Florida Department of Environmental Regulation

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

Lawton Chiles, Governor 813-623-5561 Carol M. Browner, Secretary

PERMITTEE:
Royster Phosphates, Inc.
13300 U.S. Highway 41 N
Palmetto, Florida 34221

PERMIT/CERTIFICATION:
Permit No: AO41-197112
County: Manatee
Expiration Date: 7/05/96
Project: Sulfuric Acid Plant

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 a Monsanto Double Absorption contact sulfuric acid plant. This plant is designed to produce 2,000 tons per day (83.3 tons per hour) of sulfuric acid (100% H_2SO_4 basis).

The Zink oil-burner used to heat sulfuric acid plant process equipment during startups after cold shutdowns has two guns which are fired with No. 4 fuel oil having a maximum sulfur content of 1%, at a maximum combined heat input rate of 34.32 MMBtu/hr.

Location: U.S. Highway 41 at Piney Point, Palmetto

UTM: 17-348.5 E 3057.3 N **NEDS No:** 0002 **Point ID No:** 01

Replaces Permit No.: AO41-121085

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

PERMIT/EXPIRATION
Permit No.: AO41-197112
County: Manatee
Expiration Date: 7/05/96
Project: Sulfuric Acid Plant

Specific Conditions:

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

2. Visible emissions shall not be equal to or greater than 10% opacity. [Rule 17-2.660, F.A.C. and 40 CFR 60.83(a)(2)].

3. Sulfur dioxide emissions shall not exceed the lesser of:

A. 4 pounds per ton of 100% acid produced, or

B. 333.2 pounds per hour

[Rule 17-2.660, F.A.C. and 40 CFR 60.82(a)].

4. Acid mist emissions shall not exceed the lesser of:

A. 0.15 pounds per ton of 100% acid produced, or

B. 12.5 pounds per hour

[Rule 17-2.660, F.A.C. and 40 CFR 60.83(a)(1)].

5. This source is permitted to operate 24 hours per day, 7 days per week, and 52 weeks per year (8760 hours per year).

6. 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.].

7. Test the emissions for the following pollutant(s) at intervals of 12 months ± 1 month from the date April 12, 1991 and submit a copy of the test data to the Air Section of the Southwest District Office within 45 days of such testing [Rules 17-2.700(2) and 17-2.700(7), F.A.C.]:

(X) Opacity

(X) Sulfur Dioxide

(X) Acid Mist

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

PERMIT/EXPIRATION
Permit No.: AO41-197112
County: Manatee
Expiration Date: 7/05/96
Project: Sulfuric Acid Plant

Specific Conditions:

8. The permitted maximum sulfuric acid production rate of this source is 53.7 tons per hour of 100% H_2SO_4 based upon the rate at which the April 12, 1991 compliance test was conducted. Testing of emissions to show compliance shall be conducted within 10% of the permitted rate. A compliance test submitted at an operating rate less than 90% of the permitted rate will automatically constitute an amended permit at the lesser rate until another test, showing compliance at a higher rate, is submitted. The actual production rate may increase above 53.7 tons per hour. However, any time the permitted rate of the source is exceeded by more than 10% a compliance test shall be performed within 30 days of initiation of the higher rate and the test results shall be submitted to the Department within 45 days of testing. Acceptance of the test by the Department will constitute an amended permit at the higher production rate. The emission limitations in Specific Condition Nos. 2, 3 and 4 shall not change regardless of the permitted production rate. Failure to include the actual sulfuric acid production rate in the test report may invalidate the test and fail to provide reasonable assurance of compliance.
[Rule 17-4.070(3), F.A.C.].

9. Compliance with the emission limitations of Specific Condition Nos. 2, 3, and 4 shall be determined using EPA Methods 1, 2, 6 and 9 contained in 40 CFR 60, Appendix A and adopted by reference in Rule 17-2.700, F.A.C. The minimum requirements for stationary point source emissions test procedures and reporting shall be in accordance with Rule 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

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 submit a written report of excess sulfur dioxide emissions for every calendar quarter in accordance with 40 CFR 60.7(c). Periods of excess emissions shall be all three-hour periods (or the arithmetic average of three consecutive one-hour periods) during which the integrated average sulfur dioxide emissions exceed the applicable standard under 40 CFR 60.82. Duplicate copies of the quarterly sulfur dioxide excess emission report shall be submitted to the Bureau of Air Regulation in Tallahassee and to the Southwest District Office in Tampa.
[Rule 17-2.660, F.A.C and 40 CFR 60.84(e)].

Specific Conditions:

12. This permit acknowledges that leaks of sulfur dioxide and sulfur trioxide, or other fugitive process emissions that do not pass through a stack, may occur as part of routine operations. Best operational practices to minimize these emissions shall be adhered to and shall include regular inspections and the prompt repair or correction of any leaks or other fugitive emissions.

13. Excess emissions resulting from startup, shutdown, or malfunction are permitted providing: (1) best operational practices to minimize emissions are adhered to and; (2) the duration of excess emissions are minimized. [Rule 17-2.250(1), F.A.C.]. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited. [Rule 17-2.250(4), F.A.C.]. In case of excess emissions resulting from malfunctions, the permittee shall notify the Department in accordance with Rule 17-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 17-2.250(6), F.A.C.].

14. 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.

15. 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.].

16. Submit to the Department, each calendar year, on or before March 1, an emission report 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.

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

PERMIT/EXPIRATION
Permit No.: AO41-197112
County: Manatee
Expiration Date: 7/05/96
Project: Sulfuric Acid Plant

Specific Conditions:

17. Four applications to renew this operating permit shall be submitted to the Southwest District Office of the Department at least 60 days prior to the expiration date of this permit (i.e. no later than April 6, 1996). [Rule 17-4.090(1), F.A.C.].

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

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

ATTACHMENT - GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 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.

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), F.S., the issuance of this permit does not convey any 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 of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this 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.

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.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are 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.

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 reasonable times, access to the premises where the permitted activity is located or conducted to:

(a) Have access to and copy any records that must be kept under conditions of the permit;

(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

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 for 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;
6. the results of such analyses.

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 the 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.

Recd
MAY - 4 1992

cc D.H
✓S.N 5/4/92

Florida Department of Environmental Regulation

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

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

May 1, 1992

CERTIFIED MAIL

Mr. Daniel D. Harris
Piney Point Phosphates, Inc.
13300 US 41 North
Palmetto, FL 34221-8662

Dear Mr. Harris:

Re: Manatee County - AP
A041-197112

Pursuant to Rule 17-4.080(1), Florida Administrative Code, the Department hereby adds the following specific conditions to the referenced permit:

18. The permittee shall establish acid circulation in the interpass and final absorbers for at least 20 minutes before injecting sulfur into the furnace.

19. Except during shut down, the permittee shall monitor and record the acid flows in the interpass and final absorbers. Monitoring records shall be retained at least 2 years and be available upon request.

A person whose substantial interests are affected by this permit amendment 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 amendment. 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 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;

(e) A statement of facts which petitioner contends warrant 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 amendment. 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 of the Department at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right 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 amendment 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 amendment will not be effective until further Order of the Department.

When the Order (permit amendment) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statues, 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 the Final Order is filed with the Clerk of the Department.

This letter must be attached to and becomes a part of permit A041-197112. If you have any questions, please call Mr. Viet Ta of my staff at (813) 620-6100 extension 447.

Sincerely,

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

RDG/vtq

cc: Rob Baum, MCEAC

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on MAY 0 1 1992 to the listed persons.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Marilyn Quispe
Clerk

MAY 0 1 1992
Date

APPENDIX - TAB B

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
SOUTHWEST REGION
2130 WEST FIRST STREET SUITE 401
FORT MYERS, FLORIDA 33901

JOSEPH W. LANDERS JR.
SECRETARY

August 9, 1976

Mr. J. W. Smith
Production Manager
Borden, Inc.
P. O. Box 908
Palmetto, Fla. 33561

Re: Manatee Co. - A.P.
Borden, Inc.
Sulfuric Acid Plant

Dear Mr. Smith:

Pursuant to your recent application, please find enclosed a permit (No. AO41-2042B) dated 8/5/76 to operate the subject pollution source.

This permit will expire on 8/5/81 , and will be subject to the conditions, requirements and restrictions checked or indicated otherwise in the attached sheet operation "Permit Conditions".

This permit is issued under the authority of Florida Statutes 403.061 (16). The time limits imposed herein are a condition to this permit and are enforceable under Florida Statute 403.161. You are hereby placed on Notice that the Department will review this permit before the scheduled date of expiry and will seek court action for violation of the conditions and requirements of this permit.

You have ten (10) days from the date of receipt hereof within which to seek a review of the conditions and requirements contained in this permit.

Your continued cooperation in this matter is appreciated, and in future communication please refer to your permit number.

Yours truly,

Philip R. Edwards
District Manager

PRE/TWD/mh
cc: J.P.Robb, P.E.
Manatee County Pollution Control
DER - Tallahassee

Attachment 17

OPERATION PERMIT CONDITIONS
FOR AIR POLLUTION SOURCES

(An "X" indicates applicable conditions)

DATE: 8/5/76 PERMIT NO. AO41-204

( ) 1. The density of visible emissions for existing sources, until July 1, 1975, shall not exceed a Ringelmann Number Two or an equivalent 40% opacity. The density of visible emissions for all sources after July 1, 1975, shall not exceed a Ringlemann Number One or an equivalent 20% opacity. If the presence of uncombined water is the only reason for failure to meet these visible emissions standards, such a failure shall not be in violation of this rule. (Chapter 17-2.04 (1) (a) (b) (d))

(X) 2. Test the emissions for the following pollutant (s) at intervals of 3 months* from the date of this permit and submit four copies of test results to the regional engineer or this agency within fifteen days of such testing. (Chapter 17-2.07 (1))

( )	Particulates	(X)	Sulfur Oxides
( )	Fluorides	( )	Nitrogen Oxides
( )	Plume Density	( )	Hydrocarbons

* Reference Condition No. 5

( ) 3. According to revised Chapter 17-2 (Revised 1-17-72). this facility must be modified, up graded, or eliminated in order to comply with applicable emission limitations. * To insure conpliamce pursuant to the time limitation specified in Section 17-2.03(2), Chapter 17-2, Florida Administrative Code, the following steps toward compliance are made a condition of this permit.

(A) Submit on or before _____ a final control plan for complying with Chapter 17-2, Florida Administrative Code. This plan is subject to approval by the regional office.

(B) Submit on or before _____ a copy of contract (s) for modification/control equipment and/or fuels necessary to comply with Chapter 17-2.

(C) On of before _____, construction and/or modification must be initiated. Submit 60 days prior to this date construction permit applications and necessary information.

(D) Construction and/or modifications toward compliamce must be completed by _____. Submit no later than _____ confirmation of this condition.

(E) Submit on or before _____ proof of compliance. This m include any changes in the construction permit application as submitted, and a final engineering report and _____ _____ to prove compliance. (test results and/or calculations)

* The applicable emission limitation for this facility is: _____ Section _____ Chapter 17-2, Florida Administrative Code.

(X) 4. Submit for this facility, each calander year, on or before March 1 an emission report for the preceding calander year containing the following information.

(A) Annual amount of materials and/or fuels utilized

(B) Annual emissions

(C) Any changes in the information contained in the permit application.

(X) 5. Quarterly emission reports, based upon data obtained from the existing continuous monitoring system, shall consist of (a) the average daily emission rate and (b) the maximum daily emission rate. Emission rates shall be expressed in terms of pounds of sulfur dioxide per hour and pounds of sulfur dioxide per ton of one hundred per cent sulfuric acid produced.

(X) 6. The existing continuous monitoring system shall be properly calibrated, maintained, and operated in accordance with the manufacturer's instructions.

DESCRIPTION OF PROPOSED PROJECT

A. Describe the nature and extent of the proposed project. Refer to existing pollution control facilities, DPC permits, conditions, orders and notices, expected improvement in performance of the facilities and state whether the proposed project will result in full compliance of the source. Attach additional sheet if necessary.

(SEE ATTACHMENT)

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Federally or State Financed Projects only:

Planning Complete

Financing Program Complete

Indicate other local, state and/or federal agency approvals and dates

All projects:

Start of Construction December 16, 1974

Completion of Construction June 1, 1976

C. Costs of Construction (Show a breakdown of costs for individual components/units of the proposed project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Monsanto Integral Interpass Absorption System (add-on)
Engineering and Construction

$4,300,000 approximately (final accounting incomplete)

D. Indicate any previous DPC permits, issuance dates, and expiration dates.

AO 41-529, dated 7/25/72, expiring 7/25/73
AO 41-2042, dated 5/16/73 (No expiration date given)
AC 41-2042A, dated 5/23/74, expiring 7/1/75
AO 41-2042A, dated 9/1/75, expiring 7/1/76
AC 41-2042B, dated 9/1/75, expiring 7/1/76

AIR POLLUTION SOURCES & CONTROL DEVICES

A. Identification of Air Contaminants

1) [ ] Particulates
   a) [ ] Dust b) [ ] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [X] Sulfur Compounds
   a) [X] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [ ] Nitrogen Compounds
   a) [ ] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [X] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify): _____

B. Raw Materials and Chemicals Used (Be Specific)

Data for 2,000 TPD H_2SO_4 with Interstage Absorption

Description	Utilization Tons/day, lbs./day, etc.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
Sulfur	656 TPD	Dark	N/A	

C. Process Weight: Data for 2,000 TPD H_2SO_4 with Interstage Absorption

1) Total Process Weight Rate 167,013 lbs./hr. [See Sec. 17-2.04(2)]
2) Product Weight 166,667 lb./hr. expressed as 100% H_2SO_4
3) Normal Operating Time 24 hours/day, if seasonal describe:
   7 day/week, 49 weeks/year (allowing 3 weeks for Turnaround)

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual Discharge Design Maxima	Discharge Criteria*	Allowable Discharge*	Relate Location to Flow Diagram
SO_2	4.0 lb/ton H_2SO_4	lb/ton H_2SO_4	10.0 lb/ton H_2SO_4	Stack
H_2SO_4 Mist	0.15 lb/ton H_2SO_4	OPACITY	5% OPACITY**	Stack
	See attached compliance			
	test reports for actual data.			

