of the table should indicate that the SO_2 and SAM emissions limitations of 4 and 0.15 lb/ton, respectively, are BACT limits, and correspond to the NSPS. Likewise, the VE limit for the sulfuric acid plant should reflect a BACT determination.

The molten sulfur usage rate should reflect the currently permitted rates, as discussed in Comment No. 11.

BACT DETERMINATION

The following comments are provided to clarify that the BACT determination comparisons and conclusions are dependent upon the information available. Suggested wording is provided to facilitate editing.

18. Page BD-3, Paragraph 1:

...Following scrubbing, cleaning, and drying, the gas stream introduced to the first pass at the GC plant is similar, but of a lower SO_2 strength, than that entering the first pass at PPPI...

19. Page BD-3, End of Paragraph 2:

...in the country. Information is not available, however, on plant design or operating parameters nor on the basis of the BACT emission limit.

20. Page BD-4, BACT DETERMINATION BY DEP:

The dual SO_2 emissions limit should be indicated; 4 lb/ton 100% H_2SO_4 (3-hr) and 3.5 lb/ton 100% H_2SO_4 (48-hr).

21. Page BD-4, BACT RATIONALE, Bullet 1:

The extent of repairs and restoration is at least as great as at Mississippi Phosphates, which has agreed to meet an emissions limit of 3.25 lb SO_2/ton acid to avoid PSD and BACT. Information is not available, however, on Mississippi Phosphates' plant design, or operating parameters or on the basis of the BACT determination.

22. Page BD-4, BACT RATIONALE, Bullet 2:

We do not agree with the Department's conclusion that PPPI will produce 2000 tpd of acid comfortably with lower emissions than in the past simply by screening and replacing the catalyst. The amount of catalyst and hence the conversion activity associated with the catalyst will not change. Therefore, neither SO_2 emissions nor production are expected to change.

23. Page BD-4, BACT RATIONALE, Bullet 4:

There has also been evidence presented showing that the use of cesium enhanced catalyst does not reduce SO_2 emissions. This evidence was presented by PPPI experts in meetings with the Department.

24. Page BD-5, Bullets 1-6:

FDEP's optimistic assumptions and projections regarding performance, costs and cost benefits of the cesium-promoted catalyst are largely based on information provided by the catalyst suppliers whose primary objective is boosting sales. Although PPPI has agreed with Manatee County to an SO_2 emissions rate of 3.5 lb/ton (48-hr average) and to the use of cesium enhanced catalyst in the final converter bed, there was never a claim made by PPPI that the 3.5 lb/ton emissions rate was the result of using the cesium enhanced catalyst. Therefore, there is no foundation for the Department to perform a cost analysis attributing the SO_2 reduction to the cesium enhanced catalyst.

25. Page BD-5, Bullet 7:

...may have been partially due to the cesium/vanadium catalyst. Information is not available, however, on plant design or operating parameters.

26. Page BD-6, Bullets 2 and 3:

Based on discussions with the manufacturer, the Centaur process is not cost effective for a 2000 tpd and larger plant. Also, the technology is not commercially demonstrated. It should be noted that the SO_2 emissions guarantee for the Centaur process is identical to that of the double absorption process.

27. Page BD-6, Bullet 4:

The SO_2 emissions achieved by various double absorption sulfuric acid plants in Florida depend on their operating philosophy, acid demand and plant design, whether or not the plant produces electric power and other factors referenced in the introduction of this letter.

28. Page BD-6, Bullet 5:

It is suggested that the first sentence could be more appropriately worded:

"The option of more frequent turnaround has been reviewed."

29. Page BD-7, Bullets 1-3:

The discussion on SAM emissions is not relevant to the "underpinnings for the lower SO_2 values" indicated on Page BD-4. Furthermore, the items are overly prescriptive (relative to the control equipment) and speculative (with regards to expected SAM emissions). Therefore, these items should be deleted. Also, the reference to the VE limit, while correct, does not relate to "... lower SO_2 values."

* * *

We appreciate the opportunity to provide you with these comments and trust that you will be able to incorporate them into the final permit. If you have any questions, please call Pradeep Raval or me at 352-377-5822.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par

c: Mr. Ivan Nance, PPPI
Mr. Paul Amundsen, Amundsen & Moore
Mr. David Dee, Landers & Parsons

CC: J. Reynolds, BAR
EPA
NPS

SWD
Manatee Co.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

RECEIVED

JAN 26 1998

BUREAU OF
AIR REGULATION

BOARD OF COUNTY COMMISSIONERS OF MANATEE COUNTY Petitioner, v. PINEY POINT PHOSPHATES, INC., and THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, Respondents.	DEP File No. 0810002-004-AC (PSD-FL-242)

MANATEE COUNTY'S MOTION FOR
EXTENSION OF TIME TO FILE PETITION
FOR FORMAL ADMINISTRATIVE HEARING

Petitioner, Board of County Commissioners of Manatee County ("Manatee County"), by and through its undersigned counsel, and pursuant to Rule 28-106.111, Florida Administrative Code, hereby requests the Respondent, Department of Environmental Protection ("Department"), to grant an extension of time for filing a petition for a formal administrative hearing under Section 120.596(1) and 120.57(1), Florida Statutes. In support of this motion, Manatee County says:

1. On January 9, 1998, Petitioner received a copy of the Department's notice of intent to issue a permit to Respondent, Piney Point Phosphates, Inc. ("Piney Point"), for the construction of certain repairs to Piney Point's existing sulfuric acid plant ("Plant") in Manatee County, Florida. The Department's notice of intent was attached to a draft permit ("Draft Permit").

2. Manatee County and Piney Point entered into a Settlement Agreement ("Agreement") dated December 18, 1997 which resolves various issues involving Piney Point and Manatee County, including the issuance of the Draft Permit. The Agreement provides that Manatee County will not object to the issuance of a DEP permit for the repair of Piney Point's Plant, provided the permit contains certain conditions and limitations set forth in the Agreement. In general, it appears that the Department's Draft Permit is consistent with the terms of the Agreement. Consequently, the County does not expect to file a petition for an administrative hearing concerning the Draft Permit.

3. Nonetheless, the Department will receive comments concerning the Draft Permit for 30 days and may revise the Draft Permit in a manner that is not consistent with the terms of the Agreement.

4. Manatee County does not wish to waive its right to file a petition for a formal administrative hearing until Manatee County can determine with certainty whether the Department's permit will be consistent with the terms of the Agreement. Accordingly, Manatee County wants an extension of time for filing a petition.

5. The undersigned counsel for Petitioner has discussed this request with Mr. Richard Moore, the attorney representing Piney Point. Undersigned counsel is authorized to represent that Piney Point has no objection to the County's request for an extension of time. Undersigned counsel has tried to contact the

Department's attorney, Mr. Jeff Brown, but has been unsuccessful.

WHEREFORE, Petitioner, Manatee County, respectfully requests the Department to grant a thirty day extension of time for filing a petition for a formal administrative hearing concerning the Draft Permit.

Respectfully submitted this 23rd day of January, 1998.

LANDERS & PARSONS

David S. Dee

DAVID S. DEE
Florida Bar No. 281999
JOHN T. LAVIA, III
Florida Bar No. 853666
310 West College Avenue
Post Office Box 271
Tallahassee, Florida 32302
Phone: 850/681-0311
FAX: 850/224-5595

and

JEFFREY STEINSNYDER
Florida Bar No. 614210
Manatee County Attorney's Office
Post Office Box 1000
Bradenton, Florida 34206
Phone: 941/745-3750

Attorneys for Manatee County

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that the original and one copy of Manatee County's Motion For Extension of Time To File Petition For Formal Administrative Hearing have been served by hand delivery to the Clerk, Department of Environmental Protection, 3900 Commonwealth Boulevard, Douglas Building, Tallahassee, Florida 32399; and true and correct copies of the foregoing have been served by FAX and U.S. Mail to: **Richard Moore, Esquire,** Amundsen & Moore, Attorneys at Law, 502 East Park Avenue, Tallahassee, Florida 32301; and **Jeff Brown,** Assistant General Counsel, Department of Environmental Protection, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399 this 23rd day of January, 1998.

Attorney

cc: Jeff Steinsnyder

AMUNDSEN & MOORE
ATTORNEYS AT LAW

PAUL H. AMUNDSEN
RICHARD W. MOORE
RICHARD E. TORPY
RODOLFO NUÑEZ
MICHAEL J. MERENSTEIN
JULIA E. SMITH

OF COUNSEL:
BYRON B. MATHEWS, JR.

502 EAST PARK AVENUE
TALLAHASSEE, FLORIDA 32301
(850) 425-2444
FACSIMILE: (850) 425-2447

PLEASE REPLY TO:
POST OFFICE DRAWER 1759
TALLAHASSEE, FLORIDA 32302-1759

BREVARD COUNTY OFFICE
200 S. HARBOR CITY BLVD.
SUITE 203
MELBOURNE, FL 32901
(407) 724-6262
FACSIMILE: (407) 727-2006

January 22, 1998

RECEIVED
JAN 26 1998
BUREAU OF
AIR REGULATION

VIA HAND DELIVERY

Department of Environmental Protection
F. Perry Odom, General Counsel
Attention: Jeff Brown, Esquire
3900 Commonwealth Blvd.
Mail Station 35
Tallahassee, FL 32399-3000

Re: Piney Point Phosphates, Inc.;
DEP File No. 0810002-004-AC (PSD-FL-242)
Request for Extension of Time to
File Petition For Hearing

Dear Mr. Odom:

By and through its undersigned counsel, Piney Point Phosphates, Inc. ("PPP") requests an extension of time within which to file a petition for formal administrative proceeding. By this request, PPP is seeking an extension of 30 days. The requested extension of time would extend the time for filing a petition in this matter through and including February 25, 1998. This request is made pursuant to Rules 62-113.200(3), Florida Administrative Code, and as good cause for this request for an extension, PPP states:

1. On January 12 1997, PPP received the notice of Intent to Issue Air Construction Permit.

2. Piney Point Phosphates, Inc. is reviewing the permit and would like some additional time to work with Department staff on making the draft permit consistent with a settlement reached with Manatee County concerning this matter.

3. The thirty day extension of time would provide Piney Point sufficient time to work with the Department on these issues.

4. Counsel for PPP has contacted counsel for DEP in this matter, Mr. Jeff Brown, who stated he had no objection to this request for extension of time.

WHEREFORE, PPP requests that the time within which to file a Petition for Formal Administrative Hearing with regard to DEP File No. 0810002-004-AC (PSD-FL -242) be extended for 30 days, through and including February 25, 1998, or if this request is denied, 14 days after the notice of such denial.

Sincerely,

Richard W. Moore

cc: Mr. Ivan Nance
Mr. Al Linero
David S. Dee, Esquire
cc: J. Reynolds, BAR

Bradenton Herald

102 MANATEE AVE. WEST, P.O. BOX 921
BRADENTON, FLORIDA 34206
TELEPHONE (813) 748-0411

Bradenton Herald
Published Daily
Bradenton, Manatee, Florida

STATE OF FLORIDA
COUNTY OF MANATEE:

Before the undersigned authority personally appeared Jill Headings, who on oath says that she is Legal Advertising Representative of the Bradenton Herald, a daily newspaper published at Bradenton in Manatee County, Florida; that the attached copy of the advertisement, being a Legal Advertisement in the matter of

Notice of Intent

________ in the ________ Court,

was published in said newspaper in the issues of

1/13/98

Affiant further says that the said publication is a newspaper published at Bradenton, in said Manatee County, Florida, and that the said newspaper has heretofore been continuously published in said Manatee County, Florida, each day and has been entered as second-class mail matter at the post office in Bradenton, in said Manatee County, Florida, for a period of 1 year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Jill Headings
(Signature of Affiant)

Sworn to and subscribed before me this 13 day of [illegible], 19 98.

SEAL & Notary Public

STATE OF FLORIDA NOTARY PUBLIC

Personally Known ________ or Produced Identification ________

Type of Identification Produced ________

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0810002-004-AC (PSD-FL-242)

Piney Point Phosphates Sulfuric Acid Plant and Sulfur Storage and Handling Manatee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Piney Point Phosphates, Inc. to repair and restore to previous capacity, the existing sulfuric acid plant located at on U.S. Highway 41 at Piney Point, near Palmetto, Manatee County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO2), sulfuric acid mist, and nitrogen oxides (NOx) pursuant to Rules 62-212.400 and 410, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's name and address are: Piney Point Phosphates, Inc., 13300 U.S. Highway 41, Palmetto, Florida 33476.

The sulfuric acid plant produces the reagent used to acidulate phosphate rock to make fertilizers. Molten sulfur is the necessary raw material for sulfuric acid production. The project consists of replacement of certain heat recovery and transfer equipment, boiler feedwater heater/deaerator, process towers and associated mist eliminators, gas ducts, certain foundations and structural steel, electrical components, insulation, instrumentation, certain tanks and umps, and portions of conversion catalyst. The work also includes testing, repair, maintenance, or recommissioning of the sulfur burner, main compressor, reaction vessels, other heat recovery and transfer equipment, other tanks and pumps, the plant stack, sulfur pit, molten sulfur storage tank, and the SO2 monitor.

The project will restore the plant to its previous capacity of 2000 tons per day of sulfuric acid. Control of SO2 emissions is accomplished by the process itself which is based on the conversion of SO2 to SO3 and subsequent recovery as sulfuric acid product. The efficiency of the conversion and recovery is over 99.7 percent. The BACT emission limit for SO2 was determined by the Department to be 3.5 pounds per ton of sulfuric acid produced. Maximum annual SO2 emissions will be 1279 tons per year (TPY). The sulfuric acid mist BACT for this project was determined to be replacement of all mist eliminators with new ones capable of providing optimum collection efficiency over a wide range of particle sizes. In particular the applicant will add 36 more high efficiency mist eliminators in the final tower than originally planned. This will meet the sulfuric acid mist emission limit of 0.15 points per ton of acid produced which is equal to 55 TPY. NOx emissions of 0.15 pounds per ton of acid produced and 44 TPY are inherently low and the increased is marginally significant. No cost effective methods are available to further reduce them.

The draft permit incorporates parts of the Agreement dated December 18, 1997 between Piney Point Phosphates and Manatee County which contains various conditions related to inspections, compliance assurance, reporting, safety, and technological requirements. It requries installation of 115,000 liters of cesium-vanadium catalyst in the final pass. This is the first specifically required use in this country of cesium-vanadium catalyst to reduce SO2. Plans to build a 2,700 TPD plant have been deferred. The Agreement and the terms of the draft permit require the existing plant to be permanently shut down if and when a new plant is built.

PSD increment consumption for ambient NO2 is insignificant in both PSD Class I Chassahowitzka National Wilderness Area and the PSD Class II area near the plant. The project does not consume SO2 increment in either the Class I or Class II areas because the source existed during the SO2 major source baseline year of 1975 and had much higher emissions than expected following construction of the proposed project.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit unless a response received in accordance with the following procedures results in a difference decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of this Notice. Written comments and requests for public meetings shold be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

The Department will issue FINAL Permit with the conditions of the DRAFT Permit unless a timely petition for an administrative hearing is filed pursuant to Sections 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Section 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 851/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition withint he appropriate time period shall consititue a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: **(a)** The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; **(b)** A statement of how and when each petitioner received notice of the Department's action or proposed action; **(c)** A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; **(d)** A statement of the material facts disputed by petitioner, if any; **(e)** A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; **(f)** A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and **(g)** A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the Department's action or proposed action addressed in this notice of intent.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice of intent. Persons whose substantial interests will be afected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, Except legal holidays, at:

Department of Environmental Protection, Bureau of Air Regulation, 111 S. Magnolia Drive, Suite 4, Tallahassee, FL 32301. Telephone: 850-488-1344. Fax: 850-922-6979.

Department of Environmental Protection, Southwest District Office, 3804 Coconut Palm Drive, Tampa, FL 33619-8218. Telephone: 813-744-6100. Fax: 813-744-6084.

Manatee County Environmental Management Department, 202 Sixth Avenue East, Bradenton, FL 34208. Telephone: 941-742-5980. Fax: 941-742-5996.

The complete project file includes the Draft Permit, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Adminsitrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850-588-1344, for additional information.

1/13/98

PINEY POINT PHOSPHATES, INC.

CERTIFIED/RETURN RECEIPT
NO. Z 147 586 272

RECEIVED
JAN 22 1998
BUREAU OF
AIR REGULATION

19 January 1998

Mr. A. A. Linero, P.E. Administrator
New Source Review Section
Bureau of Air Regulation
State of Florida
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: DEP File 0810002-004-AC (PSD-FL-242);
Piney Point Phosphates, Inc.
Proof of Publication

Dear Sir:

Find accompanying this letter a "Proof of Publication" from the *Bradenton Herald*. This proof is for the "Public Notice of Intent to Issue Air Construction Permit" associated with the above-referenced permit application. The notice was published on 13 January 1998.

Should further information or response be required, please contact our offices.

Very truly yours,

Ivan Nance

Ivan Nance
Corporate Environmental Manager

cc: J. Reynolds
EPA
NPS
SWD
Manatee Co.

/rmm

Attachment

cc: Amundsen & Moore
Koogler & Associates

13300 U.S. Hwy. 41 N., Palmetto, FL 34221 • *Phone* 941-722-4555 • *Fax* 941-729-3589

Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

January 8, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 US Highway 41 North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
2000 Ton Per day Sulfuric Acid Plant

Dear Mr. Stewart:

Enclosed is one copy of the Draft Air Construction Permit for the project at the existing sulfuric acid plant located at US Highway 41 at Piney Point in Palmetto, Manatee County. The Department's Intent to Issue Air Construction Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" must be published within 30 (thirty) days of receipt of this letter. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit modification.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please call Mr. Linero at 850/921-9523.

Sincerely,

C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/aal

Enclosures

Best Available Copy

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0810002-004-AC (PSD-FL-242)

Piney Point Phosphates Sulfuric Acid Plant and Sulfur Storage and Handling
Manatee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Piney Point Phosphates, Inc. to repair and restore to previous capacity, the existing sulfuric acid plant located at on U.S. Highway 41 at Piney Point, near Palmetto, Manatee County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO_2), sulfuric acid mist, and nitrogen oxides (NO_X) pursuant to Rules 62-212.400 and 410, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's name and address are: Piney Point Phosphates, Inc., 13300 U.S. Highway 41, Palmetto, Florida 33476.

The sulfuric acid plant produces the reagent used to acidulate phosphate rock to make fertilizers. Molten sulfur is the necessary raw material for sulfuric acid production. The project consists of replacement of certain heat recovery and transfer equipment, boiler feedwater heater/deaerator, process towers and associated mist eliminators, gas ducts, certain foundations and structural steel, electrical components, insulation, instrumentation, certain tanks and pumps, and portions of conversion catalyst. The work also includes testing, repair, maintenance, or recommissioning of the sulfur burner, main compressor, reaction vessels, other heat recovery and transfer equipment, other tanks and pumps, the plant stack, sulfur pit, molten sulfur storage tank, and the SO_2 monitor.

The project will restore the plant to its previous capacity of 2000 tons per day of sulfuric acid. Control of SO_2 emissions is accomplished by the process itself which is based on the conversion of SO_2 to SO_3 and subsequent recovery as sulfuric acid product. The efficiency of the conversion and recovery is over 99.7 percent. The BACT emission limit for SO_2 was determined by the Department to be 3.5 pounds per ton of sulfuric acid produced. Maximum annual SO_2 emissions will be 1279 tons per year (TPY). The sulfuric acid mist BACT for this project was determined to be replacement of all mist eliminators with new ones capable of providing optimum collection efficiency over a wide range of particle sizes. In particular the applicant will add 36 more high efficiency mist eliminators in the final tower than originally planned. This will meet the sulfuric acid mist emission limit of 0.15 pounds per ton of acid produced which is equal to 55 TPY. NO_X emissions of 0.15 pounds per ton of acid produced and 44 TPY are inherently low and the increase is marginally significant. No cost effective methods are available to further reduce them.

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PSD increment consumption for ambient NO_2 is insignificant in both PSD Class I Chassahowitzka National Wilderness Area and the PSD Class II area near the plant. The project does not consume SO_2 increment in either the Class I or Class II areas because the source existed during the SO_2 major source baseline year of 1975 and had much higher emissions than expected following construction of the proposed project.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of this Notice.

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

The Department will issue FINAL Permit with the conditions of the DRAFT Permit unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

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Department of Environmental Protection	Department of Environmental Protection	Manatee County Environmental
Bureau of Air Regulation	Southwest District Office	Management Department
111 S. Magnolia Drive, Suite 4	3804 Coconut Palm Drive	202 Sixth Avenue East
Tallahassee, Florida 32301	Tampa, Florida 33619-8218	Bradenton, Florida 34208
Telephone: 850/488-1344	Telephone: 813/744-6100	Telephone: 941/742-5980
Fax: 850/922-6979	Fax: 813/744-6084	Fax: 941/742-5996

The complete project file includes the Draft Permit, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

Best Available Copy

In the Matter of an
Application for Permit by:

Mr. Robert Stewart, Sr. Vice President, O&A
Piney Point Phosphates, Inc.
13300 US Highway 41 North
Palmetto, Florida 34221

DEP File No. 00810002-004-AC
Draft PSD Permit No. PSD-FL-242
Sulfuric Acid Plant
Manatee County

______________________________/

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed project, as detailed in the application specified above and attached Technical Review and Preliminary determination, for the reasons stated below.

The applicant, Piney Point Phosphates, Inc., applied on October 31, 1997 to the Department for an air construction permit for a sulfuric acid plant at its phosphate fertilizer facility located at US Highway 41 at Piney Point, Palmetto, Manatee County. The application is to conduct "repair activities to start up the existing sulfuric acid plant and molten sulfur storage and handling system."

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit, including a review for the Prevention of Significant Deterioration and a determination of Best Available Control Technology for the control of nitrogen oxides, is required to conduct the work described in the application.

The Department intends to issue this air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT." The notice shall be published one time only within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-1344; Fax 850/ 922-6979) within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit pursuant to Rule 62-103.150 (6), F.A.C.

The Department will issue the FINAL Permit, in accordance with the conditions of the enclosed DRAFT Permit unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT." Written comments [and requests for public meetings] should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the action or proposed action addressed in this notice of intent.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice of intent. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, and DRAFT permit) was sent by certified mail (*) and copies were mailed by U S. Mail before the close of business on 1-9-98 to the person(s) listed:

Mr. Robert Stewart, PPP Inc. *
Mr. Ivan Nance, PPP Inc.
Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. John Koogler, P.E., K&A
Mr. Bill Thomas, SWD
Ms. Karen Collins, Manatee County

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 1-9-98 (Date)

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

PINEY POINT PHOSPHATES, INC.

Phosphate Fertilizer Facility

2000 Tons Per Day Sulfuric Acid Plant and
Molten Sulfur Storage & Handling

Palmetto, Manatee County

DEP File No. 00810002-004-AC
PSD-FL-242

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

January 8, 1997

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Piney Point Phosphates, Inc.
13300 US Highway North
Palmetto, Florida 34221

Authorized Representative: Mr. Robert Stewart, V.P., Operations and Administration

1.2 Reviewing and Process Schedule

10-31-97:	Date of Receipt of Application
11-07-97:	Preliminary DEP Completeness Request
11-26-97:	DEP Completeness Request
01-07-98	Application deemed complete
01-09-98:	Issue Intent

2. FACILITY INFORMATION

2.1 Facility Location

The Piney Point Phosphates fertilizer facility is located off U.S. Highway 41 North at Piney Point, near Palmetto, Manatee County. This site is approximately 120 kilometers from the Chassahowitzka National Wilderness Area, a Class I PSD Area. The UTM coordinates of this facility are Zone 17; 348.5 km E; 3057.3 km N.

2.2 Standard Industrial Classification Codes (SIC)

Major Group No.	28	Chemicals and Allied Products
Industry Group No.	2874	Phosphate Fertilizers
Industry Group No.	2819	Industrial Inorganic Chemicals (Sulfuric Acid)

2.3 Facility Category

This phosphate fertilizer facility makes sulfuric acid, phosphoric acid and diammonium phosphate. Phosphoric acid is made by acidulation of phosphate rock with sulfuric acid. Waste gypsum is produced and stacked. The phosphoric acid is reacted with ammonia to make diammonium phosphate. The sulfuric acid is produced on-site by burning elemental sulfur, catalytically converting the resulting sulfur dioxide to sulfur trioxide, and absorbing it into a recirculating sulfuric acid solution.

The facility is classified as a major or Title V source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceed 100 TPY.

This industry is included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Per Table 62-212.400-2, modifications at the facility resulting in emissions increases greater than 40 TPY of NO_X or SO_2, 25/15 TPY of PM/PM10, or 3 TPY of fluorides (F) require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.410, F.A.C. The facility includes sulfur storage and handling for which certain analyses are required per Rule 62-212.600, F.A.C.

3. PROCESS DESCRIPTION

The plant is a sulfur-burning double absorption sulfuric acid plant. This is the most common process and it continues to be improved and employed at both existing and new installations throughout the world.

The process is comprised of three distinct steps. These are sulfur combustion and gas preparation; catalytic conversion of sulfur dioxide to sulfur trioxide; and absorption of sulfur trioxide into sulfuric acid. The reactions are as follows:

- $S + O_2 \longrightarrow SO_2$ (sulfur burning)
- $2SO_2 + O_2 \longrightarrow 2SO_3$ (in presence of vanadium-containing catalyst)
- $SO_3 + H_2O \longrightarrow H_2SO_4$ (in concentrated sulfuric acid)

A great deal of heat is evolved throughout the process. Its management is an important consideration in optimizing the conversion and absorption steps as well as providing useful energy to the plant. Reaction kinetics and thermodynamics are also important factors. Following is a description of the process (refer to Figure 1):

Atmospheric air is drawn through a filter by the main compressor and then contacted with a recirculating stream of sulfuric acid in the drying tower which is packed with small saddle-shaped ceramic media. The dried air is blown by a steam-driven compressor into a refractory-lined burner where sprayed molten sulfur is combusted to produce sulfur dioxide (SO_2). The hot combustion gases are cooled to about 800°F in a waste heat boiler which recover excess heat as saturated steam.

The stream, containing between 11 and 12 percent SO_2 and remaining air, is introduced into a converter consisting of four beds (passes) packed with vanadium (actually vanadium-containing) catalyst. In a series of steps, the SO_2 and excess oxygen from the air are progressively converted to SO_3. Between the fourth pass of the first converter and the second converter, the gases containing SO_3, some unconverted SO_2, oxygen, and atmospheric nitrogen are conveyed to an "interpass tower" where the SO_3 is absorbed into a stream of concentrated sulfuric acid and reacted with excess water to further strengthen the acid. By removing most SO_3 in the interpass absorber, the equilibrium favors further conversion of the remaining SO_2 to SO_3. This is accomplished in a single-pass converter which is also filled with vanadium catalyst. The resulting stream is conveyed to the high-efficiency "final tower" where most of the remaining SO_3 reacts with water in a 98-99 percent sulfuric acid stream.

Throughout the conversion, the temperatures are moderated by an intricate arrangement of heat exchangers, a second waste heat boiler, a superheater and an economizer so that the excess heat is removed and gases enter each bed at temperature around 800°F. Each tower, including the drying tower, is equipped with mist eliminators to insure that sulfuric acid sprays and fine mists are contained, thereby protecting plant equipment and minimizing emissions to the atmosphere.

4. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

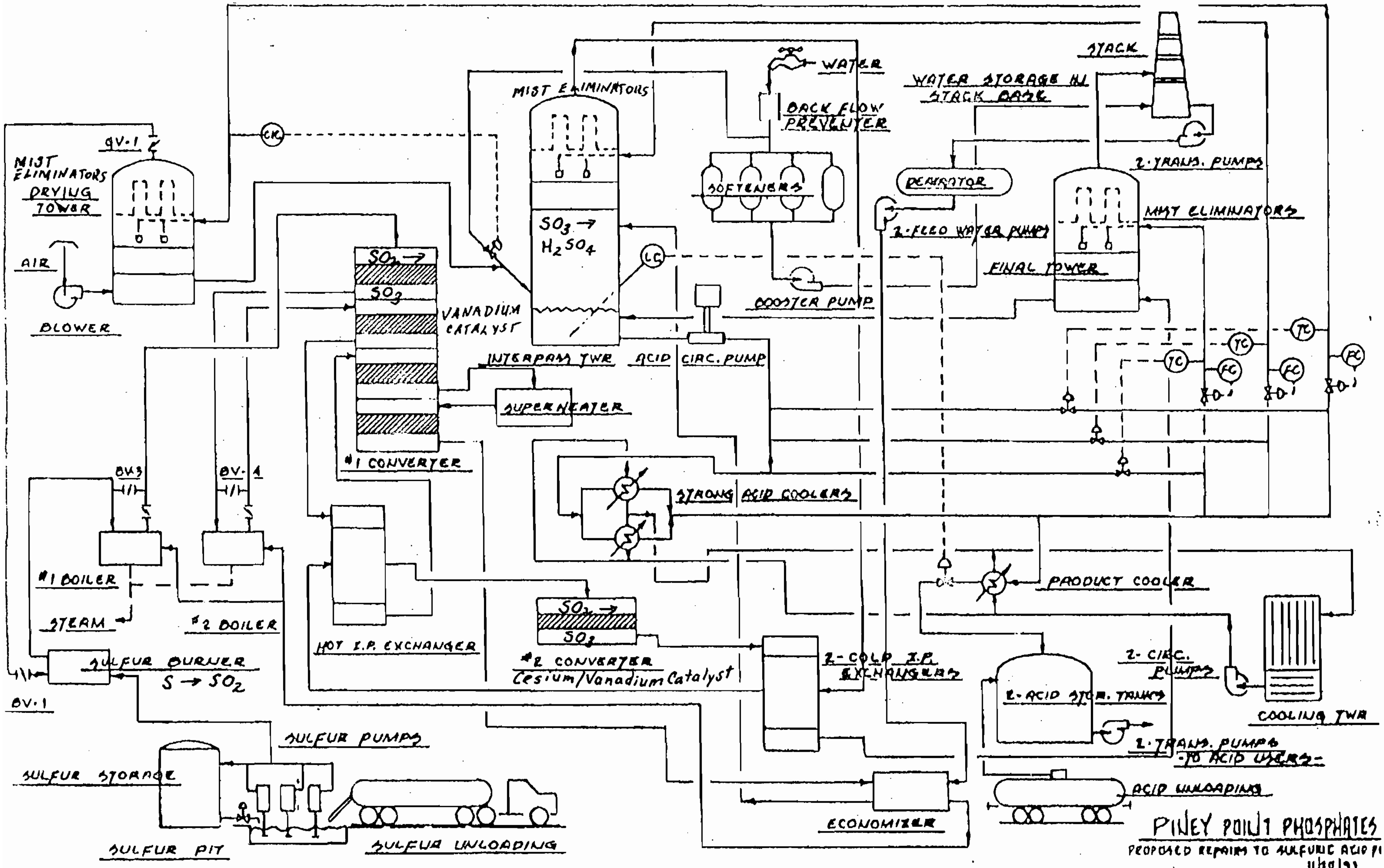

FIGURE 1 - SULFURIC ACID PROCESS
DOUBLE ABSORPTION - SULFUR BURNING

The applicant describes the project as "repair activities to start up the existing sulfuric acid plant and molten sulfur storage and handling system." The project includes replacement of the heat recovery economizer, boiler feedwater heater/deaerator, the air drying tower, both absorption towers, mist eliminators, a cooling tower, portions of the conversion catalyst in Converter 1, all catalyst in Converter 2, instrumentation, various pumps, gas ducts, a condensate storage tank, an acid pump tank, as well as certain heat exchangers, structural steel, foundations, electrical components and insulation.

The project also includes repair, maintenance, or recommissioning of the sulfur burner, waste heat boilers, main compressor, both converters, heat recovery superheater, sulfuric acid storage tanks, plant stack, certain heat exchangers, the sulfur pit, a molten sulfur storage tank, and the SO_2 monitor.

The project will restore the plant to a capacity of 2000 tons per day (TPD) of sulfuric acid. The project will allow this rate to be achieved more easily particularly because of the replacement of degraded pelletized catalyst in Converter 1 with new low pressure ring-shaped catalyst. All pelletized catalyst in Converter 2 will be replaced with ringed catalyst. This results in a lower pressure drop across the plant. Production can, therefore, probably be sustained at the permitted rate for a longer period of time during the course of a "turnaround cycle" than during previous operation of the plant. By subsequent agreement between the applicant and Manatee County, the new ringed vanadium catalyst in the final converter will contain cesium. This catalyst is more effective than other ringed catalyst at lower temperatures, thus favoring more complete conversion of the reactants and possibly lower emissions of SO_2.

As originally described by the applicant, the project will not result in annual emissions of regulated pollutants in excess of levels permitted during previous operation of the plant. The scope of the project will make the unit more reliable and the lower pressure drop will allow authorized production to be sustained at a higher level for a longer period of time between turnarounds. This will result in actual increases in SO_2, sulfuric acid mist (SAM), and NO_X. There will also be minimal emissions of particulate matter reduced sulfur compounds, volatile organic compounds and SO_2 from the molten sulfur system. Emission increases of particulate matter, reduced sulfur compounds and volatile organic compounds are below their respective significant emission levels per Table 62-212.400-2, F.A.C. and do not require PSD or non-attainment new source review. However, PSD review is required for SO_2, SAM and NO_X since emissions, per the application, will increase by more than 40 TPY.

5. RULE APPLICABILITY

The project is subject to the federal new source performance standards (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H), incorporated by reference in Rule 62-204.800, F.A.C.

The proposed project is also subject to permitting, preconstruction review, emissions limits and compliance requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in Manatee County, an area designated as attainment for all criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is subject to review under Rule 62-212.400., F.A.C., Prevention of Significant Deterioration (PSD), because the potential emission increases for SO_2, SAM, and NO_X exceed the significant emission rates given in Chapter 62-212, Table 62-212.400-2, F.A.C. PSD review requires an assessment of air quality impacts and a determination of Best Available Control Technology (BACT). New or modified sulfur storage and handling facilities require review per Rule 62-212.600, F.A.C.

The emission units affected by this permit modification shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.360	Designation of Prevention of Significant Deterioration Areas
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Rule 62-212.410	Best Available control Technology
Rule 62-212.600	Sulfur Storage and Handling Facilities
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications

6. SOURCE IMPACT ANALYSIS

6.1 Emission Limitations

The proposed project will increase annual emissions of the following PSD pollutants (Table 212.400-2, F.A.C.): SO_2, SAM, NO_X, and PM_{10}. Emissions limits for individual fuels and averaging times are being revised for SO_2, CO and mercury; however, annual emissions remain unchanged. Per the application, the current emissions and requested allowable emissions (as revised on December 18, 1997) for this modification are summarized in the following table. If the applicant were given any credit at all for past NO_X emissions, then its increase would not be significant with respect to PSD.

6.2 Emission Summary

Emissions Sulfuric Acid Plant and Sulfur Storage and Handling (total)

Pollutant	Current Emissions (tons/yr)	Future Emissions (tons/yr)	Net Increase (tons/yr)	PSD Significant Level (tons/yr)
SO_2	0	1279	1279	40
NOx	0	44	44	40
SAM	0	55	55	100

6.3 Control Technology Review

The objective of the process and the pollution control requirements are compatible. This is to convert SO_2 to SO_3 and recover it as sulfuric acid. Prior to the 1970's most sulfuric acid was produced in a manner similar to the process previously described with the exception of the interpass tower and additional converter or pass. This was characterized by lower conversion efficiency and higher potential emissions.

Where required by environmental regulations, various control technologies were employed to further remove and recover SO_2 from single absorption plants. These typically were ammonia and caustic scrubbing processes. The addition of a second tower to the basic sulfuric acid manufacturing process obviated the need for and virtually eliminated the selection of add-on control processes. Since the onset of the dual absorption technology, further improvements in the process have resulted in the possibility of greater conversion efficiency and pollution reduction. Therefore add-on systems which do not result in additional sulfuric acid production remain uncompetitive except where a clear by-product market exists, such as for sodium sulfites by pulp and paper plants.

The second converter and final absorption tower are more or less beyond the economic requirements of the process and serve as the pollution control equipment. At some plants, converters and absorbers following the interpass absorber are termed as "the abatement system." The high efficiency mist eliminators together with proper plant operation serve to minimize SAM emissions. NO_X emissions are inherently low for this process and are marginally significant.

The overall conversion of SO_2 to SO_3 in the sulfuric acid process previously described in Section 3 above is over 99.7 percent. Approximately 90-95 % of acid recovery is effected in the interpass absorber with the remainder accomplished in the second absorber. The residual SO_2 concentration exiting the final tower is somewhere between 200 and 400 parts per million (ppm). This reflects short-term emissions of 2 to 4.0 pounds of SO_2 per ton of sulfuric acid produced. This is equal to 165 to 330 pounds per hour.

Similarly, some emissions of sulfuric acid mist occur. Depending on plant conditions and mist eliminator efficiency, emissions of sulfur acid mist are on the order of 0.02 to 0.15 pounds per ton of acid produced. This is equal to 2 to 12 pounds per hour. The expected amount is less than 0.1 pounds per ton.

The details of pollution control options are discussed in the draft Best Available Control Technology determination included with this evaluation.

6.4 Air Quality Analysis

6.4.1 Introduction

According to the application, the proposed project will increase emissions of three pollutants at levels in excess of PSD significant amounts: SO_2, NO_X and SAM. SO_2 and NO_X are criteria pollutants and have national and state ambient air quality standards (AAQS) and PSD increments defined for them. SAM is a non-criteria pollutant and has no AAQS or PSD increments defined for it; therefore, no air quality dispersion modeling was done for SAM. Instead, the NSPS requirements will establish the SAM emission limit for this project. The PSD regulations require the following air quality analyses for this project:

- An analysis of existing air quality for SO_2 and NO_X;
- A PSD increment analysis for SO_2 and NO_X;
- An Ambient Air Quality Standards (AAQS) analysis for SO_2 and NO_X;
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The PSD increment and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A discussion of the required analyses follows.

6.4.2 Analysis of Existing Air Quality and Determination of Background Concentrations

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. This monitoring requirement may be satisfied by using previously existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined by air quality modeling, is less than a pollutant-specific de minimus concentration. In addition, if EPA has not established an acceptable monitoring method for the specific pollutant, monitoring may not be required.

If preconstruction ambient monitoring is exempted, determination of background concentrations for PSD significant pollutants with established AAQS may still be necessary for use in any required AAQS analysis. These concentrations may be established from the required preconstruction ambient air quality monitoring analysis or from previously existing representative monitoring data. These background ambient air quality concentrations are added to pollutant impacts predicted by modeling and represent the air quality impacts of sources not included in the modeling.

The table below shows that predicted NO_2 impacts from the project are predicted to be less than the de minimus level; therefore, preconstruction ambient air quality monitoring is not required for this pollutant. However, an NO_2 background concentration of 9 ug/m^3 was established from previously existing air quality data for use in the NO_2 AAQS analysis. Predicted SO_2 impacts are greater than the de minimus level. Therefore, an SO_2 background concentration of 14 ug/m^3 for all averaging times was established from previously existing air quality data for use in the AAQS analysis required for SO_2.

Maximum Project Air Quality Impacts for Comparison to the De Minimus Ambient Levels.

Pollutant	Avg. Time	Max Predicted Impact (ug/m^3)	Impact Greater Than De Minimus?	De Minimus Level(ug/m^3)
NO_2	Annual	0.1	NO	14
SO_2	24-hour	18	YES	13

6.4.3 Models and Meteorological Data Used in the Air Quality Impact Analysis

The applicant and the Department used the EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model to evaluate the pollutant emissions from the proposed project. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model 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, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

Since five years of data were used in ISCST3, the highest-second-high (HSH) short-term predicted concentrations were compared with the appropriate AAQS or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

6.4.4 Receptor Networks For PSD Increment And AAQS Analyses

Both the applicant and the Department did an AAQS analysis. For the AAQS analysis, receptors were placed along the property boundaries and out to 20 km from the facility. This source does not consume SO_2 increment because the sulfuric acid plant, as it was configured in the increment baseline year of 1975 for existing major sources, was a single absorption plant and emitted far greater quantities of SO_2 than is being proposed for this project. The source consumes an insignificant amount of NO_2 increment, which is discussed in the following section.

6.4.5 PSD Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant from a baseline concentration which was established in 1977 (the baseline year was 1975 for existing major sources of SO_2) for SO_2 and 1988 for NO_X. As stated above no SO_2 increment is consumed by this project. The maximum predicted NO_2 impacts from this project are 0.13 ug/m^3 in the PSD Class II area in the vicinity of the source and 0.0011 ug/m^3, annual average, in the PSD Class I Chassahowitzka National Wilderness Area (CNWA). These values are less than the respective significant impact levels of 1 ug/m^3, annual average, in the PSD Class II area and 0.03 ug/m^3, annual average, in the PSD Class I area. Therefore, no further NO_2 increment modeling was required for this project.

6.4.6 AAQS Analysis

For pollutants subject to an AAQS review, the total impact on ambient air quality is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes into account all sources of a particular pollutant that are not explicitly modeled. The results of the AAQS analysis are summarized in the table below. These results are based upon the Department's modeling since the Department had a more current source inventory. As shown in this table, emissions from the proposed facility are not expected to cause or significantly contribute to a violation of an AAQS.

Ambient Air Quality Impacts

Pollutant	Averaging Time	Major Sources Impact (ug/m^3)	Background Conc. (ug/m^3)	Total Impact (ug/m^3)	Total Impact Greater Than AAQS?	Florida AAQS (ug/m^3)
SO_2	24-hour	193	14	207	NO	260
	Annual	32	14	46	NO	60
	3-hour	606	14	620	NO	1300
NO_2	Annual	7	9	16	NO	100

6.5 Additional Impacts Analysis

6.5.1 Impact Analysis Impacts On Soils, Vegetation, And Wildlife

The maximum ground-level concentrations predicted to occur from SO_2 and NO_X emissions as a result of the proposed project, including background concentrations and all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I area. No significant impacts on this area are expected.

6.5.2 Impact On Visibility

A regional haze analysis was used to assess the potential for a significant increase in regional haze in the Class I CNWA due to this source's projected increase in emissions. A regional haze analysis to determine visibility impacts in the Class I area was required by the National Park Service. The results indicate that the impact of this project on visibility in the Class I area is insignificant.

6.5.3 Growth-Related Air Quality Impacts

The proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

6.5.4 Air Toxics Air Quality Impacts

The maximum predicted impacts of regulated and non-regulated toxic air pollutants that are proposed to be emitted by the project are all less than the Department's draft annual Ambient Reference Concentrations (ARC).

7. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations, provided the Department's BACT determination is implemented.

A. A. Linero, P.E.
Cleve Holladay, Meteorologist

DRAFT

PERMITTEE:

Piney Point Phosphates, Inc.
13300 US Highway 41 North
Palmetto, Florida 34221

File No.	0810002-004-AC
FID No.	0810002
SIC No.	2819
Permit No.	PSD-FL-242
Expires:	March 31, 1999

Authorized Representative:
Robert C. Stewart
Vice-President, Operations and Administration

PROJECT AND LOCATION:

Permit for the repair and restoration to previous capacity of a 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated sulfur storage and handling equipment serving a phosphoric acid and diammonium phosphate fertilizer facility located nine miles north of Palmetto on US Highway 41 North, Manatee County. UTM coordinates are Zone 17; 348.5 km E ; 3057.3 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Appendices and attachments made a part of this permit:

Table `1	Air Pollutant Standards and Terms
Appendix A	Best Operational Start-up Procedures for Sulfuric Acid Plants
Appendix BD	Best Available Control Technology Determination
Appendix GC	Construction Permit General Conditions
Appendix CSC	Emission Unit(s) Common Specific Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

SECTION I. FACILITY INFORMATION

SUBSECTION A. FACILITY DESCRIPTION

The existing facility consists of a sulfuric acid plant and associated molten sulfur storage and handling equipment, a phosphoric acid plant, a diammonium phosphate fertilizer plant, a gypsum stack and process cooling ponds, rail and truck shipping and receiving facilities. This permit is for the repair and restoration to previous permitted capacity of the 2000 ton per day sulfur-burning, double absorption sulfuric acid plant and associated molten sulfur handling equipment. The project includes replacement of process towers, converter catalyst, heat transfer and other process equipment as well as repair of the sulfur burner, air compressor, the converters, and other key process equipment. Air pollution control equipment consists of the double absorption process, use of cesium-vanadium catalyst in the final converter, and high efficiency mist eliminators on the final tower.

EMISSION UNITS

This permit addresses the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

SUBSECTION B. REGULATORY CLASSIFICATION

The Piney Point Phosphates Inc. (PPPI) fertilizer facility is classified as a "Major or Title V Source" per Rule 62-210.200, F.A.C., Definitions, because emissions of at least one regulated air pollutant exceed 100 tons per year (TPY).

Sulfuric acid plants are listed as a Major Facility Category in Table 62-212.400-1, F.A.C., "Major Facility Categories." Therefore, stack and fugitive emissions of over 100 TPY of sulfur dioxide are sufficient to classify the installation as a "Major Facility" per the definitions in **Rule 62-210.200, F.A.C.,** subject to the Significant Emission Rates for sulfuric acid mist and nitrogen oxides given in Table 62-212.400-2, F.A.C. and the requirements of **Rules 62-212.400 and 410, F.A.C.,** Prevention of Significant Deterioration (PSD) and Best Available Control Technology (BACT).

The molten sulfur storage and handling equipment is subject to **Rule 62-212.600, F.A.C..** The sulfuric acid plant is also subject to 40 CFR Subpart H, New Source Performance Standards (NSPS) for Sulfuric Acid Plants, incorporated by reference in **Rule 62-204.800, F.A.C.**

SECTION I. FACILITY INFORMATION

SUBSECTION C. PERMIT SCHEDULE:

- 01/XX/98 Notice of Intent published January XX, 1998 in _______
- 1/08/98 Distributed Intent to Issue Permit
- 1/07//98 Application deemed complete
- 10/31/97 Received Application

SUBSECTION D. RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Application received October 31, 1997
- Department's letters dated November 7, November 17, and November 26, 1997
- Comments from Manatee County's consultant, RTP Associates, dated November 21, 1997
- Comments from the National Park Service dated November 20 and December 15, 1997
- EPA's letter dated December 15, 1997
- Agreement between Manatee County and PPPI dated December 18, 1997
- Applicant's completeness responses dated December 26 and 30, 1997 and January 6, 1998
- Department's Technical Evaluation and Preliminary Determination dated January 8, 1997
- Department's Best Available Control Technology Determination dated February XX, 1998

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department of Environmental Protection, Southwest District Office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218 (phone number: 813/744-6100). All applications for permits to construct or modify an emissions unit(s) *subject to the Prevention of Significant Deterioration or Nonattainment (NA) review requirements* should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), 2600 Blairstone Road, Tallahassee, Florida 32399-2400 (phone number 850/488-1344).

2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in *Appendix GC* of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. **[Rule 62-4.160, F.A.C.]**

3. Emission Unit(s) Common Specific Conditions: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.

4. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

5. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. **[Rule 62-210.900, F.A.C.]**

6. Expiration: This air construction permit shall expire on December 31, 1999 **[Rule 62-210.300(1), F.A.C.]**. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the Department's Southwest District Office of any delays in completion of the project which would affect the startup day by more than 90 days. **[Rule 62-4.090, F.A.C]**

7. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the Department's Southwest District Office. **[Chapter 62-213, F.A.C.]**

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SPECIFIC CONDITIONS - SULFURIC ACID PLANT AND MOLTEN SULFUR STORAGE AND HANDLING:

The following Specific Conditions apply to the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
001	Process	Sulfuric Acid Plant
002	Raw Material	Molten Sulfur Storage and Handling

1. Emissions unit 001 shall comply with all applicable provisions of the 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart H, Sulfuric Acid Plants. **[Rule 62-204.800(7)(b)10., F.A.C]**

2. Emissions unit 001 shall also comply with all applicable requirements of 40 CFR 60, Standards of Performance for New Stationary Sources, Subpart A, General Provisions. These include:
   - 40 CFR 60.7, Notification and record keeping
   - 40 CFR 60.8, Performance tests
   - 40 CFR 60.11, Compliance with standards and maintenance requirements
   - 40 CFR 60.12, Circumvention
   - 40 CFR 60.13, Monitoring requirements
   - 40 CFR 60.19, General notification and reporting requirements

3. Emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), visible emissions (VE), and nitrogen oxides (NO_X) from the sulfuric acid plant shall not exceed the following limits: **[Rules 62-204.800(7)(b)10; 62-210.200; 62-212.410, F.A.C.]**

Pollutant	Pounds per Hour	Tons per Year	Limit Basis
SO_2	291.7 [1]	1,277.5	3.5 lb/ton 100% H_2SO_4 produced (BACT) [1]
SO_2	333.3 [2,3]		4.0 lb/ton 100% H_2SO_4 produced (NSPS) [2,3]
SAM	12.5 [3]	54.8	0.15 lb/ton 100% H_2SO_4 produced (NSPS) [3]
VE	10% opacity		BACT/NSPS
NO_X	10.0 [4]	43.8	0.12 lb/ton 100% H_2SO_4 produced [4]

1. 48-hour rolling average based on CEMS data.
2. 3-hour rolling average based on CEMS data.
3. Also, an annual EPA Method 8 test is required to demonstrate compliance with the 4.0 lb/ton SO_2 limit and the 0.15 lb/ton SAM limit.
4. Required for initial compliance test only.

4. Visible emissions (VE) shall not exceed 20% opacity from any source in the sulfur storage and handling system. **[Rule 62-296.411, F.A.C.]**

5. The design production capacity of the refurbished plant shall not exceed 2,000 tons per day of 100 percent (%) sulfuric acid. **[December 18, 1997 Agreement]**

6. The production rate shall not exceed 2000 tons per day (TPD) as 100% sulfuric acid on a 24-hour basis. **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

7. The maximum molten sulfur throughput rate shall be 655 tons per day and 239,000 tons per year based on the maximum permitted sulfuric acid production rate of 2000 TPD of 100% sulfuric acid. **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

8. These emissions units are allowed to operate continuously (8760 hours/year) **[Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]**

9. The existing sulfuric acid plant shall cease operation and be permanently shut down when a new sulfuric acid plant commences commercial operations. **[December 18, 1997 Agreement]**

10. Prior to the initial plant startup, the permittee shall install approximately 115,000 liters of cesium-promoted catalyst in the final converter pass. The cesium catalyst shall be used for at least one plant turnaround cycle, or approximately two years, whichever is longer. **[December 18, 1997 Agreement]**

11. The permitte shall install high efficiency mist eliminators incorporating "Brownian Diffusion" to minimize emissions of fine sulfuric acid mist from the final tower. **[Rule 62-212.410, F.A.C.]**

12. The permittee shall prepare and submit to the Department's Southwest District and Manatee County each calendar quarter: (a) compliance calculation worksheets for SO_2 emissions; (b) the hourly CEMS data; and (c) supporting information necessary to demonstrate compliance with the emission limitations. **[December 18, 1997 Agreement]**

13. The permittee shall implement and carry out at all times the safety program referred to in the agreement between Manatee County and the permittee. **[December 18, 1997 Agreement]**

14. The permittee shall implement and carry out at all times a risk management program that complies with 40 CFR Part 68 for Program 3. The permittee shall modify its analyses, if necessary, when pending EPA litigation of certain issues is resolved. **[December 18, 1997 Agreement]**

15. Before resuming operation of the sulfuric acid plant, the permittee shall meet with representatives of Manatee County's Emergency Response and Emergency Services Department to review the plans for complying with Specific Condition No. 8 above. If Manatee County recommends installation of a public alarm system around the perimeter of the permittee's facility, the permittee will work diligently to comply with the County recommendation. Any such alarm shall be controlled exclusively by the permittee. **[December 18, 1997 Agreement]**

16. The permittee shall inspect, operate and maintain all process and support equipment in accordance with the best management practices required under all applicable federal, state and local regulations. Any major deficiencies shall be reported to the Manatee County Emergency Response and Emergency Services Department and corrected immediately to ensure the safe operations of the facility. **[December 18, 1997 Agreement]**

17. Manatee County's building inspectors and/or environmental compliance officials shall have access to the facility, following reasonable notice, to confirm that the permittee is in compliance with all applicable codes, ordinances, laws and regulations. **[December 18, 1997 Agreement]**

18. Manatee County shall be advised by the permittee as soon as the permittee has any knowledge of any scheduled or unscheduled visit by a representative of the Department, EPA, or the Occupational Health and Safety Administration, and the County shall be allowed to have one or two qualified observers accompany the agency inspectors during their visit to the facility. **[December 18, 1997 Agreement]**

19. Manatee County shall provide the permittee with a list of qualified County representatives for the plant visits mentioned above. The list may be updated from time to time. Unless requested by the inspecting agency, no other persons are authorized by this Agreement to accompany the agencies during their inspections of the facility. **[December 18, 1997 Agreement]**

20. Whenever a Manatee County representative visits the facility, such representative shall comply with the permittee's safety regulations and shall follow all reasonable instructions provided by the permittee to ensure his or her safety. The permittee shall provide a copy of its safety regulations to the County so that the County's representatives may review the safety regulations before visiting the facility. **[December 18, 1997 Agreement]**

21. The permittee and Manatee County promptly shall provide each other with any report, test result or other information that is received from any agency concerning an inspection of the facility **[December 18, 1997 Agreement]**

22. If Manatee County wishes to collect any samples at the facility, Manatee County shall split the samples with the permittee, if requested, and promptly shall provide the permittee with the results of any tests performed on the samples. **[December 18, 1997 Agreement]**

23. During inspections of the facility, Manatee County's representatives shall notify the permittee's escort before they take any photographs of the facility. In this fashion, the County's representative shall give the permittee's representative an opportunity to view the conditions or area at the facility that is the subject of the photograph. If Manatee County takes any photograph of the facility, Manatee County promptly shall provide a copy of the photograph to the permittee. However, Manatee County shall not take photographs or any equipment or processes reasonably designated by the permittee as proprietary and confidential. Photographs shall be taken only for authorized regulatory purposes. **[December 18, 1997 Agreement]**

24. The permittee and Manatee County shall work together in a cooperative manner to ensure and confirm that the permittee is complying with all local, state, and federal regulations. If requested, the permittee shall provide a tour of the facility once each year for the Manatee Board of County Commissioners or the Board's designees. **[December 18, 1997 Agreement]**

25. The permittee shall provide Manatee County with a copy of any report or document that the permittee is required to provide to any state or federal agency, (unless such documents are confidential under state or federal law), including but not limited: (a) routine reports to agencies concerning the facility's stack tests, air emissions, surface water discharges, or other discharges; (b) reports concerning excess emissions, upset conditions or emergencies at the facility; (c) reports and other information required under the provisions of 40 CFR Part 68 or Paragraph 14, above; and (d) reports or other information that must be submitted to the Department pursuant to Paragraph 1, above. These reports and other materials shall be provided to Manatee County at the same time that they are provided to the state or federal agency. Should the permittee determine that a report or portion thereof is confidential, the permittee shall take steps to redact the confidential information, or if this is not possible, notify the County of the report and the permittee's reasons for not providing it to the County. These reports and other materials shall be submitted to the Director of the Manatee County Department of Environmental Management, P.O. Box 1000, Bradenton, Florida 34206-1000. **[December 18, 1997 Agreement]**

26. The permittee shall immediately notify Manatee County if there is an accident, malfunction or other event at the facility that poses a threat to human health or the environment in the areas located adjacent to the permittee's facility. Manatee County recognizes that, under such circumstances, the permittee may be required by law to provide notice to certain local, state, or federal agencies before the permittee provides notice to Manatee County. Minor exceedances authorized under Rule 62-210.700, F.A.C., are not subject to the notification requirements contained in this paragraph. **[December 18, 1997 Agreement]**

27. The permittee shall comply with all applicable requirements of the Department's sulfur storage and handling rule. **[Rule 62-296.411, F.A.C.]**

28. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. **[Rule 62-296.320, F.A.C.]**

29. In order to minimize excess emissions during startup/shutdown/malfunction these emissions units shall adhere to best operational practices. The provisions of the Memorandum of Understanding issued by the Department on November 21, 1989, are hereby added to this permit as **Appendix A** and shall be added to the Title V permit. **[Rule 62-210.700, F.A.C., 40 CFR 60.7 and December 18, 1997 Agreement]**

30. Plant and emission control equipment operating parameters determined during compliance testing and/or inspection that will establish the proper operation of each emissions unit shall be included in the Title V permit. **[Rule 62-297.310, F.A.C. and 62-4.070(3), F.A.C.]**

31. A continuous emissions monitoring system (CEMS) shall be installed, calibrated, maintained, operated, and used to determine compliance with the emissions limit for SO_2. The CEMS shall be installed and certified before the initial performance test and operated in compliance with 40 CFR 60, Appendix F, Quality Assurance Procedures (1996 version) or other Department-approved QA plan; 40 CFR 60, Appendix B, Performance Specification 1, 2, and 3 (1996 version).

    The CEMS shall calculate and record emission rates in units of pounds of SO_2 per hour. Sulfuric acid production rate and sulfur feed rate shall be recorded continually. Each operating day, the 3-hour and 48-hour average SO_2 emission rates for the previous 48 hours shall be calculated and recorded. Emissions shall be calculated in units of pounds per hour and pounds per ton of 100% acid produced. Averages are to be calculated as the arithmetic mean of each monitored operating hour. A monitored operating hour is each hour in which sulfur is burned in the unit and at least two emission measurements are recorded at least 15 minutes apart. Data taken during periods of startup, or when sulfur is not burned in the unit, or when the CEMS is not calibrated shall be excluded from the 48-hour average.

    For compliance with the emission limits, the 48-hour average shall not include data from periods of startup when no sulfuric acid is being produced. However, emissions during startup periods shall not exceed the pound per hour limits. Data recorded during periods of shutdown, malfunction, load change, and continuous operating periods shall be included in the daily average.

    To the extent the monitoring system is available to record emissions data, the CEMS shall be operated and shall record data at all operating hours when sulfur is burned in the unit, including periods of startup, shutdown, load change, continuous operation and malfunction.

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

Monitor downtimes and excess emissions based on daily averages, which include startup emissions, shall be reported on a quarterly basis using the SUMMARY REPORT in 40 CFR 60.7. A detailed report of the cause, duration, magnitude, and corrective action taken or preventative measures adopted for each excess emission occurrence, and a listing of monitor downtime occurrences shall accompany the SUMMARY REPORT when the total duration of excess emissions is 1% or greater or if the monitoring system downtime is 5% or greater of the total monitored operating hours.

The monitoring device shall meet the applicable requirements of Chapter 62-204, F.A.C., 40 CFR 60. Appendix F, and 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) Notification Requirements. Data on monitoring equipment specifications, manufacturer, type calibration and maintenance requirements, and the proposed location of each monitor shall be provided to the Department for review at least 90 days prior to installation of a new CEMS. **[Rule 62-4.070 (3) F.A.C and Rule 62-204.800, F.A.C.]**

32. Compliance with the emission limits for SO_2, SAM, and NO_X shall be determined using the following reference methods as described in 40 CFR 60, Appendix A (1996, version), adopted by reference in Chapter 62-204, F.A.C.

Method 7E	Determination of Nitrogen Oxides from Stationary Sources.
Method 8	Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources.
Method 9	Visual Determination of the Opacity of Emissions from Stationary Sources.

These emissions units shall comply with all applicable requirements of Rule 62-297.310, F.A.C. General Test Requirements and 40 CFR 60.8 Performance Tests.

Testing of emissions shall be conducted with the emissions units operating at permitted capacity, which is defined as 90-100% of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the unit may be tested at less than 90% of the maximum operating rate allowed by the permit; in this case, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C., and 40 CFR 60 Appendix A and 40 CFR 60.8, Subpart A].**

33. This facility shall maintain a central file containing all measurements, records, and other data that are required to be collected pursuant to this permit. Operators shall keep a daily operation and maintenance log to include, at a minimum, calibration logs for all instruments, maintenance/repair logs for any work performed on equipment or instruments, all measurements, records, and any other data required to be maintained by the permittee shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded. These data shall be made available to Department staff upon request. The Department shall be notified in writing at least 15 days prior to any emissions testing or auditing of any instrument required to be operated by these specific conditions in order to allow witnessing by authorized personnel. **[Rule 62-4.070(3), F.A.C.]**

Table 1 Air Pollutant Standards and Terms.

FACILITY ID NUMBER: 0810002

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Permittee:

Piney Point Phosphates, Inc.

Permit No.: 0810002-004-AC

Sulfuric Acid Plant and Molten Sulfur Handling and Storage
Repair and Restoration Project

Emission Units - Sulfuric Acid Plant, Molten Sulfur Handling/Storage

				Allowable Emissions [2]		Equivalent Emissions [3]	
E.U. ID#	Description	Pollutant ID	Fuel(s) [2]	Permit limits	lb/hr [1]	TPY	Basis
1	Sulfuric Acid Plant	SO_2	molten sulfur	4 lb/ton acid (3-hr)	333		NSPS
1	Sulfuric Acid plant	SO_2	molten sulfur	3.5 lb/ton acid (48-hr)	292	1278	BACT
1	Sulfuric Acid plant	SAM	molten sulfur	0.15 lb/ton acid	12.5	55	NSPS
1	Sulfuric Acid plant	NOX	molten sulfur	0.12 lb/ton acid	10	44	BACT
1	Sulfuric Acid plant	VE	molten sulfur	10 % opacity			NSPS
2	Molten Sulfur Handling	VE		20 % opacity			

ALLOWABLE OPERATING RATES

Hours of operation per year	8760
Molten Sulfur Usage	655 tons per day
Sulfuric Acid Production	2000 tons per day

NOTES

(1) At a maximum sulfuric acid production rate of 2000 TPD as 100 percent sulfuric acid.
(2) Compliance Units. This facility shall demonstrate compliance based on these standards.
(3) "Equivalent Emissions" are based on annual emissions at 8760 hrs/yr. The "Equivalent Emissions" are also listed for informational purpose and for PSD and recordkeeping tracking purposes.

APPENDIX A
BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS

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1. Only one sulfuric acid plant at a facility should be started up and burning sulfur at a time. There are times when it will be acceptable for more than one sulfuric acid plant to be in the start-up mode at the same time, provided the following condition is met. It is not acceptable to initiate sulfur burning at one sulfuric acid plant when another plant at the same facility is emitting SO_2 at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEMs emission rates for the immediately preceding 20 minutes.

2. A plant start-up must be at the lowest practicable operating rate, not to exceed 70 percent of the designated operating rate, until the SO_2 monitor indicates compliance. Because production rate is difficult to measure during start-up, if a more appropriate indicator (such as blower pressure, furnace temperature, gas strength, blower speed, number of sulfur guns operating, etc.) can be documented, tested and validated, the Department will accept this in lieu of directly documenting of the suitable list of surrogate parameters to demonstrate and document the reduced operating rate on a plant-by-plant basis. Documentation that the plant is conducting start-up at the reduced rate is the responsibility of the owner or operator.

3. Sulfuric acid plants are authorized to emit excess emissions from start-up for a period of three consecutive hours provided best operational practices, in accordance with this agreement, to minimize emissions are followed. No plant shall be operated (with sulfur as fuel) out of compliance for more than three consecutive hours. Thereafter, the plant shall be shut down. the plant shall be shut down (cease burning sulfur) if, as indicated by the continuous emission monitoring system, the plant is not in compliance within three hours of startup. Restart may occur as soon as practicable following any needed repairs or adjustments, provided the corrective action is taken and properly documented.

4. Cold Start-Up Procedures.

   a. Converter.

      (1) The inlet and outlet temperature at the first two masses of catalyst shall be sufficiently high to provide immediate ignition when SO_2 enters the masses. In no event shall the inlet temperature to the first mass be less than 800°F or the outlet temperature to the first two masses be less than 700°F. These temperatures are the desired temperatures at the time the use of auxiliary fuel is terminated

      (2) The gas stream entering the converter shall contain SO_2 at a level less than normal, and sufficiently low to promote catalytic conversion to SO_3.

   b. Absorbing Towers.

      The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

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5. Warm Restart.

a. Converter

The inlet and outlet temperatures of the first two catalyst masses should be sufficiently high to ensure conversion. One of the following three conditions must be met:

(1) The first two catalyst masses inlet and outlet temperatures must be at a minimum of 700°F; or.

(2) Two of the four inlet and outlet temperatures must be greater than or equal to 800°F; or.

(3) The inlet temperature of the first catalyst must be greater than or equal to 600°F and the outlet temperature greater than or equal to 800°F. Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to 700°F.

Failure to meet one of the above conditions, requires use of cold start-up procedures.

To allow for technologies improvements or individual plant conditions, alternative conditions will be considered by the Department in appropriate cases.

b. Absorbing Towers.

The concentration., temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

Sulfuric Acid Plant
Piney Point Phosphates Inc.
PSD-FL-242 and 0810002-004-AC
Palmetto, Manatee County

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BACKGROUND

The applicant, Piney Point Phosphates Inc., proposes to repair, restore, and restart its existing 2000 ton per day (TPD) sulfuric acid plant (SAP) at its fertilizer manufacturing facility on US Highway 41 North at Piney Point, Palmetto, Manatee County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), and nitrogen oxides (NO_X). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400 and 410, F.A.C.

Descriptions of the process, project, ambient air quality effects, and rule applicability are given in the separate Technical Evaluation and Preliminary Determination issued with the Department's Intent and Public Notice package.

DATE OF RECEIPT OF A BACT APPLICATION:

The application received on October 31, 1997 included a proposed BACT determination prepared by the applicant's consultant, Koogler and Associates.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Sulfur Dioxide	Double Absorption	4 pounds per ton 100% H_2SO_4 (3-hr)
Sulfuric Acid Mist	Fiber Mist Eliminators	0.15 pounds per ton 100% H_2SO_4
Visibility	As Above and Process Controls	10 percent
Nitrogen Oxides	None - Low Fuel Nitrogen, Combustion Temperature	0.12 pounds per ton 100% H_2SO_4

The plant with the originally proposed controls and limits will emit approximately 1460 tons per year (TPY) of SO_2, 55 TPY of SAM, and 44 TPY of NO_X. The applicant initially proposed to use the same process and control technology as used in the past to achieve the proposed limits. These limits will be met by converting 99.7 percent of SO_2 produced into sulfur trioxide (SO_3), absorbing the SO_3 in circulating streams of sulfuric acid, and minimizing SAM formation and losses by process controls and high efficiency mist eliminators.

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BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is the New Source Performance Standard (NSPS) for sulfuric acid plants built since 1971. This NSPS, promulgated by EPA as 40 CFR 60, Subpart H, was adopted by the Department by reference in Rule 62-204.800, F.A.C. It was re-affirmed in 1985 by EPA. The emission limits required by Subpart H are 4 pounds SO_2 per ton acid (lb SO_2/ton), 0.15 lb SAM/ton acid, and 10 percent visibility. Therefore the BACT proposed by the applicant is consistent with the NSPS. No National Emission Standard for Hazardous Air Pollutants exist for sulfuric acid plants.

EMISSION LIMITS AND BACT DETERMINATIONS BY EPA AND STATES:

Most sulfuric acid plant BACT determinations made to-date by EPA and the states, including the State of Florida, have been identical to the NSPS. Among the exceptions is General Chemical in Anacortes, Washington. In that case, Plant 3 undergoing a modification, was limited to the NSPS values for both SO_2 and SAM subject to subsequent testing. However, existing Plants 1 and 2 at the same facility and exhausting through the same stack, were limited to 1.159 lb SO_2/ton. An initial "BACT" limit was set for the combined stack emissions for the three units at 2.54 lb SO_2 /ton and 0.105 lb SAM/ton.

The General Chemical plants are double absorption plants like the Piney Point plant. The feedstock at General Chemical is spent sulfuric acid and hydrogen sulfide whereas the feed at Piney Point is elemental sulfur. Following scrubbing, cleaning, and drying, the gas stream introduced to the first pass at the General Chemical plant is similar to that entering the first pass at the Piney Point plant. The main distinction related to possible conversion and emissions control is that the gas strength of SO_2 going into the first pass at the General Chemical plants is more variable than the strength of SO_2 going into the first pass at Piney Point. Also the General Chemical plants are much smaller than the Piney Point plant. However no distinction was drawn or separate limits set in the preparation of the Subpart H standards which are equally applicable to both types of plants.

Recently, Mississippi Phosphates Corporation submitted an application to the State of Mississippi to increase production from 1650 TPD to 1786 TPD of acid at each of two plants. The increase will be attained by replacing pelletized vanadium (actually vanadium-containing) catalyst in the converters with low pressure drop, ring-shaped, vanadium catalyst. This will effectively debottleneck the plants with no other substantial changes. Mississippi Phosphates requested a limit of 3.25 lb SO_2/ton acid to avoid PSD review for SO_2. They proposed 0.15 lb SAM/ton acid and 10 percent opacity as BACT emission limits in satisfaction of PSD requirements. As of this date, the matter is under review by the State of Mississippi and EPA. These two plants use the same process as Piney Point. One of them is the oldest double absorption process plant in the country.

OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the National Park Service received on November 24, and December 8, 1997
- Comments from EPA Region IV received on December 24, 1997
- Evaluation by RTP Associates on behalf of Manatee county received on November 24, 1997
- Further comments from RTP Associates received on November 26, 1997
- Papers written by Monsanto Enviro-Chem on sulfur dioxide emissions control
- Papers written by Monsanto Enviro-Chem on sulfuric acid processes
- Monsanto Enviro-Chem website information on technologies, catalysts, and pollution control
- Calgon Carbon/Monsanto Enviro-Chem joint press release on new SO_2 control technology
- Papers written by Haldor Topsoe on cesium catalysts and additional product information
- BASF website information on catalysts
- EPA background documents in support of NSPS and AP-42, Compilation of Emission Factors
- AWMA Air Pollution Control Manual
- Site visits to plants by Department staff

DETERMINATION BY DEP:

POLLUTANT	CONTROL TECHNOLOGY	EMISSION LIMIT
Sulfur Dioxide	Double Absorption	3.5 pounds per ton 100% H_2SO_4 (48-hr)
Sulfuric Acid Mist	High Efficiency Mist Eliminators	0.15 pounds per ton 100% H_2SO_4 (NSPS)
Visibility	As Above and Process Controls	10 percent
Nitrogen Oxides	None - Low Fuel Nitrogen, Combustion Temperature	0.12 pounds per ton 100% H_2SO_4

DETERMINATION RATIONALE:

A "Top-Down" BACT determination rapidly converges to variations of the established double absorption technology wherein the production process and the BACT are identical, thus eliminating the need for add-on control equipment. The applicant's BACT proposal for SO_2 is equivalent to the NSPS value and will apply as a 3-hour standard. In addition, the Department's BACT determination requires compliance with a 48-hour limit of 3.5 lb SO_2/ton acid. The 48-hour average SO_2 removal efficiency required by the Department is approximately 99.74 percent (%) versus the applicant's proposed value of 99.70%. The underpinnings for the lower SO_2 values are:

- The extent of the repairs and restoration is at least as great as at Mississippi Phosphates, which has agreed to meet an emissions limit of 3.25 lb SO_2/ton acid to avoid PSD and BACT.
- The Department believes that the applicant's plant will produce 2000 TPD of acid more comfortably than in the past simply by its plan to replace screened, pelletized, vanadium catalyst in Converter 1 and all catalyst in Converter 2 with low pressure drop, ring-shaped, vanadium catalyst. The more modern towers and heat transfer equipment also provide opportunities for lower pressure drop across the plant.
- The applicant expected the plant to emit 4 lb/ton SO_2 at 2000 TPD after the proposed project and considered all operational or add-on pollution control options to be unfeasible.
- In the opinion of the Department, use of "cesium-promoted" vanadium catalyst in the fifth and final pass (Converter 2) can reduce SO_2 emissions by 20 to 40 percent (to between 3.2 and 2.4 lb/ton acid or 99.76 to 99.82% conversion efficiency) in a cost-effective manner. Attached are manufacturer summaries claiming even greater reductions under particular situations. This option provides a benchmark against which the applicant can weigh all the options available for SO_2 emissions reduction. The applicant and Manatee County recently agreed that cesium-vanadium catalyst will be installed in the final pass.
- The Department's proposed SO_2 limit reflects a 12.5 percent reduction in average SO_2 emissions while still allowing a reasonable margin for compliance. The emission limit of 3.5 lb SO_2/ton acid can be achieved over an averaging time of 48 hours. This will allow the applicant to correct and compensate for 3-hour SO_2 emissions greater than 3.5 (but less than 4 lb/ton) by achieving emissions lower than 3.5 lb/ton during the rest of the 48-hour period.

- Cesium-promoted vanadium ringed catalyst costs $3.15 per liter (per Monsanto) more than standard vanadium ringed catalyst. Therefore 117,000 liters of cesium/vanadium catalyst will cost an additional $370,000 over the cost of replacing the pelletized catalyst with non-cesium vanadium ringed catalyst as originally proposed by the applicant. The amortized cost over a period of 10 years is approximately $50,000 per year.
- Replacement of 10 percent of the catalyst every other turn-around cycle (i.e. every 3 years) over an extended period of time, results in additional annual costs of roughly $12,300. Thus total additional annual costs are approximately $62,300.
- At 12.5 percent, SO_2 emissions reductions are about 180 TPY (0.125x1,460 TPY) for a Title V fee credit (@ $25/ton SO_2) of approximately $4,500. This amount of SO_2 recovered is equivalent to about 280 TPY of acid produced for a credit (@ $35/ton of acid) of approximately $9,800. Therefore the marginal cost efficiency between 3.5 and 4 lb/ton acid is approximately $265 per ton of SO_2 removed [($62,300 - 4,500 - 9,800)/300 tons]. At the expected emission reduction between 20 and 40 percent, the marginal costs will be even lower.
- In 1997 dollars, the above value is lower than the historical double absorption technology marginal cost effectiveness compared with single absorption technology, which was $245 in 1985. It is lower than any add-on process analyzed by the applicant or reviewers. Therefore, it is not necessary to present a detailed cost-effectiveness analysis of add-on control options. The reader can refer to the application and comments by reviewers for those analyses.
- The above estimate is conservatively high because a converter full of catalyst remains after all of the screenings and replacements over the period of amortization. Cesium-promoted catalyst achieves equivalent conversions at lower temperatures than the standard type. The reduction in heating requirements after the interpass absorption tower results in an energy benefit that the Department has not quantified.
- Similar calculations can be performed using the most recent cesium/vanadium catalyst introduced by Haldor Topsoe in 1996. Though it is more expensive, it is more active than Topsoe's non-cesium line over the entire range of operating temperatures in the final pass. The Monsanto product, introduced in 1989, offers advantages over its own non-cesium line only at relatively low temperatures. The additional activity, daisy ring shape, and possibility of using less cesium catalyst indicate that the cost effectiveness of Haldor Topsoe's VK-69 catalyst would probably be at least as good as the comparable Monsanto product. BASF also makes a cesium/vanadium catalyst, but the Department has little information about it at this time.
- Cesium/vanadium catalyst (Haldor Topsoe VK-58) was used in the upper portion of the first passes at the three previously-mentioned General Chemical plants in Anacortes. While the purpose was to increase production, save startup time, and extend heat exchanger lifetime, the lower historical emissions encountered may have been partially due to the cesium/vanadium catalyst.
- Control options involving production of by-products or wastes are not advisable at Piney Point. These needlessly require storage and handling of additional materials which unnecessarily complicates operations at a site of concern to and under close scrutiny by the public. Some of these

processes were competitive prior to the development of the double absorption process. They have been phased out at many plants and are not seriously considered at any new or existing plants except where there is a market for the by-product (such as sodium sulfites used by to pulp and paper mills).

- There is no indication that add-on control methods are competitive with those which result in production of additional sulfuric acid when all costs are considered. The cost estimates available to the Department indicate they are generally more expensive than the cesium/vanadium catalyst alternative. They remain available at the discretion of Piney Point (particularly if there is a use for the by-products) as alternatives to achieve the Department's BACT SO_2 limits.

- The Centaur process, which uses low temperature wet carbon catalysis/adsorption in place of the standard final pass and absorption tower, is viable and was (according to Monsanto and Calgon Carbon statements) demonstrated on a pilot scale at a sulfur burning plant. A commercial sale incorporating Centaur for a 1000 TPD plant was made to Philippines Phosphate Fertilizer Corporation. It is licensed by Calgon Carbon and Monsanto Enviro-Chem. Emissions as low as 1 lb SO_2/ton acid are theoretically possible. However, the process has not yet been optimized and might result in a separate excess weak sulfuric acid stream (beyond plant water makeup needs) which might require treatment and disposal. Process optimization and building contingency treatment facilities would delay start up of the plant.

- The Department does not recommend the Centaur process at Piney Point at this time. It remains an option that Piney Point can choose if it prefers it over other alternatives. The process may actually gain appeal in future plants and modifications for economic reasons once the potential problems are determined and minimized.

- Department records indicate that emissions less than 4 lb SO_2/ton are commonly achieved throughout the entire turn-around cycle by several plants in Florida. In some cases, the lower levels may reflect existence of process bottlenecks, production permit limits, low production rates, or other considerations. Lower emissions may also be the result of progressive replacement of degraded pelletized vanadium catalyst with ringed vanadium catalyst without production increases over many turn-around cycles. For example, two plants at White Springs, Florida, typically emit 3.3 lb SO_2/ton throughout their entire turn-around cycles even after increasing production at each plant from 2000 to 2500 TPD several years ago.

- The option of more frequent turn-arounds has a certain appeal. Nine month turn-arounds were the norm some years ago. However, plants are capable of running longer between turn-arounds and it is the conclusion of the Department that the operator is in the best position to judge the appropriateness of shutdowns. More frequent turn-arounds make a theoretical difference in SO_2 emissions at some plants but not at others. Additionally, real costs such as lost production during additional turn-arounds are important considerations despite assertions by some reviewers that they should not be included under certain cost evaluation methods. This and any other operational option is available at the discretion of the applicant in achieving the BACT limit.

- All mist eliminators at the SAP will be replaced with the most appropriate devices (Monsanto Enviro-Chem CS-IP Co-Knit, ES, and CSII-P mist eliminators) based on the required duty. Per the original application, the Model CSII-P ("Cost Saver"), which relies only on impaction to remove SAM, was to be used in the final tower (see attached manufacturer description). The applicant has since agreed to include 36 of the high efficiency Model ES ("Energy Saver") mist eliminators in the final tower. This design incorporates "Brownian Diffusion" which enhances collection of smaller particles. This replacement constitutes BACT for this project, which is to return an existing plant to its previous capacity.
- According to the referenced EPA NSPS documents, SAM emissions ranged from a low of 0.004 to a high of 0.15 lb/ton at tested plants. The NSPS standard and Monsanto guarantee of 0.15 lb/ton together withreplacement of the mist eliminators in the final tower with high efficiency models will likely result in SAM emissions less than 0.10 lb/ton.
- The visibility limit of 10 percent opacity is consistent with the above discussion.

COMPLIANCE METHODOLOGY:

Demonstration of compliance with the NSPS limits shall be as required by Subpart H. These are EPA Reference Method 8 for SO_2 and SAM. EPA Methods 1, 2, and 3 shall be used to determine stack and flue gas properties. An initial compliance test for NO_X using EPA Method 7 or 7E is required to verify the low emission rate projected in the application.

SO_2 emissions must be continuously monitored as required by Subpart H. The monitoring shall also be used to demonstrate compliance with the Department BACT emission limit for SO_2 on a 48 hour rolling average.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E., Administrator, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

Sulphuric Acid Catalyst VK69

New Options for Double-Absorption Plants

Since the introduction of the first VK38 catalyst more than 50 years ago, the VK Series has represented Topsøe's heritage and commitment to quality and innovation.

The introduction of the first caesium-promoted vanadium catalyst, VK58, in the late 1980's meant a tremendous step forward in reducing tail-gas emissions from *single*-absorption sulphuric acid plants through operation at hitherto unseen low temperatures.

Other application areas of caesium-promoted catalysts include:

- Handling of strong, oxygen-rich SO_2 gases
- Significant reduction in SO_2 emissions during start-up
- Savings in start-up time and extended autothermal restart time limits
- Overcoming plant constraints

VK69

In 1996 Topsøe introduced VK69, a newly developed caesium-promoted catalyst, optimized for operation in the last pass of *double*-absorption sulphuric acid plants. At these conditions VK69 shows a very significant activity advantage compared to regular catalysts.

Features and Benefits

The improvement in activity has been brought about through physical as well as chemical changes compared to Topsøe's well-known VK58 caesium- promoted catalyst.

Support

VK69 is manufactured by a special extrusion process resulting in a highly porous catalyst.

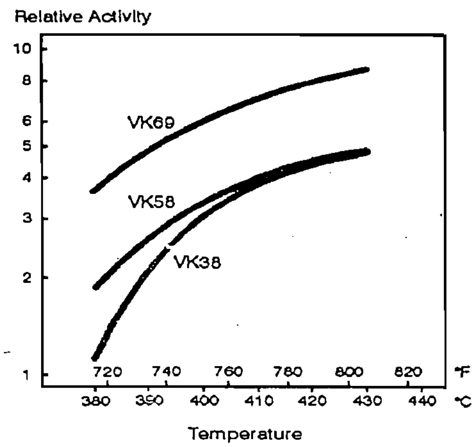
Shape

In gases with low concentrations of sulphur dioxide the rate of oxidation of sulphur dioxide is impeded by intra-particle diffusion. The size and shape of the catalyst particles are hence important for the efficiency of the catalyst.

Topsøe's new 9-mm mini-Daisy shape proves 20 % more efficient compared with smooth 10-mm rings without compromising a low pressure drop.

Chemical Composition

VK69 combines an increased vanadium content with a revised composition of the active phase. Caesium is used to stabilize the vanadium in its active state at low operating temperatures.



Outstanding Activity

The revised support material, the optimum chemical composition, and the mini-Daisy shape together result in a 2-3 times higher activity for VK69 compared to other vanadium catalysts.

Improved Performance

The very high activity of VK69 offers significant performance improvements in terms of:

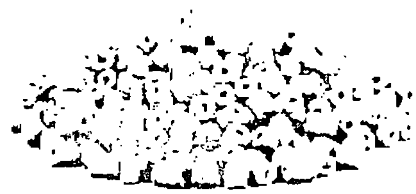
- Emissions from existing plants can be cut in half without increasing the catalyst volume
- Increased production rate by using higher-strength SO_2 gas without increasing emissions or plant pressure drop

VK69, 9-mm mini-Daisy alongside 10-mm rings and 12-mm Daisy

Enviro-Chem Systems

MONSANTO ENVIRO-CHEM SULFURIC ACID CATALYST

Monsanto has been manufacturing and marketing sulfuric acid catalyst since 1925. The catalyst is sold worldwide and Enviro-Chem provides high quality technical and commercial support before and after the sale. The vanadium-based catalyst is an extremely important "cog" in the many sulfuric acid technologies provided by Monsanto Enviro-Chem.



The sulfuric acid catalyst is used in the oxidation of sulfur dioxide (SO_2) as follows:

$$SO_2 + 1/2O_2 = SO_3$$

The sulfur trioxide (SO_3) is then reacted with water to form sulfuric acid (H_2SO_4). The main components of the Enviro-Chem catalyst include: SiO_2 (silica; as a support), vanadium (V), potassium (K) and/or cesium (Cs), and various binders and additives. The reaction shown above actually occurs within a molten salt consisting of potassium/cesium sulfates and vanadium sulfates, coated on the solid silica support. This unique catalyst has proven to be very stable and long-lived in the sulfuric acid production industry. Because of the unique chemistry of this molten salt system, the vanadium is present as a complex sulfated salt mixture and NOT as vanadium pentoxide (V_2O_5). Therefore, the catalyst is more correctly called a "vanadium-containing" catalyst rather than the commonly-used "vanadium pentoxide" catalyst.

Monsanto Enviro-Chem provides a wide variety of sulfuric acid catalyst products:

Rings	**LP-120**	**LP-110**	**LP-220**
Application	First/Second Beds	Third/Fourth Beds	First/Second Beds
Outside Diameter (mm)	12.7	9.5	9.5
Inside Diameter (mm)	5.0	4.0	4.0
Average Ring Length (mm)	14.0	13.0	13.0
Pellets	**T-210**	**T-11**	
Application	First/Second Beds	Third/Fourth Beds	
Diameter (mm)	5.5	5.5	
Crush Strength (kg)	12.0	12.0	
* **Cesium-Promoted**	**Cs-120**	**Cs-110**	**Cs-210**
Shape	Ring	Ring	Pellet
Application	First/Second Beds	Lower Beds	All Beds
Outside Diameter (mm)	12.7	9.5	5.5
Inside Diameter (mm)	5.0	4.0	

* The **cesium-promoted catalyst** was developed specifically for lower temperature operations which can lead to greater SO_2 conversion and hence lower emissions to the atmosphere. The cesium salt promoter reduces the required operating temperature for the sulfuric acid catalyst by as much as 40°C (70°F). Higher SO_2 conversion is possible at lower temperatures as long as the catalyst is "active"; the cesium-promoted catalysts are sufficiently active at these lower temperatures (390-410°C/735-770°F) to take advantage of this conversion "opportunity." The cesium/vanadium catalyst can be used in the first bed to reduce the bed inlet temperature (saving energy and start-up time). The Cs-110 or Cs-210 catalyst can be used in the final catalyst bed (at a low inlet temperature) to maximize the SO_2 conversion and reduce emissions. This unique catalyst was introduced in the late 1980's and has been applied in a variety of situations with significant SO_2 emissions reductions. Although the cesium catalyst is more costly than the standard potassium/vanadium catalysts, many customers have justified the added expense by increased production, higher steam production, and reduced emissions.

Technical service is also a major part of the overall sulfuric acid catalyst story. Enviro-Chem provides catalyst engineering studies to assist the customer in determining the catalyst needs in a specific plant, activity analysis and hardness determinations for used catalyst samples, and on-site converter-heat exchanger testing (called *PeGASvS*) to fully characterize the sulfuric acid plant operations which assist the customer in maintenance planning. Enviro-Chem has a variety of commercial and inventory locations throughout the world. Technical service functions are centered in St. Louis, MO (U.S.A.) and in Brussels, Belgium.

Enviro-Chem Systems

Some of our landmark developments and contributions to the industry include:

1920s -
Introduction in the US of a sulfuric acid **catalyst** based on vanadium, a superior catalyst to platinum in the contact sulfuric acid process.

1930 -
Monsanto process and plant engineering packages made available to industry through **Leonard Construction Company**

1960s -
Development of fiber bed mist eliminator to reduce mist emissions from phosphoric and sulfuric acid plants.

1963 -
Introduced Type 11 catalyst tailored for higher activity in lower converter passes.

1970 -
First US interpass absorption plant designed by Enviro-Chem goes on stream.

1978 -
Designed first stainless steel converter for 12% gas and introduced Monsanto's stainless steel anodically protected acid coolers to replace cast iron.

1980s -
Introduction of modern energy efficient design concepts which increased steam production by 20-25%.

1980 -
Developed low pressure drop ring catalyst.

1984 -
Patented the Heat Recovery System which produces steam for process or power generation from heat previously lost in acid cooling systems which increases net heat recovery on sulfur burning plants up to 90%.

1986 -
Introduced Sandvik SX™ stainless steel material to the marketplace to replace steel and brick and cast iron in acid systems, leading to greater safety for operators and longer on-stream times.

1987 -
Introduced DynaWave® gas scrubbers to replace venturis and open humidifiers for improved gas cleaning efficiency.

1988 -
Obtained NO_x and Nitric acid plant process technologies.

1989 -
Introduced Cesium catalyst for lower temperature operation in new and existing plants, allowing increased capacity and conversion in existing plants, and lower capital cost of new plants which require exit emissions down to 100 ppm SO_2.

1990 -
Introduced the patented wet catalytic Monarch™ process further improving the energy recovery from acid plants

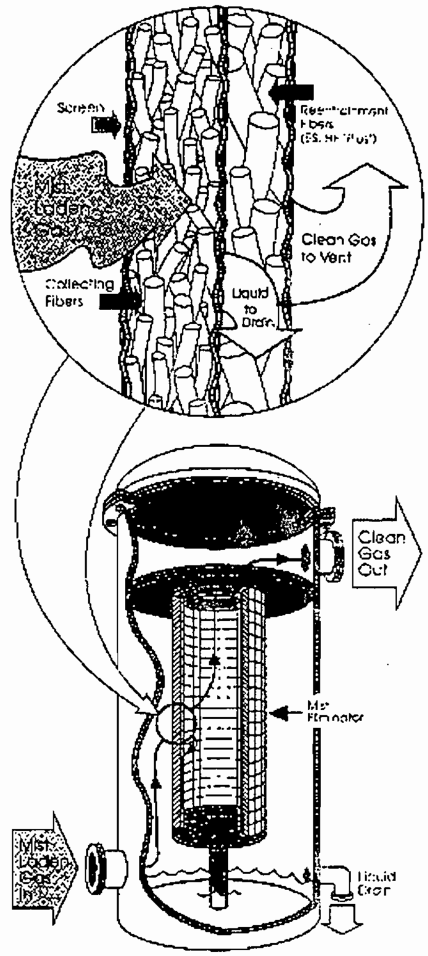
1992 -
Acquired technology for radial flow gas/gas heat exchanger which offers better layout and reduced pressure drop, and lower cost in many applications.

Enviro-Chem Systems

For Superior Removal of Submicron Liquid & Soluble Solid Particles

Brink® Fiber Bed Mist Eliminators remove liquid or soluble solid mists from gas streams. They excel at collecting the very-difficult-to-remove, submicron-size mist particles that cause visible emissions (opacity).

On plant stacks, Brink Mist Eliminators are used for pollution control. Within processes, they help protect equipment and prevent product contamination.

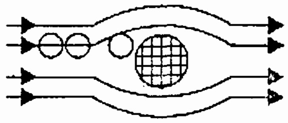


Benefit from Brownian Diffusion

The key to high efficiency removal of submicron particles is the use of Brownian diffusion as a principal collecting mechanism. High efficiency models of Brink Mist Eliminators employ Brownian diffusion in this manner. Their small fibers, "deep" beds and low velocities provide the large number of targets and residence times necessary for collection by Brownian diffusion

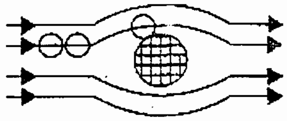
Collection Mechanism

Inertial Impaction



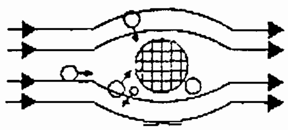
Particles collide with fiber (Particles > 3 micron)

Direct Interception



Particles touch fiber (Particles 1 - 3 micron)

Brownian Movement



Particles hit fiber as a result of random movement (Particles < 1 micron)

How It Works

All Mist Eliminators operate in a similar manner. Gases containing mist particles are directed horizontally through a bed of fibers. Particles collect on individual fibers of the bed by the mechanism of impaction, interception and Brownian diffusion, then coalesce to form liquid films which are moved through the bed by the gas flow. The collected liquid then drains off the downstream face of the bed by gravity. Brink Mist Eliminators are typically installed in a vessel from which the collected liquids are continuously drained.

Applications

Typical Brink Mist Eliminator applications include:

- Sulfuric acid
- Phosphoric acid
- Nitric acid
- Chlorine
- Sulfonation
- Pulp and paper
- AN and urea fertilizer
- Chemical scrubbers
- Plastics
- Textiles
- Asphalt
- Lube oil vent
- Machine oil mist
- Metalworking fluid mist
  - Straight oil
  - Mineral oil
  - Water soluble oil
  - Synthetic coolant
  - Semi-synthetic coolants
- Food Processing
- Incineration
- Compressed gas

A Variety of Styles and Sizes

Brink Mist Eliminators come in a variety of styles and sizes. With Brownian diffusion types, collection efficiencies on submicron particles can be designed to exceed 99.5%:
High efficiency models using Brownian diffusion:

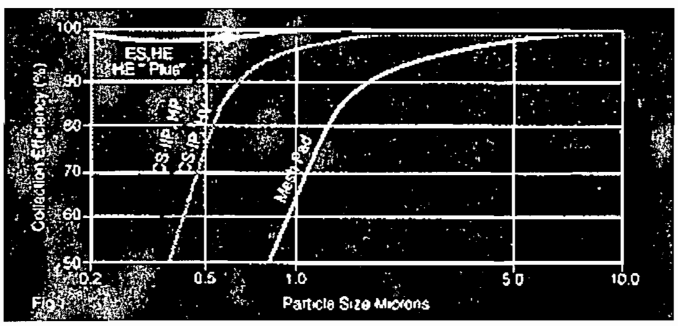
- the ES (Energy Saver)
- the HE (High Efficiency)
- the FP (Field Pack)

A recent innovation, the FP, features a special mat material in the form of a sleeve or tube that allows users to replace packing in the field without returning the element cage to the factory for fiber replacement.

Models which employ impaction only:

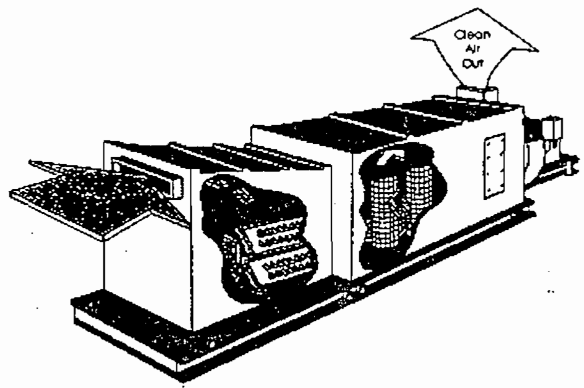
- the CS (Cost Saver)
- the HP (High Performance)
- the HV (High Velocity)

The ES, FP, HE "Plus" and CS models include a drainage layer that virtually eliminates reentrainment. Also, prefilters are available for applications where insoluble particles can cause pluggage, limiting the mist eliminator's useful life.



Complete Package Systems

Enviro-Chem also offers complete package systems to control emissions from oleum and asphalt storage and loading operations; and from asphalt saturator, textile finishing and plasticizer coating operation. Packages systems are available for collecting oil from turbine lube oil reservoir vents and metalworking fluid or oil/coolant from metalworking operations like machining, wet grinding mills, turning centers, lathes, screw machines, rolling, boring and drilling.



APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance; and
(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology *(X)*;
(b) Determination of Prevention of Significant Deterioration *(X)*; and
(c) Compliance with New Source Performance Standards *(X)*

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SUBSECTION 1.0 CONSTRUCTION REQUIREMENTS

1.1 Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation **[Rule 62-204.800 F.A.C.]**. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. **[Rule 62-210.300, F.A.C.]**

SUBSECTION 2.0 EMISSION LIMITING STANDARDS

2.1 General Particulate Emission Limiting Standards. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). **[Rule 62-296-320(4)(b)1, F.A.C.]**

2.2 Unconfined Emissions of Particulate Matter **[Rule 62-296.320(4)(c), F.A.C.]**

(a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.

(b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

(c) Reasonable precautions include the following:

- Paving and maintenance of roads, parking areas and yards.
- Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
- Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
- Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.

- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

NOTE: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

2.3 General Pollutant Emission Limiting Standards: **[Rule 62-296.320, F.A.C.]**

(a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.

(b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

NOTE: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.200(198)]

SUBSECTION 3.0 OPERATION AND MAINTENANCE

3.1 Changes/Modifications: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. *Routine maintenance of equipment will not constitute a modification of this permit.* **[Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]**

3.2 Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. **[Rule 62-4.130, F.A.C.]**

3.3 Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. **[Rules 62-210.650, F.A.C.]**

3.4 Excess Emissions Requirements **[Rule 62-210.700, F.A.C.]**

(a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24 hour period unless specifically authorized by the Permitting Authority office for longer duration. **[Rule 62-210.700(1), F.A.C.]**

(b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. **[Rule 62-210.700(4), F.A.C.]**

(c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. **[Rule 62-210.700(6), F.A.C.]**

3.5 Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. **[Rule 62-4.070(3), F.A.C.]**

SUBSECTION 4.0 MONITORING OF OPERATIONS

4.1 Determination of Process Variables

(a) The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. **[Rule 62-297.310(5), F.A.C]**

SUBSECTION 5.0 TEST REQUIREMENTS

5.1 Test Performance Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. **[Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]**

5.2 Test Procedures shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. **[Rule 62-297.310, F.A.C.]**

5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least *(30) days* (initial) and *15 days* (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. **[Rule 62-297.310 and 40 CFR 60.8, F.A.C.]**

5.4 Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62 -212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. **[Rule 62-297.310(7)(b), F.A.C.]**

5.5 Stack Testing Facilities: The owner or operator shall install stack testing facilities in accordance with **Rule 62-297.310(6), F.A.C.**.

5.6 Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in **Rule 62-297.620, F.A.C.**

5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. **[Rule 62-297.310(2) and (3), F.A.C.]**

SUBSECTION 6.0 REPORTS AND RECORDS

6.1 Duration: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. **[Rule 62-4.160(14)(b), F.A.C.]**

6.2 Emission Compliance Stack Test Reports:

(a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, but no later than 45 days after the last sampling run is completed. **[Rule 62-297.310(8), F.A.C.]**

b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in **Rule 62-297.310(8), F.A.C.**

6.3 Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. **[Rules 62-4.130 and 62-210.700(6), F.A.C.]**

6.4 Annual Operating Report for Air Pollutant Emitting Facility: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. **[Rule 62-210.370(3), F.A.C.]**

SUBSECTION 7.0 OTHER REQUIREMENTS

7.1 Waste Disposal: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.

Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy

FROM: A. A. Linero *AA Lin*

DATE: January 8, 1997

SUBJECT: Piney Point Phosphates Sulfuric Acid Plant
PSD-FL-242

Attached is the public notice package for modification of Piney Point Phosphates' existing sulfuric acid plant. The project consists of replacement of several key components including the drying tower, both absorption towers, the economizer and heat exchangers, as well as all catalyst in the final pass. It also includes replacement of various tanks, pumps, insulation, electrical components, certain foundations and structural support, etc. Repair, maintenance, and recommissioning work will be performed on other key equipment such as the main blower, other tanks, converters, etc.

The project will restore the plant to its previous capacity of 2000 TPD. We have made a BACT determination of 3.5 lb SO_2/ton acid. The applicant has agreed to achieve that limit by using cesium-vanadium catalyst in the final pass per a separate agreement with Manatee County. I expect the plant to perform better than required if properly operated (2.4 - 3.2 lb/ton).

BACT for sulfuric acid mist is the complete replacement of all mist eliminators. In particular, the ten new mist eliminators described in the application for the final tower, will be upgraded to 46 of the high efficiency mist eliminators. This will easily achieve the NSPS limit of 0.15 lb/ton acid.

I recommend you approval of this Intent to Issue.

Attachments

AAL/aal

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

P.E. Certification Statement

Permittee:

DEP File No. 00810002-004-AC (PSD-FL-242)

Piney Point Phosphates Inc.
Fertilizer Facility
Palmetto, Manatee County

Project type:

Project to repair and restore to previously permitted capacity, the 2000 ton per day sulfur burning sulfuric acid plant. Best Available Control Technology (BACT) is the double absorption process with a sulfur dioxide emission limit of 3.5 pounds per ton of acid produced. The applicant has chosen to meet this limit by use of cesium-promoted vanadium catalyst in the final converter. BACT for sulfuric acid mist emissions is the replacement of all mist eliminators and use of high efficiency mist eliminators in the final tower. Nitrogen oxides emissions are inherently low and no further control is feasible.

***I HEREBY CERTIFY** that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

A A Linero — 1/8/98

A A. Linero, P.E. — Date
Registration Number: 26032

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (850) 488-1344
Fax (850) 922-6979

A. A. LINERO CERTIFICATE NO. 26032 STATE OF FLORIDA REGISTERED ENGINEER

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert Stewart, S. V.P.
Piney Point Phosphates
13300 US Hwy 41 North
Palmetto, Fl 34221

4a. Article Number
P 265 659 278

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
1/12/98

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan Lyck

PS Form **3811**, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 278

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1-9-98 0810002-004-AC PSO-C1-242	

PS Form **3800**, April 1995

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 527-97-02

January 6, 1998

RECEIVED
JAN 07 1998
BUREAU OF
AIR REGULATION

Mr. A. A. Linero, P.E.
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subj: Piney Point Phosphates, Inc.
Manatee County
FDEP File No. 0810002-004-AC
Existing Sulfuric Acid Plant Project

Dear Mr. Linero:

This is a brief response to your letter of December 19, 1997, and the EPA Region IV letter of December 15, 1997, attached thereto. As acknowledged in your letter, the comments from EPA are similar to comments in early Department correspondence. These comments have already been addressed in our letter to you dated December 26, 1997.

In response to the introductory paragraph of the EPA letter, and in particular the statement that there will be a significant net increase in the emissions of SO2, NOx and acid mist, I would like to restate our position on this matter. Our position, which is supported by Department Rule, is that the existing Piney Point sulfuric acid plant is a fully permitted plant which has been on cold standby for the past several years. As the plant has a valid permit, the re-start of the plant does not constitute an increase in the emissions of any air pollutant.

Regarding more substantive issues, EPA's statement that the replacement of pelletized catalyst with ring-type catalyst will "...likely result in a lower SO2 emission rate..." is not correct. The use of the ring-type catalyst will reduce the pressure drop but the amount of catalyst, and hence the conversion activity associated with the catalyst, will not change. As a result, SO2 emissions are not affected by the shape of the catalyst. This statement is based on the fact that the repairs that Piney Point will make on the existing plant are like-kind repairs and, as a result, the air flow rates through the plant will not change, nor will the sulfuric acid production rate change. As stated previously, the plant will be capable of operating at a lower pressure drop because of the change in catalyst geometry but this, in itself, will have no effect on production rate or SO2 emissions.

Regarding the use of cesium-promoted catalyst, Piney Point Phosphates has agreed with Manatee County to use approximately 117,000 liters of cesium-promoted catalyst in the final stage of the converter. It should be pointed out that Piney Point Phosphates' agreement to use cesium-promoted catalyst was a good-faith effort to reach settlement with Manatee County. The use of the cesium catalyst is not based on a cost effectiveness analysis or on demonstrated proof of performance at other sulfur burning double absorption sulfuric acid plants.

Regarding the Centaur Technology referenced in the EPA letter, it was pointed out in our letter of December 26, 1997, that this technology could be cost effective for relatively small sulfuric acid plants but for a plant in the range of 2000 tons per day or larger, the process does not appear to be cost effective. This point aside, it must be recognized that the Centaur Technology has not been demonstrated in a commercially-operated sulfuric acid plant anywhere in the world at this point in time. It should also be recognized that, in the case of the existing Piney Point sulfuric acid plant, the plans are to repair the plant with like-kind components throughout, and the use of the Centaur Technology would not be consistent with these plans. Furthermore, the SO_2 emission rate guarantee of the Centaur process is identical to that of the double absorption process.

The final comment is related to the basis of the sulfuric acid mist emission limit. Piney Point Phosphates proposes to use a high-efficiency mist eliminator provided by Monsanto. The Monsanto performance guarantee for the mist eliminators is 0.15 pounds of acid mist per ton of acid produced.

I trust that this information and the information provided in our letter to you dated December 26, 1997, will adequately address all of the technical issues related to the review of the Piney Point permit application. If there should be additional questions, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:mab

c: Mr. Ivan Nance, Piney Point
Mr. Richard Moore, Admundsen & Moore

KOOGLER & ASSOCIATES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

DEC 15 1997

RECEIVED
DEC 18 1997
BUREAU OF
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental
Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc., Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO_2, NO_x, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO_2 emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO_2 and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

Although previous BACT determinations for double absorption sulfuric acid plants have resulted in selection of the NSPS limits, Piney Point Phosphates should further evaluate the feasibility of achieving lower emission rates. As indicated in the application, recent improvements in plant design and catalyst performance have enabled sulfur burning double absorption sulfuric acid plants to operate at higher production rates and still comply with an SO_2 emission rate of 4.0 lb/ton acid produced. The application indicates that in order to maximize sulfuric acid production, the

No increase in activity therefore no increase in production

sulfur feed rate to the sulfur burner is typically increased until either the sulfuric acid production rate limited by the permit is reached or the SO_2 emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO_2 emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO_2 emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO_2 emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO_2 emission rate.

We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO_2 emissions.

An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO_2 to H_2SO_4. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO_2 emissions.

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides, and Toxics Management Division

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 527-97-02

December 30, 1997

RECEIVED

JAN 06 1998

BUREAU OF
AIR REGULATION

Mr. Cleve Holladay
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Manatee County - AP
Piney Point Phosphates, Inc.
PSD Permit Application for
Existing Sulfuric Acid Plant

Dear Mr. Holladay:

This is a follow up to your telephone conversation with Pradeep Raval regarding the above referenced project.

You had requested information on the air dispersion modeling and a revised regional haze analysis to include all the sulfur dioxide emissions from the plant for the Class I area. As you are aware, this issue has been addressed in the permit application. In our opinion, the requested information is not required for the technical evaluation of the proposed project. However, the requested information has been sent to you by E-Mail in order to address the issues.

Also, an updated process flow diagram has been enclosed for your files. Please substitute this for Attachment 1 in our letter dated 12-26-97.

As the technical evaluation of this project is complete, we look forward to FDEP's prompt issuance of the draft permit. If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

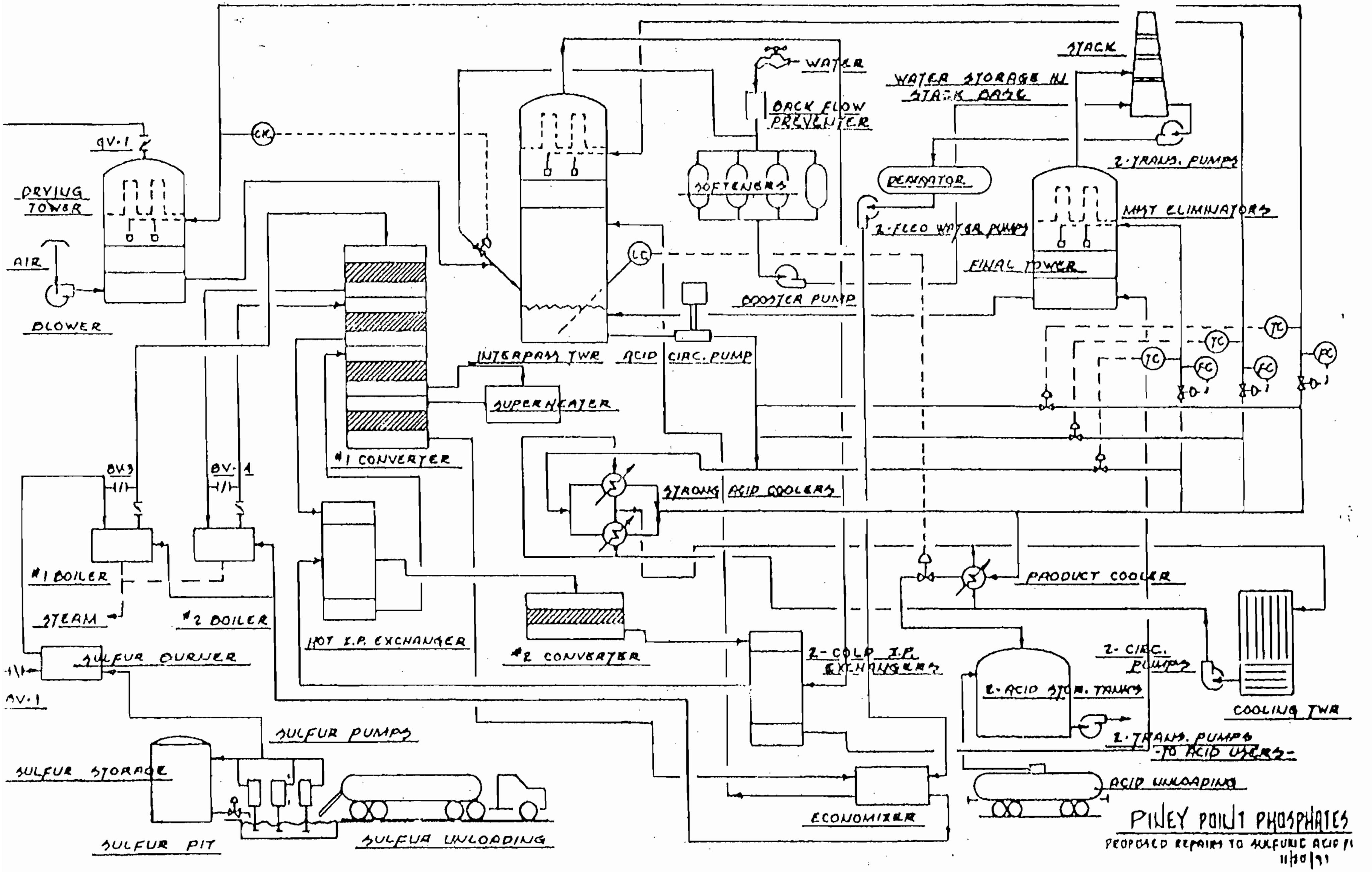
JBK:par
encl.

c: Ivan Nance, PPP

ATTACHMENT 1

UPDATED PROCESS FLOW DIAGRAM

KOOGLER & ASSOCIATES



DRYING TOWER
AIR
BLOWER
AV-1
CK
STACK
WATER
BACK FLOW PREVENTER
WATER STORAGE IN STACK BASE
SOFTENERS
DEAERATOR
2-TRANS. PUMPS
2-FEED WATER PUMPS
MIST ELIMINATORS
FINAL TOWER
LC
BOOSTER PUMP
INTERPASS TWR ACID CIRC. PUMP
SUPERHEATER
#1 CONVERTER
TC
FC
BV-3
BV-1
STRONG ACID COOLERS
#1 BOILER
STEAM
#2 BOILER
PRODUCT COOLER
SULFUR BURNER
HOT I.P. EXCHANGER
#2 CONVERTER
2-COLD I.P. EXCHANGERS
2-CIRC. PUMPS
2-ACID STOR. TANKS
COOLING TWR
SULFUR PUMPS
2-TRANS. PUMPS -TO ACID USERS-
SULFUR STORAGE
ACID UNLOADING
ECONOMIZER
SULFUR PIT
SULFUR UNLOADING
PINEY POINT PHOSPHATES
PROPOSED REPAIRS TO SULFURIC ACID P
11/20/91

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

FOR IMMEDIATE RELEASE:
December 30, 1997

CONTACT: Sam Zamani,
Vishwas Sathe, 813/744-6100 x138

DEP TO LAUNCH COMPREHENSIVE INVESTIGATION *OF MULBERRY INC. PHOSPHATE SPILL*

TALLAHASSEE -- The Florida Department of Environmental Protection (DEP) coordinated a meeting of agencies responding to the December 7, 1997, Mulberry Phosphates, Inc. spill to initiate a comprehensive damage assessment of the entire river system. In addition to DEP, the Florida Game & Fresh Water Commission, Southwest Florida Water Management District (SWFWMD), Hillsborough County Environmental Protection Commission, US Environmental Protection Agency, National Oceanic & Atmospheric Administration and US Department of the Interior Fish & Wildlife Service will study the river system to determine the short and long term effects of the phosphate spill that entered Skinned Sapling Creek and the North Prong of the Alafia River.

In response to Mulberry Phosphates, Inc.'s notification of the spill at their Polk county facility, DEP's Phosphate Management program conducted a site inspection. The inspection revealed that the spill occurred when a portion of an impoundment within the phosphogypsum stack system failed, causing the discharge of approximately 50 to 60 million gallons of acidic process wastewater.

A warning letter was issued to the company by DEP detailing the violations of rules and regulations, as well as requiring the company to investigate the affected river system to determine the environmental impacts. Simultaneously, DEP initiated an independent investigation. The department also contacted neighboring phosphate companies, the City of Lakeland and the SWFWMD requesting an increase in the amount of treated wastewater and stormwater discharge to help dilute the effects of the spill. DEP collected water quality data from several locations which indicated that the impacts from the spill had extended downstream of the site and into the marine reach of the Alafia River in Hillsborough county.

Regulatory agencies from local, state and federal levels responded to this spill. On December 17, the agencies met at the DEP office in Tampa to review the spill incident and to initiate a comprehensive damage assessment of the entire river system. In addition, Mulberry Phosphates, Inc. has been required to have the operations of the plant reviewed and monitored by a qualified independent consultant to insure the integrity of the gypsum stack impoundments. The facility will be required to perform all necessary remedial measures. The company will also be subject to enforcement action upon the completion of this investigation.

###

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 527-97-02

December 26, 1997

RECEIVED
DEC 30 1997
BUREAU OF
AIR REGULATION

Mr. A. A. Linero
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Manatee County - AP
Piney Point Phosphates, Inc.
PSD Permit Application for
Existing Sulfuric Acid Plant

Dear Mr. Linero:

This is in response to your letters dated November 7, 17, 26 and December 9, 1997, requesting additional information on the above referenced project. Your questions are addressed in the order they were raised.

1. **We do not waive the requirement for items listed in the Facility Supplementary Information. This includes basic flow diagrams which specifically reflect the existing and planned configuration. We agree that much of the information is actually in our files on the facility and we will access it in our review. However, this specific application should stand on its own and the information should be more easily accessible to anyone other than our staff who wishes to inspect it.**

RESPONSE:

The process flow diagrams for the sulfuric acid plant at Piney Point Phosphates (PPP), requested under Facility Supplemental Information Item 3, are presented in Attachment 1. It should be noted that the proposed plant repair project results in no change in the actual process flow.

Item 5 requests the identification of fugitive emissions associated with the sulfuric acid plant. It should be noted that fugitive emissions of sulfur dioxide (SO2), sulfuric acid mist (SAM) and nitrogen oxides (NOx) can occur during normal operations from the plant, as recognized by Department permits for many sulfuric acid plants, however, these fugitive emissions are not quantifiable. The fugitive emissions are minimized by proper plant maintenance.

2. **The Best Available Control Technology Review was very instructive. Please submit an analysis of a scenario wherein certain plant components are designed (or "overdesigned") such that present production objectives are met and emission levels of 3.5 and 3.0 pounds sulfur dioxide per ton of sulfuric acid (averaged for periods longer than one day but less than thirty days) are maintained throughout the turn-around cycle of the plant.**

RESPONSE:

It is not within the scope of the proposed plant repairs to over-design the existing plant. All components of the existing plant are designed for the existing permitted and operating capacity. While the scenario FDEP is requesting to be evaluated is not an option for the existing plant, it could be evaluated for a new plant.

3. **Evaluate the scenario wherein the plant (if not overdesigned) must be de-rated to meet the above values throughout the same cycle. Include benefits such as less wear and tear as well as costs.**

The scenario of de-rating the existing plant to lower the projected SO2 emissions is discussed below.

The plant capacity, in tons per day of acid (tpd), at a SO2 emission rate of 3.0 and 3.5, as opposed to 4 pounds per ton of sulfuric acid (lb/ton acid) cannot be estimated without a detailed analysis of contact time, plant temperatures and SO2/SO3 vapor pressure equilibrium. This analysis is beyond the scope of this response. Based on input from Monsanto, the de-rating can be estimated as follows:

Capacity @ 3.0 = 2000 tpd x 0.84 = 1680 tpd

Capacity @ 3.5 = 2000 tpd x 0.92 = 1840 tpd

Estimated cost of acid lost versus SO2 reduced:

For 3.0 lb/ton:

SO2 Reduction = (4 lb/ton x 2000 tpd x ton/2000 lbs) - (3 lb/ton x 1680 tpd x ton/2000 lbs)
= 1.48 tpd

Cost of Acid = (2000 - 1680) tpd x $35/ton
= $11,200 per day

KOOGLER & ASSOCIATES

Cost of Reduction	=	\$11,200 / 1.48 tpd SO_2
	=	\$7570 per ton SO_2

<u>For 3.5 lb/ton</u>:

SO_2 Reduction	=	(4 lb/ton x 2000 tpd x ton/2000 lbs) - (3.5 lb/ton x 1840 tpd x ton/2000 lbs)
	=	0.78 tpd
Cost of Acid	=	(2000 - 1840) tpd x \$35/ton
	=	\$5600 per day
Cost of Reduction	=	\$5600 / 0.78 tpd SO_2
	=	\$7180 per ton SO_2

It should be noted that there is no saving on wear and tear from plant derating.

Based on this analysis, the derating of the existing plant in order to reduce SO_2 emissions, is rejected as BACT.

4. **...Please evaluate separately and in combination, the costs and benefits of both additional catalyst replacement scenarios discussed above...(replacement of Type 210 and Type 11 vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure LP 120 and LP 110 ring catalyst <u>and</u> replacement of all pelletized VC catalyst in Converter 2 with LP 110 VC ring catalyst ... or cesium-promoted CS 110 catalyst.)**

<u>RESPONSE</u>:

This issue was addressed in the application in sufficient detail to determine that additional sulfur dioxide emissions reduction could not be expected from the alternate use of cesium-promoted catalyst. Although the use of ring catalyst would be expected to reduce the pressure drop, it does not alter the SO_2 conversion rate.

5. **...Please provide the technical and cost evaluations of all the options described above to allow the Department to make a thorough BACT determination ..(Centaur Process and peroxide scrubbing).**

RESPONSE:

Based on a telephone conversation with the manufacturer, it is our understanding that the Centaur process has the same SO2 emissions guarantee as the double absorption process. There is, however, a cost difference. For small sulfuric acid plants, of around 1000 tons per day, the Centaur process results in a lower cost. For a plant the size of PPP's, the Centaur process would be more expensive than the double absorption process. Regardless of cost, at this time the Centaur process has not been demonstrated in commercial operation.

6. **An assessment of the degree of overdesign (such as the typical 10-15%) that will be included in the proposed project at the existing plant, i.e. the ultimate maximum production capability of the refurbished plant.**

RESPONSE:

No over-design is planned for the existing plant as part of this repair project. The existing and proposed capacity of the plant is reflected by the permitted rate.

7. **A complete ambient air quality impact analysis for SO2 and NO2 for all averaging times. Modeling receptors should extend out to 20 km from the facility. This analysis should include a background monitored concentration and all applicable sources within 50 km of the facility.**

RESPONSE:

Although not necessary for the technical evaluation of this project, additional modeling was conducted to satisfy FDEP's request. The results of the requested analyses indicate that the ambient air impacts from the SO2 and NOx emitting units at PPP are well within the ambient air quality standards (see disk).

8. **Based on the information obtained from the AAQS analysis, provide an update of the additional impacts analyses. These analyses address the impacts on soils, vegetation and visibility, and the impacts on air quality related values (AQRV) in the PSD Class I Chassahowitzka National Wilderness Area.**

RESPONSE:

The results of the requested analyses indicate that the ambient air impacts from the SO2 and NOx emitting units at PPP are well within the ambient air quality standards. As there is no change in the ambient air impacts assessed, a re-evaluation of the additional impact analyses previously submitted is not required.

9. Comments from Manatee County (by RTP)...

RESPONSE:

The issues raised by Manatee County have been resolved through an agreement signed by applicant and Manatee County. It is our understanding that FDEP has a copy of that agreement. Therefore, the issues are not addressed herein.

10. Comments from NPS (similar in substance to FDEP and Manatee County comments)...

RESPONSE:

The substantive issues raised by NPS have been resolved through an agreement signed by applicant and Manatee County and are, therefore, not addressed in greater detail herein.

As the technical evaluation of this project is complete, we look forward to FDEP's prompt issuance of the draft permit. If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: Ivan Nance, PPP

KOOGLER & ASSOCIATES

ATTACHMENT 1

PROCESS FLOW DIAGRAMS

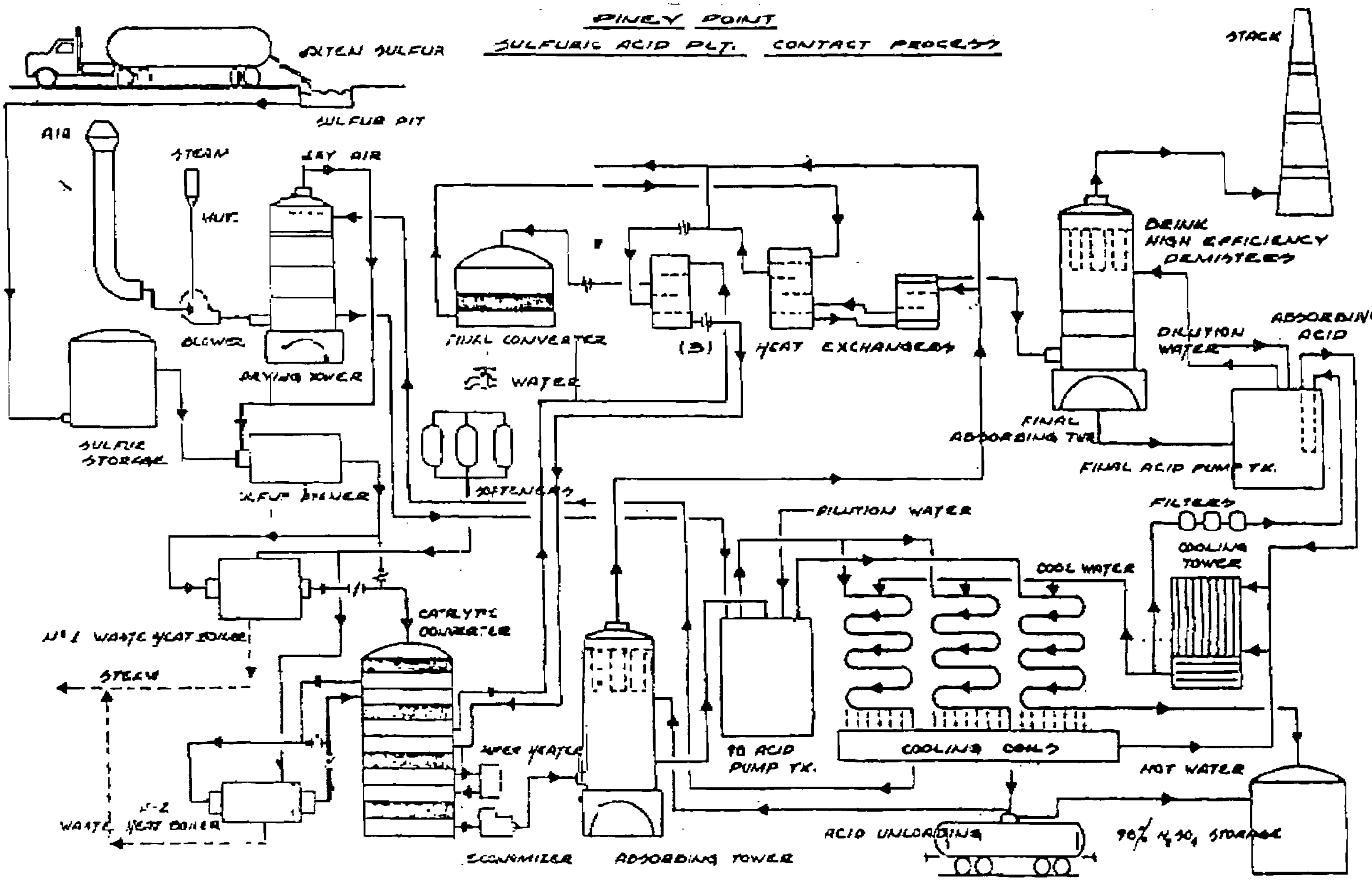
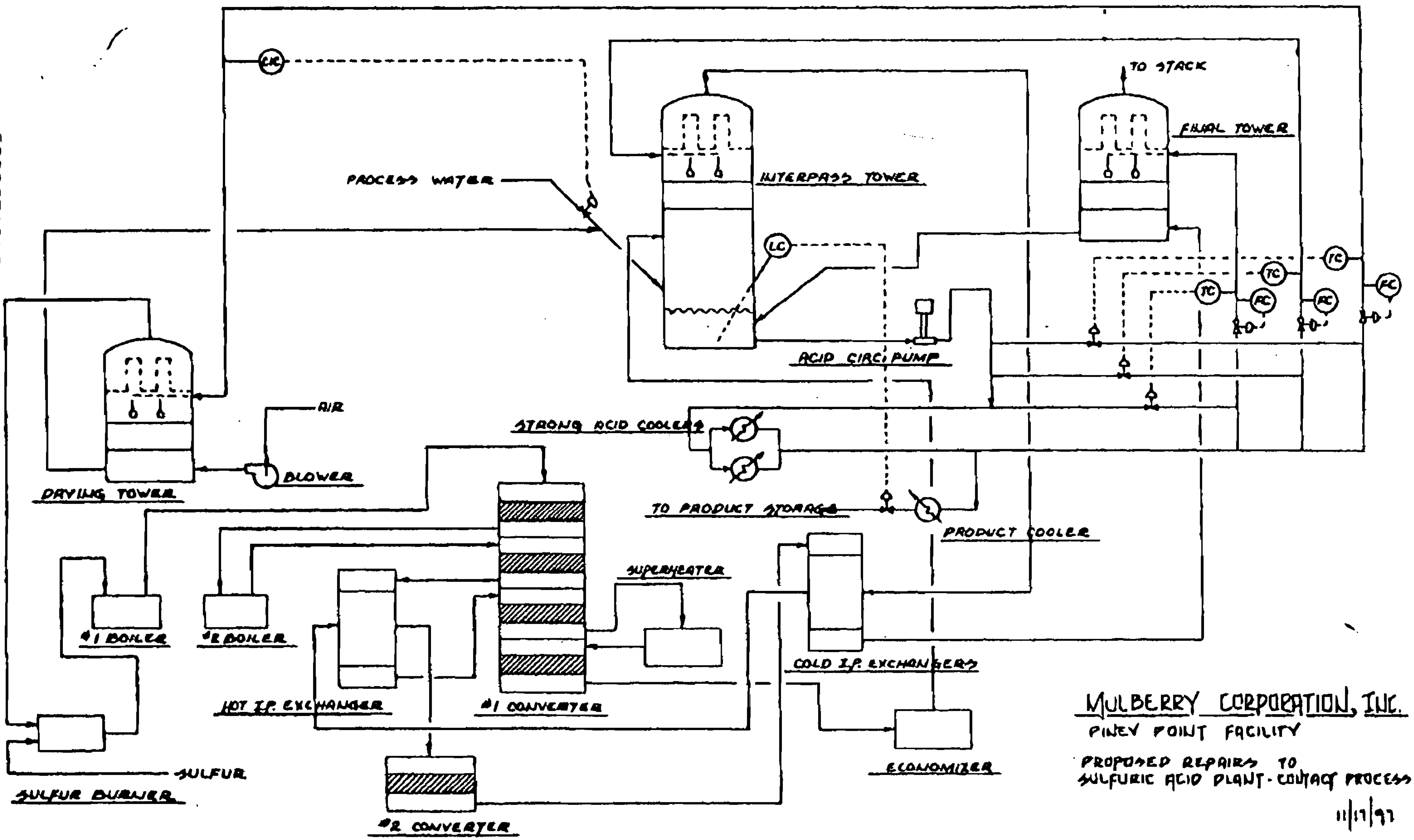

PINEY POINT
SULFURIC ACID PLT. CONTACT PROCESS
MOLTEN SULFUR
SULFUR PIT
AIR
STEAM
DRY AIR
BLOWER
DRYING TOWER
SULFUR STORAGE
SULFUR BURNER
FINAL CONVERTER
(3) HEAT EXCHANGERS
WATER
SOFTENERS
STACK
BRINK HIGH EFFICIENCY DEMISTERS
DILUTION WATER
ABSORBING ACID
FINAL ABSORBING TWR
FINAL ACID PUMP TK.
FILTERS
COOLING TOWER
COOL WATER
DILUTION WATER
CATALYTIC CONVERTER
No 1 WASTE HEAT BOILER
STEAM
No 2 WASTE HEAT BOILER
SUPER HEATER
ECONOMIZER
ABSORBING TOWER
98 ACID PUMP TK.
COOLING COILS
HOT WATER
ACID UNLOADING
98% H_2SO_4 STORAGE

FIGURE 1



MULBERRY CORPORATION, INC.

PINEY POINT FACILITY

PROPOSED REPAIRS TO SULFURIC ACID PLANT - CONTACT PROCESS

11/17/97

THIS DISK CONTAINS SULFUR DIOXIDE (SO2), AND NITROGEN DIOXIDE (NOX) MODELING FILES FOR THE PINEY POINT PHOSPHATES PLANT IN MANATEE COUNTY, FLORIDA.

THE FOLLOWING FILES CONTAIN ISCST3 MODELING OF:
SIA FOR CHASSAHOWITZKA NWR PSD CLASS I AREA,
FLORIDA AMBIENT AIR QUALITY STANDARD (FAAQS), AND
BUILDING DOWNWASH, BUILDING PROFILE INPUT PROGRAM (BPIP)
THE EXE FILES ARE IN SELF EXTRACTING ARCHIVE FORMAT.

SO2 ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND FAAQS:

```
SO2      EXE      288,763 12-25-97
```

FAAQS CULPABILITY FOR OCCURRENCES OF STANDARD VIOLATION

```
CUL5-YR  WK1        7,488 12-25-97   6:55p (IN LOTUS FORMAT)
```

NOX ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND CLASS 2 AREA:

```
NOX      EXE      109,923 12-25-97 AND:

PNY-BPIP EXE       20,752 12-25-97 BUILDING DOWNWASH CALCULATIONS
```

TO UNARCHIVE THESE FILES COPY THEM TO A HARD DISK DRIVE AND TYPE THE FILE NAME. FOR EXAMPLE TO UNARCHIVE THE SO2 ASI CLASS 2 ISCST3 OUTPUT FILES, TYPE "SO2" AND PRESS ENTER. THE FILES WILL AUTOMATICALLY UNARCHIVE TO THE HARD DISK DRIVE. THESE ARCHIVED FILES CONTAIN THE MODELING AND ANALYSIS FILES IN ASCII FORMAT DESCRIBED AS FOLLOWS;

SO2 MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1, FAAQS ARE PROVIDED:

```
C1PNY87  OUT       54,571 12-05-97  PSD CLASS 1 ASI FOR 1987
C1PNY88  OUT       54,571 12-05-97  PSD CLASS 1 ASI FOR 1988
C1PNY89  OUT       54,571 12-05-97  PSD CLASS 1 ASI FOR 1989
C1PNY90  OUT       54,571 12-05-97  PSD CLASS 1 ASI FOR 1990
C1PNY91  OUT       54,571 12-05-97  PSD CLASS 1 ASI FOR 1991

SO2AQS87 OUT      268,602 12-09-97  FAAQS FOR 1987
SO2AQS88 OUT      268,602 12-09-97  FAAQS FOR 1988
SO2AQS89 OUT      268,602 12-09-97  FAAQS FOR 1989
SO2AQS90 OUT      268,602 12-09-97  FAAQS FOR 1990
SO2AQS91 OUT      268,602 12-09-97  FAAQS FOR 1991
```

NOX MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1,SIGNIFICANT IMPACT ANALYSIS (SIA) & FAAQS ARE PROVIDED:

```
C1NOX87  OUT       31,161 10-22-97  PSD CLASS 1 ASI FOR 1987
C1NOX88  OUT       31,161 10-22-97  PSD CLASS 1 ASI FOR 1988
C1NOX89  OUT       31,161 10-22-97  PSD CLASS 1 ASI FOR 1989
C1NOX90  OUT       31,161 10-22-97  PSD CLASS 1 ASI FOR 1990
C1NOX91  OUT       31,161 10-22-97  PSD CLASS 1 ASI FOR 1991

C1PNY87  OUT       54,571 12-05-97  FAAQS FOR 1987
C1PNY88  OUT       54,571 12-05-97  FAAQS FOR 1988
C1PNY89  OUT       54,571 12-05-97  FAAQS FOR 1989
C1PNY90  OUT       54,571 12-05-97  FAAQS FOR 1990
C1PNY91  OUT       54,571 12-05-97  FAAQS FOR 1991
```

THERE ARE RECEPTORS AT 100 METER INTERVALS ALONG THE PROPERTY LINE, DISCRETE POLAR RECEPTORS FROM 700 METERS TO 1100 METERS AND POLAR RECEPTORS AT 1200, 1500, 1750, 2000, 2500, 5000, 7500, 10000, 11000 12000 13000 14000 15000 16000 17000 18000 19000 & 20000 METERS. POLAR RECEPTORS ARE CENTERED AT X=315, Y=260 THE APPROXIMATE GEOMETRIC CENTER OF THE FACILITY.

BUILDING INPUT PROFILE PROGRAM (BPIP) FILES USED IN MODELING ARE PROVIDED:

PINY-BPI INP	1,782	12-09-97	INPUT FOR SO2 & NOX SOURCES
PINY-BPI OUT	4,867	12-09-97	OUTPUT FOR SO2 & NOX SOURCES
PINY-BPI SUM	80,726	12-09-97	SUMMARY FOR SO2 & NOX SOURCES

IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CONTACT ME.

MARK KOLETZKE, P.E.
KOOGLER AND ASSOCIATES
(352) 377-5822
KOOGLER@WORLDNET.ATT.NET
DECEMBER 25, 1997

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 19, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 U.S. Highway North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

Attached are some additional comments from the U.S. EPA which they sent for our consideration. They are similar to comments previously sent to you from the Department which are being addressed by Koogler and Associates.

Also attached is some information from Haldor Topsoe indicating that they have a new cesium-promoted catalyst which maintains higher activity at all operating temperatures. This augments the information regarding Monsanto's cesium promoted catalyst. We are expecting similar information from BASF which we will send you soon.

If you have any questions regarding this matter, please call me at (850)488-1344.

Sincerely,

AA Linero 12/19

A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/kt

cc: B. Thomas, SWD
K. Collins, Manatee Co.
J. Koogler, K&A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

DEC 15 1997

RECEIVED
DEC 18 1997
BUREAU OF
AIR REGULATION

4APT-ARB

Mr. Claire H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental
Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc., Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO_2, NO_x, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO_2 emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO_2 and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

Although previous BACT determinations for double absorption sulfuric acid plants have resulted in selection of the NSPS limits, Piney Point Phosphates should further evaluate the feasibility of achieving lower emission rates. As indicated in the application, recent improvements in plant design and catalyst performance have enabled sulfur burning double absorption sulfuric acid plants to operate at higher production rates and still comply with an SO_2 emission rate of 4.0 lb/ton acid produced. The application indicates that in order to maximize sulfuric acid production, the

sulfur feed rate to the sulfur burner is typically increased until either the sulfuric acid production rate limited by the permit is reached or the SO_2 emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO_2 emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO_2 emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO_2 emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO_2 emission rate.

We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO_2 emissions.

An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO_2 to H_2SO_4. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO_2 emissions.

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides, and Toxics Management Division

Sulphuric Acid Catalyst VK69

New Options for Double-Absorption Plants

Since the introduction of the first VK38 catalyst more than 50 years ago, the VK Series has represented Topsøe's heritage and commitment to quality and innovation.

The introduction of the first caesium-promoted vanadium catalyst, VK58, in the late 1980's meant a tremendous step forward in reducing tail-gas emissions from *single*-absorption sulphuric acid plants through operation at hitherto unseen low temperatures.

Other application areas of caesium-promoted catalysts include:

- Handling of strong, oxygen-rich SO_2 gases
- Significant reduction in SO_2 emissions during start-up
- Savings in start-up time and extended autothermal restart time limits
- Overcoming plant constraints

VK69

In 1996 Topsøe introduced VK69, a newly developed caesium-promoted catalyst, optimized for operation in the last pass of *double*-absorption sulphuric acid plants. At these conditions VK69 shows a very significant activity advantage compared to regular catalysts.

Features and Benefits

The improvement in activity has been brought about through physical as well as chemical changes compared to Topsøe's well-known VK58 caesium- promoted catalyst.

Support

VK69 is manufactured by a special extrusion process resulting in a highly porous catalyst.

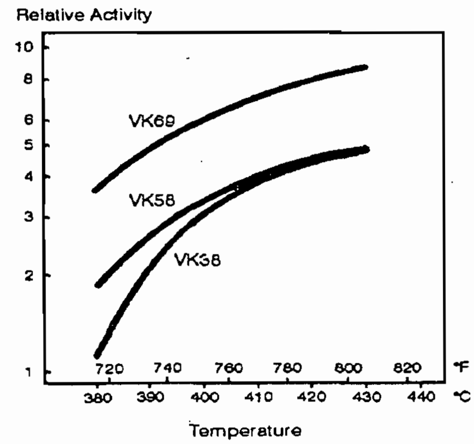
Shape

In gases with low concentrations of sulphur dioxide the rate of oxidation of sulphur dioxide is impeded by intra-particle diffusion. The size and shape of the catalyst particles are hence important for the efficiency of the catalyst.

Topsøe's new 9-mm mini-Daisy shape proves 20 % more efficient compared with smooth 10-mm rings without compromising a low pressure drop.

Chemical Composition

VK69 combines an increased vanadium content with a revised composition of the active phase. Caesium is used to stabilize the vanadium in its active state at low operating temperatures.



Outstanding Activity

The revised support material, the optimum chemical composition, and the mini-Daisy shape together result in a 2-3 times higher activity for VK69 compared to other vanadium catalysts.

Improved Performance

The very high activity of VK69 offers significant performance improvements in terms of:

- Emissions from existing plants can be cut in half without increasing the catalyst volume
- Increased production rate by using higher-strength SO_2 gas without increasing emissions or plant pressure drop

VK69, 9-mm mini-Daisy alongside 10-mm rings and 12-mm Daisy

VK69 - Proven Performance

Reduction of SO_2 Emissions

In a large 3:1 double-absorption plant burning elemental sulphur, VK69 replaced conventional catalyst in the final pass. The table provides the performance of the fourth bed before and after installation of VK69. It is observed that even at a slightly increased acid production rate the SO_2 emission has been reduced by more than 60% to below 100 ppm in the stack.

Catalyst loading in the 4th bed		97,000 litres conventional catalyst	90,600 litres VK69
Acid production rate	MTPD STPD	1460 1608	1490 1641
4th bed inlet temperature	°C °F	440 824	389 733
Overall conversion, %		99.79	99.92
SO_2 in stack gas, ppm		215	80

Capacity Expansion

An increase in acid production rate may often be achieved through an increase in gas flow rate as well as in feed gas SO_2 strength. To maintain the overall conversion efficiency using conventional catalysts, a larger catalyst volume is required. The higher gas flow rate and the increased catalyst volume both contribute to a significant increase in plant pressure drop.

The table shows performance data before and after installation of VK69 in the last pass of a 2:1 double-absorption plant feeding on off-gas from metal-ore roasting. A 14% capacity increase has been achieved solely through an increase in feed-gas SO_2 strength. Even though the oxygen-to-sulphur dioxide ratio is much less favourable this has occured without increasing the SO_2 emission level. The inlet temperature of 375°C (707°F) is remarkable.

