STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL AMENDED PERMIT

In the Matter of an
Application for Permit

Mr. Steven J. Susick, General Manager
US Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799
_____/

DEP File No. AC53-260190
PSD-FL-222
Polk County

Enclosed is the FINAL Amended Permit AC53-260190 (PSD-FL-222) to construct a 40.9 TPH prilled monoammonium phosphate plant at the US Agri-Chemicals facility located at 3225 State Road 630 West, Fort Meade, Polk County, Florida 33841. The final amended permit incorporates the Final Best Available Control Technology Determination (BACT) and revisions of permit conditions as a result of events that occurred after the original permit was issued. This permit is issued pursuant to Section 403, F.S.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 14 (fourteen) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 10-16-98 to the person(s) listed:

Mr. Steven J. Susick *
Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. Joe King, Polk County
Mr. John Koogler, K&A
Mr. Bill Thomas, SWD

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 10-16-98 (Date)

Final Determination
US Agri-Chemicals Corp.
Fort Meade, Florida

Prilled Monoammonium Phosphate (MAP) Plant
PSD-FL-222 (AC53-260190)

The Intent to Issue Amended Air Construction Permit for a 60 tons per hour prilled monoammonium phosphate (MAP) plant at US Agri-Chemicals, Inc., 3225 State Road 630 West, Fort Meade, Florida 33841-9799, Polk County, Florida, was distributed on December 23, 1996. The Public Notice of Intent to Issue was published in the Ledger on February 24, 1997. Copies of the Intent to Issue were available for public inspection at the Department's offices in Tallahassee and Tampa.

Prior to and following the publication of the public notice, the Department and the applicant pursued ways to resolve the Department's and the applicant's respective concerns about the change from a control technology-based BACT determination to an emission limit BACT. This occurred because the applicant did not install the control technology specified in the original permit. Subsequently, the applicant filed a petition for an administrative hearing. The issues were finally resolved with the parties agreeing that the production rate for the construction permit will be limited to 110% of the rate at which the plant was tested, i.e., 40.9 tons of product per hour at the same emission limits as were proposed in the Intent to Issue Amended Air Construction Permit.

If the applicant desires to operate the prilled MAP plant above 40.9 tons of product per hour, an application for a permit to modify this construction permit must be submitted followed by proper publication of the notice of the Department's Intent to Issue Amended Air Construction Permit at the higher production rate. Also, a performance test must be conducted at the higher production rate, after providing proper notice to the Department, to demonstrate compliance with the emission limits. The applicant has agreed to install additional control equipment as required if the emission limits are not met at a higher production rate.

The Department does not accept the applicant's claim that, for fluoride removal, a venturi scrubber is equivalent to a packed scrubber. Because the source is no longer a significant emitter of fluorides with respect to PSD, the BACT determination for fluorides is not pursuant to the requirements of Rule 62-212.400, F.A.C. Instead it is pursuant to 62-296.403(1)(i). It will not be used as a precedent for future BACT determinations.

Additional comments received from the applicant dated May 7, 1998, have been incorporated into the permit as appropriate. The Department's final action will be to issue the Amended Construction Permit as indicated in this Final Determination.

Z 333 612 482

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US Agri Chemicals
3225 State Rd - 630 West
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Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

PERMITTEE:
US Agri-Chemicals Corp.
3225 State Road 630 West
Fort Meade, FL 33841-9799

Permit Number: AC 53-260190
PSD-FL-222
Expiration Date: Dec. 30, 1998
County: Polk
Latitude/Longitude: 27°44'25"N
81°51'05"W
Project: 40.9 TPH Prilled MAP Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, 212, 272, 275, 276, and 297, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the emission unit shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department of Environmental Protection (Department) and specifically described as follows:

For the construction of a 40.9 TPH Prilled MAP Plant. The facility is located at 3225 State Road 630 West, Fort Meade, Polk County, Florida. The UTM coordinates are Zone 17: 416 km East and 3,069 km North.

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

Attachments are listed below:

1. DEP's letter dated November 23, 1994
2. USDOI's letter dated December 15, 1994
2. DEP's letter dated February 17, 1995
3. K&A's letter dated March 2, 1995
4. K&A's letter dated March 20, 1995
5. K&A's letter dated March 29, 1995
6. K&A's letter dated March 31, 1995
7. USAC's letter dated July 13, 1995
8. USEPA's letter dated August 7, 1995
9. K&A's letter dated August 14, 1995
10. K&A's letter dated September 12, 1995
11. K&A's letter dated June 4, 1996
12. DEP's letter dated July 3, 1996
13. K&A's letter dated October 1, 1996
14. K&A's letter dated February 7, 1997

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 403.161, 403.727, or 403.859 through 403.861, F.S. 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 the permit.

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

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

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

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of

GENERAL CONDITIONS:

credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

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

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

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

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

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

GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

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

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT) - attached and made a part of this permit.
(X) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards (NSPS)

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:

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

GENERAL CONDITIONS:

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

SPECIFIC CONDITIONS:

1. Unless otherwise indicated, the construction and operation of the subject Prilled MAP production facility shall be in accordance with the capacities and specifications stated in the application. [Rule 62-210.300, F.A.C.]

2. The production rate of the Prilled MAP plant shall not exceed 40.9 tons MAP product per hour, except as allowed by Specific Condition No. 7 below. [Rule 62-210.200, F.A.C.]

3. The Prilled MAP plant may operate up to 8760 hours per year. [Rule 62-210.200, F.A.C.]

4. Visible emissions from the Prilled MAP plant loadout baghouse shall not exceed 5% opacity. [Rules 62-296.320 and 62-212.400, F.A.C.]

5. The following emission limits shall apply to the scrubber stack: PM/PM10: 0.4 lb/ton MAP, 16.4 lb/hr and 71.7 tons/yr (based on 40.9 tons/hr MAP); Total Fluorides: 0.019 lb/ton P2O5 input, 0.39 lb/hr and 1.7 tons/yr (based on 20.5 tons/hr P2O5). Visible Emissions: 15% opacity. [Rules 62-296.403 and 62-212.400, F.A.C.]

6. Annual compliance tests for total fluorides, PM/PM10 and visible emissions shall be conducted on the scrubber stack. The product loadout baghouse shall be tested annually for visible emissions only. For the duration of all tests the emission unit shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90 percent of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.310, F.A.C.]

SPECIFIC CONDITIONS:

7. In order to regain the originally intended plant capacity of 60 tons MAP product per hour, the permittee may conduct a performance test at a rate higher than 40.9 tons MAP product per hour and up to 60 tons MAP product per hour by notifying the Department at least 15 days in advance of the special test. The plant may be operated at the higher rate for only seven consecutive days and then must resume operation at no higher than 40.9 tons MAP product per hour. In the process of regaining the originally intended capacity of 60 tons MAP product per hour, the permittee shall not be required to undergo another PSD review and BACT determination for PM/PM10 under Rule 62-212.400, F.A.C. or another BACT review for fluorides under Rule 62-296.403, F.A.C., unless the permittee submits an application to increase the plant's maximum operating capacity above 60 tons MAP product per hour. [Rules 62-212.400, 62-296.403, 62-297.310, F.A.C. and agreement of April 2, 1998]

8. The Department's Bureau of Air Regulation Office in Tallahassee and the Southwest District office shall be notified in writing at least 15 days prior to any emission test. [Rule 62-297.310, F.A.C.]

9. The test procedures for fluorides shall be in accordance with EPA Reference Methods 1, 2, 3, and 13A or 13B, as published in 40 CFR 60, Appendix A. The test procedures for PM/PM10 and visible emissions shall be in accordance with EPA Reference Methods 1, 2, 3, 5 and 9, as appropriate, as published in 40 CFR 60, Appendix A. [Rules 62-204.800, F.A.C.]

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

11. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

12. The Prilled MAP plant shall be subject to the following:

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

b. 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 62-210.700, F.A.C.]

SPECIFIC CONDITIONS:

c. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. [Rule 62-210.700, F.A.C.]

d. In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700, F.A.C.]

13. The permittee shall submit an Annual Operating Report using DEP Form 62-210.900(4) to the Department's Southwest District office by March 1 of the following year for the previous year's operation. [Rule 62-210.370, F.A.C.]

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.090, F.A.C.]

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources Management

FINAL REVISED
Best Available Control Technology (BACT) Determination
U.S. Agri-Chemicals Corporation
Fort Meade, Polk County, Florida
PSD-FL-222
AC53-260190

The applicant originally proposed to construct a 60 tons per hour (TPH) prilled monoammonium phosphate (MAP) plant at their phosphate processing facility in Fort Meade. The project as originally proposed will result in a significant increase in emissions of particulate matter (PM/PM_{10}) and fluoride (F). The project was, therefore, subjected to Prevention of Significant Deterioration (PSD) review in accordance with Rule 62-212.400, Florida Administrative Code (F.A.C.). The BACT determination is part of the review required by Rules 62-212.400 and 62-296.403(1)(i), F.A.C.

Date of Receipt of Complete Application: April 4, 1995

BACT Determination Proposed by Applicant:

Emission Limits:	Tower & Cooler	0.0417 lb F/ton P_2O_5 input 0.40 lb PM/PM_{10} per ton MAP
	Product Loadout	0.072 lb PM/PM_{10} per ton MAP
Control Technology:		Medium-energy venturi scrubber using recycled slurry (for tower and cooler) Baghouse (for product loadout)

Revised BACT Determination Procedure:

In accordance with Rule 62-210.200 (Definitions), F.A.C., this revised BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of the emission unit or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achieveable by implementation of such design, equipment, work practice or operation.

In addition, Rule 62-212.400(6)(a), F.A.C., states that in making the BACT determinations (for new or modified emission units subject to PSD) the Department shall give consideration to:

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

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

Original BACT Determined by DEP:

Emission Limits:	Tower and Cooler	Fluoride and PM/PM_{10} limits to be established after performance test
	Product Loadout	No visible emissions

Control Technology:

Options for Tower & Cooler:

Medium-energy venturi primary scrubber with packed secondary scrubber using recirculated gypsum/cooling pond water (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM_{10} over 5 microns)

Medium-to-high-energy venturi scrubber using neutralized water from dedicated scrubber pond with fresh water makeup (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM_{10} over 5 microns)

Other system with equivalent removal efficiencies approved by the Department

Product Loadout: Baghouse as proposed

Original BACT Determination Rationale:

The applicant based their proposed fluoride BACT emission limit of 0.0417 lb F per ton P2O5 on the Department's 1994 BACT determination for IMC-Agrico's granular Diammonium Phosphate plant in Polk County (PSD-FL-204). However, due to the substantial differences in air flow and other process variables that exist between the granulation and prill tower processes, the Department cannot rely on the granulation emissions to accurately predict emissions from the prill process.

PM/PM_{10} emission limits were proposed by the applicant based on a 1980 BACT determination for a prilled MAP plant operated by IMC-Agrico. Since that is the only BACT determination available (15 years old) and technological advances have no doubt been made since 1980, the Department prefers not to rely on it for this new source. This leaves the Department without an adequate basis for arriving at BACT limits for this project prior to construction.

In such cases where relevant data are not available on which to base an enforceable BACT emission limit, the Department can prescribe a design or equipment to satisfy the requirement for the application of BACT and set forth the emissions reductions achievable by implementation of such design or equipment. Such design or equipment should be at least equivalent to those imposed in other BACT determinations for the same industry.

Based on a review of state-of-the-art fluoride scrubber capabilities in the phophate industry, the Department determined that for this application, the control equipment should be capable of achieving at least 99.3% removal of gaseous fluorides and 99.0% (wt.) removal of PM/PM_{10} above 5 microns. The previously described control equipment options were consistent with the system originally proposed by USAC in its application (but subsequently revised).

The prescribed removal efficiency for fluorides is known to be achievable by the technology if calculated on the basis of fluoride entering and leaving via the gas stream compared with the theoretical equilibrium concentration of fluorides between the gas stream and the scrubbing medium. The Department required the applicant to submit scrubber design calculations and drawings to the Department for approval prior to construction to show that the equipment will meet these removal efficiencies.

The Department issued an interim permit to USAC requiring that limits be established following completion of the compliance tests, as long as USAC followed the permit and BACT requirements. USAC accepted the permit and its conditions.

Equipment Installed by Applicant:

Instead of using a venturi scrubber in conjunction with a packed scrubber and pond water or using a venturi scrubber with neutralized water, the company selected a different design. USAC installed a venturi scrubber with high-solids recirculated scrubbing slurry (up to 15% P_2O_5) for product recovery reasons. This hot slurry (122 F.) causes a higher fluoride content in the gas and consequently higher fluoride emissions compared to a packed scrubber with pond water, or the venturi alone with neutralized water from a dedicated pond.

The applicant subsequently submitted engineering calculations claiming that the venturi with its high-solids scrubbing water will provide gaseous fluoride removal equivalent to that of a packed scrubber system using much cleaner water from the cooling pond.

The Department responded by showing that USAC's scrubber would achieve only about half of the 5.3 transfer units claimed. This analysis was based in part on a technical paper that showed about 3.5 mass transfer units (vs. USAC's 5.3) would be the most that could reasonably be expected for a venturi removing fluorides using neutralized pond water.[1]

USAC's design engineers (the Jacobs Engineering Group in Lakeland, Florida) then sent a letter to USAC claiming 6.0 transfer units for their high-solids scrubbing water. This was based on their analysis of data in the above article. These data were obtained using neutralized, clean scrubbing water and not a slurry as the Jacobs design uses.

The Jacobs calculations are incorrect because of two improper assumptions. The extrapolated curve that Jacobs drew on Figure 5 of the article is not relevant for their unneutralized scrubbing water. Secondly, the data in Figure 5 cannot be infinitely extrapolated at constant L/G because the short contact time in the venturi throat prevents the mass transfer from increasing beyond a certain gas velocity.

Attached is an extrapolation performed on Figure 6 which shows the variation of transfer units with the same variables as in Figure 5 but with pressure drop added. As shown, a maximum of 4.0 transfer units is obtained for the conditions specified by Jacobs, again keeping in mind that this is applicable only for neutralized water. The highest actual test result reported was 3.6 NTU with neutralized water, therefore, the Department's 2.7 NTU estimate is reasonable for the high-solids scrubbing slurry Jacobs has proposed.

The limitations on gas/liquid mass transfer in a venturi scrubber result primarily from the short contact time. Because contact time is so short, there is a point beyond which mass transfer will not increase as additional transfer area is created by the smaller liquid drops formed with increased pressure drop. The Department, therefore, rejects the claim that the installed system is equivalent to the prescribed systems in terms of fluoride removal efficiency. This conclusion is butressed by references in the technical literature and the opinions of at least two acknowledged phosphate industry control technology experts.[2,3,4]

Tests from Constructed Plant:

Since the applicant installed a non-approved scrubber design (for enhancing product recovery rather than achieving maximum pollutant removal), the Department proposed a revised permit with a fluoride emission limit of 0.019 lb F/ton P_2O_5, believed to be achievable only by using a relatively clean scrubbing liquid. The revised permit required simultaneous sampling of the scrubber inlet. Tests were conducted by USAC at the plant on December 29, 1997. Fluoride emissions were reported to be 0.0076 lb/ton P_2O_5 while the plant was producing 37.2 tons per hour of MAP or approximately 62 percent of design capacity.[5] Although the revised permit required simultaneous sampling of the inlet with the outlet to establish the efficiency of the control unit, USAC tested only the outlet, citing permit requirements and technical difficulties.

The emissions are substantially less than the limit of 0.0417 lb/ton P_2O_5 requested in the application. However, the tests were conducted well below capacity and during the coldest part of the year which is when flouride emission potential will be at its minimum. It is noteworthy that according to the report, "low ambient temperature and high wind conditions" were also cited as reasons why it was impossible to maintain the test filter box in the specified temperature range required by the EPA Reference Method.

Revised BACT Determination:

Emission Limits:	Tower & Cooler:	0.019 lb F/ton P2O5 input 0.40 lb PM/PM_{10} per ton MAP 15% opacity
	Product Loadout:	No visible emissions

Control Technology:

Options for Tower & Cooler if Fluoride Limits Not Met:

- Venturi primary scrubber using recirculated slurry followed by secondary scrubber using once-through cooling pond water.
- Venturi scrubber using recirculated neutralized water from dedicated scrubber pond to allow proper settling of solids.

Product Loadout: Baghouse as proposed

Revised BACT Determination Rationale:

The emission-based BACT limit was set on the basis of information received from IMC-Agrico after issuance of the original USAC permit. At the emission limits proposed by the Department and at the production rates during the tests conducted by USAC, the process will emit less than 3 tons per year of fluoride. Therefore the project is not subject to PSD Review for this pollutant and is subject to the BACT requirements of Rule 62-296.403(1)(i) and not the BACT requirements of Rule 62-212.400.

Conclusion:

The Department has reasonable assurance that the plant can comply under certain circumstances with the BACT fluoride limit. The main condition is operating under a reduced production rate. Therefore the permit will be re-issued with production limits effectively de-rating the plant. In the future, USAC may request to test at higher production rates and subsequently apply for a modification of the construction permit to increase production based on the results.

USAC will be required to submit test protocols to ensure that tests are conducted in such a manner that the Department will have reasonable assurance that they reasonably represent the highest fluoride evolution potential normally encountered under the design. Installation of one of the Department prescribed technologies would provide immediate assurance, in lieu of tests, that the plant can comply with the emission limits throughout the design production range.

BACT Analysis Details Available From:

John Reynolds, Permit Engineer
A.A. Linero, PE Adminsitrator
New Source Review Section
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road (MS 5505)
Tallahassee, Florida 32399-2400

Recommended by:

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

Approved by:

Howard L. Rhodes, Director
Division of Air Resources Management

REFERENCES

[1] Djioloian, C., and Billaud, D., Rhone-Poulenc-Chemie Minerrale. "Absorbing Fluorine Compounds from Waste Gases." Chemical Engineering Progress, November, 1978.

[2] Pedersen, G.C., Kimre Inc. and Bhattacharajee, P.K., U.S. Agri-Chemical Corp. "Scrubbers with a Level Head." Chemical Engineering, November, 1997.

[3] Letter dated March 3, 1998 from Kimre, G.C., Kimre, Inc. to Linero, A.A., Florida DEP. Scrubbers, specifically for the Phosphate Industry and for other Applications.

[4] Letter dated October 4, 1996 from Teller, A.J., to Reynolds, J.M., Florida DEP. Regarding Fluoride Scrubbing using a Venturi.

[5] Letter dated January 8, 1998 from Brunk, R.L., U.S. Agri-Chemical Corp., to Proses, W., Florida DEP. Regarding Test at MAP Prill Plant.

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasee, FL 32399-2400

Dr. Mr. Reynolds,

It was indicated that a claim for achievement of 5.3 Transfer units was made for a fluoride scrubbing process using a venturi.

It should be noted that the venturi is inherently a particulate collection device and is used only as a scrubber of last resort. The reason is that the mass transfer is limited because of minimal surface renewal. The deficiency can be overcome by decreasing the particle size of the spray and increasing the L/G, provided cost of operation is not restrictive.

Inasmuch as a venturi is generally followed by a cyclone separator, an additional transfer unit can be attained due to wetted wall action.

A comparison of performance of venturi-cyclone systems is attached (Table I). As noted, the rational range of operation will provide in the region of 3.5 transfer units. The 5 transfer unit range can be achieved if the client will accept an energy consumption of 370 HP/10000 CFM.

Sincerely

TABLE I

VENTURI - CYCLONE SEPARATOR PERFORMANCE

SYSTEM	THROAT VEL., FPS	L/G GAL/1000CFM	ΔP in w.g.	HP - GAS + LIQ / 10000 CFM	NTU Transfer UNITS
VENTURI - CYCLONE	140	12	16	45	2.2 - 2.6
VENTURI - CYCLONE	250	12	50	150	3.2 - 4.0
VENTURI - CYCLONE	400	12	130	370	4.2 - 5.2

Compld. By
Ck'd. By
Date
Date

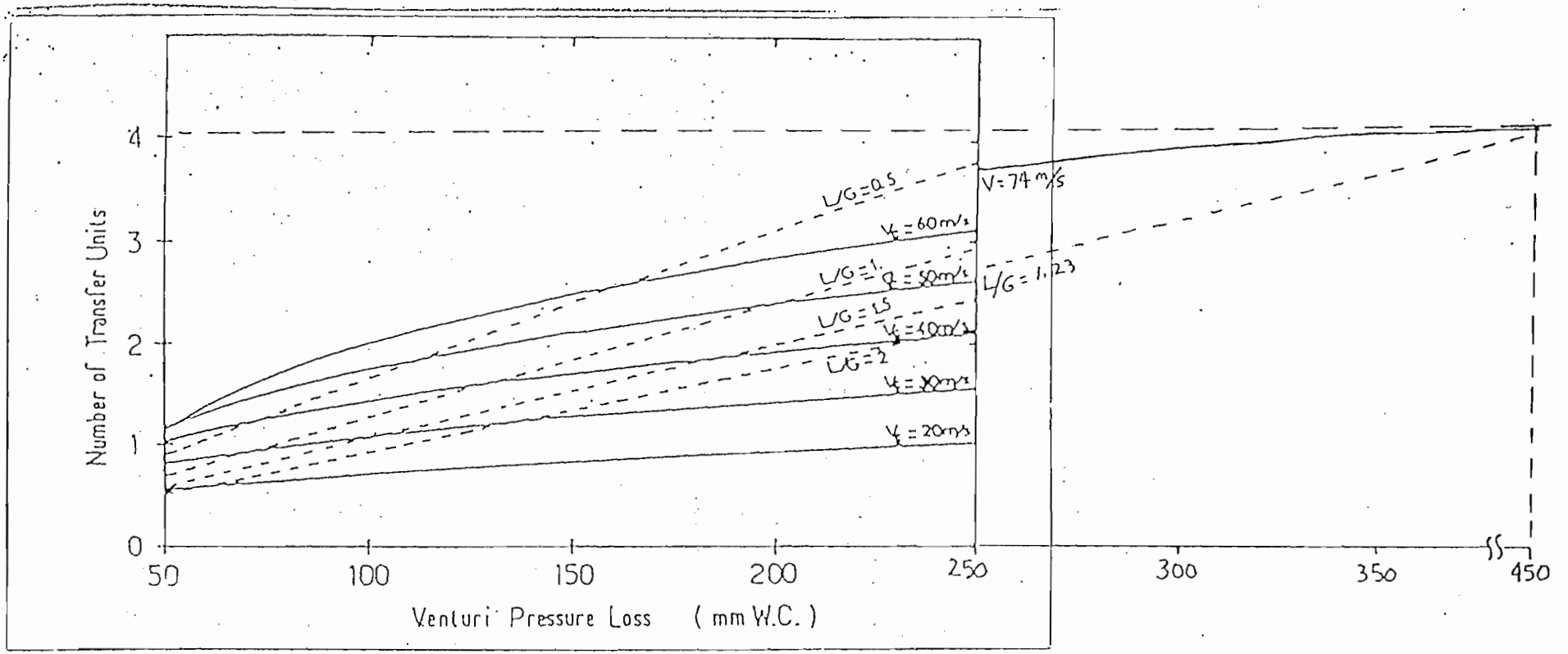

Figure 6. NTU vs. pressure loss. L/G and V_c are taken as parameters. T_{cc} = 60°C and Lv/Dc = 8.5.

Memorandum

Florida Department of
Environmental Protection

TO: Howard L. Rhodes

THROUGH: Clair Fancy
Al Linero

FROM: John Reynolds

DATE: October 13, 1998

SUBJECT: Approval of Final Amended
Construction Permit No. AC53-260190 (PSD-FL-222)
US Agri-Chemicals, Inc.

Approval and signature is requested for issuing the attached final amended construction permit. The facility is a 40.9 tons per hour Monoammonium Phosphate Plant constructed and operated by US Agri-Chemicals, Inc. (USAC) in Fort Meade, Polk County. The permit and BACT determination remain essentially the same as proposed by BAR following our meeting with USAC in April. The delay in issuing the final permit resulted from efforts by USAC to obtain concessions that BAR felt were not appropriate and not agreed to during the April meeting. A letter received from Larry Curtin on September 14 indicates that USAC has decided to accept the permit without further changes. Therefore, it is recommended that the permit be issued at this time.

10/15 Howard
The long struggle with this permit is finally over!
Clair

JR/kt

Attachments

Clair/Howard - Please sign as USAC has seen and will accept the permit based on Holland & Knight's letter of September 15. Don't date BACT. We will apply date on Clerk page when Doug confirms that petition and hearing have been dismissed. He and H&K will do that once they know this has been signed. Al

Law Offices
HOLLAND & KNIGHT LLP

316 South Calhoun Street
Suite 600
P.O. Drawer 810 (ZIP 32302-0810)
Tallahassee, Florida 32301
850-224-7000
FAX 850-224-8832
http://www.hklaw.com

Atlanta, Boca Raton, Fort Lauderdale, Jacksonville, Lakeland, Mexico City, Miami, New York, Northern Virginia, Orlando, San Francisco, St. Petersburg, Tallahassee, Tampa, Washington, D.C., West Palm Beach

September 11, 1998

LAWRENCE N. CURTIN
850-425-5678

VIA FAX

Douglas W. Beason, Esquire
Department of Environmental Protection
2600 BlairStone Road
Twin Towers Office Building, R. 659-E
Tallahassee, Florida 32399-2400

Re: U.S. Agri-Chemicals, Inc. v. Department of Environmental Protection, Case No. 97-4542

Dear Doug:

Based upon our recent telephone conversation, I understand that the changes that we proposed to Specific Condition No. 7 of the draft permit that we received from Clair Fancy and Al Linero have been deemed by the Bureau to be unacceptable. You advised that the rationale for this rejection of our proposed revised language is that the addition is unnecessary.

As I understand the Department's interpretation of the language contained in Specific Condition No. 7, the production rate of the plant may be increased to 60 tons of MAP per hour upon the successful completion of emission testing indicating that the emission rate will be met at that level, and upon processing of an amendment to the current permit. No review of the adequacy of the technology will be performed under those circumstances. Based upon this interpretation, I understand that it has been determined that the language that we proposed does not clarify or add anything to the specific condition.

At the meeting with representatives of the Department, including Howard Rhodes, that occurred earlier this year, we had an understanding that the production rate of the facility could be increased to the originally intended capacity with a minimum review by the Department, assuming that the fluoride emission limit could be met at that level based upon test data. The language that we proposed was an attempt to ensure that this would be the result. Based upon your representations that the language proposed by the

Post-it® Fax Note 7671	Date 9/14	# of pages ▶ 2
To Al Linero	From Heather	
Co./Dept.	Co. OGC	
Phone #	Phone # 1-9678	
Fax # 2-6979	Fax # 921-3000	

Department would achieve that result, we will accept the language in Specific Condition No. 7 as proposed by the Department.

This should conclude the matter and obviate the need for a hearing on November 17. We need to discuss the best way to finalize the permit. Please call me so that we can discuss an appropriate procedure.

Sincerely,

HOLLAND & KNIGHT LLP

Lawrence N. Curtin

LNC/jfg

cc: Mr. Howard Rhodes
Mr. Steven J. Susick
Mr. Ron Brunk

TAL-137939

INTEROFFICE MEMORANDUM

Sensitivity: COMPANY CONFIDENTIAL

Date: 17-Feb-1999 12:21pm
From: John Reynolds TAL
REYNOLDS_J
Dept: Air Resources Management
Tel No: 850/921-9536

To: Gerald Kissel TPA (KISSEL_G @ A1 @ TPA1)
CC: Alvaro Linero TAL (LINERO_A)

Subject: US Agri-Chem's Title V Permit

Just received your note of 2/5/99 asking us to check the language for Condition E.1.b. The condition contains a sentence that was *not* contained in the construction permit that Tallahassee issued, to wit:

"...Upon written approval of the performance test by the Department, which shall include a determination that the plant will be able to meet the limits of conditions E.2, E.3 and E.4, the plant will be authorized to operate at a rate up to and including the rate experienced during the performance test. ..."

The language, "written approval of the performance by the Department" and "a determination that the plant will be able to meet the limits..." and "the plant will be authorized to operate at a rate up to and including..." places additional requirements on the Department and sounds similar to what USAC attempted to get us to put into the permit during the legal negotiations last year. I would advise against including language that was not in the construction permit, as applied to compliance with permit limits. The construction permit requires that USAC notify Tallahassee before the test to regain the former rate. We want to review the results of that test to make certain that USAC meets all of the requirements that were agreed to in the negotiations for the construction permit.

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

November 4, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick, General Manager
U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: Amendment of Construction Permit No. AC53-260190, PSD-FL-222
MAP Prill Plant, - FID No. 1050059

Dear Mr. Susick:

The Department has reviewed your October 27, 1998 letter requesting an extension of the expiration date of the above referenced permit. This request is acceptable and the expiration date is hereby extended from December 30, 1998 to March 31, 1999.

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

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

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

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

Mediation is not available in this proceeding.

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

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

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

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

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

Sincerely,

for Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this AMENDMENT was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-5-98 to the person(s) listed:

Mr. Steven J. Susick, P.E., U.S. Agri-Chemicals*
Mr. Gerald Kissel, SWD
Ms. John B. Koogler, P.E.
Mr. Joe King, Polk County

Clerk Stamp

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

Kyra Toben 11-5-98
(Clerk) (Date)

Z 333 612 491

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

Sent to Steven Susick	
Street & Number US Agri Chem	
Post Office, State, & ZIP Code Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date PSD-FL-222 1050059 11-5-98	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Steven J. Susick, Gen Mgr
US Agri-Chemicals
3225 State Rd 630 West
Ft. Meade, Fl 33841-9799

4a. Article Number 2 333 612 491

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

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5. Received By: *(Print Name)*

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

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

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
813 285 8121

US Agri-Chemicals
A Sinochem Company

October 27, 1998

Mr. A. A. Linero, PE Administrator
New Source Review Section
FDEP, Bureau of Air Regulation
2600 Blair Stone Rd (MS 5505)
Tallahassee, FL 32399-2400

RE: MAP Prill Plant, PSD-FL-222; AC53-260190, ARMS 1050051032

Dear Mr. Linero:

This is to request that the permit expiration date be extended sixty days beyond the current date of 12/30/98. The extension will allow USAC the time necessary to prepare the application to incorporate the MAP plant into the facility Title V Operating Permit.

Please feel free to contact Mr. Ronald L. Brunk at (941) 285-7123, extension 279, if you have any questions.

Sincerely,

Steven J. Susick, P.E., General Manager
Engineering & Technical Services

xc: J. Kissel, DEP SWD
P. Hartbarger
S. Susick
D. Nettles
J. Koogler

TO: File (U.S.Agri-Chemicals, Inc. - 1050059-024-AC/PSD-FL-222)

FROM: A.A. Linero

DATE: July 13, 1998

A proposed final determination dated April 28, 1998 along with a revised BACT determination and permit was provided to the applicant for review. A letter from the applicant dated May 7 was received by the Department. It contained a number of comments which are summarized below and followed by the Department's responses.

1. *The applicant objected to the Department's representation of the BACT process and asserted that in several areas the language is adversarial, objectionable and incorrect.*

   The Department disagrees with this comment. The specific points are discussed below.

2. *The applicant quoted the Department as stating in the April 28, 1998 Draft Final Determination that "this facility will not be used as a precedent for future BACT determinations" and stated that this comment is inconsistent with Federal and State objectives for BACT determinations.*

   The Department's statement was that "It (the BACT) will not be used as a precedent for future BACT determinations." The point is that the BACT determination is now pursuant to a different rule requirement rather than the requirement of the PSD rules. Therefore it does not set a precedent for PSD projects. Further, until the applicant's claimed scrubber performance of 6.0 mass transfer units is confirmed by a fluoride efficiency test, the Department will not consider it as representative of BACT under the PSD rules. The Department's comment has been retained above.

3. *The applicant stated that the facility has demonstrated that its emissions are amongst the lowest in the world with no tangential environmental impacts that would be associated with other emission control proposals and that the plant's emission control equipment is more reliable than other emission control equipment. The applicant concludes that the plant represents an excellent precedent for future BACT determinations.*

   Future BACT determinations will be performed on a case-by-case basis as required by the rules. It is noted that this plant has not demonstrated achievement of the BACT limits at the production rates requested in the application. The scrubber was tested at only 62% of permitted plant capacity while using a 15% P2O5 recirculated slurry designed primarily for recycle of product back to the process. A second stage of scrubbing with a relatively clean scrubbing medium would be required before it could be termed an excellent precedent for future BACT determinations.

4. *The applicant states that the list of attachments to the final BACT determination are unnecessary as attachments to the final permit and requests that they be removed from the permit.*

The attachments are actually the references given in the Department's BACT determination and not in the permit *per se*. Four of the five references are expert opinions or publications addressing the efficacy of venturi scrubbing versus packed scrubbing for removal of gaseous fluorides. It is proper practice to cite references in technology review documents such as a BACT determination. The list of references will continue to be attached to the BACT determination which is an attachment to the permit.

5. *The applicant states that the final determination gives the plant production limit as 40.9 tons of product per hour (TPH) whereas the actual construction permit limits the plant operating rate to 37.2 TPH. The applicant indicates that the higher limit should be shown on the permit cover page and in Specific Condition 2.*

   It was agreed that the production rate during the tests conducted in December of 1997 would represent 90% of the maximum operating rate. That value is 40.9 TPH.

6. *The applicant requested that the agreed-upon procedure for testing and increasing permitted capacity be reflected in an additional permit condition.*

   The Department will add a new Specific Condition 7 and renumber Specific Conditions 8-13 as Specific Conditions 9-14. Normally, a public-noticed permit amendment is required before testing can be performed at a rate higher than 110% of the permitted rate. Since this plant was originally intended to operate at 60 tons per hour, the new condition will allow the plant to operate at levels greater than 40.9 tons per hour for up to 7 days at the higher production rate, for one time only, to conduct the tests. The plant must then resume operation at a rate not higher than the maximum operating rate. The applicant must then apply to the Department to increase the capacity of the plant and submit the appropriate fee per Rule 62-4, F.A.C. The tests must provide reasonable assurance as described in Rule 62-4.070, F.A.C that the plant will comply with the Department's rules. Following public notice, the final Department action will issue an amended permit at the higher rate.