* Refer to Chapter 17-2 Florida Administrative Code
(Discharge Criteria: Process Weight Rate, #/ton P_2O_5, #/M BTU/hr etc.)

** No visible emission except for 30-minute period during start-up, but no greater than 20% opacity. (Additional requirement of Manatee County Code)

E. Control Devices:

Name	Eff.	Conditions of Operation, Particle Size Range, etc.	Relate to Flow Diagram
Monsanto Interstage Absorption Sys.	-	Reduces emissions lower than 4.0 lb SO_2/ton H_2SO_4	
Brink Mist Eliminator	-	Efficiency; 100% of particles larger than 3 microns, 97% of particles less than 3 microns.	

F. Fuels:

Type (Be specific)	Daily Consumption	Heat Input BTU/hr.	Relate to Flow Diagram
(See Attached Sheet)			

G. Describe briefly, without revealing trade secrets, the unit processes/operations generating the airborne emissions identified in this application:

(SEE ATTACHED SHEET)

H. Indicate liquid or solid wastes generated and method of disposal.

Liquid wastes include boiler blowdown, cooling tower blowdown, and water treatment blowdown for a total discharge of approximately 125 to 150 gpm. Boiler blowdown is river water with natural contaminants concentrated approximately 10 times. Cooling tower blowdown is river water with natural contaminants concentrated approximately 4 times. Water treatment blowdown consists of river water with added ions of Na, Ca, Mg, and Cl as required for regeneration of Zeolite softeners.

The water discharges from the sulfuric acid plant area enter the county drainage system, passing to Piney Point Creek, and thence to Tampa Bay. Wastewater is discharged under Operating Permit IO 41-158, dated 7/25/72.

STATEMENTS BY APPLICANT AND ENGINEER

A. Applicant

The undersigned owner or authorized representative of * Borden, Inc. is fully aware that the statements made in this application for a Operation permit are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403 Florida Statutes and all the rules and regulations of the Department or revisions thereof. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted establishment.

J. W. Smith

Signature of the Owner or Authorized Representative

J. W. Smith, Production Manager

Name and Title (Please Type)

Date: June 25, 1976 Telephone No.: 813-722-4555

* Attach a letter of authorization

B. Professional Engineer Registered in Florida:

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the control and discharge of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution source(s) with appropriate control facilities, when properly maintained and operated, will comply with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the installation covered in this application.

Signature J. P. Robb

Director, Engineering and Construction

Name: J. P. Robb
(please type)

Mailing Address: Monsanto Enviro-Chem Sys. Inc.
10 S. Riverside Plaza
Chicago, IL 60606

Telephone No.: 312-782-0372

Florida Registration Number 21032
(Please affix seal)

Date: June 16, 1976

If applicant is a corporation, a Certificate of Good Standing must be submitted with application.

This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

SMITH-DOUGLASS
Division of
BORDEN CHEMICAL, BORDEN INC

Supplement to Stack Test Data - Borden, Inc.
Sulfuric Acid Plant - Piney Point
Production Rate Report for June 15, 1976

The average production rate for sulfuric acid, 100% basis, during the stack test on June 15, 1976, by Environmental Science and Engineering, Inc. was 1,798 tons per day. This report is submitted to supplement the stack test report. The production accounting details that follow cover the 16-hour period from 6:00 a.m. to 10:00 p.m. on the day of the stack test.

1. The nominal 66° Baume product (93.19%) was accumulated in the 60-foot diameter east storage tank. Outage measurements were taken at the beginning and end of the period. The tank storage factor is 12.45 tons H_2SO_4, 100% basis, per inch of tank content of 66° Baume acid. Production rate, based on tank measurements follow:

East Tank Dip

	Outage Ft. - In.	Time Military
Start	26 - 7 1/2	0558
End	18 - 7	2200
Difference	8 - 0 1/2	16 hr. 02 min.
	96.5 inches	962 minutes

Average Daily Rate $= \left(\frac{1440}{962}\right) (96.5) (12.45) = 1798$ ton/day

2. The tank factor, 12.45 tons 100% H_2SO_4 per inch, for 66° Baume product was developed as follows:

Reference: Atmospheric Emissions from Sulfuric Acid Manufacturing Processes National Air Pollution Control Administrative Publication No. 999-AP-13, 2nd Printing, September 1970. Data from pages 120 and 121 for 66° Baume Acid: (All data are referred to 60°F)
66° Baume H_2SO_4 = 93.19%
Density = 114.47 pounds per cubic foot

Specific Gravity, $60^{\circ}F/60^{\circ}F$ = 1.8354
Water density, $60^{\circ}F$ = 62.37 pounds per cubic foot
Temperature Correction for Specific Gravity - .00054 per degree F

The tank factor is calculated for 66° Baume acid at the average tank temperature of $92^{\circ}F$.

Gravity Correction = (.00054) (92-60)
= .0173
Sp. Gr. at $92^{\circ}F$ = 1.8354 - .0173
= 1.8181
Density of Acid at $92^{\circ}F$ = (1.8181) (62.37)
= 113.39 lb/cu.ft.
Sulfuric Acid Content = (.9319) (113.39)
= 105.67 lb/ cu.ft.

$$\text{Tank Factor} = \frac{(3.14159)\ (30)^2\ (105.67)}{(12)\ (2{,}000)}$$

= 12.45 tons 100% H_2SO_4 Per inch

3. The production rate, based on sulfur consumption, is also provided to confirm the reported rate. Molten sulfur was received by trucks, unloaded in a pit approximately 16 ft. x 16ft., and associated with a storage tank whose inside diameter is 28 feet. The first 17 truck loads on the attached copy of the log sheet apply to the 16-hour period under consideration. The pit factor is 1.2 tons sulfur per inch. The tank factor is 34.30 tons per foot. The calculations follow:

	Sulfur Tank Dip, Outage, Ft. - In.	Military Time	Sulfur Pit Dip, Innage, Inches	Military Time
Start	18 - 8	0553	48	0551
End	18 - 2 1/2	2153	49	2151
Difference	0 - 5 1/2	16 hours	1	16 hours

$$\text{Tank Gain} = \left(\frac{5.5}{12}\right)\ (34.30) = 15.72 \text{ tons}$$

Pit Gain = (1) (1.2) = 1.2 tons
Receipts, 17 trucks, = 410.40 tons
Sulfur Burned = 410.40 - 15.72 - 1.2
= 393.48 tons for 16-hour period
Daily Production Rate (based on guaranteed 99.7% recovery)

$$= \left(\frac{24}{16}\right)\ (393.48)\ (3.059)\ (.997) = 1800 \text{ tons per day.}$$

4. The sulfur tank and pit factors are developed as follows:

   The molten sulfur density at the average storage temperature of 280°F., for sulfur with a trace of impurities, is 111.41 pounds per cubic foot. Reference: The Sulfur Data Book, McGraw - Hill Book Co., Inc., 1954. Page 18.

   $$\text{Tank Factor} = \frac{(111.41)\ (3.14159)\ (14)^2}{2000}$$

   $$= 34.30 \text{ tons per foot}$$

   $$\text{Pit factor} = \frac{(16)(16)(111.41)}{(2000)\ (12)} = 1.2 \text{ tons/inch}$$

5. Copies of pertinent parts of the operator's logs are attached.

Sam R. Venable

Sam R. Venable
Process Engineer

SRV:clp

SULFUR RECEIPTS - 0600 to 0600 HRS. JUNE 15, 1976

NO.	TIME	CARRIER	TRACTOR TRAILER NO.	DRIVER	POUNDS NET. WT.	RECEIVED FROM
1	0639	CTL	11-201	Davidson	49220	T. Gulf
2	0715	CTL	129-202	Bush	48040	T. Gulf
3	0820	CTL	11-201	DAVIDSON	49480	T Gulf
4	0912	CTL	129-202	Bush	47560	T. Gulf.
5	0950	CTL	11-201	DAVIDSON	49220	T Gulf
6	1055	CTL	129-202	Bush	47660	T Gulf
7	1140	CTL	11-201	Davidson	49660	T. Gulf
8	1245	CTL	129-202	Bush	47800	T Gulf
9	1330	CTL	11-201	DAVIDSON	49660	T Gulf
10	1431	CTL	129-202	Bush	47820	T Gulf
11	1505	CTL	11-201	DAVIDSON	49,940	T Gulf
12	1614	CTL	CL29-202	Bush	47901	T Gulf
13	1645	CTL	C11-201	Davidson	49,860	T Gulf
14	1810	RW	677-4113	McKnight	47,200	B'Stone
15	1937	RW	677-4113	McKnight	47,700	B Stone
16	1955	RW	507 4179	Zimmerman	43,440	F'Port
17	2100	RW	677-4113	McKnight	48,040	B'Stone
18	2205	RW	507-4179	Zimmerman	43,440	F'Port
19	2225	RW	677-4113	McKnight	47,940	B'Stone
20	2350	"	" "	" "	48000	" "
21	0005	"	507-4179	Zimmerman	43440	F'Port
22	0116	"	677-4113	McKnight	48020	B'Stone
23	0143	"	507-4179	Zimmerman	43200	F'Port
24	0305	"	" "	"	43680	B'Stone
25						
26						
27						
28						

SULFURIC PLANT

PART II JUNE 15, 1976

IMP TANK			CONVERTER PRESS. DROPS					REICH TEST								MISCELL.			
										INLET			ORSAT						
2 RPMS	OPACIMETER	SHIFT 1-2-3	#1 PASS	#2 PASS	#3 PASS	#4 PASS	#5 PASS	TIME	REICH TEST - INLET ANALYZER	EXIT SO_2 - REICH DUPONT ANALYZER	SO_2 EXIT ANALYZER DUPONT	REICH TEST	ANALYZER SO_2 EXIT REICH	CONVERSION	INST. AIR PRESS.	Superheater TN OUT	Dupont Acid Coolers		
	IN		126	106	89	71	30	0800	10.4	10.05	.014	.013		.55		53	521	94	117
	OUT		113	99	79	58	23	1200	10.4	10.0	.013	.012			99.50	54	502	94	117
	DROP		13	7	10	13	7	1600	10.5	10.0	.019	.012		50	99.55	56	503	96	119
	IN		125	109	89	68	28	2000	9.9	9.85	.014	.011				52	525	96	120
	OUT		116	94	76	54	22	2400								56	526	97	120
	DROP		9	15	13	14	6	0400	10.1	9.9	.0035	.008		.35	99.96	56	509	99	123
	IN		85	72	57	47	20									57	508	99	123
	OUT		75	65	49	37	17									53	508	98	121
	DROP		10	7	8	10	3									55	509	98	121

STORAGE TANK	0600,		1400		2200 2260		0600									56	509	97	120
DRY DIP EAST	0555 26-7¼		1354 22'8¼		18-7		0555 15-5									516	509	97	120
INST. EAST					—											52	509	98	122
DRY DIP WEST	0558 12-2½		1354 15'5½		19-3		0555 23-1¾									54	509	98	119
INST. WEST	~~EAST~~				—											54	509	95	119
PRODUCT TO	~~EAST~~		EAST		EAST		West									56	509	94	118
PRODUCT FROM	West		WEST	INST	WEST 3151	INST	0554 3151									56	509	95	117
~~WEST~~ DIP SULFUR PIT	0553 48	EAST 49	1354 48"	57"	49	51	50	51½								50	518	95	119
~~INST~~ SULFUR TANK	0553 18-8	9-4	1354 18'2½	9'8	2153 18-2½	9-5	0553 18 1¼	9-8								53	563	94	113

BAUME	0900		1300		1700		2100		0100		0500					55	565	92	106
93%	66.2		66.1		65.9		65.5		65.55		66.05					55	565	91	106
LAB. SAMPLES			0900				1700				0100					56	565	90	105
RECORDER	~~EPT~~	~~EPT~~	98.46	98.74	98.44	98.21			98.37	98.30						56	564	90	105
98%	~~EPT~~	~~EPT~~	95.01	95.46	98.53	95.17			95.58	95.02						53	564	90	105
93%			93.31		93.48				92.37							55	564	90	105

4436 A 4532 Odom. A 4423
349.4 S 333 S 348.8

Attachment for Page 2, Paragraph A

The Sulfuric Acid Plant currently operating under Operation Permit AO 41-2042A, dated 9/1/75, has been modified to comply with emission limits of FAC 17-2 and the Manatee County Code by the recent completion of construction in accord with the terms of the construction permit AC 41-2042B, dated 9/1/75, and our application to construct, dated April 25, 1974.

The modification of the plant also meets the terms of the State Consent Order, Case No. 75-404, dated June 9, 1975 (the parts applicable to the Piney Point facility) and the EPA Consent Order, Docket No. 75-131 (a), dated August 28, 1975.

The plant now operates in full compliance with the rules of FAC 17-2 and the Manatee County Code.

The plant modifications were made in accord with the description of the proposed project contained in the application to construct. A copy of that description is attached hereto for reference.

Note: This description, a part of the application to contruct, dated 4/25/74, is included here for reference.

Attachment for Page 2 Paragraph A

Description of Proposed Project:

The Sulfuric Acid Plant currently operates under permit AO 41-2042, dated 5/16/73. Condition No. 3 of the permit requires that his facility be modified to comply with applicable emission limits in accord with a specified compliance schedule, citing section 17-2.4 (6) (b) 1.a and 1.b of Chapter 17-2, FAC. These paragraphs limit SO_2 emissions to 10 pounds per ton H_2SO_4 produced and visible emissions to 5% opacity (except during start-up when 40% opacity is permissible for a 30 minute period.)