		Before installation of VK69	After installation of VK69
Acid production	MTPD STPD	280 308	318 350
Feed gas SO_2 strength, %		7.9	9.3
Feed gas flow rate	Nm^3/hr SCFM	33,900 21,100	32,500 20,200
O_2/SO_2 ratio		2.1	1.7
3rd pass inlet temperature	°C °F	402 756	375 707
SO_2 in stack gas, ppm		310	312

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10/97

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SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

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3. Article Addressed to:
Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P 265 659 270

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/23/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X [signature]

PS Form **3811**, December 1994

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P 265 659 270

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
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Sent to Robert Stewart	
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Post Office, State, & ZIP Code Palmetto, Fl	
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Certified Fee	
Special Delivery Fee	
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
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PS Form **3800**, April 1995

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

DEC 15 1997

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4APT-ARB

Mr. Claire H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJ: PSD Permit Application from Piney Point Phosphates, Inc., Palmetto, Florida (PSD-FL-242)

Dear Mr. Fancy:

This is to acknowledge receipt of an application for a Prevention of Significant Deterioration (PSD) permit for the startup of the existing sulfuric acid plant at the above referenced facility. The application was submitted by a letter dated November 3, 1997, from Mr. Al Linero. The sulfuric acid plant has not been in operation since 1992, and repairs will be made to the plant before startup. No increase in the previous production rate of 2,000 tons/day of 100 percent sulfuric acid is proposed. The proposed repair project will result in a significant net increase in the emissions of SO_2, NO_x, and sulfuric acid mist. The sulfuric acid plant is subject to 40 CFR 60, Subpart H (Standards of Performance for Sulfuric Acid Plants).

Based on the applicant's best available control technology (BACT) analysis, SO_2 emissions from the sulfuric acid plant will be controlled by use of the double absorption process, and sulfuric acid mist emissions will be controlled by the use of fiber mist eliminators. The proposed emission limits are equivalent to the New Source Performance Standards (NSPS) Subpart H emission limits of 4 lb SO_2 and 0.15 lb sulfuric acid mist per ton of 100 percent sulfuric acid produced.

Although previous BACT determinations for double absorption sulfuric acid plants have resulted in selection of the NSPS limits, Piney Point Phosphates should further evaluate the feasibility of achieving lower emission rates. As indicated in the application, recent improvements in plant design and catalyst performance have enabled sulfur burning double absorption sulfuric acid plants to operate at higher production rates and still comply with an SO_2 emission rate of 4.0 lb/ton acid produced. The application indicates that in order to maximize sulfuric acid production, the

sulfur feed rate to the sulfur burner is typically increased until either the sulfuric acid production rate limited by the permit is reached or the SO_2 emission rate limited by the permit is reached. This implies that industry improvements in plant and catalyst design could reduce SO_2 emission rates, provided the sulfuric acid production rates are controlled. Piney Point Phosphates plans to replace the degraded portion of the vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure VC ring catalyst, and all pelletized VC catalyst in Converter 2 will be replaced with low pressure VC ring catalyst. These changes would likely result in a lower SO_2 emission rate, provided the sulfuric acid production rate is not increased. Piney Point Phosphates should provide information concerning the expected maximum sulfuric acid production capacity of the refurbished plant, as compared with the maximum capacity of the existing plant, and the expected effect on SO_2 emissions. Consideration should also be given to the replacement of all pelletized catalyst with ring catalyst in Converter 1 and the associated effect on the SO_2 emission rate.

We recommend that Piney Point Phosphates further evaluate the use of cesium-promoted catalyst in Converter 2. Although cesium-promoted catalyst may have not previously been applied in a sulfur burning double absorption process, the catalyst has been applied in similar double absorption processes, as indicated in the application. The application does not include information to indicate that the use of cesium catalyst is not a feasible option for further reducing SO_2 emissions.

An important part of the BACT review process is the identification of new control technologies which may be applied to the new or modified emission source. The BACT analysis should consider control technologies applied to similar source categories and gas streams, and innovative control technologies. One such control technology, as described in the State's November 17, 1997, letter, is the use of the Centaur Technology which uses activated carbon, which has both adsorptive and catalytic properties, to oxidize SO_2 to H_2SO_4. Use of the Centaur Technology, instead of the second converter at Piney Point Phosphates, may be a viable option for a reduction in SO_2 emissions.

The basis of the sulfuric acid mist emission limit (0.15 lb/ton acid produced) should be provided by the applicant. Test data and documentation from the vendor should be provided to verify the performance of the mist eliminator proposed for the plant.

Thank you for the opportunity to review and comment on the application package. If you have any questions, please contact Keith Goff of my staff at (404)562-9137.

Sincerely yours,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides, and Toxics Management Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

IN REPLY REFER TO:

December 15, 1997

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for the refurbishment of the Piney Point Phosphates sulfuric acid plant in Manatee County. The plant is located 109 km south of Chassahowitzka Wilderness Area, a Class I air quality area, administered by the Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

H Dale Hall

for Sam D. Hamilton
Regional Director

Enclosures

Technical Review of Prevention of Significant Deterioration Permit Application for Piney Point Phosphates, Inc.'s Proposed Refurbishment of a Sulfuric Acid Plant Manatee County, Florida

by

Air Quality Branch, Fish and Wildlife Service - Denver

Piney Point Phosphates, Inc. (PPP) is proposing to refurbish its sulfuric acid plant in Manatee County, Florida. The plant, which has not been in operation since 1992, is located 109 km south of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The refurbished plant will emit significant amounts (see table below) of sulfur dioxide (SO_2), sulfuric acid (H_2SO_4) mist, and nitrogen oxides (NO_x).

POLLUTANT	EMISSIONS INCREASE (TPY)
SO_2	1460
H_2SO_4 Mist	54.8
NO_x	43.8

We find the application to be incomplete. Specifically, the Class I increment analysis, the air quality related values analysis, and the best available control technology analysis are incomplete. Our reasons are stated below.

Class I Increment Analysis

PPP predicted that the maximum impact to the Class I SO_2 and NO_X increments from this project would be zero. This result is unlikely if PPP had modeled their proposed emissions increases (see table above). We ask that PPP explain what emissions values were used in the modeling analysis and that PPP provide their rationale for using those values.

Air Quality Related Values (AQRV) Analysis

PPP did not perform an analysis to assess potential impacts to visibility in Chassahowitzka Wilderness, stating that because the maximum predicted impacts were less than significant, no impacts on Class I AQRVs would be expected. This is incorrect. As we have stated in the past, the AQRV analysis is independent of the Class I increment analysis. A source may have an adverse impact on AQRVs even though its predicted impacts are less than the significant impact levels used to assess increment contribution. We therefore ask that PPP conduct a regional haze analysis, considering both their SO_2 and H_2SO_4 emissions from the project. A background visual range of 65 km should be used in the analysis. The applicant may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including proposed emissions and all other increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts.

We agree that the potential for impacts to Class I AQRVs other than visibility is low.

Best Available Control Technology (BACT) Analysis

Sulfur Dioxide: PPP proposes to control SO_2 emissions from the acid plant by the dual absorption process to a level of 4.0 pounds SO_2 per ton (lb SO_2/ton) of 100 percent acid produced. This emission level is equal to that adopted by the Environmental Protection Agency (EPA) in 1971 as the New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H). However, it should be noted that more than 12 years have elapsed since the NSPS was last reviewed, and 26 years since it was promulgated. Furthermore, according to EPA policy, the NSPS is merely the minimum level of control that is acceptable as a floor for a proper, "top-down" BACT analysis; the top, or beginning point of the BACT analysis should represent the most stringent level of control feasible. And, recent permit actions indicate that levels of control more stringent than the NSPS are feasible. For example, a recent permit drafted for Mississippi Phosphates Corporation (MPC) by the State of Mississippi Department of Environmental Quality (MDEQ) proposes a limit of 3.25 lb SO_2/ton. In developing that draft permit, MDEQ relied upon letters from MPC to MDEQ (dated 9/26/97) in which MPC stated that use of 1995 and 1996 test data "results in a calculated SO_2 emission limit of 3.02 lbs/ton." In an August 28, 1997, letter to MDEQ, MPC requested a permit limit of 3.16 lb SO_2/ton. Subsequently, MPC proposed meeting a limit of 3.25 lb SO_2/ton. Unless it can be shown that there are extenuating circumstances that make PPP unable to meet the same limit as MPC, it is reasonable to expect that PPP perform at least as well.

Following are specific comments concerning the application:

1. The data presented in Figure 4-1for SO_2 emissions per ton of sulfuric acid produced does not match presumably similar data presented in Appendix D. While the graph shown in Figure 4-1 indicates a rapid, steady increase in emissions per ton, the tabulated data in Appendix D shows a steady, low emission rate until a plant shutdown. After the shutdown, emissions jump by over 50% and climb to double the pre-shutdown level. In addition to the apparent discrepancy in data sets, the radical increase in SO_2 emissions following the plant shutdown raises a question as whether the shutdown and the emissions increase are related. Please explain the discrepancy in the data sets and the emissions increase after shutdown.

2. PPP notes that acid production is constrained by permit limits either on production or emissions. Figures 4-1 and 4-2 illustrate that, as SO_2 emissions approach their limit, production is curtailed by as much as 200 tons per day (TPD), and 100 TPD on the average over the 18 month operating cycle (equivalent to a 54,000 ton loss). If sulfuric acid is

worth \$28-\$42 per ton and is in short supply in Florida, as stated in the application, this represents a gross loss of \$1.5-2.3 million, and a net loss of over \$1 million (at PPP's \$20/ton production cost).

3. Table 4-1, Cost Analysis of an Interim Plant Turnaround for Catalyst Screening and Partial Replacement:

- Since catalyst replacement and waste disposal costs after a 9-month turnaround should be half of the same costs after an 18-month turnaround, there should be no additional annual cost for these items associated with the shorter turnaround.
- If PPP is willing to allow acid production to be limited by emissions such that it loses 54,000 tons production and over \$1 million during an 18-month period, why is it necessary to spend almost \$0.5 million to supply 17,000 tons of acid during an 8.5 day turnaround?

4. Table 4-2, Cost Analysis of Ammonia Scrubbing to reduce SO_2 Emissions from a 2000 TPD Sulfuric Acid Plant:

- Capital costs are totally unsubstantiated. Indirect Costs were incorrectly estimated as a percentage of total Direct Costs, rather than Purchased Equipment Costs (as recommended by the EPA Control Cost Manual).
- Operating Labor time appears excessive (2 hr/day vs. EPA recommended 1.5 hr/day). Other Direct Annual Costs are totally unsubstantiated. Inclusion of downtime costs is not typically allowed.
- The Capital Recovery Factor is inflated due to use of short (10 year vs. EPA recommended 15 year) equipment life and excessive interest rate (11% vs. EPA recommended 7%). This alone results in a 55% overestimation of annualized control costs.

Sulfuric Acid Mist: PPP proposes to control H_2SO_4 emissions from the acid plant by using high efficiency mist eliminators. The use of high efficiency acid mist eliminators is the predominant control strategy chosen for new or modified sulfuric acid plants regulated under the NSPS and we agree that this control strategy represents BACT for the PPP plant. The mist eliminators will control H_2SO_4 mist emissions to a level below 0.15 lb/ton of 100 percent acid produced. This level is the NSPS for H_2SO_4 emissions from new or modified sulfuric acid plants. However, as with the NSPS for SO_2 emissions from sulfuric acid plants (see above), not only is the NSPS for H_2SO_4 out-of-date, it is also unsupported by existing test data. Analysis of the data contained in the EPA's 1992 Sulfuric Acid Background Report (for its *AP-42, Compilation of Air Pollutant Emission Factors*) shows a mean of 0.108 lb H_2SO_4 emitted per ton of acid produced (Table 1.a). (Note: The AP-42 controlled emission factor is 0.128 lb H_2SO_4 /ton of acid produced.) Furthermore, the average is unduly influenced by a few very high values (see Figure 1). This results in a mean that is more than twice the median. If the eight high "outlier" values from one plant are eliminated, the average emission rate drops to 0.061 lb/ton, and there is 95% likelihood that emissions will not exceed 0.076 lb/ton (Table 1.b).

The feasibility of lower acid mist limits is further supported by a look at tests conducted at MPC (Figure 2). An inspection of the data clearly shows the difference in the two types of mist eliminators used there. Plant 2 uses a Brink type ES (Energy Saver) mist eliminator marketed by the Enviro-Chem Systems division of Monsanto. It must be noted that this is not one of the “high efficiency Brink Mist Eliminators” described in the BACT portion of the original permit. Plant 3 uses type HE (High Efficiency) mist eliminators from the same manufacturer. Even at its worst, the high efficiency mist eliminator can achieve 0.08 lb/ton. Therefore, we recommend that BACT represent a limit of not more than 0.08 lb/ton.

Finally, because FDEP has compiled extensive stack test data on emissions of SO_2, H_2SO_4 mist, and NO_x from various sulfuric acid plants, we suggest that FDEP perform a statistical analysis of that data to provide additional information regarding the emissions from these plants.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

Table 1.a.

H2SO4 Test Results

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008
53	16	1	0.494
54		2	0.301
55		3	0.417
56		4	0.541
57		5	0.358
58		6	0.609
59		7	0.419
60		8	0.201

Count = 60
Average = 0.108
Median = 0.045
Mode = 0.014
S.D. = 0.141
95% CI = 0.036 +/- 0.108

Emission Factor @ 95% 0.073 <EF< 0.144

Table 1.b.

H2SO4 Test Results **Minus Outliers**

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008

Count = 52
Average = 0.061
Median = 0.034
Mode = 0.014
S.D. = 0.057
95% CI = 0.015 +/- 0.061

Emission Factor @ 95% 0.045 <EF< 0.076

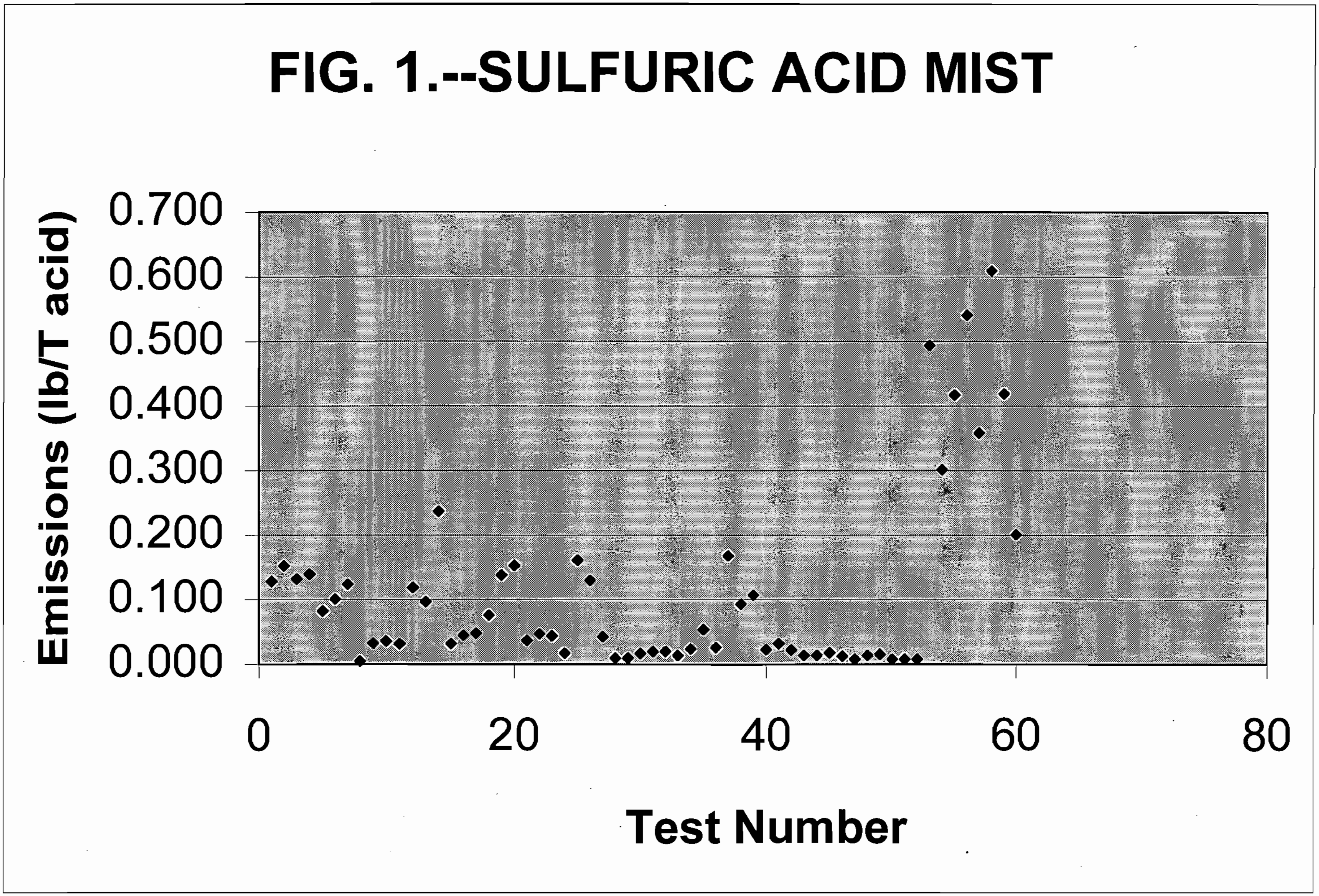

FIG. 1.--SULFURIC ACID MIST
Emissions (lb/T acid)
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
0
20
40
60
80
Test Number

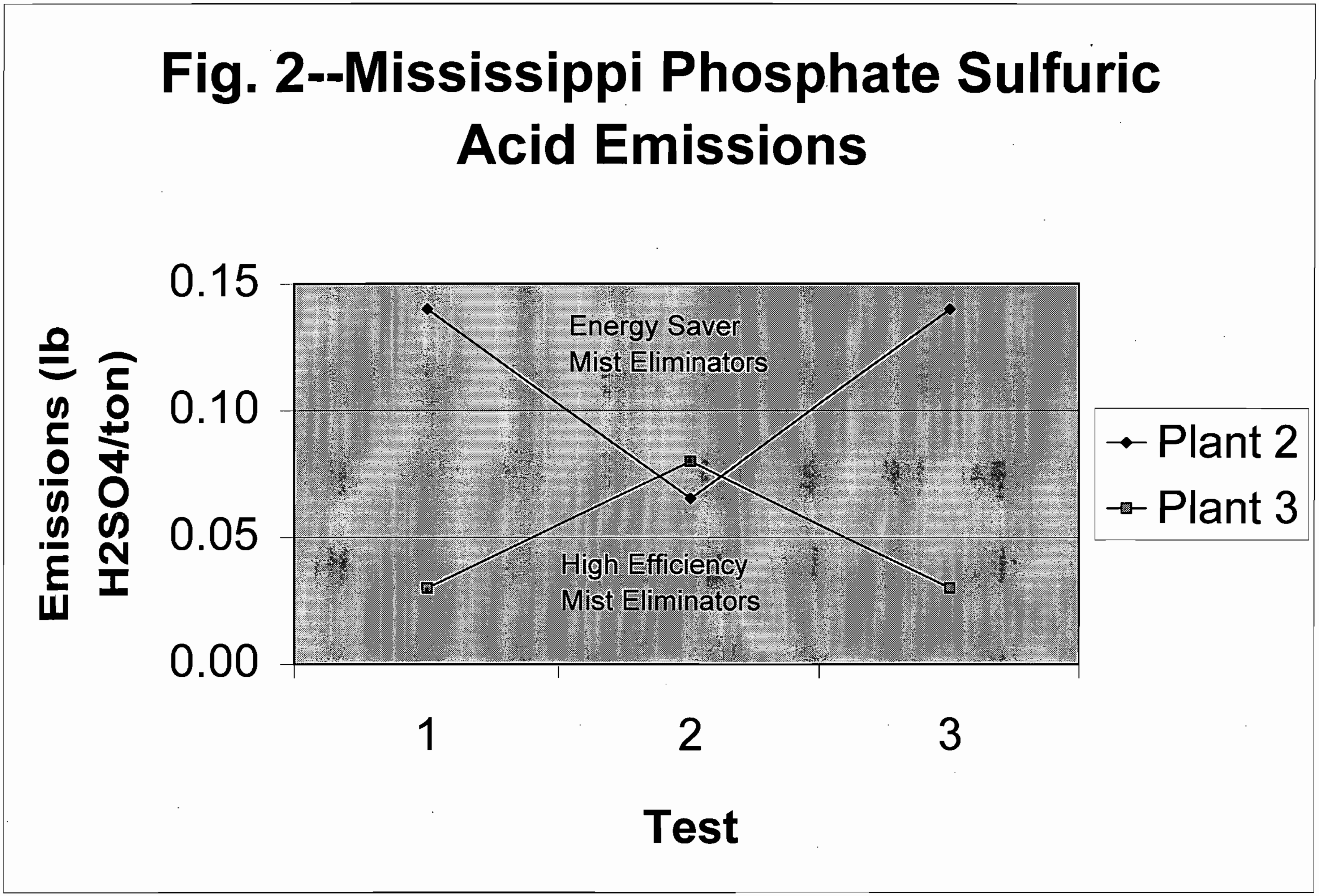

Fig. 2--Mississippi Phosphate Sulfuric Acid Emissions
0.15
0.10
0.05
0.00
Emissions (lb H2SO4/ton)
Energy Saver Mist Eliminators
High Efficiency Mist Eliminators
1
2
3
Test
Plant 2
Plant 3

LANDERS & PARSONS, P.A.
ATTORNEYS AT LAW

CINDY L. BARTIN
DAVID S. DEE
JOSEPH W. LANDERS, JR.
JOHN T. LAVIA, III
FRED A. McCORMACK
PHILIP S. PARSONS
ROBERT SCHEFFEL WRIGHT

HOWELL L. FERGUSON
OF COUNSEL

VICTORIA J. TSCHINKEL
SENIOR CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

310 WEST COLLEGE AVENUE
POST OFFICE BOX 271
TALLAHASSEE, FLORIDA 32302
TELEPHONE (850) 681-0311
TELECOPY (850) 224-5595

MEMORANDUM

HAND DELIVERY

TO: Jeff Brown
Al Linero

FROM: David S. Dee

DATE: December 15, 1997

RE: Draft Settlement Agreement Concerning
Piney Point Phosphates, Inc.

Enclosed for your review is a draft Settlement Agreement between Piney Point Phosphates, Inc., and Manatee County. This draft Settlement Agreement will be presented to the Board of County Commissioners of Manatee County at a special meeting beginning at 9:00 AM on Thursday, December 18, 1997. Please call me at your earliest convenience if you have any significant questions or concerns about the terms of the proposed Settlement Agreement.

Thank you for your prompt consideration of this issue.

cc: Clair Fancy
Howard Rhodes
Jeff Steinsnyder

RECEIVED
DEC 15 1997
BUREAU OF
AIR REGULATION

DRAFT

SETTLEMENT AGREEMENT

This Settlement Agreement ("Agreement") is made by and between Piney Point Phosphates, Inc. ("Piney Point"), and Manatee County ("County") on this ___ day of December, 1997.

Recitals

WHEREAS:

A. Piney Point owns a fertilizer manufacturing facility ("Facility") that is located in Manatee County, Florida. The Facility includes an existing sulfuric acid plant ("Existing Plant"), a diammonium phosphate plant ("DAP Plant"), and other related structures and processes.

B. Piney Point is preparing to resume commercial operation at the Existing Plant and the Facility. Piney Point also wants to build and operate a new sulfuric acid plant ("New Plant") at the Facility.

C. Manatee County is a political subdivision of the State of Florida. The County is governed by a Board of County Commissioners ("Board").

D. Piney Point and Manatee County want to ensure that Piney Point's activities at the Facility are conducted in compliance with all applicable laws, especially those laws that are designed to protect human health and the environment. Piney Point and Manatee County want the Facility to be operated in a manner that is protective of the environment, the residents of Manatee County, and Piney Point's employees.

E. Piney Point and Manatee County now want to resolve their differences, without further litigation.

THEREFORE, in consideration of the promises and covenants contained herein, Piney Point and Manatee County agree that they shall comply with and be bound by the terms and conditions of this Settlement Agreement, as set forth below:

Restart of Existing Plant

1. Piney Point has filed an application with the Florida Department of Environmental Protection ("DEP" or "Department") for a construction permit to modify and restart the Existing Plant. Upon execution of this Agreement by the Board, Piney Point shall request the Department to issue a construction permit ("the Permit") for the Existing Plant, consistent with this Agreement, as follows:

(a) The sulfur dioxide emissions limit in the Permit shall be reduced by 12.5% to 3.5 pounds of sulfur dioxide per ton of 100% sulfuric acid produced or 291.7 pounds of sulfur dioxide per hour, whichever is less. Compliance with this emission limit shall be determined by using a 48-hour rolling average. Three hour averages shall not exceed 4.0 pounds of sulfur dioxide per ton of 100% sulfuric acid produced. These emissions limits may be exceeded only under the conditions provided in DEP Rule 62-

DRAFT

210.700, Florida Administrative Code ("F.A.C."). Exceedances that meet the requirements of DEP Rule 62-210.700, F.A.C., and are caused by temporary operational upsets, plant start-ups or other conditions, shall not be used when calculating the 48-hour rolling average or three hour average.

(b) Compliance with the sulfur dioxide emission limits shall be demonstrated by using the data collected with a continuous emissions monitoring system (CEMS). The CEMS equipment shall be installed, calibrated, certified, maintained, operated and used in accordance with 40 C.F.R. 60, Appendices B and F. Unless the CEMS is inoperable, the CEMS shall be operated and shall record sulfur dioxide emissions data during all operating hours, including periods of start-up, shut-down, load change, and malfunction.

(c) Piney Point shall install cesium-promoted catalyst in the final pass of the Existing Plant (approximately 115,000 liters). The cesium-promoted catalyst shall be used for at least one turnaround cycle, or approximately two years, whichever is longer.

(d) High efficiency mist eliminators shall be installed, maintained and operated at the Existing Plant.

(e) The provisions of the Memorandum of Understanding issued by the DEP on November 21, 1989 shall be added to the Operating Permit as permit conditions. A copy of DEP's Memorandum of Understanding is attached hereto as Exhibit "A".

(f) Each calendar quarter Piney Point shall provide Manatee County with copies of all of the: (i) compliance calculation worksheets for the sulfur dioxide emissions from the Existing Plant; (ii) the hourly CEMS data; and (iii) supporting information necessary to demonstrate compliance with the emissions limitations in the Permit.

(g) The other conditions of the Permit do not need to be changed, unless changes are necessary to make the Permit consistent with the requirements of this Agreement.

2. Manatee County shall not object to the issuance of the Permit, provided the Permit is consistent with the provisions of this Agreement.

3. If DEP issues a Permit that is consistent with the provisions of this Agreement, Manatee County promptly shall withdraw its verified complaint against DEP.

4. Subject to the other provisions of this Agreement, Manatee County shall not object to the repair and restart of the Existing Plant, provided that: (a) DEP issues a Permit that is consistent with the provisions of this Agreement; (b) the repairs do not increase the capacity of the Existing Plant to levels that are greater than 2,000 tons per day of 100% sulfuric acid; (c) the repairs do not increase the emissions from the Existing Plant to levels that are greater than the limits set forth in Paragraph 1, above; (d) Piney Point uses its best efforts to ensure that the Facility is fully and completely repaired, in accordance with the best practices of the industry, to provide safe and reliable

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operations in the future; (e) Piney Point complies with any County ordinances (e.g., building codes) that are applicable to the repair and restart of the Existing Plant; and (f) Piney Point fully complies with all of the provisions of this Agreement.

BACT Determination and Permit Conditions for New Plant

5. Piney Point has submitted an application to DEP for a permit to construct the New Plant ("Construction Permit") and DEP has prepared a draft Construction Permit (DEP Permit No. AC41-173305; PSD-FL-144).

6. The Best Available Control Technology ("BACT") determination for the New Plant shall be based upon a comprehensive BACT analysis, which shall be performed by Piney Point in accordance with current U.S. Environmental Protection Agency ("EPA") guidance and in consultation with the County. The BACT determination for the New Plant shall consider information generated from the operation of the Existing Plant, including data on the performance of the cesium catalyst, and shall be subject to approval by DEP.

7. Piney Point shall ask DEP to set the emissions limit for sulfur dioxide emissions from the New Plant at a level no greater than 3.5 pounds per ton of acid produced.

8. Piney Point shall use high efficiency mist eliminators or better technology to reduce the New Plant's emissions of sulfuric acid mist.

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9. After Piney Point and Manatee County sign this Agreement, Piney Point and Manatee County promptly shall request the Administrative Law Judge to hold DOAH Case No. 95-5795 in abeyance while Piney Point and Manatee County attempt to resolve their mutual concerns about the BACT determination and the proposed permit conditions for the New Plant.

10. If Manatee County concurs with the BACT determination and the proposed conditions in DEP's draft Construction Permit for the New Plant, Manatee County shall not object to the issuance of the Construction Permit and shall voluntarily dismiss the County's petition in DOAH Case No. 95-5796.

11. Piney Point shall permanently shut down and cease operating the Existing Plant when the New Plant commences commercial operations.

Safety Programs

12. Piney Point shall use its best efforts to protect the safety of its employees and the residents of Manatee County. Piney Point shall comply with all of the local, state and federal safety regulations that are applicable to Piney Point's activities at the Facility.

13. Piney Point already has established the safety programs that are described in Exhibit "B", which is attached hereto and incorporated herein by reference. Piney Point shall continue to implement and improve its existing safety programs for the

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Facility. Piney Point shall accelerate the implementation of the safety programs that are required by this Agreement.

14. Piney Point shall implement a Risk Management Program that complies with the regulations established by the United States Environmental Protection Agency ("EPA") in 40 C.F.R. Part 68, when Piney Point resumes operations of the Facility. The processes at the Existing Plant and Facility must comply with the requirements in 40 C.F.R. Part 68 for Program 3.

15. Before Piney Point resumes operations at the Facility, Piney Point shall meet with representatives of Manatee County's emergency response and emergency services department to discuss Piney Point's plans for complying with the EPA regulations in 40 C.F.R. Part 68. If the County's representatives recommend the installation of a public alarm system around the perimeter of Piney Point's Facility, then Piney Point will work diligently to comply promptly with the County's recommendation. Any such alarm shall be under the exclusive control of Piney Point.

16. Some of the EPA requirements in 40 C.F.R. Part 68 are being challenged in pending litigation. If the validity of the EPA requirements has not been conclusively established before Piney Point performs its "Worst case Risk Analysis" and "Alternative Risk Analyses" for the Facility, Piney Point may use the best information that is available to Piney Point at that time, even if Piney Point's approach is not consistent with the requirements of 40 C.F.R. Part 68. Piney Point shall modify its

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analyses, if necessary, to comply with the EPA regulations in effect after the EPA litigation is completed.

17. Piney Point shall inspect and maintain the mechanical integrity of the Facility's equipment in accordance with the applicable provisions of the EPA regulations contained in 40 C.F.R. Part 68. In addition, Piney Point will inspect and maintain the mechanical integrity of the Facility's equipment in accordance with the best management practices required under all applicable federal, state and local regulations. These inspections shall be performed daily, weekly, monthly, quarterly and annually, as required under the applicable regulations. All inspections shall be performed by qualified personnel. Any deficiencies in the Facility's equipment shall be corrected immediately to ensure the safe operations of the Facility.

Inspections by Manatee County

18. To assure Manatee County that Piney Point is complying with all of the applicable safety and environmental regulations, Piney Point agrees to the following conditions:

(a) Manatee County's building inspectors shall have access to the Facility to confirm that the Facility is in compliance with the County's Building and Technical Codes and applicable ordinances. Manatee County shall provide reasonable notice to Piney Point before Manatee County's building inspectors visit the Facility.

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(b) Manatee County's environmental compliance officials shall have access to the Facility to confirm that the Facility is in compliance with the applicable environmental laws and regulations. Manatee County shall provide reasonable notice to Piney Point before Manatee County's environmental compliance officials visit the Facility.

(c) Manatee County shall be advised by Piney Point as soon as Piney Point has knowledge of any scheduled or unscheduled visit by a representative of DEP, EPA, or the Occupational Safety and Health Administration ("OSHA"). Manatee County recognizes that Piney Point cannot control the timing of inspections by DEP, EPA or OSHA.

(d) Whenever the Facility is visited by DEP, EPA or OSHA, Manatee County shall be allowed to have one or two qualified observers accompany the agency inspectors during their visit to the Facility.

(e) Manatee County shall provide Piney Point with a list of the County representatives that are qualified to attend the inspections by DEP, EPA or OSHA. The County may update the list from time-to-time, as necessary. Unless requested by the inspecting agency, no other persons or County representatives are authorized by this Agreement to accompany the agencies during their inspections to the Facility.

(f) Whenever a representative of Manatee County visits the Facility, the County's representative shall comply with Piney Point's safety regulations and shall follow all reasonable

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instructions provided by Piney Point while on Piney Point's property. Piney Point shall provide a copy of its safety regulations to the County so that the County's representatives may review the safety regulations before visiting the Facility.

(g) Piney Point and Manatee County promptly shall provide each other with any report, test result or other information that is received from any agency concerning an inspection of the Facility.

(h) If Manatee County wishes to collect any samples at the Facility, Manatee County shall split the samples with Piney Point, if requested, and promptly shall provide Piney Point with the results of any tests performed on the samples.

(i) During inspections of the Facility, Manatee County's representatives shall notify Piney Point's escort before they take any photographs of the Facility. In this fashion, the County's representative shall give Piney Point's representative an opportunity to view the conditions or area at the Facility that is the subject of the photograph. If Manatee County takes any photograph of the Facility, Manatee County promptly shall provide a copy of the photograph to Piney Point. However, Manatee County shall not take photographs of any equipment or processes reasonably designated by Piney Point as proprietary and confidential. Photographs shall be taken only for authorized regulatory purposes.

(j) Piney Point and Manatee County shall work together in a cooperative manner to ensure and confirm that Piney Point is

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complying with all local, state, and federal regulations. If requested, Piney Point shall provide a tour of the Facility once each year for the Board of County Commissioners or the Board's designees.

Reporting to Manatee County

19. Piney Point shall provide Manatee County with a copy of any report or document that Piney Point is required to provide to any state or federal agency, (unless such documents are confidential under state or federal law), including but not limited to: (a) routine reports to DEP or EPA concerning the Facility's stack tests, air emissions, surface water discharges, or other discharges; (b) reports concerning excess emissions, upset conditions or emergencies at the Facility; (c) reports and other information that are required under the provisions of 40 C.F.R. Part 68 or Paragraph 14, above; and (d) reports or other information that must be submitted to DEP pursuant to Paragraph 1, above. These reports and other materials shall be provided to Manatee County at the same time that they are provided to the state or federal agency. Should Piney Point determine that a report or portion thereof is confidential, Piney Point shall take steps to redact the confidential information, or if this is not possible, notify the County of the report and Piney Point's reasons for not providing it to the County. These reports and other materials shall be submitted to the Director of the Manatee

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County Department of Environmental Management, P. O. Box 1000, Bradenton, Florida 34206-1000.

20. Piney Point immediately shall notify Manatee County if there is an accident, malfunction or other event at the Facility that poses a threat to human health or the environment in the areas located adjacent to Piney Point's Facility. Manatee County recognizes that, under such circumstances, Piney Point may be required by law to provide notice to certain local, state, or federal agencies before Piney Point provides notice to Manatee County. Minor exceedances authorized under DEP Rule 62-210.700, F.A.C., are not subject to the notification requirements contained in this paragraph.

Land Use and Zoning

21. In the past, Piney Point's predecessor obtained zoning, land use and other approvals from Manatee County for the construction and operation of the Existing Plant. More recently, Piney Point provided Manatee County with preliminary plot plans and other documents which identify the repairs and maintenance improvements that will be made to the Existing Plant before Piney Point resumes operations of the Facility. Within 30 days after the effective date of this Agreement, Piney Point shall revise and update the site plan for the Existing Plant to show the proposed repairs and maintenance improvements, consistent with the preliminary plans provided to Manatee County, and shall submit the revised plot plan to Manatee County for its records.

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Thereafter, the revised plot plan shall be used and enforced by the County when processing Piney Point's applications for building permits for the proposed repairs and improvements to the Existing Plant.

22. Piney Point's plans to construct and operate the New Plant shall be subject to review and approval by Manatee County in accordance with the applicable provisions of the County ordinances in effect at the time such plans are submitted to the County.

23. If Piney Point proposes changes to the revised site plan for the Existing Plant or if Piney Point proposes changes to the site plan for the Facility, and such changes would be subject to review and approval by Manatee County under the applicable provisions of the County's ordinances, then Piney Point shall comply with the applicable County ordinances in effect at the time the plans for such changes are submitted to the County.

Pending Appeal

24. Piney Point has filed an appeal of DEP's final order regarding Piney Point's plan to restart the Existing Plant. Promptly after the execution of this Agreement by Manatee County and Piney Point, Manatee County and Piney Point shall file a joint motion requesting the District Court of Appeal to abate the appeal (DCA Case No. 97-3828) until DEP takes final agency action concerning Piney Point's application for the Permit authorizing the modification and restart of the Existing Plant. If DEP

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issues the Permit with conditions and limitations that are consistent with the terms of this Agreement, Piney Point shall dismiss the appeal in DCA Case No. 97-3828 at such time as the Permit is final and unappealable.

Miscellaneous

25. This Agreement shall become effective when it is approved by the Board of County Commissioners at a duly noticed meeting and signed by the Board's Chairperson.

26. This Agreement constitutes the entire agreement and understanding of the parties as to all matters addressed or referred to herein. This Agreement supersedes all prior and contemporaneous agreements, understandings, representations, and warranties, whether oral or written, relating to such matters.

27. This Agreement may be amended only by a written instrument specifically referring to this Agreement and executed with the same formalities as this Agreement.

28. This Agreement shall be binding upon and shall inure to the benefit of the parties, their successors and assigns.

29. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. Any action to interpret or enforce this Agreement shall be brought and maintained in the State of Florida. Venue shall be in Manatee County, Florida.

30. Except as otherwise specifically provided in this Agreement, the parties retain all of their rights and remedies at

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law and in equity, including but not limited to their right to obtain specific performance and injunctive relief to enforce the terms of this Agreement. If either party commences an action or proceeding to enforce the provisions of this Agreement, the court in its discretion may award reasonable attorneys' fees and costs to the prevailing party.

31. By executing this Agreement, Manatee County and Piney Point permanently release, waive and discharge (collectively "release") any and all claims, causes of action, and damages (collectively "claims"), known or unknown, that either party may have against the other, provided such claims are based upon or arise from facts, events or actions occurring prior to the effective date of this Agreement, and concern or relate to the permits or approvals needed for the commencement of operations at the Existing Plant or New Plant. For the purposes of the release contained in this paragraph, "Manatee County" and "Piney Point" are defined broadly to include the parties and their officers, elected officials, employees, consultants, attorneys, and all other agents serving for or on behalf of the parties, individually and collectively. For the purposes of this release, "claims" shall include but not be limited to those causes of action that are based upon a temporary or permanent taking of property rights, or violations of equal protection, or violations of civil rights.

32. Except as provided in Paragraph 30, above, Manatee County and Piney Point each shall pay all of their own costs,

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fees and expenses (collectively "Costs"), including but not limited to those Costs that: (a) have been incurred in DOAH Case No. 95-5795 or are associated with the New Plant; (b) have been incurred as a result of the parties' disagreement about the legal requirements governing the restart and operation of the Facility; and (c) are incurred in the future when the parties perform their respective obligations under this Agreement.

33. No delay or failure to exercise a right under this Agreement shall impair such right or be construed to be a waiver thereof, but such right may be exercised from time to time and as often as deemed expedient. The failure of Piney Point or the County at any time to require performance by the other party of any term in this Agreement shall in no way affect the right of Piney Point or the County thereafter to enforce same; nor shall waiver by Piney Point or the County of any breach of any term of this Agreement be taken or held to be a waiver of any succeeding breach of such term or as a waiver of any term itself. To be effective, any waiver must be in writing and signed by the party granting the waiver. Any waiver shall be limited to the particular right so waived and shall not be deemed to waive any other right under this Agreement.

34. Piney Point represents that: (a) it is a corporation duly organized under the laws of the State of Florida or qualified to do business in the State of Florida; (b) this Agreement has been duly authorized, executed and delivered in the

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State of Florida; and (c) Piney Point has the ability and authority to perform its obligations under this Agreement.

35. It is agreed between the parties hereto that no provision of this Agreement is intended to create any third-party beneficiaries hereunder, or to authorize anyone not a party to this Agreement to maintain an action pursuant to the terms or provisions of this Agreement.

36. If any provision of this Agreement is held to be void or invalid by a court of competent jurisdiction, that provision shall be deemed severable from the remainder of the Agreement and shall not affect any other provision of this Agreement. If a provision of this Agreement is deemed invalid due to its scope or breadth, that provision shall be enforced and deemed valid within the scope or breadth permitted by law.

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IN WITNESS WHEREOF, this Agreement has been duly executed by Piney Point Phosphates, Inc., and Manatee County on the dates set forth below.

PINEY POINT PHOSPHATES, INC.

By:______________________________
Robert C. Stewart
Senior Vice President

Signed, sealed and delivered
in the presence of:

____________________________	____________________________
Witness Signature	Witness Signature
____________________________	____________________________
Print Witness Name	Print Witness Name

STATE OF FLORIDA
COUNTY OF

The foregoing Settlement Agreement was acknowledged before me this ___ day of December, 1997, by Robert C. Stewart, as the Senior Vice President of Piney Point Phosphates, Inc., on behalf of the corporation. He/She is personally known top me or has produced ______________________________ as identification.

____
Notary Public - State of Florida

Print Name: ________________________
Commission Number: __________________
Commission Expiration Date: _______

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MANATEE COUNTY BOARD OF COUNTY COMMISSIONERS

By:____________________________
Patricia Glass, Chair
Board of County Commissioners

ATTEST:

Dated: ____________________________

____
R. B. Shore, Clerk of Court

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EXHIBIT "A" TO SETTLEMENT AGREEMENT
BETWEEN PINEY POINT PHOSPHATES, INC.
AND MANATEE COUNTY

Best Operational Start-Up Practices
For Sulfuric Acid Plants

BEST OPERATIONAL START-UP PRACTICES FOR SULFURIC ACID PLANTS

1. Only one sulfuric acid plant at a facility should be started up and burning sulfur at a time. There are times when it will be acceptable for more than one sulfuric acid plant to be in the start-up mode at the same time, provided the following condition is met. It is not acceptable to initiate sulfur burning at one sulfuric acid plant when another plant at the same facility is emitting SO_2 at a rate in excess of the emission limits imposed by the permit or rule, as determined by the CEMs emission rates for the immediately preceding 20 minutes.

2. A plant start-up must be at the lowest practicable operating rate, not to exceed 70 percent of the designated operating rate, until the SO_2 monitor indicates compliance. Because production rate is difficult to measure during start-up, if a more appropriate indicator (such as blower pressure, furnace temperature, gas strength, blower speed, number of sulfur guns operating, etc.) can be documented, tested and validated, the Department will accept this in lieu of directly documenting the operating rate. Implementation requires the development of a suitable list of surrogate parameters to demonstrate and document the reduced operating rate on a plant-by-plant basis. Documentation that the plant is conducting start-up at the reduced rate is the responsibility of the owner or operator.

3. Sulfuric acid plants are authorized to emit excess emissions from start-up for a period of three consecutive hours provided best operational practices, in accordance with this agreement, to minimize emissions are followed. No plant shall be operated (with sulfur as fuel) out of compliance for more than three consecutive hours. Thereafter, the plant shall be shut down. The plant shall be shut down (cease burning sulfur) if, as indicated by the continuous emission monitoring system, the plant is not in compliance within three hours of start-up. Restart may occur as soon as practicable following any needed repairs or adjustments, provided the corrective action is taken and properly documented.

4. Cold Start-Up Procedures.

a. Converter.

(1) The inlet and outlet temperature at the first two masses of catalyst shall be sufficiently high to provide immediate ignition when SO_2 enters the masses. In no event shall the inlet temperature to the first mass be less than 800°F or the outlet temperature to the first two masses be less than 700°F.

These temperatures are the desired temperatures at the time the use of auxiliary fuel is terminated.

(2) The gas stream entering the converter shall contain SO_2 at a level less than normal, and sufficiently low to promote catalytic conversion to SO_3.

b. Absorbing Towers.

The concentration, temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

5. Warm Restart.

a. Converter.

The inlet and outlet temperatures of the first two catalyst masses should be sufficiently high to ensure conversion. One of the following three conditions must be met:

(1) The first two catalyst masses inlet and outlet temperatures must be at a minimum of 700°F; or

(2) Two of the four inlet and outlet temperatures must be greater than or equal to 800°F; or

(3) The inlet temperature of the first catalyst must be greater than or equal to 600°F and the outlet temperature greater than or equal to 800°F. Also, the inlet and outlet temperatures of the second catalyst must be greater than or equal to 700°F.

Failure to meet one of the above conditions, requires use of cold start-up procedures.

To allow for technological improvements or individual plant conditions, alternative conditions will be considered by the Department in appropriate cases.

b. Absorbing Towers.

The concentration, temperature and flow of circulating acid shall be as near to normal conditions as reasonably can be achieved. In no event shall the concentration be less than 96 percent H_2SO_4.

EXHIBIT "B" TO SETTLEMENT AGREEMENT
BETWEEN PINEY POINT PHOSPHATES, INC.
AND MANATEE COUNTY

Safety Program for Piney Point Phosphates, Inc.

SAFETY PROGRAM FOR PINEY POINT
PHOSPHATES, INC.

This document describes the safety program that is used by Piney Point Phosphates, Inc., at its fertilizer manufacturing facility in Manatee County, Florida. This document supplements the provisions of the Settlement Agreement dated December ____, 1997 between Piney Point Phosphates, Inc., and Manatee County.

1. Piney Point shall have a professionally trained Safety Superintendent who shall be primarily responsible for Piney Point's safety policies and training programs at the Facility. The Safety Superintendent shall report to Piney Point's Safety Director, who in turn shall report to the Senior Management (e.g., Senior Vice President) of the Company. The Safety Department shall have appropriate authority over safety issues at the Facility. The Safety Department and Piney Point's Senior Management shall work together closely to ensure that Piney Point's Safety Policy is followed at all times.

2. Piney Point shall appoint an in-house Safety Committee that shall meet at least once each month to discuss safety issues affecting the Facility. At a minimum, the Safety Committee shall include members selected from the various operating departments within the Company. The Safety Committee shall be under the direction of the Safety Superintendent and shall perform the following tasks:

    a. The Committee shall perform announced and unannounced inspections of the Facility to ensure that the facility is in compliance with all applicable safety laws and regulations, as well as company requirements and best management practices concerning safety;

    b. The Committee shall plan, develop and present formal training programs for each employee on a monthly basis;

    c. The Safety Committee shall oversee bi-weekly safety meetings between Piney Point's employees and their direct supervisors; and

    d. The Safety Committee shall respond to the Company's Senior Management each month about the Company's safety program. The committee will present recommendations for improvements of any potential problems or shortcomings of these programs and recommend any corrective actions needed.

3. The Safety Superintendent and the Safety Committee shall thoroughly investigate every accident, injury and near miss that occurs at the Facility. For such events, a report shall be presented to Piney Point's management concerning the event, the probable cause of the event, and the appropriate response or remedy by Piney Point.

4. All of Piney Point's employees and outside contractors shall have training and experience appropriate for their job responsibilities. As applicable, the Company's employees and contractors shall be trained in the following areas:

   - The operation of forklifts, payloaders, cranes, Highreach cranes, Gantry cranes and other mobile equipment'

   - How to comply with Scaffolding Standards;

   - Control of Hazardous Energy Lockout and Tagout procedures (e.g., steam, electricity, liquids, etc.);

   - How to comply with Confined Spaces Permit Entry (e.g., tanks and vessels);

   - The operation of hand tools, power tools, and other hand-held equipment;

   - The use of personal protective equipment, including hard hats, eye protection, hand protection, acid suits, face shields, goggles, respirators, and hearing protection;

   - Hazard Communication and D.O.T. Requirements;

   - Welding and Burning Standards;

   - Fire Protection Standards;

   - Electrical Standards;

   - Walking and Working Surfaces Standards (e.g., platforms, ladders, etc., as to use, construction and location);

   - Machinery and Machine Guarding Requirements;

   - Line Breaking Procedure and Permitting;

   - First Aid/C.P.R. and Bloodborne Pathogen Training (Hepatitis & AIDS exposure prevention);

- Fall Protection Standards;
- Evacuation and Trenching Standards;
- Hazard Incident training;
- Radioactive Materials training;

5. Piney Point shall comply with all OSHA Process Safety Management Requirements for Highly Hazardous Chemicals, including the requirements concerning:

   - Employee Participation;
   - Process Safety Information;
   - Operating Procedures;
   - Process Hazard Analysis;
   - Training/Refresher Training;
   - Contractor Training (including general and site specific training);
   - Pre-Startup Safety Review;
   - Mechanical Integrity (tank and equipment testing);
   - Hot Work Permit;
   - Management of Change (in any process or material of construction);
   - Incident Investigation;
   - Emergency Planning and Response;
   - Compliance Audits;
   - Control of Contractors' Entrance and Exit of Facility

6. When hiring new employees at the Facility, Piney Point shall consider the person's awareness of and knowledge about safety and environmental issues, together with the person's work skills.

7. With regard to each new employee, Piney Point shall:

   a. Perform a complete physical examination of the individual;

b. Perform drug testing or screening for substance abuse;

c. Ensure that the person has received at least 8 hours of basic safety training; and

d. When appropriate, provide up to 1 week of additional training in the specific areas of the individual's job responsibilities.

8. The Company shall solicit safety suggestions from its employees and provide appropriate awards for those suggestions that materially benefit the Company's Safety Program. Each safety suggestion shall be evaluated by the Company's Safety Committee.

C:\WPDOCS\MAN66

Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 1, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 US Highway North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

Attached is some additional information provided for our consideration by RTP Associates relevant to the subject application. Feel free to submit any comments regarding this material.

If you have any questions, please call meat (850)488-1344.

Sincerely,

A A Linero 12/2/97

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/aal

Enclosures

cc: Bill Thomas, SWD
Karen Collins, Manatee County

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl 34221

4a. Article Number
P 265 659 258

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12/4/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan Keck

PS Form **3811**, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 258

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to R. Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	12-2-97

PS Form **3800**, April 1995

MEMORANDUM

TO: Mr. A. A. Linero, P.E.

FROM: Michael J. Hober and Donald F. Elias MJH

DATE: November 26, 1997

SUBJECT: Control Cost Estimates for the Piney Point Phosphate PSD Application

Attached are calculation sheets for two separate cases estimating a cost per ton of sulfur dioxide (SO_2) removed ($/ton) for different potential scenarios at the Piney Point Phosphates facility. Case 1 estimates potential emissions savings from overdesign of the new plant (i.e., plant designed for 2700 tons of 100% H_2SO_4 per day [ton/day] and operated at 2000 tons/day). Case 2 utilizes the Mulberry facility data provided in the PSD application for the existing plant to estimate SO_2 reductions if SO_2 plant emissions (i.e., catalyst degradation) were gradually increased over time rather than constant at the permit level. Further explanation of each case is presented below to match with the attached sheets.

Case 1 - Facility Overdesign

According to the data supplied by Piney Point Phosphates, sulfuric acid facilities are designed for a set production rate and operators maximize their operation of the plant until they reach the permit limits for acid production or SO_2 emission. Case 1 analyzes the $/ton of SO_2 removed for building a 2700 ton/day sulfuric acid plant and operating at 2000 tons/day. It is then assumed that SO_2 emissions can be maintained at either 2.0 or 2.5 lbs SO_2 per ton of acid (lb/ton) produced. This assumption is confirmed by data from U.S. Agri-Chemicals from 1990 to 1996 and by data from Piney Point from 1988 and 1989. The two scenarios presented utilize cost data presented in the March 5, 1997 letter from Robert C. Stewart of Piney Point Phosphates, Inc. to Dr. Richard Garrity of the FDEP Southwest District Office. This letter notes on page 4 that the cost of a new 2700 ton/day plant has risen to over $60 million (assumed to be $62 million) from about $44 million in 1989. Also, in the same letter on page 7, two costs are provided for a replacement 2000 ton/day plant, which are $46.5 million (Mr. Hartman) and $42 million (Monsanto). Both of these are used for comparison.

As shown in the attached calculations, operating an overdesigned plant (2700 ton/day) at 2000 ton/day, with SO_2 emissions reduced from 3.95 lb/ton to lower levels (2.0 and 2.5 lb/ton), results in costs that range from about $2050/ton to $3550/ton of SO_2 removed.

The increase in cost of 40% between a 2000 ton/day plant and a 2700 ton/day plant (an increase in production of 35%) as presented by Piney Point Phosphates appears excessive. The calculations show two common engineering methods used to escalate a capital project's cost. The first method is the "Sixth-Tenth's" rule which shows that escalating the cost of $46.5 million for a 2000 ton/day plant to 2700 tons/day would be approximately $55.7 million. The second method incorporates General Construction Cost Index factors published monthly in the Engineering News Record (ENR) which shows that the increased cost of a 2700 ton/day plant over time would be $55.2 million. Both methods indicate that Piney Point Phosphates' estimate of over $60 million in 1997 dollars for a 2700 ton/day plant appears to be excessive.

Use of a capital cost of $55.5 million for a 2700 ton/day plant operating at 2000 ton/day with SO_2 emissions of 2.0 to 2.5 lb/ton (versus 3.95 lb/ton for an 2000 ton/day plant with a capital cost of $44.25 million) would give costs for reducing SO_2 emissions of about $1500/ton (2.0 lb/ton) to $2000/ton (2.5 lb/ton). Thus, consideration of lower capital costs for constructing an overdesigned plant (2700 tons/day) would significantly reduce the $/ton of SO_2 removed costs for operations at 2000 tons/day.

It is also useful to determine how the cost of reducing emissions would affect the cost of acid production. In Appendix D of the October 31, 1997 application, data from Mulberry Phosphates, Inc. was presented and summarized. The data showed that the facility averaged 1599 tons/day of acid produced during the first nine months after a turnaround and 1558 tons/day of acid produced over an 18-month period without a 9-month turnaround. The cost of a nine-month turnaround in an 18-month cycle provided by Piney Point Phosphates in Table 4-1 of the permit application was $649,300. It appears that the costs presented in Table 4-1 are high and, more importantly, do not account for the benefit of increased acid production with a turnaround. When the data are scaled to a 2000 ton/day plant, it appears that the increased acid production with a 9-month turnaround would be 26,578 tons in an 18-month period. Assuming a minimum value of $20 per ton as claimed by Piney Point Phosphates in Table 4-1, the benefit of the increased production would be $531,560. Thus, the real cost for the 9-month turnaround would be $0.11 per ton of acid produced when based on the net cost of the turnaround ($649,300 - $531,560). This value is expected to be overly conservative. If the increased acid production allowed Piney Point Phosphates to either sell acid or avoid purchasing acid at market prices ($35/ton according to Piney Point Phosphates), the benefit to Piney Point Phosphates for a 9-month turnaround would be $930,230, which exceeds the cost of the turnaround. This is detailed in the attached calculations.

Case 2 - Gradual Catalyst Degradation

The table presented as Case 2 compares the monthly average SO_2 emission and H_2SO_4 production values for the Mulberry facility (columns II and III) included in the PSD application, with values resulting from an assumed linear degradation of the catalyst. Columns IV and VI of the table show calculated linear increased SO_2 emissions (per ton of H_2SO_4 produced) compared to calculated linear decreased production of H_2SO_4. Columns V and VII present the differential amounts of SO_2 emissions and acid production between the theoretical estimate and the actual Mulberry Station data. The differential SO_2 emissions results in assumed tons of emissions saved. The differential production of acid is the assumed production penalty (or if negative (-) surplus) resulting from lower SO_2 emissions. Columns VIII through XI present the same analysis as columns IV through VII, except these assume a nine-month turnaround is performed with resultant lower SO_2 emissions and higher production capability. Conservative end point values were taken from the Mulberry data and used for the linearization assessment. These conservative end points most likely over-estimate the production penalty amounts. The calculation of $/ton of SO_2 removed utilized the differential cost of acid ($15.00 per ton) referenced in Table 4-1 of the PSD application. Also, the cost of $649,300 for catalyst changeout referenced in Table 4-1 was included in the $/ton of SO_2 removed calculation to conservatively estimate costs for the scenario with a nine-month turnaround. These analyses result in $/ton of SO_2 removed values of $1282/ton for the 18-month turnaround scenario and $1201/ton for the 9-month turnaround scenario. The interesting point of the analysis is that costs are lower on a $/ton of SO_2 removed basis when there is an additional turnaround. The lower cost is associated with significantly lower SO_2 emissions overall and substantially increased H_2SO_4 production rates overall.

These analyses demonstrate that it is possible to optimize the plant's operations to maximize production while minimizing emissions. By comparison, the data presented in Appendix D of the October 31, 1997 application maximizes both production and emissions.

Should you have questions or need additional information, please feel free to contact either Michael J. Hober or Donald F. Elias at 732/968-9600.

cc: C. Fancy
B. Beals
G. Worley
E. Porter
D. Shepherd
G. McCutchen
W. Vatavuk
W. Corbin
Project File: LPPPP

CALCULATIONS OF COSTS FOR CASE 1 - FACILITY OVERDESIGN

Givens:

1) Capital cost of new 2700 ton/day sulfuric acid plant = $62,000,000 (per Piney Point)

2) Capital cost of new 2000 ton/day sulfuric acid plant = $46,500,000 (per Hartman) or $42,000,000 (per Monsanto)

3) Amortization period of 20 years and interest rate of 7% (based on USEPA Control Cost Manual) gives an annual cost factor = 0.094

Calculations:

a)

Capital Cost for 2700 ton/day plant	$62,000,000	$62,000,000
Capital Cost for 2000 ton/day plant	-46,500,000	-42,000,000
Capital Cost Difference between 2700 and 2000 ton/day plant	$15,500,000	$20,000,000
Annual Cost Factor	x 0.094	x 0.094
Annual Capital Cost for building a 2700 ton/day plant and operating at 2000 tons/day	$1,457,000	$1,880,000

b) Annual SO_2 emissions for 2000 ton/day plant with SO_2 emissions of 3.95 lb/ton (i.e., slightly less than NSPS limit):

$$\frac{2000\ tons\ acid}{day} \times \frac{3.95\ lbs\ SO_2}{ton\ acid} \times \frac{365\ days}{year} \times \frac{ton}{2000\ lbs} = \frac{1441.75\ tons\ SO_2}{year}$$

c) Annual SO_2 emissions for 2700 ton/day plant producing 2000 ton/day with SO_2 emissions of 2.0 and 2.5 lb/ton:

$$\frac{2000\ tons\ acid}{day} \times \frac{2.0\ lbs\ SO_2}{ton\ acid} \times \frac{365\ day}{year} \times \frac{ton}{2000\ lbs} = \frac{730\ tons\ SO_2}{year}$$

$$\frac{2000\ tons\ acid}{day} \times \frac{2.5\ lbs\ SO_2}{ton\ acid} \times \frac{365\ days}{year}\ \frac{ton}{2000\ lbs} = \frac{912.5\ tons\ SO_2}{year}$$

d) Tons/year of SO_2 removed for 2.0 lb/ton = 1442 - 730 = 712 tons/year of SO_2
Tons/year of SO_2 removed for 2.5 lb/ton = 1442 - 913 = 529 tons/year of SO_2

e) Cost ($/ton) of removed SO_2 for building a 2700 ton/day plant at $62 million and operating at 2000 ton/day versus a 2000 ton/day plant costing $46.5 million:

@ 2.0 lbs SO_2/ton H_2SO_4 = ($1,457,000)/(712) = $2046/ton SO_2 removed
@ 2.5 lbs SO_2/ton H_2SO_4 = ($1,457,000)/(529) = $2754/ton SO_2 removed

f) Cost ($/ton) of removed SO_2 for building a 2700 ton/day plant at $62 million and operating at 2000 ton/day versus a 2000 ton/day plant costing $42 million:

@ 2.0 lbs SO_2/ton H_2SO_4 = ($1,880,000)/(712) = $2640/ton SO_2 removed
@ 2.5 lbs SO_2/ton H_2SO_4 = ($1,880,000)/(529) = $3554/ton SO_2 removed

OTHER METHODS FOR CALCULATING THE COST OF A 2700 TON/DAY FACILITY:

g) "Six-Tenths" Rule:

$$\$46.5\ \textit{million for a}\ 2000\ \textit{tpd plant (per Hartman)} \times \left(\frac{2700}{2000}\right)^{0.6} = \$55.7\ \textit{million}$$

h) <u>Engineering News Review (ENR)</u>:

- Construction Cost Index for October, 1989 = 4658
- Construction Cost Index for October, 1997 = 5848
- Construction Cost Escalation Factor = $\frac{5848}{4658} = 1.255$
- Escalated Construction Costs from 1989 to 1997 =
  $44 million x 1.255 = $55,220,000

CALCULATIONS OF NET COST BENEFIT OF INCREASED ACID PRODUCTION DUE TO 9-MONTH TURNAROUND:

Givens:

1) Average daily acid production with a 9-month turnaround = 1599 tons acid/day
   Average daily acid production with an 18-month turnaround = 1558 tons acid/day

2) Cost of producing sulfuric acid = \$20 per ton
   Cost of purchasing sulfuric acid = \$35 per ton

3) Days in 18-month period = 551 days

Calculations:

a) 1599 tons acid/day x 551 days = 881,049 tons acid with 9-month turnaround
   1558 tons acid/day x 551 days = <u>858,458 tons acid with 18-month turnaround</u>
   22,591 tons acid increased production for a 1700 ton/day plant

b) Scaling the 18-month production rate and increase for a 2000 ton/day plant with a 9-month turnaround gives the following:

$$881{,}049\ tons\ x\ \frac{2000\ tons/day}{1700\ tons/day} = 1{,}036{,}528\ tons\ acid$$

= total amount of acid produced in 18 months with 2000 ton/day plant using 9-month turnaround

$$22{,}591\ tons\ x\ \frac{2000\ tons/day}{1700\ tons/day} = 26{,}578\ tons\ acid$$

= increased production for 9-month turnaround

c) Net cost benefit of 9-month turnaround for cost of producing acid is:

26,578 tons acid x \$20 per ton = \$531,560 (benefit for additional acid produced)

$$\frac{(\$649{,}300 - \$531{,}560)}{1{,}036{,}528\ tons\ of\ acid} = \$0.114/ton\ of\ acid$$ (additional cost of producing acid)

d) Net cost benefit of 9-month turnaround for cost of purchasing or selling acid is:

26,578 tons acid x \$35 per ton = \$930,230

CASE 2 - GRADUAL CATALYST DEGRADATION

Col. I	Col. II	Col. III	Col. IV	Col. V	Col. VI	Col VII	Col. VIII	Col. IX	Col. X	Col. XI
Mulberrry Station Monthly Data			Assuming Linear Catalyst Degradation				Assuming Linear Catalyst degradation and a 9 Month Catalyst Changeout			
Month	SO2 Monthly Av. Emissions (lb/ton) AVG	H2SO4 Production (ton/day) AVG	SO2 Theo. emission rate (lb/ton) AVG	Net SO2 Reduction tons M. Total	Theo H2SO4 Production Rate (tons/day) AVG	Reduction in H2SO4 Production M. Total	SO2 Theo. emission rate (lb/ton) AVG	Net SO2 Reduction tons M. Total	Theo H2SO4 Production Rate (tons/day) AVG	Reduction in H2SO4 Production M. Total
12/95	1.53	1545	1.47	0.731	1546	(-11)	1.47	0.731	1546	(-11)
1/96	3.18	1613	1.56	39.591	1541	2146	1.56	39.591	1541	2146
2/96	3.73	1625	1.67	48.415	1534	2643	1.67	48.415	1534	2643
3/96	3.71	1622	1.79	48.420	1527	2959	1.79	48.420	1527	2959
4/96	3.65	1613	1.91	40.825	1520	2703	1.91	40.825	1520	2703
5/96	3.90	1604	2.03	46.626	1512	2831	2.03	46.626	1512	2831
6/96	3.74	1577	2.15	37.960	1505	2159	2.15	37.960	1505	2159
7/96	3.75	1577	2.27	35.486	1498	2386	2.27	35.486	1498	2386
8/96	3.70	1590	2.40	29.166	1490	2800	2.40	29.166	1490	2800
9/96	3.48	1571	2.51	21.702	1483	2475	1.51	43.586	1544	764
10/96	3.91	1580	2.63	29.348	1476	3020	1.63	52.426	1537	1247
11/96	3.88	1546	2.75	26.373	1468	2331	1.75	49.737	1530	497
12/96	3.92	1519	2.87	24.701	1461	1801	1.87	48.425	1522	(-94)
01/97	3.95	1517	3.00	22.562	1454	1974	1.99	46.257	1515	79
02/97	4.01	1533	3.11	19.012	1447	2412	2.11	40.632	1508	701
03/97	3.96	1527	3.23	17.356	1440	2692	2.22	41.193	1501	796
04/97	3.95	1469	3.35	12.886	1432	1049	2.34	34.339	1494	(-724)
05/97	3.97	1490	3.47	11.578	1425	2026	2.46	34.852	1486	131
06/97	3.49	1424	3.59	1.461	1418	179	2.58	19.534	1479	(-1655)
07/97	3.62	1407	3.71	0.314	1411	(-109)	2.70	19.577	1472	(-1943)
08/97	3.73	1391	3.83	1.417	1403	(-377)	2.82	17.936	1464	(-2211)
09/97	3.91	1540	3.95	0.349	1396	4022	2.94	20.981	1457	2310
AVGs.	3.73	1540	2.72		1470		2.11		1507	
Net Totals				516		44,112		797		20,514

1) Net production loss with turnaround at end of period (tons): 44,112
   Net reduction in tons SO2: 516.282
   Cost in dollars per ton SO2 reduction[1]: $1,282

2) Net production loss with 9 month turnaround (tons): 20,514
   Net reduction in tons SO2: 796.695
   Cost in dollars per ton SO2 reduction[1 2]: $1,201

[1] Assumes a differential cost of $15/ton for lost H2SO4 production
[2] Includes Piney Point calculated cost of $649,300 for catalyst changeout

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 26, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 US Highway North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

We have finished our completeness review of your application to modify the existing sulfuric acid plant in Palmetto. In addition to the requests we previously sent you please provide the following information:

1. An assessment of the degree of overdesign (such as the typical 10-15%) that will be included in the proposed project at the existing plant; i.e. the ultimate maximum production capability of the refurbished plant.

2. A complete ambient air quality impact analysis for SO_2 and NO_2 for all averaging times. Modeling receptors should extend out to 20 km from the facility. This analysis should include a background monitored concentration and all applicable sources within 50 km of the facility.

3. Based on the information obtained from the AAQS analysis, provide an update of the additional impacts analyses. These analyses address the impacts on soils, vegetation and visibility, and the impacts on air quality related values (AQRV) in the PSD Class I Chassahowitzka National Wilderness Area.

Attached are comments from Manatee County and the National Park Service (NPS) which they have asked us to consider in our analysis. We invite your review of their comments. It is our understanding that additional comments will be provided by NPS and EPA Region 4. These will be forwarded to you as soon as we receive them.

Although the application is incomplete, we are continuing our technical review. This will allow us to process it in a timely manner once we receive your responses. If you have any questions regarding the modeling, please call Cleve Holladay. Please call me regarding any other issues. Our telephone number is 850/488-1344.

Sincerely,

AA Lin 11/26

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/aal

Enclosures

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Karen Collins, Manatee County
Ivan Nance, PPPI
John Koogler, P.E., K&A

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Operations & Administration
Piney Point Phosphates
13300 US Hwy 41 N.
Palmetto Fl 34221

4a. Article Number
P 265 659 257

4b. Service Type
☐ Registered
☐ Express Mail
☐ Return Receipt for Merchandise
☒ Certified
☐ Insured
☐ COD

7. Date of Delivery
12/11/97

5. Received By: (*Print Name*)

6. Signature: (*Addressee or Agent*)
X

8. Addressee's Address (*Only if requested and fee is paid*)

PS Form **3811**, December 1994

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Domestic Return Receipt

P 265 659 257

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	0810002-004-AC

PS Form **3800**, April 1995

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 26, 1997

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11/26

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/aal

Enclosures

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Karen Collins, Manatee County
Ivan Nance, PPPI
John Koogler, P.E., K&A

Jennie Freeman

1. Cesium catalyst [redacted]

2. low pressure modern [redacted]

RTP ENVIRONMENTAL ASSOCIATES INC.
AIR • WATER • SOLID WASTE CONSULTANTS
239 U.S. Highway 22 East • Green Brook, New Jersey 08812
(732) 968-9600

LETTER OF TRANSMITTAL

TO Mr. Al Linero
FDEP- Bureau of Air Regulation
111 South Magnolia, Suite 4
Tallahassee, FL 32301

Date: 11-21-97 Proj. ID: LPPPP

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover
VIA: ☐ 1st Class Mail ☒ Federal Express a.m. delivery ☐ Hand Delivery ☐ Other

THE FOLLOWING ITEMS:

Copies	Date	No.	Description
1	11-21-97		Manatee County Comments on October 31st Piney Point
			Phosphates Air Permit Application
1			DRAFT Copy of PSD Permit for Mississippi Phosphates
			Corp.

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For approval ☐ For review and comment ☐ Resubmit ____ copies for approval
☒ For your use ☐ Copies returned after loan ☐ For signature
☐ As requested ☐ Returned for corrections

REMARKS Al,
Here are the Manatee County comments on the October 31 Piney Point Phosphate's application. Hope they help. Have a Happy Thanksgiving!
Don

COPY TO:

SIGNED: Donald [illegible]

If enclosures are not as noted, kindly notify us at once.