7. *The applicant stated that no mention was made nor reasons given in the BACT determination for imposing the development of unique testing protocols. The applicant stated that the standard testing in the draft permit is sufficient for the source.*

   The intent was to have the applicant simply list the test methods, sampling locations, process parameters to be recorded, etc. This is not a unique requirement but a very common practice to provide reasonable assurance that the proper variables (such as pressure drops) are monitored during testing.

8. *The Applicant reiterated that the Department should insert into the permit the process by which production can be increased and that certain BACT language should be removed.*

   This comment was addressed in responses to previous comments.

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
813 285 8121

US Agri-Chemicals
A Sinochem Company

October 27, 1998

Mr. Bill Proses
Air Compliance Engineer Supervisor
FDEP, Southwest District
3804 Coconut Palm
Tampa, FL 33619-8318

RE: MAP Prill Plant, PSD-FL-222; AC53-260190, ARMS 1050051032

Dear Mr. Proses:

This is to request a waiver of the annual compliance tests specified in the referenced permit specific condition #6. Although USAC received the final amended permit on October 20, 1989, the current business condition indicates that the plant will remain shutdown for the remainder of this fiscal year. USAC will notify your office as soon as possible to schedule the tests if the plant is restarted.

Please feel free to contact me at (941) 285-7123, ext. 279 if you have any questions.

Sincerely,

Ronald L. Brunk, Manager
Environmental Engineering

xc: A. A. Linero, DEP BAR
P. Hartbarger
S. Susick
D. Nettles
J. Koogler

Kim - Copy J.R. ✓
Original to USAC file

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

U.S. AGRI-CHEMICALS, INCORPORATED,

Petitioner,

vs.

OGC CASE NO. 97-0031
DOAH CASE NO. 97-4542

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Respondent.
_____/

ORDER CLOSING FILE

On September 18, 1997, the Florida Department of Environmental Protection (Department) received a petition for administrative hearing from Petitioner, U.S. Agri-Chemicals, Incorporated. The petition challenged the Department's Intent to Issue Amended Air Construction Permit No. AC53-260190 to U.S. Agri-Chemicals, Incorporated, to construct a Prilled Monoammonium Phosphate plant, in Polk County.

On October 12, 1998, after receiving a Motion to Relinquish Jurisdiction, the assigned administrative law judge issued an order closing the file of the Division of Administrative Hearings and relinquishing jurisdiction back to the Department. See Exhibit 1. There being no further matters to consider,

IT IS ORDERED:

The petition having been withdrawn, the Department's file in this matter is closed.

Any party to this order has the right to seek judicial review of the order under section 120.68 of the Florida Statutes by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate

district court of appeal. The notice of appeal must be filed within 30 days from the date this order is filed with the clerk of the Department.

DONE AND ORDERED this 22 day of October, 1998, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

F. PERRY ODOM
General Counsel

Douglas Building
3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, Florida 32399-3000
Telephone: (850) 488-9314

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

Heather Clapman
CLERK

10/27/98
DATE

CERTIFICATE OF SERVICE

I CERTIFY that a true copy of the foregoing was mailed to:

Lawrence N. Curtin, Esq.
HOLLAND & KNIGHT
Post Office Drawer 810
Tallahassee, FL 32302-0810

on this 27th day of October, 1998.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

W. DOUGLAS BEASON
Assistant General Counsel

3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, Florida 32399-3000
Telephone: (850) 488-9314

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

U.S. AGRI-CHEMICALS, INCORPORATED, Petitioner, vs. DEPARTMENT OF ENVIRONMENTAL PROTECTION, Respondent.	)	Case No. 97-4542

ORDER CLOSING FILE AND
RELINQUISHING JURISDICTION

Upon consideration of the Motion to Relinquish Jurisdiction, it is

ORDERED that the hearing scheduled for November 17, 1998, is cancelled, the file of the Division of Administrative Hearings, is closed, and jurisdiction is relinquished to Respondent for appropriate action.

DONE AND ORDERED this 12th day of October, 1998, in Tallahassee, Leon County, Florida.

William R. Cave

WILLIAM R. CAVE
Administrative Law Judge
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-3060
(850) 488-9675 SUNCOM 278-9675
Fax Filing (850) 921-6847

Filed with the Clerk of the
Division of Administrative Hearings
this 12th day of October, 1998.

EXHIBIT 1

Law Offices
HOLLAND & KNIGHT LLP

315 South Calhoun Street
Suite 600
P.O. Drawer 810 (ZIP 32302-0810)
Tallahassee, Florida 32301

850-224-7000
FAX 850-224-8832
http://www.hklaw.com

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Tallahassee
Tampa
Washington, D.C.
West Palm Beach

Clair Fancy Howard 9/16

September 11, 1998

LAWRENCE N. CURTIN
850-425-5678

VIA FAX

Douglas W. Beason, Esquire
Department of Environmental Protection
2600 BlairStone Road
Twin Towers Office Building, R. 659-E
Tallahassee, Florida 32399-2400

Re: U.S. Agri-Chemicals, Inc. v. Department of Environmental Protection, Case No. 97-4542

Dear Doug:

Based upon our recent telephone conversation, I understand that the changes that we proposed to Specific Condition No. 7 of the draft permit that we received from Clair Fancy and Al Linero have been deemed by the Bureau to be unacceptable. You advised that the rationale for this rejection of our proposed revised language is that the addition is unnecessary.

As I understand the Department's interpretation of the language contained in Specific Condition No. 7, the production rate of the plant may be increased to 60 tons of MAP per hour upon the successful completion of emission testing indicating that the emission rate will be met at that level, and upon processing of an amendment to the current permit. No review of the adequacy of the technology will be performed under those circumstances. Based upon this interpretation, I understand that it has been determined that the language that we proposed does not clarify or add anything to the specific condition.

At the meeting with representatives of the Department, including Howard Rhodes, that occurred earlier this year, we had an understanding that the production rate of the facility could be increased to the originally intended capacity with a minimum review by the Department, assuming that the fluoride emission limit could be met at that level based upon test data. The language that we proposed was an attempt to ensure that this would be the result. Based upon your representations that the language proposed by the

Department would achieve that result, we will accept the language in Specific Condition No. 7 as proposed by the Department.

This should conclude the matter and obviate the need for a hearing on November 17. We need to discuss the best way to finalize the permit. Please call me so that we can discuss an appropriate procedure.

Sincerely,

HOLLAND & KNIGHT LLP

Lawrence N. Curtin

LNC/jfg

cc: Mr. Howard Rhodes
Mr. Steven J. Susick
Mr. Ron Brunk

TAL-137939

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 11, 1998

Mr. David A. Ludder, General Counsel
Legal Environmental Assistance Foundation
1114-E Thomasville Road
Tallahassee, Florida 32303-6290

Re: Public Records Request
U. S. Agrichem Monoammonium Phosphate Plant

Dear Mr. Ludder:

Enclosed are the following documents in response to your request:

1. Construction Permit AC53-260190 (PSD-FL-222) dated September 29, 1995.
2. Draft Intent to Issue Amended Construction Permit (and associated documents) dated December 23, 1996.
3. Comments from U. S. Agrichem's consultant, Koogler and Associates dated February 7, 1997.
4. Proposed Amended Permit sent to U. S. Agrichem on July 28, 1998.

There are numerous documents related to control technology but none that appear to match your specifications. You may prefer to review the files yourself and request copies of documents at our standard cost per copy. Alternatively, we can copy all related documents and send them to you, again at the standard rate. The related documents comprise a couple hundred pages. Please contact Ms. Kim Tober or Mr. Clay Whitfield at 488-0114 who can help you further.

Sincerely,

9/11

A. A. Linero, Administrator
New Source Review Section

AAL/aal

Enclosures

cc: Kim Tober w/o encl.
Clay Whitfield w/o encl.
Doug Beason w/o encl.

LEAF
LEGAL ENVIRONMENTAL ASSISTANCE FOUNDATION

September 9, 1998

Mr. Al Linero, Administrator
New Source Review Section
Bureau of Air Regulation
Division of Air Resources Management
Florida Department of Environmental Protection
Mail Station 5505
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Linero

Re: **U.S. Agri-Chemicals Corporation, Prilled Monoammonium Phosphate Plant, Fort Meade, Florida**

Dear Mr. Linero:

Pursuant to § 119.07, Fla. Stat. (1997), the Legal Environmental Assistance Foundation, Inc. requests that you provide copies of the following documents:

1. The construction permit (PSD-FL-222 (AC53-260190)) issued to U.S. Agri-Chemicals Corporation on September 29, 1995 for the installation of air pollution control equipment identified in an accompanying Best Available Control Technology Determination.

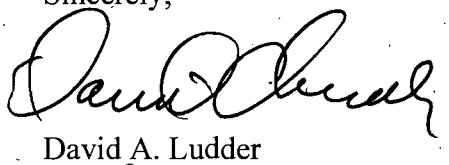
2. Any documents showing that any of the control technologies identified in the Best Available Control Technology Determination dated September 27, 1995 were installed by U.S. Agri-Chemicals Corporation.

3. Any documents showing that any control technology other than that described in the Best Available Control Technology Determination dated September 27, 1995 was installed by U.S. Agri-Chemicals Corporation.

4. Any documents which have established currently effective modifications of the construction permit (PSD-FL-222 (AC53-260190)) issued to U.S. Agri-Chemicals Corporation on September 29, 1995, or otherwise supplanted such permit.

If you have any questions regarding this request, please contact me at the above address or phone number.

Sincerely,



David A. Ludder
General Counsel

Memorandum

Florida Department of
Environmental Protection

TO: Doug Beason, OGC

FROM: Clair H. Fancy, Chief
Bureau of Air Regulation

DATE: August 11, 1998

SUBJECT: U. S. Agrichem Prilled MAP Plant
Final Permit PSD-FL-222
Message From Larry Curtin

Al Linero and I listened to the message from Larry Curtin. We thought you should know that we made a very important clarification in the most recent version. It is that we will not revisit BACT following their testing at full capacity.

They want a system of obtaining an automatic permit modification by just submitting a report to the District who in-turn would immediately give them a permit. They understand now that the application must be sent to our office for review and a fee of $250 submitted. We cannot automatically issue a permit until we review the test results. We believe the method of obtaining a permit modification is well described in our rules. Their recommended language is:

The Department shall modify this permit application to 100% of the rate of a special compliance test (not to exceed 60 tph) upon receipt of an application to modify this construction permit and proof of publication of the Department's Intent to Issue Amended Construction Permit at the higher production rate.

The first problem with this language is that it places a permit requirement on the Department. Recent practice has been to prepare permit with conditions on the applicant and not on the Department. The second problem is that the words "upon receipt' mean different things to different people. We basically would wind up changing their proposed language so much, that all we can say is that the rules adequately address the matter.

Please let Larry Curtin know that he has worked together with the Department on many issues for many years. He knows we will not act arbitrarily and capriciously on this matter. We will give the application immediate attention and will process it promptly and in Good Faith.

We appreciate that you are engaged in some very important cases. We would appreciate it if you could finalize the matter as early as your schedule permits. I do not want to deal with this anymore. Thanks.

AL

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
941 285 8121

US
Agri-Chemicals

A Sinochem Company

August 3, 1998

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

Re: Prilled MAP Plant (PSD-FL-222/AC53-260190) U.S. Agri-Chemicals Incorporated – Ft. Meade, Florida

Dear Clair:

As we discussed please find attached minor language modifications to the latest draft Air Construction Permit for our Prilled Map facility in Ft. Meade, Florida. These minor changes reflect the agreement we reached in our meeting with you, Howard Rhodes, Doug Beason, Al Linero and John Reynolds on April 2, 1998. Upon receipt of a copy of the revised permit, we will forward it to our attorney for his attachment to a stipulation agreement withdrawing our petition for a hearing, thereby concluding the process of obtaining this permit.

We appreciate your efforts and help in bringing this matter to a conclusion. Thanks again.

Sincerely,

Steven J. Susick, P.E., General Manager
Engineering & Technical Services
U.S. Agri-Chemicals Corporation

SJS/kg

cc: John Koogler
Larry Curtin
Doug Beason

h:files\sjs305.doc

cc: J. Reynolds, BAR

PHOSPHATE FEEDS YOU

GENERAL CONDITIONS:

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

SPECIFIC CONDITIONS:

1. Unless otherwise indicated, the construction and operation of the subject Prilled MAP production facility shall be in accordance with the capacities and specifications stated in the application. [Rule 62-210.300, F.A.C.]

2. The production rate of the Prilled MAP plant shall not exceed 40.9 tons MAP product per hour, except as allowed by Specific Condition No. 7 below. [Rule 62-210.200, F.A.C.]

3. The Prilled MAP plant may operate up to 8760 hours per year. [Rule 62-210.200, F.A.C.]

4. Visible emissions from the Prilled MAP plant loadout baghouse shall not exceed 5% opacity. [Rules 62-296.320 and 62-212.400, F.A.C.]

* 5. The following emission limits shall apply to the scrubber stack:

PM/PM10: 0.4 lb/ton MAP [redacted]
Total Fluorides: 0.019 lb/ton P2O5 input [redacted]
Visible Emissions: 15% opacity

[Rules 62-296.403 and 62-212.400, F.A.C.]

6. Annual compliance tests for total fluorides, PM/PM10 and visible emissions shall be conducted on the scrubber stack. The product loadout baghouse shall be tested annually for visible emissions only. For the duration of all tests the emission unit shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90 percent of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.310, F.A.C.]

SPECIFIC CONDITIONS:

SEE ATTACHMENT

7.* In order to regain the originally intended plant capacity of 60 tons MAP product per hour, the permittee may conduct a performance test at a rate higher than 40.9 tons MAP product per hour and up to 60 tons MAP product per hour by notifying the Department at least 15 days in advance of the special test. The plant may be operated at the higher rate for only seven consecutive days and then must resume operation at no higher than 40.9 tons MAP product per hour. [Rule 62-297.310, F.A.C. and agreement of April 2, 1998]

8.* The Department's Bureau of Air Regulation Office in Tallahassee and the Southwest District office shall be notified in writing at least 15 days prior to any emission test. [Rule 62-297.310, F.A.C.]

9. The test procedures for fluorides shall be in accordance with EPA Reference Methods 1, 2, 3, and 13A or 13B, as published in 40 CFR 60, Appendix A. The test procedures for PM/PM10 and visible emissions shall be in accordance with EPA Reference Methods 1, 2, 3, 5 and 9, as appropriate, as published in 40 CFR 60, Appendix A. [Rules 62-204.800, F.A.C.]

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

11. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

12. The Prilled MAP plant shall be subject to the following:

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

b. 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 62-210.700, F.A.C.]

c. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. [Rule 62-210.700, F.A.C.]

7. In order to regain the originally intended plant capacity of 60 tons MAP product per hour, the permittee may conduct a performance test at a rate higher than 40.9 tons MAP product per hour and up to 60 tons MAP product per hour by notifying the Department at least 15 days in advance of the special test. The plant may be operated at the higher rate for only seven consecutive days and then must resume operation at no higher than 40.9 tons MAP product per hour *until this permit has been modified. The Department shall modify this permit to 110% of the rate of a successful special compliance test (not to exceed 60 tph) upon receipt of an application to modify this construction permit and proof of publication of the notice of the Department's Intent to Issue Amended Air Construction Permit at the higher production rate.* In the process of regaining the originally intended capacity of 60 tons MAP product per hour, the permittee shall not be required to undergo another PSD review and BACT determination for PM/PM10 under Rule 62-212.400, FAC or another BACT review for fluorides under Rule 62-296.403, FAC, unless the permittee submits an application to increase the plant's maximum operating capacity above 60 tons MAP product per hour. [Rules 62-212.400, 62-296.403 FAC and agreement of April 2, 1998]

8. The Department's ~~Bureau of Air Regulation Office in Tallahassee and the~~ Southwest District office shall be notified in writing at least 15 days prior to any emission test. *The Department's Bureau of Air Regulation Office in Tallahassee shall be notified in writing at least 15 days prior to any special emission test to increase the permitted operating rate.* [Rule 62-297.310, FAC]

Department of Environmental Protection

DRAFT

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

PERMITTEE:
US Agri-Chemicals Corp.
3225 State Road 630 West
Fort Meade, FL 33841-9799

Permit Number: AC 53-260190
PSD-FL-222
Expiration Date: Dec. 30, 1998
County: Polk
Latitude/Longitude: 27°44'25"N
81°51'05"W
Project: 40.9 TPH Prilled MAP Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, 212, 272, 275, 276, and 297, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the emission unit shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department of Environmental Protection (Department) and specifically described as follows:

For the construction of a 40.9 TPH Prilled MAP Plant. The facility is located at 3225 State Road 630 West, Fort Meade, Polk County, Florida. The UTM coordinates are Zone 17: 416 km East and 3,069 km North.

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

Attachments are listed below:

1. DEP's letter dated November 23, 1994
2. USDOI's letter dated December 15, 1994
2. DEP's letter dated February 17, 1995
3. K&A's letter dated March 2, 1995
4. K&A's letter dated March 20, 1995
5. K&A's letter dated March 29, 1995
6. K&A's letter dated March 31, 1995
7. USAC's letter dated July 13, 1995
8. USEPA's letter dated August 7, 1995
9. K&A's letter dated August 14, 1995
10. K&A's letter dated September 12, 1995
11. K&A's letter dated June 4, 1996
12. DEP's letter dated July 3, 1996
13. K&A's letter dated October 1, 1996
14. K&A's letter dated February 7, 1997

Post-it® Fax Note 7671 | Date 7/28 | # of pages ▶ 7
To S. Susick | From A. Linero
Co. | Co: DEP - Air. Div
Phone # | Phone #
Note: Plz see expanded Condition 7 on pg. 6 -

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 403.161, 403.727, or 403.859 through 403.861, F.S. 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 the permit.

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

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

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

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of

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GENERAL CONDITIONS:

credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

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

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

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

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

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

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GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

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

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT) - attached and made a part of this permit.
(X) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards (NSPS)

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:

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

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GENERAL CONDITIONS:

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

SPECIFIC CONDITIONS:

1. Unless otherwise indicated, the construction and operation of the subject Prilled MAP production facility shall be in accordance with the capacities and specifications stated in the application. [Rule 62-210.300, F.A.C.]

2. The production rate of the Prilled MAP plant shall not exceed 40.9 tons MAP product per hour, except as allowed by Specific Condition No. 7 below. [Rule 62-210.200, F.A.C.]

3. The Prilled MAP plant may operate up to 8760 hours per year. [Rule 62-210.200, F.A.C.]

4. Visible emissions from the Prilled MAP plant loadout baghouse shall not exceed 5% opacity. [Rules 62-296.320 and 62-212.400, F.A.C.]

5. The following emission limits shall apply to the scrubber stack:

PM/PM10:	24.0 lb/hr and 105.12 tons/yr
Total Fluorides:	0.019 lb/ton P2O5 input and 1.70 tons/yr
Visible Emissions:	15% opacity

[Rules 62-296.403 and 62-212.400, F.A.C.]

6. Annual compliance tests for total fluorides, PM/PM10 and visible emissions shall be conducted on the scrubber stack. The product loadout baghouse shall be tested annually for visible emissions only. For the duration of all tests the emission unit shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90 percent of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.310, F.A.C.]

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SPECIFIC CONDITIONS:

7. In order to regain the originally intended plant capacity of 60 tons MAP product per hour, the permittee may conduct a performance test at a rate higher than 40.9 tons MAP product per hour and up to 60 tons MAP product per hour by notifying the Department at least 15 days in advance of the special test. The plant may be operated at the higher rate for only seven consecutive days and then must resume operation at no higher than 40.9 tons MAP product per hour. In the process of regaining the originally intended capacity of 60 tons MAP product per hour, the permittee shall not be required to undergo another PSD review and BACT determination for PM/PM10 under Rule 62-212.400, F.A.C. or another BACT review for fluorides under Rule 62-296.403, F.A.C., unless the permittee submits an application to increase the plant's maximum operating capacity above 60 tons MAP product per hour. [Rules 62-212.400, 62-296.403, 62-297.310, F.A.C. and agreement of April 2, 1998]

8. The Department's Bureau of Air Regulation Office in Tallahassee and the Southwest District office shall be notified in writing at least 15 days prior to any emission test. [Rule 62-297.310, F.A.C.]

9. The test procedures for fluorides shall be in accordance with EPA Reference Methods 1, 2, 3, and 13A or 13B, as published in 40 CFR 60, Appendix A. The test procedures for PM/PM10 and visible emissions shall be in accordance with EPA Reference Methods 1, 2, 3, 5 and 9, as appropriate, as published in 40 CFR 60, Appendix A. [Rules 62-204.800, F.A.C.]

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

11. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

12. The Prilled MAP plant shall be subject to the following:

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

b. 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 62-210.700, F.A.C.]

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SPECIFIC CONDITIONS:

c. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. [Rule 62-210.700, F.A.C.]

d. In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700, F.A.C.]

13. The permittee shall submit an Annual Operating Report using DEP Form 62-210.900(4) to the Department's Southwest District office by March 1 of the following year for the previous year's operation. [Rule 62-210.370, F.A.C.]

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.090, F.A.C.]

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

_____

Howard L. Rhodes, Director
Division of Air Resources Management

DRAFT

Law Offices
HOLLAND & KNIGHT LLP

315 South Calhoun Street
Suite 600
P.O. Drawer 810 (ZIP 32302-0810)
Tallahassee, Florida 32301
850-224-7000
FAX 850-224-8832
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Northern Virginia
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San Francisco
St. Petersburg
Tampa
Washington, D.C.
West Palm Beach

May 8, 1998

LAWRENCE N. CURTIN
850-425-5678

VIA HAND DELIVERY

Douglas W. Beason, Esquire
Department of Environmental Protection
2600 BlairStone Road
Twin Towers Office Building, R. 654-H
Tallahassee, Florida 32399-2400

Re: U.S. Agri-Chemicals, Inc. (PSD-FL-222/AC53-260190)

Dear Doug:

Attached for your information and review is a copy of a letter from Steve Susick to Clair Fancy containing comments on the draft BACT analysis and the redraft of the permit that we received this week. I do not believe that any of these issues are difficult to resolve. In fact, these are matters that were discussed at our meeting in April.

We would appreciate it if you could review the comments and advise us if you see any problems or issues.

Thank you for your cooperation.

Sincerely,

HOLLAND & KNIGHT LLP

Lawrence N. Curtin

LNC/jfg

Attachment

cc: Mr. C. H. Fancy
Mr. Steven J. Susick

TAL-130680

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
941 285 8121

US Agri-Chemicals

A Sinochem Company

May 7, 1998

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

Re: Prilled MAP Plant (PSD-FL-222/AC53-260190) U.S. Agri-Chemicals Incorporated – Ft. Meade, Florida

Dear Mr. Fancy:

We have received and reviewed the draft Final Determination along with the Final Construction Permit and BACT Determination for our Prilled MAP Plant in Ft. Meade, Florida. As a result of our review of these documents we have several comments that we would like you to incorporate into the Final Documents.

First, we would like to continue to register our objection to the Department's representation of the BACT process that both the Department and U.S. Agri-Chemicals has participated in over the past several years. In several areas of the BACT document this language is adversarial, objectionable and incorrect. In particular, we would like the record to reflect that U.S. Agri-Chemicals believes that the Department's comment in the Final Determination that "this facility will not be used as a precedent for future BACT determinations," is inconsistent with what we believe to be both Federal and State objectives for BACT determinations. The BACT process includes an economic analysis as well as overall environmental considerations. We believe the facility at U.S. Agri-Chemicals' Ft. Meade Chemical Complex has demonstrated that its emissions are amongst the lowest in the world with no tangential environmental impacts that would be associated with other emission control proposals. We also believe this plant's emissions control equipment is more reliable than other emission control equipment. We therefore believe that this plant, at its current tested operating rate, represents an excellent precedent for future BACT determinations. In addition, the list of attachments to the Final BACT Determination are unnecessary as attachments to the final permit, and we request that they be removed from the permit.

Our second comment is that while the final determination states that the plant will be allowed 40.9 tons of product per hour, the actual construction permit limits the plant operating capacity to 37.2 tons per hour. We believe the latter number to be an oversight and that the department, in accordance with our agreement in Tallahassee on April 2, should revise the construction capacity for the prilled MAP plant as being 40.9 tons per hour. This revision would appear in three places. First, on page 1 under the

project description, as well as paragraph 2 on this page and Specific Condition #2 of the Permit.

Our next request is that as a result of the permit processing for this facility that it is appropriate to modify Specific Condition #1 to properly reflect the process that occurred relative to this specific permit. We request that the following wording be added: "Any additional plant construction details not previously submitted to the Department will be included in the Title V Supplement submitted for this project".

Finally, as you recall, U. S. Agri-Chemicals and the Department agreed to a specific process by which U.S. Agri-Chemicals would be allowed to increase its permitted capacity for this facility. This process would involve U.S. Agri-Chemicals providing notice to the Department fourteen days in advance of a scheduled emission compliance test which would be conducted in accordance with Specific Condition #8 in the Draft Permit. Following completion of the emission compliance test, U.S. Agri-Chemicals would then be allowed to submit the compliance test data to the Department that would substantiate that the plant is within the emission limits and its permitted operating capacity would be modified appropriately. Additionally, U.S. Agri-Chemicals would be required to publicly notice the revision in the Construction Permit to the higher capacity as a result of this process. Furthermore, no mention was made, nor reasons given, in the BACT Final Determination for imposing the development of unique testing protocols. We agree that the standard testing specified in the draft permit is sufficient for this source.

Again, as we agreed to at our April 2, meeting in Tallahassee the Department was to insert this process as a Specific Condition in the Construction Permit. Therefore, we request that the Department add an additional Specific Condition to the Draft Permit to reflect this process and delete the contrary language in the BACT Final Determination.

If you have any questions to these modifications to the Permit Language please call me at (941) 285-8121, extension 344.

Sincerely,

Steven J. Susick, P.E., General Manager
Engineering & Technical Services
U.S. Agri-Chemicals Corporation

SJS/kg

cc: John Koogler
Larry Curtin
Doug Beason

h:files\sjs299.doc

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 17, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: AC53-260190 (PSD-FL-222)
MAP Plant - Permit Requirements

Dear Mr. Susick:

This is to confirm that a proposal was made through Koogler & Associates to resolve the BACT noncompliance situation that exists with U.S. Agri-Chemicals' venturi scrubber for the MAP prill tower. The Department will require that the prill tower scrubber's cyclonic separator be retrofitted with a Department-approved packed section and be operated at all times with a sufficient countercurrent flow of pond water. If that is done, there will be only one remaining issue for resolution -- that of providing the Department with a written retraction of the venturi/packed scrubber equivalency claim. This claim, if not retracted, could have consequences under Rule 61G15-19.00(4) and (6)(b), F.A.C., impacting the professional engineers who made it.

It would be in the best interests of all concerned if these two issues are resolved in a timely manner. A reasonable deadline for confirming acceptance of the retrofit proposal and to retract the scrubber equivalency claim is May 1, 1998. If you have any questions regarding this letter, please contact me at 850/921-9536 or Doug Beason (Office of General Counsel) at 850/488-9730.

Sincerely,

J. M. Reynolds
Senior Permit Engineer
New Source Review Section

JMR/kt
cc: B. Thomas, SWD
J. Koogler, P.E.
D. Beason, OGC

P 265 659 318

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

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Sent to	Steven Susick
Street & Number	US Agri Chem
Post Office, State, & ZIP Code	Ft Meade FL
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	PSO-FL-222 MAP Plant 3-18-98

PS Form **3800**, April 1995

Is your **RETURN ADDRESS** completed on the reverse side?

SENDER:

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

Consult postmaster for fee.

3. Article Addressed to:
Steven J. Susick, Gen. Mgr.
US Agri Chemicals
3225 State Rd-630 West
Ft. Meade, FL 33841-9799

4a. Article Number
P 265 659 318

4b. Service Type
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Thank you for using Return Receipt Service.

March 3, 1998

Kimre, Inc.
PHASE SEPARATION TECHNOLOGY

RECEIVED
MAR 09 1998
BUREAU OF
AIR REGULATION

Mr. John Reynolds
Florida State of
Dept. of Environmental Protection
Division of Air Resources Management
Bureau of Air Management
News Source Review Section
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Scrubbers, specifically for the Phosphate Industry and for other applications.

Dear Mr. Reynolds:

I really enjoyed having an opportunity to talk with you and Al Linero by phone on the morning of March 2nd. For your background information, I am enclosing our Fertilizer information and a copy of the paper that I gave on Cross-Flow Scrubbers in Germany last June. I do not really know how many scrubbers we have done for the phosphate fertilizer industry, but it is a lot. Current technology is that we make these scrubbers for all fertilizer operations, 100% maintainable from the outside of the vessel, so essentially all maintenance can be done without ever shutting down or going out of compliance.

Under separate cover I am sending a general set of information about Kimre and its technology with a list of papers presented. We are used by most of the scrubber manufacturers in the U.S. , we have done most of the chrome scrubbers in operation in the U.S., and our technology is directly competitive against any other technology for particulate or absorption. It is almost entirely a wet scrubber technology. I am also including a copy of my Curricula Vita for your information.

You had asked about the Venturi's competing with packed scrubbers for fluorine absorption. I will be happy to put it in a separate statement however, in my best professional opinion, Venturi's are not remotely comparable to packed scrubbers for fluorine absorption or any other kind of mass transfer. I would go somewhat further than that and say that we have found that fluorine scrubbers are considerably more complex then simple mass transfer. We design ours with simultaneous heat transfer, mass transfer and mist elimination internally in each stage. We have found that heat transfer is actually the limiting factor and the next limiting factor is mist elimination. Actual normal mass transfer is not even close to being the limiting factor for fluorine removal. This is particularly true when you consider that in some plants the fluorine load from the particulate is enough to have a significant influence. As I mentioned, we are designing scrubbers and guaranteeing emissions of 3 PPM as HF in the stack. These have become fairly sophisticated and are usually done with recycle of the liquid stream so that there is

P.O. Box 571240 Miami, FL 33257-1240 USA • 305-233-4249 • Fax: 305-233-8687

no liquid waste stream, (the normal situation in Florida) and of course, having no liquid waste stream, presents much more stringent requirements.

I mentioned Kimre's technology for Fluorine recovery and our process for Fluorine Recycle. It is feasible, and has been done to capture the fluorine as strong concentrations and recycle it to extinction, so there are basically no appreciable waste streams containing reactive fluorine. This is done routinely on single super Phosphate plants. The concepts are very simple, we are basically treating it like a cross-flow scrubber with multiple stages of liquid flowing counter current against the gas, but with each stage in a semi-cross flow mode. We can recover 18 – 25% FSA while recovering essentially all the fluorine from such streams as:

The Evaporator Steam
The Vacuum Cooler
Reactor
Acid Reactor
Any Phosphate Fertilizer off gas streams
etc.

I would love to meet with you and would like your suggestions as to a suitable time, actual timing can be coordinated with my Secretary Sharon Johnson and a list of some of the times I may be available after the middle of March are attached.

Sincerely,

KIMRE, INC.

George C. Pedersen, P.E.
President

GCP/jlf

Encl. Phosphate Mailing
Cross-Flow Scrubbers
Availability schedule

f: DEP 005
K/GCP/Technical//Phosphate/FSA Scrubbers
K/GCP/Technical/Phosphate/Fluorine Recycle

Department of
Environmental Protection

Lawton Chiles
Governor

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

no green card 7/98
P 339 251 197

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
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Sent to	Steven J Susick
Street & Number	US Agri Chem
Post Office, State, & ZIP Code	Ft. Meade, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	12-9-97

PS Form 3800, April 1995

PSD-Fl-222
MAP Pl. Ext.

December 8, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: AC53-260190 (PSD-FL-222)
MAP Plant - Permit Extension

Dear Mr. Susick:

The Department received your request on September 9, 1997 to extend the referenced permit until December 30, 1998. We have been advised not to act on the requested extension while there is a pending modification of that same permit and which is under challenge by U.S. Agrichem.

If you have any questions regarding this matter please call me at (850)488-1344 or Douglas Beason at (850)488-9730.

Sincerely,

A. A. Linero 12/8

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

AAL/kt

cc: J. Koogler, P.E.
D. Beason, OGC

Post-it® Fax Note 7671	Date 12/8	# of pages ▶ 1
To John Koogler	From A. Linero	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

(John - I forgot to give this to you today!)