The Manatee County Code requires further: No visible emissions except for a 30 minute period during startup but no greater than the opacity of 20% (Ringelmann Number 1).

By this application, it is proposed to modify the Sulfuric Acid Plant by the construction of an add-on Interstage Absorption System, designed by Monsanto Enviro-Chem Systems, Inc., and to be constructed under their responsiblity. The new system will be connected to the existing plant for the purpose of reducing SO_2 emissions below the levels for compliance with FAC 17-2.

The new system will contain a new Brink High Efficiency Mist Eliminator built into the top of the final absorbing tower. This Brink system is quaranteed to control mist emissions to less than 0.15 lb/ton H_2SO_4.

The project essentially consists of providing one additional stage of absorption and conversion, requiring the construction of a new SO_3 absorber, a new converter, and a new Brink Mist Eliminator. These additional components will be installed in the process gas train between the gas exit of the present plant and the stack. The project also includes the necessary structures, foundations, acid pumping system, heat exchangers, additional acid coolers, and a startup circuit.

The startup circuitwill contain an oil burner for supplying heat to the new converter on startups until the system becomes self-supporting. The heater will burn 3 - - 5 gpm No. 2 fuel oil of low sulfur content for a period of 24 to 36 hours after a cold startup, usually once per year. The heater may be used for short periods of time on normal startups.

Process modifications of the existing plant to accomodate the add-on SO_2 control system include the following features:

A heat exchanger will be installed to cool the process gas before the inlet of the third pass of the existing converter, eliminating the use of dilution air for cooling at that pass.

A steam superheater will be installed to cool the process gas before the inlet of the fourth pass of the existing converter, eliminating the use of dilution air for cooling at that pass.

The modifications will improve steam generation so that the entire sulfuric acid plant, as modified, will continue to be self supporting in power after start ups. All powered components will be operated by steam turbine. This design feature will provide assured reliability of the SO_2 emission control system during electrical power failures and curtailments.

The process modifications necessary for the new system, especially the elimination of dilution air for cooling before the third and fourth passes of conversion, will change the overall plant operation from processing gas at 8.0% equivalent SO_2 gas strength.* This change will automatically and incidentally extend the production capability of the plant by approximately 30%. The company proposes to utilize the additional production capability of the plant, as production schedules and marketing require, up to a maximum rate of 2,000 TPD sulfuric acid, 100% basis.

The plant modifications have been designed to produce emissions less than the following maximum values:

SO_2	4.0 lb/ton H_2SO_4
Mist	0.15 lb/ton H_2SO_4

Borden, Inc. guarantees that stack emissions will not exceed these values at any operating rate up to and including the design maximum rate of 2,000 tons per day.

The plant, as modified by the proposed construction of the Monsanto Add-on Interstage Absorption System, will utilize the required best available technology and will be in full compliance with applicable provisions of FAC 17-2 and with the governing rules of the Manatee County Code.

*to approximately 10.5% SO_2 gas strength.

Attachment for Page 4, Paragraph F

F. Fuels

The plant will use No. 2 fuel oil (low sulfur content) for heating the catalyst of the first converter to reaction temperature after a cold shutdown, usually once per year.

The final converter has an oil burner in the start-up circuit. Three to five GPM No. 2 fuel oil (low sulfur content) will be used for a period of 24 to 36 hours during a cold start-up, usually once per year. The heater will be used as required, for normal start-ups, probably 1 to 3 hours.

There is no continuous use of fuel oil, although the above-described use of fuel oil will be coincident with each other in most cases.

Paragraph G

Sulfur is burned in a furnace in a moving stream of pre-dried air. The resulting SO_2 - air mixture flows over 4 passes of the first converter, with cooling between passes, completing conversion of SO_2 to SO_3 to a degree approaching and limited by the theoretical equilibrium conditions of the reaction at the exit temperature of the fourth pass. The SO_3 content of the gas stream is removed as H_2SO_4 by the absorption of the SO_3 in 98% sulfuric acid in the first absorbing tower. The unconverted SO_2 along with the remainder of the combustion air then passes to the newly constructed second stage system.

In the new section of the plant, the final gas stream from the original plant, with the SO_3 content removed, passes through the new converter where a favorable reaction equilibrium prevails because of the low SO_3 content in the reaction zone, allowing an overall conversion of approximately 99.7%. The gas then passes through the new absorbing tower to remove the SO_3 resulting from the reaction in the new converter, and then passes through a new Brink mist eliminator before venting from the original 200 foot stack.

The final stack gas will contain only 0.3% of the original process SO_2, amounting to 380 ppm or less, resulting in SO_2 emissions of less than 4 lbs. SO_2 per ton of H_2SO_4 produced, and mist emissions of less than 0.15 lbs. per ton of H_2SO_4 produced.

ADDENDUM TO PERMIT APPLICATION
FOR
AIR POLLUTION SOURCES

Listed below are clarifications of some of the information required the application form. All information submitted must be in the format ou lined below. Space is also provided below for additional information nc contained in the original form.

AIR POLLUTION SOURCES & CONTROL DEVICES:

Item: C 1) Show the derivation of process weight.

Item: C 3) Normal operating time must be given as Hrs/Day, Days/Week and Weeks/Year.

If seasonal, give % operation by month.

Contaminants must include but not limited to: particulate matter, sulfur oxides, carbon monoxide, hydrocarbons and nitrogen oxides. This information must be submitted even though an applicable standard may not exist.

Also give actual discharge of each contaminant in lbs/hr and tons/yr.

Item: E In the space provided for Name, give model number and serial number of control device.

On separate page, give basis for efficency on the process, i. e. calculations, (Do not give a general efficency).

Item: F Include the commercial standard number of fuel oil and % sulfur, e.g. No. 6 fuel oil with 2.5% sulfur.

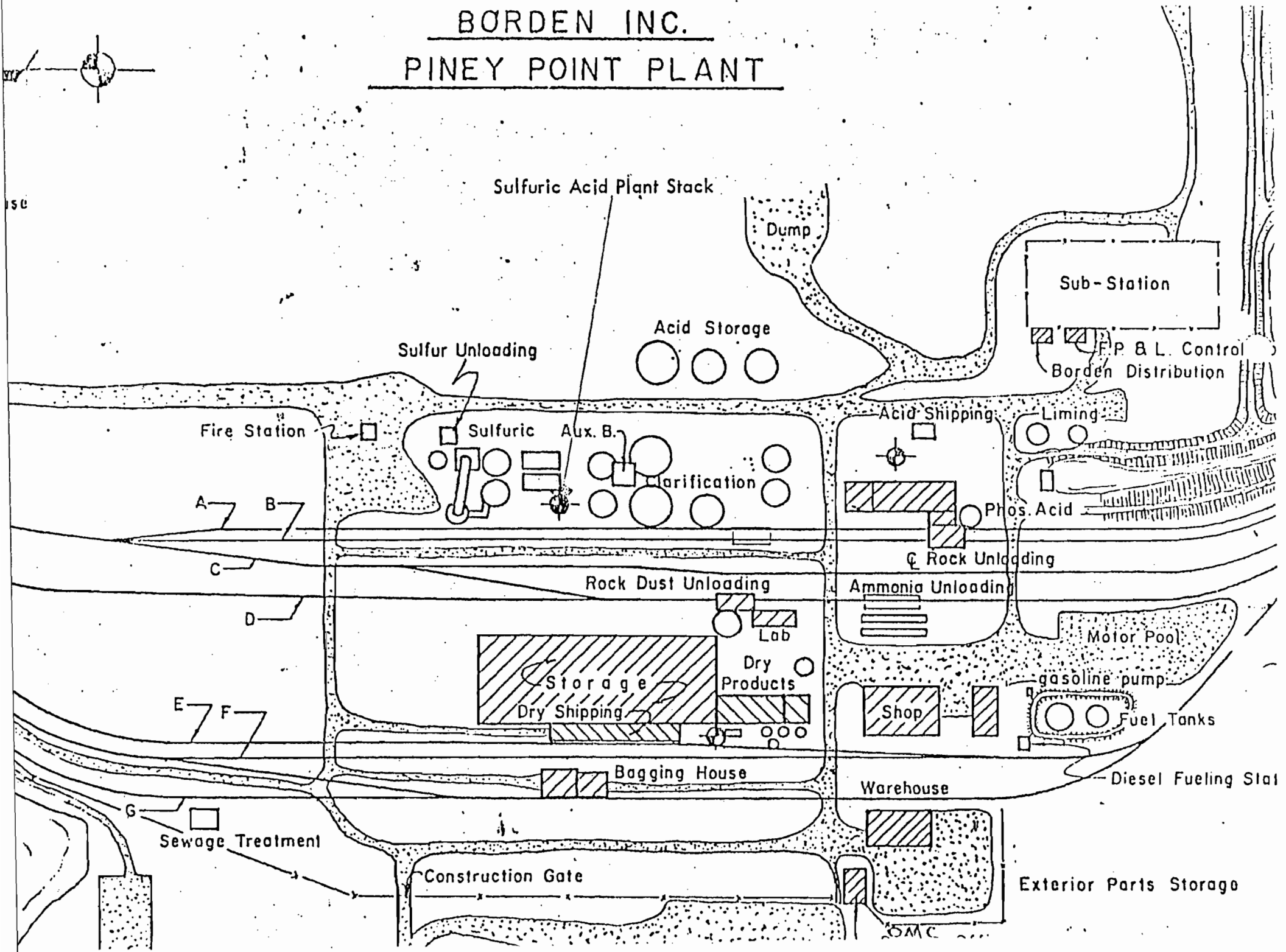
In the space provided for daily consumption, give mean and extremes.

Heat input must be the design capacity.

If application is for boiler, include manufacturer, model no. and serial no.

ADDITIONAL INFROMATION REQUIRED:

1. Flow diagram of process (without revealing trade secrets)
2. Plot plan
3. Stack data: (2,000 TPD Rate)
   Height (ft.): 200'
   Diameter (ft.): 7.75'
   Temperature (°F): 185°F Max. (exit)
   Flow Rate (ft/min.) 2,275 FPM at exit



BASIC FLOW SHEET: DOUBLE ABSORPTION SYSTEM

EQUIPMENT MARKED WITH "N" INDICATES NEW ITEM

START-UP BOILER SYSTEM (FOR START-UPS ONLY!)

BRINE HIGH EFFICIENCY DEMISTERS

GAS TO ATMOSPHERE (H_2SO_4 FREE GAS)

STACK

ABSORBING TOWER (FINAL)

ABSORBING ACID

FINAL CONDENSER

HEAT EXCHANGER

HEAT EXCHANGER

HEAT EXCHANGER

ACID PUMP TANK

ACID PUMP TANK

GAS FLOW LINES

SULFUR TANK

AIR

DRYING TOWER

MOLTEN SULFUR INPUT

SULFUR BURNER

III BOILER

II BOILER

CONVERTER (4 PASS)

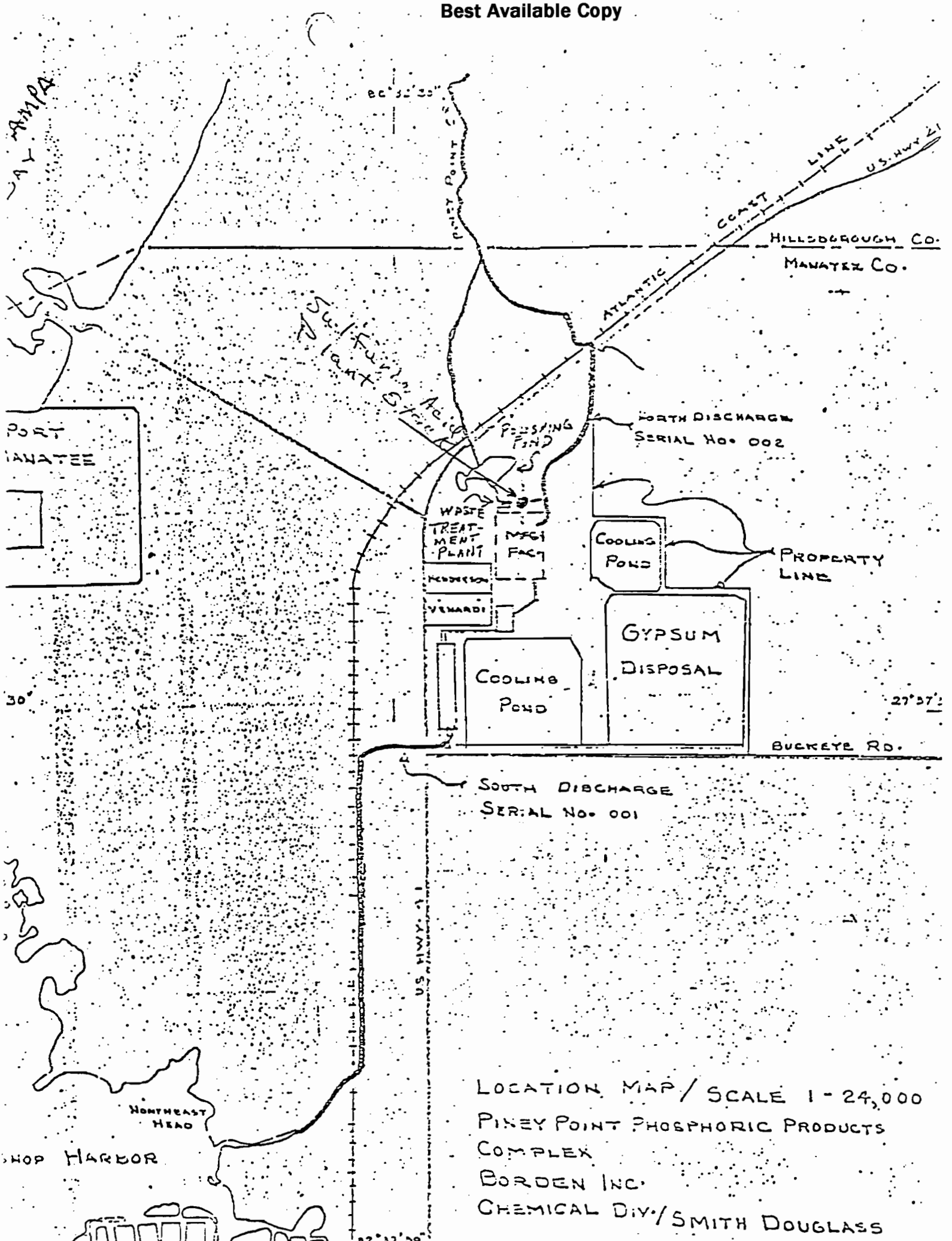
SUPERHEATER

ABSORBING TOWER (INTERMEDIATE)

BRINE HIGH EFFICIENCY DEMISTERS

BLOWER

ECONOMIZER



LOCATION MAP / SCALE 1 - 24,000

PINEY POINT PHOSPHORIC PRODUCTS COMPLEX

BORDEN INC.