RTP ENVIRONMENTAL ASSOCIATES INC.®

AIR · WATER · SOLID WASTE CONSULTANTS

239 U.S. Highway 22 East
Green Brook, New Jersey 08812-1909
(rtpnj@rtp-environmental.com)

(732) 968-9600
Fax: (732) 968-9603

November 21, 1997

RECEIVED
NOV 24 1997
BUREAU OF
AIR REGULATION

Mr. A. A. Linero, P.E.
Florida Dept. of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Manatee Co. Comments on October 31st Piney Point Phosphates Air Permit Application

Dear Mr. Linero:

We have received the October 31, 1997 PSD permit application for rehabilitation and reactivation of the existing 2000 ton/day sulfuric acid plant at Piney Point Phosphates, Inc. (PPPI). The Manatee County Attorney's Office and Environmental Management Department would like to offer the following comments:

(1) In Section 4.0 on page 19, the application states that *"In a typical plant with a double absorption system, the sulfur dioxide in the tail gas is approximately 4 pounds per ton of acid produced and the acid mist is approximately 0.15 pounds per ton of acid produced."* Since these emission levels are the New Source Performance Standards (NSPS) levels which are not to be exceeded, typical actual emissions must obviously be less. Compliance tests in the Department's Southwest District files for similar facilities show typical emission levels significantly less than NSPS limits for some plants. For example, the two U.S. Agri-Chemicals Corporation facilities in Bartow from 1990 to 1996 had the following emissions during recent compliance stack tests (production rate repermitted from 2200 to 3000 tons/day on July 10, 1995):

		-----lb SO2/ton-----				-----lb SAM/ton-----				Prod.
	Date	Run1	Run2	Run3	Avg.	Run1	Run2	Run3	Avg.	tons/day
SAP#1	11/19/96	2.03	2.01	2.04	2.03	0.046	0.041	0.038	0.042	2153
	12/06/95	1.78	1.75	1.66	1.73	0.025	0.024	0.024	0.024	2130
	04/03/95	2.39	2.36	2.31	2.36	0.032	0.031	0.028	0.030	2358
	11/29/94	1.78	1.83	1.90	1.84	0.042	0.031	0.026	0.033	1970
	??/??/93	------- 1993 stack test report not in permit files --------								
	11/13/92	1.85	1.85	1.85	1.85	0.054	0.052	0.062	0.056	2043
	11/12/91	2.56	2.57	2.51	2.55	0.036	0.040	0.038	0.038	2294
	09/20/90	1.71	1.66	1.74	1.70	0.025	0.033	0.030	0.029	2038
SAP#2	11/20/96	2.32	2.22	2.14	2.23	0.042	0.057	0.041	0.047	2222
	12/05/95	2.41	2.37	2.35	2.38	0.023	0.023	0.017	0.021	2258
	11/30/94	2.83	2.78	2.78	2.80	0.033	0.035	0.036	0.035	2364
	12/08/93	2.37	2.24	2.33	2.31	0.047	0.043	0.043	0.044	2178
	11/11/92	2.92	2.86	2.87	2.88	0.024	0.015	0.042	0.027	2260
	11/14/91	2.77	2.73	2.80	2.77	0.046	0.049	0.048	0.048	2077
	09/18/90	2.52	2.42	2.52	2.49	0.056	0.053	0.056	0.055	2152

From these data, it appears that emissions significantly lower than NSPS limits can be consistently achieved at sulfuric acid plants with throughputs around 2000 tons/day.

(2) Only control technologies included in the 1985 NSPS review document (EPA-450/3-85-012) were considered in detail in the BACT analysis for SO_2 and SAM as noted in Section 4.2 on the bottom of page 20. The 1990 USEPA Draft New Source Review Workshop Manual requires that all available control technologies be evaluated: *"The control alternatives should include not only existing controls for the source category in question, but also (through technology transfer) controls applied to similar source categories and gas streams, and innovative control technologies."* Please evaluate other types of control technologies, such as scrubbers using hydrogen peroxide or sodium sulfite (Wellman-Lord process), which could be used for control of acid gas emissions at sulfuric acid plants as described in the 1990 Air & Waste Management Association's Air Pollution Engineering Manual.

These other scrubbing technologies were discussed only briefly in Section 4.2.1.4 on page 29. The application states that sodium sulfite *"...scrubbing is not considered a demonstrated control alternative."* For other scrubbing liquors, it is stated that *"Without going through a detailed cost analysis to evaluate these scrubbing technologies, it can be stated that the capital investment cost and many of the direct and indirect annual costs will be very similar to the costs incurred with ammonia scrubbing. Because of the higher chemical costs and/or waste disposal costs, these other technologies are expected to be more costly than ammonia scrubbing."*

Scrubbing with hydrogen peroxide has the advantage of generating no by-product or purge streams since the H_2SO_4 generated can be returned to the process. Since the hydrogen peroxide scrubbing technology can be licensed from Monsanto, the vendor of the sulfuric acid plant, please have Monsanto provide cost estimates, certified by a professional engineer, on such scrubbing systems and their control efficiencies.

In addition, we have obtained a capital equipment quote from a nationally known air pollution control equipment vendor of less than $1 million to fabricate and install a fluidized bed limestone scrubber system to provide up to 95% control of SO_2 emissions for the flow characteristics given in the Permit Application. This option was not considered or evaluated in the BACT analyses contained in the Permit Application.

(3) In Section 4.2.1.1 on page 22, it is stated that *"in an effort to optimize plant performance, most plants in the fertilizer industry tend to run at SO_2 emission levels close to the permitted rate."* On pages 22 and 23, recent improvements in plant design, operating changes, and catalyst performance are discussed. These changes, as noted on page 23, *"...have allowed sulfur burning sulfuric acid plants to operate much more efficiently* (i.e., produce more acid) *and still operate in compliance with the NSPS limit*

for sulfur dioxide of 4.0 pounds per ton of acid. Further on page 23, the application states that *"If maximum sulfuric acid production is the motive of the operator, as will be the case with PPP,...[t]he sulfur feed rate to the burner will then be increased until either the sulfuric acid production rate limited by permit is reached or the sulfur dioxide emission rate limited by permit is reached."*

Please quantify the advantages/disadvantages for the plant to operate at lower lb/ton rates. Also, these statements appear to suggest that improvements in sulfuric acid plant and catalyst designs could have reduced lb/ton SO_2 emissions had production limits before any such improvements been maintained. This hypothesis is supported by the significant number of sulfuric acid plants in Florida which have been repermitted at higher production rates during the past decade without major equipment modifications. Please provide detailed information, including costs, for designing and/or operating a plant which will consistently achieve SO_2 emission rates less than 3.0 and 3.5 lbs/ton.

(4) In Section 4.2.1.1 on page 24, it is stated that *"...immediately after turnaround the sulfur dioxide emissions are in the range of 3.25 pounds per ton of acid produced and approach 4.0 pounds per ton of acid (daily average) within approximately two months after turnaround."* This is in direct contradiction to information provided by USEPA in the NSPS Review document (EPA-450/3-85-012) in which USEPA evaluated emissions data from numerous sulfuric acid plants. USEPA cited the example of an 1800 ton/day dual-absorption facility that showed initial SO_2 emissions of 0.93 lbs/ton, gradually increasing to 2.95 lbs/ton after 19 months and 3.2 lbs/ton after 30 months. This and similar data from other facilities led USEPA to the conclusion that *"Thus, even though a large percentage of the compliance test results are significantly less than the NSPS of 4 lbs/ton, it appears that SO_2 emissions tend to rise towards the control limit as the plant and catalyst age."*

The current catalyst activity information in the most recent permit application also contradicts information provided by Pradeep Raval to John Reynolds for this project (see attached February 1, 1996 memorandum), which shows SO_2 emissions of 2.7 lb/ton after turnaround, increasing relatively linearly to 3.7 lb/ton after 18 months. Also, information obtained from Farmland Hydro (also attached) shows SO_2 emissions increasing linearly from about 2.0 lb/ton after a turnaround to around 3 lb/ton about two to three months before the next turnaround. This inconsistency has serious implications with regards to the cost analyses for additional plant turnarounds as presented in Table 4-1. Please justify with data from Piney Point, if possible, the assumption that very little SO_2 reduction occurs with plant turnaround.

As noted above, the Mulberry facility data presented in Appendix D does not conform to previous information provided on catalyst degradation and plant performance. This would lead one to believe that the catalyst is being over-saturated at the Mulberry facility and the optimum production of acid relative to SO_2 emissions at the Mulberry facility lies somewhere between 1545 and 1613 tons/day (on average). If the Mulberry facility were to have been operated at slightly lower production rates consistent with previous information (i.e., SO_2 emissions linearly increase and acid production linearly decreases over time between turnarounds), calculations based on the Mulberry data show that SO_2 emissions could have been reduced by 516 tons over the 21.5 month period with an H_2SO_4 production loss of 44,112 tons -- a cost of $661,680 (at $15/ton differential cost). This would result in a control cost of $1282/ton of SO_2 as compared to operating the Mulberry facility at the maximum production rate allowed by the NSPS emission limit. Adding one additional turnaround during the 21.5 month period would have reduced SO_2 emissions by 797 tons with an H_2SO_4 production loss of 20,514 tons -- a cost of $307,710 (again, at $15/ton differential cost). Because of the savings accrued by the extra H_2SO_4 production due to the additional turnaround, the control cost is only $1200/ton of SO_2 as compared to operating the Mulberry facility at the maximum production rate allowed by the NSPS emission limit. This includes the additional cost of $649,300 given by PPPI for the turnaround cycle.

(5) Figures 4-1 and 4-2 do not appear to directly correlate to data presented in Appendix D. Were the data "smoothed" or averaged? Please explain how and why they were manipulated. Also, please explain why daily production exceeded the permitted production limit of 1700 tons/day during 26 days of the dataset and what enforcement actions resulted.

(6) Table 4-1 presents the projected costs to replace facility catalysts (turnaround) on a nine month schedule. Please provide the following information:
- (a) You provide an auxiliary steam cost by an auxiliary boiler of 1,350 gal/hour fuel at 24 hours/day. Please provide the steam requirements for the phosphoric acid and diammonium phosphate plants and detail whether continuous firing of the boiler is necessary.
- (b) What percent of the daily output of the sulfuric acid (2000 ton/day) is utilized for the fertilizer plant?
- (c) Does the phosphoric acid/diammonium phosphate plant have regular maintenance intervals that can be coincided with the additional downtime of the sulfuric acid plant? What are typical turnaround times for these facilities?
- (d) Is it not true that water treatments would be necessary for the process steam regardless if generated in a boiler or in the sulfuric acid plant? If so, why are additional costs added to Table 4-1?
- (e) The costs in Table 4-1 project facility costs for an additional nine-month plant turnaround. The text indicates that the only positive benefit is approximately 25 tons of SO_2 emissions per year. Based on the data provided in Appendix D, it appears that the facility would experience a significant H_2SO_4 production increase that would partially offset the cost of the turnaround. Based on this data, the

Mulberry facility would have produced an additional 22,591 tons of sulfuric acid in 18 months with a nine-month turnaround. Given that the data were collected when the facility was operating under Air Operating Permit number AO53-198769 with a limitation of 1700 tons/day of 100% sulfuric acid, the additional production would need to be scaled relative to the 2000 tons/day Piney Point facility. Therefore, the expected increase in production at the Piney Point facility would be 26,578 tons, resulting in an offsetting benefit of $531,560 for an H_2SO_4 cost of $20 per ton. If you assume a cost of $35 per ton (the average cost of purchased acid), the cost benefit would be $930,230. Please incorporate these benefits in your BACT figures. The calculations for the $20 per ton figure are attached.

(f) Table 4-1 includes a cost differential of $255,000 to purchase 2000 tons/day of sulfuric acid over the 8.5 day turnaround.
   (i) Does the phosphoric acid/diammonium phosphate plant fully utilize 2000 tons/day of 100% sulfuric acid? If so, please provide production data to demonstrate this.
   (ii) Wouldn't it be more cost effective to install storage vessel(s) to store excess sulfuric acid prior to shutdown than purchase material on the open market? If not, please provide a cost analysis amortized over the appropriate number of years demonstrating that the costs of storage tanks would be significantly more than $255,000 every nine months during the same period.
   (iii) Wouldn't the current two-5000 ton acid storage tanks be available for use during turnaround? Therefore, you would not need a full 8.5 days of replacement acid as these tanks could be refilled with excess acid as available or at least at favorable pricing.

(7) Why does the data presented in Appendix D, dated from December 20, 1995 through January 2, 1996, have significantly lower lb/ton values than the rest of the data set? What occurred on January 3, 1996 that doubled SO_2 emissions (on average)?

(8) As mentioned in comment (4) above, the data presented in Appendix D does not demonstrate the expected gradual increase in SO_2 emissions per ton of H_2SO_4 produced as the catalyst degrades. As noted in comment (7) above, low initial SO_2 emissions (1.53 lbs/ton on average) were observed for a 13-day period immediately after the plant turnaround, but abruptly increased by a factor of 2 (3.18 lbs/ton on average) after a shutdown of one day. SO_2 emissions then averaged between 3.5-4.0 lbs/ton for the remainder of the 18-month data period regardless of the production output of the facility. SO_2 emissions are expected to be directly proportional to the ability of the catalyst to convert SO_2 to SO_3. Over-saturating the catalyst with SO_2 may slightly increase production of H_2SO_4, but at a cost of nearly 2 to 2.5 times the emissions of SO_2. Please provide the following:

(a) What is the theoretical limit of SO_2 conversion in the catalyst system?
(b) What is the projected H_2SO_4 production at the theoretical SO_2 limit?
(c) What is the typical SO_2 concentration fed to the catalyst, and what is the ratio to the theoretical limit?
(d) Can the facility vary the inlet SO_2 concentration to the catalyst?
(e) Please provide corresponding inlet SO_2 concentrations to the catalyst for the data period in Appendix D.
(f) What are the costs involved in operating the plant at closer to the theoretical limit of SO_2?
(g) What are the costs in number 4 (above) relative to the expected decrease in SO_2 emissions?
(h) Is it possible to optimize H_2SO_4 production relative to SO_2 emissions (i.e., maximize production relative to minimum emissions)? If not, please provide detailed analyses demonstrating why.

(9) In Section 4.2.1.1 on pages 24-25, the application states that a nine-month turnaround would result in a reduction of 38 tons of SO_2. However, a value of 25 tons per year was used to determine the cost effectiveness of such an additional turnaround. This is not correct. The total increase in cost for the additional turnaround is relative to an 18-month period, thus, the total tons removed over that period should be used. Therefore, the value of 38 tons should have been used in the analysis instead of 25 tons. In addition, while reviewing the data summary at the end of Appendix D, it appears that the actual tons of SO_2 removed is 45 tons. The analysis by PPPI did not account for days the facility did not operate (268 days of operation the first nine months and 539 days of total operation in 18 months). Once again, scaling this value relative to a 2000 ton/day facility versus the 1700 ton/day Mulberry facility from which the data is derived increases the value to 53 tons. Therefore, even using the data contained in Appendix D, the BACT analysis should utilize 53 tons instead of 25 tons.

(10) In Section 4.2.1.3 on pages 27-28, the application states that the by-product of an ammonia scrubber (a 20% solution of ammonia sulfate) has the potential to be incorporated directly into either the phosphoric acid plant or the diammonium phosphate plant. It is concluded that the ammonium sulfate must be wasted because it cannot be incorporated into the diammonium phosphate plant without further consideration of the phosphoric acid plant.
(a) Please provide further detailed analyses of why the ammonium sulfate solution cannot be incorporated directly into the diammonium phosphate plant and quantify the effect on the fertilizer nitrogen and P_2O_5 contents.
(b) Please provide further detailed analyses of why the ammonium sulfate solution cannot be incorporated directly into the phosphoric acid plant and quantify the effect on production and P_2O_5 loss.

(c) Also, it is our understanding that Mr. Len Friedman has a patent on a process to allow such waste to be used at the facility. Please provide any information on the use of such a process at the subject facility.

(11) Please provide vendor quotes or other verifiable information that an ammonia scrubber system would cost $3.5 million and achieve a control efficiency of only 50% as assumed in Section 4.2.1.3 on page 28 (also see comment (2) above). Provide detailed cost analyses on costs for waste disposal, waste treatment, and utilities as shown on Table 4-2. Also, the capital recovery costs in Table 4-2 should be revised for 20 years at 7% interest as recommended by recent USEPA guidance.

(12) Please provide any data supporting the statement that the sulfuric acid plant reliability would be reduced as a result of an add-on scrubber.

(13) The modeling analyses in Section 5.0 on pages 41-44 illustrate modeling analyses where netting analyses are performed by comparing existing <u>potential</u> emissions to future potential emissions (hence all impacts are zero). This conflicts with USEPA modeling guidance in that existing <u>actual</u> emissions are to be considered in such a netting analysis (see attached January 10, 1990 letter from USEPA Region IV and May 24, 1995 letter from the Department concerning the proposed 2700 ton/day sulfuric acid plant at the same facility). Therefore, please provide a modeling analysis consistent with the facility netting analysis in Section 3.1.

If you have any questions, please feel free to contact me at (732) 968-9600.

Sincerely,

RTP ENVIRONMENTAL ASSOCIATES, INC.®

Donald F. Elias

Donald F. Elias
Principal

cc: C.Fancy
J.Steinsnyder, Esq.
D.Dee, Esq.
K.Collins-Fleming
M.Hober
W.Corbin
LPPPP Proj.File

CALCULATIONS - PINEY POINT PHOSPHATES

Based on data provided in Appendix D and the text of *Report in Support of a PSD Permit Application for Piney Point Phosphates, Inc.*, the following information was utilized to calculate the production increase resulting from a nine-month turnaround.

(a) Initial nine-month data period = 275 days (Appendix D)
(b) Average production during initial nine-month period = 1599 tons of acid per day (Appendix D)
(c) 18-month data period = 551 days (Appendix D)
(d) Average production during full 18-month period = 1558 tons of acid per day
(e) Cost of producing H_2SO_4 = \$20.00 per ton
(f) Permitted production at Mulberry Phosphates, Inc. = 1700 tons of acid per day (AO53-198789)
(g) Proposed production at Piney Point Phosphates = 2000 tons of acid per day

CALCULATIONS:

1. Additional Production Total:

$$\frac{1599\ tons}{day} \times 551\ days = 881{,}049\ tons/18\text{-}month\ period$$

$$\frac{1558\ tons}{day} \times 551\ days = 858{,}458\ tons/18\text{-}month\ period$$

$$Difference = 22{,}591\ tons/18\text{-}month\ period$$

2. Production Scale Up to Piney Point's Capability:

$$\frac{22{,}591\ tons}{1700\ tons/day} :: \frac{X}{2000}\ tons/day$$

$$X = 26{,}578\ tons\ H_2SO_4\ produced$$

3. Increased Revenue Calculation:

26,578 tons H_2SO_4 at \$20.00 per ton = \$531,560

Best Available Copy

Deps NB

MEMORANDUM

TO: John Reynolds, FDEP

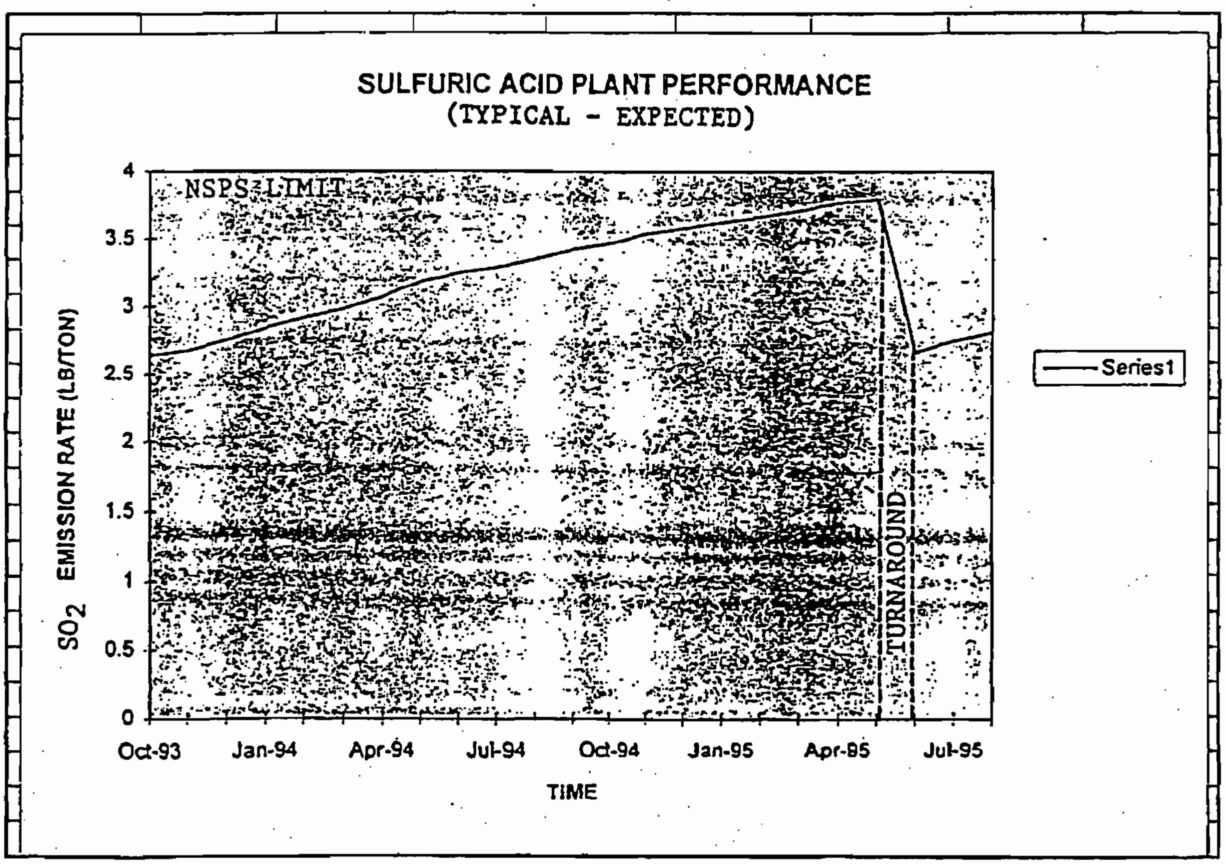
FROM: Pradeep Raval

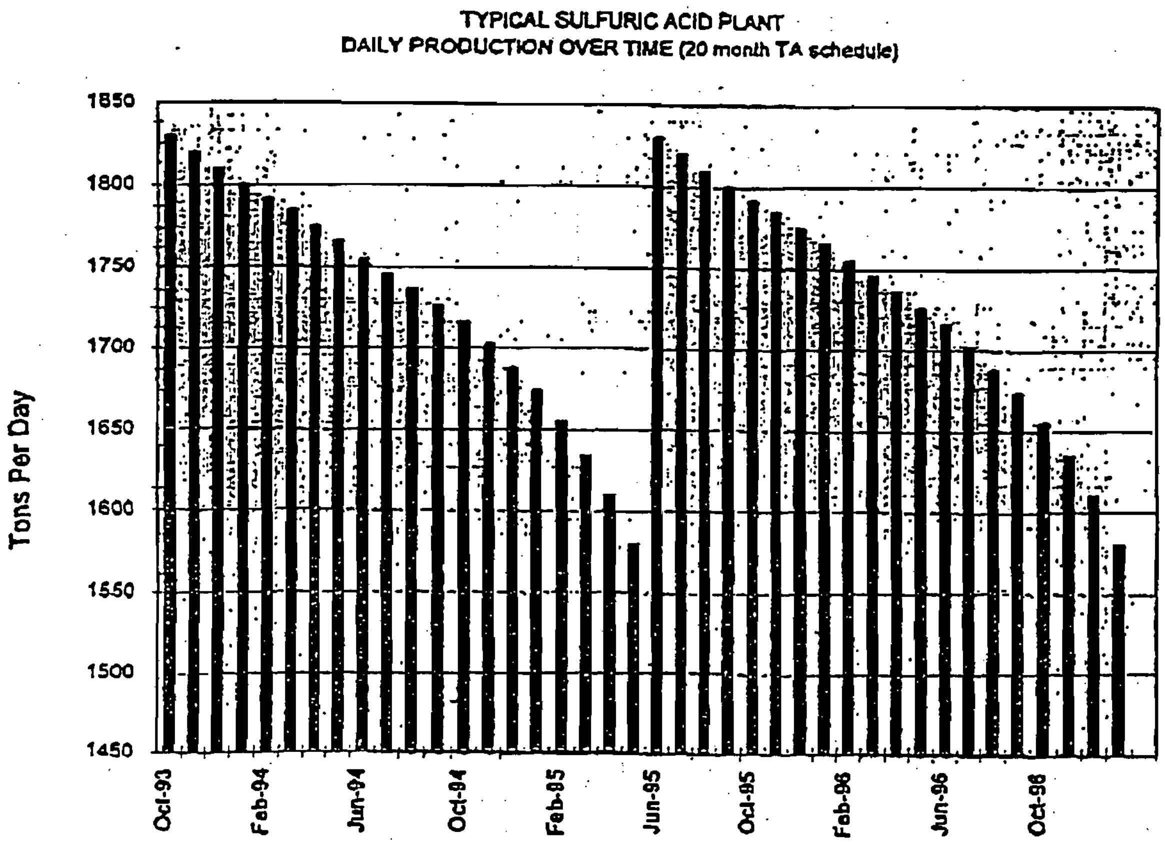
DATE: February 1, 1996

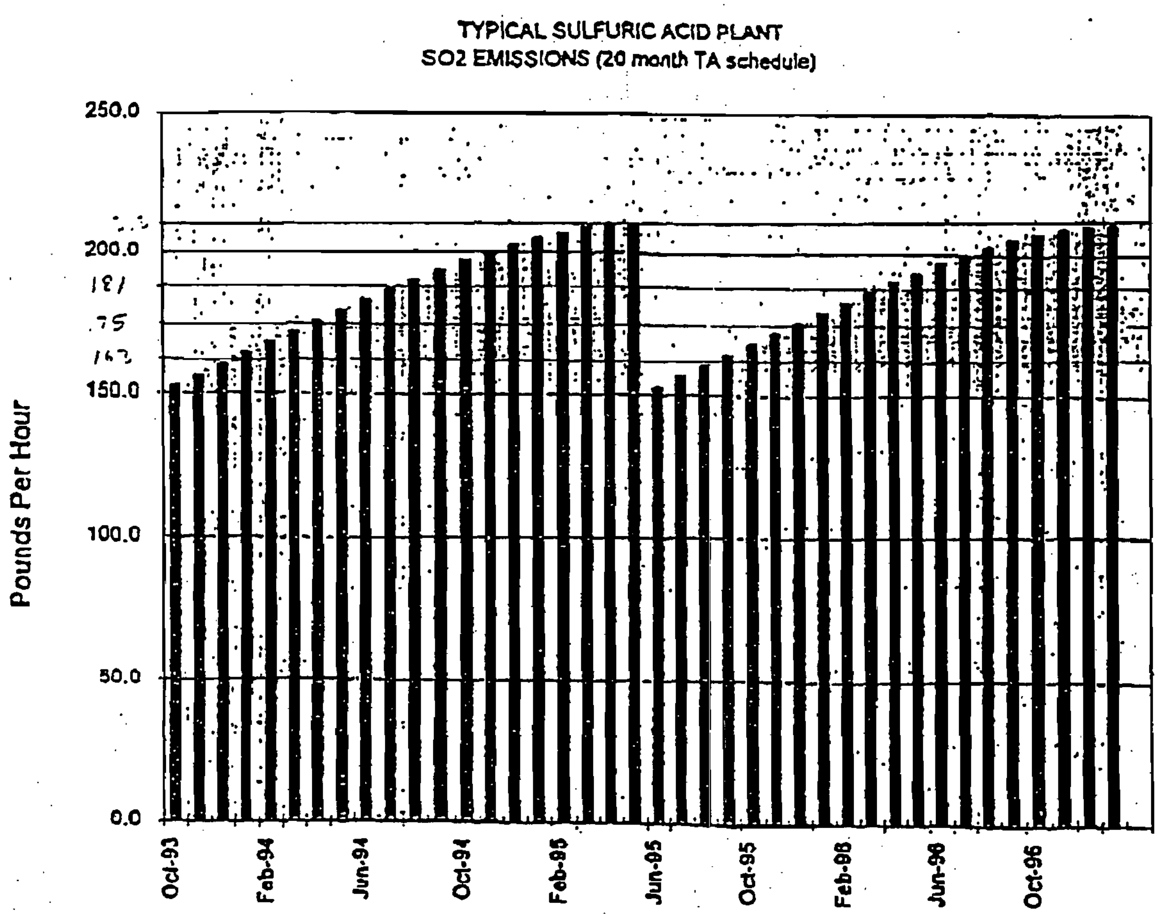
SUBJECT: Sulfuric Acid Plant Performance Information

This is a follow up to our conversation yesterday regarding the variation in performance/emissions of a typical sulfuric acid plant relative to plant turnarounds. The attached graph shows the typical performance expected from a sulfuric acid plant.

par.




TYPICAL SULFURIC ACID PLANT
DAILY PRODUCTION OVER TIME (20 month TA schedule)
Tons Per Day
1850
1800
1750
1700
1650
1600
1550
1500
1450
Oct-93
Feb-94
Jun-94
Oct-94
Feb-95
Jun-95
Oct-95
Feb-96
Jun-96
Oct-96


TYPICAL SULFURIC ACID PLANT
SO2 EMISSIONS (20 month TA schedule)
Pounds Per Hour
250.0
200.0
187
175
163
150.0
100.0
50.0
0.0
Oct-93
Feb-94
Jun-94
Oct-94
Feb-95
Jun-95
Oct-95
Feb-96
Jun-96
Oct-96

BEST AVAILABLE COPY

UNITED STATES ENVIRONMENTAL PROTECT[illegible] AGENCY

REGION IV

345 COURTLAND STREET. N.E.
ATLANTA. GEORGIA 30365

JAN 10 1990

4APT-APB-cdw

Ms. Patricia G. Adams
Planner
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Royster Phosphates, Inc. (PSD-FL-144)

Dear Ms. Adams:

This is to acknowledge receipt of the permit application for the above referenced source, dated December 6, 1989. As discussed between Mr. Barry Andrews of FDER and Mr. Gregg Worley of my staff on January 8, 1990, we have the following comment.

In determining the "actual" emissions of the existing sulfuric acid plant, the maximum production rate and emission rates which occurred during the previous five years were used. The "actual" emissions, however, should be an average of the previous two years operating data unless another period is more representative. Therefore, it is likely that the actual emissions from the existing facility are in fact lower than the maximum numbers presented by the source. Consequently, the source may also be subject to PSD review for NO_x. In any case the greater changes in emissions should be included in the modelling.

By letter dated December 14, 1989, we transmitted to your office a copy of the First Circuit Court of Appeals upholding the "actual-to-potential" applicability rules of the PSD requirements. Please refer to this ruling as a basis for our comments.

Thank you for the opportunity to review this package. Any questions or comments may be directed to Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

[illegible]
B. Andrews
[illegible]
[illegible]
[illegible]

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 24, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. F. Ivan Nance, Environmental/Technical Manager
Piney Point Phosphates, Incorporated
13300 U. S. Highway 41 North
Palmetto, Florida 34221

Dear Mr. Nance:

Subject: Permit No. AC 41-173305 & PSD-FL-144

The Department has reviewed your application for a construction permit to replace the existing sulfuric acid plant with a new plant. We need more information in order to continue processing this application. Please complete the application by providing the information requested below:

1. Your response to the attached comments from the National Park Service.

2. The annual area of significant impact modeling should be based on the difference between the proposed emissions and the actual annual hourly emissions. Please redo the annual area of significant impact modeling using the correct inputs.

If you have any questions, please call John Reynolds, permit engineer, or Cleve Holladay, meteorologist, at 904-488-1344, or send your written comments to me at the above address.

Sincerely,

5/24

A. A. Linero, P.E.
Administrator
New Source Review Section

AL/ch/kt

Enclosure

cc: John B. Koogler, Koogler and Associates

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ► 6

To Bill Corbin	From Don Shepherd
Dept./Agency RTP Assoc	Phone # 303-969-2075
Fax # 732-968-9690	Fax # 303-969-2822
NSN 7540-01-317-7368 5099-101	GENERAL SERVICES ADMINISTRATION

STATE OF MISSISSIPPI AIR POLLUTION CONTROL PERMIT

AND PREVENTION OF SIGNIFICANT DETERIORATION AUTHORITY TO CONSTRUCT AIR EMISSIONS EQUIPMENT THIS CERTIFIES THAT

Mississippi Phosphates Corporation
601 Highway 611
Pascagoula, Mississippi

has been granted permission to construct air emissions equipment to comply with emission limitations, monitoring requirements and other conditions set forth herein. This permit is issued in accordance with the provisions of the Mississippi Air and Water Pollution Control Law (Section 49-17-1 et. seq., Mississippi Code of 1972), and the regulations and standards adopted and promulgated thereunder and under authority granted by the Environmental Protection Agency under 40 CFR 52.01 and 52.21.

Issuance Date: ____________

MISSISSIPPI ENVIRONMENTAL QUALITY PERMIT BOARD

____

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No. 1280-00044

SR-539.c4.1

DRAFT

PART I
GENERAL CONDITIONS

1. Any activities not identified in the application are not authorized by this permit.

2. All air pollution control facilities shall be designed and constructed such as to allow proper operation and maintenance of the facilities.

3. The necessary facilities shall be constructed so that solids removed in the course of control of air emissions may be disposed of in a manner such as to prevent the solids from becoming windborne and to prevent the materials from entering State waters without the proper environmental permits.

4. The air pollution control facilities shall be constructed such that diversion from or bypass of collection and control facilities is not needed except as provided for in Regulation APC-S-1, "Air Emission Regulations for the Prevention, Abatement, and Control of Air Contaminants", Section 10.

5. The construction of facilities shall be performed in such a manner as to reduce both point source and fugitive dust emissions to a minimum.

6. The permittee shall allow the Mississippi Department of Environmental Quality Office of Pollution Control and the Mississippi Environmental Quality Permit Board and/or their representatives upon presentation of credentials:

   a. To enter upon the permittee's premises where an air emission source is located or in which any records are required to be kept under the terms and conditions of this permit; and

   b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any air emissions.

7. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to:

   a. Violation of any terms or conditions of this permit.

   b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts, or

   c. A change in any condition that requires either a temporary or permanent reduction or elimination of authorized air emissions.

DRAFT

8. Except for data determined to be confidential under the Mississippi Air & Water Pollution Control Law, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Mississippi Department of Environmental Quality Office of Pollution Control.

9. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Nothing herein contained shall be construed as releasing the permittee from any liability for damage to persons or property by reason of the installation, maintenance, or operation of the air cleaning facility, or from compliance with the applicable statutes of the State, or with local laws, regulations, or ordinances.

11. This permit may only be transferred upon approval of the Mississippi Environmental Quality Permit Board.

12. This permit is for air pollution control purposes only.

13. Approval to construct will expire should construction not begin within eighteen (18) months of the issuance of this permit, or should construction be suspended for eighteen (18) months.

14. Prior to startup of air emissions equipment at this source, the permittee must submit certification that construction was completed in accordance with the approved plans and specifications.

DRAFT

PART II
EMISSION LIMITATIONS AND MONITORING REQUIREMENTS

Beginning ISSUANCE DATE, the permittee is authorized to construct air emissions equipment for the emission of air contaminants from Emission Point AA-001, the No. 2 Sulfuric Acid Plant.

The air emissions equipment shall be constructed to comply with the emission limitations and monitoring requirements specified below.

EMISSION LIMITATIONS

Sulfur Dioxide	3.25 lbs/ton, not to exceed 231.9 lbs/hr and 1015.6 tons/year, as determined by EPA Reference Method 8, 40 CFR 60, Appendix A.
Sulfuric Acid Mist	0.15 lbs/ton, not to exceed 10.7 lbs/hr and 46.88 tons/year, as determined by EPA Reference Method 8, 40 CFR 60, Appendix A.
Opacity	10% as determined by EPA Reference Method 9, 40 CFR 60, Appendix A.

All test methods specified above shall be those versions, or their approved equivalents, which are in effect ISSUANCE DATE.

MONITORING REQUIREMENTS

The permittee shall install, calibrate and maintain a continuous monitoring system for the measurement of sulfur dioxide. A conversion factor shall be established for the purpose of converting monitoring data into units of the applicable standard. The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods and calculating the appropriate conversion factor for each eight-hour period.

DRAFT

PART II
EMISSION LIMITATIONS AND MONITORING REQUIREMENTS

Beginning ISSUANCE DATE, the permittee is authorized to construct air emissions equipment for the emission of air contaminants from Emission Point AA-017, the No. 3 Sulfuric Acid Plant.

The air emissions equipment shall be constructed to comply with the emission limitations and monitoring requirements specified below.

EMISSION LIMITATIONS

Sulfur Dioxide	3.25 lbs/ton, not to exceed 231.9 lbs/hr and 1015.6 tons/year, as determined by EPA Test Method 8, 40 CFR 60, Appendix A.
Sulfuric Acid Mist	0.15 lbs/ton, not to exceed 10.7 lbs/hr and 46.88 tons/year, as determined by EPA Test Method 8, 40 CFR 60, Appendix A.
Opacity	10% as determined by EPA Test Method 9, 40 CFR 60, Appendix A.

All test methods specified above shall be those versions, or their approved equivalents, which are in effect ISSUANCE DATE.

MONITORING REQUIREMENTS

The permittee shall install, calibrate and maintain a continuous monitoring system for the measurement of sulfur dioxide. A conversion factor shall be established for the purpose of converting monitoring data into units of the applicable standard. The conversion factor shall be determined, as a minimum, three times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods and calculating the appropriate conversion factor for each eight-hour period.

DRAFT

PART III
OTHER REQUIREMENTS

1) The permittee is limited to a production total of 1,250,000 tons of sulfuric acid per rolling 365 day average.

2) The permittee shall maintain records showing the production rate for each day and for each consecutive 365-day period. All records shall be maintained on site by the permittee for a period of five (5) years following the date of such record.

3) The permittee shall submit semi-annual reports summarizing the total production rate for both sulfuric acid plant No. 2 and plant No. 3 for each consecutive 365-day period. The report shall be submitted no later than 30 days from the semi-annual periods ending June 30 and December 30.

4) For Emission Points AA-001 and AA-017, within 60 days of achieving the maximum production rate but no later than 180 days after the modifications, the permittee shall demonstrate compliance with the SO_2 and Sulfuric Acid Mist emission limitations by stack testing in accordance with EPA Reference Method 8 and submittal of a stack test report.

   A pretest conference at least thirty (30) days prior to the scheduled test date is needed to ensure that all test methods and procedures are acceptable to the Office of Pollution Control. Also, the Office of Pollution Control must be notified prior to the scheduled test date. At least TEN (10) DAYS notice should be given so that an observer can be scheduled to witness the test.

5) The permittee shall submit excess emissions and monitoring systems performance reports and/or summary report form on a quarterly basis.

6) Emission Points AA-001 and AA-017, the No.2 and No. 3 Sulfuric Acid Plants, are subject to the New Source Performance Standards for Sulfuric Acid Plants as described in 40 CFR 60, Subpart H and the General Provisions as described in 40 CFR 60, Subpart A.

7) The permittee must provide in writing the date that the maximum production rates are reached. The dates must be provided no later than ten days after the actual date.

DRAFT

U.S. FISH & WILDLIFE SERVICE

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH
P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: Nov. 24, 1997

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Al Linero

From: Ellen Porter

Subject: Piney Point Phosphates. Our BACT comments attached. If you have questions, please call Don Shepherd at (303) 969-2075.

Number of Pages: 8
(Including this cover sheet)

Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235

NOTE

To: **Al Linero**

From: **Don Shepherd, Air Resources Division, National Park Service**

Subject: **Piney Point Phosphates**

Date: **November 20, 1997**

As a result of the rebuilding of the facility, proposed emissions from the acid plant would be: sulfur dioxide (SO_2) 1460 tons per year (TPY); sulfuric acid mist (SAM) 54.8 TPY; and nitrogen oxides (NO_X) 43.8 TPY.

Control Technology Analysis

Sulfur Dioxide: Sulfur dioxide emissions from the acid plant will be controlled by the dual absorption process. The dual absorption towers are proposed to control SO_2 emissions to a level of 4.0 pounds per ton (lb/ton) of 100 percent acid produced. This emission level is equal to that adopted by the Environmental Protection Agency (EPA) in 1971 as the New Source Performance Standard (NSPS) for sulfuric acid plants (40 CFR 60, Subpart H). However, it should be noted that over 12 years have elapsed since the NSPS was last reviewed, and 26 years since it was promulgated. Furthermore, according to EPA policy, the NSPS is merely the minimum level of control that is acceptable as a floor for a proper, "top-down" BACT analysis; the top, or beginning point of the BACT analysis is to represent the most stringent level of control feasible. For example, a current draft permit proposed for issuance to Mississippi Phosphates Corporation (MPC) by the State of Mississippi Department of Environmental Quality (MDEQ) proposes a limit of 3.25 lb/ton. In developing that draft permit, MDEQ relied upon letters from MPC to MDEQ dated 9/26/97 in which MPC stated that use of 1995 and 1996 test data "results in a calculated SO_2 emission limit of 3.02 lbs./ton." Furthermore, the MPC letter to MDEQ dated 8/28/97 requested a permit limit of 3.16 lbs. SO_2/ton. Eventually, MPC proposed meeting a limit of 3.25 lb SO_2/ton for this modification to an existing plant. Unless it can be shown that there are extenuating circumstances that make PPP unable to meet the same limit as MPC, it is reasonable to expect that PPP perform at least as well.

Following are specific comments concerning the application:

1. The data presented in Figure 4-1 for SO_2 emissions per ton of sulfuric acid produced does not match presumably similar data presented in Appendix D. While inspection of the graph shown in Figure 4-1 indicates a rapid, steady increase in emissions/ton, the tabulated data in Appendix D shows a steady, low emission rate until a plant shut down. After the shut down emissions jump by over 50% and climb to double the pre-shut down level. In addition to the apparent discrepancy in data sets, the radical increase in SO_2 emissions following the plant shut down raises a question as whether the shut down and the emissions increase are related, and, just how good is this data?

2. PPP notes that acid production is constrained by permit limits either on production or emissions. Figures 4-1 and 4-2 illustrate that, as SO_2 emissions approach their limit, production is curtailed by as much as 200 tons per day (TPD), and 100 TPD on the average over the 18 month operating cycle (equivalent to a 54,000 ton loss). If sulfuric acid is worth \$28-\$42 per ton and is in short supply in Florida, as stated in the application, this represents a gross loss of \$1.5-2.3 million, and a net loss of over \$1 million (at PPP's \$20/ton production cost).

3. Table 4-1, Cost Analysis of an Interim Plant Turnaround for Catalyst Screening and Partial Replacement:
   - Since catalyst replacement and waste disposal costs after a 9-month turnaround should be half of the same costs after an 18-month turnaround, there should be no additional annual cost for these items associated with the shorter turnaround.
   - If PPP is willing to allow acid production to be limited by emissions such that it loses 54,000 tons production and over \$1 million during an 18-month campaign, why is it necessary to spend almost \$1/2 million to supply 17,000 tons of acid during an 8.5 day turnaround?

4. Table 4-2, Cost Analysis of Ammonia Scrubbing to reduce SO_2 Emissions from a 2000 TPD Sulfuric Acid Plant:
   - Capital costs are totally unsubstantiated. Indirect Costs were incorrectly estimated as a percentage of total Direct Costs, rather than Purchased Equipment Costs (as recommended by the EPA Control Cost Manual).
   - Operating Labor time appears excessive (2 hr/day vs. EPA recommended 1.5 hr/day). Other Direct Annual Costs are totally unsubstantiated. Inclusion of downtime costs is not typically allowed.
   - The Capital Recovery Factor is inflated due to use of short (10 yr vs. EPA recommended 15 yr) equipment life and excessive (11% vs. EPA recommended 7%) interest rate. This alone results in a 55% overestimation of annualized control costs.

Sulfuric Acid Mist: PPP proposes to control H_2SO_4 emissions from the acid plants by using high efficiency mist eliminators. These mist eliminators control acid mist emissions to a level below 0.15 lb/ton of 100 percent acid produced. This level is also the NSPS level EPA set for H_2SO_4 emissions from new or modified sulfuric acid plants. We agree that the use of high efficiency mist eliminators is BACT to minimize H_2SO_4 emissions from this sulfuric acid plant. Use of high efficiency acid mist eliminators is the predominant control strategy chosen for new or modified sulfuric acid plants regulated under the NSPS. In 1985, EPA also found that all 46 plants built since 1971 incorporate the use of high efficiency acid mist eliminators. However, as with the discussion of SO_2 controls, not only is the NSPS grossly out-of-date, it is not supported by existing test data. Analysis of the data contained in the EPA's 1992 Sulfuric Acid Background Report (for its *AP-42, Compilation of Air Pollutant Emission Factors*) shows a mean of 0.108 lbs emitted per ton produced (Table 1.a.). (The AP-42 controlled emission factor is 0.128 lb sulfuric acid mist /ton of acid produced.) Furthermore, the average is unduly influenced by a few very high values (see Figure 1.). This results in a mean that is more than twice the median. If the eight high "outlier" values originating at one plant are eliminated, the average emission rate drops to 0.061 lb/ton, and there is 95% likelihood that emissions will not exceed 0.076 lb/ton (Table 1.b.).

The feasibility of lower acid mist limits is further supported by a look at tests conducted at MPC (Figure 2). An inspection of the data clearly shows the effect of the difference in the two types of mist eliminators used there. Plant 2 uses a Brink type ES (Energy Saver) mist eliminator marketed by the Enviro-Chem Systems division of Monsanto. It must be noted that this is not one of the "high efficiency Brink Mist Eliminators" described in the BACT portion of the original permit. Plant 3 uses type HE (High Efficiency) mist eliminators from the same manufacturer. Even at its worst, the high efficiency mist eliminator can achieve 0.08 lbs/ton.

NPS therefore recommends that BACT represent a limit of not more than 0.08 lb/ton.

Finally, in that FDEP has compiled extensive stack test data on emissions of SO_2, SAM, and NO_x, NPS suggests that FDEP perform a statistical analysis of that data to help shed additional light on the emissions from these sulfuric acid plants.

Table 1.a.

H2SO4 Test Results

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.191
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008
53	16	1	0.494
54		2	0.301
55		3	0.417
56		4	0.541
57		5	0.358
58		6	0.609
59		7	0.419
60		8	0.201

Count =	60
Average =	0.108
Median =	0.045
Mode =	0.014
S.D. =	0.141
95% CI =	0.036 +/- 0.108

Emission Factor @ 95% 0.073 <EF< 0.144

FIG. 1.--SULFURIC ACID MIST

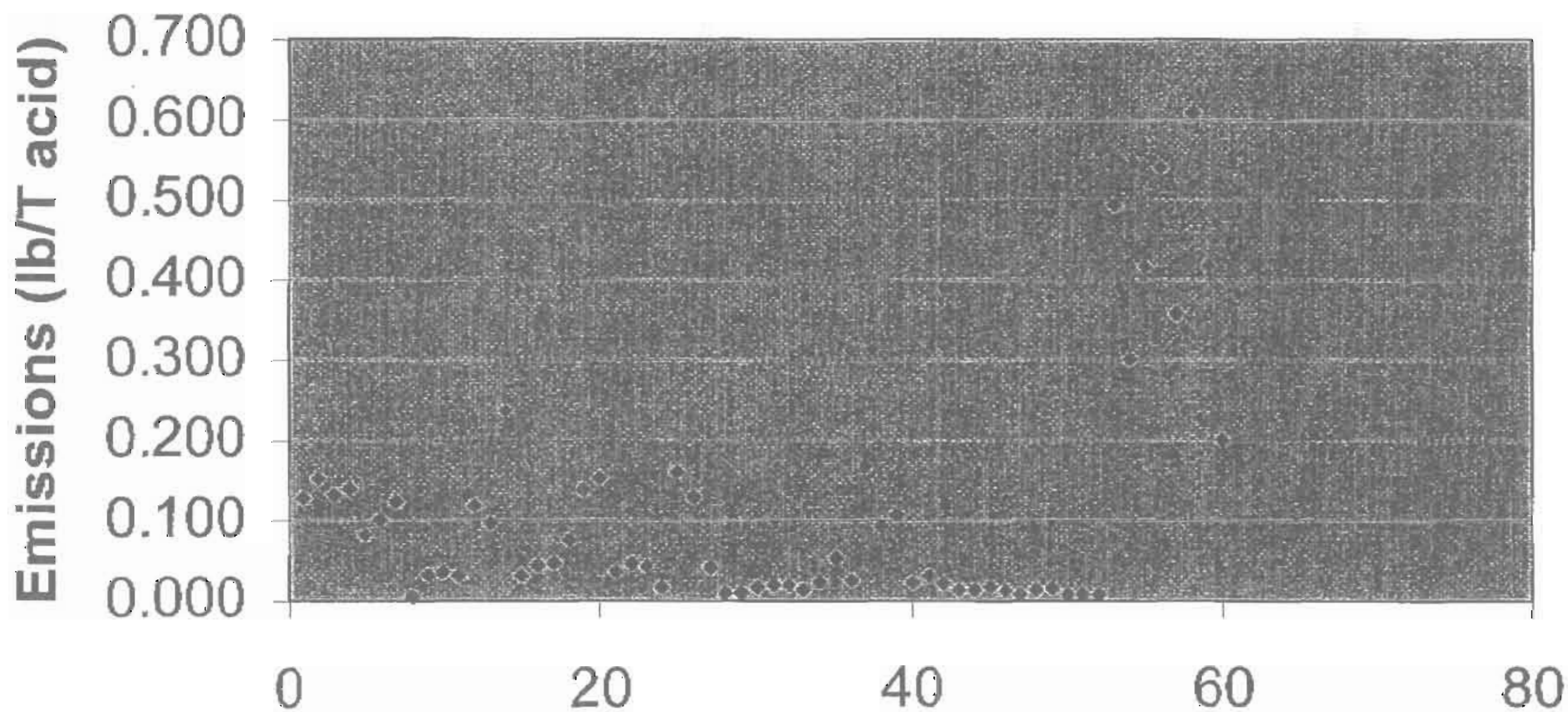


Table 1.b.

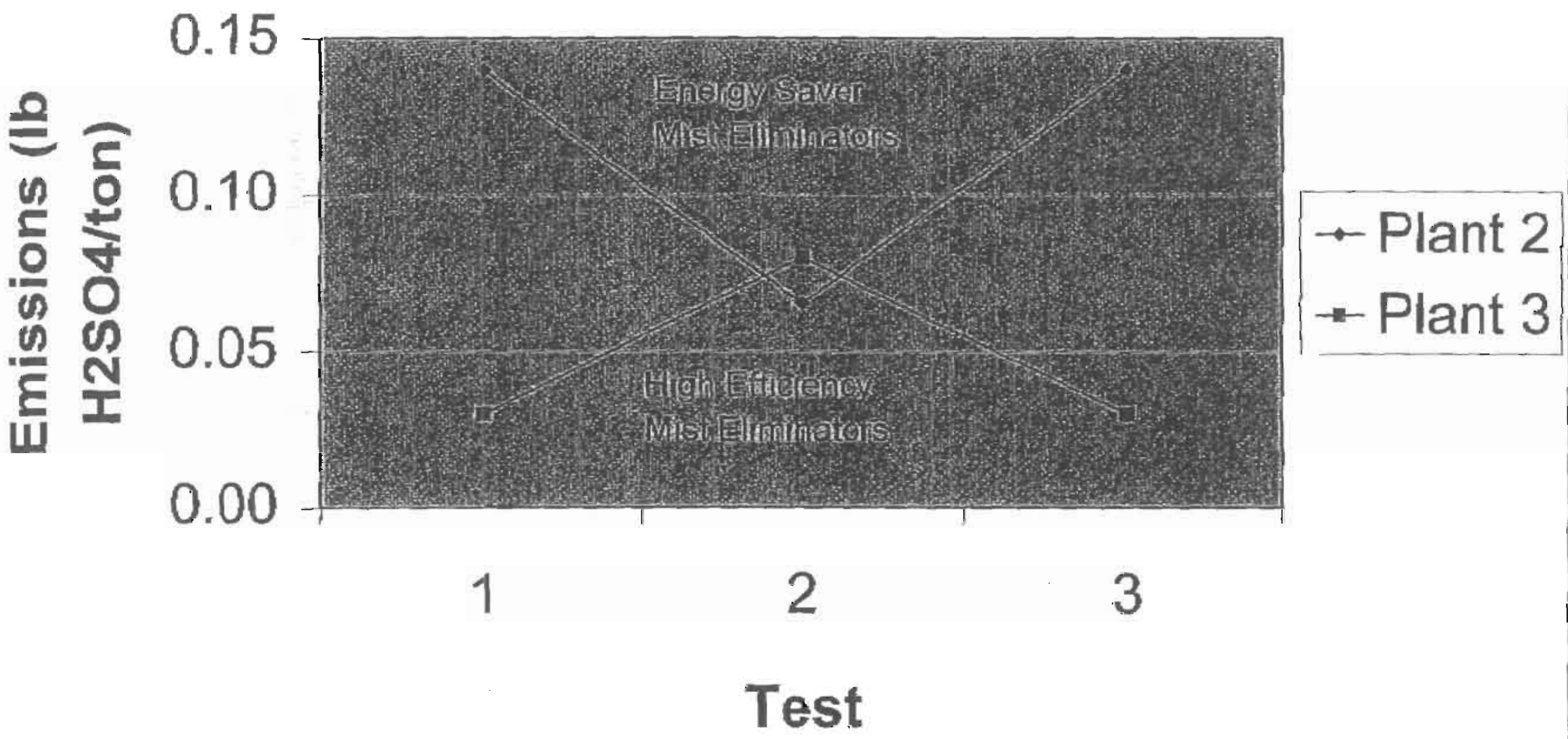
H2SO4 Test Results Minus Outliers

	Source	Test	Factor (lb/T)
1	1	1	0.129
2		2	0.153
3		3	0.132
4	2	1	0.140
5		2	0.082
6		3	0.101
7	3	1	0.124
8		2	0.005
9		3	0.033
10		4	0.036
11		5	0.031
12	4	1	0.119
13		2	0.097
14		3	0.237
15	5	1	0.032
16		2	0.045
17		3	0.048
18	6	1	0.076
19		2	0.138
20		3	0.153
21	7	1	0.037
22		2	0.047
23		3	0.044
24	8	1	0.017
25		2	0.161
26		3	0.130
27	9	1	0.043
28		2	0.010
29		3	0.010
30	10	1	0.017
31		2	0.020
32		3	0.020
33	14	1	0.014
34		2	0.024
35		3	0.054
36		4	0.026
37		5	0.168
38		6	0.093
39		7	0.107
40		8	0.023
41		9	0.032
42		10	0.022
43	15	1	0.014
44		2	0.014
45		3	0.018
46		4	0.013
47		5	0.008
48		6	0.014
49		7	0.016
50		8	0.008
51		9	0.008
52		10	0.008

Count = 52
Average = 0.061
Median = 0.034
Mode = 0.014
S.D. = 0.057
95% CI = 0.015 +/- 0.061

Emission Factor @ 95% 0.045 <EF< 0.076

Fig. 2--Mississippi Phosphate Sulfuric Acid Emissions



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 17, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Stewart, Sr. Vice President
Operations and Administration
Piney Point Phosphates, Inc.
13300 US Highway North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC
Piney Point Sulfuric Acid Plant Project

Dear Mr. Stewart:

We are reviewing your application to modify the existing sulfuric acid plant in Palmetto. It will not be complete until we receive the information requested below as well as your response from a further request for additional information which we will send you on November 25. The next request will include any comments from the National Park Service, Manatee County, EPA, and our modeling experts.

We have, nevertheless, begun our technical review. Best Available Control Technology (BACT) was proposed in the application as 4 pounds of sulfur dioxide per ton of acid (lb SO_2/ton) and 0.15 pounds of sulfuric acid mist (lb SAM/ton). The proposed values represent the New Source Performance Standards (NSPS) limits in force during the previous operation of the plant when it was permitted to produce 2000 tons per day (TPD) of sulfuric acid.

Other factors being equal, lower SO_2 emissions should result due to the planned replacement of degraded Type 210 and Type 11 vanadium containing (VC) pelletized catalyst in Converter 1 with low pressure LP 120 and LP 110 VC ring catalyst <u>and</u> the planned replacement of all pelletized VC catalyst in Converter 2 with LP 110 VC ring catalyst. The old catalysts were introduced by Monsanto in 1925 and 1963, whereas the LP line was first produced in 1980. With the lower pressure drop and improved conversion, it may be possible to enhance production, maintain it longer and still achieve lower emissions.

Though costly, total replacement of <u>all</u> pelletized catalyst in Converter 1 with the LP line could also result in even more SO_2 reduction and production improvement. It might even be advisable in order to minimize potential blockage of the internal ring openings by remaining pellets.

Instead of replacing the catalyst in Converter 2 with LP 110 VC catalyst as planned, it can be replaced with a "cesium-promoted" VC catalyst such as CS-110. This allows significant reduction of the operating temperature in Pass 5. The CS line was introduced in 1989 and has been demonstrated at several double absorption plants. This provides another opportunity for reduced emissions, higher steam production, and possibly increased production despite the higher cost. Please evaluate separately and in combination, the costs and benefits of both additional catalyst replacement scenarios given above.

We do not recommend processes which result in by-products or wastes and do not expect Piney Point Phosphates Inc. (PPPI) to review them further. It appears that these processes are not generally competitive with those which result in production of additional acid.

Since both absorption towers will be replaced, there are process modifications which should be considered which also result in production of sulfuric acid. One example is the "Centaur SO_2 Removal Process" developed by Monsanto in conjunction with Calgon. Basically, Converter 2 can be replaced with a reactor containing highly activated carbon catalyst/adsorbent. Wet conversion occurs in the bed which retains the acid. The acid is released by sequential back-washing of bed sections. The catalyst can operate at very low temperatures. This can result in reduced pressure drop across the plant as well as lower heat waste, lower emissions, and possibly increased production. Besides elimination of the second converter and its catalyst, it would eliminate the need for the planned replacement of the final tower, some heat exchangers, and the economizer.

Other possibilities exist such as peroxide oxidation of SO_2 to sulfuric acid. Monsanto or another company may have developed such a process. The point is that potentially feasible options need to be considered whether or not they have actually been employed on sulfuric acid plants in Florida. Please provide the technical and cost evaluations of all the options described above to allow the Department to make a thorough BACT determination. We would appreciate review of our information request by your contractor, Monsanto Enviro-Chem.

The planned replacement of all towers and their mist eliminators ought to make it possible to decrease SAM emissions. The mist eliminators described appear to be very efficient and the plant does not produce oleum which would otherwise make it more difficult to achieve a lower rate than 0.15 lb SAM/ton.

We are conducting the present evaluation under the assumption that a second plant will not be operated while the existing plant is used. Both the PSD analysis submitted for modifying the existing plant and the one submitted for building a second plant include emissions estimates for only one plant at the site. This will ultimately need to be reconciled when Piney Point's final plans are known. If there is a simultaneous two-plant option, it cannot be implemented under the applications submitted to-date.

If you have any questions regarding this matter, please call me at 850/488-1344.

Sincerely,

11/17

A. A. Linero, P.E. Administrator,
New Source Review Section

AAL/aal

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Karen Collins, Manatee County
Ivan Nance, PPPI
John Koogler, P.E., K&A

Fold at line over top of envelope to
the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert Stewart
Piney Point Phosphates
13300 US Hwy North
Palmetto, Fl
34221

4a. Article Number
P 265 659 490

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
11/19/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. S

PS

Receipt

Thank you for using Return Receipt Service.

P 265 659 490

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
~~Do not~~ use for International Mail *(See reverse)*

Sent to Robert Stewart	
Street & Number Piney Point Phos	
Post Office, State, & ZIP Code Palmetto Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	11-17-97

0810002-004-AC
SAP Plant

PS Form **3800**, April 1995

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

November 7, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Ivan Nance
Corporate Environmental Manager
Piney Point Phosphates, Inc.
13300 US Highway 41 North
Palmetto, Florida 34221

Re: DEP File No. 0810002-004-AC (PSD-FL-242)
Piney Point Sulfuric Acid Plant Project

Dear Mr. Nance:

We received your application on October 30, 1997 for an air construction permit to modify the existing sulfuric acid plant at Piney Point Phosphates in Palmetto, Manatee County. We are conducting a completeness review at this time. However, we understand that you wish to know of any information we may require to process this application as soon as we become aware of it. We are awaiting any comments from EPA, the National Park Service, Manatee County, and our District office as well as internal review by our review engineer and modeler/meteorologist assigned to this application. Additional Department comments will be provided to you by November 26. Any other comments will be forwarded to you as soon as we receive them. My own initial review of the application indicates that the following items need to be provided or clarified:

1. We do not waive the requirement for items listed in the Facility Supplementary Information. This includes basic process flow diagrams which specifically reflect the existing and planned configuration. We agree that much of the information is actually in our files on the facility and we will access it in our review. However this specific application should stand on its own and the information should be more easily accessible to anyone other than our staff who wishes inspect it.
2. The Best Available Control Technology Review was very instructive. Please submit an analysis of a scenario wherein certain plant components are designed (or "overdesigned") such that present production objectives are met and emission levels of 3.5 and 3.0 pounds of sulfur dioxide per ton of sulfuric acid (averaged for periods longer than one day but less than thirty days) are maintained throughout the turn-around cycle of the plant.
3. Evaluate the scenario wherein the plant (if not overdesigned) must be de-rated to meet the above values throughout the same cycle. Include benefits such as less wear and tear as well as costs.

We are continuing to process the application and will advise you as issues arise. If you have any questions regarding this matter, please call me or John Reynolds at (850)488-1344.

Sincerely,

A. A. Linero 11/7

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/aal

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Karen Collins, Manatee County
John Koogler, P.E.

Fold at line over top of envelope to the right of the return address.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Ivan Nance, CEM
Piney Point Phosphates
13300 US Hwy 41 N.
Palmetto, Fl 34221

4a. Article Number
P 265 659 484

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
11/14/97

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Susan Peck

PS Form **3811**, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 484

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Ivan Nance	
Street & Number Piney Pt.	
Post Office, State, & ZIP Code Palmetto, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0810002-004AC PSD-FI-242	11-12-97

PS Form **3800**, April 1995

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 527-97-02

October 22, 1997

RECEIVED
MAIL ROOM
OCT 30 97

Mr. A. A. Linero
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Manatee County - AP
Piney Point Phosphates, Inc.
PSD Permit Application for
Existing Sulfuric Acid Plant

Dear Mr. Linero:

Enclosed are eight (8) copies of an application for a PSD permit to start up the existing sulfuric acid plant at Piney Point Phosphates, in Manatee County, Florida.

Also enclosed is a check in the amount of $7500 (PSD permit application processing fee) and a disk containing the air dispersion modeling output.

One copy of the application has been forwarded to Manatee County.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

Raval

for John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: Ivan Nance, PPP

PINEY POINT PHOSPHATES, INC.
General Disbursements
13300 U.S. Hwy. 41 N.
Palmetto, FL 34221-8662

FLORIDA DEPT. OF ENVIRONMENTAL

INVOICE	INV DATE	DUE DATE	INV AMOUNT	DISCOUNT	NET AMOUNT
106000	10/06/97	10/07/97	7,500.00	.00	7,500.00

REMITTANCE ADVICE CHECK NO. 0804477 7,500.00 7,500.00

DETACH BEFORE DEPOSITING

PINEY POINT PHOSPHATES, INC.
General Disbursements
13300 U.S. Hwy. 41 N.
Palmetto, FL 34221-8662

ACCOUNTS PAYABLE CHECK

No 10 804477

DATE 10/07/97

CHECK NUMBER 0804477

63-600/631
8

PAY EXACTLY
SEVEN THOUSAND FIVE HUNDRED AND NO/100

AMOUNT
$7,500.00

Barnett Bank
039-008
6990 S. Florida Ave.
Lakeland, Florida 33813

Pay to the order of
FLORIDA DEPT. OF ENVIRONMENTAL
PROTECTION
2600 BLAIR STONE RD.
TALLAHASSEE, FL 32399-2400

Nola J Kenwright
AUTHORIZED SIGNATURE

[redacted]

PINEY POINT PHOSPHATES, INC.

CERTIFIED/RETURN RECEIPT
NO. P 576 123 987

7 October 1997

RECEIVED
OCT 31 1997
BUREAU OF AIR REGULATION

RECEIVED MAIL ROOM OCT 30 97

Bureau of Air Regulation
Division of Air Resource Management
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Piney Point Phosphates, Inc.;
FDEP Permit No. A041-197112

Dear Sirs:

Find accompanying this transmittal letter an application for an air construction permit to modify the existing sulfuric acid plant at the Piney Point Phosphates, Inc. ("PPP") facility in Palmetto, Florida. Also find a check in the amount of $7,500.00 submitted as the permit processing fee.

This application addresses those proposed repairs by PPP that have been reviewed by and discussed with the Department during the past months. For this reason PPP requests expedited review of the application. While PPP does not agree with the Department's position in this matter, the Company requests the permit without further delay due to the substantial expense already incurred in this matter.

Should further information or response by required, please contact our offices.

Very truly yours,

Ivan Nance

Ivan Nance
Corporate Environmental Manager

/rmm
Enclosures

cc: Dr. R. Garrity - FDEP Tampa
Mr. B. Thomas - FDEP Tampa

13300 U.S. Hwy. 41 N., Palmetto, FL 34221 · Phone 941-722-4555 · Fax 941-729-3589

Department of Environmental Protection

RECEIVED
AUG 12 1997
DIVISION OF AIR RESOURCES MANAGEMENT

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

August 12, 1997

Mr. Paul H. Amundsen, Esq.
Amundsen and Moore
502 East Park Avenue
Tallahassee, Florida 32301

Mr. Lawrence N. Curtin, Esq.
Holland and Knight
315 South Calhoun Street
Suite 600
Tallahassee, Florida 32301

Re: Petition for Declaratory Statement
Piney Point Phosphates, Inc.

Dear Sirs:

Attached is the Final Order on Petition for Declaratory Statement on behalf of Piney Point Phosphates, Inc.

If you have any questions regarding this matter, please contact me at 488-9730.

Sincerely,

Jack Chisolm

Jack Chisolm
Deputy General Counsel

JC/lr

Enclosure

cc: Howard Rhodes
David Dee, Esq.

8/12 FAXED TO: Bob Stewart Mulberry Phosphates
Bill Thomas
Rick Garrity
8/12 XC: CLAIR
ALL
Bill T.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

IN RE: Petition for Declaratory Statement;
PINEY POINT PHOSPHATES, INC.

OGC Case No.: 97-0880

FINAL ORDER ON PETITION FOR DECLARATORY STATEMENT

On May 14, 1997, Piney Point Phosphates, Inc. (Petitioner), filed a Petition for Declaratory Statement with the Department of Environmental Protection (Department), under Section 120.565, Florida Statutes (F.S.), and Rule 62-103.510, Florida Administrative Code (F.A.C.). See, Exhibit 1. The petition raises questions regarding the applicability of several air permitting rules to Petitioner's sulfuric acid plant (plant), which is a component of Petitioner's phosphate fertilizer manufacturing facility.

The issues presented by Petitioner for consideration by the Department are as follows:

1. Whether the proposed work to Petitioner's sulfuric acid plant constitutes either "reconstruction," "modification," or a "major modification," or whether the plant has otherwise been "shut down?"

2. Whether proposed work to Petitioner's sulfuric acid plant would require any air permits in addition to Petitioner's currently held permit (No. A041-197112), which requires compliance with New Source Performance Standards (NSPS)?

3. Whether the sulfuric acid plant, as currently permitted by the Department, is in compliance with NSPS requirements for sulfuric acid plants?

PRELIMINARY STATEMENT

Section 120.565(1), F.S., allows any substantially affected person to seek a declaratory statement regarding "the agency's opinion as to the applicability of a statutory provision, or of any rule or order of the agency, as it applies to the petitioner's particular set of circumstances." Declaratory statements are not available to all petitioners or all requests. Both the petitioner and the petition must meet certain minimum requirements before an agency can consider the issues raised in the petition. Sarasota County v. Department of Administration, 350 So.2d 802 (Fla. 2d DCA 1977). The agency is also guided by comparable law under Florida's declaratory judgment statute. As stated in Couch v. State, 377 So.2d 32, 33 (Fla. 1st DCA 1979):

> [o]wing to the similarity of declaratory statement proceedings under the Administrative Procedures Act and declaratory judgments under Chapter 86, Florida Statutes, we are of the opinion that in determining the availability and scope of the remedies under the former, we may be guided by decisions under the declaratory judgments statute.

As discussed below, petitions for declaratory statements must be dismissed by an agency if the agency does not have jurisdiction over the matter at issue for failure to present an actual controversy, or if the petition seeks a declaration of general applicability. An agency must also dismiss a petition for a declaratory statement if it does not have jurisdiction to interpret how a particular rule or order would apply to a petitioner. Declaratory statements, like declaratory judgments, cannot be rendered when the issues in the petition involve only the mere possibility of a dispute in the future, or when the petition requests an advisory opinion. An agency lacks jurisdiction to render a declaratory statement unless the petitioner demonstrates a "bona fide, actual, present and practical need for a declaration." Okaloosa Island Leaseholders Assoc., Inc., v. Okaloosa Island Authority, 308 So.2d 120, 122 (Fla. 1st DCA 1975). See also, Martinez v. Scanlan, 582 So.2d 1167, 1170 (Fla. 1991).

Furthermore, a preliminary test of substantial interests must be met by the petitioner before a petition may be considered. If the petitioner has no substantial interests which would be affected by the requested declaration, then the agency cannot issue the declaration and the petition must be denied. In Manasota-88, Inc., v. Gardinier, Inc., 481 So.2d 948 (Fla. 1st DCA 1986), the petitioner, Manasota-88, sought a declaration from this agency on the applicability of air pollution permits to the phosphate industry, in general, and to Gardinier, Inc., in particular. Both petitions were denied, and the denial was upheld on appeal on the grounds that the requested declaration did not affect the petitioner's substantial interests.