FAX MACHINE JOURNAL

Date	Fax Sent to and Location (Fax Number must be included)	# of Pages	Person Sending
12/8/97	TO: Orlando Sentinel FAX #: 312-222-2599	2	gc
12/8	TO: Hillsboro CO FAX #:	9	K
12/8	TO: BOB BAKER FAX #: 352-371-3918	10	C Phillips
12/8	TO: Eve Raceway FAX #: 488-1739	2	BA
	TO: Bill Thomas FAX #: SW	1	Peggy (mgt)
12/8	TO: Art Lyall FAX #: SD (E)	2	VP
12/8	TO: U.S. Agriculture - Steve Sustick FAX #: (941) 285-7088	1	A. Linero
12/8	TO: John Koogler FAX #: (352) 377-7158	1	A. Linero
12-09	TO: Pat Comer FAX #: (850) 487-4938	7	Sandy Knight
12/9	TO: V. GIARRUSSO, FPL FAX #: 561-691-7070	1	J. Kahn
	TO: FAX #:		
	TO: FAX #:		
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DEP/AIR RESOURCES MGMT Fax:904-922-6979

** Transmit Journal **

P.1 Dec 10 '97 9:59

No.	To:	Mode	Start	Time	Page	Code	Result	Note
0012	SWD	NORMAL	8,17:38	0'50"	1	0000	O K	
0013	65426458	NORMAL	8,18:04	0'49"	1	0000	O K	
0014	619412857088	NORMAL	8,18:42	0'35"	1	0000	O K	
0015	613523777158	NORMAL	8,18:44	0'38"	1	0000	O K	
0001	94874938	NORMAL	9, 9:02	4'56"	7	0000	O K	
0002	615616917070	NORMAL	9, 9:41	0'43"	1	0000	O K	
0003	619414996683	NORMAL	9, 9:58	7'43"	13	0000	O K	
0004	619416036335	NORMAL	9,11:01	6'36"	13	0000	O K	
0005	DuvalCounty	NORMAL	9,12:04	2'59"	6	0000	O K	
0006	HillsboroughCty	NORMAL	9,12:12	3'55"	7	0000	O K	
0007	24144	NORMAL	9,12:16	1'31"	2	0000	O K	
0008	619195413513	NORMAL	9,13:48	0'33"	1	0000	O K	
0009	613052283400	NORMAL	9,15:31	2'32"	3	0000	O K	
0010	94881739	NORMAL	9,16:30	3'58"	7	0000	O K	
0011	HillsboroughCty	NORMAL	9,16:35	0'50"	2	0000	O K	
0012	619416036335	NORMAL	9,16:44	3'47"	5	0000	O K	
0001	613052951145	NORMAL	10, 9:06	1'27"	3	0000	O K	
0002	613032972811	NORMAL	10, 9:08	1'35"	3	0000	O K	
0003	615616917070	NORMAL	10, 9:19	5'15"	7	0000	O K	

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
941 285 8121

US
Agri-Chemicals
A Sinochem Company

January 8, 1998

Mr. Bill Proses
Air Compliance Engineer Supervisor
FDEP, Southwest District
3804 Coconut Palm
Tampa, FL 33619-8318

RE: MAP Prill Plant, PSD-FL-222; AC53-260190, ARMS 1050051032

Bcc
Dear ~~Mr. Proses~~:

Enclosed please find report of the initial performance test required by the permit specific condition #6. The test was audited by Mr. Henry Gotsch of the Department SW District and observed by Dr. John Koogler of Koogler & Associates.

Please note that due to low ambient temperature and high wind conditions during the test, the filter box temperature could not be maintained in the range of 248 ± 25° F as specified in 40 CFR 60, App. A, Method 5, paragraph 4.1.5. Dr. Koogler has assured us that this should not affect the accuracy of the fluoride and particulate matter results.

Please feel free to contact me at (941) 285-7123, ext. 279 if you have any questions.

Sincerely,

Ronald L. Brunk, Manager
Environmental Engineering

xc: Clair Fancy, DEP BAR w/summary only
A. A. Linero, DEP BAR w/ enclosure
Eugene/Robert
P. Hartbarger
D. Taylor
S. Susick
D. Nettles

cc: J. Reynolds-BAR
SWD

PHOSPHATE FEEDS YOU

MAP

Summary

This is a report of the initial performance test conducted on 12/29/97 to determine Fluorides and particulate matter emissions from the MAP plant stack. The report also include the visible emissions test on the MAP loadout system on 12/30/97. The results are as follows:

Emissions

Permitted	Actual	
MAP Plant:		
NA	0.14	lbs of fluorides per hour;
NA	0.0076	lbs of fluorides per ton of equivalent P2O5 feed
NA	2.2	lbs of particulates per hour
Loadout system:		
5	0	% opacity

Operating conditions

MAP Plant:	
18.6	Average Feedrate (tons P2O5/hr)
37.2	Average Production rate (tons MAP/hr)

Venturi Scrubbers:		Flow (GPM)	Pressure Drop (" H2O)
	Tower	1145	18
	Cooler	332	14
7.28	Scrubber Liquid pH		
Loadout system:			
149	Railcar loading rate (tons MAP/hr)		
1	Pressure drop, " H2O		

I hereby certify that to the best of my knowledge, all data submitted is true and correct.

Ron Brunk
Environmental Manager

1/13/97
Date

MAP **INTRODUCTION**

U.S. Agri-Chemicals (USAC) constructed a 60 TPH monoammonium phosphate (MAP) plant under the Department permit No. AC53-260190. The plant is located on highway 630, 2 miles west of Ft. Meade.

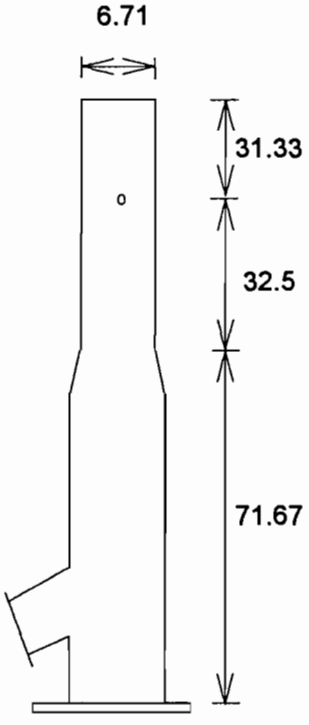
As a condition of the permit, USAC is required to conduct initial performance tests to provide data for setting fluorides (FL), particulate matter (PM), and visible emissions limits on the plant's stack. The required test methods and procedures are EPA 40 CFR, Part 60, methods 1, 2, 4, 5, and 13B. The sampling equipment is manufactured by NAPP, Inc. As authorized by the Department, USAC utilized simultaneous testing for PM and FL with alternative analytical procedure for method 13B. As specified in method 13B, a 50 ml of commercially prepared TISAB solution was added to each 50 ml of sample. A visible emission test on the product loadout baghouse vent is also required to determine compliance status with the 5% opacity standard. The test method and procedures are in accordance with EPA 40 CFR, Part 60, method 9.

PROCESS DESCRIPTION: Phosphoric Acid is reacted with vaporized ammonia in the pipe reactor and sprayed into the top of the tower to produce prill MAP. Ambient air entering the bottom of the tower removes moisture in the prill MAP as they fall by gravity to the bottom of the tower. The gas in the tower is evacuated to a venturi scrubber. The gas in the cooler is evacuated to a smaller venturi scrubber. The gas and liquid from both venturi scrubbers enter a cyclonic separator prior to discharged to the atmosphere via a stack. A portion of the scrubber liquid is used to adjust phosphoric acid concentration. Fresh water and/or cooling pond water is used to maintain scrubber water balance.

A scraper and conveyor system transfers MAP from the tower to a cooler to reduce product temperature. The cooler discharges to a transfer system which carry the MAP to a storage building. From the storage building, prill MAP is loaded into railcars by a loadout system. Dust from the loadout system is controlled by a baghouse.

The stack tests were conducted by Robert Hall and Eugene Williams. The visible emissions test on the loadout baghouse was conducted by Debbie Lovett. The report was prepared by Ronald Brunk and Viet Ta.

Attachment 1 is a diagram of the stack showing test location.
Attachment 2 contains computer printouts showing results calculated from raw data.
Attachment 3 contains raw data.
Attachment 4 is a diagram of the sampling equipment.
Attachment 5 contains equipment calibration results.
Attachment 6 contains the visible emissions observation.



Point #	inches
1	1.69
2	5.39
3	9.50
4	14.25
5	20.13
6	28.66
7	51.84
8	60.38
9	66.25
10	71.00
11	75.11
12	78.81

U.S. Agri-Chemicals Corp.
MAP Plant
Ft. Meade, Florida

Stack Diagram with traverse
point locations
Note: 1. stack dimensions = feet
2. Drawing NOT TO SCALE

Run # 1 Velocity Traverse Data Sheet

29-Dec-97	Date		57	F	Ambient Temperature
MAP	Plant		29.70	" Hg	Pbar = barometric pressure
Ft. Meade	City		02:30	mm:ss	Sample time interval
EW	Operator		0.00	" H2O	Pg = Static stack pressure
1	Filter #		0.9790	n/a	Y = Calibration factor for dry gas meter
0.008	cfm	Leak rate- (before @10" Hg)	6.71	ft	Ds = Stack Diameter
0.008	cfm	Leak rate- (after @ 10" Hg)	0.24	in	Dn = nozzle diameter
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.68	"H2O	Reference dP			

						Gas sample temperatures			Temperature	
Traverse Point	Clock Time	Vaccum	Velocity Head dPs	Orifice Pdrop dH	Gas meter reading dVm	After last impinger	Meter Inlet Tmi	Meter Outlet Tmo	Filter	Stack Ts
	(std)	(" Hg)	(" H2O)	("H2O)	(f3)	(F)	(F)	(F)	(F)	(F)
0	11:23:00				833.90					
1	11:25:30	4.0	0.67	1.85	835.9	48	70	78	210	113
2	11:28:00	7.0	0.82	2.25	838.0	48	70	81	220	113
3	11:30:30	6.3	0.90	2.45	840.2	48	70	83	226	113
4	11:33:00	8.0	0.95	2.60	842.6	48	71	84	229	113
5	11:35:30	8.0	0.95	2.60	845.0	48	71	86	234	113
6	11:38:00	8.0	0.95	2.60	847.3	48	73	86	237	113
7	11:40:30	8.0	0.90	2.45	849.7	48	73	87	240	113
8	11:43:00	8.0	0.92	2.55	852.0	48	73	88	241	113
9	11:45:30	9.0	1.10	3.00	854.5	48	74	89	242	113
10	11:48:00	9.0	1.10	3.00	857.1	50	74	89	240	113
11	11:50:30	9.0	1.10	3.00	859.7	50	75	90	241	113
12	11:53:00	7.0	1.00	2.75	862.4	50	76	91	240	113
0	12:03:00				862.4					
1	12:05:30	4.0	0.78	2.10	864.5	56	77	88	180	115
2	12:08:00	4.7	0.92	2.55	866.8	56	78	91	185	115
3	12:10:30	5.0	1.05	2.90	869.3	56	78	93	190	116
4	12:13:00	5.0	1.00	2.75	871.8	56	78	93	196	116
5	12:15:30	5.0	1.00	2.75	874.2	56	79	94	196	116
6	12:18:00	5.2	1.05	2.90	876.8	56	79	95	196	116
7	12:20:30	8.0	1.05	2.90	879.3	56	79	93	190	116
8	12:23:00	8.2	1.10	3.00	881.8	56	79	93	190	116
9	12:25:30	8.4	1.15	3.15	884.4	56	80	93	185	116
10	12:28:00	8.5	1.15	3.15	887.0	56	80	93	185	116
11	12:30:30	8.5	1.15	3.15	889.7	56	80	93	185	116
12	12:33:00	7.7	1.00	2.75	892.20	56	80	93	180	116
	Sampling Time		Average of square roots	Average orifice Pdrop	Total Gas Volume	Max after last impinger	Average meter temp			Average Stack Temp
	tt		dPave	dH	Vm		Tm			Tsa
	60		0.993	2.71	58.30	56	82.5			114.4

	Moisture content of stack gas		
	Impinger Volume (ml)		Moisture collected (ml)
Impinger	Before	After	Collected
1	626.3	720.1	93.8
2	626.9	627.2	0.3
3	445.5	447.3	1.8
4	700.1	701.7	1.6
Total		Vlc =	97.5

	Total particulate weight (g)			
	Gross	Tare	Factor	Net
Probe wash	98.7114	98.711	10	0.0040
Filter	0.4296	0.4255	n/a	0.0041
Total			Mn =	0.0081

	F (mg/l)
Probe Wash	0.43
Filter	0.13
Impingers	0.22

	Aliquot Calculations		
	Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

Run # 2 Velocity Traverse Data Sheet

29-Dec-97	Date		55	F	Ambient Temperature
MAP	Plant		29.70	" Hg	Pbar = barometric pressure
Ft. Meade	City		02:30	mm:ss	Sample time interval
EW	Operator		0.00	" H2O	Pg = Static stack pressure
2	Filter #		0.9790	n/a	Y = Calibration factor for dry gas meter
0.005	cfm	Leak rate- (before @10" Hg)	6.7083	ft	Ds = Stack Diameter
0.005	cfm	Leak rate- (after @ 10" Hg)	0.24	in	Dn = nozzle diameter
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.68	"H2O	Reference dP			

						Gas sample temperatures			Temperature	
Traverse Point	Clock Time	Vaccum	Velocity Head dPs	Orifice Pdrop dH	Gas meter reading dVm	After last impinger	Meter Inlet Tmi	Meter Outlet Tmo	Filter	Stack Ts
	(std)	(" Hg)	(" H2O)	("H2O)	(f3)	(F)	(F)	(F)	(F)	(F)
0	13:23:00				892.41					
1	13:25:30	6.0	0.77	2.10	894.5	48	78	83	180	116
2	13:28:00	7.0	0.90	2.45	896.8	48	77	87	185	116
3	13:30:30	8.0	1.00	2.75	899.2	48	77	87	185	116
4	13:33:00	8.8	1.10	3.00	901.7	48	77	87	180	116
5	13:35:30	8.8	1.10	3.00	904.2	48	76	88	182	116
6	13:38:00	8.8	1.10	3.00	906.8	48	77	88	178	116
7	13:40:30	9.6	1.20	3.25	909.4	48	77	88	172	116
8	13:43:00	8.8	1.10	3.00	912.1	48	77	88	177	116
9	13:45:30	8.8	1.10	3.00	914.6	48	77	89	179	116
10	13:48:00	8.8	1.10	3.00	917.3	48	78	90	182	116
11	13:50:30	8.3	1.05	2.90	919.8	50	78	90	185	116
12	13:53:00	7.0	0.90	2.45	922.2	50	78	90	188	116
0	14:04:00				922.2					
1	14:06:30	6.2	0.77	2.10	924.3	58	79	86	182	115
2	14:09:00	7.0	0.90	2.45	926.5	58	79	89	190	116
3	14:11:30	7.5	0.95	2.60	928.9	58	79	90	192	116
4	14:14:00	8.0	1.00	2.75	931.3	58	79	90	195	116
5	14:16:30	8.0	1.00	2.75	933.8	58	79	90	195	117
6	14:19:00	7.3	0.90	2.45	936.2	58	79	91	195	117
7	14:21:30	7.3	0.90	2.45	938.6	58	79	91	200	117
8	14:24:00	7.0	0.88	2.40	940.8	58	79	91	205	117
9	14:26:30	9.3	1.20	3.25	943.3	58	79	91	205	117
10	14:29:00	9.2	1.20	3.25	946.0	60	79	89	205	117
11	14:31:30	9.3	1.20	3.25	948.8	60	79	90	210	117
12	14:34:00	8.0	1.00	2.75	951.40	60	79	90	210	117
	Sampling Time		Average of square roots	Average orifice Pdrop	Total Gas Volume	Max after last impinger	Average meter temp			Average Stack Temp
	tt		dPave	dH	Vm		Tm			Tsa
	60		1.005	2.76	58.99	60	93.1			116.3

	Moisture content of stack gas		
	Impinger Volume (ml)		Moisture collected (ml)
Impinger	Before	After	Collected
1	633.8	709.4	75.6
2	635.6	650.8	15.2
3	438.7	440.5	1.8
4	694.3	696.3	2.0
Total		Vlc =	94.6

	Total particulate weight (g)			
	Gross	Tare	Factor	Net
Probe wash	98.8647	98.8642	10	0.0050
Filter	0.4297	0.4255	n/a	0.0042
Total			Mn =	0.0092

	F (mg/l)
Probe Wash	0.22
Filter	0.11
Impinger	0.14

	Aliquot Calculations		
	Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

Run # 3 **Velocity Traverse Data Sheet**

29-Dec-97	Date		53	F	Ambient Temperature
MAP	Plant		29.70	" Hg	Pbar = barometric pressure
Ft. Meade	City		02:30	mm:ss	Sample time interval
EW	Operator		0.00	" H2O	Pg = Static stack pressure
3	Filter #		0.9790	n/a	Y = Calibration factor for dry gas meter
0.006	cfm	Leak rate- (before @10" Hg)	6.7083	ft	Ds = Stack Diameter
0.008	cfm	Leak rate- (after @ 12" Hg)	0.24	in	Dn = nozzle diameter
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.00	"H2O	Pitot leak rate (before)	0.00	" H2O	Pitot leak rate (after)
0.68	"H2O	Reference dP			

						Gas sample temperatures			Temperature	
Traverse Point	Clock Time	Vaccum	Velocity Head dPs	Orifice Pdrop dH	Gas meter reading dVm	After last impinger	Meter Inlet Tmi	Meter Outlet Tmo	Filter	Stack Ts
	(std)	(" Hg)	(" H2O)	("H2O)	(f3)	(F)	(F)	(F)	(F)	(F)
0	15:14:00				951.62					
1	15:16:30	7.5	0.80	2.20	953.7	46	76	84	175	116
2	15:19:00	7.7	0.87	2.40	956.1	46	76	85	175	116
3	15:21:30	6.7	0.95	2.60	958.5	46	75	87	175	116
4	15:24:00	6.8	0.90	2.70	960.7	46	75	87	180	116
5	15:26:30	10.0	1.05	2.90	963.2	46	75	87	183	116
6	15:29:00	10.0	1.05	2.90	965.7	46	75	87	200	116
7	15:31:30	10.0	1.05	2.90	968.2	46	75	88	230	116
8	15:34:00	9.0	1.00	2.75	970.8	46	76	89	215	116
9	15:36:30	9.0	1.00	2.75	973.3	46	76	89	210	116
10	15:39:00	7.0	0.90	2.45	975.7	46	76	91	220	116
11	15:41:30	6.2	0.85	2.30	978.00	48	76	91	225	116
12	15:44:00	6.2	0.85	2.30	980.21	48	77	91	222	116
0	15:53:00				980.21					
1	15:55:30	5.7	0.77	2.10	982.3	54	77	87	180	115
2	15:58:00	6.2	0.90	2.45	984.5	54	77	89	180	115
3	16:00:30	7.0	1.00	2.75	987.0	54	77	89	180	116
4	16:03:00	7.2	1.05	2.90	989.5	54	77	90	180	116
5	16:05:30	7.0	1.00	2.75	992.0	54	77	90	185	116
6	16:08:00	7.0	1.00	2.75	994.5	54	77	91	185	116
7	16:10:30	7.0	1.00	2.75	996.8	54	77	91	185	116
8	16:13:00	9.2	0.97	2.65	999.1	54	77	90	185	116
9	16:15:30	9.2	0.97	2.65	1001.7	54	77	90	180	116
10	16:18:00	7.2	0.97	2.65	1004.1	55	77	90	180	116
11	16:20:30	7.0	0.95	2.60	1006.5	55	77	91	180	116
12	16:23:00	6.2	0.85	2.30	1008.90	55	77	92	180	116

Sampling Time		Average of square roots	Average orifice Pdrop	Total Gas Volume	Max after last impinger	Average meter temp		Average Stack Temp
tt		dPave	dH	Vm		Tm		Tsa
60		0.972	2.60	55.07	55	82.7		115.9

Moisture content of stack gas

	Impinger Volume (ml)		Moisture collected (ml)
Impinger	Before	After	Collected
1	648.0	731.7	83.7
2	660.4	670.4	10.0
3	447.5	448.8	1.3
4	695.8	697.2	1.4
Total		Vlc =	96.4

Total particulate weight (g)

	Gross	Tare	Factor	Net
Probe wash	98.6141	98.6136	10	0.0050
Filter	0.4239	0.4199	n/a	0.0040
Total			Mn =	0.0090

	F (mg/l)
Probe Wash	0.17
Filter	0.11
Impingers	0.13

Aliquot Calculations

	Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

Stack flow calculations

29-Dec-97 Date

MAP Plant

Run #1	Run #2	Run #3		
0.24	0.24	0.24	in	Dn = nozzle diameter
0.0003	0.0003	0.0003	sqf	An = nozzle cross sectional area
6.71	6.71	6.71	ft	Ds = stack diameter
35.34	35.34	35.34	sqf	As = stack cross sectional area
58.30	58.99	55.07	cf	Vm = Dry gas volume (cf)
97.5	94.6	96.4	ml	Vlc = Volume of liquid collected
0.979	0.979	0.979	n/a	Y = Calibration factor for dry gas meter
0.84	0.84	0.84	n/a	Cp = Pitot tube coefficient
0.993	1.005	0.972	" H2O	dPave = average of square roots of velocity heads dP
2.71	2.76	2.60	" H2O	dH = Orifice pressure drop
29.7	29.7	29.7	" Hg	Pbar = barometric (ambient)
0.00	0.00	0.00	" H2O	Pg = Static stack pressure
60.00	60.00	60.00	min	tt = total sampling time
82.5	93.1	82.7	F	Tm = average dry gas meter temperature
114.4	116.3	115.9	F	Tsa = average stack gas temperature
4.59	4.45	4.54	cf	Vwstd = volume water vapor @stp = 0.04707 * Vlc
55.49	55.08	52.39	cf	Vmstd = dry gas volume @stp = 17.64 Vm Y (Pbar + (dH/13.6)/(Tm + 460))
0.076	0.075	0.080	%	Bws = % moisture volume = Vwstd / (Vmstd + Vwstd)
28.16	28.18	28.12	lb/mole	Ms = molecular weight of stack gas dry = Md (1-Bws) + 18 Bws
29.70	29.70	29.70	"Hg	Ps = absolute stack pressure = Pbar + Pg/13.6
59.10	59.87	57.94	f/s	vs = average stack gas velocity
105,621	106,826	102,904	dscf/m	Qsd = Average dry stack flow rate
98.6	96.7	95.5	n/a	I = isokinetic factor
		29.92	" Hg	Pstd = standard pressure
		68	F	Tstd = standard temperature
		29	lb/mole	Md = molecular weight of stack gas dry (lb/lb-mole) == 29

vs = average stack gas velocity = 85.49 * Cp * (dPave) * sqrt((Tsave+ 460)/PsMs)

Qsd = Average dry stack flow rate dry = 60 (1-Bws) *vs*As(Tstd+460) * Ps/ ((Tsa+460) *Pstd)

I = isokinetic factor = 0.0945 * Tsa (R) * Vmstd (cf) / [Ps ("Hg) * vs (f/s) * An (sqf) * tt(min) * (1-Bws)(%)]

Analytical Worksheet

29-Dec-97 Date
MAP Plant

Fluorine content of stack gas

Run 1	Run 2	Run 3	
1,000	1,000	1,000	Vw = Total probe wash after final dilution (ml)
1,000	1,000	1,000	Vf = Total volume of filter wash after final dilution (ml)
1,000	1,000	1,000	Vi = Total volume of impinger wash after final dilution (ml)
0.43	0.22	0.17	Cw = Concentration of fluorine in probe wash (mg/l)
0.13	0.11	0.11	Cf = Concentration of fluorine in filter wash sample (mg/l)
0.22	0.14	0.13	Ci = Concentration of fluorine in impinger wash sample (mg/l)
0.78	0.47	0.41	Ft = Total fluoride recovered (mg) = (Vi * Ci + Vw * Cw + Vf * Cf) / 1,000 (ml/l)
55.49	55.08	52.39	Vmstd = dry gas volume @stp
0.0141	0.0085	0.0078	Cf = Concentration of fluorine in stack gas (mg/dscf) = Ft / Vmstd
0.20	0.12	0.11	Fh = lbs Fl/hr = Cf (mg/dscf) Qsd (dscf/m) 2.205 eex-6(lb/mg) 60 (m/h)
0.0103	0.0065	0.0059	Ft = lbs Fl/ton P2O5 feed = Fh (lbs Fl/hr) / Feedrate (tons P2O5/hr)
		0.141	Fh ave lbs Fl/hr
		0.008	Ft ave lbs Fl/ton P2O5 feed

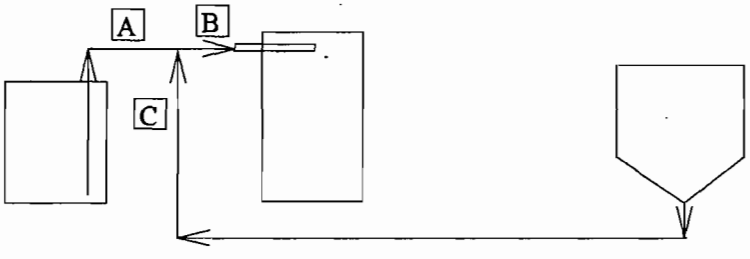
Particulate content of stack gas

Run 1	Run 2	Run 3	
0.0081	0.0092	0.0090	Mn = Mass of particulate matter collected (mg)
55.49	55.08	52.39	Vmstd = dry gas volume @stp
0.00015	0.00017	0.00017	Cp = Particulate concentration (g/dscf) = (0.001 g/mg) (Mn/Vmstd)
105,621	106,826	102,904	Qsd (dscf/m)
2.04	2.36	2.34	Particulates (lb/h) = Cp (g/dscf) 2.205 eex-3 (lb/g) Qsd (dscf/m) 60 (m/h)
0.0535	0.0635	0.0644	Particulates lbs/ton MAP
		2.246	Particulates lbs/hr (ave)
		0.060	Particulates lbs/ton MAP (ave)

29-Dec-97	Date
MAP	Plant

P2O5 feed rate calculation (tons P2O5/hr)

	Start		Stop		Feedrate	Analyses		Feedrate	Production
RUN 1	Time	Totalizer (gallons)	Time	Totalizer (gallons)	(gpm)	Specific Gravity	%P2O5	P2O5 (tph)	MAP (tph)
Reactor	11:19	10,623	12:39	18,789	102.1				
Scrubber	11:19	1,550	12:39	2,636	13.6				
					88.5	1.712	50.33	19.1	38.2
RUN 2									
Reactor	1:17	22,539	2:31	30,128	102.6				
Scrubber	1:17	3,172	2:31	4,384	16.4				
					86.2	1.712	50.33	18.6	37.2
RUN 3									
Reactor	3:11	34,083	4:20	41,107	101.8				
Scrubber	3:11	5,043	4:20	6,257	17.6				
					84.2	1.712	50.33	18.2	36.3
							Average	18.6	37.2



Day Tank Reactor Scrubber

Feed Rate Flow A = Reactor Input Flow B - Scrubber Recycle Flow C
P2O5 input = A * Acid % P2O5 * Acid Sp. Gr.

MAP Plant Operating Data

Date: 12-29-97 Run: 1

Phosphoric Acid Input Rate:

	Start		Stop	
	Time	Totalizer (gallons)	Time	Totalizer (gallons)
Reactor Acid Totalizer reading	11:19	10622.8	12:39	18789
Scrubber liquid Totalizer reading	11:19	1549.7	12:39	2636

Venturi Scrubbers operating data:

	Flow (GPM)	Pressure Drop (" H2O)
Tower	1050	18
Cooler	307	14

MAP Plant Operating Data

Date: 12-29-97 Run: 2

Phosphoric Acid Input Rate:

	Start		Stop	
	Time	Totalizer (gallons)	Time	Totalizer (gallons)
Reactor Acid Totalizer reading	13:17	22539.4	14:31	30128.3
Scrubber liquid Totalizer reading	13:17	3172.4	14:31	4384.4

Venturi Scrubbers operating data:

	Flow (GPM)	Pressure Drop (" H2O)
Tower	1196	18
Cooler	349	14

MAP Plant Operating Data

Date: 12-29-97 Run: 3

Phosphoric Acid Input Rate:

	Start		Stop	
	Time	Totalizer (gallons)	Time	Totalizer (gallons)
Reactor Acid Totalizer reading	15:11	34082.7	16:20	41106.7
Scrubber liquid Totalizer reading	15:11	5042.7	16:20	6257.4

Venturi Scrubbers operating data:

	Flow (GPM)	Pressure Drop (" H2O)
Tower	1189	18
Cooler	340	14

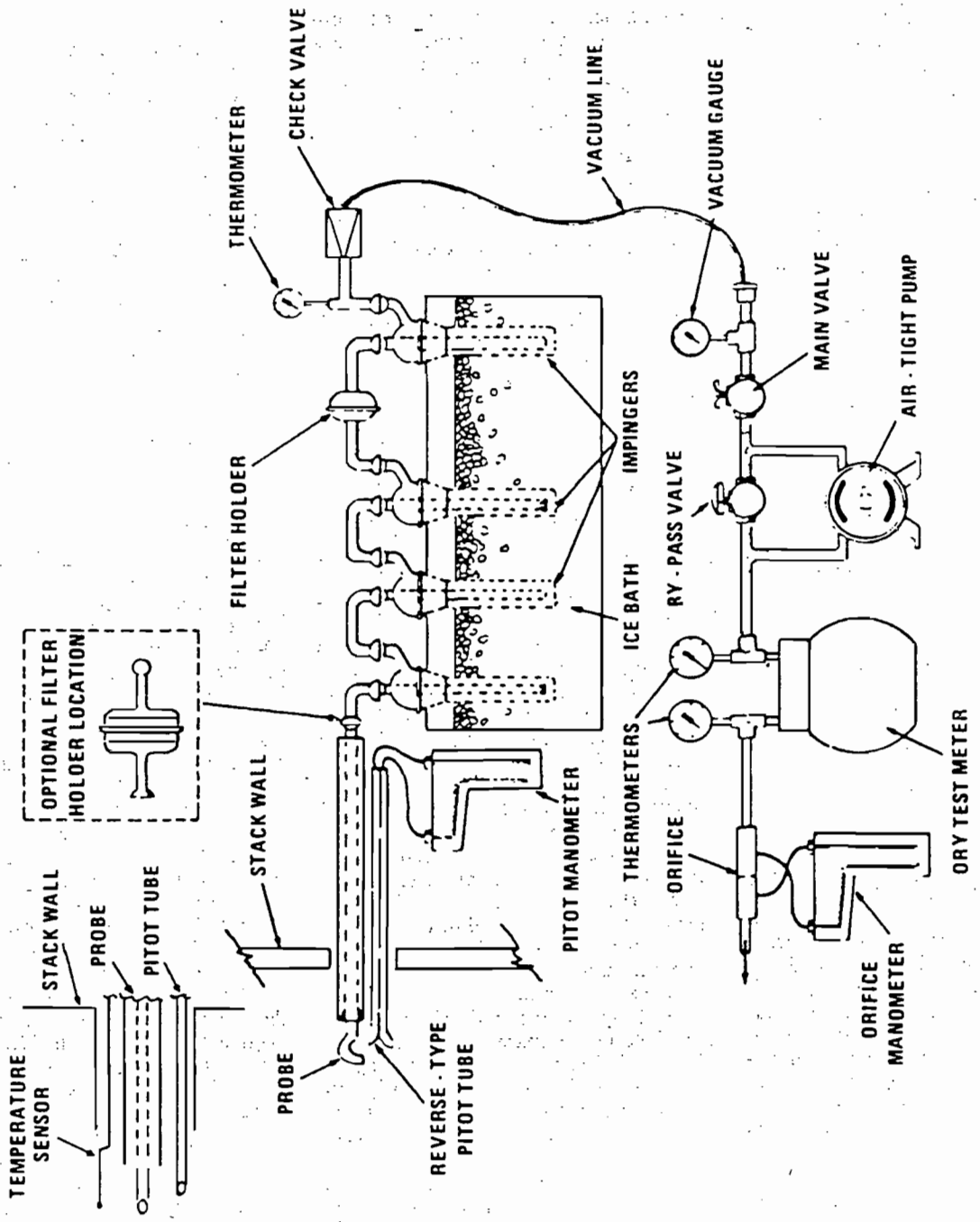


Figure 13A-1. Fluoride sampling train.

[Part 60, Appendix A, Method 13A]

Jan 7, 1998

Viet TA.

Load out Test at MAP on Dec. 30, 1997 is as follows

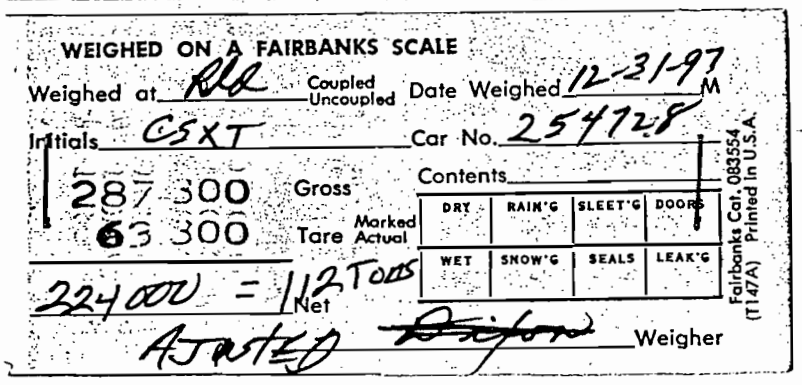
Test 45 min

Tons 112.0

lbs 224000

CAR # CSXT 254728

Paul Hartbarger


WEIGHED ON A FAIRBANKS SCALE

Weighed at RR Coupled Uncoupled Date Weighed 12-31-97 M

Initials CSXT Car No. 254728

287 300 Gross

63 300 Tare Marked Actual

224000 = 112 Net Tons

AJUSTED

Contents

DRY	RAIN'G	SLEET'G	DOORS
WET	SNOW'G	SEALS	LEAK'G

~~Dickson~~ Weigher

Fairbanks Cat. 083554 (T147A) Printed in U.S.A.