CHEMICAL DIV./SMITH DOUGLASS

DRAFT

Addendum

Item C 1) Derivation of Process Weight

(2,000 TPD H_2SO_4 Basis)

Materials entering into product, including sulfur, oxygen, and water of constitution, 2,000 tons, lb/hr. $= \frac{2,000 \times 2,000}{24} = 166,667$

SO_2 processed and lost, max. lb/hr. $= \frac{4.0 \times 2,000}{24} = 333$

H_2SO_4 produced and lost as mist, max. lb/hr $= \frac{0.15 \times 2,000}{24} = 13$

Total Material lb/hr 167,013

Item D Discharges at Lb/Hr and Ton/Yr

Lb/Hr. at 2,000 TPD Rate

$SO_2 = \frac{2,000 \times 4}{24} = 333$ lb/hr

Mist $= \frac{2,000 \times .15}{24} = 13$ lb/hr

Tons/Year 1,940 TPD avg. rate (max.) 98% Operating Factor
344 Days Operation.

$SO_2 = \frac{1,940 \times 4 \times 344 \times .98}{2,000} = 1,308$ Tons/year

Mist $= \frac{1,940 \times 0.15 \times 344 \times .98}{2,000} = 49$ Tons/Year

APPENDIX - TAB C

Department of
Environmental Protection

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:

APPENDIX - TAB D

PINEY POINT PHOSPHATES, INC.

13300 U. S. Hwy. 41 North
Palmetto, Florida 34221
(941) 722-4555

CERTIFIED/RETURN RECEIPT NO. P 576 124 740

17 December 1996

Mr. W. C. Thomas, P.E., Administrator
State of Florida
Department of Environmental Protection
Division of Air Resources Management
Southwest District Office
3820 Coconut Palm Drive
Tampa, FL 33619

Re: Piney Point Phosphates, Inc.;
FDEP Permit No. A041-197112
Sulfuric Acid Plant

Dear Sir:

Piney Point Phosphates, Inc. (PPP) appreciates the opportunity and time you gave Company representatives on 10 December 1996 to discuss the forthcoming restart of the above-referenced sulfuric acid plant. As you may recall, PPP intends to repair the existing 2,000-ton-per-day sulfuric acid plant for restart in late 1997. PPP has identified several specific areas that will be repaired or equipment replaced to different configurations.

Due to technical improvements and safety considerations, several plant components are currently proposed to be physically relocated during repairs. PPP does not anticipate that these actions will in any way affect the plant production capability or alter the emissions from the source. Further, due to technical obsolescence, some of the existing equipment or repair components are no longer available.

Concomitant with the sulfuric acid plant repair will be repairs to the Sulfur Storage Tank operated under FDEP permit AO41-206854. PPP does not anticipate any changes in emissions or operations rate in this source after repairs.

PPP will also be installing an auxiliary boiler that is currently permitted under FDEP permit AC41-232096.

Attached as "Exhibit I" find a list and short description of the repairs. These repairs represent approximately 90% of the repair activities associated with the repair and restart. PPP anticipates expending approximately $18 million effecting these repairs, including installation of a new Sulfur Storage Tank and auxiliary boiler ($16 million without these later two items).

PPP has reviewed these repair costs in contrast to constructing a new grassroots sulfuric acid plant and found the costs to be less than 50% of an entirely new plant. Find as "Exhibit II" a professional engineer's certification of the estimated repair costs and estimated new plant costs associated with this project. Repairs will be made primarily by Monsanto Enviro-Chem Systems, the original designer and builder of the original plant.

In closing, we appreciate your taking time to discuss this matter with our representatives. Please consider the attached exhibits and foregoing information; then if further information or response is needed, please contact me. Thank you.

Sincerely,

Ivan Nance
Corporate Environmental Manager

/rmm

Attachments

bcc: R. Stewart
R. Moore
C. Masio
T. Baroody

EXHIBIT I

PROPOSED REPAIRS AND EQUIPMENT REPLACEMENT TO THE EXISTING SULFURIC ACID PLANT AT PINEY POINT

Note: These are the major repairs that are planned. They are not all inclusive, but comprise about 90% of the work that is proposed.

1. Sulfur Burner: The existing unit will be retained and repaired.

2. Boiler Feedwater Heater: A new heater of same size and similar design will replace the existing unit that will be demolished.

3. Waste Heat Boilers: The two (2) existing boilers will be retained and repaired.

4. Economizer: A new economizer of larger size and similar design will replace the existing unit which will be demolished.

5. Main Compressor: The existing compressor will be retained and refurbished.

6. No. 1 Converter: The existing unit will be retained. The 1st pass section (of four passes) will be replaced with high temperature materials. The remaining passes will be retained and refurbished. Catalyst will be replaced as necessary.

7. No. 2 Converter: The existing unit will be retained and the converter floor repaired. All catalyst will be replaced.

8. Acid Towers: All three (3) acid towers (drying, interpass absorption and final absorption) will be replaced with smaller size units of similar design and higher efficiency. The existing towers will be demolished. Two (2) towers will be relocated from on-top of the control room to separate free standing foundations.

9. Mist Eliminators: New mist eliminators will be provided in all three of the new towers.

10. Heat Exchangers: One new heat exchanger of smaller size and similar design will replace the existing unit that will be demolished. Two existing

heat exchangers will be retained and repaired.

11. Superheater: The existing unit will be retained and repaired.

12. Condensate System: A new condensate storage tank of larger size, similar design and different metallurgy will replace the existing unit that will be demolished. The condensate system will be of similar design.

13. Cooling Tower: A new tower of smaller flow and similar design of higher efficiency will be installed in the area occupied by the previous unit, which was previously destroyed in a storm.

14. Acid Coolers: New coolers of a new design (shell & tube anodic protection) will replace the existing cast iron coolers which will be demolished.

15. Acid Pump Tanks: The two (2) existing pump tanks will be replaced with one (1) new pump tank integral to the new interpass tower/pump tank.

16. Acid Storage Tanks: The two (2) existing sulfuric acid storage tanks will be retained and repaired.

17. Plant Stack/ Water System: The stack will be retained and rehabilitated. The associated soft water system will be comprised of new softeners of similar capacity and design.

18. Pumps: New pumps will be installed as follows: sulfur pumps (3), common acid circulating pump (1), acid drain pump (1), product acid booster pump (1), cooling water pumps (2), and condensate transfer pump (1).

19. Ducts: Sixteen (16) ducts will be replaced. Four (4) new ducts of the same design will be moved to relocated towers. One duct will be of different metallurgy. One duct will be lenghtened and inlet bird screen replaced. All other ducts will be unchanged from original design.

20. Misc. Piping/Valves: New piping and valves of similar design and size will be moved to relocated acid towers and coolers.

21. SO2 Monitor: The existing monitor will be repaired with new retrofit solid state

parts.

22. Office: A generator and air compressor will be removed and a new office will be constructed from the existing room.

23. Civil, Structural, Insulation, Electrical, Painting: New piling and foundations will be supplied for the new drying and certain support equipment. An existing foundation will be used for the new interpass tower/pump tank. Otherwise existing foundations will be utilized for the balance of the plant. Most existing structural steel will be retained and rehabilitated; certain steel will be replaced where needed. Most insulation will be removed and replaced with new insulation. A new motor control center (MCC) will be installed adjacent to existing MCC in the same building; new lighting will be provided; new electrical tray, conduit and cable will be provided for new power, control and instrumentation wiring. All new equipment, vessels, steel, piping and ductwork, as well as existing support and access steel, will be painted.

24. Instrumentation: A new electronic system (distributive control-solid state) will replace the existing pneumatic system.

PROPOSED REPAIRS AND EQUIPMENT REPLACEMENT OF ITEMS ASSOCIATED WITH THE EXISTING SULFURIC ACID PLANT AT PINEY POINT

1. Auxiliary Boiler: A new package boiler rated at 190 MMBtu/hour will replace the existing 96 MMBtu/hour boiler. Note that PPPI is already permitted for the larger boiler (Permit No. AC41-232096).

2. Sulfur Tank and Pit: A new tank of the same size and similar design will replace the existing tank that will be demolished; The existing sulfur pit will be retained and repaired with similar designed coils and cover. Note that the sulfur storage tank is covered under Permit No. AO41-206854.

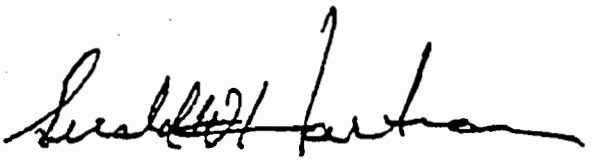
EXHIBIT II

CERTIFICATION OF COST OF PROPOSED REPAIRS AND EQUIPMENT REPLACEMENT TO THE EXISTING SULFURIC ACID PLANT AT PINEY POINT

The undersigned, being a duly registered professional engineer in the State of Florida, hereby certify that I am experienced in the design, construction and operation and maintenance of sulfuric acid plants. In my professional opinion, the repairs and equipment replacements to the existing sulfuric acid plant at Piney Point, estimated to cost approximately $16.9 million, will not exceed 50% of the cost of building a new grassroots plant of the same capacity (2,000 TPD), design (double contact wet process) and emission limitations (currently permitted limits) on the current Piney Point site. Based on my professional opinion, and the review of independent contractor proposals, the construction of a new grassroots plant having the preceeding specifications will cost in excess of $40 million.

The cost of the repairs and replacement equipment ancillary to the sulfuric acid plant (auxiliary boiler and sulfur tank/pit) are estimated to cost about $1.3 million.

Signed



Gerald W. Hartman
December 13, 1996

Registered Professional Engineer in the State of Florida
License No. PE 48452

APPENDIX - TAB E

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

December 19, 1996

Mr. Ivan Nance
Mulberry Phosphates, Inc.
P.O. Drawer 797
Mulberry, FL 33860

RE: Permitting of Piney Point Sulfuric Acid Plant Repairs/Renovations

Dear Mr. Nance:

From our meeting of December 10, 1996, it appears that the proposed repairs/renovations will not involve air permitting, with the following possible exceptions:

1) Any significant new emission unit, or a change involving a modification (as defined in the air rules) would require a construction permit (which includes public notice). A new molten sulfur tank could fall in this category.

2) The only construction permit applicable to this facility is AC41-2042B, dated 9/1/75, expired 9/1/76. This permit is referenced in our files but we do not have a copy. If there are specific limits/specifications in that permit which the proposed project would revise, that would probably require a construction permit. By this letter, I'm requesting that you and Manatee County check as to whether you have a copy of that permit.

If you have any questions, please call me at (813) 744-6100, Extension 107.

Sincerely,

Gerald Kissel, P.E.
District Air Engineer

cc: Manatee County

c:\piny1296

APPENDIX - TAB F

PINEY POINT PHOSPHATES, INC.

March 5, 1997

Dr. Richard D. Garrity
Director of District Management & Staff
State of Florida
Department of Environmental Protection
Southwest District Office
3820 Coconut Palm Drive
Tampa, Florida 33619

Re: Piney Point Phosphates, Inc.

Dear Dr. Garrity:

We appreciate having had the opportunity to meet with you, representatives of your Department and of Manatee County at our Piney Point facility on February 24th. We felt that the meeting was very open, informative, and frank, and addressed all of the salient issues regarding the restart of our existing sulfuric acid plant. Piney Point Phosphates, Inc., and our parent, Mulberry Corporation, feel strongly that Piney Point has the right, without being re-subjected to a new permitting process, to repair and restart its existing sulfuric acid plant at the discretion of its management. The Piney Point chemical plant and the Wingate Creek mine represent approximately 50% of Mulberry Corporation's assets, so we take this issue with the utmost seriousness. In fact, if these facilities were not in Manatee County, we do not believe that these issues would be before us today.

Preamble

This correspondence has been prepared in response to your Department's request at the February 24th meeting that we provide written back-up and some supplementary information that DEP would find useful in reviewing its position with respect to the restart of our sulfuric acid plant at Piney Point. In particular, we are providing as much of the information as is possible that was requested in Mr. Beason's February 20, 1997 letter to our attorney in Tallahassee, Richard W. Moore of Amundsen & Moore.

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

We believe that the law, precedent in the industry, and simple common sense all unequivocally support our belief that the repair of our sulfuric acid plant at Piney Point, along with its subsequent restart, are not subject to NSPS or PSD review or any other permitting procedure. Manatee County's assertions, as made in Mr. Dee's letter to DEP's Mr. Beason of 1/16/97, their comments during our 2/24/97 meeting, and underscored in their complaint verified on 2/28/97, and served on DEP on 3/3/97, are simply tortured and unprecedented readings of regulations that serve no useful environmental regulatory purpose. They are mainly the hope of some county officials that they can demoralize Piney Point into "going away".

We plan to repair the plant in a high quality and workman-like manner that will ensure safe and reliable production of sulfuric acid at the currently permitted rate of 2,000 tons per day, with emissions that will not exceed currently permitted limits. We consider the repair work that will be undertaken to be in the category of routine repair and maintenance. We are not repairing or replacing any components that are not normally repaired or replaced in the course of the life of a similar type facility.