Standing under section 120.565 of the Florida Statutes is limited to declaratory statements which apply to the petitioner in its particular set of circumstances only. If the petitioner has no substantial interests which would be affected by the requested declaration, then the agency cannot issue the declaration and the petition must be denied. Manasota-88, at 949-50. Furthermore, requested declarations of general applicability cannot be answered by an agency. If the requested declaration carries implications for others statewide, declaratory statement proceedings are inappropriate even though the declaration would have a direct impact on the petitioner. Mental Health District Board, II-B v. Florida Department of Health and Rehabilitative Services, 425 So.2d 160 (Fla. 1st DCA 1983). Declaratory statements of general applicability would be rules, as defined by section 120.52 of the Florida Statutes. These rules would be subject to invalidation for failure of the agency to comply with the requirements of section 120.54 of the Florida Statutes in the promulgation of the rule. Price Wise Buying Group v. Nuzum, 343 So.2d 115 (Fla. 1st DCA 1977).

Applying these principles of law to the Statement of Facts set forth below, the Department finds that it has jurisdiction over the requested interpretation contained in Issues 1 and 2 identified above, and that the petitioner has standing to request such an interpretation, since the declaratory statement applies to the petitioner in its particular set of circumstances only and presents an actual controversy. The Department also finds that insufficient information was provided to allow an interpretation as to Issue 3.

STATEMENT OF FACTS

The following facts, as set forth in the petition and its attachments, are the only facts considered in deciding the issues. The Department takes no position with regard to the truth or accuracy of these facts, but merely accepts them as presented by Petitioner for the purpose of this Final Order.

1. Petitioner, Piney Point Phosphates, Inc., located at 13300 U.S. Highway 41 North, Palmetto, Florida, is a phosphate fertilizer manufacturing facility that includes a Monsanto double-absorption sulfuric acid plant.

2. This sulfuric acid plant currently holds an air operation permit, No. A041-197112, which requires the plant to comply with NSPS for sulfuric acid plants, as set forth in Rule 62-296.402, F.A.C.

3. The sulfuric acid plant was constructed to its present configuration in the mid 1970s .

4. The plant was fully operable when it temporarily ceased operations in June, 1992, because of market conditions.

5. At no time has Piney Point management intended that the plant be permanently shut down.

6. The Department has maintained the air pollutant emissions from the plant in the Department's Emissions Inventory. Consequently, those emissions are presumed by the Department to be occurring, and the ground level ambient air concentrations resulting from those emissions are considered by the Department when analyzing air quality impacts and increment consumption from other emissions units seeking permits to construct air pollution sources.

7. In 1996, Piney Point management decided to resume operations at the plant.

8. The plan to restart the plant required the repair and replacement of certain plant components.

9. The restarted plant would have the same capacity, design basis, and physical configuration, as previously permitted, and there would be no change in the pollutants emitted.

10. Piney Point management states that the scope of work will cost approximately 16.9 million dollars.

11. Letters to the Department from Robert C. Stewart, Senior Vice President of Piney Point, dated March 5, and March 26, 1997, describe the proposed work.

12. The construction of a new plant at Piney Point Phospates, Inc., with a 2000 tons per day capacity, having a double contact wet process design, and emission limitations as of December 13, 1996, will cost in excess of $40 million (as stated in attachment identified by

Petitioner as "Exhibit 2" to Petitioner's letter to the Department, dated December 17, 1996, contained within Appendix - Tab D).

CONCLUSIONS OF LAW

ISSUE 1

Whether the proposed work to Petitioner's sulfuric acid plant constitutes either "reconstruction," "modification," or a "major modification," or whether the plant has otherwise been "shut down?"

The Department finds that the proposed work by Piney Point is not a "reconstruction" as defined in Rule 62-210.200(240), F.A.C. Accepting Petitioner's "Statement of Fact 12," the proposed expenditure of $16,900,000 represents less than half of the fixed capital cost that would be required to build a new facility (2000 tons per day sulfuric acid plant). Thus, an expenditure of $16,900,000 would not meet the definition of "reconstruction."

Regarding the issues of "modification" and "major modification," the Department finds as follows. The Department does not consider the overall scope of the project as described in Petitioner's letter to the Department dated December 17, 1996 (Appendix - Tab D, with attachment identified by Petitioner as "Exhibit 1"), including the replacement of certain components of the sulfuric acid plant, to be routine maintenance. For example, the Department does not consider the replacement of all three acid towers as routine. Also, any replacements involving redesign, such as the acid coolers, the economizer, and the instrumentation, would not be considered as routine maintenance. Since the plant was erected over thirty years ago (based on Robert C. Stewart's statement in his letter of March 26, 1997, to the Department), and was near the end of its useful life when it was shut down in June of 1992, such major replacements must be viewed as life extension items and, therefore, not routine maintenance. Thus, the project is not exempt under Title 40 of the Code of Federal Regulations (CFR), Part 60 (40 CFR 60.14), from the definition of "modification" under 40 CFR 60.2 as routine maintenance, repair, or replacement of component parts of an emissions unit. The project is also not exempt from the definition of "modification" per Rule 62-210.200(187)(a)1.a., F.A.C., for the same reasons as cited above.

Per Section 13 of Piney Point's request for a Declaratory Statement, "[t]he plan to restart the plant, scheduled for late 1997, *required* the repair and replacement of certain plant components. *Following that work*, the restarted plant would have the same capacity, design basis and physical configuration as previously permitted . . . ." (emphasis supplied). The Department concludes that without the described work, the restarted plant (if it could be restarted) would be incapable of achieving an hourly production rate of 83.3 tons per hour (TPH) corresponding to the projected 2000 tons per day (TPD) permitted capacity. The resulting physical changes at the plant, coupled with operation at the projected production limit versus the presently achievable production rates, will increase the actual hourly rate of sulfur dioxide and sulfuric acid mist emissions. Since the project is not exempt from the definition of "modification" mentioned above, this meets the definitions of "modification" under 40 CFR 60.2 and Rule 62-210.200(187)(a), F.A.C. As stated in "Statement of Fact 9," Petitioner declared that there would be "no change in the pollutants emitted." Based on the Department's assessment of the proposed project, the Department interprets Petitioner's statement to indicate that there would be no change in the *type* of pollutants emitted, since the Department concludes that there would be a change in the *rate* and *amount* of emissions.

This sulfuric acid plant is a major facility under Rule 62-212.400(2)(d)2.b., F.A.C., since it has the potential to emit at least 100 tons per year (TPY) of the criteria pollutant, sulfur dioxide. Furthermore, it is expected that actual emissions of sulfur dioxide will increase by well over the significant emission rate of 40 TPY, as identified in Table 212.400-2, Regulated Air Pollutants - Significant Emissions Rates, F.A.C. This expectation is based on the production rate of 2,000 tons of sulfuric acid per day, given in the above-referenced letter of December 17, 1996, which equates to 730,000 TPY. The sulfur dioxide emissions rate allowed by "Specific Condition 3" of the existing permit, No. AO41-197112 (submitted as Appendix - Tab A), is 4 pounds of sulfur dioxide per ton of acid produced. Using this emissions rate and the projected annual production, the plant would emit 2,920,000 pounds (1460 tons) of sulfur dioxide per year. "Specific Condition 8" of the same permit allows a production rate of only 53.7 TPH of sulfuric acid, which equates to 470,000 TPY. Applying the 4 pounds of sulfur dioxide per ton of acid rate, present annual emissions of sulfur dioxide are limited to 940 TPY. The difference in sulfur dioxide emissions, based on Piney Point's presently permitted and future projected operating rates, is 520 TPY, which is obviously greater than 40 TPY. A value in the same order of magnitude as this 520 TPY difference would also result if past *actual* emissions data had been submitted by Piney Point to compare with future projected emissions.[1] Similar analyses show that actual emissions of sulfuric acid mist would increase by more than the significant emission rate of 7 TPY, as identified in Table 212.400-2, F.A.C.

[1]According to an application submitted by Piney Point's former owner, Royster, past actual emissions were 906 TPY of sulfur dioxide and 23.9 TPY of sulfuric acid mist. Potential emissions after the plant resumes operations following the proposed changes would be 1460 TPY of sulfur dioxide and 55 TPY sulfuric acid mist. Thus, the increases would be 554 TPY and 31 TPY for these two pollutants.

The estimated annual emissions increases represent "significant net emissions increases," as described in Rule 62-212.400 (2)(e)2., F.A.C., per Table 212.400-2 in Rule 62-212.400, F.A.C. The project, together with such emissions increases, constitutes a modification to a major facility, per Rule 62-212.400 (2)(d)4.a., F.A.C. The Department does not specifically define the term "major modification" in its rules; however, the foregoing factors also satisfy the conditions for a "major modification," as defined in 40 CFR 52.21(b)(2)(i).

Increases in hourly and annual emissions of sulfur dioxide normally result in increases of hourly and annual ambient concentration of sulfur dioxide. Sulfur dioxide is a pollutant for which national standards have been promulgated under 40 CFR 50.4 - National Primary Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide), and 40 CFR 50.5 - National Secondary Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide). "[A]ny physical change in, or change in the method of operation of, a stationary source which increases the emission rate of any pollutant for which a national standard has been promulgated under part 50" of Chapter 40 of the Code of Federal Regulations satisfies the definition of "modification" or "modified source" given in 40 CFR 52.01. This, in turn, fulfills the definition of "modification" given in Rule 62-210.200(187)(b)3., F.A.C.

Per Rule 62-210.300(1), F.A.C., an air construction permit shall be obtained by the owner or operator of any proposed new or modified facility or emissions unit prior to the beginning of construction or modification. As a modification to a major facility, the Preconstruction Review Requirements of Rule 62-212.400(5), F.A.C., and the Best Available Control Technology (BACT) provisions of Rule 62-212.400(6), F.A.C., are applicable to the described project.

Regarding the issue of whether "the plant has not otherwise been 'shut down,'" the Department determines as follows. The Department considers the plant to have shut down, but acknowledges that the 1992 shut down was not intended to be permanent.

ISSUE 2

> Whether proposed work to Petitioner's sulfuric acid plant would require any air permits in addition to Petitioner's currently held permit (No. A041-197112) which requires compliance with New Source Performance Standards (NSPS)?

Since the Department has determined that the scope of proposed work described by Petitioner is a modification under Rule 62-210.200(187), F.A.C., a construction permit is required in accordance with Rule 62-210.300(1), F.A.C., and Petitioner must satisfy the preconstruction review requirements as indicated above.

ISSUE 3

> Whether the sulfuric acid plant, as currently permitted by the Department, is in compliance with NSPS requirements for sulfuric acid plants?

The Department cannot confirm that the plant is presently in compliance with 40 CFR 60, Subpart H - Standards of Performance for Sulfuric Acid Plants ("NSPS requirements"), adopted by reference in Rule 62-204.800, F.A.C., because it is not operating and cannot operate without "required repairs" and substantial expenditures. Actual operation is required to conduct the necessary compliance inspections and source tests to determine if the plant is in compliance with the applicable NSPS.

THEREFORE, IT IS ORDERED THAT the Petition for Declaratory Statement filed by Piney Point Phosphates, Inc., is determined as stated herein.

NOTICE OF RIGHTS

Any party to this order has the right to seek judicial review of the order under Section 120.68 of the Florida Statutes by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date this order is filed with the clerk of the Department.

DONE AND ORDERED this 12th day of August, 1997, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Virginia B. Wetherell
VIRGINIA B. WETHERELL
Secretary

3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, FL 32399-3000
Telephone: (904) 488-4805

FILING AND ACKNOWLEDGMENT FILED on this date, under section 120.52 of the Florida Statutes, with the designated Department Clerk, who hereby acknowledges receipt of this order.

Rebecca [signature]
CLERK

8-12-97
DATE

CERTIFICATE OF SERVICE

I CERTIFY that a true copy of the foregoing was mailed to co-counsel for Petitioner: Lawrence N. Curtin, Holland & Knight, 315 South Calhoun Street, Suite 600, Tallahassee, Florida 32301 and Paul H. Amundsen, Amundsen & Moore, 502 East Park Avenue, Tallahassee, Florida, 32301, on this 12th day of August, 1997.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Linda K. Reel

LINDA K. REEL
Assistant General Counsel

3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, FL 32399-3000
Telephone: (904) 488-9730

Department of Environmental Protection

RECEIVED

OCT 31 1997

BUREAU OF AIR REGULATION

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

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

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name: **Piney Point Phosphates, Inc.**	
2. Site Name: **Piney Point**	
3. Facility Identification Number: **0810002** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **US 41 N at Piney Point** City: **Palmetto** County: **Manatee** Zip Code: **34221**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	Oct 31, 1997
2. Permit Number:	0810002-004-AC
3. PSD Number (if applicable):	PSD-FL-242
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
Robert Stewart, Sr. Vice President, Operations & Administration

2. Owner/Authorized Representative or Responsible Official Mailing Address:

Organization/Firm: **Piney Point Phosphates, Inc.**
Street Address: **13300 US Highway 41 North**
City: **Palmetto** State: **FL** Zip Code: **34221**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
Telephone: (**813**) **722-4555** Fax: ( )

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., 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.*

Robert C. Stewart 10-27-97
Signature Date

* Attach letter of authorization if not currently on file.

Scope of Application

This Application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID	Description of Emissions Unit	Permit Type
001	Sulfuric Acid Plant	AC1A
002	Molten Sulfur Storage & Handling Facility	AC1A

Purpose of Application and Category

Check one (except as otherwise indicated):

Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., 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: ____________________

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: ____________________

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

Current construction permit number: ____________________

Operation permit to be revised: ____________________

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: ____________________

[ ] Air operation permit revision for a Title V source 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 to be revised: ____________________

Reason for revision: ____________________

Category II: All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s): ____________________

[ ] Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: ____________________

[ ] Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit to be revised: ____________________

Reason for revision: ____________________

____

Category III: All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain:

[**X**] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: **AO41-206854 & AO41-197112**

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

Current operation permit number(s): ____________________

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

Application Processing Fee

Check one:

[X] Attached - Amount: $ 7,500.00 [ ] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations: **The proposed project consists of repair activities to start up the existing sulfuric acid plant and molten sulfur storage & handling system.**
2. Projected or Actual Date of Commencement of Construction: **December 1, 1997**
3. Projected Date of Completion of Construction: **December 1, 1999**

Professional Engineer Certification

1. Professional Engineer Name: : **John B. Koogler, Ph.D., P.E.** Registration Number: **12925**
2. Professional Engineer Mailing Address: Organization/Firm: **Koogler & Associates** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **FL** Zip Code: **32609**
3. Professional Engineer Telephone Numbers: Telephone: **(352) 377 - 5822** Fax: **(352) 377 - 7158**

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

(seal)

10/17/97

Date

DEP Form No. 62-210.900(1) - Form
Effective: 3-21-96

Application Contact

1. Name and Title of Application Contact: **Pradeep Raval**	
2. Application Contact Mailing Address: Organization/Firm: **Koogler & Associates** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **FL** Zip Code: **32609**	
3. Application Contact Telephone Numbers: Telephone: (**352**) **377** - **5822**	Fax: (**352**) **377** - **7158**

Application Comment

NA

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **348.5** North (km): **3057.3**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **29/23/00** Longitude (DD/MM/SS): **82/20/00**			
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): **Phosphate Fertilizer**			

Facility Contact

1. Name and Title of Facility Contact: **Ivan Nance, Corporate Environmental Manager**
2. Facility Contact Mailing Address: Organization/Firm: **Piney Point Phosphates, Inc.** Street Address: **13300 US Highway 41 North** City: **Palmetto** State: **FL** Zip Code: **34221**
3. Facility Contact Telephone Numbers: Telephone: (**813**) **722-4555** Fax: ( )

Facility Regulatory Classifications

1. Small Business Stationary Source? [ ] Yes [X] No [ ] Unknown
2. Title V Source? [X] Yes [ ] No
3. Synthetic Non-Title V Source? [ ] Yes [X] No
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)? [X] Yes [ ] No
5. Synthetic Minor Source of Pollutants Other than HAPs? [ ] Yes [X] No
6. Major Source of Hazardous Air Pollutants (HAPs)? [ ] Yes [X] No
7. Synthetic Minor Source of HAPs? [ ] Yes [X] No
8. One or More Emissions Units Subject to NSPS? [X] Yes [ ] No
9. One or More Emission Units Subject to NESHAP? [ ] Yes [X] No
10. Title V Source by EPA Designation? [ ] Yes [X] No
11. Facility Regulatory Classifications Comment (limit to 200 characters):

B. FACILITY REGULATIONS

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

N/A

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

DEP Core List	
FS 120, 403	
FAC 62-4, 204, 210, 212, 213, 214, 252, 256, 257, 281, 296, 297	
40 CFR 52, 55, 60, 61, 63, 82	

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
PM/PM10	**A**
SO2	**A**
NOX	**A**
CO	**A**
FL	**B**

D. FACILITY POLLUTANT DETAIL INFORMATION NA

Facility Pollutant Detail Information: Pollutant ______ of ______

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hour)	(tons/year)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

Facility Pollutant Detail Information: Pollutant ______ of ______

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hour)	(tons/year)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location: [X] Attached, Document ID: **REPORT** [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: **REPORT** [ ] Not Applicable [X] Waiver Requested
3. Process Flow Diagram(s): [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
5. Fugitive Emissions Identification: [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: **PSD REPORT** [ ] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities: [ ] Attached, Document ID:________ [X] Not Applicable
8. 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
9. Alternative Methods of Operation: [ ] Attached, Document ID:________ [X] Not Applicable
10. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [X] Not Applicable

11. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:________ [**X**] Not Applicable
12. Compliance Assurance Monitoring Plan: [ ] Attached, Document ID:________ [**X**] Not Applicable
13. Risk Management Plan Verification: [ ] Plan Submitted to Implementing Agency - Verification Attached, Document ID:________ [ ] Plan to be Submitted to Implementing Agency by Required Date [**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

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L 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. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. 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.

2. Single Process, Group of Processes, or Fugitive Only? Check one:

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

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

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

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Sulfuric Acid Plant**		
2. Emissions Unit Identification Number: **001** [ ] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code: **A**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **28**
6. Emissions Unit Comment (limit to 500 characters):		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Double Absorption**
2. Control Device or Method Code: **044**

B.

1. Description (limit to 200 characters): **Demisters**
2. Control Device or Method Code: **014**

C.

1. Description (limit to 200 characters):
2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **N/A**		
2. Long-term Reserve Shutdown Date: **N/A**		
3. Package Unit: **N/A** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **N/A**	MW	
5. Incinerator Information: **N/A** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **N/A**		mmBtu/hr
2. Maximum Incineration Rate: **N/A**	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate: **2000 tons per day 100% H2SO4**		
5. Operating Capacity Comment (limit to 200 characters):		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

N/A

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

See Page 12.	

E. 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: [X] 1 [ ] 2 [ ] 3 [ ] 4	
3. Descriptions of Emissions 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: **N/A**	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W	
6. Stack Height:	**200** feet
7. Exit Diameter:	**7.8** feet
8. Exit Temperature:	**147** °F

9. Actual Volumetric Flow Rate:	**86,000** acfm
10. Percent Water Vapor :	%
11. Maximum Dry Standard Flow Rate:	dscfm
12. Nonstack Emission Point Height:	feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters):	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Sulfuric Acid Production**	
2. Source Classification Code (SCC): **3-01-023-04**	
3. SCC Units: **Tons 100% H2SO4**	
4. Maximum Hourly Rate: **83.3**	5. Maximum Annual Rate : **730,000**
6. Estimated Annual Activity Factor: **N/A**	
7. Maximum Percent Sulfur: **N/A**	8. Maximum Percent Ash: **N/A**
9. Million Btu per SCC Unit: **N/A**	
10. Segment Comment (limit to 200 characters): **Maximum annual rate = 2000 tpd x 365 days/yr = 730,000 tpy 100% H2SO4**	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO2	**044**	**014**	**EL**
SAM	**014**	**000**	**EL**
NOx	**000**	**000**	**EL**

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SO2**

2. Total Percent Efficiency of Control: **99.7 %**

3. Potential Emissions: **333.3** lb/hour **1460** tons/year

4. Synthetically Limited?
   [ ] Yes [X] No

5. Range of Estimated Fugitive/Other Emissions:
   [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year

6. Emission Factor: **4 LB/TON 100% ACID**
   Reference: **Permit**

7. Emissions Method Code:
   [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5

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

SO2 = 2000 tpd/24 hrs/day x 4 lb/ton = 333.3 lb/hr
X 8760 hrs/yr X ton/2000 lbs = 1460 tpy

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

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **RULE**
2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **4.0 lb/ton 100% ACID**
4. Equivalent Allowable Emissions: **333.3** lb/hour **1460** tons/year
5. Method of Compliance (limit to 60 characters): **EPA METHOD 8**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **40 CFR 60, SUBPART H.**

B.

1. Basis for Allowable Emissions Code:
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SAM**
2. Total Percent Efficiency of Control: **99** %
3. Potential Emissions: **12.5** lb/hour **54.8** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No
5. Range of Estimated Fugitive/Other Emissions: **N/A** [ ] 1 [ ] 2 [ ] 3 _______ to _______ tons/year
6. Emission Factor: **12.5 LB/HR** Reference: **PERMIT**
7. Emissions Method Code: [**X**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **SAM = 12.5 LB/HR X 8760 HRS/YR X TON/2000 LBS = 54.8 TPY**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **RULE**
2. Future Effective Date of Allowable Emissions:**NA**
3. Requested Allowable Emissions and Units: **0.15 lb/ton 100% ACID**
4. Equivalent Allowable Emissions: **12.5** lb/hour **54.8** Tons/year
5. Method of Compliance (limit to 60 characters): **EPA METHOD 8**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **40 CFR 60, SUBPART H.**

B.

1. Basis for Allowable Emissions Code:
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **NOX**		
2. Total Percent Efficiency of Control:		%
3. Potential Emissions:	**10** lb/hour	**43.8** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No		
5. Range of Estimated Fugitive/Other Emissions: **N/A** [ ] 1 [ ] 2 [ ] 3		_______ to _______ tons/year
6. Emission Factor: **0.12 lb/ton** Reference: **Similar Permit**		
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5		
8. Calculation of Emissions (limit to 600 characters): **NOX = 2000 tpd/24 hrs/day x 0.12 lb/ton = 10 lb/hr** **X 8760 hrs/yr X ton/2000 lbs = 43.8 tpy**		
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Emission factor based on permits issued to similar sulfuric acid plants.**		

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **RULE**		
2. Future Effective Date of Allowable Emissions:**NA**		
3. Requested Allowable Emissions and Units: **0.12 lb/ton 100% ACID**		
4. Equivalent Allowable Emissions:	**10** lb/hour	**43.8** Tons/year
5. Method of Compliance (limit to 60 characters): **EPA METHOD 7E**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **BACT**		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation _1_of_1_

1. Visible Emissions Subtype: **VE10**	
2. Basis for Allowable Opacity: [X] Rule [ ] Other	
3. Requested Allowable Opacity: Normal Conditions: **10%** 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): **40 CFR 60, SUBPART H.**	

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	
2. Basis for Allowable Opacity: [ ] Rule [ ] Other	
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor _1_of_1_

1. Parameter Code: **EM**	2. Pollutant(s): **SO2**
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):	

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):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

[X] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[X] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[ ] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		lb/hour	tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			

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

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **REPORT** [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [ ] Not Applicable [X] Waiver Requested **Department has on file**
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID:________ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:________ [X] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

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

14. Acid Rain 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:_______

    [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L 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. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. 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.

2. Single Process, Group of Processes, or Fugitive Only? 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.

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

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

   Molten Sulfur Storage & Handling System

2. Emissions Unit Identification Number: **002** [ ] No Corresponding ID [ ] Unknown

3. Emissions Unit Status Code: **A**	4. Acid Rain Unit? [ ] Yes [**X**] No	5. Emissions Unit Major Group SIC Code: **28**

6. Emissions Unit Comment (limit to 500 characters):

This unit includes the rail and truck sulfur unloading; receiving pit; storage tank; pumps and piping.

For emission iventory and PSD purposes, the estimated maximum emissions from the sources in this emissions unit are:

PM/PM10 = 0.61 tpy
SO_2 = 1.2 tpy
H_2S = 0.28 tpy
TRS = 0.79 tpy

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **NA**

2. Control Device or Method Code:

B.

1. Description (limit to 200 characters):
2. Control Device or Method Code:

C.

1. Description (limit to 200 characters):
2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1. Initial Startup Date: **N/A**		
2. Long-term Reserve Shutdown Date: **N/A**		
3. Package Unit: **N/A** Manufacturer:	Model Number:	
4. Generator Nameplate Rating: **N/A**	MW	
5. Incinerator Information: **N/A** Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate: **N/A**		mmBtu/hr
2. Maximum Incineration Rate: **N/A**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **747 tpd**		
4. Maximum Production Rate: NA		
5. Operating Capacity Comment (limit to 200 characters):		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:		
	24 hours/day	**7** days/week
	52 weeks/year	**8760** hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

N/A

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

See Page 12.	

E. 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: [X] 1 [ ] 2 [ ] 3 [ ] 4	
3. Descriptions of Emissions 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: **N/A**	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [ ] V [X] W	
6. Stack Height:	**NA** feet
7. Exit Diameter:	**NA** feet
8. Exit Temperature:	**200** °F

9. Actual Volumetric Flow Rate:	acfm
10. Percent Water Vapor :	%
11. Maximum Dry Standard Flow Rate:	**NA** dscfm
12. Nonstack Emission Point Height:	**24** feet
13. Emission Point UTM Coordinates: Zone: East (km): North (km):	
14. Emission Point Comment (limit to 200 characters): **Tank vent.**	

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment __1__of__1__

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters): **Molten Sulfur Storage & Handling**	
2. Source Classification Code (SCC): **03-01-023-99**	
3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **31 (avg.)**	5. Maximum Annual Rate : **272,655**
6. Estimated Annual Activity Factor: **N/A**	
7. Maximum Percent Sulfur: **N/A**	8. Maximum Percent Ash: **N/A**
9. Million Btu per SCC Unit: **N/A**	
10. Segment Comment (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	000	000	NS
SO2	000	000	NS
H2S	000	000	NS
VOC	000	000	NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **NA**					
2. Total Percent Efficiency of Control:		%			
3. Potential Emissions:		lb/hour		tons/year	
4. Synthetically Limited? [ ] Yes	[ ] No				
5. Range of Estimated Fugitive/Other Emissions: [ ] 1	[ ] 2	[ ] 3	_______ to _______ tons/year		
6. Emission Factor: Reference:					
7. Emissions Method Code: [ ] 0	[ ] 1	[ ] 2	[ ] 3	[ ] 4	[ ] 5
8. Calculation of Emissions (limit to 600 characters):					
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):					

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **NA**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hour Tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

B.

1. Basis for Allowable Emissions Code:
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:
4. Equivalent Allowable Emissions: lb/hr tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

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): **MOLTEN SULFUR RULE, 62-296.11 FAC.**	

Visible Emissions Limitation: Visible Emissions Limitation ______ of ______

1. Visible Emissions Subtype:	
2. Basis for Allowable Opacity: [ ] Rule [ ] Other	
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

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):	

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):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [X] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

   If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

   [X] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[ ] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		lb/hour	tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			

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

Supplemental Requirements for All Applications

1. Process Flow Diagram [ ] Attached, Document ID:_______ [ ] Not Applicable [X] Waiver Requested **Department has on file**
2. Fuel Analysis or Specification [ ] Attached, Document ID:_______ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:_______ [X] 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
7. Operation and Maintenance Plan [ ] Attached, Document ID:_______ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_______ [X] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

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

14. Acid Rain 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:________

    [X] Not Applicable

REPORT IN SUPPORT OF
A PSD PERMIT APPLICATION

PREPARED FOR:

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

OCTOBER 1997

PREPARED BY:

KOOGLER & ASSOCIATES
4014 N.W. 13TH STREET
GAINESVILLE, FLORIDA 32609
(352) 377-5822

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1.0 SYNOPSIS OF APPLICATION

1.1 APPLICANT

Piney Point Phosphates, Inc.
13300 US Hwy 41 North
Palmetto, Florida 34221-8662

1.2 FACILITY LOCATION

Piney Point Phosphates, Inc. (previously Royster Phosphates) operates a fertilizer plant located approximately nine miles north of Palmetto on US Highway 41 in Manatee County, Florida (see Figures 1-1 and 1-2). The UTM coordinates of the facility are Zone 17, 348.5 km east and 3057.3 km north.

1.3 PROJECT OVERVIEW

Piney Point Phosphates, Inc. (PPP) proposes to start up the existing permitted sulfuric acid plant. The sulfuric acid plant has not been in operation since 1992. The molten sulfur storage & handling system will also be activated to pump molten sulfur to the sulfuric acid plant. PPP does not propose to increase the production rate or pollutant emissions from the plant. Some repair work is proposed prior to plant start up.

The proposed plant repairs (see Appendix A), are no different than those required at other existing sulfuric acid plants over a period of time, on a routine basis. However, the Florida Department of Environmental Protection (FDEP) has indicated that the proposed scope of repairs at PPP is non-routine in nature and would constitute a modification pursuant to Rule 62-212, Florida Administrative Code (FAC).

PPP is not in agreement with FDEP's opinion regarding the rule interpretation. However, in an effort to expedite the sulfuric acid plant start up, this application is being prepared to address the rule requirements applicable to a modification. Based on this approach, the proposed repair project will result in a significant net increase (in accordance with Rule 62-212, Florida Administrative Code), in the emission rates of sulfur dioxide (SO_2), nitrogen oxides (NOx) and sulfuric acid mist (SAM).

PPP is submitting this report in support of the application to bring the existing permitted sulfuric acid plant and molten sulfur system back on-line. The report includes a description of the existing chemical complex and the sulfuric acid plant, a review of Best Available Control Technology, an ambient air quality analysis and an evaluation of the impact of the proposed project on soils, vegetation and visibility.

Best Available Copy

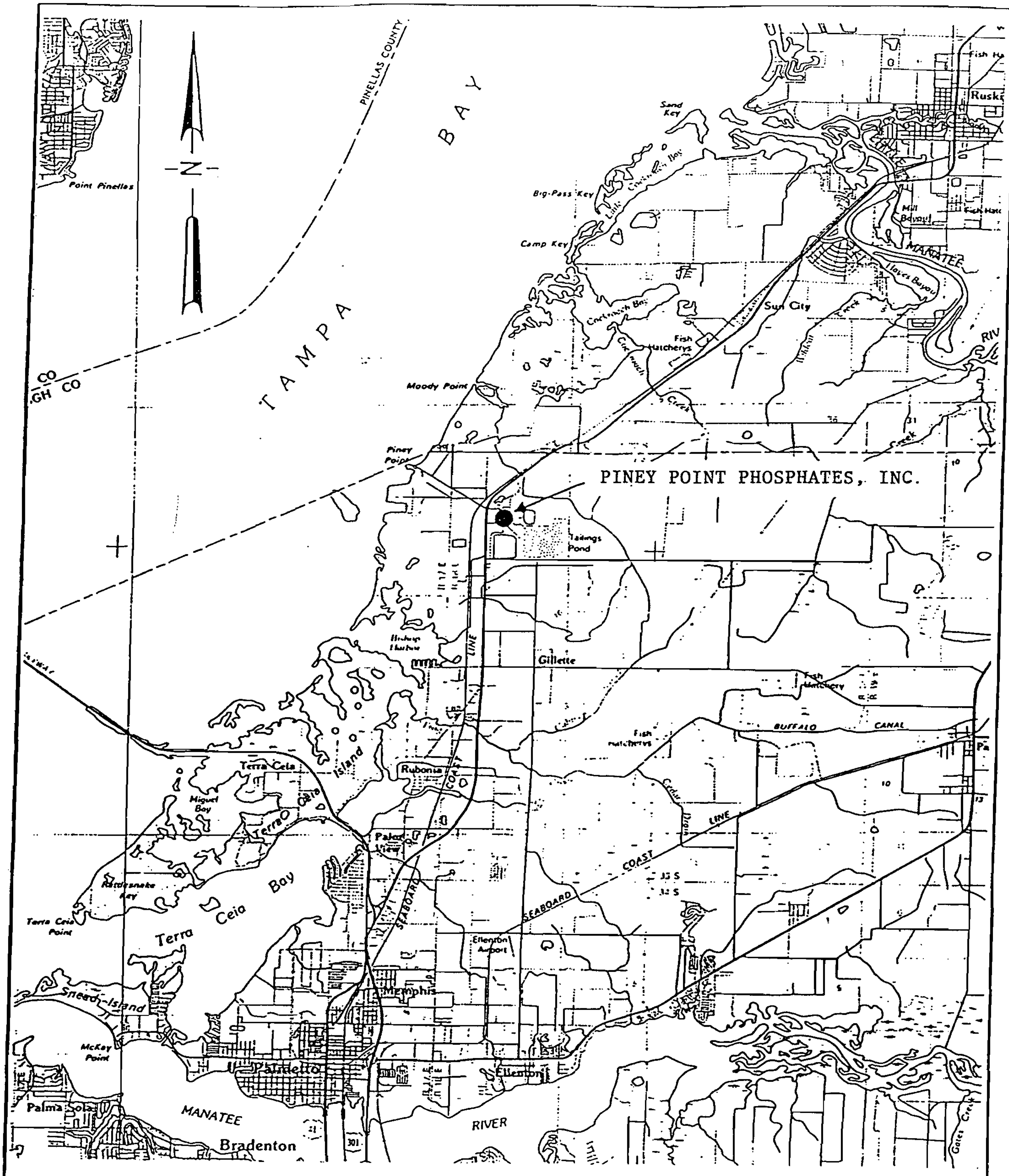


FIGURE 1-1

SITE LOCATION

PINEY POINT PHOSPHATES, INC.

KOOGLER & ASSOCIATES

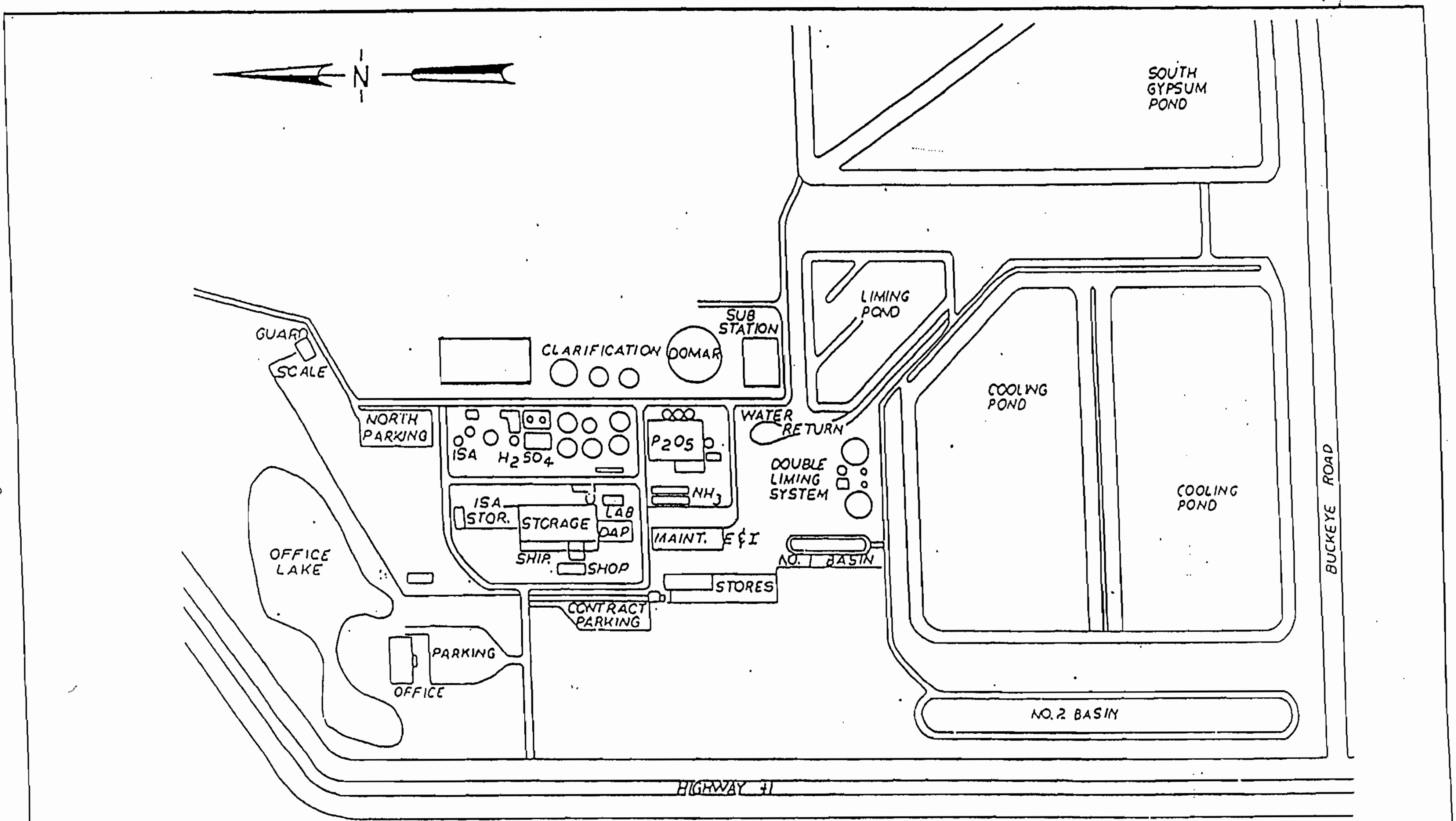


FIGURE 1-2

FACILITY PLOT PLAN

PINEY POINT PHOSPHATES, INC.

KOOGLER & ASSOCIATES

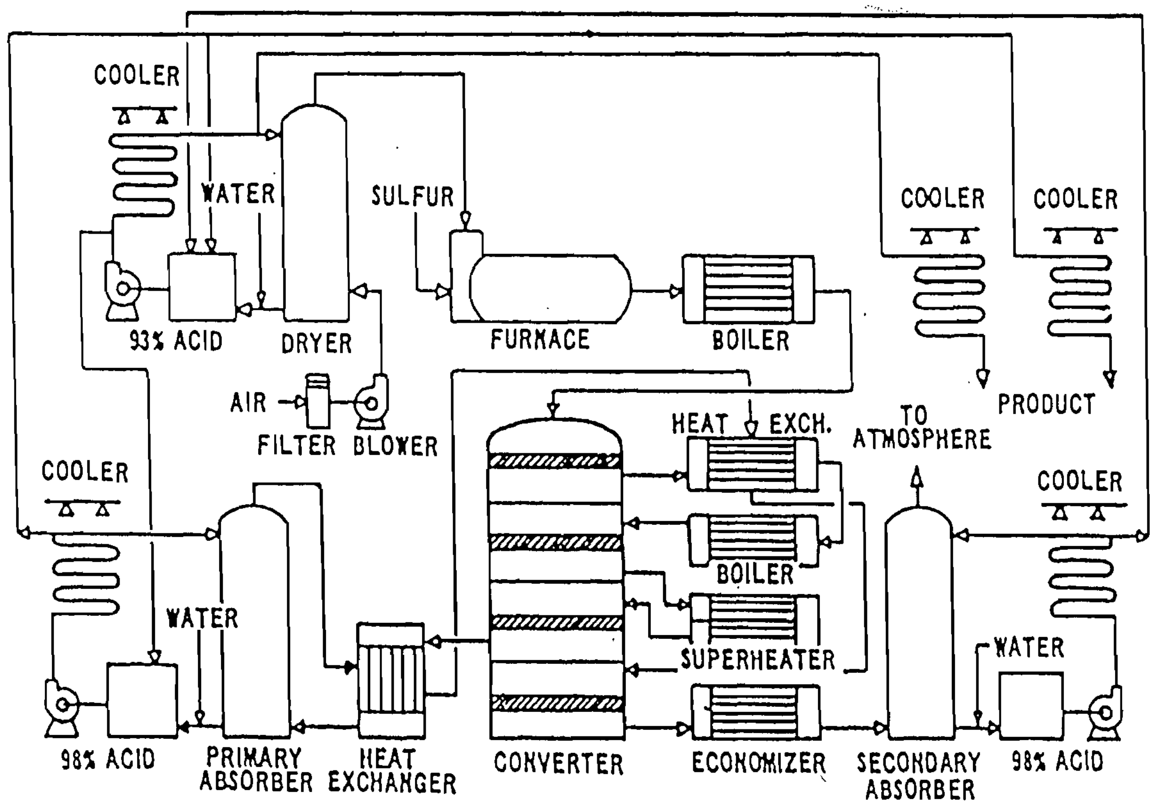
2.0 FACILITY DESCRIPTION

The existing fertilizer complex consists of an auxiliary steam boiler, one sulfuric acid plant, one phosphoric acid plant, one diammonium phosphate plant, storage and handling facilities for molten sulfur, phosphate rock and fertilizer products and a water management system.

2.1 PROCESS DESCRIPTION

The existing sulfuric acid plant is presently permitted for continuous operation at a production rate of 2000 tons per day of 100 percent H_2SO_4. The plant is subject to Federal New Source Performance Standards as set forth in 40 CFR 60, Subpart H.

Molten sulfur is received by truck and rail, unloaded into molten sulfur pits, and pumped to molten sulfur storage tanks for storage. The sulfuric acid plant utilizes the double absorption process which produces sulfuric acid by burning sulfur to produce sulfur dioxide, converting the sulfur dioxide to sulfur trioxide using a catalyst, and then contacting the sulfur trioxide with sulfuric acid in primary and secondary absorption towers. A process flow diagram is presented in Figure 2-1.



$S + O_2 \rightarrow SO_2$ (BURNER)

$SO_2 + \frac{1}{2} O_2 \rightleftharpoons SO_3$ (CONVERTER)

$SO_3 + H_2O \rightarrow H_2SO_4$ (ABSORBER)

FIGURE 2-1
TYPICAL SULFURIC ACID
DOUBLE ABSORPTION PLANT
PROCESS FLOW DIAGRAM

KOOGLER & ASSOCIATES

3.0 PROPOSED PROJECT

PPP proposes to repair and start up the existing sulfuric acid plant and molten sulfur system. Appendix A contains a detailed list of the proposed repair work.

The repair work will not affect the existing process in any way. Any equipment changes will be like-kind replacements, as previously explained to FDEP. As a result, there will be no change in material flows, production rate or emission rates from the existing plant.

The current FDEP air permit numbers for the sulfuric acid plant and the molten sulfur system are as follows:

UNIT	Air Permit No.	Expiration Date
SAP	A041-197112	07-05-96*
Molten Sulfur	A041-206854	02-07-97*

* Extended by Title V provisions.

3.1 AIR EMISSIONS

The sulfuric acid plant is expected to emit sulfur dioxide (SO_2), sulfuric acid mist (SAM) and nitrogen oxides (NOx). The molten sulfur system is expected to emit very small quantities of sulfur particulate (PM), reduced sulfur compounds like hydrogen sulfide (H_2S), volatile organic compounds (VOCs) and SO_2.

The air emissions from the sulfuric acid plant are inherently controlled by the double absorption process and mist eliminators. The air emissions from the molten sulfur system are minimized by work practices.

The emission limits for the sulfuric acid plant are based on the Federal New Source Performance Standards under 40 CFR 60, Subpart H, and the corresponding state rule, which limit SO_2 and SAM emissions to 4.0 and 0.15 pounds per ton of 100 percent sulfuric acid, respectively. Visible emissions are limited to 10 percent opacity.

Visible emissions from the molten sulfur system are limited under the state rule to 20 percent opacity. There are no mass emission standards for the molten sulfur system.

A summary of the permitted, actual and proposed operating characteristics of the sulfuric acid plant and the molten sulfur system is presented in Table 3-1. The emission changes as a result of the proposed project are presented in Table 3-2. As indicated in Table 3-2, there will be a significant net increase, as defined in Rule 62-212, FAC, in the emissions of SO_2, NOx and SAM.

There are fugitive emissions from process operations and vehicular traffic on paved roads at the facility, as acknowledged by existing FDEP permits. Changes in fugitive emissions as a result of the proposed project are expected to be negligible and do not affect the rule applicability for the project.

Emission calculations for the existing plant and molten sulfur system are provided in Appendix B.

3.2 RULE REVIEW

The following are the state and federal air regulatory requirements that apply to new or modified sources subject to a Prevention of Significant Deterioration (PSD) review.

In accordance with EPA and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) are subject to preconstruction review. Florida's State Implementation Plan (SIP), approved by the EPA, authorizes the Florida Department of Environmental Protection (FDEP) to manage the air pollution program in Florida.

The PSD review determines whether or not significant air quality deterioration will result from a new or modified facility. Federal PSD regulations are contained in 40CFR52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations which are essentially identical to the federal regulations and are contained in Chapter 62-212 of the Florida Administration Code (FAC).

All new major facilities and major modifications to existing facilities are subject to control technology review, source impact analysis, air quality analysis and additional impact analyses for each pollutant subject to a PSD review. A facility must also comply with the Good Engineering Practice (GEP) stack height rule.

A major facility is defined in the PSD rules as any one of the 28 specific source categories (see Table 3-3) which has the potential to emit 100 tons per year (tpy) or more, or any other stationary facility which has the potential to emit 250 tpy or more, of any pollutant regulated under the Clean Air Act. A major modification is defined in the PSD rules as a change at an existing major facility which increases the actual emissions by greater than significant amounts (see Table 3-4).

3.2.1 Ambient Air Quality Standards

The EPA and the state of Florida have developed/adopted ambient air quality standards, AAQS (see Table 3-5). Primary AAQS protect the public health while the secondary AAQS protect the public welfare from adverse effects of air pollution. Areas of the country have been designated as attainment or nonattainment for specific pollutants. Areas not meeting the AAQS for a given pollutant are designated as nonattainment areas for that pollutant. Any new source or expansion of existing sources in or near these nonattainment areas are usually subject to more stringent air permitting requirements. Projects proposed in attainment areas are subject to air permit requirements which would ensure continued attainment status.

3.2.2 PSD Increments

In promulgating the CAA Amendments, Congress quantified concentration increases above an air quality baseline concentration levels for sulfur dioxide (SO_2) and particulate matter less than 10 microns (PM10) which would constitute significant deterioration. The size of the allowable increment depends on the classification of the area in which the source would be located or have an impact. Class I areas include specific national parks, wilderness areas and memorial parks. Class II areas are all areas not designated as Class I areas and Class III areas are industrial areas in which greater deterioration than Class II areas would be allowed. There are no designated Class III areas in Florida.

In 1988, EPA promulgated PSD regulations for nitrogen oxides (NOx) and PSD increments for nitrogen dioxide (NO_2) concentrations. FDEP adopted the NO_2 increments in July 1990 (see Table 3-6 for PSD increments).

In the PSD regulations, baseline concentration is defined as the ambient concentration level for a given pollutant which exists in the baseline area at the time of the applicable baseline date and includes the actual emissions representative of facilities in existence on the applicable baseline date, and the allowable emissions of major stationary facilities which commenced construction before January 6, 1975, but were not in operation by the applicable baseline date.

The emissions not included in the baseline concentration and, therefore, affecting PSD increment consumption are the actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM10, and February 8, 1988, for NO_2 and the actual emission increases and decreases at any stationary facility occurring after the baseline date.

3.2.3 Control Technology Evaluation

The PSD control technology review requires that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to the source. The BACT requirements are applicable to all regulated pollutants subject to a PSD review.

BACT is defined in Chapter 62-210, FAC as an emission limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead, to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation. Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The reason for evaluating the BACT is to minimize as much as possible the consumption of PSD increments and to allow future growth without significantly degrading air quality. The BACT review also analyzes if the most current control systems are incorporated in the design of a proposed facility. The BACT, as a minimum, has to comply with the applicable New Source Performance Standard for the source. The BACT analysis requires the evaluation of the available air pollution control methods including a cost-benefit analysis of the alternatives. The cost-benefit analysis includes consideration of materials, energy, and economic penalties associated with the control systems, as well as environmental benefits derived from the alternatives.

EPA recently determined that the bottom-up approach (starting at NSPS and working up to BACT) was not providing the level of BACT originally intended. As a result, in December 1987, EPA strongly suggested changes in the implementation of the PSD program including the "top-down" approach to BACT. The top-down approach requires an application to start with the most stringent control alternative, often Lowest Achievable Emission Rate (LAER), and justify its rejection or acceptance as BACT. Rejection of control alternatives may be based on technical or economical infeasibility, physical differences, locational differences, and environmental or energy impact differences when comparing a proposed project with a project previously subject to that BACT.

3.2.4 Air Quality Monitoring

An application for a PSD permit requires an analysis of ambient air quality in the area affected by the proposed facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate.

Ambient air monitoring for a period of up to one year, but no less than four months, is required. Existing ambient air data for a location in the vicinity of the proposed project is acceptable if the data meet FDEP quality assurance requirements. If not, additional data would need to be gathered. There are guidelines available for designing a PSD air monitoring network in EPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration."

FDEP may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause air quality impacts less than the de minimis levels (see Table 3-4).

3.2.5 Ambient Impact Analysis

A source impact analysis is required for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate. Specific atmospheric dispersion models are required in performing the impact analysis. The analysis should demonstrate the project's compliance with AAQS and allowable PSD increments. The impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significant impact levels.

Typically, a five-year period is used for the evaluation of the highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors. The second-highest concentration is considered because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor is normally used.

3.2.6 Additional Impact Analysis

The PSD rules also require analyses of the impairment to visibility and the impact on soils and vegetation that would occur as a result of the project. A visibility impairment analysis must be conducted for PSD Class I areas along with an air quality related values (AQRV) analysis. Impacts due to commercial, residential, industrial, and other growth associated with the source must be addressed.

3.2.7 Good Engineering Practice Stack Height

In accordance with Rule 62-210, FAC, the degree of emission limitation required for control of any pollutant should not be affected by a stack height that exceeds GEP, or any other dispersion technique. GEP stack height is defined as the highest of:

1. 65 meters (m), or

2. A height established by applying the formula:
   $Hg = H + 1.5\ L$
   Where:
   - Hg - GEP stack height,
   - H - Height of the structure or nearby structure, and
   - L - Lesser dimension, height or projected width of nearby structure(s)

3. A height demonstrated by a model or field study.

The GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height. The actual stack height may be higher or lower.

3.3 RULE APPLICABILITY

The proposed repair project, to bring the sulfuric acid plant and molten sulfur storage & handling system back on-line, has been classified as a major modification to a major facility subject to both state and federal regulations as set forth in Chapter 62-212, FAC, by FDEP. PPP does not agree with this determination, but is submitting the permit application to expedite the startup of the plant.

The facility is located in an area classified as attainment for each of the regulated air pollutants.

The proposed repair activities to bring the sulfuric acid plant and molten storage & handling system back on-line will result in significant increases in SO_2, NOx and SAM emissions as defined by Rule 62-212, FAC, and will therefore be subject to PSD preconstruction review requirements. This will include a determination of Best Available Control Technology (BACT), an air quality review, Good Engineering Practice stack height analysis and an evaluation of impacts on soils, vegetation and visibility.

TABLE 3-1

CHANGES IN PRODUCTION AND EMISSION RATES

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

	Sulfuric Acid Plant	Molten Sulfur System
Permit Allowable Conditions : Based on Current Permits		
Rate (TPD)	2000	747
SO_2 (lb/hr)	333.3	NA
(TPY)	1460	NA
Mist (lb/hr)	12.5	NA
(TPY)	54.8	NA
Annual Operating Hours	8760	8760
Actual Conditions : Based on most recent 2-year data (FDEP files)		
Rate (TPD)	0	0
SO_2 (lb/hr)	0	0
(TPY)	0	0
Mist (lb/hr)	0	0
(TPY)	0	0
NOx (lb/hr)	0	0
(TPY)	0	0
Annual Operating Hours	0	0
Proposed Conditions		
Rate (TPD)	2000	747
SO_2 (lb/hr)	333.3	NA
(TPY)	1460	NA
Mist (lb/hr)	12.5	NA
(TPY)	54.8	NA
NOx (lb/hr)	10.0	NA
(TPY)	43.8	NA
Annual Operating Hours	8760	8760

NOTE: (1) The plant has not operated in the last two years.
(2) There are no mass emission limits for the sulfur system.

TABLE 3-2

NET EMISSION INCREASES (1)

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Pollutant	Emissions (tons/yr) Sulfuric Acid Plant	Molten Sulfur System
SO_2		
Present (actual)	0	0
Proposed	1460	1.2
Change	1460	1.2
Contemporaneous Changes	0	
Total Increase	1461.2	
Significant Increase (2)	40	
PSD Review ?	YES	
MIST		
Present (actual)	0	
Proposed	54.8	
Change	54.8	
Contemporaneous Changes	0	
Total Increase	54.8	
Significant Increase (2)	7	
PSD Review ?	YES	
NOx		
Present (actual)	0	
Proposed	43.8	
Change	43.8	
Contemporaneous Changes	0	
Total Increase	43.8	
Significant Increase (2)	40	
PSD Review ?	YES	

(1) See Appendix B for emission calculations.
(2) Significant levels are listed in Rule 62-212, FAC.

Regarding the NSPS for sulfuric acid mist, EPA concluded:

> "Making the acid mist standard more stringent is not believed to be practical at this time because of the need to provide a margin of safety due to in-plant operating fluctuations, which introduce variable quantities of moisture into the sulfuric acid production line."

There has been no change in EPA philosophy related to sulfuric acid plants since the 1985 review.

A review of BACT/LAER determinations published in the EPA Clearinghouse indicates that no new control alternatives have been applied to the double absorption sulfuric acid plants as of 1997 that would result in a consistent reduction in sulfur dioxide emission below 4.0 pounds per ton of acid nor would result in a consistent reduction of sulfuric acid mist emissions below 0.15 pounds per ton of acid. No control technologies for nitrogen oxides are discussed in either the NSPS review or in BACT/LAER determinations as there is typically no control of NOx from the double absorption sulfuric acid plants.

4.2 CONTROL TECHNOLOGIES

The control of sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants can be achieved by various processes. The process of choice for sulfur dioxide control has been double absorption and the process of choice for controlling sulfuric acid mist emission has been one of the various types of fiber mist eliminators. These processes have been selected based on cost, product recovery, the formation of no undesirable by-products and the fact that neither introduces operating processes that are foreign to plant personnel.

In EPA's review of NSPS for sulfuric acid plants in March 1985 (EPA-450/3-85-012), 46 sulfuric acid plants built between 1971 and 1985 were reviewed. Of these 46 plants, 40 used the double absorption process for sulfur dioxide control with the remaining six using some type of acid gas scrubbing. All 46 plants used the high efficiency mist eliminators for acid mist control. The control of nitrogen oxides in sulfuric acid plants has not been addressed to date because the low concentration of nitrogen oxides in the tail gases of sulfuric acid plants (10-20 parts per million) does not lend itself to cost effective controls.

Also in the 1985 EPA review, several potential control technologies that had been used to control sulfur dioxide and sulfuric acid mist emissions from sulfuric acid plants were addressed. The alternatives included the double absorption process, ammonia scrubbing, sodium sulfite-bisulfite scrubbing, and molecular sieves for sulfur dioxide control and filter type mist eliminators and electrostatic precipitators for sulfuric acid mist control. A review of the EPA BACT/LAER Clearinghouse information indicated that no other control alternatives have been considered for sulfuric acid plants prior to or since the 1985 NSPS review and no emission limits have been set that are more stringent than 4.0 pounds per hour for sulfur dioxide and 0.15 pounds per ton for acid mist. No control alternatives were addressed for nitrogen oxides control in either the 1985 EPA NSPS review or in the BACT/LAER Clearinghouse covering determinations made since the 1985 EPA review.

4.2.1 Sulfur Dioxide Control

The control alternatives for sulfur dioxide have been summarized based upon information compiled by EPA in the 1985 NSPS review for sulfuric acid plants, information recently submitted to FDEP by companies with similar sulfuric acid plants during review of production increase requests (refer to PSD-FL-225, 229, 235 and 238) and on data developed specifically for PPP.

4.2.1.1 Double Absorption Process Including Frequency of Turnaround

The second absorber tower on double absorption sulfuric acid plants is sulfur dioxide control technology. The second absorption tower adds about 20 percent to the cost of a plant and it increases operating costs by reducing the amount of high pressure steam that can be recovered and by increasing the pressure drop across the plant. The second absorption stage, in reducing sulfur dioxide emissions, results in the recovery of about 25-26 pounds of sulfur dioxide per ton of acid produced. This sulfur dioxide is converted to sulfuric acid, resulting in about a two percent increase in acid production. The cost of this additional acid is about $69 per ton compared with a current market price for sulfuric acid of about $35 per ton. From the analysis, it is quite apparent that the second absorption stage is added for sulfur dioxide control, not increased acid production.

As a sulfur dioxide control system, the double absorption process has become the system of choice within the sulfuric acid industry since the promulgation of NSPS in 1971. Of the 46 new sulfuric acid plants constructed between 1971 and 1985, 40 employed this process for sulfur dioxide control. Several single absorption plants have also been converted to double absorption plants in order to comply with sulfur dioxide emission standards. The PPP plant, for example, was built as a single absorption plant and was converted to a double absorption plant in about 1975.

The double absorption process offers the following advantages over other SO_2 control technologies:

1. 99.7 percent of the sulfur is converted to sulfuric acid compared with about 97.7 percent conversion with a single absorption plant;

2. there are no by-products produced;

3. there are no new operating processes that plant personnel must become familiar with;

4. the process permits higher inlet sulfur dioxide concentrations resulting in a reduction in equipment size;

5. there is no reduction in overall plant operating time or efficiency; and

6. there is no increase in manpower requirements.

The double absorption plant is capable of operating at a sulfur dioxide emission rate of 4.0 pounds per ton of acid or less as required by New Source Performance Standards (NSPS). However, in an effort to optimize plant performance, most plants in the fertilizer industry tend to run at sulfur dioxide emission levels close to the permitted rate.

It should be noted that when EPA adopted the NSPS for sulfuric acid plants in 1971, it was recognized that double absorption plants could operate with a sulfur dioxide emission rate in the range of 2-4 pounds per ton of acid. The sulfur dioxide emission limit, however, was set at 4.0 pounds per ton of acid to account for fluctuations that invariably occur in operating plants.

Since the adoption of the NSPS, there have been design and operating changes in sulfur burning sulfuric acid plants as well as changes and improvements in catalyst technology. At the time the NSPS were adopted, the SO_2 concentration in the gas stream leaving the sulfur burner was in the range of 9.0-9.5 percent. In recent years, changes in plant design have increased the sulfur dioxide concentration at the burner exit to 11.5-11.7 percent (see Appendix C).

It should be noted that sulfuric acid plants operating in conjunction with smelters or spent acid regeneration plants still operate with a feed gas sulfur dioxide concentration in the range of 7-9 percent. Because of this difference in the concentration of sulfur dioxide in the feed gas, it is not possible to compare the performance of a sulfur burning sulfuric acid plant as operated in Florida with a sulfuric acid plant operating at a smelter or a spent acid recovery plant. If the PPP sulfuric acid plant were to operate with a sulfur dioxide strength in the range of 7-9%, so as to be comparable to a plant operating at a smelter, the acid production rate would have to be reduced to less than 1400 tons per day.

The second improvement in sulfuric acid plant technology has been in catalyst performance. Changes have occurred in the composition of the vanadium/sodium/potassium catalyst and in the physical shape of the catalyst; from a pellet (4 and 6 millimeters in diameter by 8-15 millimeters long) to a ring-type structure (see Appendix C). The change in the composition of the catalyst plus the change in the catalyst shape has resulted in a catalyst with a higher activity and a much lower pressure drop. These changes coupled with the increase in the sulfur dioxide concentration of the feed gas have allowed sulfur burning sulfuric acid plants to operate much more efficiently and still operate in compliance with the NSPS limit for sulfur dioxide of 4.0 pounds per ton of acid.

As in 1971, plants can still operate with sulfur dioxide emissions somewhat below 4.0 pounds per ton of acid but fluctuations do occur which result in sulfur dioxide emissions that approach the NSPS limit. It was the intent of EPA when the NSPS limits were adopted in 1971 and reviewed in 1985 that the sulfur dioxide emission limit should be set with a margin of safety that will allow for these slight fluctuations in plant operation without the occurrence of a reportable violation.

Another factor that determines the sulfur dioxide emission rate from a double absorption sulfur burning sulfuric acid plant is the specific design of the plant. If maximum sulfuric acid production is the motive of the operator, as will be the case with PPP, the blower of the sulfuric acid plant will be set to operate at the maximum sustainable rate. The sulfur feed rate to the sulfur burner will then be increased until either the sulfuric acid production rate limited by permit is reached or the sulfur dioxide emission rate limited by permit is reached. Data are presented in Appendix D to illustrate the relationship between sulfur dioxide emissions and acid production at one plant.

With the sulfur dioxide emission rate set at or near the emission limit of 4.0 pounds per ton of acid, the plant will operate at a production rate that is maximum for the plant immediately after a turnaround (catalyst screening and partial replacement plus other necessary repairs). As the plant continues to operate, the pressure drop across the catalyst builds; effectively reducing the output of the blower. As this happens and as sulfur dioxide emissions are already at the limits established by NSPS, the sulfur feed rate to the plant has to be cut back resulting in a reduction in sulfuric acid production. The pressure drop across the plant continues to build and the sulfuric acid production rate continues to decline until the loss in production can no longer be tolerated. At this point, the plant is shutdown for a turnaround including catalyst screening and partial replacement and other necessary preventive maintenance to the plant. Typically, the time between turnarounds in double absorption sulfur burning sulfuric acid plants in Florida is in the range of 18-24 months.

Suggestions have been made that if the time between turnarounds is reduced to approximately nine months, the activity of the catalyst will be upgraded more frequently resulting in lower sulfur dioxide emissions. While catalyst activity will be improved as a result of screening and partial replacement, the plant production rate will also be increased. The primary factor driving the plant turnaround schedule is the pressure drop across the plant and more specifically, the sulfuric acid production rate of the plant. In many cases, sulfur dioxide emissions are not significantly reduced during the period of time immediately following a turnaround. Sulfur dioxide emission data and sulfuric acid production data presented both as Figure 4-1 and in Appendix D illustrate this point.

These data show (see Figure 4-1 and Appendix D) that immediately after turnaround the sulfur dioxide emissions are in the range of 3.25 pounds per ton of acid produced and approach 4.0 pounds per ton of acid (daily average) within approximately two months after turnaround. At the same time, it will be noted that immediately following turnaround the production rate is about 1650 tons per day. The production rate drops off at more or less a uniform rate until it reaches a rate in the range of 1400 tons per day prior to the next turnaround.

The effect of increasing the frequency of sulfuric acid plant turnaround at PPP from once every 18 months to once every nine months is forecasted in Appendix D. These data show that total sulfur dioxide emissions over an 18-month period with a turnaround once every 18 months will be in the range of 1566 tons (per 18-month period). With a turnaround once every nine months, the total sulfur dioxide emissions over a similar 18-month period (two successive 9-month periods) will be 1528 tons. The reduction is about 38 tons over an 18-month period, or about 25 tons per year.

Associated with the slight reduction in sulfur dioxide emissions is the cost of the interim turnaround (the 9-month turnaround). This cost is in the range of $600,000 (Table 4-1). The downtime with such a turnaround will be between 7-10 days. For purposes of this analysis, a downtime of 8.5 days was selected. The cost associated with catalyst replacement and disposal, catalyst screening, supplies, contract labor and payroll were developed from data provided by PPP. The steam cost and water treatment cost are the costs associated with operating an auxiliary boiler to provide steam to run the remainder of the PPP fertilizer complex normally provided by the sulfuric acid plant. The sulfuric acid cost is for the sulfuric acid that PPP would have to purchase to continue operating the phosphoric acid plant and granular fertilizer plant during the 8.5 day shutdown. The cost used is the differential cost between what PPP would pay for sulfuric acid on the open market if the acid was available and the cost of production. It should be noted that at the present time, it is very difficult to purchase sulfuric acid in Florida. The fuel cost for reheating is the fuel necessary to reheat the sulfuric acid plant during startup and the sulfur and sulfuric acid lost are quantities of these materials wasted as a result of the shutdown.

In summary, an extra turnaround of the PPP sulfuric acid plant during the ninth month of a normal 18-month turnaround cycle will cost approximately $600,000 and will result in a decrease in sulfur dioxide emissions of approximately 25 tons per year. The cost of sulfur dioxide control is $25,972 per ton. More frequent catalyst changes are therefore rejected from BACT consideration.

4.2.1.2 Addition of Another Catalyst Bed to a Double Absorption Sulfuric Acid Plant

Most double absorption sulfur burning sulfuric acid plants consist of a sulfur burner, three catalyst beds to convert SO_2 to SO_3, an intermediate absorption tower, a fourth catalyst bed, a final absorption tower, acid mist control and a heat recovery system. These plants are referred to as 3 by 1 (three catalyst beds followed by one catalyst bed) plants. The predominance of this type of plant is dictated by the fact that this arrangement has been determined to be the most cost effective design. The PPP sulfuric acid plant is a 4 by 1 plant as a result of the initial design and subsequent modifications that were made in about 1975.

The conversion of sulfur dioxide produced in the sulfur burner to sulfur trioxide in the catalyst bed and the subsequent absorption of the sulfur trioxide determines the conversion efficiency of a plant (conversion of sulfur to sulfuric acid). As the only release of unconverted sulfur is sulfur dioxide (and a small amount of acid mist) in the stack gas, the conversion efficiency also determines the emissions from the plant.

The conversion from sulfur dioxide to sulfur trioxide is a complex reaction (Appendix C). The equilibrium concentrations of this reaction are determined in part by temperature, the oxygen:sulfur dioxide ratio and the sulfur trioxide concentration. The approach to this equilibrium is a function of temperature, reaction time and the activity of the catalyst.

Lower temperatures promote a higher conversion of sulfur dioxide to sulfur trioxide; however, lower temperatures reduce the reaction rate. Increasing the contact time to compensate for a reduced reaction rate at lower temperatures requires more catalyst (greater contact time). The overall conversion process is a complex balance between these and possibly other factors in a temperature range between approximately 770°F and 1150°F and in a time period of approximately 1.5 seconds.

The lower temperature limit is determined by the activation temperature of the catalyst. Conventional catalysts have a minimum activation temperature of approximately 770°F (a practical operating minimum of 790°F). The upper temperature limit of the catalyst is about 1150°F.

In a typical double absorption plant (a 3 by 1 plant), approximately 90-94 percent of the sulfur dioxide is converted to sulfur trioxide in the first three catalyst beds. The gas stream then passes through an intermediate absorption tower where the sulfur trioxide is absorbed resulting in a shift in the equilibrium curve favoring further conversion of sulfur dioxide to sulfur trioxide. In the fourth catalyst bed, conversion from 90-94 percent to the final overall conversion of 99.7 percent occurs. This overall conversion results in a sulfur dioxide emission rate of 4.0 pounds per ton of acid produced.

The addition of one or more catalyst beds following the final bed (without the addition of a third absorption tower) will theoretically result in a fractional increase in conversion efficiency. The increase is limited by the slope of the equilibrium curve as 100 percent conversion is approached (see Appendix C) and by the fact that the temperature required to reach the higher conversion approaches the lower activation limits of the catalyst.

In practice, however, it has been observed that there is no measurable improvement in conversion between a 3 by 1 plant and a 3 by 2 plant (The same would apply between a 4 by 1 plant and a 4 by 2 plant). The cost to add an additional catalyst bed to an existing 2000 ton per day sulfuric acid plant is estimated to be in the range $1.5-2.0 million. Operational costs will also increase because of the increased pressure drop across the plant and maintenance costs will increase. This expenditure might theoretically result in an additional 10 to 15 percent conversion (from 99.7 to 99.73 or 99.75 percent) but in practice will result in no observable conversion increase. The cost estimated to add a third absorption tower followed by an additional catalyst bed is in the range of $6.6 million. It is for these reasons that the addition of more catalyst beds to double absorption plants has been determined to be impractical.

4.2.1.3 Ammonia Scrubbing

Five sulfuric acid plants constructed between 1971 and 1985 use ammonia scrubbing for sulfur dioxide control. None of these plants were double absorption plants. The process can be effective for reducing sulfur dioxide emissions to below 4.0 pounds per ton and also for controlling sulfuric acid mist emissions. The major disadvantages of ammonia scrubbing are:

1. a waste by-product is produced;

2. the scrubbing system is a high maintenance item and requires additional manpower for operation; and

3. no sulfuric acid production increase benefits are achieved with the scrubbing system; and

4. the environmental liabilities of introducing a potential Hazardous Air Pollutant release point at another location in the plant.

Ammonia scrubbing uses anhydrous ammonia and water in a scrubbing system to convert sulfur dioxide to ammonium sulfite/bisulfite and eventually to ammonium sulfate. The ammonium sulfate can be crystallized and sold as a market commodity, it can be blended back into the fertilizer plant or it can be disposed of as a waste. One plant that operates ammonia scrubbers on sulfuric acid plants had an ammonium sulfate crystallizer but abandoned it because of the volatility of the market.

There are several factors that must be considered when determining whether or not ammonium sulfate can be blended back into a fertilizer plant; particularly back into an existing plant. The ammonium sulfate would be added back as about a 20% solution. The options for adding it back include adding it to the attack tank of the phosphoric acid plant or, in the case of PPP, adding it to the reactor of the DAP plant.

Adding the ammonium sulfate solution to the phosphoric plant has three major drawbacks. First, the additional sulfate affects the sulfate balance in the reaction between the sulfuric acid and phosphate rock creating problems with the gypsum crystal growth; the heart of phosphoric acid production. Secondly, and related to gypsum crystal formation, the added sulfate will affect the filterability of the phosphoric acid resulting in a greater P_2O_5 loss. The third major drawback is that the water added along with the ammonium sulfate will increase the load on the evaporators of the phosphoric acid plant. In an existing plant, the added load on the evaporators will result in a reduction in phosphoric acid production.