Date 10,-7-97
Calib. by Robert E. Hol
FT. Meade

Meter # 31D-639C Bar. 30.05 Pretest Y 98.68
STD Meter # 208 Correction Factor. .9860

	STD Meter FT.3	Test Meter FT 3	STD Meter Temp Inlet	STD Meter Temp Outlet	Test Meter Temp Inlet	Test Meter Temp Outlet	Time	Vac Inc Hg
0.2	294.172	787.239	71	71	85	95	7" 18.4 Sec	
	292.168	785.141	71	71	82	90		0.50 H2O
	2.004	2.098	71	(531)	88	(548)		.037 Hg
0.8	299.178	792.465	71	71	88	105	9.40.4	
	294.172	787.239	71	71	85	97		1.4" H2O
	5.006	5.226	71	(531)	93.8	(553.8)		.10 Hg
1.8	304.304	797.823	71	71	91	108	6.45.2	
	299.178	792.465	71	71	89	105		2.65" H2O
	5.126	5.358	71	(531)	98.5	(585)		.195 Hg
3.4	314.325	808.242	71	71	93	116		
	304.304	797.823	71	71	91	110	9.30	4.85" H2O
	10.021	10.419	71	531	102.5	562.5		.357 Hg
5.0	324.337	818.647	71	71	95	117		
	314.325	808.242	71	71	93	110	7.54	.42" Hg
	10.012	10.405	71	531	103.8	563.8		
8.0	334.367	828.990	71	71	97	118		
	324.337	818.647	71	71	95	114	6.17 Sec	.70 Hg
	10.030	10.343	71	531	106.0	566.0		

$Y = 0.9790$

Date 10-7-97
Calib By RE Hall
FT. Meade

Meter # 318-639C

ΔH inches H2O			
.2	$\frac{2.004\ (30.05 - .037)(548)(.9860)}{2.098\ (30.05 + \frac{.2}{13.6})(531)}$	$= \frac{32,498.596}{33,493.2248}$	$= 0.9703$
.8	$\frac{5.006\ (30.05 - .10)(553.8)(.9860)}{5.226\ (30.05 + \frac{.8}{13.6})(531)}$	$= \frac{81,868.6329}{83\,552.1659}$	$= 0.9799$
1.8	$\frac{5.126\ (30.05 - .195)(558.5)(.986)}{5.358\ (30.05 + \frac{1.8}{13.6})(531)}$	$= \frac{84\,274.4195}{85.871.752}$	$= 0.9814$
3.4	$\frac{10.021\ (30.05 - .357)(5625)(0.986)}{10.419\ (30.05 + \frac{3.4}{13.6})(531)}$	$= \frac{165030.6393}{167634.4167}$	$= 0.9845$
5.0	$\frac{10.012\ (30.05 - .42)(563.8)(0.986)}{10.405\ (30.05 + \frac{5.0}{13.6})(531)}$	$= \frac{164.912.8431}{168059.173}$	$= 0.9813$
8.0	$\frac{10.030\ (30.05 - .70)(566.0)(0.986)}{10.343\ (30.05 + \frac{8.0}{13.6})(531)}$	$= \frac{164286.6919}{168269.2631}$	$= 0.9763$

Total 5.8737

meter Avg Y . 9790

.2 $\dfrac{(0.0317)(0.2)\left[\dfrac{531.0 \times 7.31_{min}}{2.004}\right]^2}{30.05 \times 548}$ 1.4444

.8 $\dfrac{(0.0317)(0.8\left[\dfrac{531.0 \times 9.67}{5.006}\right]^2}{30.05 \times 553.8}$ 1.6033

1.8 $\dfrac{(0.0317)(1.8\left[\dfrac{531 \times 6.753}{5.126}\right]^2}{30.05 \times 558.5}$ 1.6638

3.4 $\dfrac{(0.0317)(3.4\left[\dfrac{531 \times 9.5}{10.021}\right]^2}{30.05 \times 562.5}$ 1.6158

5.0 $\dfrac{0.0317 \times 5.0\left[\dfrac{531 \quad 7.9}{10.012}\right]^2}{30.05 \times 563.8}$ 1.6423

8.0 $\dfrac{0.0317)(8.0\left[\dfrac{531 \quad 6.283}{10.03}\right]^2}{30.05 \times 566}$ 1.6497

9.6193

orfice 1.6032

NOZZLE CALIBRATION

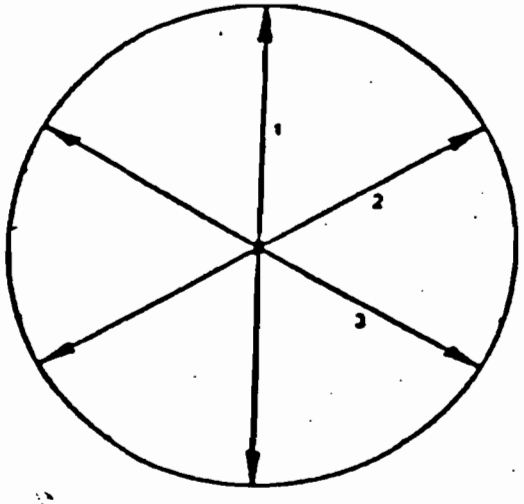
Nozzle 1364 Date 12-29-97

Measurement No.	Inside Diameter (inches)
1	0.240
2	0.240
3	0.240

Average 0.240

Area of Nozzle 0.000314 Ft^2

Calibrated by: Robert E. Hall



Nozzle X-section

Run # 1 Velocity Traverse Data Sheet

12-29-97	Date	
MAP	Plant	
Ft. Meade	City	
EW	Operator	
1	Filter #	
0.008	cfm	Leak rate- (before @10" Hg)
0.008	cfm	Leak rate- (after @ 10" Hg)
0.0	"H2O +	Pitot leak rate (before) 15 SEC.
0.0	"H2O –	Pitot leak rate (before) 15 SEC
0.68	"H2O	Reference dP

57	F	Ambient Temperature
29.70	" Hg	Pbar = barometric pressure
02:30	mm:ss	Sample time interval
0.0	" H2O	Pg = Static stack pressure
0.979	n/a	Y = Calibration factor for dry gas meter
6.71	ft	Ds = Stack Diameter
0.24	in	Dn = nozzle diameter
0.0	" H2O +	Pitot leak rate (after) 15 SEC
0.0	" H2O –	Pitot leak rate (after) 15 SEC

Traverse Point	Clock Time	Vaccum	Velocity Head	Orifice Pdrop	Gas meter reading	Gas sample temperatures: After last impinger	Gas sample temperatures: Meter Inlet	Gas sample temperatures: Meter Outlet	Temperature: Filter	Temperature: Stack
	(std)	(" Hg)	(" H2O)	("H2O)	(f3)	(F)	(F)	(F)	(F)	(F)
0	11:23				833.9					
1	25.5	4.0	.67	1.85	835.9	48	70	78	210	113
2	28	7.0	.82	2.25	838.0	48	70	81	220	113
3	30.5	6.3	.9	2.45	840.2	48	70	83	226	113
4	33.0	8.0	.95	2.6	842.6	48	71	84	229	113
5	35.5	8.0	.95	2.6	845.0	48	71	86	234	113
6	38	8.0	.95	2.6	847.3	48	73	86	237	113
7	40.5	8.0	.9	2.45	849.7	48	73	87	240	113
8	43	8.0	.92	2.55	852.0	48	73	88	241	113
9	45.5	9.0	1.1	3.0	854.5	48	74	89	242	113
10	48	9.0	1.1	3.0	857.1	50	74	89	240	113
11	50.5	9.0	1.1	3.0	859.7	50	75	90	241	113
12	53.0	7.0	1.0	2.75	862.395	50	76	91	240	113
0	12:03				862.395					
1	05.5	4.0	.78	2.1	864.5	56	77	88	180	114
2	08	4.7	.92	2.55	866.8	56	78	91	185	114
3	10.5	5.0	1.05	2.9	869.3	56	78	93	190	116
4	13.0	5.0	1.0	2.75	871.8	56	78	93	196	116
5	15.5	5.0	1.0	2.75	874.2	56	79	94	196	116
6	18.0	5.2	1.05	2.9	876.8	56	79	95	196	116
7	20.5	8.0	1.05	2.9	879.3	56	79	93	190	116
8	23.0	8.2	1.1	3.0	881.8	56	79	93	190	116
9	25.5	8.4	1.15	3.15	884.4	56	80	93	185	116
10	28.0	8.5	1.15	3.15	887.0	56	80	93	185	116
11	30.5	8.5	1.15	3.15	889.7	56	80	93	185	116
12	33.0	7.7	1.0	2.75	892.2	56	80	93	180	116

Moisture content of stack gas

Impinger	Impinger Volume (ml) Before	Impinger Volume (ml) After	Moisture collected (ml) Collected
1	626.3	720.1	
2	626.9	627.2	
3	445.5	447.3	
4	700.1	701.7	
Total		Vlc =	

Total particulate weight (g)

	Gross	Tare	Factor	Net
Probe wash	98.7114	98.7110	10	
Filter	0.4296	0.4255	n/a	
Total			Mn =	

	F (mg/l)
Probe Wash	0.43
Filter	0.13
Impingers	0.22
TOTAL	0.78

Aliquot Calculations

	Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

F-STD

BLK — 0.023

STD — 1.0 — 1.0

" 10.0 — 10.0

SLOPE-57.3

Run # 2 Velocity Traverse Data Sheet

12-29-97	Date		55	F	Ambient Temperature
MAP	Plant		29.7	" Hg	Pbar = barometric pressure
Ft. Meade	City		02:30	mm:ss	Sample time interval
EW	Operator		0.0	" H2O	Pg = Static stack pressure
2	Filter #		0.979	n/a	Y = Calibration factor for dry gas meter
0.005	cfm	Leak rate- (before @10" Hg)	6.71	ft	Ds = Stack Diameter
0.005	cfm	Leak rate- (after @ 10" Hg)	0.24	in	Dn = nozzle diameter
0.0	+ "H2O	Pitot leak rate (before) 15 SEC	0.0	" H2O +	Pitot leak rate (after) 15 SEC
0.0	− "H2O	Pitot leak rate (before) 15 SEC	0.0	" H2O −	Pitot leak rate (after) 15 SEC
0.68	"H2O	Reference dP			

Traverse Point	Clock Time	Vaccum	Velocity Head dPs	Orifice Pdrop dH	Gas meter reading dVm	Gas sample temperatures: After last impinger	Gas sample temperatures: Meter Inlet Tmi	Gas sample temperatures: Meter Outlet Tmo	Temperature: Filter	Temperature: Stack Ts
	(std)	(" Hg)	(" H2O)	("H2O)	(ft3)	(F)	(F)	(F)	(F)	(F)
0	823				892.41					
1	29.5	6.0	.77	2.10	894.5	48	78	83	180	116
2	28.0	7.0	.9	2.45	896.8	48	77	87	185	116
3	30.5	8.0	1.0	2.75	899.2	48	77	87	185	116
4	33.0	8.8	1.1	3.0	901.7	48	77	87	180	116
5	35.5	8.8	1.1	3.0	904.2	48	76	88	182	116
6	38.0	8.8	1.1	3.0	906.8	48	77	88	178	116
7	40.5	9.6	1.2	3.25	909.4	48	77	88	172	116
8	43.0	8.8	1.1	3.0	912.1	48	77	88	177	116
9	45.5	8.8	1.1	3.0	914.6	48	77	89	179	116
10	48	8.8	1.1	3.0	917.3	48	78	90	182	116
11	50.5	8.3	1.05	2.9	919.8	50	78	90	185	116
12	53.0	7.0	.9	2.45	922.2	50	78	90	188	116
0	1404				922.2					
1	06.5	6.2	.77	2.1	924.3	58	79	86	182	115
2	09	7.0	.9	2.45	926.5	58	79	89	190	116
3	11.5	7.5	.95	2.6	928.9	58	79	90	192	116
4	14	8.0	1.0	2.75	931.3	58	79	90	195	116
5	16.5	8.0	1.0	2.75	933.8	58	79	90	195	117
6	19	7.3	.9	2.45	936.2	58	79	91	195	117
7	21.5	7.3	.9	2.45	938.6	58	79	91	200	117
8	24	7.0	.88	2.4	941.8	58	79	91	205	117
9	26.5	9.3	1.2	3.25	943.3	58	79	91	205	117
10	29	9.2	1.2	3.25	946.0	60	79	89	205	117
11	31.5	9.3	1.2	3.25	948.8	60	79	90	210	117
12	34	8.0	1.0	2.75	951.4	60	79	90	210	117

B

Moisture content of stack gas			
	Impinger Volume (ml)		Moisture collected (ml)
Impinger	Before	After	Collected
1	633.8	709.4	
2	635.6	650.8	
3	438.7	440.5	
4	694.3	696.3	
Total		Vlc =	

Total particulate weight (g)				
	Gross	Tare	Factor	Net
Probe wash	98.8647	98.8642	10	
Filter	0.4297	0.4255	n/a	
Total			Mn =	

	F (mg/l)
Probe Wash	0.22
Filter	0.11
Impingers	0.14
TOTAL	0.47

Aliquot Calculations			
	Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

Run #3 Velocity Traverse Data Sheet

12-29-97	Date	
MAP	Plant	
Ft. Meade	City	
FW	Operator	
3	Filter #	
0.006	cfm	Leak rate- (before @10" Hg)
0.008	cfm	Leak rate- (after @ Hg) 12"
0.0	+ "H2O	Pitot leak rate (before) 15 sec
0.0	− "H2O	Pitot leak rate (before) 15 sec
0.68	"H2O	Reference dP

53	F	Ambient Temperature
29.70	" Hg	Pbar = barometric pressure
02:30	mm:ss	Sample time interval
0.6	" H2O	Pg = Static stack pressure
0.979	n/a	Y = Calibration factor for dry gas meter
6.71	ft	Ds = Stack Diameter
0.24	in	Dn = nozzle diameter
0.0	+ " H2O	Pitot leak rate (after) 15 sec
0.0	− " H2O	Pitot leak rate (after) 15 sec

Traverse Point	Clock Time	Vaccum	Velocity Head dPs	Orifice Pdrop dH	Gas meter reading dVm	Gas sample temperatures: After last impinger	Gas sample temperatures: Meter Inlet Tmi	Gas sample temperatures: Meter Outlet Tmo	Temperature: Filter	Temperature: Stack Ts
	(std)	(" Hg)	(" H2O)	("H2O)	(f3)	(F)	(F)	(F)	(F)	(F)
0	1514				951.62					
1	16.5	7.5	.8	2.2	953.7	46	76	84	175	116
2	19	7.7	.87	2.4	956.1	46	76	85	175	116
3	21.5	6.7	.95	2.6	958.5	46	75	87	175	116
4	24	6.8	.9	2.7	960.7	46	75	87	180	116
5	26.5	10.0	1.05	2.9	963.2	46	75	87	183	116
6	29	10.0	1.05	2.9	965.7	46	75	87	200	116
7	31.5	10.0	1.05	2.9	968.2	46	75	88	230	116
8	34	9.0	1.0	2.75	970.8	46	76	89	215	116
9	36.5	9.0	1.0	2.75	973.3	46	76	89	210	116
10	39	7.0	.9	2.45	975.7	46	76	91	220	116
11	41.5	6.2	.85	2.3	978.0	48	76	91	225	116
12	44	6.2	.85	2.3	980.21	48	77	91	222	116
0	1553				980.21					
1	55.5	5.7	.77	2.1	982.3	54	77	87	180	115
2	58	6.2	.9	2.45	984.5	54	77	89	180	115
3	1600.5	7.0	1.0	2.75	987.0	54	77	89	180	116
4	03.0	7.2	1.05	2.9	989.5	54	77	90	180	116
5	05.5	7.0	1.0	2.75	992.0	54	77	90	185	116
6	08.0	7.0	1.0	2.75	994.5	54	77	91	185	116
7	10.5	7.0	1.0	2.75	996.8	54	77	91	185	116
8	13.0	9.2	.97	2.65	999.1	54	77	90	185	116
9	15.5	9.2	.97	2.65	1001.7	54	77	90	180	116
10	18.0	7.2	.97	2.65	1004.1	55	77	90	180	116
11	20.5	7.0	.95	2.6	1006.5	55	77	91	180	116
12	23.0	6.2	.85	2.3	1008.9	55	77	92	180	116

C

Impinger	Moisture content of stack gas: Impinger Volume (ml) Before	After	Moisture collected (ml) Collected
1	648.0	731.7	
2	660.4	670.4	
3	447.5	448.8	
4	695.8	697.2	
Total		Vlc =	

	Total particulate weight (g) Gross	Tare	Factor	Net
Probe wash	98.6441	98.6136	10	
Filter	0.4239	0.4199	n/a	
Total			Mn =	

	F (mg/l)
Probe Wash	0.17
Filter	0.11
Impingers	0.13

TOTAL 0.41

	Aliquot Calculations: Total Wash	Aliquot Dried	Factor
Probewash	1000	100	10

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7156

KA 173-94-04

December 15, 1997

VIA FAX AND U.S. MAIL

Mr. W. C. Thomas
Florida Department of
Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, FL 33619-8318

Subject: U.S. Agri-Chemicals Corporation
Polk County, Florida
Permits AC53-260190/PSD-FL-222
Notification of Compliance Test

Dear Mr. Thomas:

In accordance with Rule 62-297.310(1)(*i*), F.A. C. and Specific Condition No. 7 of the subject permit, the U.S. Agri-Chemicals Corporation (USAC) is providing the Department 15 days written notice of compliance testing to be conducted on the prilled MAP plant covered by the subject permit. The plant is at the USAC fertilizer complex located at 3225 State Road 630 West, Ft. Meade, Florida.

Pursuant to Specific Condition No. 8 of the subject permit, visible emissions observations and emission tests for fluorides and PM/PM10 will be conducted on the MAP plant stack. The visible emissions observations will be conducted in accordance with EPA Method 9, fluoride emission measurements will be conducted in accordance with EPA Methods 1, 2, 3 and 13B and PM/PM10 emission measurements will be conducted in accordance with EPA Method 1, 2, 3 and 5. All methods are published in 40 CFR 60, Appendix A.

The testing is scheduled to be conducted December 30, 1997. The testing will begin at approximately 9:00 a.m. and will continue until completed. It is anticipated

Mr. W. C. Thomas
Florida Department of
Environmental Protection

December 15, 1997
Page 2

that all of the testing can be conducted on December 30, 1997. If you have questions regarding this compliance testing, please contact me or Ron Brunk at USAC. Mr Brunk's phone number is 914-285-8121, Extension 279.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa

c: Mr. Steve Susick, USAC
Mr. Ron Brunk, USAC
Mr. Larry Curtin, Holland & Knight

U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799
941 285 8121

US
Agri-Chemicals

A Sinochem Company

November 19, 1997

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

Re: Resolution of Air Construction Permit No.: AC53-260190(PSD-FL-222)
Prilled/Granular MAP Plant

Dear Mr. Fancy:

As we discussed on the phone this morning, U.S. Agri-Chemicals Corporation, is willing in an effort to conclude the permitting process for it's prilled/granular MAP plant in Ft. Meade, Florida to perform a scrubber inlet sample at the time of the initial performance test for the facility while producing prilled MAP. This is in response to the Florida Department of Environmental Protection's request for inlet testing of both scrubbers and the scrubber stack during the initial performance test of the plant for total fluorides. This request was defined in Specific Condition Number 6 of the Draft Permit which was issued May 22, 1997.

With nearly 80% of the particulate fluoride and almost all of the gaseous fluorides from this plant coming from the prill tower during production of the prilled monoammonium phosphate, U.S. Agri-Chemicals is willing to conduct inlet scrubber sampling at an accessible location along the scrubber inlet duct from the prill tower. This information will be collected one time during the initial performance for this facility while the plant is producing prilled MAP and will be used by the Department for informational purposes only.

An additional change in the permit will be required to reflect the construction of a new granular process at this facility with the expiration date and compliance dates being adjusted to reflect this additional construction. To address these two modifications, U.S. Agri-Chemicals has re-drafted Specific Condition Number 5 and Specific Condition Number 6 which are attached on a separate sheet for your review and use for the re-draft of the final permit for this facility. U.S. Agri-Chemicals understands there will be standard permit language requiring compliance demonstration with particulate matter and fluoride emission limits while the plant is producing granular MAP; but on the scrubber stack only.

PHOSPHATE FEEDS YOU

If you have any questions about these modifications to the permit language, please contact me at (941) 285-8121, Ext. 344.

Sincerely,

Steven J. Susick, General Manager
Engineering and Technical Services
U.S. AGRI-CHEMICALS CORPORATION

SJS/cdd

Enclosure

xc: John Koogler
Larry Curtain

sjs278.doc

Language Modification to May 22, 1997
Air Construction Permit Number AC53-260190(PSD-FL-222)

Granular/Prilled MAP Plant

The following are modifications to previously issued Draft Specific Permit conditions relative to the prilled MAP Plant: In addition to the changes noted below the Draft Permit will also be revised to show combination of granular and prill MAP processes at this facility.

Specific Condition No. 5:

The permittee shall have one (1) year from the time of ~~plant~~ startup of the granulation facility to demonstrate compliance with these limits.

Specific Condition No. 6:

At the same time of the initial performance test for total fluoride emissions from the plants' scrubber stack, the permittee will collect a sample at the inlet to the prill tower scrubber. This initial sample at the prill tower scrubber inlet is a one (1) time only process which will be conducted at an accessible location in the duct between the prill tower and the scrubber. Since the duct between the prill tower and the scrubber inlet was not designed to accommodate sampling ports located as required by EPA method 1, the mass flow rate of total fluoride measured at this location may be of limited validity. Regardless of the quality of the scrubber inlet data, the data will be used by the Department for informational purposes only and will not be used by the Department for any other purposes in the future relative to this permit or this facility. Annual compliance testing for fluorides thereafter, shall be done on the scrubber stack only. PM/PM10 test shall be conducted on the scrubber stack. Visual emission tests shall be conducted on the product loadout baghouse. For the duration for all tests, the emission units shall be operating at permitted capacity. Permitting capacity is defined as 90 to 100% of the maximum operating rate allowed by the permit. If it is impractical to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90% of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110% of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacity is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.340(1)(a), F.A.C.].

> Language to be added by the Department regarding standard annual compliance testing at the scrubber stack only for total fluorides, particulate matter and visible emissions while producing granular MAP.

Finally, the expiration date for this permit should be revised to reflect an expiration date of 12/30/2000 to accommodate the construction of the new granulation facility at this plant.

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

KA 173-94-04

October 27, 1997

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

Subject: U.S. Agri-Chemical Corporation
Polk County, Florida
Permit AC53-260190/PSD-FL-222
Permit Amendment

Dear Mr. Fancy:

The referenced air construction permit was issued to U.S. Agri-Chemical Corporation (USAC) on or about September 29, 1995, for the construction of a 60 ton-per-hour prilled MAP plant. The permit is due to expire on December 30, 1997; however, a letter requesting an extension of this permit to December 30, 1998, was sent to your office on our letterhead dated September 8, 1997. Amendments to this permit are presently being processed.

By this letter, USAC is requesting an additional amendment to the permit that will allow MAP to be produced by the granular process as an alternative method of operation to the prill process currently covered by the subject permit. The granular MAP production system that is proposed to be added to the plant is typical of granular MAP production processes permitted and operating elsewhere in Florida. In addition, USAC is also offering permit conditions that will apply to the operation of the air pollution control system designed for the plant. The details of the granulation process and the conditions offered for the operation of the control system are described in the following paragraphs and in the attached process flow diagram.

To expedite the Department's processing of this request and to bring the permitting process to completion, USAC is willing to accept that when the plant operates in the granular MAP mode, the presently permitted production rate (60 tons per hour) and the presently permitted fluoride and particulate matter limits will apply. The fluoride emissions limit of 0.019 pounds of fluoride per ton of P_2O_5 from the plant while operating in the granular MAP mode will represent, to the best of our knowledge, the most stringent fluoride emission limit applicable to a granular MAP or DAP plant in Florida or elsewhere.

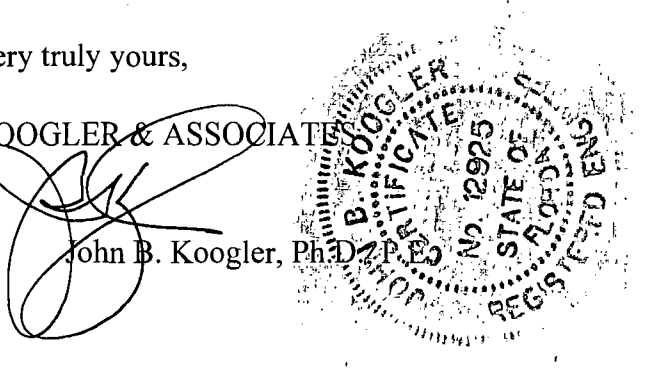
Regarding the fluoride control technology, USAC proposes to upgrade the present control system. The fluoride control system designed for the plant is a medium energy venturi scrubber using neutralized scrubber liquor recirculated through a scrubber water recirculation tank. To assure that the fluoride emission limit is achieved and to provide the Department with a meaningful and recorded scrubber operating parameter that will provide assurance that fluoride emission limits are met on a continuing basis, USAC will agree to pH limits for the recirculated scrubbing liquor. It is proposed that the pH limit be in the range of 6.0-8.5 and be established during initial compliance testing. Since the pH of the scrubbing liquor will be controlled, make-up water can be either fresh water or pond water.

With the addition of pH limits and monitoring as proposed permit conditions, the control technology is fundamentally consistent with the second option suggested by the Department in the BACT determination of the subject air construction permit; i.e., a medium energy venturi scrubber using neutralized scrubbing liquor. The water is recirculated through a scrubber water recirculation tank rather than the "dedicated scrubber pond" as stated in the BACT determination. With the addition of pH control by ammonia to maintain neutralization within the desired range, USAC is confident that the fluoride emission limit of 0.019 pounds per tons of P_2O_5 can be achieved.

We would appreciate your review and comments on this requested amendment and the proposed limits for scrubber operation. Attached please find a $250 check to cover the processing fee for this minor amendment. If additional information is required, please do not hesitate to contact us.

Very truly yours,

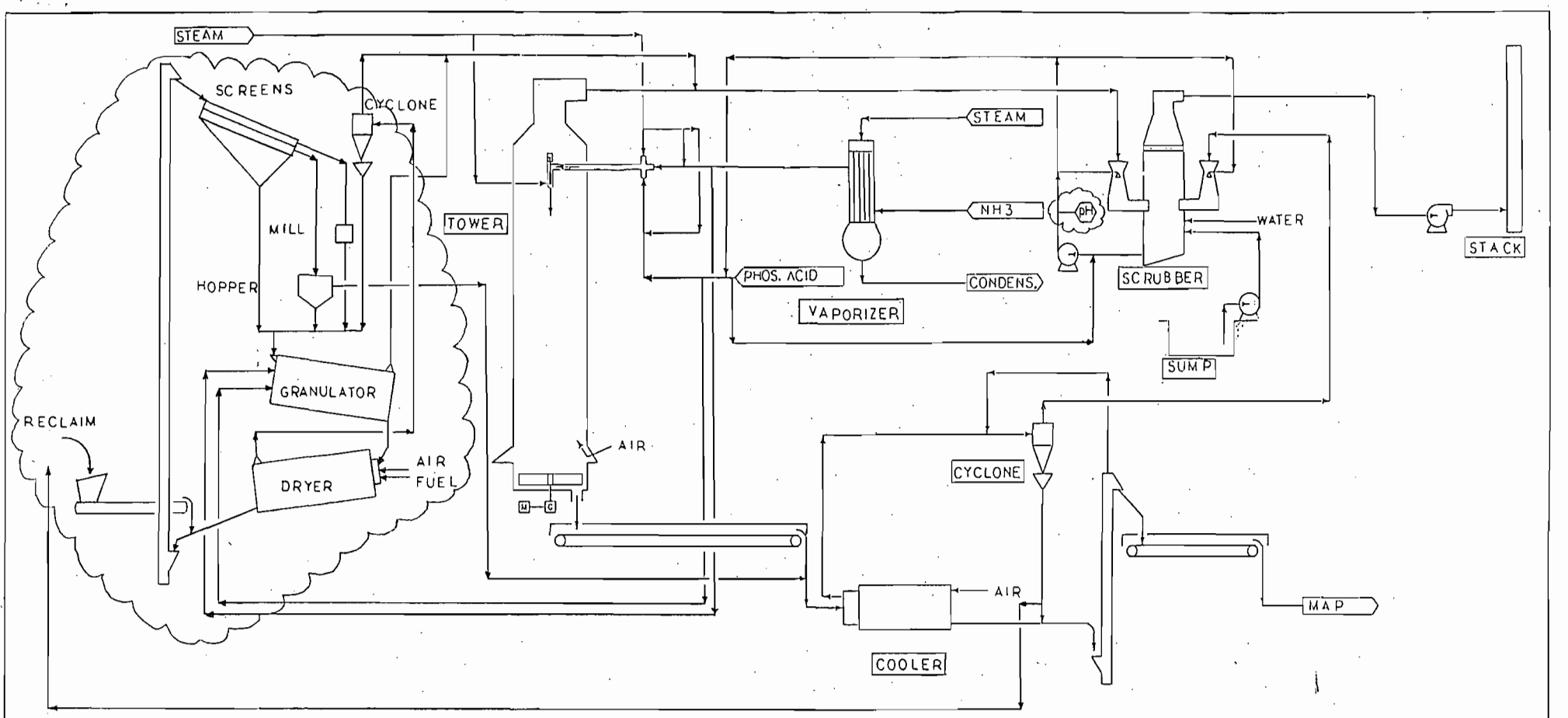
KOOGLER & ASSOCIATES



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

JBK:wa
Enc.

c: Mr. Steve Susick, USAC
Mr. Ron Brunk, USAC
Mr. Viet Ta, USAC
Mr. Larry Curtin, Holland & Knight



USAC MAP PLANT PROCESS FLOW DIAGRAM			
NONE	28-J697-00	KD-001-2	1

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Fax Number ~~(904)~~ (850) 921-3000

FAX COVER SHEET

DATE: 9-24-97

TO: ~~Doug Beason~~ c/o Al Linero **PHONE:** _____ **FAX:** _____

FROM: Headquarters **PHONE:** _____

REGARDING: _____

[ ] This document will be mailed after faxing [ ] This document will not be mailed after faxing

Number of pages including cover sheet: 3

Message _____

Law Offices
HOLLAND & KNIGHT
A Registered Limited Liability Partnership

315 South Calhoun Street
Suite 600
P.O. Drawer 810 (ZIP 32302-0810)
Tallahassee, Florida 32301
850-224-7000
FAX 850-224-8832

Atlanta
Boca Raton
Fort Lauderdale
Jacksonville
Lakeland
Miami
New York
Orlando
San Francisco
St. Petersburg
Tallahassee
Tampa
Washington, D.C.
West Palm Beach

September 11, 1997

LAWRENCE N. CURTIN
850-425-5678

VIA HAND DELIVERY

Douglas W. Beason, Esquire
Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building, R. 654-H
Tallahassee, Florida 32399-2400

Re: Permit No. PSD-FL-222 (AC53-260190)

Dear Doug:

As we discussed, I have enclosed the original Best Available Control Technology recertification for the referenced permit prepared by Dr. John Koogler. Although the document is dated August 22, it was not transmitted to me until this week.

We need to discuss how best to proceed from here. As I understand it, the request for extension of time has been denied and we have been provided a period of time to request an administrative hearing. It is my understanding that this is the direction that we will be taking unless the testing condition is removed from the final permit.

We can discuss this at your convenience. Thank you for your cooperation.

Sincerely,

HOLLAND & KNIGHT LLP

Lawrence N. Curtin

LNC/jfg

Enclosure

TAL-115527

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)
PROFESSIONAL ENGINEERING RE-CERTIFICATION

I, the undersigned Professional Engineer, hereby certify that the PM/PM10, fluoride and V.E. emission limits established by the BACT determination prepared by the Department of Environmental Protection and described in the Intent to Issue dated December 26, 1996, Air Construction Permit Number PSD-FL-222 (AC53-260190), are technically achievable. To the best of my knowledge, there is reasonable assurance that these emission limits can be achieved by the application of sound engineering principles incorporated into the design of the plant and emission control equipment covered by this determination and by the proper operation and maintenance of all components of the affected facility.

Signature

8/22/97
Date

(Seal)

no check enclosed

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

KA 173-94-04

September 8, 1997

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

Subject: U.S. Agri-Chemicals Corporation
Polk County
Permit AC53-260190/PAD-FL-222
Permit Extension

Dear Mr. Fancy:

The referenced air construction permit was issued to the U.S. Agri-Chemicals Corporation (USAC) on or about September 29, 1995 for the construction of a 60 ton-per-hour prilled MAP plant. The permit is due to expire on December 30, 1997.

By this letter, I am requesting on behalf of USAC that the subject permit be extended to December 30, 1998. This extension is requested to provide USAC with the assurance that the plant will continue to be covered by permit while the final details of a modified permit are being worked out by the Department and USAC. I have enclosed a check in the amount of $50 to cover the processing of the requested extension.

If you have any questions regarding this matter, please do not hesitate to contact me. I appreciate your cooperation on this matter.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. S. Susick, USAC
Mr. R. Brunk, USAC
Mr. L. Curtin, Holland & Knight
CC: Al Linero, BAR
John Reynolds, BAR

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

KA 173-94-04

July 24, 1997

RECEIVED
JUL 28 1997
BUREAU OF
AIR REGULATION

VIA FAX AND MAIL

Mr. William Congden, Esq.
Office of General Counsel
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Motion for Extension of Time to
File an Appeal
U.S. Agri-Chemicals Corporation
Polk County, Florida

Dear Mr. Congden:

Attached is a request for an extension of time to file an Appeal in accordance with Rule 62-103.070, F.A.C.

If you have any questions concerning this request, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. Clair Fancy, FDEP, Tallahassee
Mr. A. A. Linero, FDEP, Tallahassee
Mr. Steven Susick, USAC
Mr. Ron Brunk, USAC
Mr. Larry Curtin, Holland & Knight, Tallahassee

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of an Air Permit for

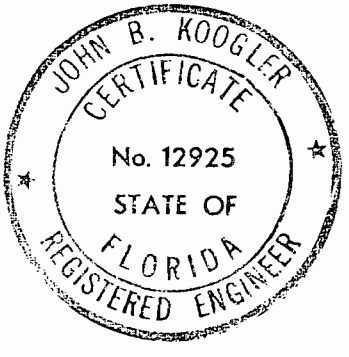
U.S. Agri-Chemicals Corporation
3225 S.R. 630, West
Ft. Meade, Florida 33841-9799

FDEP File No. AC53-260190 (PSD-FL-222)
OGC Case No. 97-0031
Polk County - AP

MOTION FOR EXTENSION OF TIME

The Applicant, U.S. Agri-Chemicals Corporation by and through its undersigned Engineer of Record and pursuant to Rule 62-103.070, F.A.C., requests the Secretary of the Florida Department of Environmental Protection to grant an extension of time until November 1, 1997, in which to file an Appeal. The additional time will allow U.S. Agri-Chemicals Corporation and the Florida Department of Environmental Protection adequate time to resolve disputed permit conditions.