We also believe that we have precedent on our side, in that the Department apparently approved, without requiring additional NSPS/PSD review, the restart of CF Industries no. 6 sulfuric acid plant in 1995, after it had been shutdown for about six years. CF's no. 6 sulfuric acid unit was restarted from a zero base emissions level after being shutdown for a longer period than Piney Point, and did not require a PSD review. This is directly contrary to Manatee County's assertion about our plant starting from a zero base emissions level and therefore requiring PSD review. Secondly, CF's facility was allowed to restart at an SO_2 emissions rate of 5.76 lbs/ton of sulfuric acid produced, a rate that is significantly higher than the NSPS limit of 4 lbs/ton of sulfuric acid produced. After restart, our plant will conform to the NSPS limit of 4 lbs/ton, and has in fact conformed to that NSPS rate since 1976.

Finally, CF informed the Department that the fixed capital estimate for restarting their no. 6 unit was $2.5 million. As people knowledgeable about the cost of repairing these type plants, we believe the actual cost was closer to $8 million. We mention this only because CF may have expensed certain routine repair and maintenance costs instead of capitalizing them. We have chosen to capitalize all of these type costs in our representations to the Department, and such costs represent about 25% of the total costs we have estimated. CF's percentage of these type costs is undoubtedly higher than ours because we do not think that they replaced any items of major equipment. Had we chosen to expense these type costs, our total capital estimate for plant repair would be reduced to about $13.5 million from the current $18.1 million.

There are several other instances of Department approvals, without permitting review, of

restarts of long idle facilities in the phosphate industry. These include a defluorination kiln at CMI/Coronet Phosphate's Plant City complex, and a phosphate rock dryer at AMAX/Mobil's Big Four mine. Finally, there was the Department's December 19, 1996 letter to us, following a detailed review of our repair project at a meeting on December 10, 1996 at the DEP Tampa office, which approved our repair project without the need for further permitting, except for the possibility of a sulfur tank replacement.

Response to DEP's 2/20/97 Letter

With regard to specific issues raised in Mr. Beason's February 20th letter, we will respond basically in the order of presentation in that letter. But before starting, I would like to restate we have chosen to do a first class repair of the sulfuric acid plant, as is our style and that is reflective of our continuing view of the long term health of our business.

1. *Comment that "Piney Point, has to date, committed or expended upwards of $2 million towards restarting the Piney Point plant with additional, substantial expenditures ongoing or immediately forthcoming." Reference Paul H. Amundsen letter of February 7, 1997 to Douglas Beason.*

Mr. Rinaldi addressed this issue at the February 24th meeting. To amplify, as of January 31, 1997, Piney Point had spent nearly $1.2 million towards restarting the plant. The "plant", in that instance, refers to the entire complex, including an auxiliary boiler, the phosphoric acid plant, the diammonium phosphate (DAP) production facilities, and miscellaneous plant service facilities. These are in addition to and apart from the sulfuric acid plant. As of that date, another $1.6 million had been committed towards the purchase of additional equipment and services. The breakout of these expenditures by areas of the entire plant complex is as follows:

	$000		
	Spent as of 1/31/97	Committed Beyond 1/31/97	Total
Sulfuric Acid Plant	500	185	685
Auxiliary Boiler	16	1,040	1,056
Phos Acid/DAP Plants & Misc Facilities/Services	625	412	1,037
Total	1,141	1,637	2,778

The funds shown above for the sulfuric acid plant represent engineering ($500,000) and site preparation, but no equipment orders or construction. Most of the funds for the phos acid/DAP facilities include the purchase of key equipment having long lead times for

delivery. All costs are monies paid, or to be paid, to third parties and exclude Piney Point idle costs.

2. *Piney Point's pending application for a PSD permit for a new sulfuric acid plant to replace the existing plant.*

This issue was reviewed thoroughly by Mr. Rinaldi at the February 24th meeting. To reiterate, we believe that Manatee County is causing confusion by trying to link the issue of the permit for a new 2,700 TPD sulfuric acid plant with our repair and restart of the existing 2,000 TPD facility. We intend to continue the process of obtaining the permit for the new plant as we consider that to be our sulfuric acid plant of the future. And as indicated in DEP's Notice of Intent to Issue, Piney Point would permanently shut down the existing sulfuric acid plant at such time as the new facility is built and begins to operate. The DEP would be permitting 2,700 TPD of sulfuric acid, not 4,700 (2,000 + 2,700).

However, the Department must appreciate that it has been almost eight years since the initial permit application for the new plant was filed, and to date the permit has not been issued. We cannot control or even project with certainty when the DEP air construction permit will issue (Manatee County has been blocking issuance for the past year), and once that permit issues, we will have to obtain a county building permit which will take even more time with the outcome being even more uncertain. We also cannot control or predict what the economics of constructing a new and expanded sulfuric acid plant will be by the time permits issue. And once construction is started on the new plant, it would not be operational for two years. In the intervening period the price of a new 2,700 TPD plant of the type we planned to build has risen to over $60 million from about $44 million in 1989. Also during that time frame, the market price for sulfuric acid and cogenerated power has fluctuated dramatically.

Our desire to continue pursuing the 2,700 TPD plant is based on our economic projections of the availability of sulfur and sulfuric acid in the world market. While the Department may not understand the rationale, we must make the business decisions to run the company based on sound factual data. Based on these business factors, compounded by the nexus of regulatory delays we have already encountered in obtaining the permit for the new plant, and with no definitive time frame for obtaining that permit, we considered that the repair of the existing facility as our most logical and economical business alternative at the present time. That was the case in 1989 when Piney Point (then known as Royster Phosphates, Inc.) first applied for the permit, it was so when we re-opened the issue in 1993, and remains so today.

3. Questions (a) through (d) concerning Exhibit I of our letter to W.A. Thomas dated December 17, 1996.

Mr. Beason's February 20th letter reveals some confusion regarding our use of certain

terms in Exhibit 1 of our December 17th letter. First of all the terms "repaired", "rehabilitated" and "refurbished" all have the same meaning in that exhibit, i.e. they are simply different expressions of the same verb meaning, according to Webster's New World Dictionary, "to put back in good condition after damage, decay, etc.; mend; fix." In the context of our plant, these terms plainly mean that we will fix an existing piece of equipment in place, restoring it to good and safe operable condition. Likewise in our context, the terms "replace" and "new" also have the same meaning, i.e. we will be replacing a piece of worn out equipment with its equivalent item, where possible, and that item will be new (we are not planning to replace any items with used equipment unless we are forced to do so by interpretation of the rules from your Department). For instance, the new mist eliminators you referenced are not additions to the facility, instead they are new items replacing worn out mist eliminators that already exist. The same applies to new ducts, pumps, piping/valves, motor control center, etc.

In arriving at the conclusions as to what equipment would be repaired or replaced, certain judgments were made by our engineering and maintenance personnel and those of Monsanto in determining what items could be salvaged, and what could not be. For the current scope of work laid out in Exhibit I of the referenced letter, we jointly took the position that if there was some question about whether a piece of equipment could be repaired or replaced, the more conservative approach would be taken, i.e. it would be replaced with an equivalent or comparable new unit, taking into consideration any technological changes that may have occurred with respect to the replacement unit. This does not necessarily mean that such a piece of equipment could not be repaired and put back in safe operable condition, only that we wanted to do a first class job to make the entire plant as new and reliable as possible from an operating and safety standpoint. We simply believe that this is the right objective and we can prove that our operating methods support what we say - and we are confused by Manatee County's public expressions of concern over safety and their pressure on us to make cheap, minimally acceptable capital repairs.

As a result of this procedure, Monsanto was invited to bid the job based on this scope. Their bid originally was $15.8 million, which, with adjustments discussed at that time was increased to $16.1 million. This was the basis for the estimates provided in Exhibit II of our December 17th letter. To that figure we added certain work that would be undertaken directly by Piney Point Phosphates such as the auxiliary boiler, which is already permitted, to arrive at a total estimate of $18.2 million (see 4 below for a more detailed explanation of these costs). Subsequent to that date, we have slightly altered the scope of work to be undertaken by Monsanto, the most prominent of which is repair of the existing sulfur tank rather than its replacement. The revised bid by Monsanto, and what forms the basis of our current contract with them, is $16.530 million. This is summarized in a letter from Monsanto dated February 26, 1997 attached as Appendix 1. The contract is attached as Appendix 2. I want to emphasize that our contract with Monsanto is guaranteed lump sum so that risk of cost overruns are borne by Monsanto. This "insurance" undeniably added

to the cost of the contract, but we felt the additional expense to be well worth it.

Both Monsanto and our own project engineering staff have separately developed a "least cost" scenario for restoration of the plant back to safe operable condition. These estimates have been prepared so that Piney Point could understand what its alternative is to restart without permit review, in the event that Manatee County succeeds in preventing us from doing a first class repair on a timely basis. This alternative would result in substantially lower capital costs at the outset, but may require more frequent downtime for repairs during operations, and shorter lives on some of the major equipment items. Monsanto's estimate for this alternative was $13 million (see Monsanto letter dated 2/27/97 attached as Appendix 3), and our staff's estimate was approximately $9 million (see estimate attached as Appendix 5-2). The major reason that our own estimate is so much lower than Monsanto's is that we would self-manage such a job in the least cost manner, and not be subject to Monsanto's high overhead and profit margin. To confirm our least cost estimate, we are currently in the process of employing a contractor experienced in the repair and rehabilitation of sulfuric acid plants to provide us with an independent estimate of a least cost effort. The results can be provided to the Department in several weeks when we obtain the results.

As discussed at the February 24th meeting, Monsanto estimated that the replacement cost for a comparable 2,000 TPD sulfuric acid plant complex at the same location as the existing plant will be approximately $42 million. A copy of a February 20, 1997 letter from Monsanto attesting to this figure, is attached as Appendix 4.

In order to best address the Department's questions in paragraphs (a) through (d) in a meaningful manner, we have provided a series of extensive spreadsheets (Appendices 5-1, 5-2 and 5-3) showing all of the major items listed on Exhibit I of our December 17, 1996 letter. Appendix 5-1 contains data related directly to the current project scope of work, the basis of which is Monsanto's bid and contract (Appendices 1 and 2). Appendix 5-2 contains the "least cost" repair/replacement estimate developed by our staff, and Appendix 5-3 contains the replacement in-kind plant estimate developed by Monsanto as noted on Appendix 4. Each appendix lists the following categories:

1. The original in-service date for a piece of equipment, and the date of any replacement that may have been made.
2. The original expected life of that equipment at the time.
3. Whether the item will be repaired or replaced.
4. The extent of work to be performed, which contains a description of the repair or replacement contemplated. If the item is to be relocated, the reason for relocation. In the case of the current scope of work (Appendix 5-1), a very detailed scope of work is available and is provided as a separate Attachment (1) to Appendix 5-1.
5. The expected life of the item after repair or replacement.

APPENDIX 5-2

PINEY POINT SULFURIC ACID PLANT REPAIR (Minimum Required)

LEAST COST SCOPE OF WORK - PPI MANAGED

	ITEM	ORIGINAL PLANT DATE IN SERVICE	ORIGINAL PLANT DATE REPLACED	ORIGINAL EXPECTED LIFE *	REPAIRED	REPLACED	EXTENT OF WORK	EXPECTED LIFE (yr.)	EFFECT ON CAPACITY and EMISSIONS @2,000T/D	ESTIMATED COST (000 $)
1	SULFUR BURNER	1966	1979	15-20	X		Repair 2/3 of wind-box & its refractory	5-7	NONE	$20
2	BOILER FEED WATER HEATER	1966		20-25		X	New unit / use existing instrumentation	20-25	NONE	200
3	WASTE HEAT BOILERS	1966		30-40	X		Clean boilers and replace by-pass valve	5-7	NONE	10
4	ECONOMIZER	1966		5-15		X	New unit / use existing instrumentation	5-15	NONE	300
5	MAIN COMPRESSOR	1966		30 +	X		Repair steam leak and standard inspection	1-2	NONE	50
6	NO. 1 CONVERTER	1966		30 +	X		Replace #1 grids and screen catalyst	4-7	NONE	500
7	NO. 2 CONVERTER	1976		30 +	X		Screen catalyst and repair leak	9-12	NONE	150
8	ACID TOWERS									2,400
	Drying (28.5' dia.)	1966		15-20	X		Repair in place	2-3	NONE	
	Interpass (26.5' dia.)	1966		15-20		X	Replace w/ 18.5' dia. in place	15-20	NONE	
	Final (21.1' dia.)	1976		15-20	X		Repair in place	2-3	NONE	
9	MIST ELIMINATORS	1966	Various	[illegible]	X		One new and two repaired sets	[illegible]	NONE	400
10	HEAT EXCHANGERS	1966		8-20	X		Inspect and clean if necessary	4-7	NONE	200
11	SUPER HEATER	1966		10-25	X		Clean and inspect	5-6	NONE	20
12	CONDENSATE SYSTEM	1966		20-25	X		Clean and inspect	1-2	NONE	20
13	COOLING TOWER	1966		20-25		X	New tower / use existing instrumentation	20-25	NONE	850
14	ACID COOLERS	1966		15-25		X	New shell and tube units w/ new controls	15-25	NONE	800
15	ACID PUMP TANKS	1966		20-25	X		Replace one and repair one	Replace 15-20 Repair 2-4	NONE	240
16	ACID STORAGE TANKS	1966		40	X		Clean and inspect; repair as nec'y	4-6	NONE	100
17	PLANT STACK/WATER SYSTEM	1966		30-40	X		Clean/repair softeners and repair stack	2-4	NONE	100
18	PUMPS	1966		10-20	X		Repair all pumps	1-3	NONE	125
19	DUCTS	1966 / 76		15-20	X		Replace two and repair others	Replace 15-20 Repair 5-7	NONE	300
20	MISC. PIPING/VALVES	1966	Various	8-15	X		Repair relief valves and test piping	5-7	NONE	90
21	SO2 MONITOR	1981		20-25	X		Repair and upgrade	4-5	NONE	25
22	OFFICE	1966		25-40	X		Repair block walls and roof	10-15	NONE	50
23	CIVIL, STRUCTURAL, PAINTING, ETC.	1966	Various	5-40	X		Inspect and repair	5-15	NONE	300
24	INSTRUMENTATION	1966		15-25	X		Inspect and repair	2-4	NONE	100
25	SULFUR TANK/PIT	1966		25-35	X		Replace tank floor and repair pit	5-10	NONE	100
26	AUXILIARY BOILER	1966		20-25		X	New 150,000 pph unit	20-25	NONE	1,100
27	MISCELLANEOUS	1966		N/A	X		Small item repairs	1-2	NONE	600
	TOTAL:									$9,150