When added to the DAP plant, the ammonium sulfate solution has other drawbacks. First, the addition water in the ammonium sulfate solution will add to the evaporative load of the DAP dryer; resulting in greater fuel use and the associated emission increases. Secondly, the additional sulfate interferes with the granulation process making an acceptable grade of granulative product more difficult to produce. Thirdly, and perhaps most critical, the additional sulfate will "dilute" the nitrogen and P_2O_5 contents of DAP. DAP typically has a nitrogen content of 18% and a P_2O_5 content of 46%. This grade is necessary for the product to be competitive on the international market. The added sulfate will reduce the nitrogen and P_2O_5 contents resulting in a product that may not be marketable.

PPP has determined that with all factors considered, the ammonium sulfate scrubbing liquor cannot be incorporated into the DAP plant. Thus, at PPP, the ammonium sulfate must be considered a waste and counted as a cost in the ammonia scrubbing cost analysis.

The cost of an ammonia scrubber on the existing PPP sulfuric acid plant was based on a sulfuric acid production rate of 2000 tons per day and the reduction of sulfur dioxide emissions to 2.0 pounds per ton of acid. The cost of an ammonia scrubber was estimated to be $3.5 million. This cost and other cost factors are summarized in Table 4-2. The total annual cost for recovering capital and operating an ammonia scrubber is approximately $2.23 million. The sulfur dioxide emission reduction (from 4.0 to 2.0 pounds per ton of acid) will be approximately 730 tons per year. The cost of sulfur dioxide removal will be approximately $3,053 per ton. This cost, coupled with the reduced reliability factor that will be introduced by the add-on scrubber system, makes ammonia scrubbing not cost effective as BACT.

It should also be noted that ammonia scrubbers have not been added to any double absorption sulfuric acid plant in Florida nor to any double absorption sulfuric acid plant anywhere as far as could be determined.

This fact confirms the conclusion reached herein regarding the cost effectiveness of ammonia scrubbers as add-on control for double absorption plants.

4.2.1.4 Other Scrubbing Technologies

Between 1971 and 1985, two sulfuric acid plants were constructed employing sodium sulfite-bisulfite scrubbing to control sulfur dioxide emissions. One of the plants was subsequently converted to ammonia scrubbing and the second plant has never been used. As a result, sodium sulfite-bisulfite scrubbing is not considered a demonstrated sulfur dioxide control alternative.

Other scrubbing liquors that have a potential for reducing sulfur dioxide emissions include caustic, sodium carbonate, calcium oxide and hydrogen peroxide. Without going through a detailed cost analysis to evaluate these scrubbing technologies, it can be stated that the capital investment cost and many of the direct and indirect annual costs will be very similar to the costs incurred with ammonia scrubbing (Table 4-2). Because of higher chemical costs and/or waste disposal costs, these other technologies are expected to be more costly than ammonia scrubbing. For this reason, these technologies would not be considered the scrubbing technology choice.

4.2.1.5 Molecular Sieves

A molecular sieve was installed at one sulfuric acid plant in Florida for sulfur dioxide control. The system was effective for controlling sulfur dioxide; however, extensive operating problems were experienced as the molecular sieve also absorbed nitrogen oxides. The regeneration of sieves resulted in the formation of nitric acid within the sulfuric acid plant. The nitric acid/sulfuric acid mixture resulted in severe corrosion problems which caused the molecular sieve system to be abandoned. As a result, molecular sieves are not considered a viable alternative for sulfur dioxide control in sulfuric acid plants.

4.2.1.6 Catalyst Selection

The two papers in Appendix C reference changes in catalyst composition and shape that have occurred since NSPS for sulfuric acid plants were adopted in the early 1970s. The first major change was a change in catalyst shape. The catalyst went from pellets that were 4.0 millimeters and 6.0 millimeters in diameter by 8-15 millimeters long to a ring-type catalyst. The major effect of this shape change was to reduce the pressure drop through the sulfuric plants both initially and over time. The results of this improvement were to extend the time between plant turnarounds from approximately nine months to 18 months or more and to reduce blower operating costs.

A change in catalyst composition, beyond changes in the vanadium content of the catalyst, has been the reintroduction of the "cesium catalyst". The cesium catalyst is a 6-8 percent vanadium catalyst with a portion of the potassium promoter replaced by cesium. The introduction of cesium reduces the activation temperature of the catalyst by approximately 20°F (from about 770°F to 750°F). At temperatures above approximately 770°F, the performance of the cesium catalyst and the conventional catalyst are about the same.

The advantage of the cesium catalyst is that it allows the startup of a sulfuric acid plant at a lower entrance gas temperature. This is a distinct advantage for sulfuric acid plants operating at smelters and spent acid recovery plants where there are frequent plant startups and shutdowns. In sulfuric acid plants that are operating at a steady-state, the potential advantage of using a cesium catalyst is that the temperature (normally of the last catalyst bed) can be reduced about 20°F.

The shift to a lower temperature also has a disadvantage; i.e.,reducing the reaction rate which slows the approach to equilibrium. In existing plants, physical constraints limit the amount of catalyst that can be used, thus limiting how much the contact (reaction) time can be increased to offset the reduced reaction rate. The reduction in reaction rate therefore could offset the more favorable conversion resulting in no appreciable overall improvement in plant conversion efficiency.

Cesium catalyst has not been used in any sulfur burning double absorption plant in the U.S. as far as could be determined. The Monsanto paper in Appendix C cites five examples of the utilization of cesium catalyst: two in double absorption spent acid plants, one in a single absorption spent acid plant and two in single absorption sulfur burning plants. Four of the five plants were operating with feed gas sulfur dioxide concentrations in the range of 7-9 percent (compared with 11.5-11.75 percent in Florida plants). Performance data from these plants therefore cannot be extrapolated to Florida plants. The fifth example was a double absorption spent acid plant with a "12 percent SO_2 gas strength." The paper says nothing about the oxygen:sulfur ratio of this plant and further says nothing about sulfur dioxide emissions other than they were "low".

It was also pointed out (Appendix C) that cesium catalyst has rarely been used in sulfur burning plants but that it has some advantages in spent acid and metallurgical sulfuric acid plants. The advantages are related to plant startup at lower gas temperatures. Both papers in Appendix C discuss potential problems with pressure buildup when using cesium catalyst and the Monsanto paper discusses the compatibility of the heat exchange systems in existing plants with cesium catalyst. Another disadvantage of the cesium catalyst is that the cesium catalyst cost is 2.5-3.0 times the cost of conventional catalyst.

Although cesium catalyst has the potential for reducing sulfur dioxide emissions, the results have not been demonstrated in sulfur burning double absorption plants as operated in Florida. The potential improvement in conversion efficiency is the result of operating a catalyst bed at a lower temperature. This shift in temperature also has the effect of reducing the sulfur dioxide to sulfur trioxide reaction rate. In existing plants where plant geometry is fixed, the amount of catalyst that can be used (and hence, the contact time or reaction time) is fixed. As a result, the approach to equilibrium is rate limited.

Thus, the improved conversion efficiency must be balanced against the reduced reaction rate and the heat exchange capacity of existing plants. Other unknowns or disadvantages of using cesium catalyst in sulfur burning double absorption plants include the potential for pressure drop buildup which will increase plant turnaround frequency and the costs associated therewith, and the premium costs of cesium catalysts.

As a result of weighing the potential advantage of cesium catalyst (improved performance as a result of operating at a lower temperature and not the result of a higher catalyst activity) against the potential disadvantages of the catalyst (slower reaction rate, potential for pressure drop buildup, heat exchange compatibility and cost), cesium catalyst has not been used in sulfur burning double absorption plants and hence, is not a demonstrated technology.

4.2.1.7 Monsanto Heat Recovery System

The Monsanto Heat Recovery System (HRS) is not a sulfur dioxide control option. It was developed, as the name implies, to improve heat recovery in sulfuric acid plants. The system is mentioned here only to clarify this point.

The HRS is described in Appendix E. Although the paper addresses reduced sulfur dioxide emissions from the plant where the heat recovery system (HRS) was installed, the primary focus of the paper was on the more efficient recovery of the heat generated in sulfuric acid plants.

The plant on which the HRS was installed was a single absorption 1350 ton per day sulfuric acid plant with a feed gas SO_2 concentration of 7.8 percent. The sulfur dioxide to sulfur trioxide conversion prior to the installation of the HRS was 97.7 percent; a conversion typical of single absorption sulfuric acid plants. It was guaranteed that following the installation of the HRS, the plant could operate with an 8.3 percent sulfur dioxide feed gas, the acid production of the plant would remain at 1350 tons per day and the sulfur dioxide to sulfur trioxide conversion would increase to 99.6 percent.

In actuality, the HRS converted the single absorption plant to a double absorption plant by introducing an intermediate absorption tower followed by a fourth catalyst bed. The actual production of the plant increased to 1430-1440 tons per day and the sulfur dioxide to sulfur trioxide conversion improved to 99.85-99.90 percent. Neither the increased production nor the conversion efficiency is surprising. The production increase resulted from the improvement in conversion and from the planned increase in the SO_2 concentration of the feed gas stream from 7.8 percent to 8.3 percent.[1] The higher than guaranteed conversion efficiency is strictly a function of the effect of the high oxygen:sulfur dioxide ratio on the sulfur dioxide:sulfur trioxide conversion equilibrium.

4.2.2 Sulfuric Acid Mist Control

Control alternatives that were reviewed by EPA in the 1985 New Source Performance Standards review are summarized in the following sections.

4.2.2.1 Fiber Mist Eliminators

The 46 new sulfuric acid plants constructed between 1971 and 1985, all used the fiber-type mist eliminators for sulfuric acid mist control. Operations demonstrated that these types of mist eliminators can control sulfuric acid mist emissions to 0.15 pounds per ton of sulfuric acid or less.

The mist eliminators are the choice of control for sulfuric acid mist within the sulfuric acid industry because they require very little operation and maintenance attention and because of the small space requirement associated with these devices. The disadvantage of this type of mist eliminator is that the pressure drop across the elements varies

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[1]Note: Pre-conversion production of 1350 tpd x (8.3/7.8), ratio of pre- and post-conversion SO_2 feed concentrations x (99.85/97.7), ratio of conversion efficiencies = Expected post-conversion production; 1468 tpd.

from five to 15 inches of water; resulting in an increase in operating utility costs.

4.2.2.2 Electrostatic Precipitators

Electrostatic precipitators (ESPs) have the potential for controlling sulfuric acid mist emissions from sulfuric acid plants; however, there is no demonstrated application of ESPs. The disadvantages associated with ESPs and hence, the reason they have not been used, include the initial cost, size requirements, operating and maintenance requirements and the potential for corrosion.

4.2.3 Nitrogen Oxides Control

The combustion of sulfur in a sulfur burning sulfuric acid plant is a relatively low temperature process at oxygen levels that are, out of necessity, relatively high. The gas temperature exiting a sulfur furnace is in the range of 2000^{o}F with an oxygen concentration in the range of 9.2 percent. If the oxygen concentration is decreased (and the sulfur dioxide concentration correspondingly increased), the catalyst in sulfuric acid plants becomes ineffective and sulfur dioxide to sulfur trioxide conversion efficiency drops off markedly. The temperature of the exit gas is strictly a function of the heat of combustion of sulfur at the air flow rate necessary to provide approximately 9.2 percent oxygen and 11.7 percent sulfur dioxide in the furnace exit gas.

Compared to a fossil fuel fired combustion source, the temperature of a sulfur furnace is generally lower and the oxygen content of the combustion gas is generally higher. As a result of the relatively low combustion temperature, the nitrogen oxides concentration in the gas stream leaving the sulfur furnace is inherently quite low; in the range of 20 parts per million (v/v). This compares with NOx concentrations of several hundred parts per million in stack gases from typical fossil fuel combustion sources. As a result, there has historically not been any emphasis placed on controlling NOx emissions from the sulfuric acid plants. For purposes of this analysis, control technologies for NOx will be briefly reviewed as they might apply to sulfur burning sulfuric acid plants.

Flue gas recirculation and low-NOx burners are not applicable. Flue gas recirculation would not be practical as reducing oxygen levels below 9.2 percent will be counterproductive as previously discussed. The low-NOx burner is not applicable for the reason that combustion temperatures are already relatively low and further refinements to the combustion process will not be productive in further reducing the NOx concentration in the furnace exit gas. Furthermore, low-NOx burners for sulfur furnaces do not exist.

Add-on control devices include selective catalytic and non-catalytic NOx reduction. Both involve the introduction of ammonia to the stack gas. If introduced, the ammonia would first react with any sulfuric acid mist that is present, producing an ammonium sulfite/bisulfite/sulfate aerosol. These aerosols will plug the mist eliminator normally used in sulfuric acid plants if the NOx control system is installed prior to the mist eliminator. If installed after the mist eliminator, the aerosols will be extremely difficult to remove from the gas stream and will result in a very visible plume from the sulfuric acid plant.

Another consideration related to the use of catalytic and non-catalytic NOx reduction is the operating temperatures of the systems. The catalytic reduction system requires a temperature in the range of 600-750^{o}F while the non-catalytic reduction system requires a temperature between 1500-2200^{o}F. The temperature of the gas stream exiting a sulfuric acid plant is normally in the range of 170^{o}F. The energy to heat the gas stream to a temperature range of even 600-750^{o}F would be about 50 MMBtu per hour. The NOx generated by the production of this heat (by fossil fuel combustion) would be about 7.5 pounds per hour. This compares to a total NOx emission rate from the PPP sulfuric acid plant of 10.0 pounds per hour.

This brief analysis of NOX control alternatives demonstrates that none are applicable to sulfur burning sulfuric acid plants.

4.3 BACT CONCLUSION

All recent FDEP and EPA BACT determinations for sulfur burning double absorption sulfuric acid plants have concluded that the double absorption process for sulfur dioxide control and the fiber mist eliminators for sulfuric acid mist control represent BACT. No control has been imposed for NOx emissions. These determinations were based on case-by-case analyses taking into account environmental, energy and economic impacts, the degree of emission reduction and the demonstrated availability of the control technology. The BACT determinations placed no restrictions on plant operating practices nor were they specific regarding component parts of the plant.

The BACT review conducted for PPP has reviewed the basic double absorption system, modifications to this system, changes in normal sulfuric acid plant operating practices, changes in catalyst type and various add-on control systems for sulfur dioxide control. For sulfuric acid mist control, the PPP BACT analysis included the fiber-type high efficiency mist eliminators and electrostatic precipitators. For NOx control, the analysis included sulfur furnace modifications and add-on control systems.

From the results of this BACT analysis, it can be concluded that for sulfur dioxide:

1. Increasing the frequency of plant turnarounds for catalyst screening and partial replacement could result in a slight decrease in sulfur dioxide emissions. The cost of sulfur dioxide control with this alternative however is in the range of $26,000 per ton (Table 4-1).

2. The addition of catalyst beds to a double absorption sulfuric acid plant theoretically could slightly reduce emissions but practically will have no measurable effect on emissions. The capital cost of one additional catalyst bed is in the range of $1.5-2.0 million. The operating and maintenance costs will also be increased.

3. The use of an add-on ammonia scrubber to control emissions from a double absorption sulfuric acid plant could be effective. The cost of sulfur dioxide control using an ammonia scrubber is in the range of $3,100 per ton (Table 4-2). In addition to this cost, the operating factor of a sulfuric acid plant will be reduced because of the additional downtime associated with the ammonia scrubber.

4. Other scrubbing technologies will have the same approximate capital and operating costs as an ammonia scrubber. However, chemical and/or waste disposal costs will be higher. As a result, other scrubbing technologies were excluded for further consideration.

5. Molecular sieves are not a control alternative because of severe corrosion problems inherent to these systems.

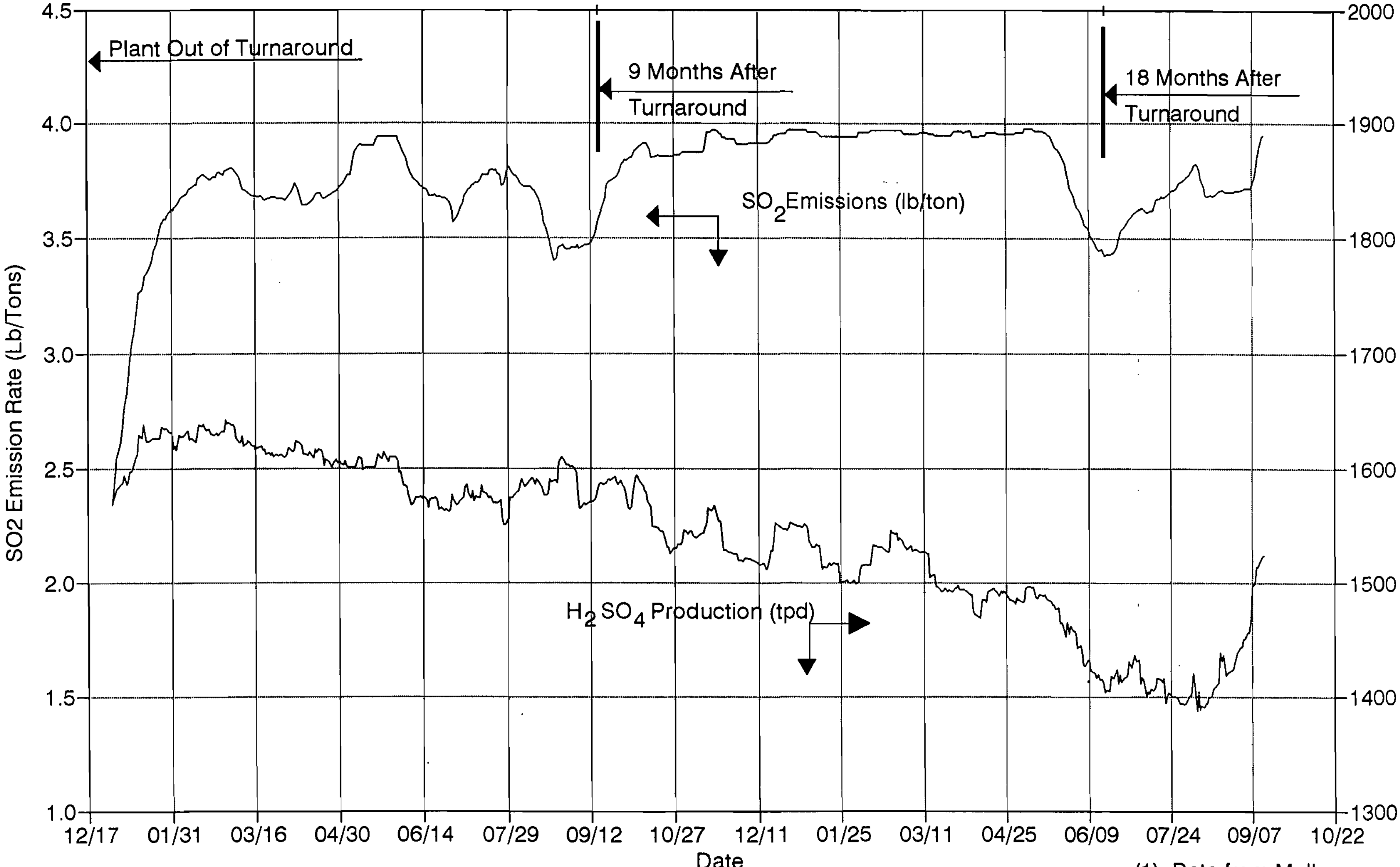
6. The use of a cesium catalyst is not demonstrated technology when applied to sulfur burning double absorption sulfuric acid plants as operated in Florida. There are potential advantages and potential disadvantages to the use of cesium catalyst in sulfur burning double absorption plants. The net effect of the advantages and disadvantages could be that there is no reduction in sulfur dioxide emissions. The technology is not proven.

7. The Monsanto Heat Recovery System (HRS) is a heat recovery system; not a sulfur dioxide control system. Sulfur dioxide emissions might be reduced by the HRS; but as the result of another absorption tower and another catalyst bed that are integral parts of the HRS.

For sulfuric acid mist control, this analysis considered fiber mist eliminators and electrostatic precipitators. Mist eliminators were determined to be the choice of control for sulfuric acid mist throughout the industry.

The review of control technologies for NOx emissions demonstrated that sulfur furnace modifications were not applicable for reducing the NOx generated during the sulfur combustion process. The analysis also demonstrated that selective catalytic and non-catalytic reduction for NOx control was not feasible for sulfuric acid plants because of temperature incompatibilities.

Considering all of these factors, PPP will continue to use the double absorption system for sulfur dioxide control with no restrictions on operating practices or on catalyst type. For sulfuric acid mist control, PPP will continue to use fiber mist eliminators and for NOx emissions, no control is proposed. This determination is based on a top-down BACT analysis and the conclusions are consistent with the 1985 EPA NSPS review for sulfuric acid plants and with BACT determinations that have been made since that time; both in Florida and elsewhere in the U.S.



(1) Data from Mulberry Phosphates, Inc Mulberry, Florida

Figure 4-1
Sulfur Dioxide Emission Rate (lb/ton of acid) and Production Rate (tons/day of acid) as a Function of Time After Plant Turnaround (1)
Piney Point Phosphates, Manatee County, Florida

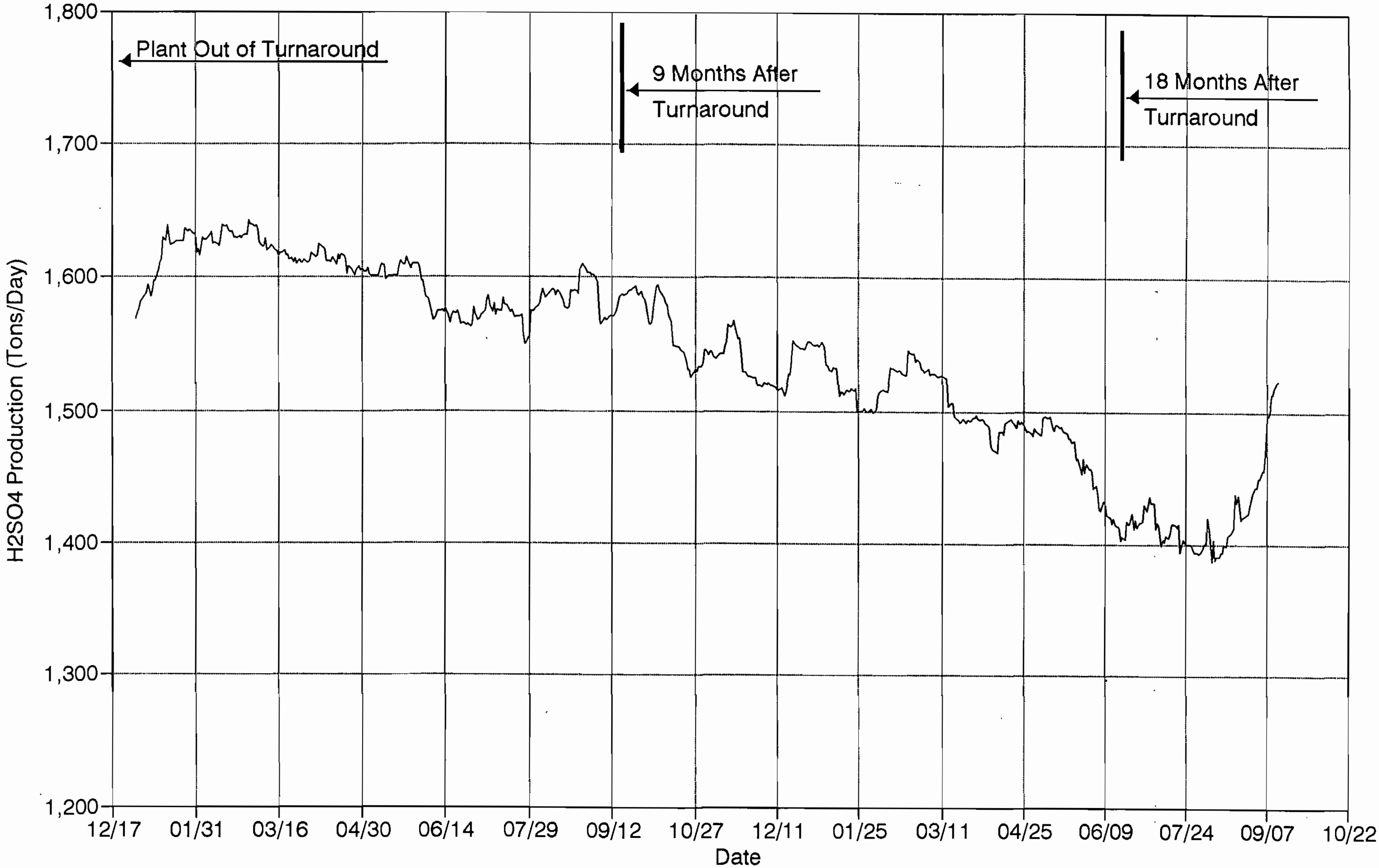


Figure 4-2
Sulfuric Acid Production Rate
as a Function of Time After Plant Turnaround (1)
Piney Point Phosphates, Manatee County, Florida

(1) Data from Mulberry Phosphates, Inc. Mulberry, Florida

TABLE 4-1

COST ANALYSIS OF AN INTERIM SULFURIC ACID PLANT TURNAROUND FOR CATALYST SCREENING AND PARTIAL REPLACEMENT(1)

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Average Downtime for Catalyst Screening - 8.5 days

Catalyst Replacement (includes disposal)	$ 49,900
Screening (Contract)	39,600
Supplies/Equipment/Contract Labor	48,500
Warehouse Issued Materials	14,300
Payroll	12,800
	$ 165,100
Steam Cost by Auxiliary Boiler (2) Fuel @ 1350 gal/hr x $0.70/gal x (24 x 8.5) hr	$ 192,800
Water Treatment for Boiler (2)	10,000
H_2SO_4 Cost Differential (3) 2000 tpd x 8.5 day x ($35-20)/ton(4)	255,000
Fuel to Reheat	9,600
Sulfur Lost(5)	3,000
H_2SO_4 Lost(5)	13,800
TOTAL COST OF TURNAROUND	$ 649,300

(1) Determined from records of actual turnaround costs at Mulberry Phosphates, Inc.

(2) Steam produced by plant auxiliary boiler to run fertilizer complex while sulfuric acid plant is down.

(3) Differential cost (market cost minus cost that would have been incurred by PPP) to provide 2000 tpd H_2SO_4 to run fertilizer complex while sulfuric acid plant is down.

(4) Sulfuric acid prices fluctuate between $28-42 per ton.

(5) Material wasted because of shutdown.

TABLE 3-3

MAJOR FACILITY CATEGORIES

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Fossil fuel fired steam electric plants, more than 250 MMBTU/hr heat input
Coal cleaning plants (with thermal dryers)
Kraft pulp mills
Portland cement plants
Primary zinc smelters
Iron and steel mill plants
Primary aluminum ore reduction plants
Primary copper smelters
Municipal incinerators capable of charging more than 250 tons of refuse per day
Hydrofluoric acid plants
Sulfuric acid plants
Nitric acid plants
Petroleum refineries
Lime plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants
Fossil fuel boilers (or combinations thereof) totaling more than 250 million BTU/hr heat input
Petroleum storage and transfer units with total storage capacity exceeding 300,000 barrels
Taconite ore processing plants
Glass fiber processing plants
Charcoal production plants

TABLE 3-4

REGULATED AIR POLLUTANTS - SIGNIFICANT EMISSION RATES

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Pollutant	Significant Emission Rate tons/yr	De Minimis Ambient Impacts ug/m3
CO	100	575 (8-hour)
NOx	40	14 (NO2, Annual)
SO_2	40	13 (24-hour)
Ozone	40 (VOC)	-
PM	25	10 (24-hour)
PM10	15	10 (24-hour)
TRS (including H2S)	10	0.2 (1-hour)
H2SO4 mist	7	-
Fluorides	3	0.25 (24-hour)
Vinyl Chloride	1	15 (24-hour)
	pounds/yr	
Lead	1200	0.1 (Quarterly avg)
Mercury	200	0.25 (24-hour)
Asbestos	14	-
Beryllium	0.8	0.001 (24-hour)

TABLE 3-5

AMBIENT AIR QUALITY STANDARDS

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Pollutant	FDEP (State)		USEPA (National) Primary		USEPA (National) Secondary	
	ug/m3	PPM	ug/m3	PPM	ug/m3	PPM
SO_2, 3-hour	1,300	0.5	-	-	1300	0.5
24-hour	260	0.1	365	0.14	-	-
Annual	60	0.02	80	0.03	-	-
PM10, 24-hour	150	-	150	-	150	-
Annual	50	-	50	-	50	-
CO, 1-hour	40,000	35	40,000	35	-	-
8-hour	10,000	9	10,000	9	-	-
Ozone, 1-hour	235	0.12	235	0.12	235	0.12
NO_2, Annual	100	0.053	100	-	100	-
Lead, Quarterly	1.5	-	1.5	-	1.5	-

TABLE 3-6

PSD INCREMENTS

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Pollutant	Allowable PSD Increments (State/National) Class I ug/m3	Class II ug/m3	Class III ug/m3
PM10, Annual	4	17	34
24-hour	8	30	60
SO_2, Annual	2	20	40
24-hour	5	91	182
3-hour	25	512	700
NO_2, Annual	2.5	25	50

4.0 BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is required to control air pollutants emitted from newly constructed major sources or from modification to the major emitting facilities if the modification results in significant increase in the emission rate of regulated pollutants (see Table 3-4 for significant emission levels).

The emission rates from the repaired plant have been summarized in Table 3-2. The SO_2, SAM and NOx emissions increases from the proposed project were determined to represent a significant increase by FDEP.

The SO_2, SAM and NOx are present in the tail gas from all contact process sulfuric acid plants. In a typical plant with a single absorption system, the sulfur dioxide in the tail gas is approximately 30 pounds per ton of acid produced and the acid mist is approximately 4 pounds per ton of acid produced. In a typical plant with a double absorption system, the sulfur dioxide in the tail gas is approximately 4 pounds per ton of acid produced and the acid mist is approximately 0.15 pounds per ton of acid produced. The nitrogen oxides that are present in the tail gas are formed in the sulfur burners as a result of the fixation of atmospheric nitrogen. Recent measurements have indicated that the concentration of nitrogen oxides in the tail gas from a sulfuric acid plant can be around 0.12 pound per ton of acid produced.

4.1 EMISSION STANDARDS FOR SULFURIC ACID PLANTS

Federal New Source Performance Standards (NSPS) for sulfuric acid plants became effective on August 17, 1971. These standards are codified in 40 CFR 60, Subpart H and require sulfur dioxide emissions to be limited to no more than 4.0 pounds per ton of 100 percent acid produced and require that sulfuric acid mist emissions be limited to no more than 0.15 pounds per ton of 100 percent acid produced. Additionally, the standards limit the opacity of the emissions from new or modified sulfuric acid plants to less than 10 percent. There are no emission standards under NSPS for nitrogen oxides from sulfuric acid plants.

EPA's most recent review of the New Source Performance Standards for sulfuric acid plants in 1985 (EPA-450/3-85-012), concluded that because of variations in sulfur dioxide emissions as a function of catalyst age:

> "... the level of SO_2 emissions as specified in the current NSPS (should) not be changed ...."

TABLE 4-2
COST ANALYSIS OF AMMONIA SCRUBBING TO REDUCE
SO_2 EMISSIONS FROM A 2000 TPD SULFURIC ACID PLANT

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

CAPITAL COST FACTORS		
Total Direct Cost (DC)		$ 3,500,000
Indirect Costs (IC)		
Total (0.31 x DC)		$ 1,085,000
Total Capital Investment (TCI)		
DC + IC		$ 4,585,000
ANNUAL COST FACTORS		
Direct Annual Costs (DAC)		
Operating Labor [2 hr/day x 360 d/yr x $20.00/hr] x 1.15	=	$ 16,600
Maintenance Labor plus Materials 3% of TCI	=	$ 137,600
Chemicals	=	$ 155,100
Water Treatment for Scrubber Make-up Water	=	$ 52,300
Waste Disposal	=	$ 451,800
Utilities	=	$ 247,200
Cost of 2 days per year H2SO4 Plant downtime because of scrubber	=	$ 122,700
TOTAL DIRECT ANNUAL COST (DAC)		$ 1,173,300
Indirect Annual Costs (IAC)		
Overhead (60 % of Operating & Maintenance)	=	$ 92,500
Admin/Tax/Ins (0.04 x TCI)	=	$ 183,400
Capital Recovery (10 years at 11%) (0.170 x TCI)		$ 779,500
TOTAL INDIRECT ANNUAL COST (IAC)		$ 1,055,400
Total Annual Cost		
DAC + IAC		$ 2,228,700

5.0 AIR QUALITY REVIEW

The air quality review for the proposed project included emission increases associated with the sulfuric acid plant and the molten sulfur system. The modeling associated with this review demonstrated that the maximum predicted air impacts of SO_2, SAM and NOx emission increases are less than significant.

5.1 AIR QUALITY MODELING

A preliminary modeling analysis was conducted to determine the ambient air impacts resulting from SO_2, SAM and NOx emissions as a result of the proposed project. The allowable pollutant emission levels associated with the existing sulfuric acid plant and the molten sulfur system were considered in the preliminary modeling analysis. As acknowledged by FDEP and suggested by EPA modeling guidance, the allowable emissions of the existing plant were included in the modeling as these emissions are from a permitted source and have been carried forward in the sulfur dioxide emissions inventories for all PSD projects in the area.

5.1.1 Significant Impact Analysis

The Significant Impact Analysis (SIA) modeling was conducted using the Industrial Source Complex-Short Term air quality model, Version 96113 (ISC3), in accordance with guidelines established by EPA and published in the document, *Guideline for Air Quality Modeling*, (Revised), July 1986.

The SO_2 emissions modeled for the SIA were the emissions associated with the existing sulfuric acid plant, the repaired sulfuric acid plant and molten sulfur system. The currently permitted SO_2 emissions were represented as negative inputs while the proposed (identical) SO_2 emissions from the repaired plant and molten sulfur system were represented as positive inputs to the model. The plant was modeled at annual hours of operation of 8760. Modeling inputs are presented in Table 5-1.

A SIA was also conducted for the nearest Class I area, Chassahowitzka National Wildlife Refuge, located about 115 kilometers north of the plant. Although the ISC3 model is not generally recommended for impact analyses beyond 50 kilometers from a source, it has been accepted by FDEP, EPA and the NPS as a preliminary "screening" model to determine the potential impacts of a proposed project on areas beyond 50 kilometers. From a practical standpoint, the regulatory agency has accepted ISC3 modeling analyses in these types of circumstances mainly because (a) the impacts predicted by the ISC model over such long distances are far greater (more conservative) than impacts predicted by the EPA recommended MESOPUFF (long range transport) model; and, (b) effort intensive MESOPUFF modeling could potentially be avoided by favorable ISC3 results.

The Class I area SIA modeling included 13 discrete receptors previously determined by FDEP to be representative of the Chassahowitzka National Wildlife Refuge boundary.

The meteorological data used for the modeling were for Tampa, Florida, and represented the five consecutive year period of 1987-1991.

The modeling results, summarized in Table 5-2, indicate less than significant ambient air impacts in both Class I and Class II PSD areas as a result of the proposed project. Therefore, additional refined modeling was not necessary.

TABLE 5-1

AIR QUALITY MODELING PARAMETERS

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

Emission Unit	Stack Ht (m)	Stack Dia (m)	Stack Gas Vel (mps)	Stack Gas Temp (^{o}K)	Emission Rates SO_2 (g/s)	Emission Rates SAM (g/s)	Emission Rates NOx (g/s)
Sulfuric Acid Plant							
Exist.	60.98	2.38	8.75	338	42.0	1.6	1.3
Prop.	60.98	2.38	8.75	338	42.0	1.6	1.3
Molten Sulfur							
Exist.	7.3	1.21	0.1	366	0.03	NA	NA
Prop.	7.3	1.21	0.1	366	0.03	NA	NA

NOTES:

1. The molten sulfur system stack corresponds to the large storage tank vent.

2. Building downwash effects were included in the modeling.

TABLE 5-2

SUMMARY OF SULFUR DIOXIDE, NITROGEN OXIDES
AND SULFURIC ACID MIST SIGNIFICANT IMPACT ANALYSIS

PINEY POINT PHOSPHATES, INC.
MANATEE COUNTY, FLORIDA

MAXIMUM PREDICTED CLASS I/II IMPACTS (ug/m^3) (1)(2)(3)

MET DATA	SULFUR DIOXIDE 3-hr	SULFUR DIOXIDE 24-hr	SULFUR DIOXIDE Annual	NITROGEN OXIDES Annual	SULFURIC ACID MIST Annual
1987	0	0	0	0	0
1988	0	0	0	0	0
1989	0	0	0	0	0
1990	0	0	0	0	0
1991	0	0	0	0	0

NOTE:

(1) The maximum predicted impacts represent the highest-high impacts, as requested by FDEP.

(2) Class I and Class II area impacts; impacts in both areas are zero.

(3) The predicted impacts, being zero, are less than significant.

6.0 GOOD ENGINEERING PRACTICE STACK HEIGHT

The criteria for good engineering practice stack height in Rule 62-210, FAC, states that the height of a stack should not exceed the greater of 65 meters (213) feet or the height of nearby structures plus the lesser of 1.5 times the height or cross-wind width of the nearby structure. This stack height policy is designed to prevent achieving ambient air quality goals solely through the use of excessive stack heights and air dispersion.

Based on this policy, the limiting height for the sulfuric acid plant stacks is 213 feet. The sulfuric acid plant stack is less than 213 feet in height above-grade, and therefore, in compliance with GEP stack height criteria.

7.0 IMPACTS ON SOILS, VEGETATION AND VISIBILITY

The U. S. Environmental Protection Agency was directed by Congress to develop primary and secondary ambient air quality standards. The primary standards were to protect human health and the secondary standards were to:

> "... protect the public welfare from any known or anticipated adverse effects of a pollutant."

The public welfare was to include soils, vegetation and visibility.

As a basis for promulgating the air quality standards, EPA undertook studies related to the effects of all major air pollutants and published criteria documents summarizing the results of the studies. The studies included in the criteria documents were related to both acute and chronic effects of air pollutants. Based on the results of these studies, the criteria documents recommended air pollutant concentration limits for various periods of time that would protect against both chronic and acute effects of air pollutants with a reasonable margin of safety.

The preliminary air quality modeling for the proposed project demonstrated that the maximum predicted impacts will be less than significant. Consequently, it is reasonable to conclude that there will be no adverse effect to the soils, vegetation or visibility of the area. Also, the proposed project is not expected to have any growth related impacts associated with the plant start up.

8.0 CLASS I AREA AQRV ANALYSIS

In the previous section, the impact of the air emission increases on air quality related values in the vicinity of the proposed project was addressed. The analysis addressed in this section extends the review of the impact of increased emissions on air quality related values to the Chassahowitzka Class I PSD area; an area in excess of 115 kilometers northwest of the proposed project.

As preliminary air quality modeling for the proposed project demonstrated that the maximum predicted Class I area impacts will be less than significant, it is reasonable to conclude that there will be no adverse impact on the Class I area air quality related values from the proposed project.

9.0 CONCLUSION

It can be concluded from the information in this report that the proposed project, consisting of repair and start up of the existing PPP sulfuric acid plant and molten sulfur system, as described in this report will not cause or contribute to a violation of any air quality standard, PSD increment, or any other provision of Chapter 62, FAC.

APPENDICES

A LIST OF PROPOSED REPAIRS

B EMISSION RATE CALCULATIONS

C REFERENCES ON SULFURIC ACID PLANTS

D SO_2 EMISSION RATES AND H2SO4 PRODUCTION RATES FOR MULBERRY PHOSPHATES, INC. SULFURIC ACID PLANT FOR 21 MONTHJS FOLLOWING A TURNAROUND

E MONSANTO ENVIRO-SYSTEMS, INC. HEAT RECOVERY SYSTEMS FOR SULFURIC ACID PLANTS

F AIR MODELING INFORMATION

KOOGLER & ASSOCIATES

APPENDIX A

LIST OF PROPOSED REPAIRS

KOOGLER & ASSOCIATES

EXTENT OF WORK

1. Sulfur Burner (Existing)

The existing sulfur burner will be retained with minor repairs. The air inlet windbox requires castable and metal repairs. The air inlet damper (BV-1) will be replaced. A new rain shield will be installed over the outlet gas duct and tied into the existing rain shields over the unit.

2. BFW Heater(Deaerator) (New)

The existing boiler feedwater heater/deaerator and associated piping, valves, and instrumentation will be demolished. A new unit, sized in accordance with MEC design standards, will be installed on the existing foundation and steel. New piping, valves and instrumentation are provided for the unit. The new unit has the capacity to heat and deaerate 220,000 lb/hr (normal) and 255,000 lb/hr (design) of boiler feedwater at 55°F.

3. Waste Heater Boilers (Existing)

The two existing boilers shall be maintained and re-rated as required by the manufacturer to meet the acid plant capacity requirements as defined in Section 1, Design Basis. The boilers shall be re-rated and certified as required for 350 psig design pressure and a 300 psig operating pressure.

The tube (process gas) side will be mechanically cleaned and inspected. The hot end ferrules and castable will be removed and replaced.

The shell (water/steam) sides of both boilers and common steam drum will be inspected and hydro tested at 350 psig, or in accordance with the manufacturer's recommendations. Any necessary repairs will be identified. The pressure relief valves will be removed, shop inspected, certified, and re-installed. Any necessary repairs to the pressure relief valves will be identified. The hand-hold inspection plates will be replaced.

All repairs identified from inspections, including manufacturer's evaluations, recommended or required repairs, shall be undertaken.

4. Economizer (New)

The existing economizer and associated piping, valves and instruments are to be demolished. A new economizer will be installed on the existing foundation and new piping, valves and instruments will be provided. The water side will be designed and stamped per ASME code. The new economizer is designed to cool the gases to 350°F prior to entering the interpass tower. The heat transfer area is approximately 28,000 ft.

5. Main Compressor (Existing)

The main air compressor is an Elliott centrifugal compressor which is driven by a 275/40 psig steam turbine. The compressor, steam turbine and steam control valve are to be disassembled, cleaned as necessary, and each sent to a qualified repair facility for inspection and for any repairs that are identified.

The compressor and turbine shall be re-rated as required by the manufacturer to meet the acid plant capacity requirements.

Repairs identified from these inspections required to achieve the acid plant capacity shall be undertaken.

The compressor, steam turbine and steam control valve will be returned to the plant site for reinstallation. This includes reinstallation of all piping, valves, instrumentation, and controls, proper alignment of the system, cleaning and refilling of the lube oil system, and checking out and test-running the unit.

The vibration monitor (and its wiring) will be replaced with a new unit.

6. No. 1 Converter (Existing)

The existing 35'-3" diameter No. 1 converter will be retained. All of the catalyst and quartz will be removed and screened. The pass 1 shell and roof, catalyst support grates, and the grate support steel will be replaced. The pass 1 shell and roof will be ASTM 516 Grade 70 and metallized. The pass 1 6" support grates and posts will be HS Meehanite. The pass 1 division plate will be replaced. The catalyst and quartz will be reinstalled. All of the external insulation will be removed and replaced. All of the floor and wall insulating brick will be removed and replaced. The converter loadings will be as follows:

Catalyst loading at 2000 STPD:

Pass No.	Liters	Type
1	51,000	MEC Existing T-210 and New LP-120
2	55,600	MEC Existing T-210 and New LP-120
3	48,000	MEC Existing T-11 and New LP-110
4	56,000	MEC Existing T-11 and New LP-110

After catalyst make-up needs have been determined, the purchase and delivery of the make-up will be undertaken. The catalyst screening losses will be removed and disposed of at an approved facility by MEC.

7. No. 2 Converter (Existing)

The existing 42" diameter No. 2 converter will be retained. All of the catalyst and quartz will be removed and disposed of at an approved facility by MEC. New MEC LP-110 catalyst will be provided. The catalyst and quartz will be reinstalled. All of the external insulation will be removed and replaced. The converter floor will be inspected, and needed repairs identified. Any required repairs will be undertaken. The converter loading will be as follows:

Pass No.	Liters	Type
5	117,000	New MEC LP-1120

8. Drying Tower (New)

The new drying tower is 18'-0" diameter IDB by approximately 35 ft tall. It is a vertical, dished bottom, acid-brick-lined carbon steel vessel. The packed section contains 8 ft of 3" ceramic saddles capped by an 8" layer of 2" ceramic saddles as a spray catcher zone. The distribution system is comprised of Mondi header pipes, SX troughs and 310M stainless steel downcomers. The mist eliminators are set at the top of the vessel on a 326L tubesheet within the 14 ft diameter carbon steel housing. The new drying tower will be relocated to a new foundation and away from the top of the control room for safety reasons.

The gas inlet and outlet nozzles are 66" diameter carbon steel. The external piping is Mondi with Lewmet butterfly valves for control.

Interpass Tower (New)

The new interpass tower is 18'-0" diameter IDB by approximately 55 ft tall. It is a vertical, dished bottom, acid-brick-lined carbon steel vessel. The packed section contains 8 ft of 3" ceramic saddles capped by an 8" layer of 2" ceramic saddles as a spray catcher zone. The distribution system is comprised of Mondi header pipes, SX troughs and 310M stainless steel downcomers. The mist eliminators are set at the top of the vessel on a 316L tubesheet within the 19 ft diameter carbon steel housing. The new interpass tower will be relocated to a new foundation and away from the top of the control room for safety reasons.

The gas inlet and outlet nozzles are 66" diameter carbon steel. The external piping is Mondi with Lewmet butterfly valves for control.

Final Tower (New)

The new interpass tower is 18'-0" diameter IDB by approximately 45 ft tall. It is a vertical, dished bottom, acid-brick-lined carbon steel vessel. The packed section contains 8 ft of 3" ceramic saddles capped by an 8" layer of 2" ceramic saddles as a spray catcher zone. The distribution system is comprised of Mondi header pipes, SX troughs and 310M stainless steel downcomers. The mist eliminators are set at the top of the vessel on a 316L tubesheet within the 14 ft diameter carbon steel housing. The new final tower will be placed on the original support of the existing tower.

The gas inlet and outlet nozzles are 66" diameter carbon steel. The external piping is Mondi with Lewmet butterfly valves for control.

9. Drying Tower Mist Eliminators (New)

Six (6) Monsanto Enviro-Chem CS-IP Co-Knit mist eliminators, plus an additional blank for a future element, will be installed in an approximate 14 ft diameter "dog house" atop of the new drying tower. These elements provide excellent collection efficiency of a wide range of mist particle sizes.

Interpass Tower Mist Eliminators (New)

Thirty-six (36) Monsanto Enviro-Chem ES mist eliminators, plus an additional 4 blanks for future elements, will be installed in an approximate 21 ft diameter "dog house" atop of the new interpass tower. These elements provide excellent collection efficiency of a wide range of mist particle sizes.

Final Tower Mist Eliminators (New)

Ten (10) Monsanto Enviro-Chem CSII-P mist eliminators, plus an additional blank for future element, will be installed in an approximate 14 ft diameter "dog house" atop of the new final tower. These elements provide excellent collection efficiency of a wide range of mist particle sizes.

10. Cold Interpass Heat Exchanger (Cold Shell) (New)

The existing Cold IP heat exchanger (cold shell) will be demolished. A new heat exchanger will be installed on new grillage on the existing foundation. The new exchanger has a heat transfer area of approximately 14,000 ft². The unit will be shop pressure tested before shipping.

Cold Interpass Heat Exchanger (Hot Shell) (Existing)

The existing Cold IP heat exchanger (hot shell) will be retained. The exchanger will be cleaned on both the tube side and shall side where accessible. The exchanger will be inspected and the tubes tested for leaks with low pressure air.

Hot Interpass Head Exchanger (Existing)

The existing Hot IP heat exchanger will be retained. The exchanger will be cleaned on both the tube side and shell side where accessible. The exchanger will be inspected and the tubes tested for leaks with low pressure air.

Any repairs identified from the inspections or tests will be undertaken.

11. No. 1 Superheater (Existing)

The existing superheater will be retained. The tubes will be cleaned both internally and externally. The tubes will be hydro tested at 350 psig.

Any repair needs identified during the testing will be undertaken.

12. Condensate Storage Tank (New)

The existing condensate storage tank at the phosphoric acid plant and associated pump, piping, valves, electrical and instrumentation will be demolished. A new 14 ft diameter by 16 ft tall 304 SS tank complete with piping, valves, electrical and instrumentation will be installed. The tank will have the capacity for 18,000 gallons of condensate.

13. Cooling Tower (New)

The new cooling tower will be installed within the area occupied by the previous unit. A new pump pit will be provided. Fire and lightning protection will be provided. The capacity of the tower will be 13,500 gpm of water from 113°F to 89°F.

14. Combination Acid Coolers (New)

The existing cooling coils along with all associated pumps, piping, valves, electrical and instrumentation will be demolished. Prior to the demolition of any acid containing equipment, the residual acid will be neutralized. Two new MEC shell and tube exchangers will be installed in the existing cooling pit along with the necessary piping, valves, electrical and instrumentation. The coolers will be sized in accordance with the design standards, plus an additional 10% of excess area for fouling. The two coolers are identical in duty, and are approximately 40 in. diameter by 30 ft. Tube length with approximately 4,400 ft² each of heat transfer area.

Product Acid Cooler (New)

The existing cooling coils along with all associated pumps, piping, valves, electrical and instrumentation will be demolished. Prior to the demolition of any acid containing equipment, the residual acid will be neutralized. One new MEC shell and tube exchanger will be installed in the existing cooling pit along with the necessary piping, valves, electrical and instrumentation. The cooler will be sized in accordance with MEC design standards, plus an additional 10% of excess area for fouling. The cooler is approximately 15 in. diameter by 32 ft tube length with approximately 1,100 ft² of heat transfer area.

15. Acid Pump Tank (New)

The bottom 10 ft of the interpass tower serves as the pump boot for the acid system. The drying and final towers drain back to the boot, and the dilution water is added with the drying tower return acid. The outlet of the interpass tower feeds the common acid circulating pump. The interpass tower will contain a packing chip internal strainer manufactured of SX at the tower acid outlet line to the common acid pump.

16. Sulfuric Acid Storage Tanks (Existing)

Repair of these tanks will be by PPPI, and will involve cleaning and neutralizing the tanks, inspection and thickness tests, repairs to welds, catwalks, grating and stairs, and sandblasting/painting tanks.

17. Plant Stack (Existing)

Repair of the existing 7'-9" minimum diameter stack will be by PPPI. The soft waster system in the bottom of the stack will be replaced with three new softeners and water pumps; piping and hoses will be required/replaced, and the well water line will be replaced. The catwalks, ladders and grating on the stack will be repaired and it will be repainted.

18. Sulfur Pumps (New)

The three sulfur pumps are vertical, centrifugal submerged, Lewis pumps to be installed in the existing sulfur pit. The capacity of each pump will be 68 gpm of molten sulfur at approximately 275 ft TDH. Two of the pumps will be motor driven and one will be steam turbine driven. One of the motor driven pumps is an installed spare. The pumps discharge into a common header for sulfur feed to either the sulfur burner or the sulfur storage tank.

Common Acid Circulating Pump (New)

The one acid circulating pump is a vertical, centrifugal external Lewis pump to be installed on the interpass tower outlet line. The pump has a capacity of 8,200 gpm at 85 ft TDH. The pump will be motor driven and provides the required acid flow to/around the common acid coolers to all three acid towers.

Acid Drain Pump (New)

The acid drain pump is a horizontal, centrifugal Alloy 20 pump to be installed on a pad near the acid coolers. The pump will have a capacity of 1250 gpm at 100 ft TDH. The pump will be piped to allow complete drainage of the interpass tower pump boot and the acid coolers.

Cooling Water Pumps (New)

The two cooling water pumps are vertical, centrifugal pumps to be installed in a new cooling water pit. The capacity of each pump is approximately 13,500 gpm at 100 ft TDH. One pump will be motor driven, and the other will be steam turbine driven. The motor driven pump is an installed spare. The wetted pump parts shall not contain any copper-bearing alloys.

Condensate Transfer Pump (New)

The condensate transfer pump is a horizontal, centrifugal pump to be installed on a pad next to the new condensate tank at the Phosphoric acid plant. The capacity of the pump will be 300 gpm at 250 ft TDH. The pump will be motor driven.

19. Gas Ducts (New)

The following gas ducts will be replaced (all of the new ducts are carbon steel, except Pass 1 outlet, which is 304 S.S. Metallized ducts are denoted by an "M"):

Compressor inlet duct, inlet screen, and silencer (as required) to meet OSHA-established noise levels)
Compressor outlet duct to the drying tower
Drying tower to the sulfur furnace with new manually-controlled BV-1 damper, new control-room-operated GV-1 isolation valve, and repaired (by change order) secondary air damper.
Pass 1 outlet to the No. 2 WHB
New heat-up duct from pass 1 inlet to No. 2 converter, with manually operated BV53-A gas valve and gas-tight blank - M
Pass 2 outlet to hot IP heat exchanger - M
Hot IP heat exchanger to pass 3 - M
Pass 3 to the superheater - M
Superheater to pass 4 - M
Pass 4 to the economizer - M
Economizer to the interpass tower
Interpass tower to the first Cold IP heat exchanger (sloped)
Cold IP heat exchanger to the final tower
Final tower to the stack

20. Strong Acid Piping (New)

All of the existing acid circulation system piping along with the associated pumps, valves, electrical and instrumentation will be demolished. Prior to the demolition of any acid containing equipment, the residual acid will be neutralized. Mondi piping will be supplied and installed for the three acid towers, the three acid coolers, and the acid drain pump for tie-in to the storage tanks.

The existing acid return line, which originates from the north acid storage tank pump, shall be re-routed to the interpass tower pump tank (tower bottom). New piping shall be 4" minimum.

Miscellaneous Piping

The existing steam piping will be inspected (as per API 574) and hydro tested, and any necessary repairs will be undertaken. The BFW piping at the new economizer will be replaced. New cooling water piping will be provided to/from the cooling tower pump pit to the acid coolers. New piping will be provided at the condensate storage tank and pumped to the softened water storage tank.

Valves

All of the existing acid valves will be replaced. All of the existing BFW and steam system pressure relief valves will be removed, shop-certified, and re-installed. All of the existing BFW and steam control valves will be hydro tested in-line. Any repairs will be undertaken. New BFW valves will be provided at the deaerator and the economizer. New cooling water valves will be provided at the cooling tower pump pit and acid coolers. Coordinated inlet/dump valves are provided at the condensate tank inlet as well as isolation valves at the condensate transfer pump. The No. 1 boiler by-pass valve BV-3 will be removed and the spare will be fully reinstalled in its place, checked out, and tested. The No. 2 boiler by-pass valve (BV-4) will be inspected. Any repair needs identified for BV-4 will be undertaken. Operators will be provided for BV-3 and BV-4 and controlled remotely from the control room.

21. SO_2 Monitor (Existing)

The existing SO_2 monitor will be retrofitted with new solid state parts. This work will be undertaken by PPPI.

22. Offices (Existing)

A generator and air compressor will be removed and a new office will be constructed from the existing room. Also, the existing control room walls will be repaired/rebuilt as necessary. This work will be undertaken by PPPI.

23. Structural Steel

The existing structural steel within the Sulfuric Acid Plant battery limits (to include the portion of main pipe rack where utilities connect to the plant adjacent to the Cooling Water Tower and along SAP battery limits to the Sulfur Furnace) will be sandblasted and inspected as part of MEC scope. Modification of grillage steel at the Cold IP Heat Exchanger (X-51), and at the Cooling Tower pipe rack (to facilitate removal of steel, piping and equipment to allow installation of a new pump pit) is included. Grating, handrail, stairs and ladders will be repaired or replaced at the following existing equipment/access areas: Sulfuric Acid Storage, Deaerator, Waste Heat Boiler, Sulfur Furnace burner access platform, and both Converters. Any repairs/replacement beyond this scope such as existing pipe racks, Main Compressor enclosure, etc. will undertaken.

New access/platform steel will be provided at the Acid Towers at the following locations: Platform with stair access to Tower/Pump support level, Platform with ladder access at distributor pipe inlet, tubesheet and roof (Mist Eliminator Access) levels, Platform with ladder access to damper GV-1 at Drying Tower. New steel is provided for pipe and duct support.

Insulation

All new equipment, duct, piping and associated tie-ins will be insulated per MEC specifications. Existing insulation will be removed and replaced at both the 4-pass and single 5th Pass converters and the duct run between the WHB-2 tube bundle and the 2nd Pass of the 4-pass converter. Repair of damaged insulation will be performed upon the WHB steam drum and both tube bundles. The duct from the Interpass Tower to the Cold IP Heat Exchanger X-51 will be insulated. If additional insulation replacement such as sulfur, steam, and utility piping, Heat Exchangers (X52/X53) and interconnecting duct is required it will be undertaken.

Painting

All new equipment, vessels, steel, piping and ductwork will be painted per MEC specifications. All existing support and access steel will be painted per MEC specifications.

Electrical

A fusible disconnect will be installed at the existing main substation with a 4160 volt feeder in aluminum cable tray run to a new MVC located in the existing Control Building. PPPI will provide space in existing building to accommodate the new MVC equipment. New 5 kV starters will be vacuum type. The existing 480 volt MCC will be modified to accommodate additional electrical requirements per MEC scope. Modifications will include the re-use of existing starters or installation of new combination starters with fusible disconnects, installation of fusible switches for auxiliary transformers and panels and the addition of a 5 KVA uninterruptible power supply for new electronic instrumentation.

New lighting will be metal halide fixtures.

Aluminum tray, aluminum conduit and copper tray cable will be provided for new power, control and instrumentation wiring per MEC design standards. No electrical heat tracing is provided. Demolition of the existing electrical system will be limited to that required to allow for installation of the new electrical system.

Piling/Foundation

New piling is provided for the Drying and Interpass Acid Towers, new Compressor Inlet duct support structure and pipe rack addition between the new Acid Coolers and IPA/Final Acid Towers. One test pile is included.

New foundations are provided for the Drying and Interpass towers, Compressor Inlet Duct support structure, new pipe rack, and pipe/duct support. Existing foundations will be modified for the Acid Coolers and Drain pump, Cooling Tower pump pit, Final tower, and Condensate Storage Tank.

24. Instrumentation

MEC will provide new electronic instrumentation and a control panel in the existing Control Room. New instrumentation will be provided for the Acid Circulation, Acid Cooling, Transfer and Drain system, Cooling Tower and Cooling Water system, Dilution water system, Deaerator/Economizer and interconnecting BFW system, Sulfur Storage and Pump system and Condensate Storage Collection/Transfer system at the Phosphoric Acid Area. Moore controllers are preferred by PPPI. The existing panel added during MEN 2014 (IPA conversion) project will be demolished to make room for the new control panel. Only the stack analyzer recorder will be relocated to the new panel with all other instrumentation demolished in place. No additional modification of the existing control panel is included in MEC scope.

MEC will quote Moore DCS system as an alternate to the electronic instruments (base case). Subject to PPPI's selection, the incremental cost of the DCS system will be undertaken.

25. Molten Sulfur Storage Tank (Existing)

The bottom part of the existing 800 ton sulfur storage tank will be cut away and replaced. New piping, steam coils, electrical tie-ins, access stairs, and platforms will be provided for the tank.

Sulfur Pit (Existing)

The existing sulfur pit contains some sulfur which will be removed. The pit walls will be inspected and any necessary repairs will be undertaken. The steam coils, piping and traps will be replaced with new ones. The new coils will be removable without requiring that the pit be drained. The pit cover will be replaced, with structural support steel external to the pit.

26. Auxiliary Boiler (New)

A new 150,000 lb/hr 300 psig packaged boiler is to be supplied and installed by PPPI to replace the existing 75,000 lb/hr boiler. Note: PPPI is already permitted for this boiler (Permit No. AC41-232096).

27. Miscellaneous

This includes many incidental and support items such as asbestos removal, replacement of insulation and miscellaneous pumps and motors, etc. Also includes allowances for change orders and contingencies.

APPENDIX B

EMISSION RATE CALCULATIONS

KOOGLER & ASSOCIATES

EMISSION RATE CALCULATIONS

1.0 PERMITTED EMISSION RATES

1.1 SULFURIC ACID PLANT

SO_2 = 333.3 lbs/hr
x 8760 hrs/yr x ton/2000 lbs
= 1460 TPY

SAM = 12.5 lbs/hr
x 8760 hrs/yr x ton/2000 lbs
= 54.8 TPY

1.2 MOLTEN SULFUR SYSTEM

PM/PM10 = 0.61 TPY

SO_2 = 1.2 TPY

H2S = 0.28 TPY

VOC = 0.79 TPY

NOTE: Pollutant emissions associated with the molten sulfur storage & handling system are provided for emission inventory and PSD purposes only and are not considered allowable emission rates.

2.0 ACTUAL EMISSION RATE CALCULATIONS

The following actual emission rates for the sulfuric acid plant are based on compliance test results and annual operation hours previously submitted to FDEP.

OPERATION YEAR	ANNUAL OPERATING HOURS
1988	3982
1989	7762
1990	7875
1991	6881
1992	3410
1993	0
1994	0
1995	0
1996	0

NOTES: (1) Data based on annual operation reports submitted to FDEP.

The sulfuric acid plant and molten sulfur system were not operated during the most recent two years. Therefore, for purposes of this PSD application actual pollutant emissions are assumed to be zero. It should be noted that FDEP's assessment of actual emissions for the existing plant, documented in the Technical Evaluation and Preliminary Determination dated September 8, 1995, reflect annual emissions for SO_2, NOx and SAM of 820.5 tpy, 19.7 tpy and 17.4 tpy, respectively. The Department may utilize these emissions as actual emissions. However, the following analysis is based on an assumption of zero actual emissions to provide a conservative analysis.

3.0 PROPOSED EMISSION RATES

3.1 SULFURIC ACID PLANT

SO_2	=	83.3 tph x 4 lb/ton
	=	333.3 lbs/hr
		x 8760 hrs/yr x ton/2000 lbs
	=	1460 TPY
SAM	=	83.3 tph x 0.15 lb/ton
	=	12.5 lbs/hr
		x 8760 hrs/yr x ton/2000 lbs
	=	54.8 TPY
NOx	=	83.3 tph x 0.12 lb/ton
	=	10.0 lbs/hr
		x 8760 hrs/yr x ton/2000 lbs
	=	43.8 tpy

3.2 MOLTEN SULFUR SYSTEM

PM/PM10	=	0.61 TPY
SO_2	=	1.2 TPY
H2S	=	0.28 TPY
VOC	=	0.79 TPY

NOTE: Pollutant emissions associated with the molten sulfur storage & handling system are provided for emission inventory and PSD purposes only and are not to be considered allowable emission rates.

4.0 NET EMISSIONS INCREASE

The net emissions increase from the proposed project are as follows:

SO_2 = (1460 - 0) tpy + (1.2 - 0) tpy
= 1461.2 tpy

SAM = (54.8 - 0) tpy
= 54.8 tpy

NOx = (43.8 - 0) tpy
= 43.8 tpy

Please note that there are no contemporaneous increases or decreases associated with the proposed project. The above increases exceed the PSD significant emissions levels, under Rule 62-212, FAC, of 40 tpy, 7 tpy and 40 tpy for SO_2, SAM and NOx, respectively.

APPENDIX C

REFERENCES ON SULFURIC ACID PLANTS

Comparison of Sulfuric Acid Plant Catalysts

by

Leonard J. Friedman

Acid Engineering & Consulting, Inc.
Lakeland, Florida

Comparison of Sulfuric Acid Plant Catalysts

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Introduction

The contact process for the production of sulfuric acid is based on the oxidation of sulfur dioxide to sulfur trioxide in the presence of a vanadium catalyst. From its beginnings in 1831 when Phillips of Bristol, England patented the oxidation of SO2 to SO3 over a platinum catalyst, to the modern plants of today using high activity, low pressure drop, ribbed rings of vanadium catalyst, the contact process and the catalyst it is based on have undergone significant (but subtle) changes, with the vast majority of developments in the last thirty years.

This paper will review the basic principals of the catalytic sulfuric acid process, and using a summary of operating data compare the three catalysts normally used in North America in the areas of conversion efficiency, activity, ignition temperature, loss in activity over time and screening losses. The paper will also review the advantages and problems with extensive plant converter testing using gas chromatography, Reich or other test methods.

Background

Before 1900, essentially all sulfuric acid was produced by the "Chamber" process, where nitrogen oxides were used to catalyze the oxidation of sulfur dioxide to sulfur trioxide. Plant size was small, unusually less than 50 STPD, and product acid strength limited to 65% to 75% sulfuric acid. The development of the chemical (dye) industry and the need for gun powder in the late 1800's necessitated a process to produce high strength sulfuric acid and Oleum. Early work (1870's - 1910) based on platinum as a solid catalyst, usually as platinum impregnated asbestos gauze, was the first technical and economic application of the "Contact" process. The high cost of platinum and its susceptibility to poisoning by many materials (notably arsenic present in the roaster gas streams of the day), led to the development of vanadium pentoxide based catalysts using alkali metal prompters on a porous silica carrier in the early 1900's (BASF patent of 1913). This is essentially the vanadium based catalyst used today. The following table shows the transition from the Chamber to Contact process:

Transition to the Contact Process

	1910	1930	1950	1960	1980
Contact Process %	20	27	75	85	100
Chamber Process %	80	73	25	15	0

Vanadium Catalyst

Vanadium catalyst usually contains 6% - 9% vanadium pentoxide with alkali metal promoters. The promoters are potassium sulfate with an atomic ratio of potassium to vanadium of 2 - 4 and a small amount of sodium sulfate to adjust (lower) the eutectic melt temperature of the mixture. The active components are supported on a highly porous silica base (diatomaceous earth).

In 1948 Topsoe & Nielsen demonstrated catalyst at operating temperatures exists as a melt within the pores of the silica support. The melt consists of vanadium sulfur complexes dissolved in pyrosulfates. In other words, the oxidation of sulfur dioxide to sulfur trioxide is a homogeneous reaction in the liquid film covering the surfaces of the support and not the heterogeneous reaction it would appear to be. The activity of the catalyst is from active species of vanadium pentoxide (V_2O_5), with the mechanism involving changes in the valence of vanadium.

The reaction rate is the result of many factors, including; the solubility of SO_2, SO_3 and oxygen in the melt, mass transfer limitations, the concentration of the active catalyst components and their solubility's in the melt, the porosity and pore size distribution of the silica support, as well as other less obvious factors (manufacturing process, etc.). The effect and interaction of each variable is not completely defined, so changes leading to improvements are more by trial and error than science. The difference between conversion predicted by rate equations and conversion actually obtained is accounted for by adding a so called "catalyst effectiveness factor" or fudge factor to the rate equation. The reaction rate can be described by the following relationship:

$$r = k\,[p(SO_2)^{l}\,p(O_2)^{m}\,p(SO_3)^{-n}]\,K_{act}\,K_{eff}$$

r = reaction rate - g mole SO_2/g catalyst, sec
k = rate constant - function on catalyst properties
$p()^{x}$ = partial pressure of components
K act = adjustment factor for catalyst activity
K eff = adjustment factor for system unknowns

The acknowledgment of the reaction taking place in the liquid melt leads to an understanding of catalyst ignition temperature as the temperature at which the melt first forms. The decrease in activity at low temperature is explained by the precipitation of some of the vanadium compounds reducing the concentration of the vanadium in the melt. The loss in catalyst activity at high temperature is attributed to the melt exceeding the capacity of the catalyst pores, with the liquid melt forming large inactive globules. The "old wives tale" of catalyst having a memory - once operated at high temperature, it must always be operated at high temperature - is explained by the loss in activity from melt components flowing out of the catalyst.

Sulfur dioxide to sulfur trioxide equilibrium is determined by the following equation:

$$Kp = \frac{p(SO3)}{p(SO2)\,p(O2)^{.5}}$$

A typical equilibrium curve showing operating lines for a four bed single or double absorption system is shown in Figure 1. The figure shows the change in the equilibrium curve resulting from the removal of SO3 in the interstage absorber (upper equilibrium line), and the reason the double absorption process increases conversion of SO2 to SO3 from 98.5% to 99.7%.

A review of the equilibrium equation indicates increasing pressure will increase equilibrium conversion. Figure 2 shows the effect of increasing pressure. In the example shown, increasing pressure from 1.3 bar (3.8 psi) to 10 bar (127 psi) will increase equilibrium conversion in a first catalyst stage from 63% to 75%. In the late 1960's, I did extensive work developing and evaluating a pressure process for sulfuric acid production - looking at single absorption at pressure versus double absorption. The conclusion of that work indicated double absorption could not be avoided at reasonable pressures to meet 99.7% conversion, eliminating the pressure process from economic consideration. In the mid 1970's, Krebs built a plant at PCUK in France based on the pressure process. The plant was a double absorption unit operating at 70 psi. Analysis indicated capital cost savings compared to the conventional double absorption route to be small (< 10%), with the plant experiencing extremely high corrosion and low energy efficiency.

Another route to increased conversion is to increase the oxygen concentration in the converter gas by using enriched air or pure oxygen. Analysis indicates improved conversion efficiency, but not enough to eliminate double absorption. A process using pure oxygen was evaluated in the late 1960's as an alternate to double absorption. The system was not economically sound due to the continuing cost of oxygen. No plants based on pure oxygen have been built. A number of spent acid regeneration plants use enriched air to overcome capacity limitations in the gas cleaning sections of the plant, and oxygen use to enrich the gas in the contact section is being used in a few places. The cost is a balance of the need for additional capacity versus the continuing cost of oxygen.