Dated the 24th day of July 1997 in Gainesville, Alachua County, Florida.



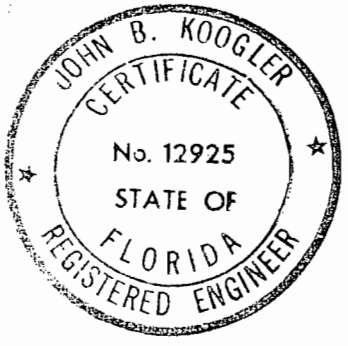
Koogler & Associates
Environmental Services

John B. Koogler, Ph.D., P.E.
Engineer of Record for
U.S. Agri-Chemicals Corporation
Florida Registration No. 12925
4014 N.W. 13th Street
Gainesville, FL 32609
(352) 377-5822

KOOGLER & ASSOCIATES

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing has been furnished to Mr. William Congden, Office of the General Counsel, Mr. Clair Fancy and Mr. A. A. Linero, Florida Department of Environmental Protection, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; Mr. Steven Susick and Mr. Ron Brunk, U.S. Agri-Chemicals Corporation, 3225 S.R. 630 West, Ft. Meade, Florida 33841-9799; and Mr. Larry Curtin, Holland & Knight, P.O. Drawer 810, Tallahassee, Florida 32302, by FAX and by U.S. Mail this 24th day of July 1997.



John B. Koogler, Ph.D., P.E.
Florida Registration No. 12925

KOOGLER & ASSOCIATES

ACE
AIR CONSULTING
& ENGINEERING, INC.

2106 N.W. 67th Place • Suite 4 • Gainesville, Florida • 32653
(352) 335-1889 FAX (352) 335-1891

June 20, 1997

Mr. John Reynolds
Florida Department of Environmental Protection
Bureau of Air Regulation
Mail Station 5505
2600 Blair Stone Road
Tallahassee, Florida 32399

Dear Mr. Reynolds:

Air Consulting and Engineering, Inc. (ACE) is pleased to provide a price quote for conducting Fluoride emissions testing on one outlet exhaust of a phosphate plant in Polk County, Florida.

ACE will provide a two-man team and all equipment necessary to perform testing according to United States Environmental Protection Agency (EPA) Method 13A as stated in the Code of Federal Regulations, Title 40, Part 60 Appendix A.

Charges are based on time and materials per the attached Professional Fee Schedule for a total estimated cost of $2,715.00. A price break-down is included for your review. Should delays occur beyond the control of ACE personnel or equipment (i.e., plant downtime, bad weather conditions, etc.) additional charges may be made. Overtime rates are charged for time beyond 8 hours per day and for all hours on weekend and holidays. All pricing will remain firm for 90 days. Invoicing will be made upon submittal of final report and will be due in 30 days.

Four copies of the final report are included in the price.

Please contact me at with any questions concerning this quote. Thank you for allowing ACE to quote on this valued work.

Respectfully,

AIR CONSULTING AND ENGINEERING, INC.

Dagmar Fick
Mechanical Engineer

Enclosures

DF/cvt

ACE File: 999 97 043

ACE Bid 999-97-043; FEDP BUREAU OF AIR REGULATIONS

Category	Item		No.	Rate	hrs/units	Subtotal	Totals
MOBILIZATION	Environmental Specialist			40		0	
	Sen. Environmental Specialist		2	50	3	300	
	Environmental Engineer			60		0	
	Sen. Engineer/Scientist			80		0	
Post Test Cal.	Environmental Specialist		1	40	1	40	
							340
TRAVEL							
	Environmental Specialist			40		0	
	Sen. Environmental Specialist		2	50	7	700	
	Environmental Engineer			60		0	
	Sen. Engineer/Scientist			80		0	
mileage	Van + Trailer		1	0.75	340	255	
	Van			0.50		0	
per diem	personnell		2	85	1	170	
							1125
TESTING							
	Environmental Specialist			40		0	
	Sen. Environmental Specialist			50	10	0	
	Environmental Engineer			60		0	
	Sen. Engineer/Scientist			80		0	
overtime labor	Environmental Specialist			60		0	
	Sen. Environmental Specialist		2	75	2	300	
	Environmental Engineer			80		0	
							300
EQUIPMENT charges							
	O2 analyzer	(EPA 3A)		50		0	
	CO2 analyzer	(EPA3A)		100		0	
	Dioxin/Furan train	(EPA 23)		100			
	HCL train	(EPA 26)		100			
	Mercury train	(EPA 101,101A)		100		100	
	Multi Metals train	(EPA 29,12)		100			
	PM train	(EPA 4,5,17)		100		0	
	Fluoride train	(EPA 13A)	1	100	1	100	
	SO2 train	(EPA 6,8)		100		0	
	SO2 analyzer	(EPA 6C)		100		0	
	NOx analyzer	(EPA 7E, 20)		100		0	
	CO analyzer	(EPA 10)		100		0	
	VOC analyzer	(EPA 25A)		100		0	
Reagent Charges							
	O2 calibration gases	(EPA 3A)		25		0	
	CO2 calibration gases	(EPA 3A)		50		0	
	SO2 calibration gases	(EPA 6C)		50		0	
	NOx calibration gases	(EPA 7E, 20)		50		0	
	CO calibration gases	(EPA 10)		50		0	
	VOC calibration gases	(EPA 25A)		50		0	
	Orsat Reagents	(EPA 3)	1	10	3	30	
	Moisture Reagents	(EPA 4)		10		0	
	Fluoride reagents	(EPA 13A)	1	15	3	45	
	PM reagents	(EPA 5, 17)		15		0	
	SO2 reagents	(EPA 6, 8)		25		0	
	Dioxin Furan reagen	(EPA 23)		35		0	
	VOC reagents	(EPA 25)		25		0	
	HCl reagents	(EPA 26)		25		0	
	Multi-Metals reagents	(EPA 29)		30		0	
	Mercury reagents	(EPA 101, 101A)		25		75	
Lab Charges							
	Particulate analysis	(EPA 5, 17)		40		0	
	SOx analysis	(EPA 6, 8)		40		0	
	Dioxins/Furans analysis	(EPA 23		1,250		0	
	VOC analysis	(EPA 25)		275		0	
	HCl analysis	(EPA 26)		65		0	
	Metals analysis (list)	(EPA 29)		30		0	
	Hg analysis	(EPA 101, 101A)		40		0	
	Fluoride analysis	(EPA 13A)	1	50	4	200	
							350
FORMAL REPORT	Sen. Engineer/Scientist		1	80	1	80	
	Environmental Engineer		1	60	5	300	
	Administrative		1	40	2	80	
	Clerical		1	20	2	40	
							500
Copy Charges							
Communication						54	100
Miscellaneous						41	
					Final Total		2715

[6-20-97]; This bid is based on completing all travel and testing in (1) day.

AIR CONSULTING AND ENGINEERING, INC.
PROFESSIONAL FEE SCHEDULE
JUNE 1997

CATEGORY	ITEM		RATE
TRAVEL	milage, Van & Trailer		$0.75/mile
	milage, Van or personal vehicle		$0.50/mile
	** per diem (nominal)		$85/day
	** Per Diems in larger cities or during special events will be charged at cost		
LABOR	Sen. Engineer/Scientist		$80/hr
	Environmental Engineer		$60/hr
	*Sen. Environmental Specialist		$50/hr
	*Environmental Specialist		$40/hr
	* Eligible for overtime at 1.5 x Rate for more than 8.0 hours/day or 40 hours/week		
EQUIPMENT CHARGES	O2 analyzer	(EPA 3A)	$ 50/day, $250/wk
	CO2 analyzer	(EPA 3A)	$100/day, $500/wk
	Dioxin/Furan train	(EPA 23)	$100/day, $500/wk
	HCL train	(EPA 26,26A)	$100/day, $500/wk
	Mercury train	(EPA 101,101A)	$100/day, $500/wk
	Multi Metals train	(EPA 29,12,13,104)	$100/day, $500/wk
	PM train	(EPA 4,5,17)	$100/day, $500/wk
	SO2 train	(EPA 6,8)	$100/day, $500/wk
	SO2 analyzer	(EPA 6C)	$100/day, $500/wk
	NOx analyzer	(EPA 7E, 20)	$100/day, $500/wk
	CO analyzer	(EPA 10)	$100/day, $500/wk
	VOC analyzer or manual Train	(EPA 25A,25)	$100/day, $500/wk
	Velocity & Moisture Train	(EPA 2,4)	$ 50/day, $250/wk
REAGENT CHARGES	O2 calibration gases		$25/day
	CO,CO2,NOx,SO2,VOC calibration gases		$50/day/gas
	Orsat Reagents	(EPA 3)	$10/Run
	Moisture Reagents	(EPA 4)	$10/Run
	PM reagents	(EPA 5, 17)	$15/Run
	SO2 reagents	(EPA 6, 8)	$10/Run
	Dioxin Furan reagen	(EPA 23)	$60/Run
	VOC reagents	(EPA 25)	$25/Run
	HCl reagents	(EPA 26,26A)	$15/Run
	Multi-Metals reagents	(EPA 29)	$40/Run
	Mercury reagents	(EPA 101, 101A)	$15/Run
LAB CHARGES	Particulate analysis	(EPA 5, 17)	$40/sample
	SOx analysis	(EPA 6, 8)	$40/sample
	Dioxins/Furans analysis	(EPA 23)	$2000/sample
	VOC analysis	(EPA 25)	$275/sample
	HCl analysis	(EPA 26)	$65/sample
	Metals analysis (list)	(EPA 29)	$40/sample/parameter
	Mercury analysis	(EPA 101, 101A)	$40/sample
SUPPORT SERVICES	copy charges, black & white		$0.10/copy
	copy charges, color reduction		$1.50/copy
	communication		1.5% of total charges
	Shipping/Postage		at cost + 10%
	Outside Services		at cost + 10%

Air Consulting and Engineering, Inc.
2106 NW 67th Place, Suite 4
Gainesville, Florida 32653
Tel: (352) 335-1889 Fax: (352) 335-1891

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

KA 173-94-04

May 28, 1997

VIA FAX AND MAIL

Mr. William Congden, Esq.
Office of General Counsel
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Motion for Extension of Time to
File an Appeal
U.S. Agri-Chemicals Corporation
Polk County, Florida

Dear Mr. Congden:

Attached is a request for an extension of time to file an Appeal in accordance with Rule 62-103.070, FAC.

If you have any questions concerning this request, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. Clair Fancy, FDEP, Tallahassee
Mr. A. A. Linero, FDEP, Tallahassee
Mr. Steven Susick, USAC
Mr. Ron Brunk, USAC
Mr. Viet Ta, USAC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of an Air Permit for

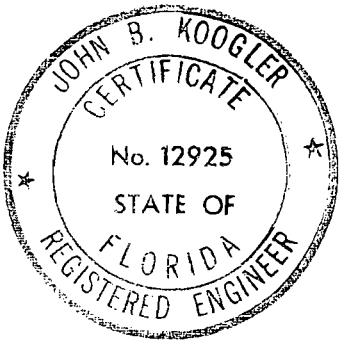
U.S. Agri-Chemicals Corporation
3225 S.R. 630, West
Ft. Meade, Florida 33841-9799

FDEP File No. AC53-260190 (PSD-FL-222)
OGC Case No. 97-0031
Polk County - AP

MOTION FOR EXTENSION OF TIME

The Applicant, U.S. Agri-Chemicals Corporation by and through its undersigned Engineer of Record and pursuant to Rule 62-103.070, FAC, requests the Secretary of FDEP to grant an extension of time until August 1, 1997, in which to file an Appeal. The additional time will allow U.S. Agri-Chemicals Corporation adequate time to review the permit and to request minor modifications, if necessary.

Dated the 28th day of May 1997 in Gainesville, Alachua County, Florida.



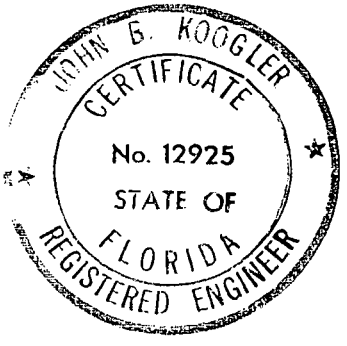
Koogler & Associates
Environmental Services

John B. Koogler, Ph.D., P.E.
Engineer of Record for
U.S. Agri-Chemicals Corporation
Florida Registration No. 12925
4014 N.W. 13th Street
Gainesville, FL 32609
(352) 377-5822

KOOGLER & ASSOCIATES

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing has been furnished to Mr. William Congden, Office of the General Counsel, FDEP, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, Mr. Clair Fancy and Mr. A. A. Linero, FDEP, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and Mr. Steven Susick, Mr. Ron Brunk and Mr. Viet Ta, U.S. Agri-Chemicals Corporation, 3225 S.R. 630 West, Ft. Meade, Florida 33841-9799 by FAX and by U.S. Mail, this 28th day of May 1997.



John B. Koogler, Ph.D., P.E.
Florida Registration No. 12925

KOOGLER & ASSOCIATES

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

May 22, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: P.E. Recertification of Final Amended Air Construction Permit No. AC53-260190 (PSD-FL-222)
Prilled MAP Plant

Dear Mr. Susick:

Before the above referenced final amended permit can be issued, a recertification of the BACT determination and final emission limits must be completed by the Professional Engineer (P.E.) who prepared the permit application.

Enclosed are drafts of the Final Amended Permit, the Final Determination addressing comments submitted by Koogler & Associates, and the Revised BACT determination. Also enclosed is a form for P.E. recertification. When the completed form is received, the Department will issue the permit.

If there are questions about the recertification requirement, please call me or John Reynolds at (904)488-1344.

Sincerely,

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

CHF/kt

cc: J. Koogler, P.E.
B. Thomas, SWD

Best Available Control Technology (BACT)
PROFESSIONAL ENGINEERING RE-CERTIFICATION

I, the undersigned Professional Engineer, hereby certify that the BACT determination prepared by the Department of Environmental Protection and described in the Intent to Issue dated December 26, 1996, Air Construction Permit Number PSD-FL-222 (AC53-260190), is technically and economically achievable. I also have reasonable assurance that this standard can be achieved, when properly operated and maintained, by the application of sound engineering principles applicable to the control of emissions of the air pollutants covered by this determination.

Signature Date

(Seal)

P 265 659 190

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

Sent to Steven Susick	
Street & Number US Agri Chem	
Post Office, State & ZIP Code Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date P.E. Recert. AC53-260190 PSO-FI-222	5-23-97

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Steven J. Susick, Gen Mgr
US Agri-Chemicals
3225 State Road 630 West
Ft. Meade, Fl
33841-9799

4a. Article Number P 265 659 190

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

7. Date of Delivery 5-28-97

5. Received By: *(Print Name)*

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

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

PS Form **3811**, December 1994

Thank you for using Return Receipt Service.

Final Determination

US Agri-Chemicals Corp.
Prilled Monoammonium Phosphate Plant
Polk County
Fort Meade, Florida

Permit Number
PSD-FL-222
AC 53-260190

Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

May 22, 1997

Final Determination
US Agri-Chemicals Corp.
PSD-FL-222
AC53-260190

The Intent to Issue Amended Air Construction Permit for a 60 tons per hour prilled monoammonium phosphate (MAP) plant at US Agri-Chemicals, Inc., 3225 State Road 630 West, Fort Meade, Florida 33841-9799, Polk County, Florida, was distributed on December 23, 1996. The Public Notice of Intent to Issue was published in the Ledger on February 24, 1997. Copies of the Intent to Issue were available for public inspection at the Department's offices in Tallahassee and Tampa.

Prior to the publication of the public notice, the Department received comments from the applicant. No other comments were received. The applicant's pertinent comments are addressed below.

1. The Department disagrees with the applicant's statement that the original BACT determination did not consider costs. The Department evaluated cost information from independent sources such as the Ceilcote Air Pollution Control Company and found that cost considerations did not prohibit the technology specified as BACT.

2. The Department cannot concur with the statement: "...there is a strong professional disagreement regarding the control technology that represents BACT with no evidence to demonstrate which opinion is correct or mostly correct." The applicant has not submitted any credible data, credible calculations, or credible explanation from a qualified expert as to how a venturi scrubber could possibly achieve 5-6 transfer units at the energy level proposed. The Department's analysis has been confirmed by two PhD-degreed experts in scrubber technology.

3. The original application receipt date need not be included in the Intent or Notice. Proper application means submitting a complete application which was done on April 4, 1995.

4. The applicant's contention that public notice is not required for this amendment is moot since the Department published the notice after the applicant declined to do so. This action appropriately allowed the public to be notified of the change in the basis for setting final emission limits.

5. The wording of Specific Condition No. 4 is standard and indicates that the opacity is being limited as a surrogate for PM/PM10. The rule cited is the only rule specific to phosphate processing that encompasses BACT. A BACT determination should include PM/PM10 for sources that generate particulate emissions. The reference to the additional rule the applicant requested has been added.

6. The applicant stated that the 15% opacity limit for the scrubber stack is too stringent compared to the 20% opacity "typically allowed" for PM emissions in the same mass range. The 15% opacity standard for the scrubber is actually less stringent than some recent BACT determinations for

11. The applicant stated that it did not propose a scrubber using recycled slurry. However, specification sheets submitted by the applicant show that the P2O5 content of the scrubbing liquid is as high as 15%, indicating high solids content in the recycled scrubbing liquid stream. (This is the first phosphate BACT facility that will be allowed to operate, at least initially, without using a relatively clean scrubbing medium such as pond water for last stage contact with exhaust gases).

12. The applicant argued that the control technology section of the BACT determination is not necessary. EPA's New Source Review Manual states (page B.56) that the technology upon which the BACT emissions limit is based should be specified in the permit. The applicant also contends it is not necessary to specify both an emission limit and a control technology. Specification of the control technology, in the alternative, resulted when the applicant did not follow the original BACT determination. Although the applicant claims it complied with the original BACT, in no way can the applicant be considered as being in compliance with the original BACT because it required the Department's approval before installing any "equivalent" option. The Department informed the applicant that its proposed scrubber design would not be approved as BACT for fluoride removal, yet the applicant installed it anyway. This action resulted in the revised BACT determination which provides the applicant a chance to meet the limit with its proposed system while still requiring the original approach if the limit is not achieved. This is the equivalent of "requiring the Department's approval" after the fact.

13. Regarding the events that led to the revised BACT determination, the BACT discussion should explain what occurred in order to clarify the Department's position with respect to the applicant's scrubber performance claims. The explanation should be provided in the BACT discussion in the event that similar claims need to be addressed again in future permits. The applicant stated that it considers the Department's analysis of the applicant's claims as "argumentative" and that the Department "should not place itself in the engineering business". One of the Department's functions in the permit review process is to make engineering judgments regarding the accuracy of claims made by applicants and their consulting engineers. In cases such as this where there has not been evidence presented to back up an applicant's claims, it is imperative that this be mentioned in the technical discussion so that others will understand the issues when basing their BACT decisions on this one. It is also necessary that the Department investigate the applicant's venturi scrubber performance claims so that, if true, this information can be used for future BACT determinations. This is the reason for on-site monitoring of the performance test by Department staff and the sampling of the scrubber inlet. If the applicant's claims prove to be true, the Department must know this so that it can change the way in which BACT decisions are made in the future.

scrubbers in similar applications. A BACT determination done by the Department in 1994 for Cargill's No. 4 DAP plant in Bartow (PSD-FL-211) included a 10% opacity limit for the scrubber. Cargill's mass PM emission limit was 22.8 lb/hr compared with the applicant's 24.0 lb/hr. The Department deemed that 15% is more appropriate in this case since the applicant claimed earlier than the percentage of fine particulate would be higher than for DAP emissions.

7. The wording of Specific Condition No. 5 will be changed to reflect the one year period for demonstrating compliance. This concession was made following the issuance of the original permit.

8. The applicant objected to the requirement in Specific Condition No. 6 that a one-time stack test be conducted simultaneously on the inlets of the scrubbers and the stack. The Department considers this as the only practical way to evaluate the claims of equivalent scrubber performance that have been made by the applicant. This evaluation must be made, not for compliance purposes, but to establish whether or not the applicant has a venturi scrubber design which will achieve 5-6 mass transfer units as the applicant has claimed. If this claim turns out to be factual, the Department needs to have this information for future BACT determinations. The applicant's claim can be evaluated based on a combination of inlet gas sampling and scrubber liquid sampling.

9. The applicant thought that Specific Condition No. 6 requires an EPA Method 5 test for the product loadout baghouse. It is clear from Specific Condition No. 5 and Specific Condition No. 8 that there is no mass emission limit for the baghouse and therefore there could be no requirement for a Method 5 test. Nevertheless, the words "and visible emissions" and "as appropriate" will be included in Specific Condition No. 8.

10. The applicant's representations regarding the original emission limit proposals are not entirely accurate. Page 17 of the original application states:

> "The emission standard propose (sic) by the applicant is:
> - Fluorides: 0.046 lbs. per ton of MAP product

The emissions standard selected by the applicant represents the fluorides emission limit imposed by the BACT standard for fluoride applied by FDEP to two MAP plants operated by Cargill Fertilizer in Florida. Cargill MAP BACT for each of two reactors is 0.037 lbs F/ton product and that for the cooler (which processes product from both reactors) is 0.018. Therefore, the combined BACT is 0.037 + (0.018/2) = 0.046."

In the November 23, 1994 letter, the Department noted that the proposed 0.046 lb/ton of MAP product, since it is "per ton of MAP product" instead of the standard unit "per ton of P2O5 input", is considerably less stringent than the most recent (at that time) granular MAP BACT limit of 0.060 lb/ton P2O5, there being only about one-half ton of P2O5 in a ton of MAP product. The 0.060 limit was based on the federal new source performance standard for DAP plants since the granular process for MAP is very similar to that for DAP and there is no federal standard for MAP. The Department also noted that if one assumes equivalency of fluoride emissions from the prilled and granular processes, as well as from MAP and DAP processes, one would arrive at a limit lower than 0.060 because the most recent BACT limit for DAP was 0.0417 (lower than the most recent BACT limit for MAP). The Department was simply stating that the applicant selected the wrong BACT (and the wrong units) for its proposal.

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

PERMITTEE:
US Agri-Chemicals Corp.
3225 State Road 630 West
Fort Meade, FL 33841-9799

Permit Number: AC 53-260190
PSD-FL-222
Expiration Date: Dec. 30, 1998
County: Polk
Latitude/Longitude: 27°44'25"N
81°51'05"W
Project: 60 TPH Prilled MAP Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, 212, 272, 275, 276, and 297, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the emission unit shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department of Environmental Protection (Department) and specifically described as follows:

For the construction of a 60 TPH Prilled MAP Plant. The facility is located at 3225 State Road 630 West, Fort Meade, Polk County, Florida. The UTM coordinates are Zone 17: 416 km East and 3,069 km North.

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

Attachments are listed below:

1. DEP's letter dated November 23, 1994
2. USDOI's letter dated December 15, 1994
2. DEP's letter dated February 17, 1995
3. K&A's letter dated March 2, 1995
4. K&A's letter dated March 20, 1995
5. K&A's letter dated March 29, 1995
6. K&A's letter dated March 31, 1995
7. USAC's letter dated July 13, 1995
8. USEPA's letter dated August 7, 1995
9. K&A's letter dated August 14, 1995
10. K&A's letter dated September 12, 1995
11. K&A's letter dated June 4, 1996
12. DEP's letter dated July 3, 1996
13. K&A's letter dated October 1, 1996
14. K&A's letter dated February 7, 1997

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 403.161, 403.727, or 403.859 through 403.861, F.S. 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 the permit.

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

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

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

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of

GENERAL CONDITIONS:

credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

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

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

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

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

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

GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

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

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT)
(X) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards (NSPS)

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:

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

GENERAL CONDITIONS:

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

SPECIFIC CONDITIONS:

1. Unless otherwise indicated, the construction and operation of the subject Prilled MAP production facility shall be in accordance with the capacities and specifications stated in the application. [Rule 62-210.300, F.A.C.]

2. The production rate of the Prilled MAP plant shall not exceed 60 tons MAP product per hour. [Rule 62-212.200(223), F.A.C.]

3. The Prilled MAP plant may operate up to 8760 hours per year. [Rule 62-212.200(223), F.A.C.]

4. Visible emissions from the Prilled MAP plant loadout baghouse shall not exceed 5% opacity. [Rules 62-296.403 and 297.620(4), F.A.C.]

5. PM/PM10, total fluorides and visible emissions from the scrubber stack shall not exceed the following limits: [Rules 62-296.403 and 297.620(4) F.A.C.]

PM/PM10:	24.0 lb/hr and 105.12 tons/yr
Total Fluorides:	0.58 lb/hr and 2.54 tons/yr
Visible Emissions:	15% opacity

The permittee shall have one year from the time of plant startup to demonstrate compliance with these limits.

6. The initial performance test for total fluorides shall be done simultaneously on both scrubber inlets and the scrubber stack with monitoring of parameters by Department staff. Annual compliance tests for fluorides thereafter shall be done on the outlet only unless otherwise required by the Department. PM/PM10 tests shall be conducted on the scrubber stack. Visible emissions shall be tested for the product loadout baghouse. For the duration of all tests the emission unit shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90 percent of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new

SPECIFIC CONDITIONS:

test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.340(1)(a), F.A.C.]

7. The Department's Southwest District office shall be notified in writing at least 15 days prior to the performance test. Compliance test results shall be submitted to that office within 45 days of test completion. [Rule 62-297.340(1)(i), F.A.C.]

8. The test procedures for fluorides shall be in accordance with EPA Reference Methods 1, 2, 3, and 13A or 13B, as published in 40 CFR 60, Appendix A. The test procedures for PM/PM10 and visible emissions shall be in accordance with EPA Reference Methods 1, 2, 3, 5 and 9, as appropriate, as published in 40 CFR 60, Appendix A. [Rules 62-296.800 and 62-297.401, F.A.C.]

9. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

10. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

11. The Prilled MAP plant shall be subject to the following:

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

b. 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 62-210.700(4), F.A.C.]

c. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. [Rule 62-210.700(5), F.A.C.]

SPECIFIC CONDITIONS:

d. In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]

12. The permittee shall submit an Annual Operating Report using DEP Form 62-210.900(4) to the Department's Southwest District office by March 1 of the following year for the previous year's operation. [Rule 62-210.370, F.A.C.]

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.090, F.A.C.]

14. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit. [Rules 62-4.055 and 62-4.220, F.A.C.]

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

_____

Howard L. Rhodes, Director
Division of Air Resources Management

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REVISED
Best Available Control Technology (BACT) Determination
U.S. Agri-Chemicals Corporation
Fort Meade, Polk County, Florida
PSD-FL-222
AC53-260190

The applicant proposes to construct a 60 tons per hour (TPH) prilled monoammonium phosphate (MAP) plant at their phosphate processing facility in Fort Meade. The proposed project will result in a significant increase in emissions of particulate matter (PM-PM10). The project is, therefore, subject to Prevention of Significant Deterioration (PSD) review in accordance with Rule 62-212.400, Florida Administrative Code (F.A.C.). The BACT determination is part of the review required by Rules 62-212.400 and 62-296.403(1)(i), F.A.C.

Date of Receipt of Complete Application: April 4, 1995

BACT Determination Proposed by Applicant:

Emission Limits: Tower & Cooler - 0.0417 lb F/ton P_2O_5 input
- 0.40 lb PM-PM10/ton MAP
Product Loadout - 0.072 lb PM-PM10/ton MAP

Control Technology: - Medium-energy venturi scrubber using recycled slurry (for tower and cooler)
- Baghouse (for product loadout)

BACT Determination Procedure:

In accordance with F.A.C. Chapter 62-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, Rule 62-212.410(1), F.A.C., states that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emision limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

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

Original BACT Determined by DEP:

Emission Limits: Tower and Cooler - Fluoride and PM/PM10 limits to be established after performance test
Product Loadout - No visible emissions

Control Technology:

Options for Tower & Cooler:

- Medium-energy venturi primary scrubber with packed secondary scrubber using recirculated gypsum/cooling pond water (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM10 over 5 microns)

- Medium-to-high-energy venturi scrubber using neutralized water from dedicated scrubber pond with fresh water makeup (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM10 over 5 microns)

- Other system with equivalent removal efficiencies approved by the Department

Product Loadout: Baghouse as proposed

Original BACT Determination Rationale:

The applicant based their proposed fluoride BACT emission limit of 0.0417 lb F per ton P2O5 on the Department's 1994 BACT determination for IMC-Agrico's granular Diammonium Phosphate plant in Polk County (PSD-FL-204). However, due to the substantial differences in air flow and other process variables that exist between the granulation and prill tower processes, the Department cannot rely on the granulation emissions to accurately predict emissions from the prill process.

neutralized scrubbing water and a dedicated scrubber pond for settling of solids. USAC had accepted the permit and the BACT determination with this condition. Instead, USAC used a high-solids, environmentally inferior, recirculated scrubbing slurry (up to 15% P2O5) for product recovery reasons. This hot slurry (122 F.) will cause a higher fluoride content in the gas compared to pond water.

Due to the limited emission test data available for this type of plant, the Department issued an interim permit to USAC requiring that limits be established following completion of the compliance tests, as long as USAC followed the BACT requirements. USAC accepted the permit and its conditions, then submitted engineering calculations claiming that the venturi with its high-solids scrubbing water will provide gaseous fluoride removal equivalent to that of a packed scrubber system using much cleaner water from the cooling pond.

The Department responded by showing that USAC's scrubber would achieve only about half of the 5.3 transfer units claimed. This analysis was based in part on a technical paper that showed about 3.5 mass transfer units (vs. USAC's 5.3) would be the most that could reasonably be expected for a venturi removing fluorides using neutralized pond water. USAC's design engineers (the Jacobs Engineering Group in Lakeland, Florida) then sent a letter to USAC claiming 6.0 transfer units for their high-solids scrubbing water. This was based on their analysis of data in the above article. These data were obtained using neutralized, clean scrubbing water and not a slurry as the Jacobs design uses. A copy of Jacobs' original submittal, the Department's response, and Jacobs' followup letter is attached to the permit.

The Jacobs calculations are incorrect because of two improper assumptions. The extrapolated curve that Jacobs drew on Figure 5 of the article is not relevant for their unneutralized scrubbing water. Secondly, the data in Figure 5 cannot be infinitely extrapolated at constant L/G because the short contact time in the venturi throat prevents the mass transfer from increasing beyond a certain gas velocity. Attached is an extrapolation performed on Figure 6 which shows the variation of transfer units with the same variables as in Figure 5 but with pressure drop added. As shown, a maximum of 4.0 transfer units is obtained for the conditions specified by Jacobs, again keeping in mind that this is applicable only for neutralized water. The highest actual test result reported was 3.6 NTU with neutralized water, therefore, the Department's 2.7 NTU estimate is reasonable for the high-solids scrubbing slurry Jacobs has proposed.

The limitations on gas/liquid mass transfer in a venturi scrubber result primarily from the short contact time. Since the

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PM/PM10 emission limits were proposed by the applicant based on a 1980 BACT determination for a prilled MAP plant operated by IMC-Agrico. Since that is the only BACT determination available (15 years old) and technological advances have no doubt been made since 1980, the Department prefers not to rely on it for this new source.

This leaves the Department without an adequate basis for arriving at BACT limits for this project prior to construction. In such cases where relevant data are not available on which to base an enforceable BACT emission limit, the Department must require that the level of control and the emission control equipment capabilities be at least equivalent to those imposed in other BACT determinations for the same industry.

Based on a review of state-of-the-art fluoride scrubber capabilities in the phophate industry, the Department finds that for this application the control equipment should be capable of achieving at least 99.3% removal of gaseous fluorides and 99.0% (wt.) removal of PM/PM10 above 5 microns. The applicant must submit scrubber design calculations and drawings to the Department prior to construction to show that the equipment will meet these removal efficiencies. The BACT emission limits will be established upon completion of the performance tests.

Revised BACT Determined by DEP:

Emission Limits: Tower & Cooler - 0.019 lb F/ton P2O5 input
0.40 lb PM-PM10/ton MAP
15% opacity
Product Loadout - No visible emissions

Control Technology:

Options for Tower & Cooler if Fluoride Limits Not Met:

- Venturi primary scrubber using recirculated slurry followed by secondary scrubber using once-through cooling pond water.
- Venturi scrubber using recirculated neutralized water from dedicated scrubber pond.

Product Loadout: Baghouse as proposed

Revised BACT Determination Rationale

This revised BACT determination was required since USAC did not follow the Department's BACT requirement for the venturi-only option listed in the original determination; namely, the use of

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time is so short, there is a point beyond which mass transfer will not increase as additional transfer area is created by the smaller liquid drops formed with increased pressure drop.

To further substantiate the Department's analysis, attached is a copy of Dr. Aaron J. Teller's October 4 letter describing what would be required to achieve greater than 3.5 NTU. As he states, a throat velocity of 400 ft/s (122 m/s vs. Jacobs' 74 m/s), L/G of 12 gpm/1000 cfm (1.60 m3/1000 m3 vs. Jacobs' 1.23 m3/1000 m3), and pressure drop of 130 in.wc. (3300 mm wc. vs. Jacobs' 483 mm wc.), would be required to achieve 4.2-5.2 NTU. The energy consumption required would be about 6-7 times higher than the Jacobs design calls for.