NOTE: * Based on Attachment (2)

APPENDIX 5-3

PINEY POINT SULFURIC ACID PLANT REPLACEMENT

		ORIGINAL PLANT			NEW 2,000 T/D PLANT - MONSANTO			
	ITEM	DATE IN SERVICE	DATE REPLACED	ORIGINAL EXPECTED LIFE *	EXTENT OF WORK	EXPECTED LIFE	EFFECT ON CAPACITY and EMISSIONS @2,000T/D	NEW PLANT COST (000 $) **
1	SULFUR BURNER	1966	1979	15-20	Identical replacement item	15-20	NONE	$1,000
2	BOILER FEED WATER HEATER	1966		20-25	"	20-25	NONE	250
3	WASTE HEAT BOILERS	1966		30-40	"	30-40	NONE	3,000
4	ECONOMIZER	1966		5-15	"	5-15	NONE	350
5	MAIN COMPRESSOR	1966		30 +	"	30 +	NONE	1,200
6	NO. 1 CONVERTER	1966		30 +	"	30 +	NONE	4,600
7	NO. 2 CONVERTER	1976		30 +	"	30 +	NONE	2,000
8	ACID TOWERS							6,000
	Drying (28.5' dia.)	1966		15-20	"	15-20	NONE	
	Interpass (28.5' dia.)	1966		15-20	"	15-20	NONE	
	Final (21.1' dia.)	1976		15-20	"	15-20	NONE	
9	MIST ELIMINATORS	1966	Various	1-5 Drying 10-15 Others	New: Current available technology	1-5 Drying 10-15 Others	NONE	600
10	HEAT EXCHANGERS	1966		8-20	Identical replacement item	8-20	NONE	1,200
11	SUPER HEATER	1966		10-25	"	10-25	NONE	700
12	CONDENSATE SYSTEM	1966		20-25	"	20-25	NONE	300
13	COOLING TOWER	1966		20-25	"	20-25	NONE	1,100
14	ACID COOLERS	1966		15-25	New: Shell & tube in place of cast iron	15-25	NONE	1,000
15	ACID PUMP TANKS	1966		20-25	Identical replacement item	20-25	NONE	400
16	ACID STORAGE TANKS	1966		40	"	40	NONE	1,800
17	PLANT STACK/WATER SYSTEM	1966		30-40	"	30-40	NONE	1,000
18	PUMPS	1966		10-20	"	10-20	NONE	500
19	DUCTS	1966 / 76		15-20	"	15-20	NONE	1,000
20	MISC. PIPING/VALVES	1966	Various	8-15	"	8-15	NONE	2,100
21	SO2 MONITOR	1981		20-25	New: Current available technology	20-25	NONE	100
22	OFFICE	1966		25-40	Identical replacement item	25-40	NONE	600
23	CIVIL, STRUCTURAL, PAINTING, ETC.	1966	Various	5-40	"	5-40	NONE	5,000
24	INSTRUMENTATION	1966		15-25	New: Current available technology	15-25	NONE	1,000
25	SULFUR TANK/PIT	1966		25-35	Identical replacement item	25-35	NONE	700
26	AUXILIARY BOILER	1966		20-25	New 150,000 pph unit	20-25	NONE	1,500
27	MISCELLANEOUS	1966		N/A	Mostly identical	N/A	NONE	3,000
	TOTAL:							$42,000

NOTE: * Based on Attachment (2)

NOTE: ** Monsanto bid break-down estimated by PPPI

MEMO TO: Tom Baroody

FROM: Jerry Hartman

December 13, 1996

SUBJECT: Break down of cost estimate for new SAP @ PPPI

NOTE: The following estimates a costed as "installed", which includes design engineering, construction labor and equipment, and any necessary foundations, piling, piping, valves, instrumentation, insulation, and painting. The equipment is based on the existing plant except for the acid coolers which are of the new style because of the cost and safety hazards related to the old style.

	DESCRIPTION	COST (MM$)
1.	Steam generation and heat recovery equipment, including waste heat boilers (2 ea. with one steam drum), economizers, and steam superheater.	6.5
2.	Boiler feed water system, including water treatment system with storage, water pumps, deaerator and boiler feed water pumps.	5.5
3.	Process blower and turbine drive including lub oil system and inlet duct with silencer/filter.	3.4
4.	Drying tower, sulfur burner, converters (2 ea. inc catalyst), absorption towers (2 ea.) and all connecting ducts with valves.	14.0
5.	Process control building containing the operator control room and motor control center, including medium and low voltage switch gear and plant control instrumentation with compressor for air supply.	.6
6.	Sulfur storage tank (800 ton) including truck receiving pits with necessary steam heating and pumps with piping to the storage tank and the sulfur burner.	.7
7.	Acid cooling system, including cooling tower, water pumps (2 ea.), acid coolers (3 ea.), acid pump tank and acid circulation pump.	2.5
8.	Auxiliary boiler (150,000 pph, 350 psi) with all ancillary equipment and controls and fuel oil storage with containment.	1.5
9.	Acid storage tanks (2 @ 5,000 ton ea.) with environmental containment and truck loading facility with pumps (2 ea.).	1.8
10.	Main utility electrical supply with main breaker and transformer.	.4
11.	Demolition and site preparation.	2.0
12.	Project management.	1.5
13.	Contractor profit @ 15%	6.1
	TOTAL PROJECT COST:.....	46.5

APPENDIX - TAB G

PINEY POINT PHOSPHATES, INC.

13300 U. S. Hwy. 41 North
Palmetto, Florida 34221
(941) 722-4555

March 26th, 1997

Mr. Richard D. Garrity
Director of District Management
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Mr. Howard Rhodes
Dept Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Piney Point Phosphates, Inc.

Dear Messrs Garrity and Rhodes:

We appreciated the opportunity of meeting with DEP in Tallahassee on March 20, 1997 to discuss issues related to the repairs and restart of our existing sulfuric acid plant at Piney Point. This letter is being prepared to assist the Department in better understanding our contention that the sulfuric acid plant repairs we are planning to do at Piney consist of routine maintenance, repair and or replacement of component parts of the facility, and therefore do not fall into the category of a physical change resulting in an emissions increase. As you know, we do not believe that the repair work requires a pre-construction review by the Department for new permitting.

The repairs we are proposing to make at Piney Point fall into two general categories. (1) repairs to existing parts and component equipment and; (2) replacements of worn-out parts and component equipment. In general we have elected to replace component parts rather than make substantial repairs in order to maximize the on stream reliability after restart, Therefore approximately 70% of the cost of the work involves replacements of component parts, and 30% is physical repairs to existing units.

The major items to be replaced at our facility include the following (see Exhibit 5-1 of our 3/5/97 letter and Exhibit I of our 12/19/96 letter to the Department for further details):

1. Economizers
2. Acid Towers (3)
3. Mist Eliminators (3 sets)
4. Heat Exchanger (1 of 3)
5. Cooling Tower
6. Acid Coolers
7. Acid Pump Tank
8. Boiler

To highlight that these replacements are normal repairs to a plant of this type and vintage, we have asked several sulfuric acid plants specialists to provide reports that identify similar repairs and replacements that have occurred to other sulfuric acid plants. These specialists include Monsanto Enviro-Chem, the company engaged by Piney Point to engineer/construct the vast majority of repairs to our facility, and Acid Engineering & Consulting ("AEC"). Monsanto has engineered, constructed and/or modified about 90% of the sulfuric acid plants built worldwide, while AEC had vast experience in consulting, engineering and design activities related to sulfuric and plants.

Attached as Exhibit I is Monsanto's report dated March {2}5, 1997 describing replacement components and equipment for sulfuric acid plants for which they are knowledgeable in the US. Note that this list contains replacements for some 18 economizers, 26 acid towers, 21 sets of mist eliminators, 19 heat exchangers, 1 cooling tower (ours was destroyed in a storm), 27 acid coolers, 20 acid pump tanks, and 5 boilers. In addition; there are numerous replacements shown for items that we propose to repair and not replace, e.g converters, superheaters and sulfur burners. Please note that most of the replacement items occur in the 1990's, a time by which the bulk of sulfuric acid plants built in the country are 20-30 years old. Our plant was built in 1966, and modified in 1976, therefore the items we are replacing generally fall in line with the replacements made at other plants of this vintage. Once again, none of the replacements and repairs we are making will increase production or emissions from the plant above the levels of our permit. This falls in line with the existing permit limits of a maximum 2,000 tons per day of sulfuric acid production, and no more that 4lbs/ton SO2 per ton of sulfuric acid produced, and no more than 0.15 tons of sulfuric acid mist per ton of sulfuric acid produced (current NSPS limits).

Attached Exhibit II is the ACE report, which from a totally independent perspective, demonstrates that many of these same items are normally replaced as a part of routine plant repairs and maintenance over the normal life of a sulfuric acid plant. The principal of AEC, Mr. Leonard Friedman, is a generally recognized industry expert in the area of sulfuric acid design, maintenance and modification; and has been in fact referred to by Manatee County's own consultant in this regard.

The purpose of these exhibits is to demonstrate the factual basis for our contention that the replacements being made to the Piney Point facility comprise routine repairs and maintenance that are normally make during the life of a typical sulfuric acid plant such as Piney Point.

We trust that this letter and enclosed supporting documentation will help convince the Department that the work being done at Piney Point cannot be classified as a "modification" and hence should not trigger pre-construction review by the Department.

We look forward to the Department's timely determination of the merits of our contention; which of course are diametrically opposed to those of Manatee County. Please let us know if we can supply any additional information that you may require.

Sincerely,

Robert C. Stewart
Senior Vice-President-Operations
and Administration

March 5, 1997

BEST AVAILABLE COPY

Mr. Thomas E. Baroody
Piney Point Phosphates, Inc.
3 Miles East of Mulberry on Hwy. 60
Mulberry, FL 33860

Dear Tom:

Enviro-Chem has completed a record search of all known domestic sulfuric acid replacement components/equipment. The search was not limited to just sulfur burning plants, but included both metallurgical and spent acid regeneration plants. Likewise, the geographical area was expanded to include the entire United States. The list includes primarily those replacements engineered, manufactured, or installed by Enviro-Chem. The information collected is organized by replacement equipment type and is enclose for your review.

Each replacement equipment item is identified by company, location, component replaced, number of replacements, and the year(s) in which the quantity of replacements were installed.

The specific company names nor plant location were not provided upon advice from our legal council as it may constitute a breach of confidentially. Therefore, I have substituted a unique number for each company name and the plant location is identified only by reference to the state. Should Piney Point Phosphates determine that the specific company names and locations are needed, the individual companies will have to be contacted to secure their permission.

If I can be of any further assistance, please contact me.

Sincerely,

Jeffrey P. Walser

Jeffrey P. Walser
Regional Sales Manager

Enclosure

ENVIRO-CHEM SYSTEMS
A Monsanto Company
14527 South Outer Forty Road
Chesterfield, Missouri 63017
P.O. Box 14547
St. Louis, Missouri 63178
(314) 275-5700

Company	Location	Equipment Item or Commodity Replaced	No.	Year(s) Installed
1	Idaho	Acid Cooler T & S	1	1996
2	Louisiana	Acid Cooler T & S	1	1993
3	Missouri	Acid Cooler T & S	1	1991
4	Plant City	Acid Cooler T & S	2	1982, 1983
5	Arizona	Acid Cooler T & S	2	1996
6	Missouri	Acid Cooler T & S	1	1989
7	Texas	Acid Cooler T & S	1	1990
7	Texas	Acid Cooler T & S	2	1993
7	Tennessee	Acid Cooler T & S	1	1988
8	Florida	Acid Cooler T & S	2	1986
9	Florida	Acid Cooler T & S	1	1990
10	Arizona	Acid Cooler T & S	4	1987
11	Louisiana	Acid Cooler T & S	1	1992
12	Idaho	Acid Cooler T & S	1	1996
17	Georgia	Acid Cooler T & S	1	1988
18	California	Acid Cooler T & S	1	1988
19	North Carolina	Acid Cooler T & S	1	1988
20	California	Acid Cooler T & S	1	1988
21	California	Acid Cooler T & S	2	1993
22	Alabama	Acid Pump Tank	1	1988
23	Virginia	Acid Pump Tank	1	1984
24	Illinois	Acid Pump Tank	1	1987
4	Florida	Acid Pump Tank	4	1994
7	Louisiana	Acid Pump Tank	1	1986, 1990
25	Georgia	Acid pump Tank	1	1990, 1991, 1992
10	Arizona	Acid Pump Tank	3	1995
26	Florida	Acid Pump Tank	1	1988
27	North Carolina	Acid Pump Tank	1	1992, 1994
27	North Carolina	Acid Pump Tank	1	1995, 1996
28	Louisiana	Acid Pump Tank	1	1995
12	Idaho	Acid Pump Tank	1	1992
21	California	Acid Pump Tank	2	1993
21	California	Acid Pump Tank	1	1995
8	Florida	Cooling Tower	1	1986
29	Louisiana	Converter	1	1998
5	Arizona	Converter	1	1998
7	Louisiana	Converter	1	1996
7	Louisiana	Converter	1	1996
7	New Jersey	Converter	1	1997
25	Georgia	Converter	1	1997
47	Tennessee	Converter	1	1996
10	Arizona	Converter	1	1995
20	California	Converter	1	1996