Catalyst Shape and Composition

In the 1960's and early 1970's catalyst was in the form of pellets, usually 1/4" and 5/32" diameter by 0.3" to 0.6" long (6 mm & 4 mm diameter by 8 mm - 15 mm long). The catalyst normally contained 6% to 8% V2O5, and was sold in North America by many vendors:

Stauffer	Allied
Cyanamid	Monsanto
BASF	Topsoe
Catalyst & Chemicals	Imperial Smelting

In the mid to late 1970's lower pressure drop through the catalyst bed was achieved by the use of a larger diameter pellet, 8 mm in diameter or 5/16" rather than 6 mm diameter. This size pellet was heavily promoted by Monsanto as 516 catalyst. At about the same time Topsoe introduced the ring shape catalyst to the North American market. Topsoe claimed significantly lower pressure drop and greater dust holding capacity. Initial installations used ring catalyst to top off the pellets in the first catalyst bed. Data showed lower initial pressure drop, and lower rate of pressure drop build-up (greater dust holding capacity). Complete first beds of ring catalyst showed acceptable activity and conversion while maintaining the low pressure drop and pressure drop build-up. Ring catalyst allowed an increase in operating time between turnarounds from 12 months to 18 - 24 months. It took a number of years for ring catalyst to be accepted and used in the entire converter. Now the three principal catalyst suppliers to North America (Topsoe, BASF, Monsanto) all offer ring shaped catalyst - with pellet and 516 catalyst essentially obsolete. The most recent change in catalyst shape has been the ribbed ring, offered by Topsoe as "Daisy" and BASF as "Star" rings, providing about 20% lower pressure drop than the normal 10 mm rings.

In addition to catalyst shape changes, in the last twenty years catalyst composition changes have provided improved performance permitting 99.7% conversion in a double absorption plant with increasing SO2 gas strengths (9.5% - 10% in the 1970's to 11.5% - 11.75% today). A catalyst with 6% - 8% V2O5 is used in the first and second beds of the converter to attain resistance to activity loss at high temperature and maintain high temperature strength (reduced screening loss). The lower vanadium content - lower activity is offset by the higher average operating temperature of the upper beds, resulting in a high reaction rate and acceptable catalyst loading and approach to equilibrium. A catalyst with 7% to 9% V2O5 is used in the third and fourth catalyst beds to provide higher activity, lower ignition temperature and high reaction rate at the lower average operating temperature. The higher vanadium, lower bed catalyst has 10% to 20% greater activity than the 6% - 8% V2O5 upper bed catalyst.

The most recent catalyst development (re-invention of a 1948 discovery) is the so called "Cesium Catalyst". Cesium catalyst is really a 6% - 8% V2O5 catalyst with the formulation adjusted by substituting cesium for a portion of the potassium promoter. The use of cesium doubles the activity of the catalyst in the low temperature region, permitting continuous operation at bed inlet temperatures in the 720 F - 730 F region. The high cost of cesium promoted catalyst (about 2.5 times standard catalyst) limits its use to special applications.

The various catalyst shapes are shown in Figures 3 and 4. The following tables compare catalyst size and composition.

Shape

		Pellet	Pellet	Ring	Ribbed Ring
Diameter	mm	6	8	10	12
Length	mm	8	12 - 15	9 - 14	10
Pressure Drop	"H2O	1.0	0.9 - 0.95	0.5	0.4

Composition

	V2O5 Content	**Comments**
Upper Bed Catalyst	6% to 8%	High Temperature Operation Hardness & Temperature Resistance
Lower Bed Catalyst	7% to 9%	Low Temperature Operation High Activity - Softer Catalyst
Cesium Catalyst	6% to 8%	High Activity at Low Temperature (720 F) Can be Sticky at High Temperature

Catalyst Operation Analysis

Over the last ten years Acid Engineering & Consulting, Inc. has been involved with the operation of over one-hundred sulfuric acid plants around the world. In many cases data collected included information on various catalysts, including conversion efficiency, ignition temperature, loss in activity, screening loss, pressure drop and pressure drop build-up. A statistical analysis was performed on the data and the resulting observations are presented below. The analysis was made for the three main North America catalyst suppliers, Topsoe, BASF, and Monsanto, identified and supplier "A", "B", and "C". Note: If the analysis is on target, acid plant operators should be able to connect the supplier with their performance data.

Conversion Efficiency - The data suggests little significant difference in overall conversion efficiency between the three suppliers. Conversion efficiency analysis was complicated by many operating plants with more than one manufacturers catalyst in the converter, and many with two or three suppliers catalyst in a particular bed. Although there was some statistical difference, one could not use the conversion efficiency difference to tell which catalyst was in a particular converter.

Loss in Activity - The reduction in activity of a particular catalyst over time was determined by a review of catalyst suppliers activity test results and operating data showing changes in bed inlet and exit temperatures and conversions over time. The results were based on plants operating with high converter inlet SO2 concentrations resulting in bed 1 exit temperatures of 1140 F to 1160 F. The table below summarizes the activity loss over an 18 month to 24 month period for ring catalyst.

Loss in Activity (18 - 24 Months)

	Supplier "A"	Supplier "B"	Supplier "C"
Bed 1	20% - 35%	9% - 12%	9% - 13%
Bed 2	8% - 12%	5% - 8%	5% - 8%
Bed 3	< 5%	< 5%	< 5%
Bed 4	< 5%	< 5%	< 5%

The data indicates supplier "A" upper bed catalyst looses activity at a significantly higher rate than the others, about 2 to 3 times the activity loss between turnarounds. This would suggest a formulation problem resulting in the melt solution leaving the pores of the catalyst when operating at high temperature. The data is consistent over many years, eliminating the possibility of a bad batch or run of catalyst causing the results. In fact, for many years this supplier recommended limiting first bed exit temperature to less than 1125 F.

Screening Loss - Data for screening loss was based on ring catalyst, vacuum screened per suppliers instructions, usually by the same two commercial catalyst screening companies. The wide variation in the data for a particular supplier is attributed to operating time at high temperature, screening rate and the amount of broken pieces returned to the converter.

Screening Loss (% of Bed)

	Supplier "A"	Supplier "B"	Supplier "C"
Bed 1	25% - 40%	10% - 15%	11% - 16%
Bed 2	20% - 30%	9% - 15%	10% - 15%
Bed 3	15% - 20%	8% - 14%	8% - 14%
Bed 4	12% - 17%	8% - 12%	8% - 12%

The data is consistent, indicating a problem with supplier "A" catalyst, especially in the high temperature area, suggesting a formulation problem (high screening loss and loss in activity). The data is from many plants over a number of years with more data points for beds 1 and 2, and limited data for beds 3 and 4.

Pressure Drop Build-up - Data for sulfur burning plants was analyzed to determine differences in the rate of pressure drop build-up over an 18 month operating period between turnarounds. The analysis was complicated by unknown variations in the ash content of the sulfur and the amount of broken pieces returned to the converter after screening. After some adjustment for bed area, gas velocity, etc., the data indicated no significant difference in the rate of pressure drop build-up between the three catalysts.

Comparison Summary

Overall the catalyst comparison indicates supplier "A" has a problem with its upper bed ring catalyst when operated at high gas strength - high temperature (exit temperatures above 1130 F), resulting in excessive loss of activity over time and screening losses two to three times the others. In fact, the high screening loss and subsequent make-up with fresh catalyst obscures the activity loss problem, so overall plant conversion efficiency is maintained. Based on the analysis, supplier "B" and "C" catalyst are close in all aspects studied, with supplier "A" upper bed catalyst of lower overall performance.

Cesium Promoted Catalyst

Cesium promoted catalyst is offered by the three North American suppliers. The high cost, about 2.5 - 3 times conventional catalyst, has limited use to special situations. Cesium catalyst is rarely used in sulfur burning plants, but has found some advantages in spent acid regeneration and metallurgical plants. The catalyst has been used as a top layer of the first catalyst bed to provide operation at 720 F - 730 F, reducing gas heat exchanger requirements, while allowing restart of the plant when the catalyst bed is at 600 F.

Early installations of cesium promoted catalyst experienced severe pressure drop build-up. Pressure drop in some plants increased 30" to 60" H2O in a few months. Investigation indicated the plants experiencing the problem were operating at first bed inlet temperature of 780 F to 820 F, while plants without problems operated at 720 F to 740 F. The operating data indicates the cesium catalyst becomes very sticky at elevated temperatures. Recently, Topsoe has reformulated their cesium catalyst so it can be operated at low or high temperature without the pressure drop build-up problem. The other suppliers are expected to produce an adjusted formulation in the near future.

Converter Testing

Traditionally catalyst performance evaluations are made by reviewing bed inlet temperatures and temperature rise, inlet SO2 gas strength and overall conversion efficiency. Changes in these operating variables, although small from day to day, are good indicators of catalyst bed performance over time. Recently, one catalyst supplier has offered portable gas chromatograph testing of converter systems. The tests provide the composition of gas into and out of each catalyst bed. Comparing actual bed conversion with calculated conversion and equilibrium would be a superior way of determining catalyst activity - performance.

Acid Engineering & Consulting, Inc. has reviewed the results of a number of gas chromatograph tests of converter systems. In most cases, the test data was consistent with evaluations based on traditional methods, and was a useful tool in determining catalyst activity - replacement requirements for an upcoming turnaround. In a number of cases, the test results were obviously incorrect and the interpretation of the results flawed and self-serving. Objectivity comes into question when the one doing the testing is selling catalyst or testing his own catalyst to show how good it is, or how bad a competitors is. In one case, the test data indicated 7% to 8% conversion of SO2 to SO3 in the sulfur furnace - well above equilibrium. This was coupled with extremely low conversion in the first catalyst bed, indicating low catalyst activity and the need for additional replacement catalyst. In another case, a spent acid regeneration plant was experiencing conversion efficiency problems (very low first bed temperature rise) after a major plant modification. The catalyst in the first bed was changed, but the same problem persisted. Gas chromatograph tests (purchased with the replacement bed of catalyst) were run at various O2/SO2 ratios (0.72 to 0.92) and SO2 gas strengths (9.4% - 10.7%). Note: Most sulfur burning plants operate at O2/SO2 ratios of 0.75 to 0.77 and SO2 gas strengths of 11.5% - 11.75%. The test results are summarized below:

Plant Test Data

	Run 1	Run 2	Run 3
O2/SO2 Ratio	0.72	0.86	0.92
Overall Conversion	90.8%	94.2%	95.4%
Bed 1 Catalyst Activity	104%	83%	82%

Note: Catalyst activity dropped 22% between test runs 1 and 3. This was reported as "catalyst activities are in the normal range".

The conclusion presented by the testing company - catalyst supplier was the plant design at 0.75 O2/SO2 ratio and 97% conversion in a single absorption plant was not possible with the catalyst type, volume and O2/SO2 ratio. However, the catalyst supplier - testing company would be happy to study ways to achieve plant conversion and capacity, although they stated "there are no clear cut, low cost ways to do this". Note: Acid Engineering & Consulting, Inc. adjusted plant operating conditions and in four hours the plant was able to meet design capacity at an O2/SO2 ratio of 0.75 with conversion exceeding 98%. In this case, knowledge and experience was able to do what blind or self-serving testing could not do - get the plant operating at or above design without additional catalyst or costly modifications.

Conclusion

This work was intended to provide an understanding of sulfuric acid plant catalysts and to present a comparison of the three catalysts used in North America. Data from many plants over a number of years was reviewed, adjusted and evaluated to obtain comparative catalyst performance. The data indicated suppliers "B" and "C" catalyst to be about equal in each of the areas examined, with supplier "A" catalyst of lower performance (activity loss over time and high screening loss).

If some have a better understanding of sulfuric acid plant converter operation and catalysts, and supplier "A" is encouraged to improve their catalyst, the time and effort spent on this work will have been justified.

Figure 1

Converter Equilibrium

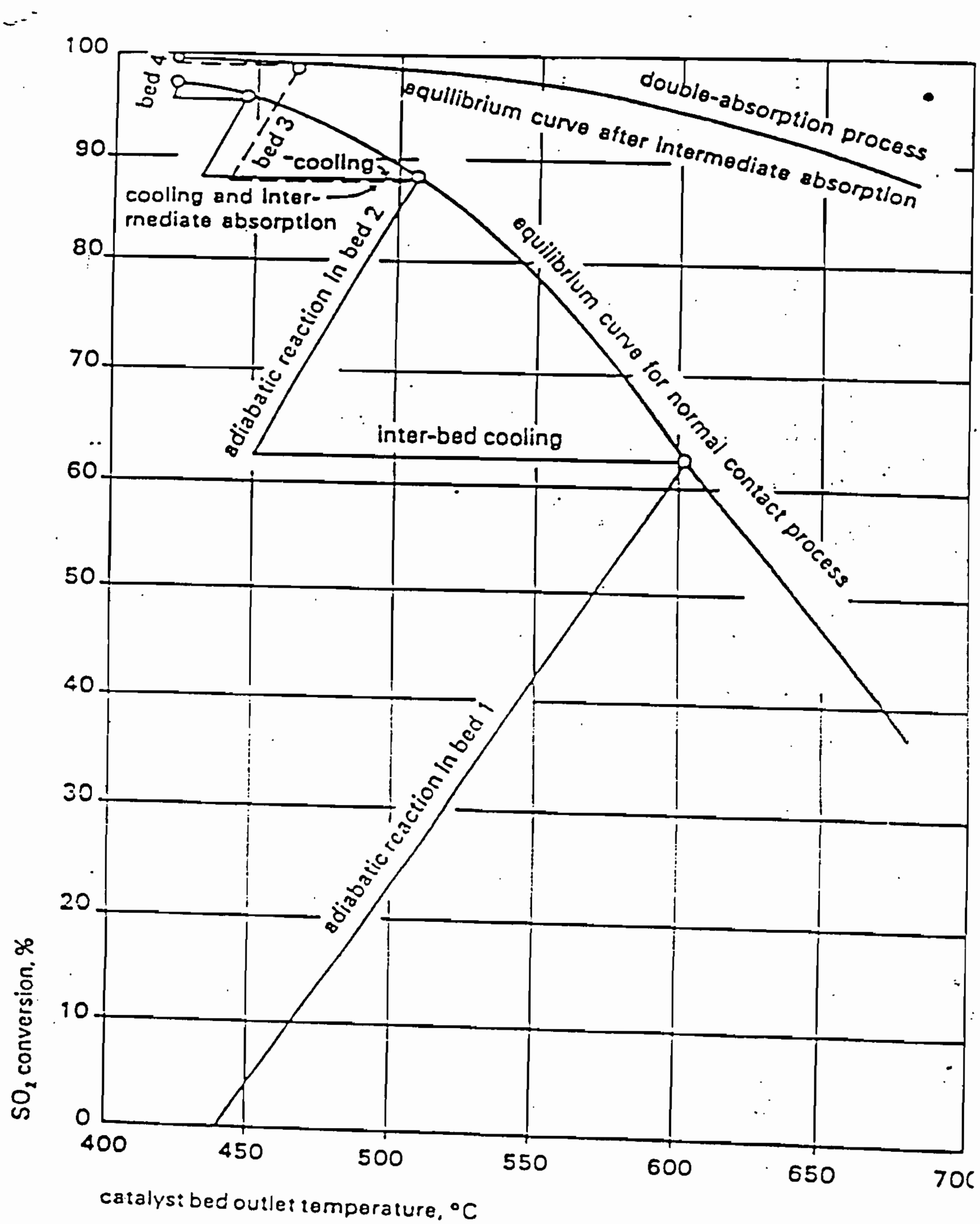


Figure 2

Pressure Effect on Equilibrium

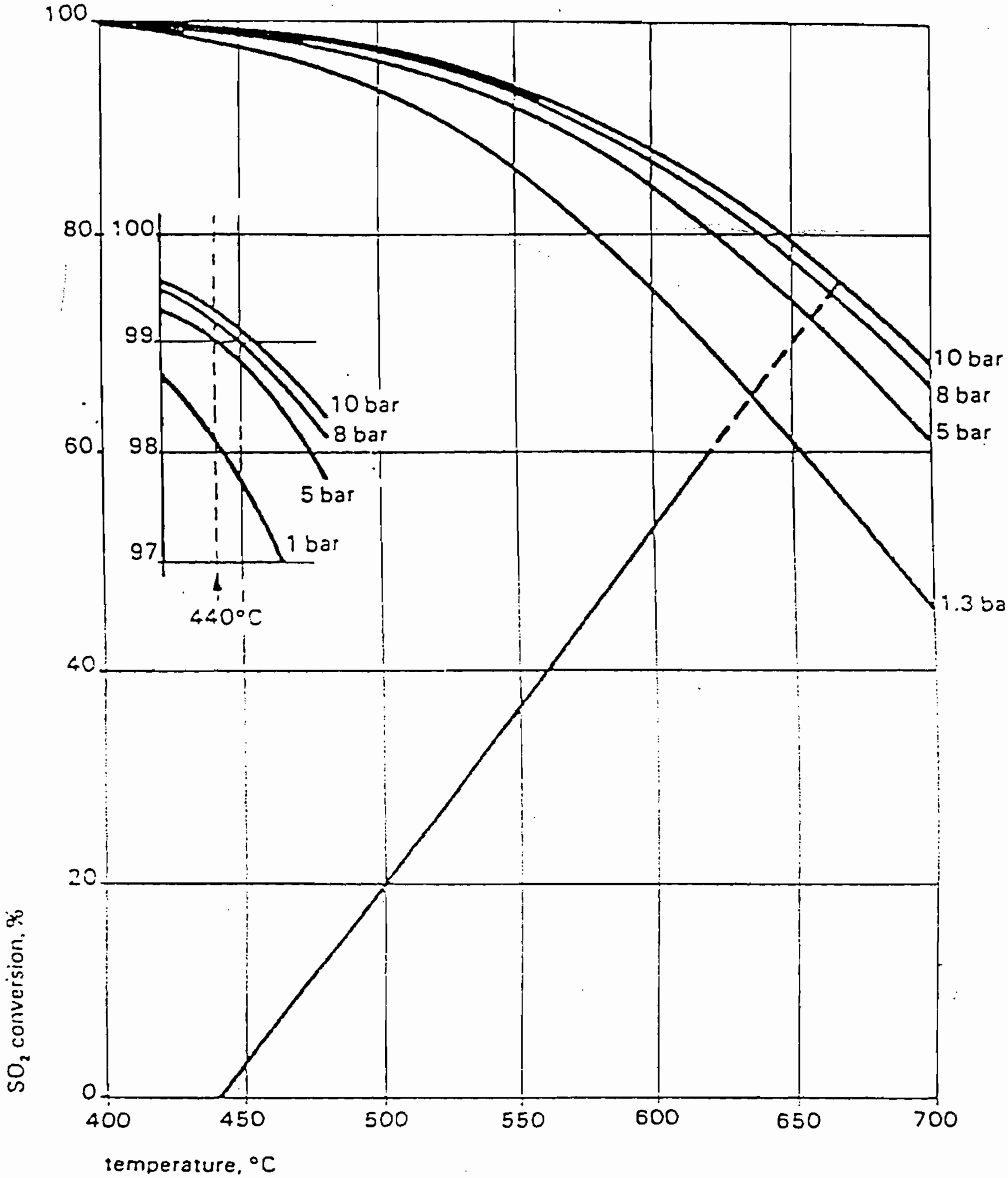


Figure 3

Catalyst Shapes & Sizes

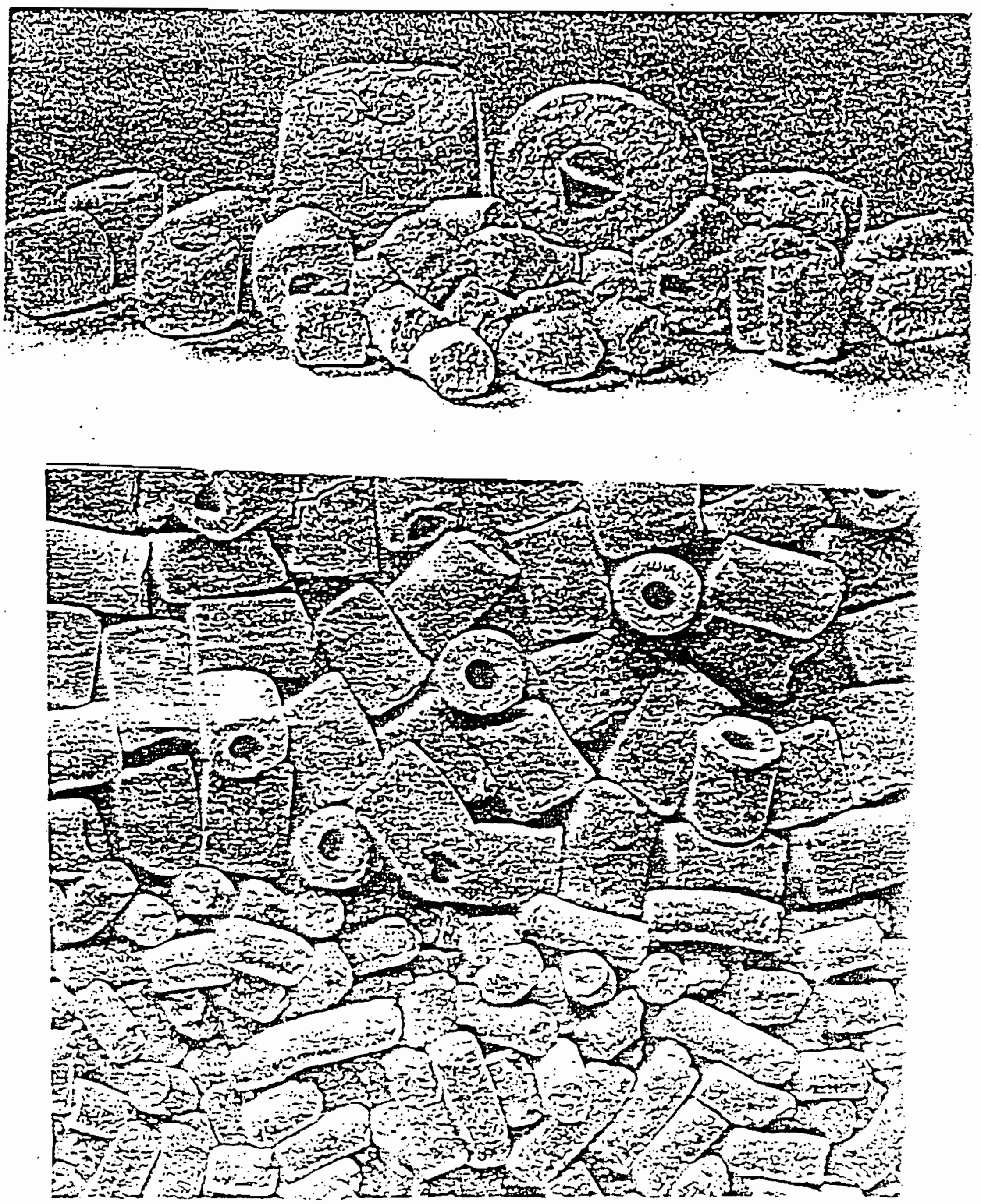
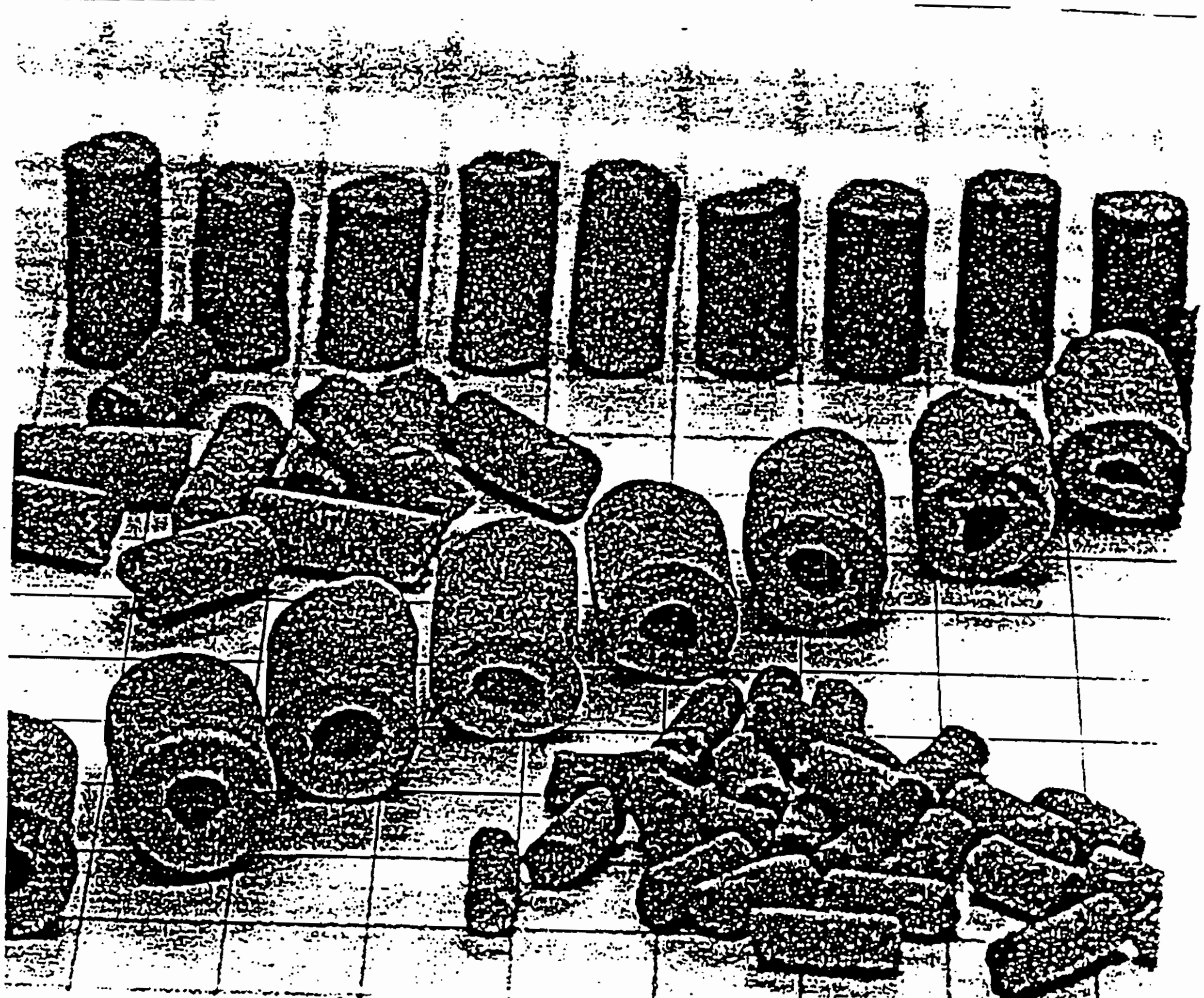


Figure 4

Catalyst Shapes & Sizes



SO_2 EMISSIONS REDUCTIONS IN SULFURIC ACID PLANTS

by

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ABSTRACT

The current trend in the sulfuric acid industry is to reduce the emission of sulfur dioxide (SO_2) to the atmosphere while maintaining or increasing acid production. Utilizing Monsanto cesium-modified catalysts, a number of sulfuric acid producers have effectively reduced their SO_2 emissions in both single absorption and double absorption cases. This paper will present the realized possibilities for the reduction in emissions using Monsanto Cesium Catalyst and the optimization of plant operations utilizing the Monsanto Portable Gas Analysis System (PeGASyS). The portable gas analyzer has served as an invaluable tool to optimize plant operations and demonstrate the advantages of the cesium catalyst in reducing emissions. The utilization of both the Monsanto Cesium Catalyst and the Portable Gas Analysis System in many plant applications will set the new standard for sulfuric converter performance.

INTRODUCTION

The trends in sulfuric acid plant design have changed dramatically over the last several decades. The demand for operations with minimal SO_2 emissions has required the development of the double absorption contact process for SO_2 oxidation which is capable of generating greater than 99.7 % conversion of the sulfur dioxide fed to the plant. Pollution reduction commitments by many major corporations as well as government regulatory requirements are responsible for the continuing trend to develop new and cost effective technologies to further reduce the SO_2 emission levels from sulfuric acid plants.

There are still a large number of sulfuric acid plants in the world which operate in the single absorption mode with SO_2 conversion levels near 98 %. Although these plants are operating within authorized conversion limits, many companies are striving to reduce the SO_2 emissions as much as is technically and economically feasible. Until recently, the technologies to accomplish this goal were limited. Plant operations were "optimized" using crude chemical techniques and often inaccurate temperature measurements, resulting in less than ideal performance in the plants. Over the years, conventional sulfuric acid catalyst improvements have enhanced the plant performance significantly, but further advances were limited by thermodynamic and kinetic barriers.

This paper presents the results of implementing two new technologies in the sulfuric acid industry. Monsanto Enviro-Chem has developed a low temperature cesium-promoted catalyst which eases some of the aforementioned limitations and improves the overall conversion in both single and double absorption plants, resulting in significantly less SO_2 emissions to the stack. A discussion of some case histories of cesium (Cs) catalyst installations and the potential applications of the technology are presented. The second technology developed by Monsanto Enviro-Chem is the Portable Gas Analysis System (PeGASyS) which is used to measure and optimize sulfuric acid plant converter/heat exchanger performance. Using this state-of-the-art instrumentation, plant problems are quickly and easily identified and resolved. Catalyst performance can be quickly determined and optimum operation conditions can be determined based on the catalyst quality and desired conversion results. Examples of the applications of the PeGASyS technology are presented in this paper. When utilized together, the cesium catalyst technology and the PeGASyS system can generate the optimum performance from any sulfuric acid plant and lead to lower SO_2 emissions.

CATALYST DEVELOPMENT AND APPLICATIONS

In the contact sulfuric acid process, there is often an interest in lowering the inlet temperatures to the various adiabatic catalyst beds in order to provide more favorable equilibrium conditions. The addition of cesium (Cs) to the conventional alkali-vanadium sulfuric acid catalyst has long been known to enhance the low temperature properties of the catalyst (1). The cesium salt promoter stabilizes the vanadium +5 oxidation state at temperatures below 420°C (790°F) and keeps the vanadium species solubilized in the melt and available for reaction. In the conventional K-V catalyst, vanadium compounds precipitate out of the molten salt at lower temperatures, causing loss of catalyst activity (2,3). The stabilizing effects of the cesium appear at relatively low Cs concentrations. A qualitative display of this effect is shown in Figure 1. At high temperatures (> 430°C/806°F), the activity of the conventional catalyst and the cesium-promoted catalysts are fairly similar. However, near 410°C (770°F), the reaction rate of the conventional catalyst drops off dramatically due to the precipitation of vanadium compounds (curve breakpoint # 1). As the temperature is further lowered (moving to the right on the graph), the cesium-promoted catalyst maintains a higher reaction rate until the temperature drops well below 400°C (750°F) when its activity finally begins to decline due to vanadium salt precipitation (curve breakpoint # 2). Although the reaction rate of the cesium-promoted catalyst drops off at relatively low temperatures, it is still sufficiently high to generate good conversion at acceptable catalyst loadings. Over the last several years, Monsanto Enviro-Chem has utilized its strong base in cesium catalyst studies (4-7) to develop an optimized and affordable cesium promoted catalyst (Cs-120 and Cs-110). These products contain the optimum levels of alkali metal salts (potassium and cesium) to provide excellent *low* and *high* temperature performance in the converter. Following extensive lab development and field testing, the products were commercialized in 1989 and have been installed in over 20 sulfuric acid plants worldwide.

There are many applications for the cesium-promoted catalyst in sulfuric acid plants. The smaller 9.5 mm (3/8 in.) Cs-110 rings can be loaded into the lower beds and allow for lower bed inlet temperatures and higher overall conversion. Figure 2 shows a graphical display of the advantage of using the Cs-110 catalyst in the 4th pass of a single absorption plant. The lower inlet temperature with Cs-110 catalyst opens a larger thermodynamic "window" which permits greater overall conversion. This higher level of conversion is not possible with the conventional catalyst at the lower inlet temperature as the catalyst loadings would have to be extremely high, creating excessive pressure drop. A similar scenario can be devised for the lower beds of double absorption plants, resulting in lower stack emissions.

Another cesium-promoted catalyst application involves installing a 33-50 % cap of Cs-120 rings in the first pass of a sulfuric acid plant. This catalyst configuration will dramatically lower the required inlet temperature for good conversion in this bed. Figure 3 shows that the conversion versus bed depth profile for a capped Cs-120 bed with an inlet temperature of 380°C (715°F). A full bed of conventional catalyst will produce very little conversion with this low inlet temperature at any reasonable catalyst loading. A full first bed of Cs-120 rings is not required in this application as the outlet temperature from the cesium catalyst portion of the bed is high enough to ignite the remaining conventional catalyst layer. The lower first pass inlet temperature is advantageous for plants with very high inlet SO_2 strength. In this case, the lower inlet temperature will lead to a lower outlet temperature, therefore extending the life of the first pass exit posts and grids. Furthermore, the overall conversion in the first pass will also be increased over that possible with conventional catalyst. The use of the Cs-120 rings in Pass 1 will also reduce or eliminate the need for startup gas pre-heating in spent acid and metallurgical plants following short shutdowns.

The cesium-promoted catalyst can also be utilized in situations where heat exchanger deficiencies (undersized or plugged) limit the inlet temperatures to lower passes. The Cs-110 rings can effectively operate at the reduced temperatures and hence maintain the needed conversion in the lower beds. Also, the Cs-120 first pass caps and the full beds of Cs-110 in the lower passes can greatly reduce the time required to startup the sulfuric acid plant. The cesium catalyst beds will ignite at much lower temperatures than conventional catalyst beds and hence require less pre-heating. Also, due to the high activity at low temperatures, the cesium catalyst beds help to minimize the stack SO_2 emissions during plant startup operations. Examples of many of these cesium catalyst applications are presented in subsequent sections.

Cs-110/Cs-120 CATALYST APPLICATIONS

The applications of the Cs-110 and Cs-120 catalysts in reducing SO_2 emissions will be presented as a series of case histories. Although the applications vary from plant to plant, the common threads in each case are lower stack emissions and improved operating versatility. The following are five examples of Monsanto cesium promoted catalyst performance: (Note: STPD = Short Tons acid produced Per Day)

Case 1: *Single Absorption Spent Acid Plant*

Pre-Cs Data:

(1) Conventional catalyst in Pass 4.
(2) Pass 4 operating at 430°C (806°F) inlet temperature.
(3) Conversion at 98.0 % with 9 % SO_2 feed gas.
(4) Stack SO_2 emissions were over 25 lbs./STPD.

Post-Cs Information:

(1) Installed full bed of Cs-110 ring in Pass 4.
(2) Pass 4 inlet temperature optimized at 410°C (770°F).
(3) Conversion measured at 98.5 % with 9 % SO_2 fed.
(4) Stack SO_2 emissions at 19 lbs./STPD (24 % reduction).

Case 2: *Single Absorption Sulfur Burning Plant*

Pre-Cs Data:

(1) Aging, conventional catalyst in all beds.
(2) Pass 4 operating at 427°C (800°F) inlet temperature.
(3) Conversion at 97.5 % with 8 % SO_2 feed gas.
(4) Stack SO_2 emissions at 33 lbs./STPD.

Post-Cs Information:

(1) Screened all beds; full fourth pass of Cs-110.
(2) Pass 4 operating at 395-405°C (743-760°F).
(3) Conversion measured at 98.4 % with 8 % SO_2 fed.
(4) Stack SO_2 emissions at 21 lbs./STPD (36 % reduction).

Case 3: *Single Absorption Sulfur Burning Plant*

Pre-Cs Data:

(1) Used conventional catalyst in all five passes.
(2) Pass 5 operating near 430°C (806°F) inlet temp.
(3) Conversion at 98 % (air dilution plant).
(4) Stack SO_2 emissions at 26 lbs./STPD.

Post-Cs Information:

(1) Fresh catalyst in all beds; Cs-110 in Passes 4 and 5.
(2) Passes 4 and 5 operating at 410°C (770°F) inlet temp.
(3) Conversion reaches *99.1 %* with 8 % SO_2 fed.
(4) Stack SO_2 emissions at 12 lbs./STPD (*50 % reduction*).

Case 4: *Double Absorption Spent Acid Plant*

Pre-Cs Data:

(1) Standard catalyst in all beds; 12 % SO_2 gas strength.
(2) Pass 1 at 405°C (760°F); Pass 3 at 400°C (750°F).
(3) Heat exchanger pluggage limited Pass 3 inlet temp.
(4) Pre-heater required, especially after short shutdowns.
(5) Rate reduced to stay with SO_2 stack requirements.

Post-Cs Information:

(1) Cs-120 cap in Pass 1; full 3rd bed of Cs-110 rings.
(2) Pass 1 inlet at 360°C (680°F); outlet at 600°C (1110°F).
(3) Pass 3 operating well at 400°C (750°F).
(4) Need for pre-heater virtually eliminated.
(5) Rate dramatically increased with low SO_2 emissions.

Case 5: *Double Absorption Spent Acid Plant*

Pre-Cs Data:

(1) Used conventional catalyst in all beds; 7 % SO_2 fed.
(2) Pass 3 inlet at 410°C (770°F); heat exchange limits.
(3) Pass 4 inlet at 390°C (735°F) due to low 3rd pass temp.
(4) Emissions high (especially at startup);rate limited.

Post-Cs Information:

(1) Installed full bed of Cs-110 rings in Pass 3.
(2) Pass 3 operating very well at 410°C (770°F) inlet.
(3) Pass 4 operating very well at 425°C (800°F) inlet.
(4) Very low startup emissions; production rate increased; no gas pre-heating required after short shutdown.

Several other applications for the cesium promoted catalyst are under consideration. Scenarios have been developed for increasing the acid production rates for double absorption plants and yet maintaining the same permitted hourly SO_2 emissions. Using Cs-110 rings in the bottom pass of double absorption plants, it is possible to reduce the lbs. SO_2 per ton of acid and hence allowing for greater production at the same SO_2 ppm level in the stack.

In order to take advantage of the benefits of the cesium-promoted Cs-120 and Cs-110 catalysts, there are some considerations that need to be evaluated prior to installation. Firstly, the heat exchange capacity in the plant must be evaluated in order to insure the feasibility of reaching the lower inlet temperatures required for the cesium catalyst beds. Secondly, there may be a greater tendency for pressure drop buildup in first passes equipped with cesium catalyst caps if the incoming gas stream is very dust-laden or contains acid mist. The highly active cesium-promoted catalyst has a more mobile molten salt than that of the conventional catalyst, which has a slightly greater tendency for accumulating incoming converter dust. The larger Cs-120 rings (12.5 mm, 1/2 in.) were developed to minimize the potential pressure drop buildup and yet maintain the required performance. The low temperature benefits of the Cs-120 rings in the first pass must be weighed against the slight possibility of higher pressure drop. Cs-110 applications in all other passes have been in operation for over two years without any indication of pressure drop buildup and/or loss of activity.

Overall, the use of the cesium-promoted catalyst in sulfuric acid converters has contributed to the significant reduction in SO_2 emissions and improved operability of the acid plants.

PORTABLE GAS ANALYSIS SYSTEM (*PeGASyS*)

The Monsanto Enviro-Chem Portable Gas Analysis System was developed several years ago to provide sulfuric acid producers with the means to fully characterize their plant operations. The PeGASyS system consists of a highly specialized gas sampling system and the state-of-the-art gas analyzer. Figure 4 shows a photograph of a portion of the gas analyzer system, including the specially design gas syringe. The analyzer is generally set up near a control room or laboratory and occupies a desk-sized space. A gas sample is taken from a slip stream of gas at the converter, heat exchanger, or absorbing tower pressure tap (or any available sampling port). The gas sample is then injected into the analyzer (state-of-the-art gas chromatograph) which accurately determines the SO_2 and O_2 levels. The PeGASyS method for characterizing the sulfuric acid plant operations is much more reliable and accurate than the standard wet chemical Reich test method. A typical sulfur burning plant can be completely analyzed in only a few hours with the PeGASyS system.

The results obtained with the PeGASyS system consist of an analysis report of the SO_2 and O_2 levels in each sample and a conversion calculation for each specific converter sample based on the inlet gas to the first bed. Figure 5 shows a typical Converter Performance Summary for a sulfur burning double absorption plant. The custom PeGASyS software also calculates gas flow rates based on the given production rates. Utilizing the PeGASyS data, the converter performance can be effectively simulated using the Monsanto Enviro-Chem proprietary modeling software. This information can then be used to optimize the plant operations, adjusting bed inlet temperatures, upgrading catalyst charges to maximize conversion and minimize SO_2 emissions.

Another important application of the PeGASyS system is in gas-gas heat exchanger leak detection. The exchanger must have shell side and tube side gas streams which contain different SO_2 levelsin order for the analysis to be effective. Figure 6 shows the typical output for a heat exchanger analysis. Often, leaking heat exchangers contribute to high SO_2 emissions by bleeding high SO_2 gas directly to the stack or flooding lower pass catalyst beds with SO_2-rich gas. Once the leaking exchanger is identified, it can be repaired, leading to a direct reduction in the stack emissions.

The following are case histories of typical applications of the PeGASyS service to reducing stack emissions:

Case 1: *Spent Acid Double Absorption Plant*

Issue: SO_2 emissions higher than expected.

Result: PeGASyS analysis indicated that the aging first pass was operating at a reduced efficiency. Replacement of the first pass resulted in significant reduction in stack emissions.

Case 2: *Sulfur Burning Double Absorption Plant*

Issue: SO_2 emissions were approaching permitted limit.

Result: PeGASyS analysis indicated a severe leak in the cold heat exchanger. Following exchanger repair, SO_2 emissions decreased from 3.9 lbs./STPD to 2.0 lbs./STPD.

Case 3: *Sulfur Burning Single Absorption Plant*

Issue: Emissions extremely high; poor conversion.

Result: PeGASyS analysis determined that Passes 2 and 3 were performing very poorly. It was determined that low bed inlet temperatures were responsible. Raising the temperatures led to a dramatic reduction in SO_2 emissions. The results also indicated that a 4th pass Cs-110 application was justified. With a full 4th pass of Cs-110 rings, this plant now has extremely low SO_2 emissions.

Case 4: *Spent Acid Double Absorption Plant*

Issue: SO_2 emissions approaching allowed limit.

Result: PeGASyS analysis of the cold heat exchanger identified a minute leak which was allowing some first pass feed gas to bypass directly to the final tower. This leak added over 200 ppm SO_2 to the stack. Repairs to this exchanger resolved the problem.

As can be seen from these examples, the Portable Gas Analysis System is an extremely effective tool for optimizing sulfuric plant operations and reducing stack SO_2 emissions. In a number of cases, the PeGASyS results have led to the installation of Monsanto cesium-promoted catalyst which resulted in the best overall conversion and the lowest level of sulfur dioxide escaping to the atmosphere.

CONCLUSIONS

The effectiveness of the Monsanto Enviro-Chem cesium-promoted catalysts (Cs-120 and Cs-110 rings) in improving sulfur dioxide conversion and reducing stack emissions has been demonstrated in a number of applications. The cesium catalyst can be applied in a variety of situations which can reduce emissions as well as enhance the versatility of the plant operations. In many situations, the catalyst can be used to reduce the impact of heat exchanger limitations. Cesium catalyst effectiveness in both single absorption and double absorption plants has been demonstrated and novel applications are still under development.

The Monsanto Enviro-Chem Portable Gas Analysis System (PeGASyS) has effectively been used in a variety of plants to optimize converter performance and identify problem areas. The results of the gas analyses are often used to identify the most effective applications of the Monsanto Cesium Catalyst in order to minimize SO_2 emissions and maximize converter performance. The use of these products and services allows for not only a positive impact on the environment but also improved performance and profitability for the sulfuric acid producer.

ACKNOWLEDGMENTS

The authors would like to acknowledge and thank David A. Berkel of Monsanto Enviro-Chem Systems, Inc. for developing the Portable Gas Analysis System and refining the unit into an extremely effective tool for our sulfuric acid customers.

The authors would like to acknowledge the St. Louis R&D Team and the Manufacturing Team in Martinez, CA for their work on the cesium-promoted catalyst development.

REFERENCES

(1) Tandy, G. H., *J. Appl. Chem.* 6, 68 (1956) and the references therein.

(2) Villadsen, J., and Livbjerg, H., *Catal. Rev. Sci. Eng.*, 17, 203 (1978).

(3) Boghosian, S., Fehrmann, R., Bjerrum, N. J., and Papatheodorou, G. N., *J. Catalysis* 119, 121 (1989).

(4) Villadsen, J., *U. S. Patent No. 4,193,894* (3/18/80) (assigned to Monsanto Company).

(5) Doering, F. J. and Berkel, D. A., *J. Catalysis* 103, 126 (1987).

(6) Doering, F. J., Yuen, H. K., Berger, P. A., and Unland, M. L., *J. Catalysis* 104, 186 (1987).

(7) Doering, F. J., Unland, M. L., and Berkel, D. A., *Chem. Eng. Sci.* 43, 221 (1988).

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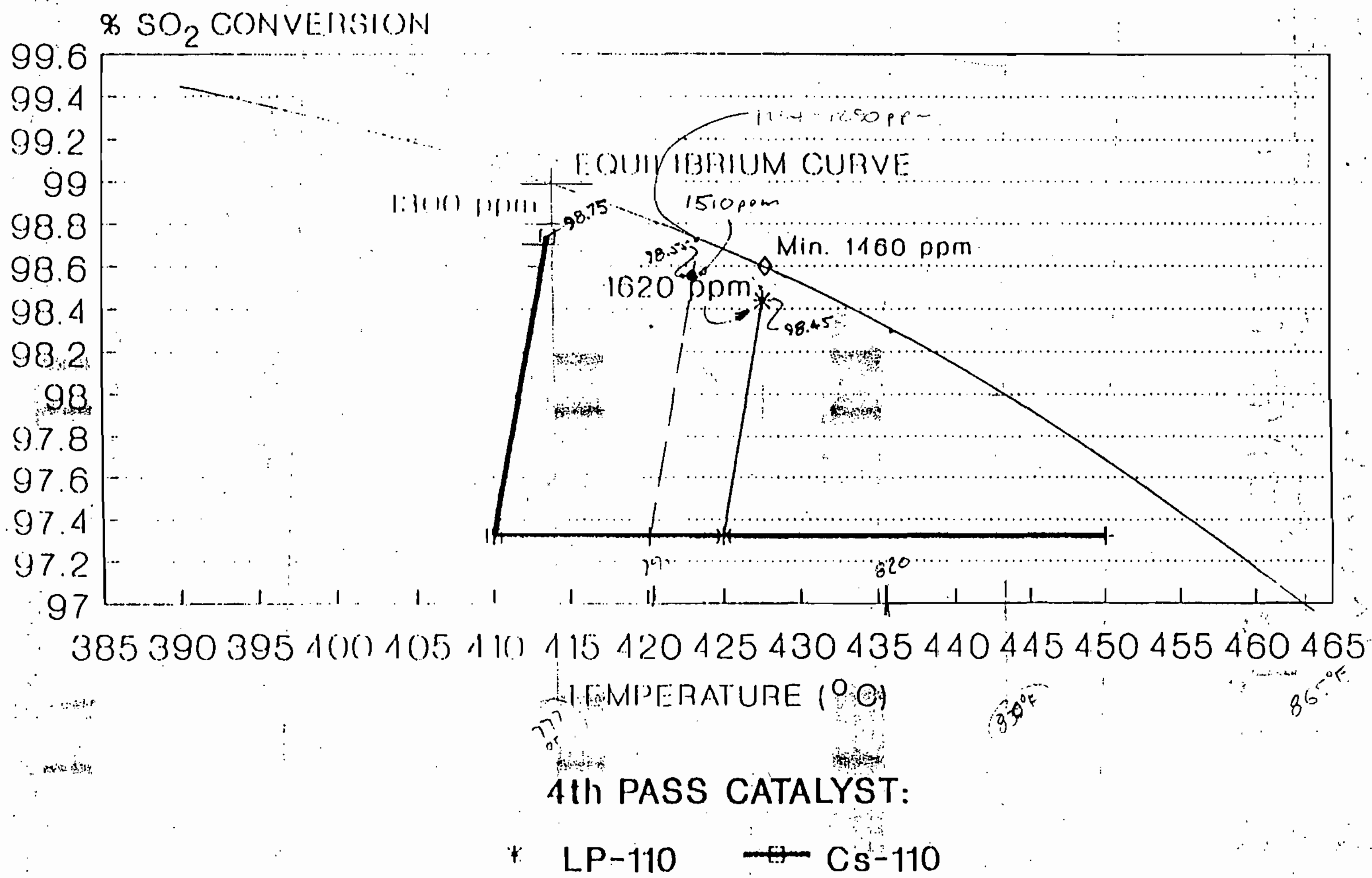
Figure 2

SINGLE ABSORPTION: Cs ADVANTAGE



FEED GAS = 9 % SO_2, 11.9 % O_2
410°C = 770°F; 425°C = 797°F

Figure 1

SO_2 OXIDATION RATE VERSUS TEMPERATURE

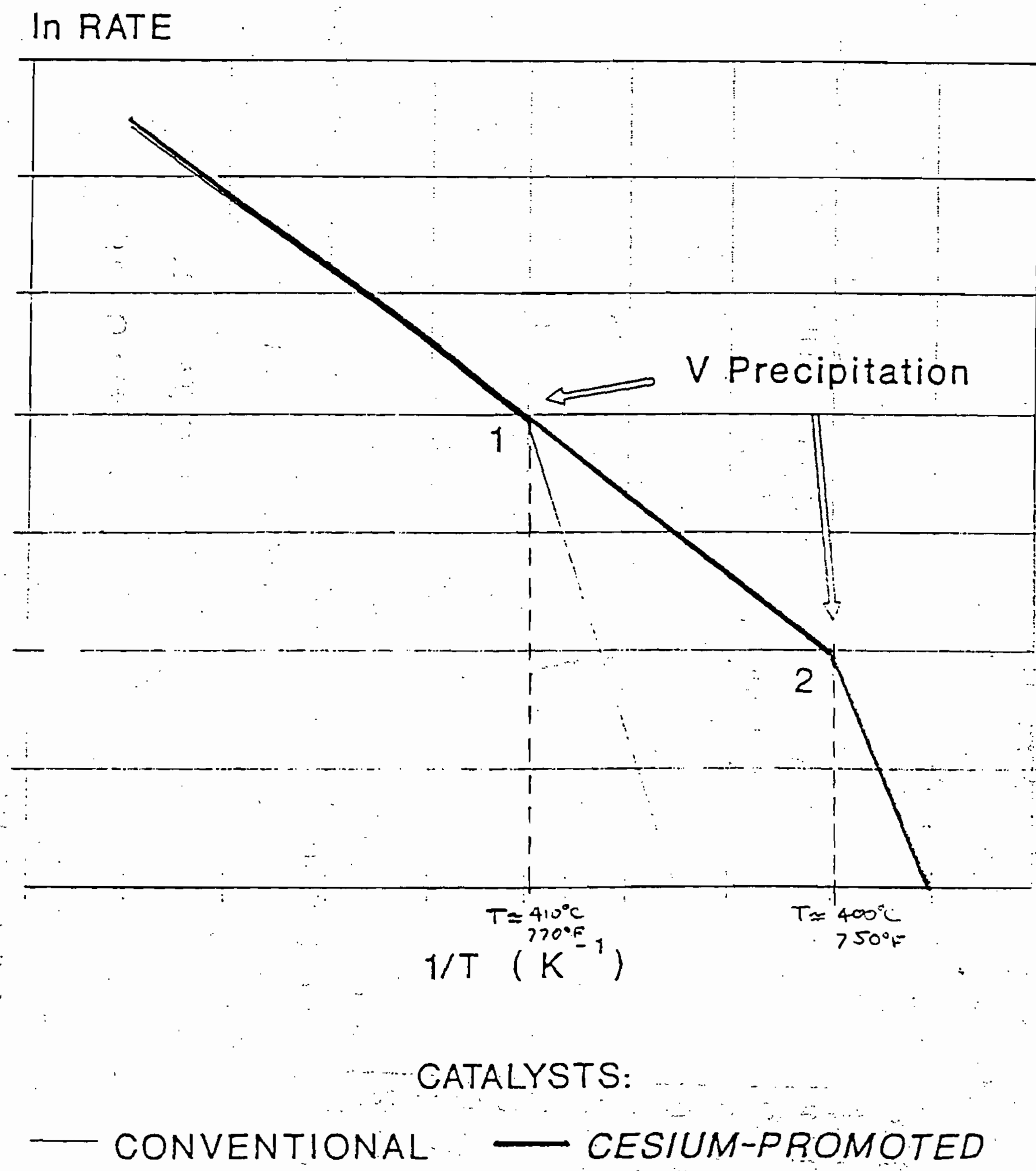
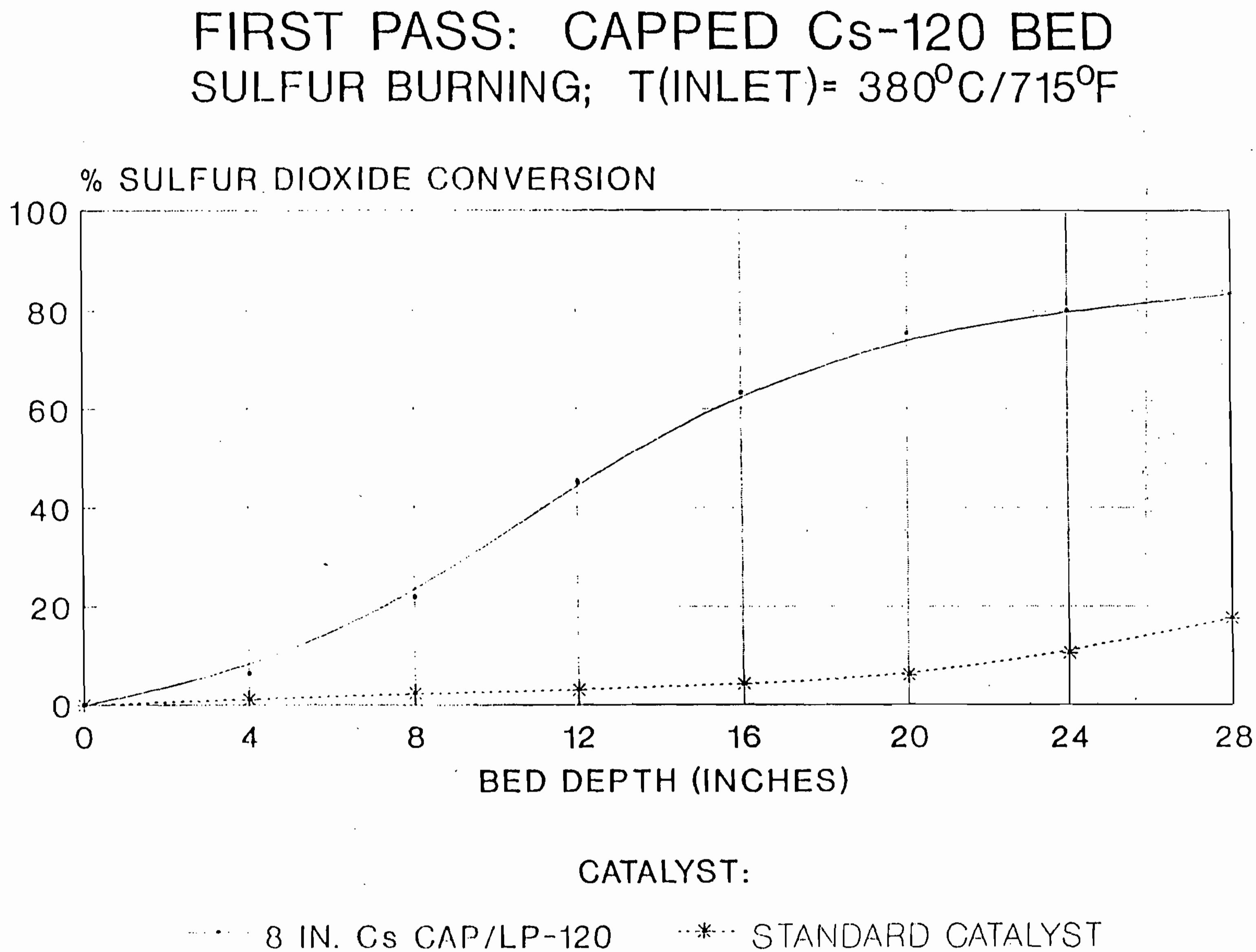


Figure 3



8 IN. Cs-120 CAP ON LP-120 RINGS

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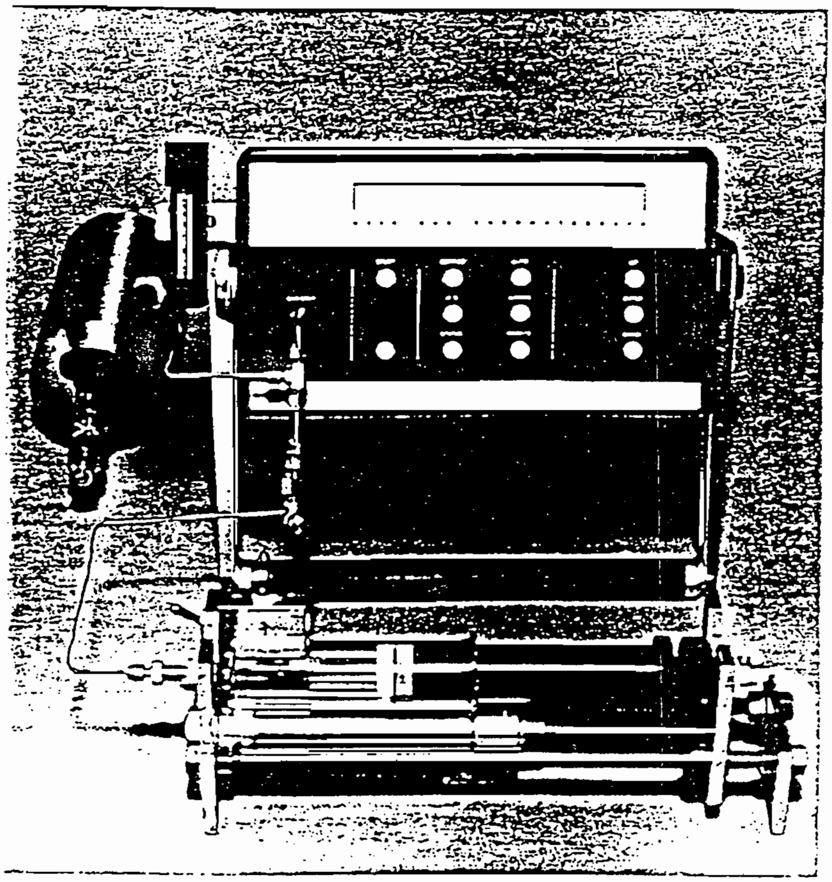
Figure 4

PeGASyS

Portable Gas Analysis System



Monsanto Enviro-Chem Systems, Inc.

Figure 5

MONSANTO ENVIRO-CHEM SYSTEMS, INC.

CONVERTER PERFORMANCE SUMMARY

CUSTOMER NAME: EXAMPLE 3 DATA FILE: XXX003.SAM

PLANT LOCATION: U. S. A.

PLANT NUMBER: 3

PLANT TYPE: SULFUR BURNER DOUBLE ABSORPTION

SAMPLE NO.	SAMPLE IDENTIFICATION	DATE / TIME OF SAMPLE		% SO_2	% O_2	% CONV.
5	SULFUR BURNER OUTLET	4-1-91	1600	11.209	9.506	1.563
4	FIRST PASS OUTLET	4-1-91	1600	5.135	6.998	59.394
3	SECOND PASS OUTLET	4-1-91	1600	2.088	5.638	84.269
2	THIRD PASS OUTLET	4-1-91	1600	0.911	5.144	93.257
1	FOURTH PASS OUTLET	4-1-91	1600	0.035	4.771	99.744
		SULFUR BURNER GAS		11.366	9.580	

SAMPLE NO.	SAMPLING POINT
1	OUTLET OF FINAL TOWER ABOVE MIST ELIM.
2	PASS 4 INLET AT CONVERTER TAP
3	PASS 3 INLET AT CONVERTER TAP
4	PASS 2 INLET AT CONVERTER TAP
5	PASS 1 INLET AT CONVERTER TAP

	KG/HR.	LBS./HR.
SULFUR FEED RATE	26054.80	57441.31
SO_2 EMISSIONS	133.04	293.30

LBS.SO_2/TON = 3.35 KG SO_2/TON = 1.67

	NM^3/HR	SCFM
AIR TO SULFUR BURNER	160139.22	94243.89
CONVERTER INLET GAS	160139.22	94243.89
CONVERTER OUTLET GAS	132907.50	78217.69
DILUTION AIR	0.00	0.00
TOTAL GAS TO PLANT	160139.22	94243.89

PRODUCTION RATE = 2100.00 SHORT TONS PER DAY

NOTE: ALL GAS VOLUMES ARE BASED ON DRY, SO_3-FREE GAS.

CATALYST BED TEMPERATURES

L/STPD	BED	°F	°C
	1 IN	779	415
31.5	1 OUT	1130	610
	RISE	351	195
	2 IN	824	440
33.0	2 OUT	988	531
	RISE	164	91
	3 IN	831	444
38.5	3 OUT	891	477
	RISE	60	33
	4 IN	795	424
50.5	4 OUT	844	451
	RISE	49	27
	5 IN		
	5 OUT		
	RISE		
	TOTAL R	624	346

Figure 6

MONSANTO ENVIRO-CHEM SYSTEMS, INC.

HEAT EXCHANGER EVALUATION

DATE / TIME: 4-1-91 / 1500 FILE: INTHEX.HEX

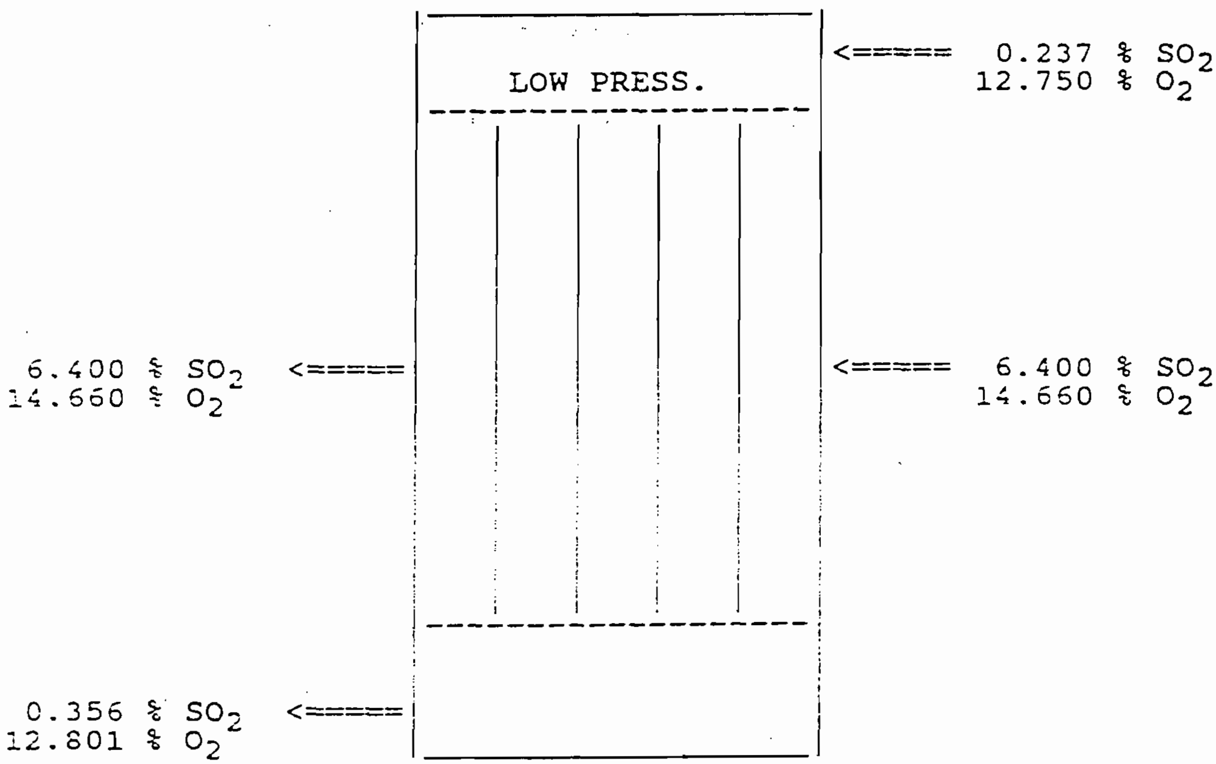
CUSTOMER: EXAMPLE

PLANT LOCATION: U. S. A.