Conclusion:

As a result of the change in the basis for the emission limits, the fluoride BACT applicability comes under Rule 62-296.403(1)(i), F.A.C., instead of Rule 62-212.400, F.A.C. The Department believes that it will ultimately be necessary for the permittee to implement the technology specified by the Department to meet the BACT fluoride limit. If the permittee is unable to comply with the limit using the Jacobs scrubber design, the permittee will need to install the technology described by the Department or otherwise achieve the specified limit. The pemittee will have one year to demonstrate compliance with the limit.

BACT Analysis Details Available From:

John Reynolds, Permit Engineer
New Source Review Section
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road (MS 5505)
Tallahassee, Florida 32399-2400

Recommended by:

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

_____, 1997
Date

Approved by:

Howard L. Rhodes, Director
Division of Air Resources Management

_____, 1997
Date

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasse, FL 32399-2400

Dr. Mr. Reynolds,

It was indicated that a claim for achievement of 5.3 Transfer units was made for a fluoride scrubbing process using a venturi.

It should be noted that the venturi is inherently a particulate collection device and is used only as a scrubber of last resort. The reason is that the mass transfer is limited because of minimal surface renewal. The deficiency can be overcome by decreasing the parhead size of the spray and increasing the L/G, provided cost of operation is not restrictive.

Inasmuch as a venturi is generally followed by a cyclone separator, an additional transfer unit can be attained due to wetted wall action.

A comparison of performance of venturi-cyclone systems is attached (Table I). As noted, the rational range of operation will provide in the region of 3.5 transfer units. The 5 transfer unit range can be achieved if the client will accept an energy consumption of 370 HP/1000 CFM.

Sincerely

TABLE I

VENTURI - CYCLONE SEPARATOR PERFORMANCE

SYSTEM	THROAT VEL., FPS	L/G GAL/1000CFM	ΔP in w.g.	HP - GAS + LIQ / 1000 CFM	NTU Transfer UNITS
VENTURI - CYCLONE	140	12	16	45	2.2 - 2.6
VENTURI - CYCLONE	250	12	50	150	3.2 - 4.0
VENTURI - CYCLONE	400	12	130	370	4.2 - 5.2

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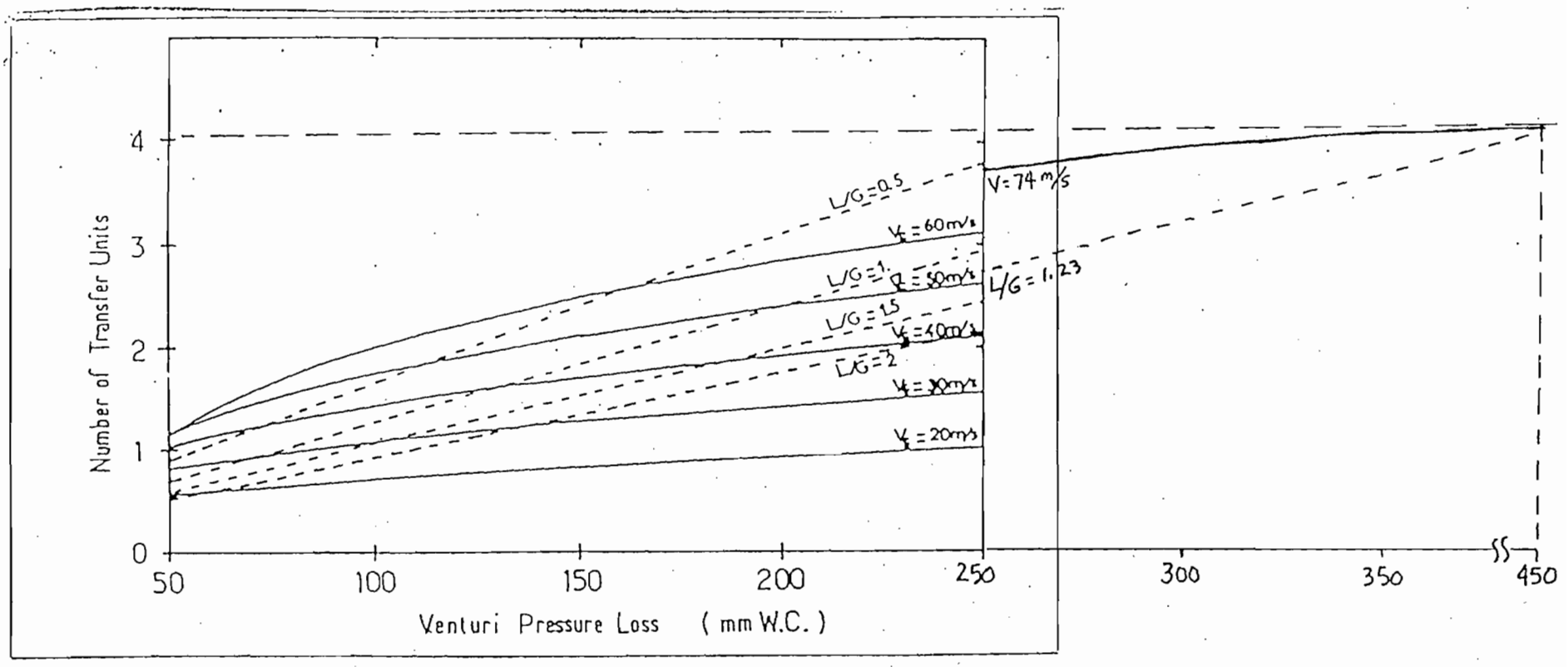


Figure 6. NTU vs. pressure loss. L/G and V_G are taken as parameters. T_{GE} = 60°C and Lv/Dc = 8.5.

MEMORANDUM

TO: John Reynolds

FROM: Bill Proses

DATE: April 28, 1997

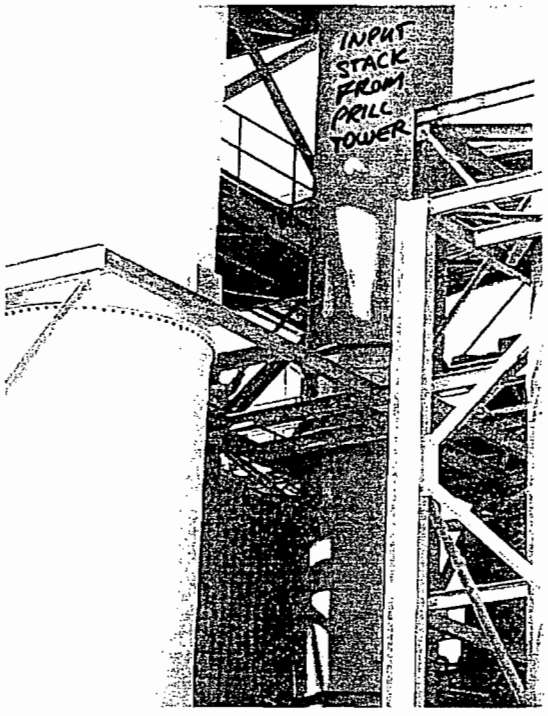
SUBJECT: USAC MAP Plant

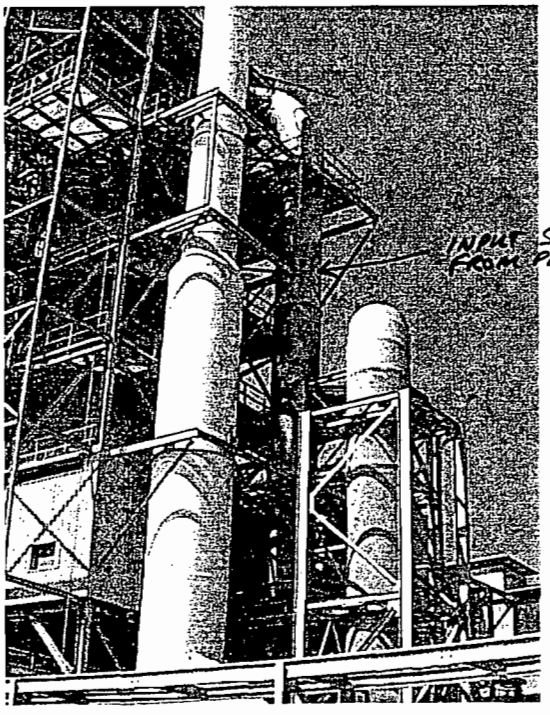
Bob Soich and I visited USAC on Friday, April 28,1997, to look at the new MAP Plant. We looked at the two scrubber inlet ducts.

The larger inlet duct comes from the prill tower and runs vertically for at least eight duct diameters. Setting up a station for stack testing on that inlet should be similar to setting up the station that already exists on the outlet duct.

The smaller inlet duct comes from the cooler cyclones and is approximately five duct diameters long. The five duct diameter run is from a height four or five stories down to a height of two stories. The duct runs at approximately 45 degrees to the horizontal. Setting up a station for stack testing for this duct is possible, but will be complicated and expensive due to the location and awkward geometry involved.

All size estimates are based on looking at the ducts and measuring diameters and length from pictures taken of the ducts. We do not have diagrams of the plant that show the actual dimensions. USAC was unable to provide us diagrams and has promised to provide the actual dimensions as soon as they locate them.


INPUT STACK FROM DRILL TOWER


INPUT STACK FROM DRILL TOWER


INPUT STACK FROM COOLER CYCLONES

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

KA 173-94-04

March 10, 1997

VIA FAX AND MAIL

Mr. William Congden, Esq.
Office of General Counsel
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Motion for Extension of Time to File an Appeal
U.S. Agri-Chemicals Corporation
Polk County, Florida

Dear Mr. Congden:

Attached is a request for an extension of time to file an Appeal in accordance with Rule 62-103.070, FAC.

If you have any questions concerning this request, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. Clair Fancy, FDEP, Tallahassee
Mr. A. A. Linero, FDEP, Tallahassee
Mr. Steven Susick, USAC
Mr. Ron Brunk, USAC
Mr. Viet Ta, USAC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of an Air Permit for

U.S. Agri-Chemicals Corporation
3225 S.R. 630, West
Ft. Meade, Florida 33841-9799

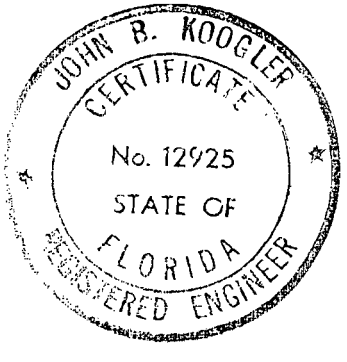
FDEP File No. AC53-260190 (PSD-FL-222)

Polk County - AP

MOTION FOR EXTENSION OF TIME

The Applicant, U.S. Agri-Chemicals Corporation by and through its undersigned Engineer of Record and pursuant to Rule 62-103.070, FAC, requests the Secretary of FDEP to grant a 90-day extension of time in which to file an Appeal. The additional time will allow U.S. Agri-Chemicals adequate time to review the permit and to request minor modifications, if necessary.

Dated the 10th day of March 1997 in Gainesville, Alachua County, Florida.



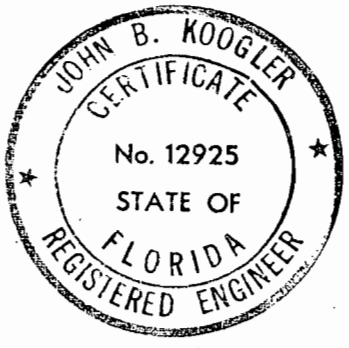
Koogler & Associates
Environmental Services

John B. Koogler, Ph.D., P.E.
Engineer of Record for
U.S. Agri-Chemicals Corporation
Florida Registration No. 12925
4014 N.W. 13th Street
Gainesville, FL 32609
(352) 377-5822

KOOGLER & ASSOCIATES

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing has been furnished to Mr. William Congden, Office of the General Counsel, FDEP, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; Mr. Clair Fancy and Mr. A. A. Linero, FDEP, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and Mr. Steven Susick, Mr. Ron Brunk and Mr. Viet Ta, U.S. Agri-Chemicals, 3225 S.R. 630 West, Ft. Meade, Florida 33841-9799 by FAX and by U.S. Mail, this 10th day of March 1997.



John B. Koogler, Ph.D., P.E.
Florida Registration No. 12925

KOOGLER & ASSOCIATES

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 5, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: Draft Amended Air Construction Permit No. AC53-260190 (PSD-FL-222)
Final BACT Determination for Ft. Meade Prilled MAP Plant/Proof of Publication

Dear Mr. Susick:

Enclosed is a copy of the Proof of Publication of the Public Notice of Intent to Issue Permit. The public comment period will end on March 26, 1997.

We will address all comments received by that date in our Final Determination, including those already submitted by Mr. John Koogler on behalf of U.S. Agri-Chemicals, Inc.

Sincerely,

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

AAL/kt

cc: J. Koogler, P.E.
B. Beals, EPA
J. Bunyak, NPS
R. Harwood, Polk Co.
B. Thomas, SWD

P 265 659 180

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to Steven Zusick	
Street & Number US Agri Chemicals	
Post Office, State, & ZIP Code Fort Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 3-5-97	

AC53-260190
PSD-FI-222

PS Form **3800**, April 1995

[redacted]

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Steven D. Zusick, Gen. Mgr
US Agri Chemicals
3225 State Rd 630 W
Fort Meade, Fl
33841-9779

4a. Article Number P 265 659 180

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

7. Date of Delivery 3-10-97

5. Received By: *(Print Name)*

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

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

PS Form **3811**, December 1994

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

The Ledger

401 South Missouri Avenue (33801)
P.O. Box 408
Lakeland, FL 33802 941-687-7000

Lakeland, Florida FAX NO. (941) 687-7090

Please deliver the following pages to:

Name: KIM TOBER

Telecopier No: 1-904-922-6979

Company/Firm: FLORIDA DEPT of ENVIRONMENTAL PROTECTION

From: DON JENKINS 941-687-7921 Extension:

We are transmitting a total of 3 pages including this cover letter.

Date: 3-4-97

Time: 3:36

Notes:

AFFIDAVIT OF PUBLICATION

THE LEDGER
Lakeland, Polk County, Florida

Case No .....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared Nelson Kirkland, who on oath says that he is Classified Advertising Manager of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

Public Notice Of Intent

in the matter of

Draft Permit No.:AC53-260190(PSD-FL-222)

in the

Court, was published in said newspaper in the issues of

February 24;

1997

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed .....
Nelson Kirkland
Classified Advertising Manager

By Nelson Kirkland who is personally known to me

Sworn to and subscribed before me this 24th

day of February A.D. 19 97

(Seal) .....
Notary Public

DONALD RAY JENKINS
MY COMMISSION # CC 586345
EXPIRES: September 18, 2000
Bonded Thru Notary Public Underwriters

My Commission Expires .....

Order#658441
PO#S3700731879

A32

PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit No.: AC53-260190 (PSD-FL-222)
US Agri-Chemicals, Inc.
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an amended air construction permit to US Agri-Chemicals, Inc. for a prilled MAP plant located at 3225 State Road 630 West, Fort Meade, Polk County. A Best Achievable Control Technology (BACT) determination was required for the applicant's names and address are: US Agri-Chemicals, Inc., 3225 State Road 630 West, Fort Meade, Florida 33841.

This company applied on April 4, 1995, to construct a prilled MAP plant at its existing facility. The original construction permit was issued on September 29, 1995. Particulate and fluoride emissions from the prill tower and cooler are controlled by a scrubber while the product loadout area is controlled by a baghouse. This amendment was necessitated by a change in the basis for setting final emission limits. The final emission limit for gaseous fluoride is more stringent than that contemplated in the original permit, while there is no change in the particulate matter emissions originally contemplated.

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

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

The Department will issue the FINAL Permit with the proposed amended conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S. or a party requests mediation as an alternative remedy under section 120.573 before the deadline for filing a petition. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for petitioning for a hearing are set forth below, followed by the procedures for requesting mediation.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 of the F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000; telephone: 904/488-9370; fax: 904/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition (or a request for mediation, as discussed below) within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with rule 28-5.207 of the Florida Administrative Code.

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

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

A person whose substantial interests are affected by the Department's proposed permitting decision, may elect to pursue mediation by asking all parties to the proceeding to agree to such mediation and by filing with the Department a request for mediation and the written agreement of all such parties to mediate the dispute. The request and agreement must be filed in (received by)

A request for mediation must contain the following information: (a) The name, address, and telephone number of the person requesting mediation and that person's representative, if any; (b) A statement of the preliminary agency action; (c) A statement of the relief sought; and (d) Either an explanation of how the requester's substantial interests will be affected by the action or proposed action addressed in this notice of intent or a statement clearly identifying the petition for hearing that the requester has already filed, and incorporating it by reference.

The agreement to mediate must include the following: (a) The names, addresses, and telephone numbers of any persons who may attend the mediation; (b) The name, address, and telephone number of the mediator selected by the parties, or a provision for selecting a mediator within a specified time; (c) The agreed allocation of the costs and fees associated with the mediation; (d) The agreement of the parties on the confidentiality of discussions and documents introduced during mediation; (e) The date, time, and place of the first mediation session, or a deadline for holding the first session, if no mediator has yet been chosen; (f) The name of each party's representative who shall have authority to settle or recommend settlement; and (g) The signatures of all parties or their authorized representatives.

As provided in section 120.573, F.S., the timely agreement of all parties to mediate will toll the time limitations imposed by sections 120.569 and 120.57 for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons whose substantial interests will be affected by such modified final decision of the Department have a right to petition for a hearing only in accordance with the requirements for such petitions set forth above. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under sections 120.569 and 120.57 remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

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

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 904/488-1344
Fax: 904/922-6979

Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the Draft Amended Permit, the revised BACT Determination, the original permit, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 904/488-1344, for additional information.

A-32 - 2-24- 1997

PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit No.: AC53-260190 (PSD-FL-222)
US Agri-Chemicals, Inc.
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an amended air construction permit to US Agri-Chemicals, Inc. for a prilled MAP plant located at 3225 State Road 630 West, Fort Meade, Polk County. A Best Achievable Control Technology (BACT) determination was required. The applicant's names and address are: US Agri-Chemicals, Inc.; 3225 State Road 630 West, Fort Meade, Florida 33841.

This company applied on April 4, 1995, to construct a prilled MAP plant at its existing facility. The original construction permit was issued on September 29, 1995. Particulate and fluoride emissions from the prill tower and cooler are controlled by a scrubber, while the product loadout area is controlled by a baghouse. This amendment was necessitated by a change in the basis for setting final emission limits. The final emission limit for gaseous fluoride is more stringent than that contemplated in the original permit, while there is no change in the particulate matter emissions originally contemplated.

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

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

The Department will issue the FINAL Permit with the proposed amended conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S. or a party requests mediation as an alternative remedy under section 120.573 before the deadline for filing a petition. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for petitioning for a hearing are set forth below, followed by the procedures for requesting mediation.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 of the F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, Telephone: 904/488-9370, fax: 904/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition (or a request for mediation, as discussed below) within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with rule 28-6.207 of the Florida Administrative Code.

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position [illegible] notice of intent. Persons whose

modification of the Department's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the Department's action or proposed action addressed in this notice of intent.

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

A person whose substantial interests are affected by the Department's proposed permitting decision may elect to pursue mediation by asking all parties to the proceeding to agree to such mediation and by filing with the Department a request for mediation and the written agreement of all such parties to mediate the dispute. The request and agreement must be filed in (received by) the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, by the same deadline as set forth above for the filing of a petition.

A request for mediation must contain the following information: (a) The name, address, and telephone number of the person requesting mediation and that person's representative, if any; (b) A statement of the preliminary agency action; (c) A statement of the relief sought; and (d) Either an explanation of how the requester's substantial interests will be affected by the action or proposed action addressed in this notice of intent or a statement clearly identifying the petition for hearing that the requester has already filed, and incorporating it by reference.

The agreement to mediate must include the following: (a) The names, addresses, and telephone numbers of any persons who may attend the mediation; (b) The name, address, and telephone number of the mediator selected by the parties, or a provision for selecting a mediator within a specified time; (c) The agreed allocation of the costs and fees associated with the mediation; (d) The agreement of the parties on the confidentiality of discussions and documents introduced during mediation; (e) The date, time, and place of the first mediation session, or a deadline for holding the first session, if no mediator has yet been chosen; (f) The name of each party's representative who shall have authority to settle or recommend settlement; and (g) The signatures of all parties or their authorized representatives.

As provided in section 120.573 F.S., the timely agreement of all parties to mediate will toll the time limitations imposed by sections 120.569 and 120.57 for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons whose substantial interests will be affected by such modified final decision of the Department have a right to petition for a hearing only in accordance with the requirements for such petitions set forth above. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under sections 120.569 and 120.57 remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

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Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 904/488-1344
Fax: 904/922-6979

Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the Draft Amended Permit, the revised BACT Determination, the original permit, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 904/488-1344, for additional information.

A-32 - 2-24: 1997

Florida Department of
Environmental Protection

Memorandum

TO: Legal Advertising
Attention Mr. Jenkins

FROM: Al Linero, P.E., Administrator
Division of Air Resources
Department of Environmental Regulation

2/20

DATE: February 20, 1997

SUBJ: Public Notice for U.S. Agri-Chemicals, Inc.

Please publish the following public notice in The Ledger on Monday, February 24, 1997. (one day only)

Also, Kim Tober needs a total cost of publication so she can complete the purchase order for the publication. Her number is (904)488-1344. If she is not there, please leave a message with the total amount.

Please mail the affadavit/invoice to:

Sharolyn Wood
Department of Environmental Protection
Division of Air Resources Management - MS 5500
2600 Blair Stone Road, Twin Towers
Tallahassee, Fl 32399-2400

Thank You.

/kt

Date: 2/19/97 11:24:48 AM
From: Alvaro Linero TAL
Subject: U.S. Agrichem - MAP Plant Public Notice
To: Kim Tober TAL
CC: John Reynolds TAL
CC: Clair Fancy TAL

Kim. Please look through files for recent permits issued in Polk County. Find a newspaper of general circulation.

Get the Public Notice published that we issued to U.S. Agrichem sometime in in late December/early January.

Unless you already know what to do, please consult with Sharolyn and/or Jeanne Carver as to the process for authorizing payment, providing the PN to the newspaper, etc. Thanks.

Fed ID
59-138-1032

Mr. Jenkins

send us an affidavit
Attn: Sharolyn Wood
2600 Blair Stone Road
MS 5500
Tallahassee, FL 32399-2400

2 1/2 pages

941
FAX - 687 7976

cover letter authorizing

how many days

What date?

cost $

Bill to DEP

he will send back an ad

Earliest - Monday 2/17

The

Legal address:
PO Box 408
Lakeland, Fl 33802

attent
Legal ad

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

PURCHASE ORDER REQUISITION

PAGE 1 OF 1 (THIS IS NOT A PURCHASE ORDER) REF. NO. DARM 97-318

VENDOR NAME: The Ledger -US Agri Chem		FEID/SSN: 59-138-1032	
ADDRESS: P.O. Box 408	AC 53-260190 - PSD-FL-222 (gr)		
CITY: Lakeland	STATE: FL ZIP: 33802	PHONE: (941) 687 7820	
SHIP: DEP		INVOICE:	
ATTN: Sharalyn Wood CODE: 176		ATTN: CODE: 176	
PHONE: (904) 488-0114 SC: 278 0114		PHONE: ( ) SC:	
111 S Magnolia Drive M/S: 500		PO# S3700 731879 M/S:	
ROOM: 241		ROOM:	
CITY: Tallahassee STATE: FL ZIP: 32301		CITY: STATE: ZIP:	

PURCHASING USE ONLY | P/C: | MESSAGES: | B/C

QUANTITY	UNIT	CLASS / GROUP	DESCRIPTION / DEP PROPERTY # FOR EACH ITEM	UNIT COST	TOTAL
1	job	973040	Legal notice to run on February 24, 1997		567.85
			Need P.O. # today *Please call with P.O. # so ad can be ran on 2-24-97. Thanks		

GRAND TOTAL $ 567.85

DELIVERY : _____ DAYS ARO OR WPU | F. O. B. : DEST / SP / VENDOR | DEP / DMS CONTRACT NO. :

FOR FCO USE ONLY | PROJECT NO. : | CATEGORY NO. : /9___ | FUND NO. :

JUSTIFICATION:

FISCAL YEAR FOR ENCUMBRANCE: 96 / 97

LINE	ORGANIZATION CODE					EO	OBJECT	AMOUNT
0001	37	55	02	04	000	31	133102	567.85
0002	37							

LINE	FUND	CATEGORY	MODULE	GRANT NO.
0001	035001	040000	557	
0002				

APPROVALS		DATE
REQUESTOR:		2/19
COST CENTER:		2/19
SECTION:		2/19
BUREAU:		2/19
DIV. / SEC. :		
PURCHASING:		

11-003 (REV. 12/93) ORIGINAL-TO PURCHASING; OTHER COPIES FOR YOUR FILES OR DISTRIBUTION

1. Page ? of ?. Attach second page of requisition if purchasing more commodities than can be entered on the original requisition.

2. **REFERENCE NUMBER:** Enter requisition number.

3. **VENDOR INFORMATION:** Enter vendor name, FEID/SSN number, street address and P.O. Box No. (if both available), city, state, zip code, phone number and contact person (if available).

4. **SHIP:** Enter division, bureau (use mail station number and room number for areas within Tallahassee), district, region, park or section name where commodities are to be shipped. Use a specific street address or delivery location. Include the ship to code and name of a contact person. Enter both the regular telephone number and suncom number (if suncom is applicable).

5. **INVOICE:** Use this space only if invoice is being sent to an address different than that of the shipping address.

6. **QUANTITY:** Number of items to be purchased.

7. **UNIT:** Enter "each", "lot", "box", "gallon", "job", "pack", "case" or any other descriptive term applicable.

8. **DMS CLASS/GROUP CODE OR FULL COMMODITY NUMBER FOR EACH ITEM:**
EXAMPLE-Class Code: 595-580 Plants, Bedding (Landscaping) or 991-820 Trash, Garbage and Paper Removal Services.
EXAMPLE-COMMODITY NUMBER (STATE CONTRACT): 618-720-200-0200 Pens, Highlighters or 618-720-260-0100 Pens, Highlighters Dry Fluorescent.

9. **DESCRIPTION FOR EACH ITEM:** DEP Property Number (if applicable), Page Number of State Contract (if applicable), Brand Name, Model Number, Color (if applicable), Dimensions (if applicable), period of service (if applicable), payment terms (if applicable), hourly rate (if applicable), Account Number (if applicable).

10. **UNIT COST:** Enter the per unit cost.
11. **TOTAL:** Enter extended cost of each item.
12. **GRAND TOTAL:** Enter total cost of all requisitioned items.

13. **DELIVERY:** Enter the agreed upon number of days established with the vendor in calendar days. NOTE: DO NOT USE "ASAP". Or circle "WPU" which means "Will Pick Up".

14. **F.O.B. (Freight on Board): DEST/SP/VENDOR** Circle the appropriate terminology to identify who is responsible for paying shipping charges.

DESTINATION (DEST) - The items are delivered to the "Ship Materials To" address, include shipping charges. Note: It is always the best policy for the DEP requisitioner to obtain prices which include the shipping charges (F.O.B. Destination).
SHIPPING POINT (SP) - Vendor adds shipping charges separately to the cost of the item.
VENDOR - Requisitioner picks up the item at the vendor's location and there are no shipping charges.

15. **DMS CONTRACT NO.:** Enter the current D.M.S. state contract number (if applicable).

16. **FOR FCO USE ONLY:** Enter Fixed Capital Outlay Project number (if applicable), category number with year end indicator and fund number.

17. **PURPOSE OR NEED:** Describe in detail why the commodities or contractual services requested are needed and/or benefit to the State.

18. **FISCAL YEAR FOR ENCUMBRANCE:** Enter the fiscal year from which the purchase is to be made (Example: 92/93 or 93/94).

19. **REQUESTOR / DATE:** Signature of person making request and date of signature.

20. **COST CENTER / DATE:** Signature of cost center administrator and date of signature.

21. **SECTION / DATE:** Signature of department personnel having authority to authorize the procurement of commodities or contractual services and date of signature.

22. **BUREAU / DATE:** Signature of bureau chief, if required by their respective Division, and date of signature.

23. **DIVISION / SECRETARY / DATE:** Signature of division director, if required, and date of signature; or signature of Agency Secretary/Deputy Secretary, if required, and date of signature.

24. **PURCHASING** For Purchasing Section use only.

25. **ORGANIZATIONAL CODE** (EXAMPLE: 3705-9999-999)

26. **EXPANSION OPTION** (EXAMPLE: 06 or A6)

27. **OBJECT CODE** (EXAMPLE: 240010) **MUST USE ALL SIX DIGITS.**

28. **AMOUNT OF PURCHASE ORDER.**

29. **FUND** (EXAMPLE: 675002, 510013)

30. **CATEGORY** (EXAMPLE: 04, 06, O3)

31. **MODULE** (EXAMPLE: 9414, 9434, 1304, 0160)

32. **GRANT NO.** (EXAMPLE: AIR 10694, HWO 94)

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

KA 173-94-04

February 7, 1997

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

Subject: U.S. Agri-Chemicals, Inc.
Polk County, Florida
Air Construction Permit AC53-260190
(PSD-FL-222)

Dear Mr. Fancy:

U.S. Agri-Chemicals, Inc. (USAC) has reviewed the draft of amended construction permit AC53-260190 (PSD-FL-222) dated December 23, 1996. After a thorough review of the draft permit and my telephone conversations in December 1996 with Al Linero regarding the permit, USAC offers the following comments on the draft permit and the attached documents.

First, however, a general statement is in order to put several of our comments in perspective. As you will recall, the original construction permit was issued to USAC on September 29, 1995, setting forth technology based Best Available Control Technology (BACT) for fluoride emissions from a prilled MAP plant. The technology based BACT was determined by the Department with no consideration given to cost. The original permit further required Department approval of the control technology selected by USAC.

The control technology selected by the USAC design engineer did not meet Department approval and very divided professional opinions developed. The USAC design engineer claimed, based on reputable references and design experience, that the proposed control technology was comparable to the technology based BACT established by the Department taking into consideration all factors required in a BACT determination. The Department's review engineer, citing comparable references, stated the control technology selected by USAC was not equivalent to the technology based BACT established by the Department.

At this point in time, there is a strong professional disagreement regarding the control technology that represents BACT with no evidence to demonstrate which opinion is correct or most nearly correct. To maintain

the professional integrity of the Department, it is my professional opinion that the referenced permit and the associated documents should be written in a manner that recognizes a difference of professional opinion without taking the judgmental position that one opinion is correct and the other is not.

With this as a basis, we offer the following comments on the draft permit and the associated documents:

INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT

Page 1, paragraph 2.

It should be noted that USAC originally applied for the referenced air construction permit on October 28, 1994. The application was deemed complete on April 4, 1995.

It is suggested that the last sentence in this paragraph be reworded as follows:

> However, because the applicant and the Department cannot agree that the control technology proposed by USAC complied with the Department's technology based BACT determination, the Department is issuing a revised BACT determination and this amended air construction permit with final emission limits.

The rationale for this change is addressed in the introductory paragraphs of this letter.

Page 1, paragraph 5.

This paragraph requires the publication of a Public Notice of the Intent to Issue an Amended Air Construction Permit and cites the requirement of Chapter 403.815 F.S. and Rule 62-103.150, F.A.C. It is our interpretation of Rule 62-103.150, F.A.C. that a Public Notice is not required. Rule 62-103.150(2)(a)1, F.A.C. states,

> The Department shall require publication of notice of the Department's proposed action on an application in the following circumstances:
>
> > All applicants for construction permits for ... air pollution sources shall publish ... a Notice of Intent to Issue a Permit.

Rule 62-103.150(2)(a)5, F.A.C. further states:

> After publication of a Notice of Intent to Issue ... the application shall publish an additional notice if the subject activity or project is substantially modified by the applicant and the Department proposes to issue the permit with the modification. ... For purposes of this subparagraph, the term "substantial modification" means a major relocation or modification of the activity or project that is reasonably expected to cause new or greater adverse environmental impacts on the substantial interests of a person other than the applicant. [Emphasis added]

In the case of the referenced project, no relocation is involved and the only change between this draft permit and the original permit issued on September 29, 1995, is the establishment of numeric fluoride emission limits that are more stringent than limits anticipated at the time the original construction permit was issued.

Based on these facts, it is our interpretation of the referenced rules that no Public Notice should be required for this amended construction permit.

PUBLIC NOTICE OF INTENT TO ISSUE

As stated in our previous comment, it is our interpretation that a Public Notice is not required for the amended air construction permit.

Page 1, paragraph 2.

Again, it should be noted that USAC applied for the permit on October 28, 1994. The permit application was determined to be complete on April 4, 1995.

DRAFT AIR CONSTRUCTION PERMIT

Page 5 of 7, Specific Condition 4

It is suggested that this specific condition be reworded:

> The opacity of emissions from the prilled MAP plant loadout baghouse shall not exceed five percent. [Rule _____, F.A.C.]

Rationale:

Although particulate matter would be the cause of any opacity of emissions, it is the opacity and not the PM/PM10 that is being limited by this condition.

The rule that was cited, 62-296.403, F.A.C., addresses only fluoride emissions. It would be more appropriate to cite a rule related to PM/PM10 and/or visible emissions. The cite could be to Rule 62-297.620(4), F.A.C. which allows alternative test procedures or to one of the general BACT rules (such as Rule 62-296.330, F.A.C. before its repeal).

Page 5 of 7, Specific Condition 5

It is suggested that this condition be reworded as follows:

> Emissions from the prill tower scrubber stack shall not exceed the following limits: [Rule 62-296.403 and _____, F.A.C.]
>
> | | |
> |---|---|
> | PM/PM10: | 24.00 lb/hr and 105.12 tons/yr |
> | Total Fluorides: | 0.58 lb/hr and 2.54 tons/yr |
> | Visible Emissions: | 20% opacity |
>
> The permittee shall have one year from the time of plant startup to demonstrate compliance with these limits.