Company	Location	Equipment Item or Component Replaced	No.	Year(s) Installed
14	Tennessee	Economizer	2	1991
13	Florida	Economizer	2	1992
7	Louisiana	Economizer	1	1984, 1988
7	Texas	Economizer	1	1987
7	Ollo	Economizer	1	1990
7	Kentucky	Economizer	1	1989
8	Louisiana	Economizer	1	1995
9	Florida	Economizer	2	1983
9	Florida	Economizer	1	1986
30	Arkansas	Economizer	1	1980
19	North Carolina	Economizer	2	1984
31	Florida	Economizer	3	1985
13	Florida	Gas Heat Exchanger	2	1992
1	Idaho	Gas Heat Exchanger	1	1997
32	Arizona	Gas Heat Exchanger	1	1995
33	Florida	Gas Heat Exchanger	3	1995
33	Florida	Gas Heat Exchanger	1	1996
3	Arizona	Gas Heat Exchanger	4	1996
27	North Carolina	Gas Heat Exchnager	1	1987
34	Florida	Gas Heat Exchanger	2	1995, 1998
10	Arizona	Gas Heat Exchnager	2	1995
12	Idaho	Gas Heat Exchanger	1	1998
21	California	Gas HeatExchanger	1	1993
13	Florida	Mist Eliminators (FAT)	1	1995
33	Florida	Mist Eliminators (FAT)	1	1987
33	Florida	Mist Eliminators (DT)	1	1988, 1994, 1995
33	Florida	Mist Eliminators (IPAT)	1	1995
4	Florida	Mist Eliminators (IPAT)	1	1989
4	Florida	Mist Eliminators (FAT)	1	1986, 1991
16	Florida	Mist Eliminators (FAT)	1	1995
16	Florida	Mist Eliminators (IPAT)	1	1985, 1988, 1995
8	Florida	Mist Eliminators (IPAT)	1	1988, 1989
9	Florida	Mist Eliminators (IPAT)	1	1986, 1987, 1989
9	Florida	Mist Eliminators (IPAT)	1	1990
10	Arizona	Mist Eliminators (DT,IP,PAT)	3	1995
35	Florida	Mist Eliminators (FAT)	1	1993
36	Florida	Mist Eliminators (FAT)	1	1990
36	Florida	Mist Eliminators (DT)	1	1991, 1992, 1993
19	North Carolina	Mist Eliminators (DT)	3	1984
37	Florida	Mist Eliminators (FAT)	1	1991, 1992
14	Tennessee	Superheater	2	1991
33	Florida	Superheater	1	1995
9	Florida	Superheater	2	1983

Company	Location	Equipment Item or Component Replaced	No.	Year(s) No. Installed
9	Florida	Superheater	1	1988
12	Idaho	Superheater	2	1998
13	Florida	Sulfur Burner	1	1992
14	Tennessee	Sulfur Burner	1	1990
15	Florida	Sulfur Burner	1	1980
7	Louisiana	Sulfur Burner	1	1985
4	Florida	Sulfur Burner	1	1977, 1992, 1997
16	Florida	Sulfur Burner	1	1989
38	New Mexico	Sulfur Burner	1	1980
26	Florida	Sulfur Burner	2	1979
39	Virginia	Tower - Drying	1	1984
24	Illinois	Tower - Absorbing	1	1987
29	Louisiana	Tower - Drying	1	1981
29	Louisiana	Tower - Absorbing	1	1981
40	Hawaii	Tower - Final	1	1990
4	Florida	Tower - Drying	2	1997
33	Florida	Tower - Interpass	1	1995
5	Arizona	Tower - Final	1	1996
7	Louisiana	Tower - Absorbing	1	1988
7	Ohio	Tower - Drying	1	1995
7	Ohio	Tower - Absorbing	1	1984
41	Tennessee	Tower - Drying	1	1994
34	Florida	Tower - Final	1	1992, 1995
25	Georgia	Tower - Final	1	1995
25	Georgia	Tower - Interpass	1	1994, 1998
10	Arizona	Tower - Final	1	1995
42	Texas	Tower - Absorbing	1	1989
43	New Mexico	Tower - Final	2	1995
43	New Mexico	Tower - Final	1	1995
44	Texas	Tower - Absorbing	1	1996, 1997
45	Wyoming	Tower - Interpass	1	1993
12	Idaho	Tower - Drying	1	1993, 1995
21	California	Tower - Drying	1	1993, 1995
46	Pennsylvania	Tower - Final	1	1989
13	Florida	Waste Heat Boiler	1	1992
14	Tennessee	Waste Heat Boiler	1	1990
33	Florida	Waste Heat Boiler	1	1996
34	Florida	Waste Heat Boiler (Rerated & re-certified)	1	1993
34	Florida	Waste Heat Boiler	1	1992, 1995
31	Florida	Replace Steam Drum	1	1985

ACID ENGINEERING & CONSULTING, INC.
L.J. Friedman, P.E.

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Boca Raton, Florida 334
Phone: (561) 995-16
Fax: (561) 995-16

March 24, 1997

Mr. Thomas E. Baroody
Mulberry Corporation
Post Office Box 797
Mulberry, Florida 33860

Re: Piney Point Phosphates - Sulfuric Acid Plant Equipment Replacement

Dear Mr. Baroody,

It was a pleasure meeting you and discussing the work you are undertaking to repair and restart the Piney Point sulfuric acid plant. In your discussions with Florida DEP and Manatee County there was a question concerning normal replacement of equipment in sulfuric acid plants. Acid Engineering & Consulting, Inc. has been involved with the design and/or operation of over two hundred sulfuric acid plants and is providing the following information to clarify normal replacement of major sulfuric acid plant equipment. The information includes an explanation of normal equipment replacement practice in sulfuric acid plants, with examples of specific plant major equipment replacements.

For your information, attached please find some background information on Acid Engineering & Consulting, Inc. and a brief resume for Leonard J. Friedman, including a listing of technical papers presented at various technical meetings and seminars around the world. L. J. Friedman has over thirty two years experience in the design and operation of chemical plants and for the last twenty four years specializing in sulfuric acid plant design and operation. In 1991, L. J. Friedman was elected to the grade of Fellow in the American Institute of Chemical Engineers, a grade of membership recognizing over twenty five years of outstanding contributions to the chemical engineering profession, AIChE and the community.

Sulfuric Acid Plant Equipment Replacement

The useful life of equipment in a sulfuric acid plant is highly variable and is a function of the design and design details of the item, materials of construction and material thickness (corrosion allowance), construction and installation methods, and operating history-conditions. For example, plants that have had a number of owners with different operating staffs, or have been shut down for varying periods, require replacement of major pieces of equipment more frequently than a plant operating continuously with a stable staff. However, even under the best operating scenario, replacement of major equipment items in a sulfuric acid plant is required on a regular basis. To minimize the down time associated with major equipment replacement, operating plants replace only one or two pieces of equipment at a

time during the regular maintenance turnaround (every 18 months to 2 years). Restart of a shutdown plant offers the opportunity to make needed replacements at one time (before restart).

Acid Piping - Acid piping has a useful operating life of five to ten years, with high velocity areas requiring replacement more frequently. It is normal practice to monitor the thickness of acid piping and schedule replacement at the turnaround as required. When a plant is down for an extended period, grooving and localized thinning occurs, requiring replacement to insure a sound and safe system.

Acid Pumps - Acid pumps are normally replaced at each turnaround, with the replaced pump reconditioned as a spare and for reuse at the next turnaround.

Acid Coolers - Anodically protected stainless steel shell and tube acid coolers have been available to the sulfuric acid industry since 1970, and have been the standard acid cooling device since 1975, replacing cast iron type acid coolers. Essentially all sulfuric acid plants in North America use anodically protected shell and tube acid coolers. Cast iron coolers were subject to frequent acid leaks, with releases of sulfuric acid to the cooling water system and acid mist to the environment.

Mist Eliminators - Mist eliminator replacement is a function of the type of device and the materials of construction. For example, dry tower stainless steel pad type mist eliminators require replacement at each turnaround, while fiberglass candle type mist eliminators can operate five to ten years between replacement.

Acid Towers - Life of acid towers varies from five to ten years for poorly designed and/or constructed towers, to over thirty years. Average tower life is twenty to thirty years.

Boilers and Heat Exchangers - Boilers have a useful life of twenty to thirty years. Overheating of the boiler inlet tubesheet can cause damage and require replacement more frequently. Hot gas heat exchangers have a life of twenty to thirty years, while cold exchanger life depends on the amount of sulfuric acid entering the exchanger (dry tower and mist eliminator efficiency), and can be as short as two years and as long as fifteen years.

Converter - Sulfuric acid plant converters (carbon steel with cast iron internals) have a normal life in excess of thirty years. Overheating of the first catalyst bed area can cause localized plate buckling, requiring replacement of the high temperature cast iron grids and upper vessel area steel plate and insulating brick lining.

Typical Sulfuric Acid Plant Major Equipment Replacement

Plant Name & Location	Equipment Replaced
CF Industries, Plant City, Florida (1965) - Two Plants	Absorber with Mist Eliminator (1975), Acid Pump Tank (1975), Superheater-Economizer (1991), Boiler with Steam Drum (1991), Acid Coolers (1975), SO2 Scrubber (1991), Stack Mist Eliminators (1991), Dry Tower with Mist Eliminator (1997), Sulfur Furnace (1997), Product Acid Cooler (1997).
J.R. Simplot, Pocatello, Idaho (1985)	Boiler, Superheater, Economizer, Sulfur Furnace, Gas Heat Exchanger, Acid Pump Tank, Acid Cooler. (1994-1996)
General Chemical, Richmond, CA (1955, 1965)	Converter, Gas Heat Exchangers (4), Blower and Drive, Start-up Heater, Acid Coolers, Absorber and Dry Tower Mist Eliminators. Water Cooling Tower, Mist Precipitators. (1992)
Olin Corporation, Beaumont, Texas (1955, 1965)	Dry Tower and Mist Eliminator (1984), Absorber and Mist Eliminator (1982), Acid Coolers (1975), Converter (1975), Gas Heat Exchangers (3) (1975, 1988), Start-up Heater (1975), SO2 Scrubber (1974, 1988), Stack Mist Eliminators (1975, 1988), Boiler (1965), Quench Tower (1976), Gas Coolers (1965, 1975, 1985), Mist Precipitators (1965).
Cargill, Bartow, Florida (1975)	Boilers (2) with Steam Drum (1996), Gas Heat Exchangers (1996), Absorber Replaced with HRS System (1993).
Arcadian, Geismar, Louisiana (1966)	Converter (1996), Economizer (1996), Acid Pump Tank (1985), Acid Coolers (1985), Absorber and Dry Tower with Mist Eliminators (1985).
SF Phosphates, Rock Springs, WY (1980)	Absorber with Mist Eliminator, Gas Heat Exchanger, Acid Cooler, Mist Eliminators (1992)
IMC-Agrico, South Pierce, Florida (1975)	Absorber Replaced with HRS (1993), Gas Heat Exchangers (2) (1985, 1993), Superheater-Economizer (1993), Mist Eliminators (1993), Absorber (1996).

Electronic Chemicals, Tulsa, OK (1942)	Dry and Absorbing Towers with Mist Eliminators (1965), Converter 1997), Boilers (2) with Steam Drum (1997), Acid Coolers (1997), Dilution Pump Tank (1992), Economizer (1997), Sulfur Furnace (1997), Water Cooling Tower (2) (1992, 1997), SO2 Scrubber (1997), Stack Mist Eliminator (1992, 1997),

Note: The above table shows typical major equipment replacement for sulfur burning plants in Florida, Idaho, Louisiana, Oklahoma and Wyoming, and spent acid regeneration plants in California and Texas indicating similar experience independent of plant location and type. New equipment for increased capacity or to meet new emission requirements are not included in the table. The approximate date of original plant start-up is shown as (19xx), and the approximate date of equipment replacement is shown as (19xx).

I trust this provides the information you require. Please contact me if you require any additional information or clarification. Thank you for the opportunity to be of service to Mulberry Corporation.

Very truly yours,

L. J. Friedman

Leonard J. Friedman

ACID ENGINEERING & CONSULTING, INC.

BACKGROUND & EXPERIENCE

COMPANY

Acid Engineering & Consulting, Inc. was formed in 1979 and is composed of a principal, L. J. Friedman and a number of key process, estimating and detail design people. Each member of the group has over thirty years experience in his area of specialty. The group has been involved in the design and operation of over two-hundred sulfuric acid plants and numerous sulfur and sulfur dioxide recovery plants around the world. L. J. Friedman has held senior positions with Olin Corporation, and Stauffer Chemical Company and prior to forming AE&C was head of sulfur-sulfuric acid processes for Davy-McKee, a major sulfuric acid plant contractor. Friedman designed plants are in operation throughout the world. Clients include Olin Corporation, Rhone Poulenc, Star (Getty Oil), Mississippi Chemical, Asarco, Anaconda, NL Industries, Quimbrasil, Fertimex, Codelco-Chile, Inco, Farmland, Chevron, Cargill, CF Industries, Texasgulf, Agrico, Amoco, etc.

SERVICES OFFERED

The company offers engineering and consulting services in the sulfur, sulfur dioxide recovery and sulfuric acid areas. Services offered are outlined below and include feasibility studies, case studies with economic analysis, project scope definition, preparation of bid specifications, review of bids, design reviews, front end engineering and design packages for new plants or units, and engineering design, troubleshooting, debottlenecking, efficiency and modification studies for existing plants.