PLANT NUMBER: 1

PLANT TYPE: METALLURGICAL; SINGLE ABSORPTION

HEAT EXCHANGER: INTERMEDIATE HEX



2.0 % OF SHELL SIDE GAS IS LEAKING INTO TUBE SIDE

TUBE SIDE INLET GAS WAS SAMPLED AT:
INLET TO INTERMEDIATE HEX

TUBE SIDE OUTLET GAS WAS SAMPLED AT:
PASS 4 INLET AT CONVERTER

APPENDIX D

SO_2 EMISSION RATES AND H_2SO_4 PRODUCTION RATES
FOR MULBERRY PHOSPHATES, INC. SULFURIC ACID PLANT
FOR 21 MONTHS FOLLOWING A TURNAROUND

12/95-9/97

MULBERRY PHOSPHATES, INC.
MULBERRY, FLORIDA

KOOGLER & ASSOCIATES

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
12/20/95	1.45		1539		1.116	
12/21/95	1.54		1553		1.196	
12/22/95	1.43		1545		1.105	
12/23/95	1.47		1571		1.155	
12/24/95	1.42		1573		1.117	
12/25/95	1.41		1545		1.089	
12/26/95	1.43		1564		1.118	
12/27/95	1.46		1542		1.126	
12/28/95	1.45		1493		1.082	
12/29/95	1.55		1703		1.320	
12/30/95	1.69		1424		1.203	
12/31/95	2.11	1.53	1493	1,545	1.575	1.183
01/01/96	2.02		1593		1.609	
01/02/96	1.97		1146		1.129	
01/03/96	Plant Down					
01/04/96	3.33		1729		2.879	
01/05/96	3.23		1317		2.127	
01/06/96	2.71		1666		2.257	
01/07/96	2.95		1633		2.409	
01/08/96	3.13		1692		2.648	
01/09/96	3.14		1631		2.561	
01/10/96	3.12		1642		2.562	
01/11/96	2.98		1653		2.463	
01/12/96	3.08		1655		2.549	
01/13/96	3.15		1662		2.618	
01/14/96	3.06		1669		2.554	
01/15/96	2.96		1408		2.084	
01/16/96	3.09		1644		2.540	
01/17/96	3.21		1649		2.647	
01/18/96	3.23		1652		2.668	
01/19/96	3.46		1651		2.856	
01/20/96	3.42		1678		2.869	
01/21/96	3.41		1700		2.899	
01/22/96	3.41		1620		2.762	
01/23/96	3.54		1721		3.046	
01/24/96	3.27		1329		2.173	
01/25/96	3.32		1660		2.756	
01/26/96	3.49		1702		2.970	
01/27/96	3.53		1705		3.009	
01/28/96	3.63		1654		3.002	
01/29/96	3.52		1636		2.879	
01/30/96	3.47		1662		2.884	
01/31/96	3.57	3.18	1619	1,613	2.890	2.577
02/01/96	3.69		1640		3.026	
02/02/96	3.84		1649		3.166	
02/03/96	3.87		1447		2.800	
02/04/96	3.16		1435		2.267	
02/05/96	3.68		1710		3.146	
02/06/96	3.77		1663		3.135	
02/07/96	3.86		1671		3.225	
02/08/96	3.89		1659		3.227	
02/09/96	3.92		1657		3.248	
02/10/96	3.94		1657		3.264	
02/11/96	3.91		1671		3.267	
02/12/96	3.73		1691		3.154	
02/13/96	3.67		1565		2.872	
02/14/96	3.16		1699		2.684	
02/15/96	3.61		1609		2.904	

Appendix D

Date	SO2 Emission Rate Daily Average (lb/ton)	SO2 Emission Rate Monthly Average (lb/ton)	H2SO4 Production Production (ton/day)	H2SO4 Production Monthly Average (ton/day)	SO2 Emissions (ton/day)	SO2 Emissions Monthly Average (ton/day)
02/16/96	3.84		1599		3.070	
02/17/96	3.84		1654		3.176	
02/18/96	3.29		1307		2.150	
02/19/96	3.78		1713		3.238	
02/20/96	3.66		1587		2.904	
02/21/96	3.69		1713		3.160	
02/22/96	3.79		1593		3.019	
02/23/96	3.75		1724		3.233	
02/24/96	3.74		1711		3.200	
02/25/96	3.70		1749		3.236	
02/26/96	3.69		1692		3.122	
02/27/96	3.89		1419		2.760	
02/28/96	3.78		1651		3.120	
02/29/96	3.89	3.73	1595	1,625	3.102	3.030
03/01/96	3.96		1600		3.168	
03/02/96	3.95		1647		3.253	
03/03/96	3.95		1668		3.294	
03/04/96	3.91		1677		3.279	
03/05/96	3.91		1700		3.324	
03/06/96	3.87		1585		3.067	
03/07/96	3.87		1606		3.108	
03/08/96	3.49		1673		2.919	
03/09/96	3.83		1544		2.957	
03/10/96	3.99		1661		3.314	
03/11/96	3.90		1658		3.233	
03/12/96	3.67		1630		2.991	
03/13/96	3.71		1642		3.046	
03/14/96	3.70		1669		3.088	
03/15/96	3.76		1630		3.064	
03/16/96	3.71		1647		3.055	
03/17/96	3.69		1610		2.970	
03/18/96	3.76		1616		3.038	
03/19/96	3.88		1602		3.108	
03/20/96	3.80		1663		3.160	
03/21/96	3.78		1603		3.030	
03/22/96	3.66		1640		3.001	
03/23/96	3.43		1452		2.490	
03/24/96	3.16		1662		2.626	
03/25/96	3.17		1698		2.691	
03/26/96	3.31		1579		2.613	
03/27/96	3.23		1391		2.246	
03/28/96	3.76		1657		3.115	
03/29/96	3.76		1652		3.106	
03/30/96	3.78		1636		3.092	
03/31/96	3.81	3.71	1593	1,622	3.035	3.016
04/01/96	3.88		1632		3.166	
04/02/96	3.82		1627		3.108	
04/03/96	3.82		1633		3.119	
04/04/96	3.78		1605		3.033	
04/05/96	3.69		1718		3.170	
04/06/96	3.64		1428		2.599	
04/07/96	3.72		1707		3.175	
04/08/96	3.76		1536		2.888	
04/09/96	3.85		1655		3.186	
04/10/96	3.84		1573		3.020	
04/11/96	3.77		1743		3.286	
04/12/96	3.76		1533		2.882	
04/13/96	3.65		1710		3.121	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
04/14/96	3.63		1574		2.857	
04/15/96	3.72		1616		3.006	
04/16/96	3.88		1647		3.195	
04/17/96	3.74		1597		2.986	
04/18/96	3.67		1606		2.947	
04/19/96	3.68		1668		3.069	
04/20/96	3.68		1638		3.014	
04/21/96	3.70		1585		2.932	
04/22/96	3.58		1687		3.020	
04/23/96	3.54		1608		2.846	
04/24/96	3.90		1620		3.159	
04/25/96	Plant Down					
04/26/96	2.99		1624		2.428	
04/27/96	3.08		1603		2.469	
04/28/96	3.11		1614		2.510	
04/29/96	3.25		1362		2.213	
04/30/96	3.83	3.65	1624	1,613	3.110	2.949
05/01/96	3.84		1604		3.080	
05/02/96	3.96		1734		3.433	
05/03/96	3.97		1552		3.081	
05/04/96	3.99		1617		3.226	
05/05/96	3.95		1631		3.221	
05/06/96	3.96		1615		3.198	
05/07/96	3.95		1639		3.237	
05/08/96	3.97		1632		3.240	
05/09/96	3.24		1483		2.402	
05/10/96	3.62		1442		2.610	
05/11/96	3.86		1698		3.277	
05/12/96	3.88		1641		3.184	
05/13/96	3.83		1454		2.784	
05/14/96	3.91		1706		3.335	
05/15/96	3.93		1731		3.401	
05/16/96	3.95		1524		3.010	
05/17/96	3.93		1647		3.236	
05/18/96	3.96		1603		3.174	
05/19/96	3.97		1624		3.224	
05/20/96	3.97		1670		3.315	
05/21/96	3.98		1553		3.090	
05/22/96	3.97		1598		3.172	
05/23/96	3.98		1621		3.226	
05/24/96	3.95		1602		3.164	
05/25/96	3.95		1616		3.192	
05/26/96	3.96		1616		3.200	
05/27/96	3.95		1605		3.170	
05/28/96	3.98		1586		3.156	
05/29/96	3.97		1602		3.180	
05/30/96	3.73		1443		2.691	
05/31/96	3.98	3.90	1623	1,604	3.230	3.134
06/01/96	3.97		1635		3.245	
06/02/96	3.97		1624		3.224	
06/03/96	3.97		1624		3.224	
06/04/96	3.95		1628		3.215	
06/05/96	3.95		1603		3.166	
06/06/96	3.98		1672		3.327	
06/07/96	3.97		1588		3.152	
06/08/96	3.88		1623		3.149	
06/09/96	3.88		1629		3.160	
06/10/96	3.84		1615		3.101	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
06/11/96	3.93		1630		3.203	
06/12/96	3.96		1571		3.111	
06/13/96	3.97		1637		3.249	
06/14/96	3.97		1649		3.273	
06/15/96	3.97		1590		3.156	
06/16/96	3.96		1628		3.223	
06/17/96	3.88		1588		3.081	
06/18/96	3.44		1268		2.181	
06/19/96	3.66		1615		2.955	
06/20/96	3.02		1268		1.915	
06/21/96	3.59		1589		2.852	
06/22/96	3.49		1596		2.785	
06/23/96	3.07		1440		2.210	
06/24/96	3.06		1327		2.030	
06/25/96	3.52		1609		2.832	
06/26/96	3.65		1680		3.066	
06/27/96	3.68		1541		2.835	
06/28/96	3.69		1621		2.991	
06/29/96	3.63		1669		3.029	
06/30/96	3.76	3.74	1552	1,577	2.918	2.962
07/01/96	3.82		1706		3.258	
07/02/96	3.77		1512		2.850	
07/03/96	3.65		1420		2.592	
07/04/96	Reduced Rate					
07/05/96	3.52		1850		3.256	
07/06/96	3.94		1631		3.213	
07/07/96	3.92		1610		3.156	
07/08/96	3.97		1681		3.337	
07/09/96	3.54		1531		2.710	
07/10/96	3.91		1423		2.782	
07/11/96	3.98		1603		3.190	
07/12/96	3.89		1600		3.112	
07/13/96	3.95		1629		3.217	
07/14/96	3.90		1615		3.149	
07/15/96	3.60		1571		2.828	
07/16/96	3.53		1650		2.912	
07/17/96	3.01		1628		2.450	
07/18/96	1.84		1474		1.356	
07/19/96	3.55		1146		2.034	
07/20/96	3.97		1616		3.208	
07/21/96	3.98		1657		3.297	
07/22/96	3.99		1539		3.070	
07/23/96	3.98		1584		3.152	
07/24/96	3.97		1676		3.327	
07/25/96	3.97		1448		2.874	
07/26/96	3.97		1414		2.807	
07/27/96	3.95		1812		3.579	
07/28/96	3.71		1414		2.623	
07/29/96	3.96		1679		3.324	
07/30/96	3.94		1682		3.314	
07/31/96	3.93	3.75	1514	1,577	2.975	2.965
08/01/96	3.97		1693		3.361	
08/02/96	3.96		1695		3.356	
08/03/96	3.97		1609		3.194	
08/04/96	3.96		1540		3.049	
08/05/96	3.96		1608		3.184	
08/06/96	3.97		1594		3.164	

Appendix D

	SO2 Emission Rate			H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)		Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
08/07/96	3.98			1255		2.497	
08/08/96		Plant Down					
08/09/96		Plant Down					
08/10/96		Plant Down					
08/11/96	3.91			1630		3.187	
08/12/96	3.96			1590		3.148	
08/13/96	3.58			1639		2.934	
08/14/96	3.65			1655		3.020	
08/15/96	2.40			1146		1.375	
08/16/96	3.46			1468		2.540	
08/17/96	3.57			1648		2.942	
08/18/96	3.57			1633		2.915	
08/19/96	3.56			1644		2.926	
08/20/96	3.64			1616		2.941	
08/21/96	3.68			1648		3.032	
08/22/96	3.64			1621		2.950	
08/23/96	3.79			1633		3.095	
08/24/96	3.70			1719		3.180	
08/25/96	3.70			1625		3.006	
08/26/96	3.65			1538		2.807	
08/27/96	3.62			1625		2.941	
08/28/96	3.60			1614		2.905	
08/29/96	3.71			1654		3.068	
08/30/96	3.70			1567		2.899	
08/31/96	3.62		3.70	1617	1,590	2.927	2.948
09/01/96	3.42			1620		2.770	
09/02/96	3.42			1608		2.750	
09/03/96	3.30			1560		2.574	
09/04/96	2.17			1393		1.511	
09/05/96	3.24			1578		2.556	
09/06/96	3.30			1626		2.683	
09/07/96	3.31			1614		2.671	
09/08/96	2.93			1592		2.332	
09/09/96	2.40			1618		1.942	
09/10/96		Plant Down					
09/11/96	3.74			1620		3.029	
09/12/96	3.70			1610		2.979	
09/13/96	3.70			1643		3.040	
09/14/96	3.74			1595		2.983	
09/15/96	3.74			1599		2.990	
09/16/96	3.24			1560		2.527	
09/17/96	3.27			1571		2.569	
09/18/96	3.72			1612		2.998	
09/19/96	3.69			1600		2.952	
NOTE: 9 MONTHS AFTER TURNAROUND							
09/20/96	3.74			1637		3.061	
09/21/96	3.77			1608		3.031	
09/22/96	3.81			1584		3.018	
09/23/96	3.92			1124		2.203	
09/24/96		Plant Down					
09/25/96	3.19			1171		1.868	
09/26/96	3.81			1637		3.118	
09/27/96	3.80			1741		3.308	
09/28/96	3.78			1580		2.986	
09/29/96	3.76			1644		3.091	
09/30/96	3.85		3.48	1656	1,571	3.188	2.740
10/01/96	3.81			1603		3.054	
10/02/96	3.77			1646		3.103	

Appendix D

Date	SO2 Emission Rate: Daily Average (lb/ton)	SO2 Emission Rate: Monthly Average (lb/ton)	H2SO4 Production: Production (ton/day)	H2SO4 Production: Monthly Average (ton/day)	SO2 Emissions: (ton/day)	SO2 Emissions: Monthly Average (ton/day)
10/03/96	3.81		1641		3.126	
10/04/96	3.76		1667		3.134	
10/05/96	3.79		1629		3.087	
10/06/96	3.78		1634		3.088	
10/07/96	3.87		1597		3.090	
10/08/96	3.97		1628		3.232	
10/09/96	3.98		1666		3.315	
10/10/96	3.96		1653		3.273	
10/11/96	3.95		1595		3.150	
10/12/96	3.94		1738		3.424	
10/13/96	3.96		1456		2.883	
10/14/96	3.86		1534		2.961	
10/15/96	3.98		1646		3.276	
10/16/96		Plant Down				
10/17/96		Plant Down				
10/18/96	3.96		1466		2.903	
10/19/96	3.96		1566		3.101	
10/20/96	3.94		1482		2.920	
10/21/96	3.81		1254		2.389	
10/22/96	3.97		1572		3.120	
10/23/96	3.94		1642		3.235	
10/24/96	3.97		1482		2.942	
10/25/96	3.95		1551		3.063	
10/26/96	3.98		1657		3.297	
10/27/96	3.97		1643		3.261	
10/28/96	3.98		1520		3.025	
10/29/96	3.97		1547		3.071	
10/30/96	3.97		1529		3.035	
10/31/96	3.97	3.91	1573	1,580	3.122	3.092
11/01/96	3.76		1432		2.692	
11/02/96	2.90		1509		2.188	
11/03/96	2.78		1179		1.639	
11/04/96	3.95		1589		3.138	
11/05/96	3.93		1591		3.126	
11/06/96	3.83		1549		2.966	
11/07/96	3.90		1615		3.149	
11/08/96	3.95		1456		2.876	
11/09/96	3.97		1495		2.968	
11/10/96	3.95		1587		3.134	
11/11/96	3.98		1582		3.148	
11/12/96	3.99		1576		3.144	
11/13/96	3.98		1582		3.148	
11/14/96	3.98		1591		3.166	
11/15/96	3.98		1566		3.116	
11/16/96	3.98		1570		3.124	
11/17/96	3.99		1573		3.138	
11/18/96	3.98		1515		3.015	
11/19/96	3.97		1589		3.154	
11/20/96	3.97		1537		3.051	
11/21/96	3.97		1557		3.091	
11/22/96	3.97		1543		3.063	
11/23/96	3.97		1554		3.085	
11/24/96	3.98		1598		3.180	
11/25/96	3.96		1550		3.069	
11/26/96	3.98		1574		3.132	
11/27/96	3.97		1562		3.101	
11/28/96	3.98		1586		3.156	
11/29/96	3.98		1587		3.158	
11/30/96	3.97	3.88	1591	1,546	3.158	3.009

Appendix D

Date	SO2 Emission Rate Daily Average (lb/ton)	SO2 Emission Rate Monthly Average (lb/ton)	H2SO4 Production Production (ton/day)	H2SO4 Production Monthly Average (ton/day)	SO2 Emissions (ton/day)	SO2 Emissions Monthly Average (ton/day)
12/01/96	3.96		1550		3.069	
12/02/96	3.97		1533		3.043	
12/03/96	3.98		1620		3.224	
12/04/96	3.97		1645		3.265	
12/05/96	3.99		1492		2.977	
12/06/96	3.78		1189		2.247	
12/07/96	3.68		1522		2.800	
12/08/96	3.83		1252		2.398	
12/09/96	3.51		1207		2.118	
12/10/96	3.98		1570		3.124	
12/11/96	3.94		1545		3.044	
12/12/96	3.95		1562		3.085	
12/13/96	3.98		1549		3.083	
12/14/96	3.97		1559		3.095	
12/15/96	3.98		1564		3.112	
12/16/96	3.66		1509		2.761	
12/17/96	3.72		1426		2.652	
12/18/96	3.95		1540		3.042	
12/19/96	3.98		1543		3.071	
12/20/96	3.97		1597		3.170	
12/21/96	3.98		1583		3.150	
12/22/96	3.98		1554		3.092	
12/23/96	3.98		1572		3.128	
12/24/96	3.98		1524		3.033	
12/25/96	3.98		1567		3.118	
12/26/96	3.96		1550		3.069	
12/27/96	3.99		1569		3.130	
12/28/96	3.96		1538		3.045	
12/29/96	3.96		1574		3.117	
12/30/96	3.97		1565		3.107	
12/31/96	3.98	3.92	1538	1,520	3.061	2.982
01/01/97	3.98		1562		3.108	
01/02/97	3.98		1565		3.114	
01/03/97	3.97		1590		3.156	
01/04/97	3.98		1491		2.967	
01/05/97	3.98		1560		3.104	
01/06/97	3.98		1609		3.202	
01/07/97	3.97		1500		2.978	
01/08/97	3.97		1511		2.999	
01/09/97	3.96		1522		3.014	
01/10/97	3.98		1541		3.067	
01/11/97	3.98		1550		3.085	
01/12/97	3.98		1538		3.061	
01/13/97	3.97		1553		3.083	
01/14/97	3.98		1554		3.092	
01/15/97	3.95		1526		3.014	
01/16/97	3.98		1523		3.031	
01/17/97	3.98		1573		3.130	
01/18/97	3.99		1549		3.090	
01/19/97	3.99		1570		3.132	
01/20/97	3.98		1541		3.067	
01/21/97	3.99		1565		3.122	
01/22/97	3.98		1621		3.226	
01/23/97	3.94		1441		2.839	
01/24/97	3.60		1215		2.187	
01/25/97	3.94		1506		2.967	
01/26/97	3.95		1494		2.951	
01/27/97	3.97		1548		3.073	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
01/28/97	3.99		1605		3.202	
01/29/97	3.94		1540		3.034	
01/30/97	3.97		1552		3.081	
01/31/97	3.60	3.95	1026	1,517	1.847	3.001
02/01/97	3.95		1558		3.077	
02/02/97	3.96		1561		3.091	
02/03/97	3.97		1551		3.079	
02/04/97	3.98		1627		3.238	
02/05/97	3.98		1467		2.919	
02/06/97	3.97		1541		3.059	
02/07/97	3.97		1586		3.148	
02/08/97	3.98		1510		3.005	
02/09/97	3.99		1569		3.130	
02/10/97	4.95		1064		2.633	
02/11/97	3.98		1551		3.086	
02/12/97	3.98		1557		3.098	
02/13/97	3.98		1534		3.053	
02/14/97	3.98		1617		3.218	
02/15/97	3.97		1466		2.910	
02/16/97	3.98		1586		3.156	
02/17/97	3.98		1570		3.124	
02/18/97	3.99		1584		3.160	
02/19/97	3.99		1525		3.042	
02/20/97	3.98		1518		3.021	
02/21/97	3.99		1515		3.022	
02/22/97	3.98		1590		3.164	
02/23/97	3.98		1500		2.985	
02/24/97	3.98		1584		3.152	
02/25/97	3.98		1576		3.136	
02/26/97	3.98		1546		3.077	
02/27/97	3.91		1530		2.991	
02/28/97	3.95	4.01	1538	1,533	3.038	3.065
03/01/97	3.96		1540		3.049	
03/02/97	3.97		1545		3.067	
03/03/97	3.96		1536		3.041	
03/04/97	3.98		1609		3.202	
03/05/97	3.99		1475		2.943	
03/06/97	3.97		1512		3.001	
03/07/97	3.98		1549		3.083	
03/08/97	3.98		1464		2.913	
03/09/97	3.98		1580		3.144	
03/10/97	3.98		1579		3.142	
03/11/97	3.98		1500		2.985	
03/12/97	3.97		1529		3.035	
03/13/97	3.98		1539		3.063	
03/14/97	3.97		1454		2.886	
03/15/97	3.99		1519		3.030	
03/16/97	3.98		1534		3.053	
03/17/97	3.52		1428		2.513	
03/18/97	3.98		1547		3.079	
03/19/97	3.98		1472		2.929	
03/20/97	3.98		1586		3.156	
03/21/97	3.99		1527		3.046	
03/22/97	3.99		1467		2.927	
03/23/97	3.97		1520		3.017	
03/24/97	3.97		1600		3.176	
03/25/97	3.96		1530		3.029	
03/26/97	3.97		1530		3.037	

Appendix D

Date	SO2 Emission Rate Daily Average (lb/ton)	SO2 Emission Rate Monthly Average (lb/ton)	H2SO4 Production Production (ton/day)	H2SO4 Production Monthly Average (ton/day)	SO2 Emissions (ton/day)	SO2 Emissions Monthly Average (ton/day)
03/27/97	3.99		1526		3.044	
03/28/97	3.97		1569		3.114	
03/29/97	3.97		1512		3.001	
03/30/97	3.97		1520		3.017	
03/31/97	3.97	3.96	1524	1,527	3.025	3.024
04/01/97	3.83		1014		1.942	
04/02/97	3.98		1545		3.075	
04/03/97	3.99		1527		3.046	
04/04/97	3.77		1252		2.360	
04/05/97	3.97		1454		2.886	
04/06/97	3.97		1521		3.019	
04/07/97	3.98		1509		3.003	
04/08/97	3.97		1542		3.061	
04/09/97	3.99		1593		3.178	
04/10/97	3.98		1432		2.850	
04/11/97	3.99		1522		3.036	
04/12/97	3.99		1505		3.002	
04/13/97	3.98		1506		2.997	
04/14/97	3.98		1515		3.015	
04/15/97	3.99		1547		3.086	
04/16/97	Reduced Rate					
04/17/97	3.98		1525		3.035	
04/18/97	3.98		1502		2.989	
04/19/97	3.97		1517		3.011	
04/20/97	3.97		1477		2.932	
04/21/97	3.97		1493		2.964	
04/22/97	3.98		1557		3.098	
04/23/97	3.98		1475		2.935	
04/24/97	3.98		1507		2.999	
04/25/97	3.44		1106		1.902	
04/26/97	3.98		1507		2.999	
04/27/97	3.98		1485		2.955	
04/28/97	3.97		1493		2.964	
04/29/97	3.98		1489		2.963	
04/30/97	3.94	3.95	1472	1,469	2.900	2.904
05/01/97	3.98		1553		3.090	
05/02/97	3.99		1449		2.891	
05/03/97	3.99		1503		2.998	
05/04/97	3.97		1527		3.031	
05/05/97	3.99		1549		3.090	
05/06/97	3.97		1457		2.892	
05/07/97	3.96		1491		2.952	
05/08/97	3.97		1504		2.985	
05/09/97	3.98		1578		3.140	
05/10/97	3.99		1444		2.881	
05/11/97	3.97		1562		3.101	
05/12/97	3.99		1432		2.857	
05/13/97	3.99		1463		2.919	
05/14/97	3.98		1450		2.886	
05/15/97	3.99		1545		3.082	
05/16/97	3.98		1466		2.917	
05/17/97	3.98		1452		2.889	
05/18/97	3.99		1638		3.268	
05/19/97	3.98		1432		2.850	
05/20/97	3.98		1512		3.009	
05/21/97	3.97		1458		2.894	
05/22/97	3.98		1512		3.009	
05/23/97	3.97		1454		2.886	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
05/24/97	3.97		1541		3.059	
05/25/97	3.97		1460		2.898	
05/26/97	3.97		1475		2.928	
05/27/97	3.99		1525		3.042	
05/28/97	3.66		1222		2.236	
05/29/97	3.95		1490		2.943	
05/30/97	3.98		1559		3.102	
05/31/97	3.97	3.97	1502	1,490	2.981	2.958
06/01/97	3.94		1495		2.945	
06/02/97	3.98		1575		3.134	
06/03/97	3.95		1371		2.708	
06/04/97	3.78		1467		2.773	
06/05/97	3.58		1455		2.604	
06/06/97	3.59		1486		2.667	
06/07/97	3.58		1447		2.590	
06/08/97	3.58		1467		2.626	
06/09/97	3.64		1465		2.666	
06/10/97	3.70		1070		1.980	
06/11/97	3.59		1469		2.637	
06/12/97	3.72		1452		2.701	
06/13/97	3.10		1236		1.916	
06/14/97	3.00		1785		2.678	
06/15/97	2.99		1342		2.006	
06/16/97	3.09		1626		2.512	
06/17/97	3.38		1389		2.347	
06/18/97	3.37		1456		2.453	
06/19/97	3.40		1452		2.468	
06/20/97	3.41		1102		1.879	
06/21/97	3.43		1594		2.734	
NOTE: 18 MONTHS AFTER TURNAROUND						
06/22/97	3.39		1310		2.220	
06/23/97	3.51		1140		2.001	
06/24/97	3.42		1491		2.550	
06/25/97	3.34		1413		2.360	
06/26/97	3.54		1455		2.575	
06/27/97	3.39		1315		2.229	
06/28/97	3.57		1468		2.620	
06/29/97	3.57		1477		2.636	
06/30/97	3.46	3.50	1444	1,424	2.498	2.490
07/01/97	3.63		1468		2.664	
07/02/97	3.61		1344		2.426	
07/03/97	3.69		1433		2.644	
07/04/97	3.14		1407		2.209	
07/05/97	3.31		1207		1.998	
07/06/97	3.64		1543		2.808	
07/07/97	3.76		1416		2.662	
07/08/97	3.72		1470		2.734	
07/09/97	3.67		1401		2.571	
07/10/97	3.75		1450		2.719	
07/11/97	3.73		1467		2.736	
07/12/97	3.74		1434		2.682	
07/13/97	3.67		1556		2.855	
07/14/97	3.76		1439		2.705	
07/15/97	3.72		1502		2.794	
07/16/97	3.65		1468		2.679	
07/17/97	3.73		1479		2.758	
07/18/97	3.72		1453		2.703	
07/19/97	3.73		1457		2.717	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
07/20/97	3.74		1463		2.736	
07/21/97	3.63		1303		2.365	
07/22/97	3.64		1340		2.439	
07/23/97	3.66		1434		2.624	
07/24/97	Plant Down					
07/25/97	3.56		884		1.574	
07/26/97	3.54		1466		2.595	
07/27/97	3.50		1413		2.473	
07/28/97	3.21		1040		1.669	
07/29/97	3.47		1570		2.724	
07/30/97	3.58		1408		2.520	
07/31/97	3.70	3.62	1495	1,407	2.766	2.552
08/01/97	3.70		1380		2.553	
08/02/97	3.90		1482		2.890	
08/03/97	3.90		1425		2.779	
08/04/97	3.72		1537		2.859	
08/05/97	3.90		1405		2.740	
08/06/97	3.92		1403		2.750	
08/07/97	3.62		1478		2.675	
08/08/97	3.76		851		1.600	
08/09/97	3.96		1734		3.433	
08/10/97	3.93		1386		2.723	
08/11/97	3.94		1503		2.961	
08/12/97	3.96		1438		2.847	
08/13/97	3.96		1461		2.893	
08/14/97	3.97		1399		2.777	
08/15/97	3.93		1418		2.786	
08/16/97	3.94		1444		2.845	
08/17/97	Reduced Rate					
08/18/97	3.87		1446		2.798	
08/19/97	3.86		1483		2.862	
08/20/97	3.90		1367		2.666	
08/21/97	3.91		1475		2.884	
08/22/97	3.95		1414		2.793	
08/23/97	3.94		1449		2.855	
08/24/97	3.94		1211		2.386	
08/25/97	Plant Down					
08/26/97	Plant Down					
08/27/97	3.75		723		1.356	
08/28/97	2.89		1519		2.195	
08/29/97	2.90		1139		1.652	
08/30/97	2.68		1489		1.995	
08/31/97	2.72	3.73	1482	1,391	2.016	2.592
09/01/97	2.75		1461		2.009	
09/02/97	3.75		1488		2.790	
09/03/97	3.94		1593		3.138	
09/04/97	3.83		1519		2.909	
09/05/97	3.79		1603		3.038	
09/06/97	3.96		1482		2.934	
09/07/97	3.97		1574		3.124	
09/08/97	3.98		1570		3.124	
09/09/97	3.98		1534		3.053	
09/10/97	3.97		1551		3.079	
09/11/97	Reduced Rate					
09/12/97	3.97		1497		2.972	
09/13/97	3.97		1564		3.105	
09/14/97	3.98		1549		3.083	
09/15/97	3.97		1541		3.059	

Appendix D

	SO2 Emission Rate		H2SO4 Production		SO2 Emissions	
Date	Daily Average (lb/ton)	Monthly Average (lb/ton)	Production (ton/day)	Monthly Average (ton/day)	(ton/day)	Monthly Average (ton/day)
09/16/97	3.98		1582		3.148	
09/17/97	3.96		1578		3.124	
09/18/97	3.95		1483		2.929	
09/19/97	3.97		1547		3.071	
09/20/97	3.97		1484		2.946	
09/21/97	3.97		1572		3.120	
09/22/97	3.98		1461		2.907	
09/23/97	3.98		1557		3.098	
09/24/97	3.97		1492		2.962	
09/25/97	3.97		1619		3.214	
09/26/97	3.98		1517		3.019	
09/27/97	3.98		1509		3.003	
09/28/97	3.98		1611		3.206	
09/29/97	3.99		1571		3.134	
09/30/97	3.98	3.91	1519	1,539	3.023	3.011

18-Month		551	Days	78.7	Weeks	18.18	Months		
12/20/95	to	06/21/97	Average			Average		Total	
			3.73	lb/ton		1,558	ton/day	1566.49	ton for the 550 day Period
9-Month		275	Days	39.3	Weeks	9.07	Months		
12/20/95	to	09/19/96	Average			Average		Total	
			3.55	lb/ton		1,599	ton/day	763.72	ton for the 275 day Period
								Total	
							763.72	x 2 =	1527.43 tons for two 275 day Period

APPENDIX E

MONSANTO ENVIRO-SYSTEMS, INC. HEAT RECOVERY SYSTEMS FOR SULFURIC ACID PLANTS

KOOGLER & ASSOCIATES

Monsanto Enviro-Chem

SULFURIC ACID HEAT RECOVERY SYSTEM (HRS) OPERATIONS AT NAMHAE CHEMICAL CORPORATION, KOREA

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November, 1988

ABSTRACT

Monsanto Enviro-Chem's (MEC) patented new Heat Recovery System (HRS) recovers most of the heat from sulfuric acid plant absorbers at up to 10 bars pressure. HRS was proven in pilot plant operation from 1983 to 1985. The first commercial unit was started up very successfully on Namhae Chemical Corporation's (NCC) 1350 t/d plant in November, 1987. With almost a year of operating experience, HRS has proven easy to operate, met all design criteria and has operated with a high on-stream time. HRS has been sold to several other customers and many others are evaluating the economics in their plants.

The following comment was made by K.P. Chae, Managing Director of Engineering and Projects and former Plant Manager of Namhae's Yeosu site:

> "Without challenging spirit, you can't get much. We are proud of being the first case of commercial application of Monsanto Enviro-Chem's HRS technology.
>
> After many sleepless nights during the initial start-up and then following eight months' uninterrupted operation, now I can comfortably say that Namhae has made the right decision to go ahead with HRS, which has been tremendously profitable for Namhae Chemical Corporation by killing 'three birds with one stone': Energy saving, production increase and lowering emission."

TECHNICAL BACKGROUND

The production of sulfuric acid in sulfur burning acid plants generates large quantities of heat from the combustion of sulfur to sulfur dioxide; the catalytic oxidation of sulfur dioxide to sulfur trioxide; and the heat of formation of acid as SO_3 is absorbed in sulfuric acid.

The heat of sulfur combustion and oxidation of sulfur dioxide have been utilized for years to generate steam. Until the mid-1970's, energy recovery from acid plants was about 55%. Then, as fuel prices increased, acid plants were optimized to generate more steam. Low gas-temperature economizers, low pressure drop catalyst, suction drying towers, increased SO_2 gas concentration and preheating boiler feedwater with acid became commonplace and energy recovery from acid plants increased to 70%. However, 30% of the heat was still lost. This heat loss was primarily in the acid formation and cooling process.

Monsanto Enviro-Chem initiated a major research effort in the late 1970's to recover more of this lost energy. The research progressed through studies and laboratory tests until 1983 when a pilot tower was installed in a 550 t/d acid plant to demonstrate the now patented Heat Recovery System (HRS).

The basis of the HRS is that sulfuric acid in the 99% range has low corrosivity toward certain commercially available alloys at temperatures up to 220°C and higher. The high acid temperature provides the driving force to economically generate steam while the acid still readily absorbs SO_3 gas.

The HRS becomes commercially viable when it is located before existing absorption towers or is used as the interpass absorption tower in a new plant. Figure 1 is a process diagram showing the major equipment items. The sulfur trioxide ladened gas flows to the Heat Recovery Tower (HRT) where the sulfur trioxide is absorbed in sulfuric acid. The absorption of the sulfur trioxide increases the temperature and concentration of the sulfuric acid. Concentrated, hot sulfuric acid leaves the tower at Point B. The acid is cooled by generating steam in a boiler and leaves the boiler at Point C. After the product is removed, the remaining acid is diluted with water and recirculated to the tower at Point A.

The process is shown on the HRS operating cycle diagram in Figure 2. The curves on the left are isocorrosion lines for 310 stainless steel. The right hand line defines the limiting conditions for the absorption of sulfur trioxide. The points on the triangle correspond to the process conditions identified in the Figure 1 process diagram. Acid near 100% concentration leaves the tower at 200°C (Point B). The acid is cooled in the boiler to approximately 160°C (Point C). The acid is diluted to 99% with a temperature rise due to heat of dilution (Point A). Finally, sulfur trioxide is absorbed in the tower, raising the acid concentration and temperature to complete the cycle.

This example is a 3.5 bar (50 psig) steam system but steam can be generated at up to 10 bar (150 psig). HRS can boost energy recovery to 90% to 95% of the total energy generated in a sulfur burning plant.

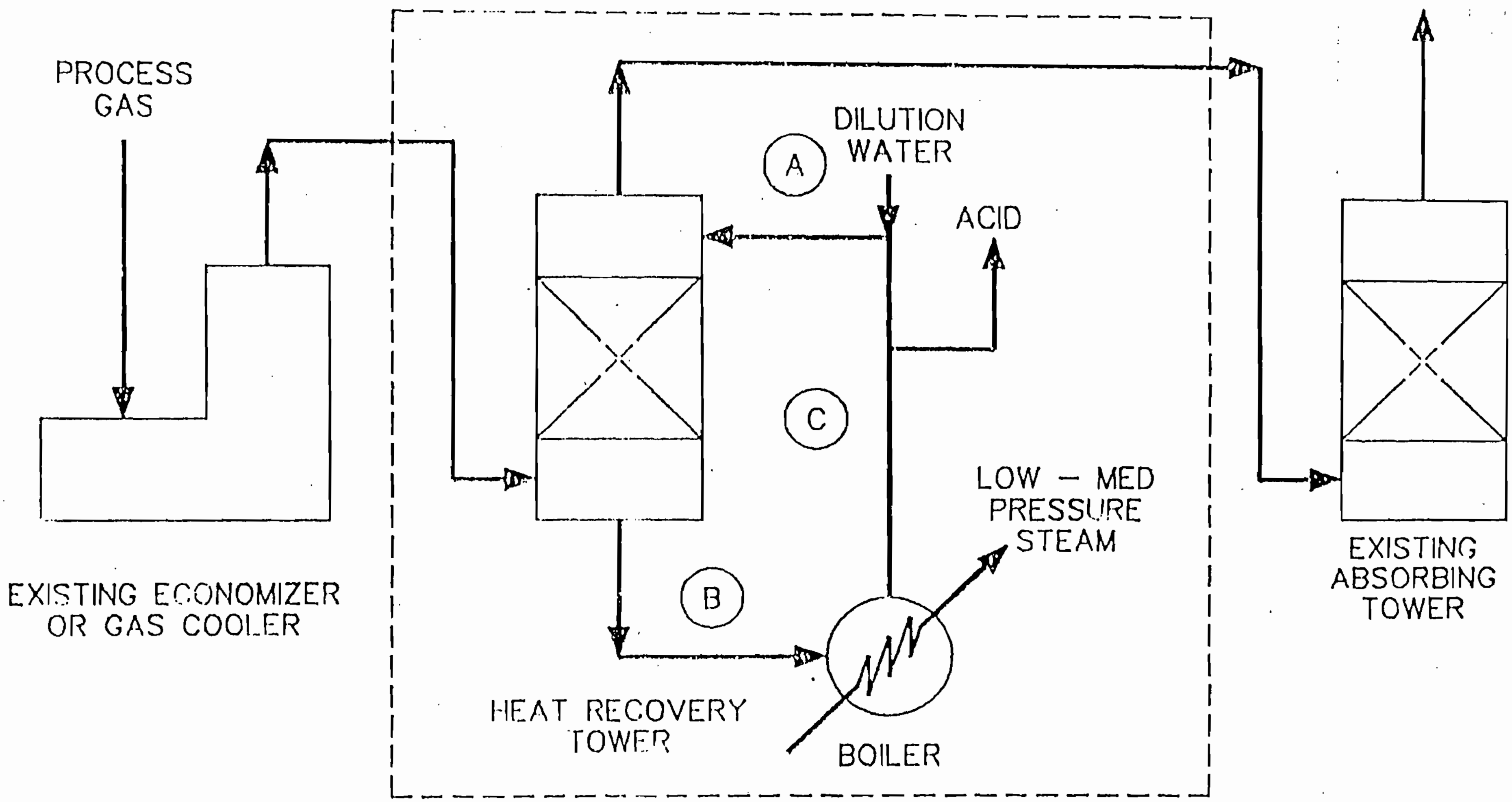

FIGURE 1 - HEAT RECOVERY SYSTEM

Monsanto Enviro-Chem

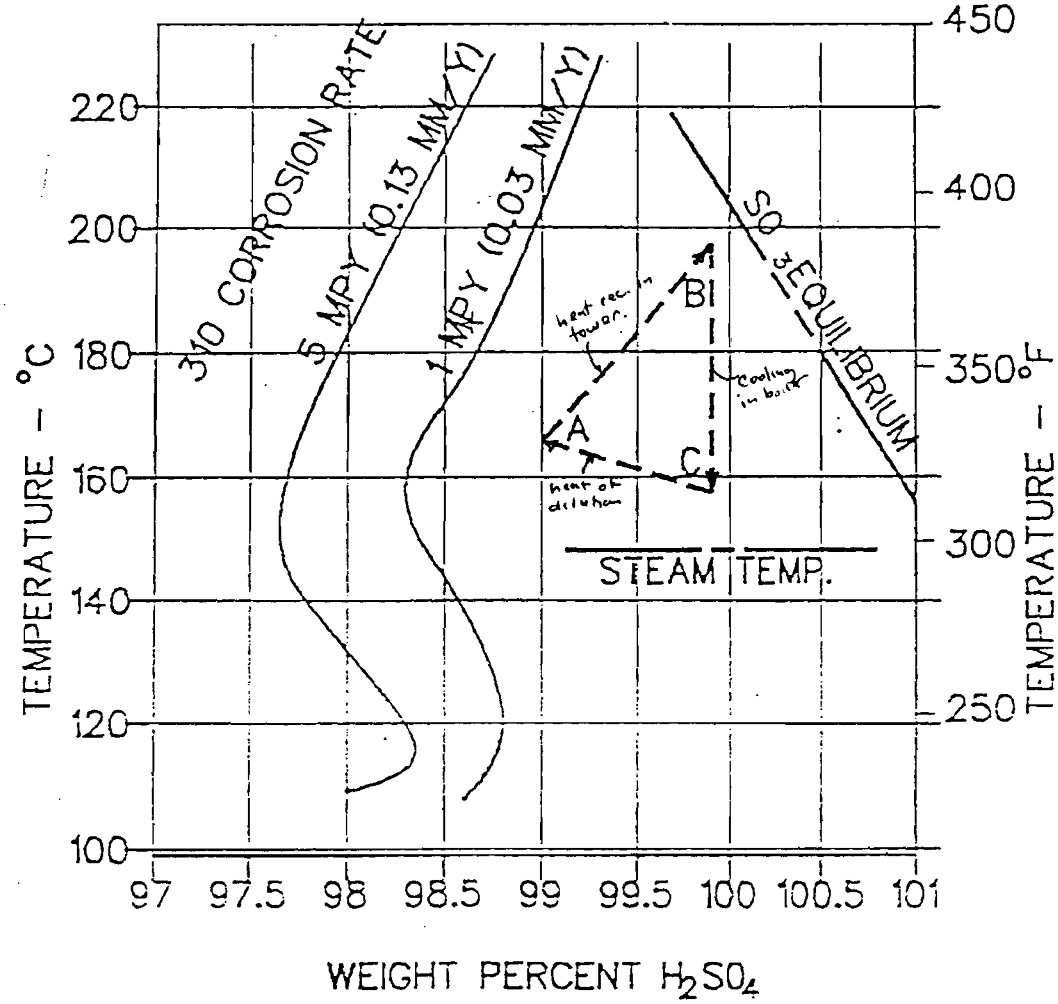

FIGURE 2 — HRS OPERATING CYCLE

NAMHAE HRS PROJECT

Namhae of Yeosu, South Korea is a billion dollar a year producer of fertilizer chemicals. Namhae is committed to supply competitively priced quality products to their worldwide clients through efficient operations and best available up-to-date plant technology.

In 1986, Namhae initiated a project to reduce the SO_2 emissions from their two existing, ten year old, single absorption sulfur burning sulfuric acid plants. Monsanto Enviro-Chem of St. Louis, Missouri, U.S.A., made several proposals for Namhae's consideration:

- Add tail gas ammonia scrubbing tower to the plants.
- Convert the plants to double absorption plants with an interpass tower and acid cooler addition.
- Convert the plants to double absorption using the new Heat Recovery System (HRS) as the interpass tower.

Although Monsanto Enviro-Chem had extensive pilot plant experience and data, there were no commercial Heat Recovery Systems in existence at that time. However, Namhae's commitment to cost effective operations and confidence in Monsanto Enviro-Chem's 55 years of reliable acid plant design experience convinced K. P. Chae, Namhae's Managing Director of Engineering and Projects, to select the new Heat Recovery System for Namhae's sulfuric acid plants.

In October, 1986, Namhae awarded Monsanto Enviro-Chem the contract to modify the plants. The project goals were to:

- Increase SO_2 to SO_3 conversion from 97.7% to 99.6%.
- Maintain each plant capacity at 1350 t/d. The original 1050 t/d plants were debottlenecked using Monsanto LP catalyst, increasing gas strength to 8.3% from 7.8% and adding low-temperature economics.
- Increase steam production by adding HRS and adding a new turbine generator dedicated to HRS steam.
- Maximize use of existing plant equipment.

The final design included:

- The Monsanto Enviro-Chem Heat Recovery System as the interpass absorption tower to remove SO_3 and a 150 psig heat recovery boiler to remove the heat of acid formation.
- A final separate one-pass stainless steel converter for the after interpass absorption conversion of SO_2 to SO_3. Monsanto Enviro-Chem LP catalyst was used here and in some passes in the existing converter to lower pressure drop and ensure required conversion was met.

- Cold interpass and hot interpass heat exchangers to heat gas going from the HRS interpass absorption tower to the final catalyst pass.
- Additional economizers and superheaters to recover more heat in the form of high pressure steam than in the form of low pressure steam.
- Much existing equipment was reused without modifications (blower, boiler, economizers and superheaters).

The gas flow diagram in Figure 3 shows the modifications.

In addition, a 9000 kWh turbogenerator was installed to convert the 130,000 lbs/hr of 150 psig steam from HRS to electricity.

Namhae's Project Manager, M. K. Oh, committed to a fast 14 month schedule. The first plant came on-line 13 months after the contract award and both plants and the turbogenerator were demonstrated in an excellent 14-1/2 months.

NAMHAE HEAT RECOVERY SYSTEM

The HRS operates very similar to a sulfuric acid plant absorbing tower. The main difference is higher acid temperatures; the acid is cooled in a boiler rather than an acid cooler; and the tower is stainless steel rather than bricklined steel. The flow diagram for HRS is shown in Figure 4.

The main equipment items in an HRS are:

1. Heat Recovery Tower

   This is a two stage 310 stainless steel tower with ceramic Intalox packing and Monsanto Enviro-Chem ES mist eliminators.

2. HRS Acid Circulation Pump

   This is a vertical submerged stainless steel pump manufactured by the Lewis Pump Co. The pump design is very similar to the proven design of the many vertical sulfuric acid pumps now in service.

3. HRS Boiler and Heaters

   This is a "kettle" type boiler with acid flow through stainless steel tubes. The water side of the boiler is operated and controlled similar to other firetube boilers.

   The HRS water heaters are similar to shell and tube acid coolers but without anodic protection. Their function is to cool product acid by heating the boiler feedwater coming to the HRS boiler.

4. The diluter is where hot dilution water is mixed and absorbed by the hot acid in a turbulent reaction.

5. Instrumention

HRS includes flow, temperature and pressure measurement and control instruments that are normally used in acid plants, but there are also three special instruments that we want to tell you more about.

A. Concentration Control

The acid concentration to the tower must be controlled above 98.5% acid to minimize corrosion. Modern electrodeless torroidal conductivity analyzers were used to provide the reliable and accurate concentration measurement that is needed. These improved analyzers will rapidly become the standard of the industry in all drying and absorbing towers as well as in HRS.

B. Corrosion Monitor

The corrosion monitor measures the current generated by the corrosion reaction of the stainless steel probes in the acid circuit. The monitor, located in the control room, indicates the corrosion rate of the stainless steel and alarms if the rate exceeds set limits for any reason.

C. Acoustic Leak Monitor (ALM)

The acoustic leak monitor was especially developed several years ago by Monsanto and the manufacturer to detect boiler or heat exchanger leaks using acoustic (sound) emissions. The acoustic (sound) wave is transformed into an electric signal and is monitored in the control room.

Boiler or heat exchanger leaks cause an increase in the acoustic emission which sounds the alarm so the plant can be shutdown safely for repairs. There have been no leaks at Namhae.

The other materials in an HRS such as pipe, valves, thermowells and etc. are made of stainless steels compatible with high temperature sulfuric acid.

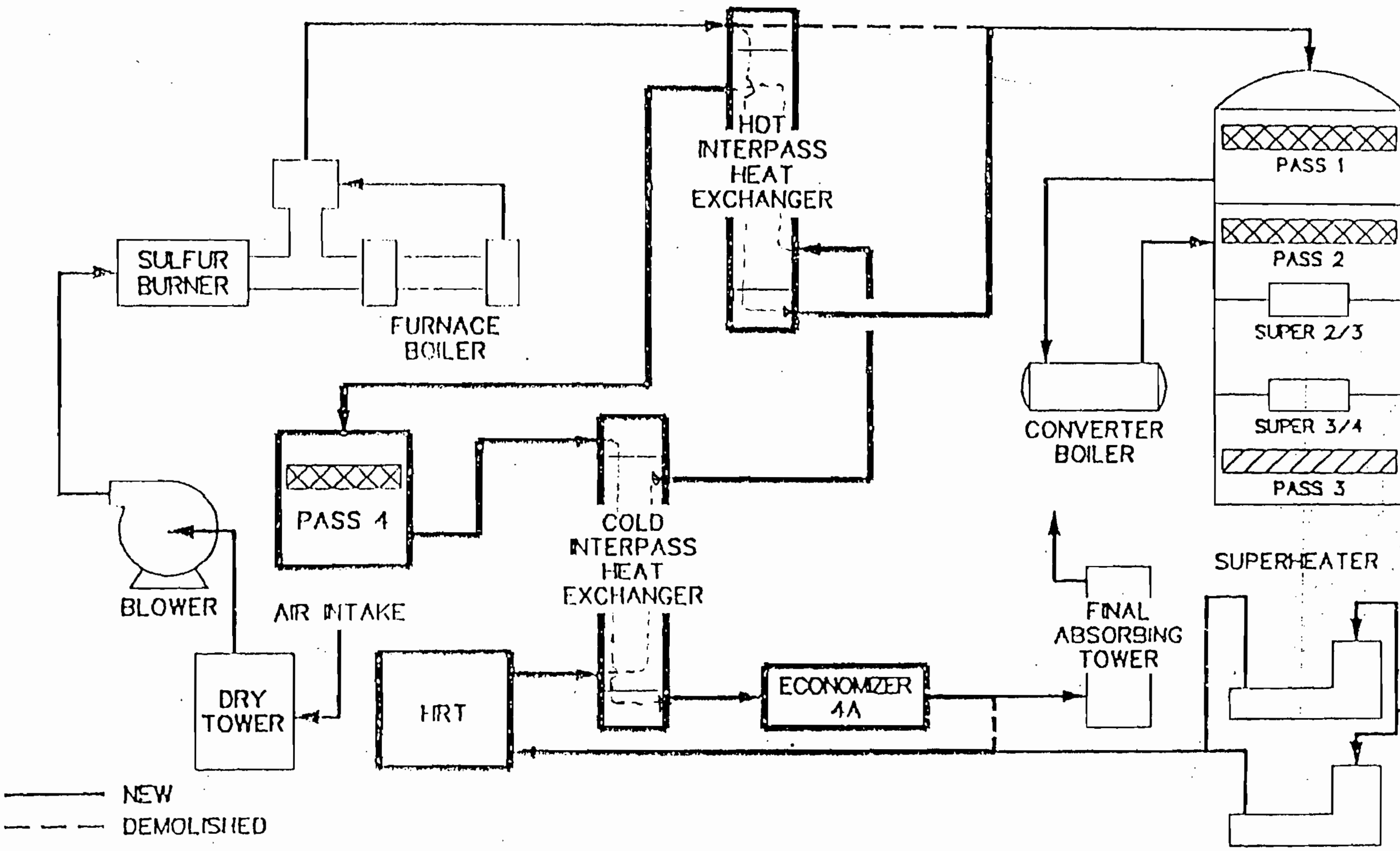

FIGURE 3 – GAS FLOW DIAGRAM

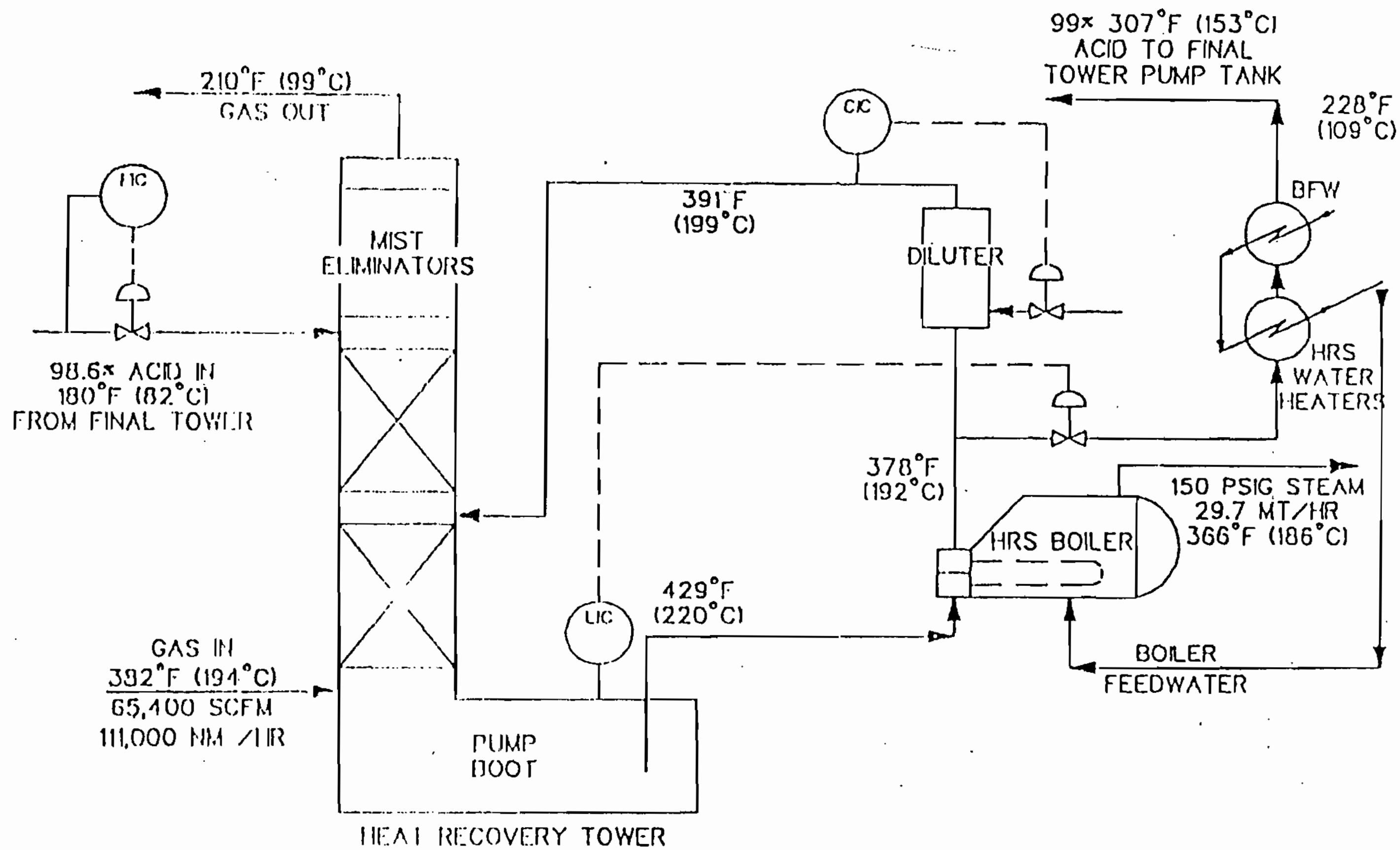

FIGURE 4 – HEAT RECOVERY SYSTEM

HRS START-UP (NOVEMBER AND DECEMBER, 1987)

The plant and HRS start-ups went extremely well. The first plant started up November 19, 1987, and all guarantees were demonstrated within 2-1/2 weeks. The second plant and the turbogenerator power guarantees were demonstrated 1 week after the Plant No. 2 start-up December 23, 1987.

All project guarantees and expectations were readily achieved. The conversion of SO_2 to SO_3 was much better than expected. In fact, the conversion analysis was double and triple checked before it was accepted.

HRS DEMONSTRATION RESULTS

	Guarantee	Expected	Plant #1	Plant #2
Production, t/d	1350	1350	1442	1430
SO_2 Emission, ppm	500	370	208	152
Steam Production, t/hr	27.9	29.7	33.2	30.6
Tons/Ton Acid	.50	.53	.55	.51
Conversion	99.6	99.7	99.85	99.9
T/G Electrical Power kWh	8760		8772 for both plants	

There were a few minor problems during the start-up. In fact, loss of control of acid strength, which is the major concern of many customers, occurred a few hours after start-up. When acid concentration was first put on automatic control, acid strength was rapidly dropped to 94% because the control action was reversed. It took a few hours to get the acid strenth into control and the plant was exposed to 200°C and 94% concentration. Inspection of the plant showed that the only damage was excessive corrosion on the acid pump impeller and wear parts where velocity is highest. However, the pump was still serviceable and was put back into operation. After examination of the pump, Lewis and Monsanto metallurgists concluded that damage was related completely to the low acid strength. However, Namhae had some concerns so some parts of alternate materials were installed for testing in one pump.

A second problem was excessive vibrations transmitted from the diluter to the platform walkway. The mixing of hot water and hot acid produces a turbulent reaction. The diluter requires a solid structural support to grade. The original diluter was supported from horizontal steel beams that support the walkway. The support was redesigned on heavier steel beams that extend down to grade. Excessive walkway vibrations were eliminated.

A third problem was collapse of some teflon lined pipe that was used between the diluter and the tower as a precaution against incomplete mixing which would cause higher than expected localized corrosion rates. Part of the pipe liner collapsed during the start-up period when the plant was shutdown and the acid was drained from the diluter causing a vacuum in the line. Some of the liner was removed as not being necessary and a vacuum breaker will be installed to further protect the remaining liner.

Typical start-up instrument adjustment difficulties were experienced on the Plant No. 1 start-up for the acoustic leak detector and the corrater. However, the Plant No. 2 instrument adjustment was minimal after Namhae's Instrument Section assumed responsibility from the construction contractor.

OPERATION - (JANUARY TO AUGUST, 1988)

Following the demonstration in December, both HRS units continued to operate according to the design and there were no significant operating or equipment problems.

In April, Namhae and Enviro-Chem showed the plant to 40 potential customers from all over the world. During the discussion a customer asked Namhae how many acid plant shutdowns had been caused by HRS equipment. After checking the record, Namhae stated there had only been one 4 hour shutdown to inspect the acid pump on the No. 1 plant. The pump was inspected in March and showed little additional corrosion since exposure to 94% acid during the initial start-up. The No. 2 acid plant continued to run well and was not even inspected until August.

Corrosion coupons that were installed in the acid system were checked occasionally. All showed the expected low corrosion rate except the one located directly after the diluter which showed 20 mils per year. This showed the need for improved mixing of the acid and water in the diluter. These modifications were delayed until the diluter supports were strengthened during the August turnaround because of the possibility that vibration would increase. It was not considered urgent because piping after the dilutor was teflon and no damage was being done.

During normal operation 0.5 to 1.0 liters per shift of drip acid was drained ahead of the cold interpass heat exchanger. This was considered to be condensation particularly on the dome of the tower which was not insulated and did not cause much concern. We have increased our attention to this matter since some duct leaks developed prior to the August turnaround. Improvements are being implemented which are expected to stop the drip acid.

The HRS performed well, consistently producing steam to generate over 9 MW of electrical power. HRS equipment performed as expected. Acid quality is significantly improved with the elimination of iron sulfates, cast iron slag, brick mortar particles and etc. as compared to bricklined acid towers.

The annual gross savings for both plants is 6600 tons of sulfur saved based on a 2.1% conversion improvement and a 350 day per year operating schedule at design rate. Also, 74,000 MWh of electrical power is generated under these conditions. The savings in U.S. dollars would be \$0.9 million for sulfur, based on a \$130/t delivered price, and \$4.6 million for electrical power, based on \$0.062/kWh costs, for a total yearly savings of \$5.5 million. These cost figures are used for illustration only and are not necessarily those used by Namhae.

TURNAROUND INSPECTION - (AUGUST, 1988)

Plant No. 2 was shutdown for scheduled maintenance on August 20 after eight (8) months of operation. Plant No. 1 was shutdown on September 3 after nine (9) months of service. Both HRS units and sulfuric plants were inspected carefully to determine if any problems were developing.

Overall, both HRS units were in excellent condition. The corrosion rates were as expected.

The corrosion rates were determined by exact weight losses of metal coupons placed throughout the system and numerous metal thickness measurements of pipe and tower walls. Excluding the first start-up days, the corrosion rate of the tower and piping system was less than 2 mils per year (0.050 mm/yr) in all areas. The corrosion rate of the acid pipe from the tower to the boiler was about 1.5 mils per year (0.037 mm/yr) and less than 0.5 mil per year (0.012 mm/yr) after the boiler.

The corrosion rate of the coupons in the teflon lined pipe between the diluter and the tower was between 20 and 30 mils per year (.5 and .75 mm/yr). This higher than expected rate was attributed to inadequate mixing of the acid and water in the diluter. Inspection showed only normal corrosion on the tower as is discussed below. However, the diluter is being modified to improve acid and water mixing.

In addition to the corrosion coupons, the HRS units were checked by taking thickness readings with an ultrasonic thickness gauge ("D" meter) and micrometer. The ultrasonic thickness gauge uses sound waves to measure the thickness of equipment when it is impractical to reach both sides of a plate or pipe wall. The actual measured corrosion rates of HRS plate and pipe supported the data of the corrosion coupons.

The No. 2 plant HRS acid pump was pulled for the first time and inspected. The visual inspection of the pump showed it to be in good condition. Corrosion was no more than that experienced on other absorbing tower circulation pumps. The replaceable static wear rings were replaced to assure reliable service until the next turnaround and the pump was placed back in service. Although replaced, most of the wear rings were still within specification. We have concluded that the original materials of construction specification for the HRS pump was the proper choice for long-term life.

The HRS boiler was in excellent condition on both the acid and water side. The corrosion rate on the acid side was less than 2 mils per year.

All HRS equipment was inspected and found to be in good condition. The HRS tower shell, packing, packing supports and mist eliminators checked out in fine condition. Acid distributor header orifices showed some corrosion which could result from the poor mixing in the diluter or it could have occurred at the time the 94% acid corroded the acid pump.

The gas duct from the HRS tower to the cold interpass heat exchanger and the shell side inlet to the exchanger were inspected since drip acid had been routinely drained from the duct. There was significant iron sulfate in the bottom of the duct and on the exchanger tubesheet. There were a few leaking tubes which were repaired by driving a smaller tube inside. During the turnaround the top of the tower was insulated and the acid drain system ahead of the heat exchanger was modified to improve drainage and keep acid from getting into the exchanger. Drains will be monitored and gas sampling is planned to see that the problem has been solved.

The design, construction and successful demonstration of the first two commercial Heat Recovery Systems, complete with dedicated turbogenerator, is considered an outstanding success by Namhae Chemical Corporation and Monsanto Enviro-Chem Systems, Inc.

Many sulfuric acid plant operators from around the world have visited the Namhae acid plant. Visitors are quite impressed with the Namhae's HRS installation, clean and orderly facilities and Namhae's courage and dedication to install the first HRS.

SUMMARY

Namhae Chemical Corporation has proven that the HRS is a successful commercial process.

The initial concerns have been laid to rest and most of the minor problems have been solved. And, as a customer who visited the plant during the recent turnaround said, "The few remaining problems can be readily solved and I am not afraid of the Heat Recovery System".

Namhae and Monsanto Enviro-Chem will continue to review the HRS operations for good performance and maintenance. As with all new technology, improvements in design and HRS products are expected as experience is gained.

Three new HRS units are now being designed for clients who have visited the Namhae facilities. HRS projects are under consideration by other clients.

The attraction of using the HRS as an interpass absorption tower to reduce SO_2 emissions while producing an additional 0.5 t steam/t acid produced or 3.1 kWh of electrical power per t/d of H_2SO_4 will make the HRS a key component of future sulfuric acid plants.

FALCONBRIDGE, NORWAY

Several people have asked about the Falconbridge HRS start-up status. Falconbridge Nikkelverks of Kristiansand, Norway has a 240 t/d sulfuric acid plant and HRS for their smelter SO_2 offgas. Fenco Engineers of Toronto, Canada designed and constructed the acid plant as well as the SO_2 gas purification system. The acid plant is designed so that the HRS can operate as an interpass tower with normal interpass acid temperatures or as an HRS where steam is generated from cooling the acid.

The acid plant started up in October, 1987, in the conventional acid plant mode without steam generation. The HRS circuit has not operated much of the time because of operating problems in other parts of the acid plant and roasters. However, the HRS was successfully operated several weeks during mid-1988 and tests showed that it is operating in accordance with design. However, Falconbridge has commitments to produce liquid SO_2 which have required that the acid plant be shutdown until the last quarter of 1988.

REFERENCES

McAlister, D. R.; Corey, A. G.; Ewing, L. J.; Ziebold, S.A., "A Major Breakthrough in Sulfuric Acid Heat Recovery", paper presented at the 1986 Annual Meeting of AIChE, New Orleans, Louisiana.

Johnson, C. A.; Smith, R. M., "Reduce P_2O_5 Costs 10% by Recovering 95% of the Energy from Your Sulfuric Plants". Proceedings of the IFA Technical Conference, Port el Kantoui, Tunisia (October, 1986).

Niesse, J. E.; McAlister, D. R., "Stainless Steels for Heat Recovery from High Temperature Sulfuric Acid", Paper No. 22 presented at the March, 1987, "Corrosion 87" Meeting of NACE.

"HRS Fronts Monsanto's Latest Push in Sulphuric Acid Technology". Supplement to Sulphur 189 (March-April, 1987).

APPENDIX F

AIR MODELING INFORMATION

KOOGLER & ASSOCIATES

THIS DISK CONTAINS SULFUR DIOXIDE (SO2), NITROGEN DIOXIDE (NOX), SULFURIC ACID MIST (SAM), MODELING FILES FOR THE PINEY POINT PHOSPHATES PLANT IN MANATEE COUNTY, FLORIDA.

THE FOLLOWING FILES CONTAIN ISCST3 MODELING OF:
SIGNIFICANT IMPACT ANALYSIS (SIA) FOR CLASS 2 AREA
SIA FOR CHASSAHOWITZKA NWR PSD CLASS I AREA, AND
BUILDING DOWNWASH, BUILDING PROFILE INPUT PROGRAM (BPIP)
AND ARE IN SELF EXTRACTING ARCHIVE FORMAT.

SO2 ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND CLASS 2 AREA:
PINY-SO2 EXE 150,006 10-22-97

NOX ASI ANALYSIS OF CHASSAHOWITZKA NWR PSD CLASS I AND CLASS 2 AREA:
PINY-NOX EXE 82,196 10-22-97

SULFURIC ACID MIST (SAM) ANALYSIS OF LOCAL ARES IMPACT:
PINY-SAM EXE 67,022 10-22-97

AND:
PNY-BPIP EXE 20,010 10-22-97 BUILDING DOWNWASH CALCULATIONS

TO UNARCHIVE THESE FILES COPY THEM TO A HARD DISK DRIVE AND TYPE THE FILE NAME. FOR EXAMPLE TO UNARCHIVE THE SO2 ASI CLASS 2 ISCST3 OUTPUT FILES, TYPE "PINY-SO2" AND PRESS ENTER. THE FILES WILL AUTOMATICALLY UNARCHIVE TO THE HARD DISK DRIVE. THESE ARCHIVED FILES CONTAIN THE MODELING AND ANALYSIS FILES IN ASCII FORMAT DESCRIBED AS FOLLOWS;

SO2 MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1, AND CLASS 2 SIGNIFICANT IMPACT ANALYSIS (SIA) ARE PROVIDED:

PNY1ASI0 OUT	57,392	08-28-97	PSD CLASS 1 ASI FOR 1987
PNY1ASI1 OUT	57,377	08-28-97	PSD CLASS 1 ASI FOR 1988
PNY1ASI7 OUT	57,407	08-28-97	PSD CLASS 1 ASI FOR 1989
PNY1ASI8 OUT	57,407	08-28-97	PSD CLASS 1 ASI FOR 1990
PNY1ASI9 OUT	57,392	08-28-97	PSD CLASS 1 ASI FOR 1991
PNY2ASI0 OUT	187,546	08-28-97	PSD CLASS 2 ASI FOR 1987
PNY2ASI1 OUT	187,546	08-28-97	PSD CLASS 2 ASI FOR 1988
PNY2ASI7 OUT	187,546	08-28-97	PSD CLASS 2 ASI FOR 1989
PNY2ASI8 OUT	187,546	08-28-97	PSD CLASS 2 ASI FOR 1990
PNY2ASI9 OUT	187,546	08-28-97	PSD CLASS 2 ASI FOR 1991

NOX MODELING FILES FOR THE CHASSAHOWITZKA NWR PSD CLASS 1, AND CLASS 2 SIGNIFICANT IMPACT ANALYSIS (SIA) ARE PROVIDED:

C1NOX87	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1987
C1NOX88	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1988
C1NOX89	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1989
C1NOX90	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1990
C1NOX91	OUT	31,161	10-22-97	PSD CLASS 1 ASI FOR 1991
C2NOX87	OUT	78,776	10-22-97	PSD CLASS 2 ASI FOR 1987
C2NOX88	OUT	78,776	10-22-97	PSD CLASS 2 ASI FOR 1988
C2NOX89	OUT	78,776	10-22-97	PSD CLASS 2 ASI FOR 1989
C2NOX90	OUT	78,776	10-22-97	PSD CLASS 2 ASI FOR 1990
C2NOX91	OUT	78,776	10-22-97	PSD CLASS 2 ASI FOR 1991

SULFURIC ACID MIST (SAM) IMPACT ANALYSIS FOR THE PLANT AREA:

C2SAM87	OUT	162,305	10-22-97	FOR 1987
C2SAM88	OUT	162,305	10-22-97	FOR 1988
C2SAM89	OUT	162,305	10-22-97	FOR 1989
C2SAM90	OUT	162,305	10-22-97	FOR 1990
C2SAM91	OUT	162,305	10-22-97	FOR 1991

THERE ARE RECEPTORS AT 100 METER INTERVALS ALONG THE PROPERTY LINE, DISCRETE POLAR RECEPTORS FROM 700 METERS TO 1100 METERS AND POLAR RECEPTORS AT 1200, 1500, 1750, 2000, 2500, 5000, 7500, AND 10000 METERS. POLAR RECEPTORS ARE CENTERED AT X=315, Y=260 THE APPROXIMATE GEOMETRIC CENTER OF THE FACILITY.

BUILDING INPUT PROFILE PROGRAM (BPIP) FILES USED IN MODELING ARE PROVIDED:

PNY-BPI	INP	1,373	08-28-97	INPUT FOR SO2 SOURCES
PNY-BPI	OUT	3,898	08-28-97	OUTPUT FOR SO2 SOURCES
PNY-BPI	SUM	56,773	08-28-97	SUMMARY FOR SO2 SOURCES

IF I MAY PROVIDE ADDITIONAL FILES, OR CLARIFICATION PLEASE CONTACT ME.

MARK KOLETZKE, P.E.
KOOGLER AND ASSOCIATES
(352) 377-5822
KOOGLER@WORLDNET.ATT.NET
OCTOBER 22, 1997

16. Sulfuric Acid Tanks (existing): Repairs complete

17. Plant Stack (existing): Repairs complete, repainting pending

18. Sulfur Pumps (new): Procured, installation pending

    Common Acid Circulation Pump (new): Procured, installation pending

    Acid Drain Pump (new): Procured, installation pending

    Cooling Water Pumps (new): Procured, installation pending

    Condensate Transfer Pump (new): Procured, installation pending

19. Gas Ducts (new and existing): Procurement and installation pending

20. Strong Acid Piping: Procurement and installation pending

    Miscellaneous Piping: Procurement and installation pending

    Valves: Procurement and installation pending

21. SO_2 Monitor (existing): Repairs pending

22. Office - Control Room (existing): Clean-up complete, rebuild pending

23. Structural Steel: Repairs to existing pending, new procured w/ 25% installed

    Insulation: Procurement and installation pending

    Painting: Pending

    Electrical: Pending

    Pilings and Foundations: Complete

24. Instrumentation: Procurement and installation pending

25. Molten Storage Tank (existing): Repair complete, reinstallation and piping pending

26. Auxiliary Boiler (new): Complete

27. Miscellaneous: Most items pending

3. Waste Heat Boilers (existing): Inspection complete, repairs pending

4. Economizer (new): Procured, installation pending
5. Main Compressor (existing): Repairs complete, installation pending

6. No. 1 Converter (existing): Inspection complete, repairs pending

7. No. 2 Converter (existing): Inspection complete, repairs pending

8. Drying Tower (new): Vessel complete w/ brick lining installed, acid distribution procured, installation pending

   Interpass Tower (new): Vessel complete, brick lining, acid distribution procured, installation pending

   Final Tower (new): Vessel complete, brick lining, acid distribution procured, installation pending

9. Drying Tower Mist Eliminators (new): Procured, installation pending

   Interpass Tower Mist Eliminators (new): Procured, installation pending

   Final Tower Mist Eliminators (new): Procured, installation pending

10. Cold Interpass Heat Exchanger (cold shell / new): Procured, foundation complete, installation pending

    Cold Interpass Heat Exchanger (hot shell / existing): Cleaned

    Hot Interpass Heat Exchanger (cold shell / new): Cleaned

11. No. 1 Superheater (existing): Inspection not complete

12. Condensate Storage Tank (new): Procured, installation pending

13. Cooling Tower (new): Installed

14. Combination Acid Coolers (new): Procured, installation pending

    Product Acid Cooler (new): Procured, installation pending

15. Acid Pump Tank (new): Part of interpass tower (#8 above)

--- MEMORANDUM ---

TO: Ivan Nance

FROM: G. W. Hartman, P.E.

DATE: May 25, 2000

SUBJECT: PPP Sulfuric Acid Plant / Construction Status

COPY: Al Castle / Leon Willis

Dear Mr. Nance:

The final project status issued at the end of 1999 by Monsanto Enviro-Chem (MEC) still stands as there has been no activity this year:

Engineering:	97% complete
Procurement:	76% committed
Construction:	27% complete
Project:	68% complete

Assuming favorable market indications and approval for a project re-start by September 2000, approximately 2 months will be required for re-mobilization (on the parts of both PPP and MEC) during which time the engineering and procurement efforts should be completed. With clement weather and no unforseen circumstances being encountered during construction, a plant start up can be anticipated as early as June 2001.

The following is a re-cap of the task list submitted with the original permit application as "APPENDIX A: List of Proposed Repairs."

1. Sulfur Burner (existing): No activity

2. BFW Heater (deaerator / new): Procured, installation pending

PINEY POINT PHOSPHATES, INC.
13300 U.S. Hwy. 41 N., Palmetto, FL 34221 • Phone 941-722-4555 • Fax 941-729-3589