Rationale:

The rule citation should be expanded to include particulate matter and visible emissions. See comments on Specific Condition 4.

It is requested that the opacity of emissions from the prill tower scrubber stack be limited to 20 percent. The BACT determination accompanying the original permit issued on September 29, 1995, contained no opacity limit for the prill tower. The 15 percent opacity limit appeared for the first time in the draft BACT determination accompanying this draft permit without discussion. Considering the particulate matter emission limit of 24.00 pounds per hour and the opacity of emissions typically allowed for sources with particulate matter emissions in this range, USAC requests an opacity limit of 20 percent for the prill tower scrubber stack.

The time period of one year to comply with the emission limits established by this specific condition is consistent with the proposed BACT

determination. It is suggested that this condition be placed in the permit for purposes of clarity.

Page 5 of 7, Specific Condition 6

This condition, in part, requires simultaneous testing of fluoride levels at the inlet and outlet of the prill tower scrubber. There is no basis for this requirement as the draft permit establishes only an emission limit for fluoride and PM/PM10 from the stack following the scrubber. Nowhere in the permit is a scrubber efficiency specified nor are there any other requirements that would require measuring the fluoride (or PM/PM10) levels at the inlet of the prill tower scrubber. USAC therefore requests that the requirement for scrubber inlet testing be removed from Specific Condition 6.

Specific Condition 6 also implies that PM/PM10 emission measurements by EPA Method 5 are required for the product loadout baghouse. As there is no mass PM/PM10 emission limit established for the product loadout baghouse, the compliance testing requirements should be clarified to specify only visible emissions testing in accordance with EPA Method 9.

In view of these comments, it is suggested that Specific Condition 6 be reworded as follows:

> The initial performance test for total fluorides and annual compliance testing thereafter shall be conducted on the stack of the prill tower scrubber. The initial performance test shall be conducted with the Department option of on-site monitoring by Department staff. PM/PM10 tests and visible emission observations shall be conducted on the prill tower scrubber stack and visible emissions observations shall be conducted on the product loadout baghouse stack ....

Page 6 of 7, Specific Condition 8

The second sentence of this condition should be expanded to include visible emissions observations as well as the PM/PM10 tests.

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

Page 1, BACT Determination Proposed by Applicant

The fluoride emission limit from the prill tower of 0.0417 pounds per ton of P_2O_5 was not proposed by USAC. USAC proposed a limit 0.046 pounds of

fluoride per ton of P_2O_5 input. The limit of 0.0417 pounds per ton was first put forth in a Department letter to USAC dated November 23, 1994.

Regarding the proposed control technology, USAC did not propose a scrubber using recycled slurry. The slurry terminology originated with the Department following the submittal of a Jacobs Engineering document dated September 26, 1996.

Page 3, Revised BACT Determined by DEP

As stated previously, the opacity limit of 15 percent for the prill tower is not consistent with a particulate matter emission rate of 24.0 pounds per hour considering opacity limits established for similar sources with particulate matter emission rates of the same order of magnitude. USAC requests an opacity limit of 20 percent for the prill tower scrubber stack.

The Control Technology section is not necessary. It is recognized that BACT can be emission limiting or technology based. In this particular case, the Department has established a numeric emission limit for fluoride emissions and is further mandating a technology based standard if this limit cannot be met. Both are not necessary. The control technology used by USAC in achieving the numeric BACT limit is the choice of USAC; not of the Department. By specifying control technology in addition to a numeric emission limit, the Department is placing itself in the role of the plant engineer. The Department's role should be to establish an emission limit which it has done.

Page 3, Revised BACT Determination Rationale

In my professional opinion, this section as it is presented is unnecessary. Furthermore, it is judgmental and fails to take into consideration an honest difference of professional opinion. Statements such as:

> ... USAC did not follow the Department's BACT requirement for the venturi-only option listed in the original determination ....

and the statement:

> USAC's proposal is to use a high-solids environmentally inferior, recirculated scrubbing slurry ....

imply failure by USAC to comply with conditions in the original permit. USAC's position is that it complied with the third control technology option presented by the Department in the original BACT determination;

namely, the use of "other system of equivalent removal efficiencies ...." USAC demonstrated equivalent removal efficiencies taking into consideration all factors that must be included in a BACT determination. The fact that there is a honest difference in professional opinion regarding the performance of the system proposed by USAC should not deteriorate into insinuations regarding USAC's compliance with the conditions in the original permit.

The remainder of the rationale presented by the Department rehashes arguments that are already in the record and serves no purpose in the final BACT determination. The rationale is argumentative and presents one side of a technical argument that is totally unnecessary given that the Department has established a numeric emission limit for fluorides. If the BACT determination was a technology based determination (as was the original determination), a technical discussion of control technology might be warranted. In this case, it is not.

Page 5, Conclusion

The Department's opinion of whether or not USAC will be able to achieve the BACT emission limit for fluorides is irrelevant and unnecessary. The statement that "... the permittee will need to install technology described by the Department ...." should be deleted as previously discussed. The Department has established a numeric BACT emission limit and the technology that USAC uses to meet this limit should be left to the company. The Department should not place itself in the engineering business.

I appreciate your consideration of these comments and would be more than happy to provide additional information should it be required. Please feel free to contact me if you have any questions or comments.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa

c: Mr. A. Linero, FDEP
Mr. S. Susick, USAC
Mr. R. Brunk, USAC
Mr. L. Curtin
cc: J. Reynolds, BAR
B. Thomas, SWD
R. Harwood, Polk Co.
EPA
NPS

KOOGLER & ASSOCIATES

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

KA 173-94-04

January 2, 1997

VIA FAX AND MAIL

Mr. William Congden, Esq.
Office of General Counsel
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Motion for Extension of Time to
File an Appeal
U.S. Agri-Chemicals Corporation
Polk County, Florida

Dear Mr. Congden:

Attached is a request for an extension of time to file an Appeal in accordance with Rule 62-103.070, FAC.

If you have any questions concerning this request, please do not hesitate to contact me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

c: Mr. Clair Fancy, FDEP, Tallahassee
Mr. A. A. Linero, FDEP, Tallahassee
Mr. Steven Susick, USAC
Mr. Ron Brunk, USAC
Mr. Viet Ta, USAC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of an Air Permit for

U.S. Agri-Chemicals Corporation
3225 S.R. 630, West
Ft. Meade, Florida 33841-9799

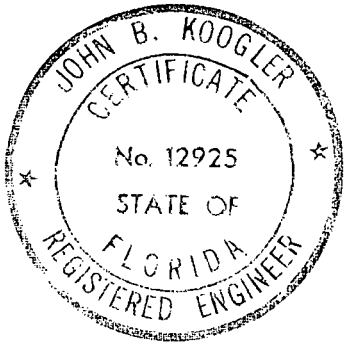
FDEP File No. AC53-260190 (PSD-FL-222)

Polk County - AP

MOTION FOR EXTENSION OF TIME

The Applicant, U.S. Agri-Chemicals Corporation by and through its undersigned Engineer of Record and pursuant to Rule 62-103.070, FAC, requests the Secretary of FDEP to grant a 60-day extension of time in which to file an Appeal. The additional time will allow U.S. Agri-Chemicals adequate time to review the permit and to request minor modifications, if necessary.

Dated the 2nd day of January 1997 in Gainesville, Alachua County, Florida.



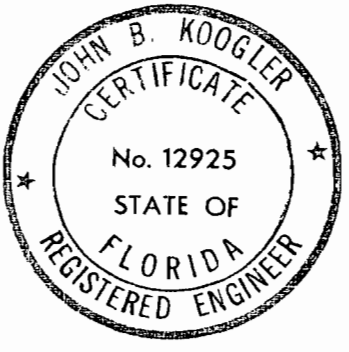
Koogler & Associates
Environmental Services

John B. Koogler, Ph.D., P.E.
Engineer of Record for
U.S. Agri-Chemicals Corporation
Florida Registration No. 12925
4014 N.W. 13th Street
Gainesville, FL 32609
(352) 377-5822

KOOGLER & ASSOCIATES

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing has been furnished to Mr. William Congden, Office of the General Counsel, FDEP, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, Mr. Clair Fancy and Mr. A. A. Linero, FDEP, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and Mr. Steven Susick, Mr. Ron Brunk and Mr. Viet Ta, U.S. Agri-Chemicals, 3225 S.R. 630 West, Ft. Meade, Florida 33841-9799 by FAX and by U.S. Mail, this 2nd day of January 1997.



John B. Koogler, Ph.D., P.E.
Florida Registration No. 12925

KOOGLER & ASSOCIATES

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

December 23, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
US Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: DRAFT Amended Air Construction Permit No. AC53-260190 (PSD-FL-222)
and Final BACT Determination for Ft. Meade Prilled MAP Plant

Dear Mr. Susick:

Enclosed is one copy of the DRAFT Amended Air Construction Permit and Revised BACT Determination for the Prilled MAP Plant to be constructed at 3225 State Road 630 West, Ft. Meade, Polk County. The Department's Intent to Issue Amended Air Construction Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT" must be published within 30 (thirty) days of receipt of this letter. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. A. A. Linero, P.E. at the above letterhead address. If you have any questions, please contact John Reynolds at 904/488-1344.

Sincerely,

A. A. Linero, P.E. 12/23

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

CHF/hh

Enclosures

P 265 659 119

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

Sent to Mr. Steven J. Susick	
Street & Number 3225 SR 630 West	
Post Office, State, & ZIP Code Fort Meade, FL 33841-9799	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 12-26-96 Permit: AC53-260190 PSD-FL-222	

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered. AC53-260190 PSD-FL-222

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Steven J. Susick
General Manager
US Agrichemicals, Inc.
3225 State Road 630 West
Fort Meade, FL 33841-9799

4a. Article Number
P 265 659 119

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

7. Date of Delivery
12-30-96

5. Received By: *(Print Name)*

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

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

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

Thank you for using Return Receipt Service.

In the Matter of an
Application for Permit by:

US Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841/

Permit No. AC53-260190 (PSD-FL-222)
Prilled MAP Plant
Polk County

INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an amended air construction permit (copy of DRAFT Amended Permit enclosed) as detailed in the permit file specified above, for the reasons stated below.

US Agri-Chemicals, Inc., applied on April 4, 1995, to the Department for an air construction permit to construct a Prilled Monoammonium Phosphate (MAP) plant located at 3225 State Road 630 West, near Ft. Meade in Polk County. The original construction permit was issued on September 29, 1995, requiring, prior to construction, Department approval of the control technology design for the BACT option selected. Emissions tests were required by the original permit following construction so that final emission limits could be established in a final BACT determination and amended construction permit. However, because the applicant's control technology design does not comply with the Department's BACT determination, the Department is issuing a Revised BACT Determination and this amended air construction permit with final emission limits.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, 62-212. This source is not exempt from permitting procedures.

The Department intends to issue this amended air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Sections 403.815 and Rule 62-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed "PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT." The notice shall be published one time only within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400

(Telephone: 904/488-1344; Fax: 904/922-6979), within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit pursuant to Rule 62-103.150(6), F.A.C.

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

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

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., or a party requests mediation as an alternative remedy under section 120.573 before the deadline for filing a petition. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for petitioning for a hearing are set forth below, followed by the procedures for requesting mediation.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 904/488-9730, fax: 904/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition (or a request for mediation, as discussed below) within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with rule 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county

in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the action or proposed action addressed in this notice of intent.

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

A person whose substantial interests are affected by the Department's proposed permitting decision, may elect to pursue mediation by asking all parties to the proceeding to agree to such mediation and by filing with the Department a request for mediation and the written agreement of all such parties to mediate the dispute. The request and agreement must be filed in (received by) the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, by the same deadline as set forth above for the filing of a petition.

A request for mediation must contain the following information: (a) The name, address, and telephone number of the person requesting mediation and that person's representative, if any; (b) A statement of the preliminary agency action; (c) A statement of the relief sought; and (d) Either an explanation of how the requester's substantial interests will be affected by the action or proposed action addressed in this notice of intent or a statement clearly identifying the petition for hearing that the requester has already filed, and incorporating it by reference.

The agreement to mediate must include the following: (a) The names, addresses, and telephone numbers of any persons who may attend the mediation; (b) The name, address, and telephone number of the mediator selected by the parties, or a provision for selecting a mediator within a specified time; (c) The agreed allocation of the costs and fees associated with the mediation; (d) The agreement of the parties on the confidentiality of discussions and documents introduced during mediation; (e) The date, time, and place of the first mediation session, or a deadline for holding the first session, if no mediator has yet been chosen; (f) The name of each party's representative who shall have authority to settle or recommend settlement; and (g) The signatures of all parties or their authorized representatives.

As provided in section 120.573 F.S., the timely agreement of all parties to mediate will toll the time limitations imposed by sections 120.569 and 120.57 for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons whose substantial interests will be affected by such modified final decision of the Department have a right to petition for a hearing only in accordance with the requirements for such petitions set forth above. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under sections 120.569 and 120.57 remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

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

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

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

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the

Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, revised BACT Determination, and the DRAFT permit) and copies were mailed by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12-26-96 to the persons listed:

Mr. Steven J. Susick, P.E., US Agri-Chemicals, Inc. *
Mr. Bill Thomas, SWD
Mr. Roy Harwood, Polk County
Mr. Brian Beals, EPA
Mr. John Bunyak, NPS

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Lori Tober 12-26-96
(Clerk) (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AMENDED AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit No.: AC53-260190 (PSD-FL-222)
US Agri-Chemicals, Inc.
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an amended air construction permit to US Agri-Chemicals, Inc. for a prilled MAP plant located at 3225 State Road 630 West, Fort Meade, Polk County. A Best Achievable Control Technology (BACT) determination was required. The applicant's name and address are: US Agri-Chemicals, Inc., 3225 State Road 630 West, Fort Meade, Florida 33841.

This company applied on April 4, 1995, to construct a prilled MAP plant at its existing facility. The original construction permit was issued on September 29, 1995. Particulate and fluoride emissions from the prill tower and cooler are controlled by a scrubber while the product loadout area is controlled by a baghouse. This amendment was necessitated by a change in the basis for setting final emission limits. The final emission limit for gaseous fluoride is more stringent than that contemplated in the original permit, while there is no change in the particulate matter emissions originally contemplated.

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

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

The Department will issue the FINAL Permit with the proposed amended conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S. or a party requests mediation as an alternative remedy under section 120.573 before the deadline for filing a petition. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for petitioning for a hearing are set forth below, followed by the procedures for requesting mediation.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 of the F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 904/488-9370, fax: 904/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition (or a request for mediation, as discussed below) within the appropriate

time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with rule 28-5.207 of the Florida Administrative Code.

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

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

A person whose substantial interests are affected by the Department's proposed permitting decision, may elect to pursue mediation by asking all parties to the proceeding to agree to such mediation and by filing with the Department a request for mediation and the written agreement of all such parties to mediate the dispute. The request and agreement must be filed in (received by) the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, by the same deadline as set forth above for the filing of a petition.

A request for mediation must contain the following information: (a) The name, address, and telephone number of the person requesting mediation and that person's representative, if any; (b) A statement of the preliminary agency action; (c) A statement of the relief sought; and (d) Either an explanation of how the requester's substantial interests will be affected by the action or proposed action addressed in this notice of intent or a statement clearly identifying the petition for hearing that the requester has already filed, and incorporating it by reference.

The agreement to mediate must include the following: (a) The names, addresses, and telephone numbers of any persons who may attend the mediation; (b) The name, address, and telephone number of the mediator selected by the parties, or a provision for selecting a mediator within a specified time; (c) The agreed allocation of the costs and fees associated with the mediation; (d) The agreement of the parties on the confidentiality of discussions and documents introduced during mediation; (e) The date, time, and place of the first mediation session, or a deadline for holding the first session, if no mediator has yet been chosen; (f) The name of each party's representative who shall have authority to settle or recommend settlement; and (g) The signatures of all parties or their authorized representatives.

As provided in section 120.573 F.S., the timely agreement of all parties to mediate will toll the time limitations imposed by sections 120.569 and 120.57 for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of

the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons whose substantial interests will be affected by such modified final decision of the Department have a right to petition for a hearing only in accordance with the requirements for such petitions set forth above. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under sections 120.569 and 120.57 remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

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

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 904/488-1344
Fax: 904/922-6979

Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the Draft Amended Permit, the revised BACT Determination, the original permit, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 904/488-1344, for additional information.

Department of Environmental Protection

DRAFT

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

PERMITTEE:
US Agri-Chemicals Corp.
3225 State Road 630 West
Fort Meade, FL 33841-9799

Permit Number: AC 53-260190
PSD-FL-222
Expiration Date: Dec. 30, 1998
County: Polk
Latitude/Longitude: 27°44'25"N
81°51'05"W
Project: 60 TPH Prilled MAP Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, 212, 272, 275, 276, and 297, Florida Administrative Code (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the emission unit shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department of Environmental Protection (Department) and specifically described as follows:

For the construction of a 60 TPH Prilled MAP Plant. The facility is located at 3225 State Road 630 West, Fort Meade, Polk County, Florida. The UTM coordinates are Zone 17: 416 km East and 3,069 km North.

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

Attachments are listed below:

1. DEP's letter dated November 23, 1994
2. USDOI's letter dated December 15, 1994
2. DEP's letter dated February 17, 1995
3. K&A's letter dated March 2, 1995
4. K&A's letter dated March 20, 1995
5. K&A's letter dated March 29, 1995
6. K&A's letter dated March 31, 1995
7. USAC's letter dated July 13, 1995
8. USEPA's letter dated August 7, 1995
9. K&A's letter dated August 14, 1995
10. K&A's letter dated September 12, 1995
11. K&A's letter dated June 4, 1996
12. DEP's letter dated July 3, 1996
13. K&A's letter dated October 1, 1996

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 403.161, 403.727, or 403.859 through 403.861, F.S. 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 the permit.

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

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

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

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of

GENERAL CONDITIONS:

credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

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

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

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

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

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

GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

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

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT)
(X) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards (NSPS)

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:

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

GENERAL CONDITIONS:

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

SPECIFIC CONDITIONS:

1. Unless otherwise indicated, the construction and operation of the subject Prilled MAP production facility shall be in accordance with the capacities and specifications stated in the application. [Rule 62-210.300, F.A.C.]

2. The production rate of the Prilled MAP plant shall not exceed 60 tons MAP product per hour. [Rule 62-212.200(223), F.A.C.]

3. The Prilled MAP plant may operate up to 8760 hours per year. [Rule 62-212.200(223), F.A.C.]

4. PM/PM10 emissions from the Prilled MAP plant loadout baghouse shall not exceed 5% opacity. [Rule 62-296.403, F.A.C.]

5. Emissions of fluorides and PM/PM10 from the scrubber shall not exceed the following limits: [Rule 62-296.403, F.A.C.]

PM/PM10:	24.00 lb/hr and 105.12 tons/yr
Total Fluorides:	0.58 lb/hr and 2.54 tons/yr
Visible Emissions:	15% opacity

6. The initial performance test for total fluorides shall be done simultaneously on both inlets and the outlet of the prill tower scrubber, with on-site monitoring by Department staff. Annual compliance tests for fluorides thereafter shall be done on the outlet only unless otherwise required by the Department. PM/PM10 tests shall be conducted on the prill tower scrubber outlet and the product loadout baghouse. For the duration of all tests the emission unit shall be operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum operating rate allowed by the permit. If it is impracticable to test at permitted capacity, then the emission unit may be tested at less than capacity (i.e., less than 90 percent of maximum operating rate allowed by the permit); in this case, subsequent emission unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emission unit is so limited, then operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity in the permit. [Rule 62-297.340(1)(a), F.A.C.]

SPECIFIC CONDITIONS:

7. The Department's Southwest District office shall be notified in writing at least 15 days prior to the performance test. Compliance test results shall be submitted to that office within 45 days of test completion. [Rule 62-297.340(1)(i), F.A.C.]

8. The test procedures for fluorides shall be in accordance with EPA Reference Methods 1, 2, 3, and 13A or 13B, as published in 40 CFR 60, Appendix A. The test procedures for PM/PM10 shall be in accordance with EPA Reference Methods 1, 2, 3, 5 and 9 as published in 40 CFR 60, Appendix A. [Rules 62-296.800 and 62-297.401, F.A.C.]

9. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

10. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

11. The Prilled MAP plant shall be subject to the following:

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

b. 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 62-210.700(4), F.A.C.]

c. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest. [Rule 62-210.700(5), F.A.C.]

d. In case of excess emissions resulting from malfunctions, each source shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]

SPECIFIC CONDITIONS:

12. The permittee shall submit an Annual Operating Report using DEP Form 62-210.900(4) to the Department's Southwest District office by March 1 of the following year for the previous year's operation. [Rule 62-210.370, F.A.C.]

13. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.090, F.A.C.]

14. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit. [Rules 62-4.055 and 62-4.220, F.A.C.]

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

_____

Howard L. Rhodes, Director
Division of Air Resources Management

DRAFT

REVISED
Best Available Control Technology (BACT) Determination
U.S. Agri-Chemicals Corporation
Fort Meade, Polk County, Florida
PSD-FL-222
AC53-260190

The applicant proposes to construct a 60 tons per hour (TPH) prilled monoammonium phosphate (MAP) plant at their phosphate processing facility in Fort Meade. The proposed project will result in a significant increase in emissions of particulate matter (PM-PM10). The project is, therefore, subject to Prevention of Significant Deterioration (PSD) review in accordance with Rule 62-212.400, Florida Administrative Code (F.A.C.). The BACT determination is part of the review required by Rules 62-212.400 and 62-296.403(1)(i), F.A.C.

Date of Receipt of Complete Application: April 4, 1995

BACT Determination Proposed by Applicant:

Emission Limits: Tower & Cooler - 0.0417 lb F/ton P_2O_5 input
- 0.40 lb PM-PM10/ton MAP
Product Loadout - 0.072 lb PM-PM10/ton MAP

Control Technology: - Medium-energy venturi scrubber using recycled slurry (for tower and cooler)
- Baghouse (for product loadout)

BACT Determination Procedure:

In accordance with F.A.C. Chapter 62-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, Rule 62-212.410(1), F.A.C., states that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emision limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

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

Original BACT Determined by DEP:

Emission Limits: Tower and Cooler - Fluoride and PM/PM10 limits to be established after performance test
Product Loadout - No visible emissions

Control Technology:

Options for Tower & Cooler:

- Medium-energy venturi primary scrubber with packed secondary scrubber using recirculated gypsum/cooling pond water (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM10 over 5 microns)

- Medium-to-high-energy venturi scrubber using neutralized water from dedicated scrubber pond with fresh water makeup (minimum 99.3% removal of total gaseous fluorides and 99.0% removal by weight of PM/PM10 over 5 microns)

- Other system with equivalent removal efficiencies approved by the Department

Product Loadout: Baghouse as proposed

Original BACT Determination Rationale:

The applicant based their proposed fluoride BACT emission limit of 0.0417 lb F per ton P2O5 on the Department's 1994 BACT determination for IMC-Agrico's granular Diammonium Phosphate plant in Polk County (PSD-FL-204). However, due to the substantial differences in air flow and other process variables that exist between the granulation and prill tower processes, the Department cannot rely on the granulation emissions to accurately predict emissions from the prill process.

PM/PM10 emission limits were proposed by the applicant based on a 1980 BACT determination for a prilled MAP plant operated by IMC-Agrico. Since that is the only BACT determination available (15 years old) and technological advances have no doubt been made since 1980, the Department prefers not to rely on it for this new source.

This leaves the Department without an adequate basis for arriving at BACT limits for this project prior to construction. In such cases where relevant data are not available on which to base an enforceable BACT emission limit, the Department must require that the level of control and the emission control equipment capabilities be at least equivalent to those imposed in other BACT determinations for the same industry.

Based on a review of state-of-the-art fluoride scrubber capabilities in the phophate industry, the Department finds that for this application the control equipment should be capable of achieving at least 99.3% removal of gaseous fluorides and 99.0% (wt.) removal of PM/PM10 above 5 microns. The applicant must submit scrubber design calculations and drawings to the Department prior to construction to show that the equipment will meet these removal efficiencies. The BACT emission limits will be established upon completion of the performance tests.

Revised BACT Determined by DEP:

Emission Limits: Tower & Cooler - 0.019 lb F/ton P2O5 input
0.40 lb PM-PM10/ton MAP
15% opacity
Product Loadout - No visible emissions

Control Technology:

Options for Tower & Cooler if Fluoride Limits Not Met:

- Venturi primary scrubber using recirculated slurry followed by secondary scrubber using once-through cooling pond water.
- Venturi scrubber using recirculated neutralized water from dedicated scrubber pond.

Product Loadout: Baghouse as proposed

Revised BACT Determination Rationale

This revised BACT determination was required since USAC did not follow the Department's BACT requirement for the venturi-only option listed in the original determination; namely, the use of

neutralized scrubbing water and a dedicated scrubber pond for settling of solids. USAC's proposal is to use a high-solids, environmentally inferior, recirculated scrubbing slurry (up to 15% P2O5) for product recovery reasons. This hot slurry (122 F.) will cause a higher fluoride content in the gas compared to pond water.

Due to the limited emission test data available for this type of plant, the Department issued a permit to USAC requiring that limits be established following completion of the compliance tests, as long as USAC followed the BACT requirements. USAC accepted the permit and its conditions, then submitted engineering calculations claiming that the venturi with its high-solids scrubbing water will provide gaseous fluoride removal equivalent to that of a two-stage scrubber system using much cleaner water from the process water cooling pond.

The Department responded by showing that USAC's scrubber would achieve only about half of the 5.3 transfer units claimed. This analysis was based in part on a technical paper that showed about 3.5 mass transfer units (vs. USAC's 5.3) would be the most that could reasonably be expected for a venturi removing fluorides using neutralized pond water. USAC's design engineers (the Jacobs Engineering Group in Lakeland, Florida) then sent a letter to USAC claiming 6.0 transfer units for their high-solids scrubbing water. This was based on their analysis of data in the above article. These data were obtained using neutralized, clean scrubbing water and not a slurry as the Jacobs design uses. A copy of Jacobs' original submittal, the Department's response, and Jacobs' followup letter is attached to the permit.

The Jacobs calculations are incorrect because of two improper assumptions. The extrapolated curve that Jacobs drew on Figure 5 of the article is not relevant for their unneutralized scrubbing water. Secondly, the data in Figure 5 cannot be infinitely extrapolated at constant L/G because the short contact time in the venturi throat prevents the mass transfer from increasing beyond a certain gas velocity. Attached is an extrapolation performed on Figure 6 which shows the variation of transfer units with the same variables as in Figure 5 but with pressure drop added. As shown, a maximum of 4.0 transfer units is obtained for the conditions specified by Jacobs, again keeping in mind that this is applicable only for neutralized water. The highest actual test result reported was 3.6 NTU with neutralized water, therefore, the Department's 2.7 NTU estimate is reasonable for the high-solids scrubbing slurry Jacobs has proposed.

The limitations on gas/liquid mass transfer in a venturi scrubber result primarily from the short contact time. Since the

time is so short, there is a point beyond which mass transfer will not increase as additional transfer area is created by the smaller liquid drops formed with increased pressure drop.

To further substantiate the Department's analysis, attached is a copy of Dr. Aaron J. Teller's October 4 letter describing what would be required to achieve greater than 3.5 NTU. As he states, a throat velocity of 400 ft/s (122 m/s vs. Jacobs' 74 m/s), L/G of 12 gpm/1000 cfm (1.60 m3/1000 m3 vs. Jacobs' 1.23 m3/1000 m3), and pressure drop of 130 in.wc (3300 mm.wc vs. Jacobs' 483 mm.wc), would be required to achieve 4.2-5.2 NTU. The energy consumption required would be about 6-7 times higher than the Jacobs design calls for.

Conclusion:

As a result of the change in the basis for the emission limits, the fluoride BACT applicability comes under Rule 62-296.403(1)(i), F.A.C., instead of Rule 62-212.400, F.A.C. The Department believes that it will ultimately be necessary for the permittee to implement the technology specified by the Department to meet the BACT fluoride limit. If the permittee is unable to comply with the limit using the Jacobs scrubber design, the permittee will need to install the technology described by the Department or otherwise achieve the specified limit. The pemittee will have one year to demonstrate compliance with the limit.

BACT Analysis Details Available From:

John Reynolds, Permit Engineer
A. A. Linero, P.E., Administrator
New Source Review Section
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road (MS 5505)
Tallahassee, Florida 32399-2400

Recommended by:

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

_____, 1996
Date

Approved by:

Howard L. Rhodes, Director
Division of Air Resources Management

_____, 1996
Date

DRAFT

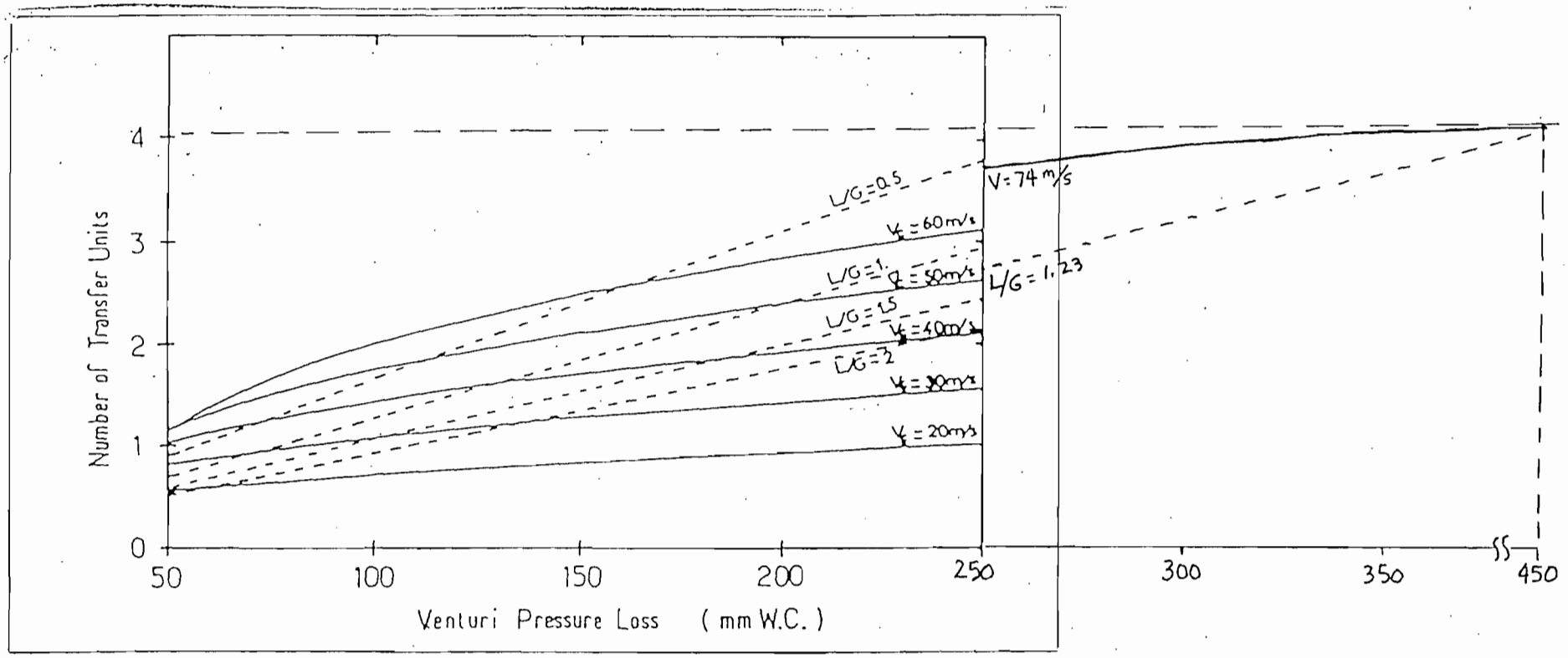


Figure 6. NTU vs. pressure loss. L/G and V_G are taken as parameters. T_{GE} = 60°C and Lv/Dc = 8.5.

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasee, FL 32399-2400

Dr. Mr. Reynolds,

It was indicated that a claim for achievement of 5.3 Transfer units was made for a fluoride scrubbing process using a venturi.

It should be noted that the venturi is inherently a particulate collection device and is used only as a scrubber of last resort. The reason is that the mass transfer is limited because of minimal surface renewal. The deficiency can be overcome by decreasing the partical size of the spray and increasing the L/G, provided cost of operation is not restrictive.

Inasmuch as a venturi is generally followed by a cyclone seperator, an additional transfer unit can be attained due to wetted wall action

A comparison of performance of venturi-cyclone systems is attached (Table I). As noted, the rational range of operation will provide in the region of 3.5 transfer units. The 5 transfer unit range can be achieved if the client will accept an energy consumption of 370 HP/100000 CFM.

Sincerely

AJT

TABLE I

VENTURI - CYCLONE SEPARATOR PERFORMANCE

SYSTEM	THROAT VEL., FPS	L/G GAL/1000CFM	ΔP in w.g.	HP - GAS + LIQ / 1000 CFM	NTU Transfer UNITS
VENTURI - CYCLONE	140	12	16	45	2.2 - 2.6
VENTURI - CYCLONE	250	12	50	150	3.2 - 4.0
VENTURI - CYCLONE	400	12	130	370	4.2 - 5.2

Acct. No. Page of
Compld. By Date
Ck'd. By Date

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

October 17, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Ft. Meade, Florida 33841-9799

Re: Prilled Monoammonium Phosphate Plant - Ft. Meade
Permit No. AC53-260190 (PSD-FL-222)

Dear Mr. Susick:

The Department has reviewed the various submittals regarding the air pollution control equipment to be used at the new prilled MAP plant.