NEW PLANTS & MODIFICATIONS TO EXISTING PLANTS

Review and evaluate alternate overall system designs.
Prepare or review energy utilization and optimization studies.
Prepare bid specifications.
Prepare technical bid evaluations.
Prepare or review process designs, heat and material balances and equipment specifications.
Prepare or review piping and instrument diagrams.
Prepare or review detailed designs of vessels, heat exchangers, equipment, piping and ducts.
Prepare or review plant operating instruction manuals.
Provide plant operator training, start-up and trouble-shooting assistance.

EXISTING PLANTS

Review and evaluate current operation with the goal of improving efficiency and capacity whil reducing operating and maintenance costs.
Prepare debottlenecking studies and designs for cost effective capacity increases.
Prepare modification studies and designs to incorporate energy recovery, new equipment, feed stock or products.
Provide plant troubleshooting studies - assistance.
Prepare energy utilization and optimization studies.
Provide emission control system evaluation.

PARTIAL LIST OF CLIENTS

Clermont Engineering/U. S. Army Corps of Engineers
Codelco-Chile - Division El Teniente - Chile
Public Service Company of New Mexico
Cominco - Canada
Olin Corporation
Royster
Stauffer Chemical - Rhone Poulenc
Rohm & Haas
Anaconda
Davy McKee
St. Joe Lead Company
CF Industries
Industrial Chemicals Corp.
Inco - Canada
Texasgulf Chemicals, Inc. - PCA
Friendland - Taiwan Power - Taiwan ROC
J. R. Simplot
Cargill - Gardinier
Farmland Industries
Arcadian Corp.
Chevron Chemical & Refining
National Zinc Corp
General Chemical
Peridot Chemical
Resources Conservation Company
Tampa Electric Company
Sheritt, Inc. - Canada
Marsulex - Canada
Southern Peru Copper Corp - Peru
Gore, Allison & Associates
FFM - Mexico
Esso Chemical Canada
Occidental Chemical
Met-Mex Penoles - Mexico
Zimpro/Sterling Drug
Shattuck Chemical
Acres Davy McKee - Canada
Noranda - Canada
Agrico Chemical
Jacobs Engineering/SOMEX
Rotem Fertilizer - Israel
St. Joe Resources Company
Conserv, Inc.
Chemical Marketing Services
Kennecott Minerals
Asarco, Inc.
Techpro/ZCCM - Zambia
Allied Fibers - Chemical
Mobil Mining & Minerals
American Cyanamid - Cytec
Amoco Oil Company
Stebbins Engineering
SF Phosphates Limited
Mulberry Phosphates
DB Constructors, Inc.
Electronic Chemicals, Inc.
Chemetics International - Formosa Plastics - Canada, Taiwan ROC

PLANT OPERATION ANALYSIS - CONSULTING

Plant & Equipment Operation Review & Evaluation
Capacity Increase Metallurgical Sulfuric Acid Plant
Capacity Increase Sulfur Burning Sulfuric Acid Plant
Capacity Increase Spent Acid Regeneration Sulfuric Acid Plant
Troubleshooting SO3/Acid Mist Emissions
Troubleshooting Equipment Failure/Corrosion
Plant Operating Problem Analysis With Alternate Solutions

CONSULTING SERVICES

Plant Start-up Consultant
Coke Oven Gas Desulfurization System Bid Preparation & Marketing Consultant
Expert Witness Legal Suits, Sulfuric Acid Plant Design and Operation, S02 Emission Control

PUBLICATIONS & PATENTS

Numerous publications and patents in the sulfur dioxide recovery and sulfuric acid areas. Publications in Chemical Engineering, Chemical Engineering Progress, Environmental Progress and Journal of Metals. Papers have been presented at national meetings of AIChE, ACS, TMS, AIME, AIME-TMS International Sulfide Smelting Symposium, Canadian Institute of Mining and Metallurgy Professional Enhancement Seminar - Reduction of Sulfur Dioxide Emissions from Non-Ferrous Smelters, and British Sulfur Corporation's International Sulfur and Sulfuric Acid Conferences, as well as, Florida Section AIChE annual meetings and sulfuric acid seminars.

TYPICAL PROJECTS - SCOPE OF WORK

FRONT END ENGINEERING & EQUIPMENT DESIGN

Sulfur Burning Sulfuric Acid Plant
Spent Acid Regeneration Sulfuric Acid Plant
Sulfuric Acid Plant Conversion To Double Absorption
Ammonia and Sodium SO2 Scrubbing Systems
Oleum System & Liquid SO3 Plant
Process Modifications & Equipment Design
    Heat Exchangers, Converters, Towers, Piping, Instrumentation, Ducts, etc.
Sulfur Unloading & Storage System
Modification To Spent Acid Regeneration

PROJECT CONSULTANT - DESIGN REVIEW

Preparation of Bid Specifications & Design Review - Metallurgical Sulfuric Acid Plant
Preparation of Bid Specifications & Design Review - Sulfur Burning Sulfuric Acid Plant
Preparation of Bid Specifications & Design Review Sulfuric Acid Plant Modifications - Turbogenerator
Project Consultant With Design Review S02 Scrubbing System & Sulfuric Acid Plant
Design Review & Improvement Studies Ammonia S02 Scrubbing System
Design Review Liquid S02 Plant
Project Consultant With Design Review Sulfuric Acid Plant - Turbogenerator System

FEASIBILITY & OPTIMIZATION STUDIES

Energy Utilization & Optimization Studies
Sulfuric Acid Plant Capacity & Energy Recovery Studies
Capacity Optimization Studies Liquid S02 & Sulfuric Acid Plant
SO2 Emission Control System Alternate Evaluation
Feasibility, Case Studies SO2 Scrubbing Metallurgical Gases & Sulfuric Acid Plant
Case Studies Ammonia S02 Scrubbing, Ammonium Sulfate Crystallization
Sulfuric Acid Plant Relocation Studies
Evaluation Studies Single Absorption Ammonia Scrubbing vs Double Absorption
Evaluation Studies Sulfuric Acid, Elemental Sulfur & Liquid S02 From High Strength S02 Gas

BRIEF BIOGRAPHY

LEONARD J. FRIEDMAN, P.E.

Education

Undergraduate - Bachelors Degree - BS ChE

Polytechnic University of New York - Chemical & Nuclear Engineering

Graduate - Masters Program

Pace College Graduate School - Business Administration

State University of New York at Buffalo - Nuclear Engineering

Experience

Acid Engineering & Consulting, Inc. - President

The company employs from five to thirty technical people, each with over thirty years experience in the design and operation of sulfur, sulfur dioxide recovery and sulfuric acid plants. Recent work has included projects in the United States, South America (Brazil, Chile, Peru), Middle East, Taiwan, Canada and Africa. (See attached AE&C Background and Experience for additional information.)

Davy McKee Corporation - Senior Supervising Engineer

Head of the sulfur-sulfuric acid process design group. Involved in the study, proposal, design, start-up and trouble-shooting of sulfur dioxide recovery and sulfuric acid plants around the world. Plants for Asarco, Anaconda, National Lead, Mississippi Chemical, CF Industries, Farmland Industries, Quimbrasil, Copebras, Fertimex, Getty Oil, Stauffer Chemical, Rohm & Haas, Public Service Company of New Mexico, etc. Scrubbing systems included both sodium and ammonia based systems. Sulfuric acid plants included metallurgical (for copper, lead, and zinc smelters), spent acid regeneration, sulfur burning, and recovered SO2 from sodium scrubbing systems.

Olin Corporation - Project Manager

Managed major engineering projects from base at corporate headquarters. Projects included chlorine barge terminal, RF-230 flame retardant polyol for urethanes, Thermolin 101 polyol additive for urethanes, urethane foam blending system, Amine hydrogenation system, and corporate headquarters ventilation system modifications.

Member of urethane business team responsible for planning and implementing research, engineering and marketing for Olins' urethane business.

Stauffer Chemical Company - Senior Process Engineer - Group Leader

Responsible for process design for various major engineering projects from base at Dobbs Ferry, New York engineering center. Projects included Claus Plants, Spent Acid Regeneration Sulfuric Acid Plants, Silicone Monomer, Vinyl Chloride Monomer, PVC, Perchlorethylene/Carbon Tetrachloride, Chlorinated Methanes, Chlorine/Caustic, Elemental Phosphorous, Sodium Tripolyphosphate, Trimethyl/Triethyl Phosphite, Imidan, Sutan, Hippuric Acid, Sodium Phenoxyacetate, Phosphorous Trichloride, Phosphorous Oxychloride, Phosgene, Carbon Monoxide, Methyl/Ethyl Parathion, Carbon Disulfide, Carbon Tetrachloride (CS2-Cl), Metal Chlorides, etc.

Nuclear Fuel Services Inc. - Nuclear Engineer

Nuclear engineer in power reactor fuel reprocessing plant technical group. Assignments included criticality studies, shielding studies and design, nuclear materials accountability manual (contributor), plant safety analysis (contributor), plant check-out and computer modeling, preparation of plant check-out and start-up procedures, operator training, preparation of operating run plans for various fuels, studies for recovery of Neptunium and Americium, and technical support of operations.

Professional Society Affiliation

American Institute of Chemical Engineers (AIChE) - Fellow

The Minerals, Metals, & Materials Society (TMS) of The American Institute of Mining, Metallurgical, & Petroleum Engineers (AIME) - Member

SULFURIC ACID & SO2 RELATED

TECHNICAL PAPERS BY L. J. FRIEDMAN

1. "Incidents in Sulfuric Acid Plants - What Can We Learn?" Eleventh Annual Regional Phosphate Conference (AIME, AIChE, FIPR), Lakeland, Florida, October 1996.

2. Recent Advances in the Design and Operation of Spent Acid Regeneration Sulfuric Acid Plants. British Sulphur Corporation International Conference "Sulphur 96", Vancouver, British Columbia, Canada, October 1996. Published in the Conference Proceedings.

3. "Smelter Acid - Where Has It Gone?" Tenth Annual Regional Phosphate Conference (AIME, AIChE, FIPR), Lakeland, Florida, October 1995.

4. Sulfuric Acid Catalyst Comparison. Florida AIChE Spring Symposium, Clearwater, Florida, May 1995. Published in the Symposium Proceedings.

5. Innovation - The Key to Survival of the Sulfuric Acid Industry. British Sulphur Corporation International Conference "Sulphur 94", Tampa, Florida, November 1994. Published in the Conference Proceedings.

6. Innovation in the 1990's and 21st Century - Doing It Right. Ninth Annual Regional Phosphate Conference (AIME, AIChE, FIPR), Lakeland, Florida, October 1994.

7. A Cost Effective - Energy Efficient Process to Produce Sulfuric Acid From High Strength Metallurgical Gas. TMS-AIME National Meeting, San Francisco, March 1994.

8. Analysis of Recent Advances in Smelter Gas Cleaning Systems. TMS-AIME National Meeting, San Diego, March 1992. Published in Smelter Process Gas Handling & Treatment.

9. Formal Hazard and Operability Analysis as Applied to a Modern Sulfuric Acid Plant. AIChE 1991, British Sulphur Corporation International Conference "Sulphur 91", New Orleans, La., November 1991; AIChE National Meeting, New Orleans, April 1992. Published in AIChE Symposium Series, "Advances in Phosphate Fertilizer Manufacture", 1993.

10. Application of BSF Technology CTC3 to a Phosphate Fertilizer Complex. AIChE Spring National Meeting, Orlando, 1990.

11. Operational and Energy Advantages of Single Absorption - Ammonia Scrubbing Compared to Double Absorption. British Sulphur International Conference "Sulphur '90", Cancun, Mexico, 1990. Published in the Conference Proceedings.

12. The Sulfuric Acid Plant - Recent Advances - Review and Analysis. British Sulphur International Conference "Sulphur '89", Wein, Austria, 1989. AIChE 1990. Published in the Conference Proceedings.

13. The Metallurgical Sulfuric Acid Plant - Design, Operating and Material Considerations. Presented at Canadian Institute of Metals Sulfur Dioxide Control Professional Enhancement Seminar, August 1986; National Association of Corrosion Engineers, 1987; British Sulphur International Conference - "Sulphur 87", 1987. Published in the Conference Proceedings.

14. The Royster Power Program - Start-up and Operating Experience. AIChE 1986. Published in the Conference Proceedings.

15. Energy Recovery in Phosphate Fertilizer Manufacture Industry Status - " State of the Art ". British Sulphur International Conference "Sulphur '85", November 1985; AIChE April 1986. Published in the Conference Proceedings.

16. Energy Recovery in Phosphate Fertilizer Manufacture - "State of the Art". AIChE 1985. Published in the Conference Proceedings.

17. The Royster "POWER" Program. AIChE 1984. Published in the Conference Proceedings.

18. Sulfur Dioxide Control System Arrangements for Modern Smelters. TMS-AIME 1983. Published in Advances in Sulfide Smelting 1983.

19. Energy Recovery from Sulfuric Acid Production - A Major Contributor to Phosphate Fertilizer Profits. ACS 1983.

20. SO3 Emission Control - The Problem - Solutions. TMS-AIME 1982. Published in Journal of Metals 1982.

21. Production of Liquid SO2, Sulfur and Sulfuric Acid from High Strength Metallurgical Gas. TMS-AIME 1981; British Sulphur International Sulfuric Acid Conference 1981. Published in Sulfur Dioxide Control in Pyrometallurgy.

22. Analysis of Modern Sodium and Ammonia Based Scrubbing Systems. TMS-AIME 1981. Published in Sulfur Dioxide Control in Pyrometallurgy.

23. Update on Ammonia Scrubbing. AIChE 1981. Published in AIChE Symposium Series & Environmental Progress 1982.

24. Sulfuric Acid - Energy Design for the Eighties. AIChE 1980; AIChE 1981. Published in Chemical Engineering Progress 1982 & AIChE Symposium Series.

25. Evaluation of Sulfur Dioxide Recovery Systems. AIChE 1978. Published in the Conference Proceedings.