The IMC data appear to a logical basis for setting a final fluoride emission limit. We recommend a limit of 0.019 lb F/ton P_2O_5 and intend to modify your construction permit accordingly. We can provide USAC a 12 month period to test and take subsequent measures (if necessary) to install additional or different control equipment (such as that previously specified by the Department) in order to meet our proposed limit.

Attached is a review of the most recent submittal sent to us on behalf of USAC.

Sincerely,

C. H. Fancy, Chief
Bureau of Air Regulation

CHF/chf/l

cc: Brian Beals, EPA
John Bunyak, NPS
Al Linero, BAR
Bill Thomas, SWD
John Koogler, K&A

P 339 251 171

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Sent to: Steven Swick	
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PSD-FI-222	

PS Form 3800, April 1995

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3. Article Addressed to:
Steven Swick, Gen. Mgr
US Agri-Chemicals Corp
3225 State Rd 630 West
Ft. Meade, Fl 33841-9799

4a. Article Number: P 339 251 171

4b. Service Type
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☐ Express Mail ☐ Return Receipt for Merchandise

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EVALUATION OF INFORMATION SUBMITTED
BY US AGRI-CHEMICALS, INC.
ON OCTOBER 1, 1996

This is an evaluation of the information presented in the September 26 and October 1, 1996 letters from Koogler & Associates and Jacobs Engineering Group, Inc., concerning PSD-FL-222 for the US Agri-Chemicals (USAC) Prilled MAP Plant. Before addressing the details of USAC's latest submittals, a review of the history of this permit is summarized below.

Rather than proposing a conventional scrubbing system where the gas is contacted with relatively clean pond water, USAC sought approval for a venturi scrubber that uses a recirculated scrubbing medium for product recovery reasons. USAC's proposal was to use a high-solids, environmentally inferior, recirculated scrubbing slurry (up to 15% P_2O_5), part of which could be recycled to the prill tower. This hot slurry (122 F.) would result in a higher fluoride content in the gas compared to pond water, since it is well known that temperature has a far greater effect on fluoride emissions than concentration. The Department found that this would not be acceptable for best available control technology (BACT) and issued a BACT determination requiring neutralization of the scrubber water and a dedicated pond for cooling and settling of solids (USAC proposed the pond in their application).

Due to the limited emission test data available for this type of plant, the Department issued a permit to USAC requiring that limits be established following completion of the compliance tests, as long as USAC followed the BACT requirements. USAC accepted the permit and its conditions, then submitted engineering calculations claiming that the venturi with its high-solids scrubbing water will provide gaseous fluoride removal equivalent to that of a packed scrubber using once-through pond water.

The Department responded on July 3 taking issue with USAC's claim of equivalent results. Our analysis was based in part on a technical paper we enclosed showing that about 3.5 mass transfer units (vs. USAC's 5.3) would be the most that could reasonably be expected for a venturi removing fluorides using neutralized pond water. On September 26, Jacobs Engineering sent a letter to USAC claiming 6.0 transfer units for their high-solids scrubbing water. This was based on their analysis of data in the article which was obtained using neutralized scrubbing water.

The Department cannot agree with these latest calculations submitted by Jacobs. The extrapolated curve that Jacobs drew on Figure 5 of the article is not relevant for their unneutralized scrubbing slurry. Secondly, the data in Figure 5 cannot be infinitely extrapolated at constant L/G because the short contact time in the venturi throat prevents the mass transfer from increasing beyond a certain gas velocity.

Attached is an extrapolation performed on Figure 6 which shows the variation of transfer units with the same variables as in Figure 5 but with pressure drop added. As shown, a maximum of 4.0 transfer units is obtained for the conditions specified by Jacobs, again keeping in mind that this is applicable only for neutralized water. The highest actual test result reported in the article was 3.6 NTU with neutralized water, therefore, the Department's 2.7 NTU estimate is reasonable for the high-solids scrubbing slurry Jacobs has proposed.

The limitations on gas/liquid mass transfer in a venturi scrubber result primarily from the short contact time. Since the time is so short, there is a point beyond which mass transfer will not increase as additional transfer area is created by the smaller liquid drops formed with increased pressure drop. Consequently, transfer unit values cannot be extrapolated as Jacobs attempted.

To further substantiate the Department's analysis, attached is a copy of Dr. Aaron J. Teller's October 4 letter describing what would be required to achieve greater than 3.5 NTU. As he states, a throat velocity of 400 ft/s (122 m/s vs. Jacobs' 74 m/s), L/G of 12 gpm/1000 cfm (1.60 m3/1000 m3 vs. Jacobs' 1.23 m3/1000 m3), and pressure drop of 130 in.wc (3300 mm.wc vs. Jacobs' 483 mm.wc), would be required to achieve 4.2-5.2 NTU. The energy consumption required would be about 6-7 times higher than the Jacobs design calls for.

Conclusion:

Jacobs' venturi design will not accomplish the fluoride removal that they have represented to the Department. Therefore, the USAC proposal is not representative of BACT for fluorides. The final emission limits for the MAP prill tower and cooler should be the same as proposed in the Department's July 3 letter.

John Reynolds 10-17-96

John Reynolds, Permit Engineer
New Source Review Section
Bureau of Air Regulation
Department of Environmental Protection

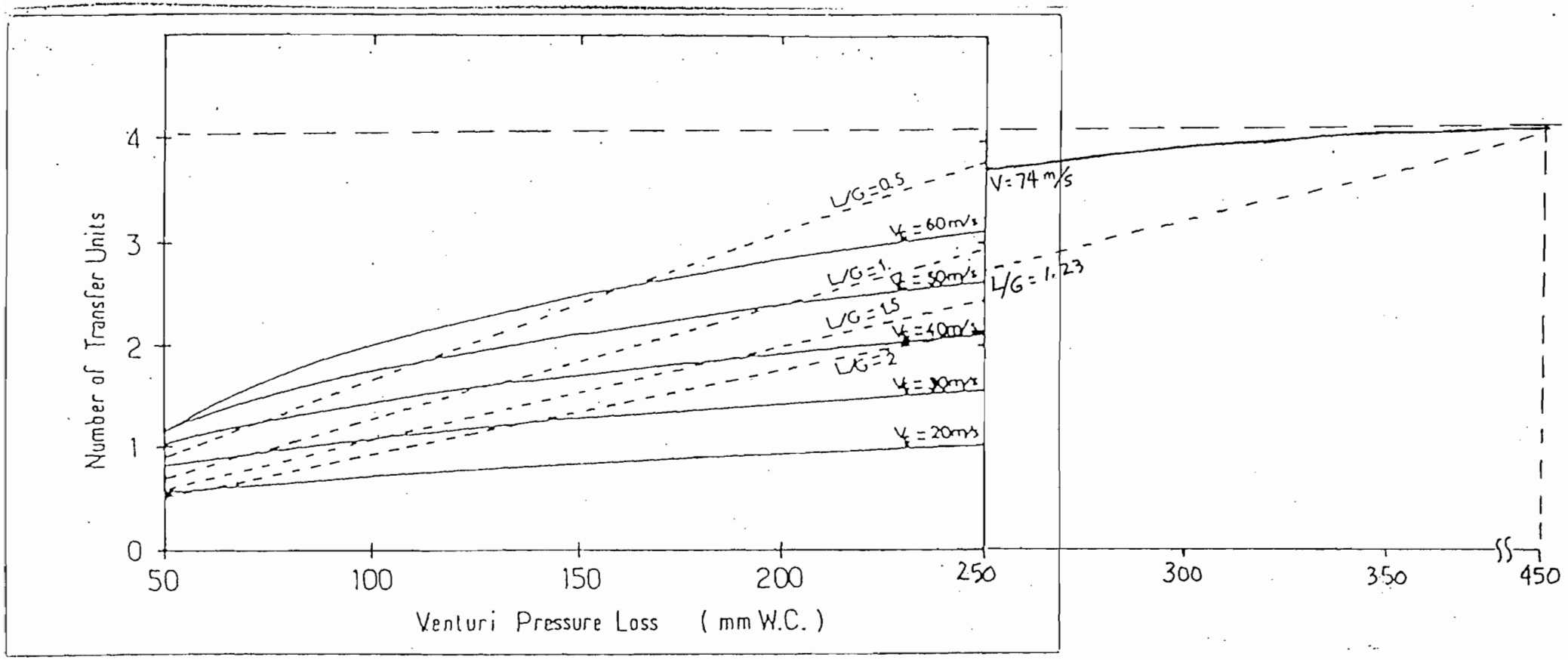

Figure 6. NTU vs. pressure loss. L/G and V_G are taken as parameters. T_{GE} = 60°C and Lv/Dc = 8.5.

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasse, FL 32399-2400

Dr. Mr. Reynolds,

It was indicated that a claim for achievement of 5.3 transfer units was made for a fluoride scrubbing process using a venturi.

It should be noted that the venturi is inherently a particulate collection device and is used only as a scrubber of last resort. The reason is that the mass transfer is limited because of minimal surface renewal. The deficiency can be overcome by decreasing the partical size of the spray and increasing the L/G, provided cost of operation is not restrictive.

Inasmuch as a venturi is generally followed by a cyclone separator, an additional transfer unit can be attained due to wetted wall action.

A comparison of performance of venturi-cyclone systems is attached (Table I). As noted, the rational range of operation will provide in the region of 3.5 transfer units. The 5 transfer unit range can be achieved if the client will accept an energy consumption of 370 HP/100000 CFM.

Sincerely

A. Teller

TABLE I

VENTURI - CYCLONE SEPARATOR PERFORMANCE

SYSTEM	THROAT VEL, FPS	L/G GAL/1000CFM	ΔP in w.g.	HP - GAS + LIQ / 10000 CFM	NTU Transfer UNITS
VENTURI - CYCLONE	140	12	16	45	2.2 - 2.6
VENTURI - CYCLONE	250	12	50	150	3.2 - 4.0
VENTURI - CYCLONE	400	12	130	370	4.2 - 5.2

Acct. No. Page
Compld. By Date
Ck'd. By Date

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasse, FL 32399-2400

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Sincerely

AJT

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg.
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

32399/6364

TABLE I

VENTURI - CYCLONE SEPARATOR PERFORMANCE

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Acct. No. Page of
Compld. By Date
Ck'd. By Date

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 173-94-04

October 1, 1996

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

Subject: USAC Powdered MAP Plant
AC53-260190 (PSD-FL-222)

Dear Mr. Linero:

On behalf of U.S. Agri-Chemicals, Inc. (USAC), I am forwarding under cover of this letter final drawings and additional information to describe the performance of the venturi scrubber/cyclonic separator that USAC is proposing to control fluoride (gaseous and particulate) and particulate matter emissions from a powdered MAP plant. Based upon information developed by the Jacobs Engineering Group, Inc. (Jacobs) using the reference in the November 1978 issue of Chemical Engineering Progress (*Absorbing Fluorine Compounds from Waste Gases*, C. Djololian and D. Billaud, Rhone-Poulenc, Paris, France) provided by FDEP, the scrubber system proposed by USAC will achieve six or more transfer units. This is the number of transfer units typically required to achieve acceptable fluoride emission rates from a phosphoric acid plant.

During the May 21, 1996, meeting between the Department and USAC, scrubber performance based on NTUs rather than on efficiency of fluoride removal was agreed to. This matter was discussed as a scrubber with about six NTUs operating on a phosphoric acid plant can achieve a fluoride removal efficiency in the range of 99+ percent and Jacobs explained that the MAP plant venturi cyclonic scrubber would achieve an NTU comparable to this. Based upon supporting documentation being provided to FDEP, USAC would be allowed to construct the scrubbing system and conduct tests to demonstrate the performance of the system. Based on these tests, a permittable emission rate for the plant would be established.

As stated previously, Jacobs, using the reference provided by FDEP, has determined that the venturi scrubber/cyclonic separator system proposed for the USAC powdered MAP plant can achieve six NTUs and is therefore equivalent to the performance achieved by scrubbing systems permitted for phosphoric acid plants.

With your approval, I will proceed with the development of a protocol that can be used to establish a permittable fluoride (gaseous plus particulate) emission rate for the plant once the plant is operating.

Regarding particulate matter emission limits, USAC concurs with the limit of 24.0 lb/hr of particulate matter from the spray tower/cooler system as stated in the Department's July 3, 1996, letter. Based on applicable Department standards, the opacity limit for this system should be 20 percent.

I appreciate your review of this information and look forward to a final resolution of this matter. If you have any questions, please give me a call or contact Bryan Blythe of Jacobs at 941-665-1511.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

cc: J. Reynolds

JACOBS ENGINEERING GROUP INC.

POST OFFICE BOX 2008 • LAKELAND, FL 33806-2008 • HIGHWAY 98S AT STATE ROAD 540 • LAKELAND, FL 33813-9763
TELEPHONE (941) 665-1511 • FAX (941) 665-5323

September 26, 1996

Mr. Steven J. Susick, P.E.
U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799

Fax No: ***285-9779***

Subject: **USAC Prilled MAP Plant**
Particulate and Fluoride Emissions

Dear Mr. Susick:

As you requested, I have reviewed the July 3, 1996, letter from A.A. Linero concerning emissions from your prilled MAP plant. The following comments are relevant:-

Rhone-Poulenc Article

Rhone-Poulenc was a major fertilizer producer in Europe in the 1970's when this article was written and they also licensed their fertilizer plant technology for plants built throughout the world. Jacobs has competed against Rhone-Poulenc for international fertilizer projects on several occasions. I believe they sold their fertilizer licensing technology to Spechim in the 1990's. Rhone-Poulenc may be considered skilled in the art of fertilizer technology and we are, indeed, indebted to the Florida Department of Environmental Protection for providing this authoritative reference which was also used by the vendor in the design of the scrubber.

However, we do not agree with the Florida Department of Environmental Protection's conclusion, drawn from this article, that the venturi cyclonic scrubber on the MAP spray tower effluent will achieve only about half of the 5.3 transfer units. We also believe that percentage approach to equilibrium concentration is no better a yard stick for scrubber evaluation than the original percentage removal approach used by the department.

Figure 5 of this article shows the number of transfer units at five for a throat velocity of 60 meters per second and a liquid to gas ratio ($m^3/1{,}000m^3$) of 1.9. Our specification (attached) shows a pressure drop of 19 inches of water, an irrigation rate of 900 gpm and a gas flow of 97,626 acfm.

Using Figure 3 and Figure 5 of this article, these data correspond to a gas velocity in the throat of 74.5 meters per second, a liquid to gas ratio of 1.23 and six transfer units. This corresponds to an approach to equilibrium at 1.7% of the equilibrium vapor concentration

Our calculations of the number of transfer units for the spray tower venturi cyclonic scrubber, based upon the Rhone-Poulenc article provided by the Florida Department of Environmental Protection, are attached in Exhibit 1.

Particulate

The letter of July 3, 1996, concludes that the venturi cyclonic scrubber will pass 52 pounds per hour of particulate, or .87 pounds per ton of MAP product and uses this as a basis for the further calculations that the addition of a second scrubber will reduce the particulate emission to 27.86 pounds per hour of particulate. Our warranty from the scrubber vendor, D R Technologies, corresponds to an emission rate of 0.4 pounds per ton of MAP product which also corresponds with the requested permitted level.

The following two facts are well known:-

- The efficiency of a venturi cyclonic scrubber to remove particulate falls as the pressure drop across the unit is reduced.

- Packed Towers are ineffective in removing fine particulate and aerosol mists

As IMC has already certified that "The MAP plant's fluoride emissions tested lower after replacement of the original two-stage venturi/packed scrubber with a low energy venturi cyclonic unit", and this supports the conclusions of my letter of June 4, no further comment will be made on the FDEP's particulate analysis at this time.

If you have any questions on the data presented here, please call.

Yours sincerely,

JACOBS ENGINEERING GROUP INC.

Bryan M. Blythe
Technical Center Director

BMB:ree

Attachments

Exhibit 1

Rhone-Poulenc Article CEP November 1978

Liquid Rate	L = 900 gpm	or	$\frac{900 \times 60}{7.48 \times 35.316}$	=	204.4 m^3/Hr
Gas Rate	G = 97626 acfm	or	$\frac{97626 \times 60}{35.316}$	=	165861 m^3/Hr
Pressure Drop	ΔP = 19 inches WG	or	$\frac{19 \times 62.43 \times 3.28^2}{12 \times 2.20462}$	=	482 Kg/m^2
Gravitational Acceleration g_c				=	9.817 m/sec^2
Gas Density	ρ_g = 0.0585 lb/cuft	or	$\frac{0.0585 \times 35.316}{2.20462}$	=	0.937 Kg/m^3
Volume Ratio	L/G= 204.4/165.861			=	1.232
from Figure 3 - Pressure Loss Factor C				=	1.833

i.e. $C = \frac{\Delta P \times 2 \times g_c}{\rho_g \times V_G^2}$ or $V_G^2 = \frac{\Delta P \times 2 \times g_c}{\rho_g \times C}$

$V_G^2 = \frac{482 \times 2 \times 9.817}{0.937 \times 1.833}$ $V_G^2 = 5510$ V_G = 74.2 m/sec

from Figure 5 - Number of transfer Units = 6.0

Notes:

1) Spray Tower Venturi Flow Area is 6.65 ft^2 equivalent to 890mm throat diameter. Top curve used in Figure 3 to give most conservative calculation of transfer units.

2) V_G linearly extrapolated - regression would give higher value for Number of Transfer Units

3) This calculation is for the Number of Transfer Units achieved by the Venturi. Sprays in the throat and the cyclonic separator will also contribute to mass transfer.

4) Approach to equilibrium as a percentage of equilibrium concentration. - Using the calculation previously submitted to FDER - Where y_1 and y_2 are inlet and outlet concentrations of fluorine and y* is the equilibrium concentration.

$NTU = 6.0 = \ln \frac{(y_1 - y^*)}{(y_2 - y^*)} = \ln \frac{(23 - 2.9)}{(y_2 - 2.9)}$: $(y_2 - y^*) = 2.95$ $\frac{(y_2 - y^*)}{y^*} = 1.7\%$

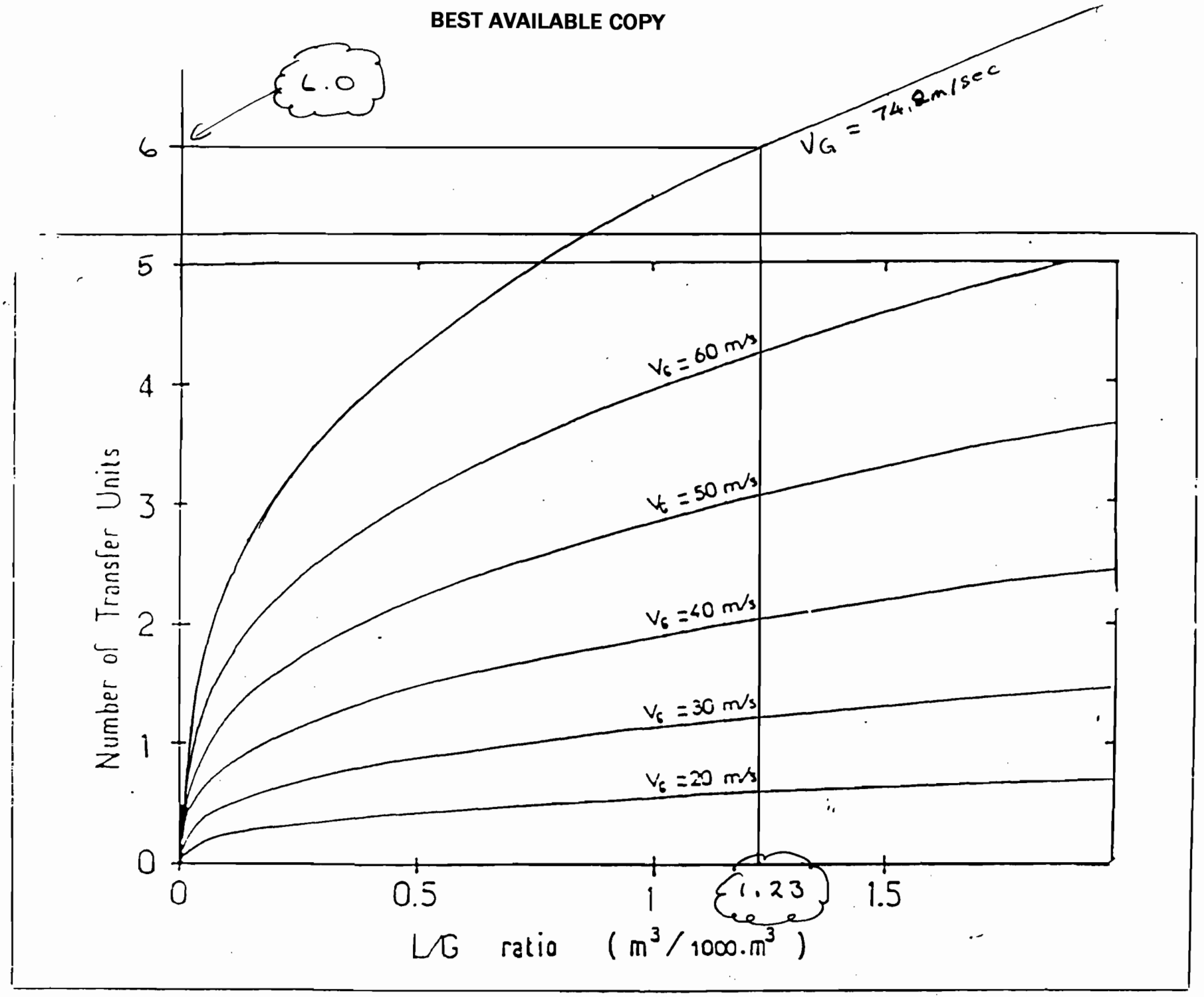


Figure 5. Variation of NTU with L/G ratio and V_G calculated from the empirical law. Using T_{ss} = 60°C and saturated gases; Lx/Dc = 8.5.

(subscript 2):

$$\Delta P = (\rho_{G_1} V_{G_1}^2/2g)\cdot C_1 + (\rho_{G_2} V_{G_2}^2/2g)\cdot C_2 \quad (1)$$

A stepwise correlation method, to keep the essential controlled variables, has been used and is based on the prin-

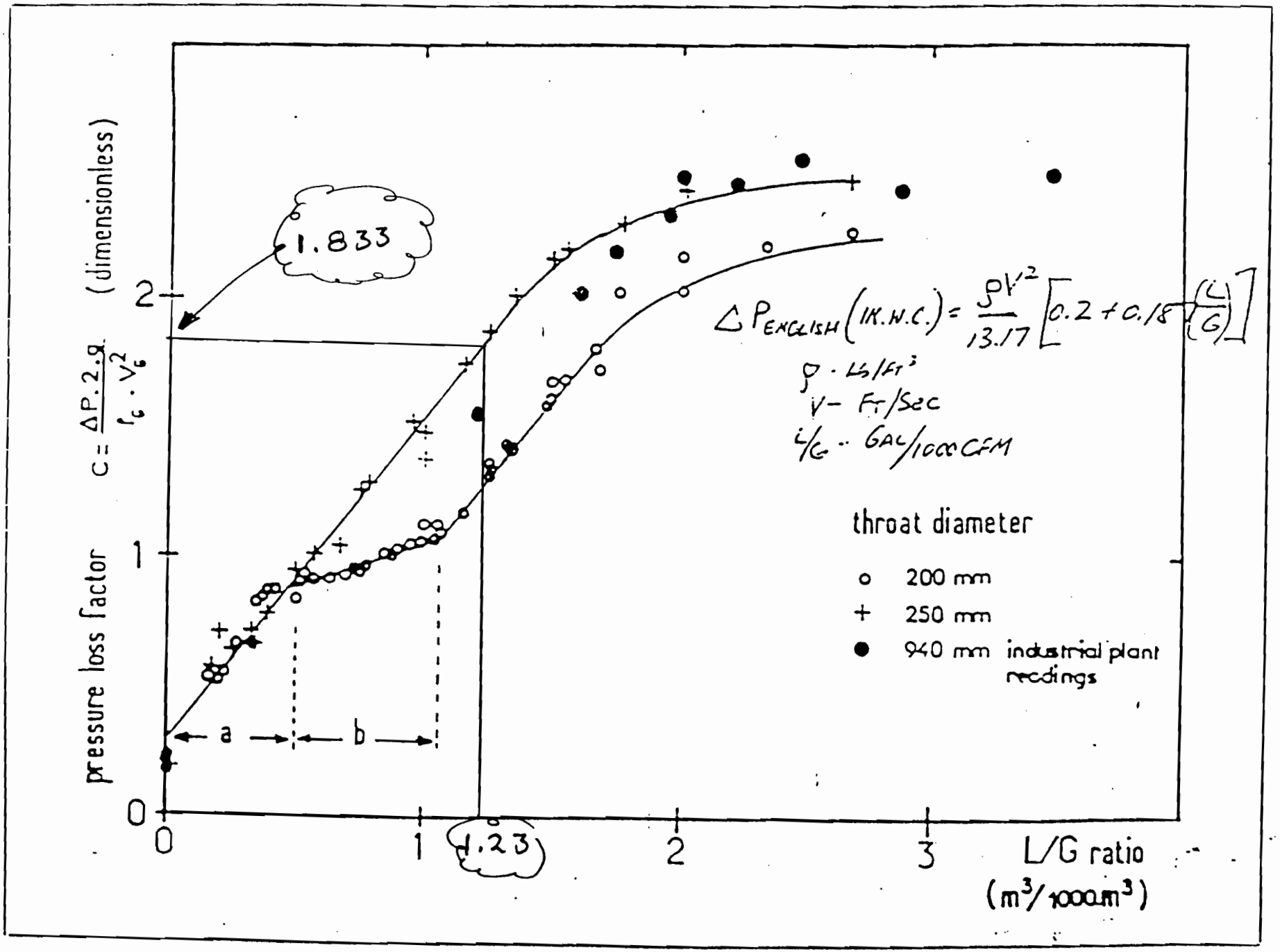


Figure 3. Pressure loss factor vs. L/G ratio.

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10.110
SPECIFICATION No. 10000-2

FOR *US Agri-Chemicals*	SERVICE *MAP spray tower scrubber*
SITE *Fort Meade, Florida*	MANUFACTURER *D.R. Technology* /O
NUMBER REQUIRED *1*	TYPE *Adjustable throat venturi*

DESIGN: [X] API 650 [ ] PS 15-69 [ ] ASTM D3299 [ ] OTHER

OPERATING CONDITIONS

GAS HANDLED *Moist air containing MAP dust and traces of fluorine*

		INLET	OUTLET
FLOW	lb/hr	*342,557*	*see note 1*
	SCFM	*79,977*	
	ft3/min @ T,P	*97,626*	*95300*
PRESSURE	psig (in WATER)	*(-1)*	*(-20)*
TEMPERATURE	°F	*185*	*126* /O
DENSITY	lb/ft3	*0.0585*	*0.062*
MOLECULAR WEIGHT			
HUMIDITY	lb WATER/lb DRY GAS	*0.0909*	
PARTICULATE LOADING *see note 2*	gr/ft3 (stp)	*0.572*	
PARTICULATE COMPOSTION	% WT.	*100% MAP (10-50-0) with 2.1% F*	
FLUORINE LOADING Gaseous/Total	gr/ft3 (stp)	*0.0055/0.0179*	
SCRUBBING LIQUID		/O *MAP Solution*	
FLOW	gals/min @ FT	*900* 7.4 # loaded ft3	
FEED TEMPERATURE	°F	*122*	
SPECIFIC GRAVITY @ FT		*1.1 - 1.2*	
VISCOSITY @ FT	cP	*1-2*	
COMPOSITION	by WT.	*5-15% P2O5*	
		1500 ppm F	

PERFORMANCE

PARTICULATE REMOVAL	*96.9%*	GAS TURNDOWN RATIO	
FLUORINE REMOVAL	*94.75%* /O		

DESIGN AND CONSTRUCTION

OPERATING PRESSURE	/O *(-20)* psig (in WATER) @ *185 °F*		
DESIGN PRESSURE (INTERNAL)	*(-25)* psig (in WATER) @ *185 °F*		
(EXTERNAL)	*14.7* psia (in WATER) @ *185 °F*		
CORROSION ALLOWANCE: SHELL	*None*	HEADS *None*	INTERNALS *None*
[ ] STRESS RELIEVE	[ ] X-RAY		
WIND LOAD: UBC MAP AREA			
SEISMIC ZONE:			
FIREPROOFING: THICKNESS	*None*		ft²
INSULATION: THICKNESS	*None*		ft²
SURFACE PREPARATION SPECIFICATION	*Carbon Steel Surfaces**		
PAINTING SPECIFICATION	*Carbon Steel Surfaces**		

FAB WT	*4250 lb.* /O	OPERATING WT *	TEST WT

REMARKS: * INDICATES INFORMATION TO BE FURNISHED/CONFIRMED BY VENDOR

Note 1. Scrubber outlet discharges into Cyclonic Separator item no. 10.130

Note 2. Particulates size are 99% > 1 micron

REV/DATE	A / 6/22/95	B / 7/14/95	C / 11/14/9	O / 1/29/96
PREP/DATE	DMI / 6/22/95	DMI / 7/14/95	JME / 11/14/9	JME / 1/16/96
CHK'D/DATE	DRK / 6/30/95	/	DMI / 11/14/9	DMI / 1/29/96
APP'D/DATE	/	/	/	/
APP'D/DATE	/	/	/	/

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10.110
SPECIFICATION No. 10000-2

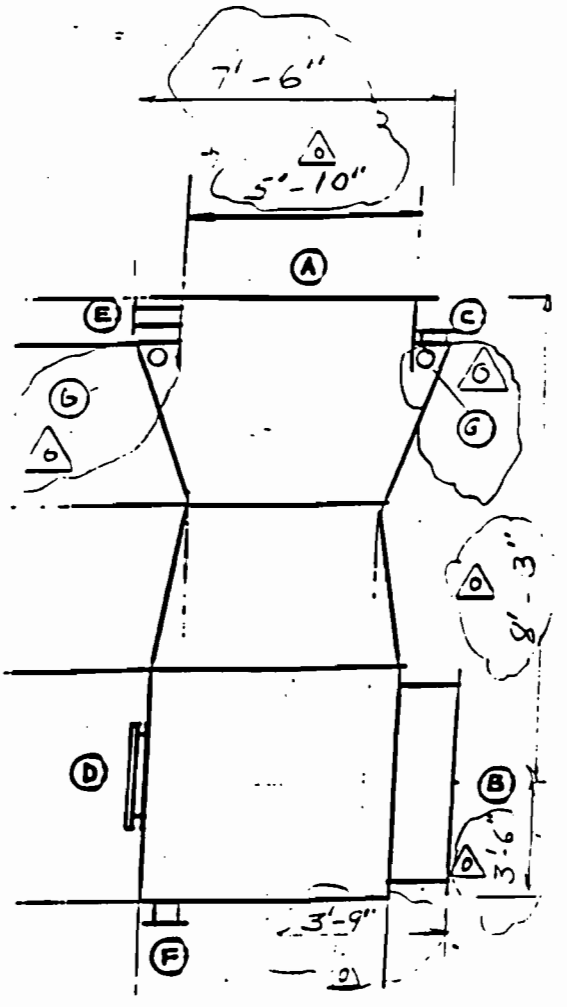
FOR *US Agri-Chemicals* SERVICE *MAP spray tower scrubber*
SITE *Fort Meade, Florida* MANUFACTURER *D:R Technology*

DESIGN AND CONSTRUCTION

PART	MATERIAL	DESCRIPTION
SHELL	*316 L SS*	*See Remarks*
HEADS		☐ SEMIELLIP ☐ DISHED
LINING	*None*	
MANHOLES	*316 L SS*	X HINGE ☐ DAVIT
NOZZLES	*316 L SS*	*See Remarks*
COUPLINGS		
INTERNALS	*316 L SS*	*See Remarks*
CLIPS		
LUGS		
RINGS		☐ INSULATION
DAVIT		LOADING

NOZZLES

MARK	SERVICE	QTY	SIZE	RATING	FACING
A	*Gas Inlet*	1	70"		
B	*Gas Outlet*	1	54"x68"		
C	*Inspection hatches*	4	4"x6"		
D	*Manway*	1	24"		
E	*Liquor In*	1	6"		
F	*Drain*	1	4"		
G	*Liquor In (tangential)*	4	2"		



REMARKS: * INDICATES INFORMATION TO BE FURNISHED BY VENDOR

1. Minimum plate thickness 3/16". (6)

REV/DATE	*A* / *6/22/95*	*C* / *11/14/9*	*D*	*11-29-96*	/		
PREP/DATE	*DMI* / *6/22/95*	*JME* / *11/10/9*	*JME*	*11-14-96*	/		
CHK'D/DAT	*DRK* / *6/30/95*	*DMI* / *11/14/9*	*EAK*	*11-29-96*	/		
APP'D/DATE	/	/		/	/		
APP'D/DATE	/	/		/	/		

10110A

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10. 120
SPECIFICATION No. 10000-2

FOR *US Agri-Chemicals*	SERVICE *Cooler scrubber*
SITE *Fort Meade. Florida*	MANUFACTURER *D.R. Technology*
NUMBER REQUIRED *1*	TYPE *Adjustable throat venturi*

DESIGN: [X] API 650 [ ] PS 15-69 [ ] ASTM D3299 [ ] OTHER

OPERATING CONDITIONS

GAS HANDLED *Moist air containing MAP dust*

		INLET	OUTLET
FLOW	lb/hr	*103,407 max*	*see note 1*
	SCFM	*23,231 max*	
	ft3/min @ T,P	*27,999 max*	*26700*
PRESSURE	psig (in WATER)	*(-5)*	*(-17)*
TEMPERATURE	°F	*171*	*97*
DENSITY	lb/ft3	*0.0616*	*0.067*
MOLECULAR WEIGHT			
HUMIDITY	lb WATER/lb DRY GAS	*0.020*	
PARTICULATE LOADING *see note 2*	gr/ft3 (stp)	*0.850*	
PARTICULATE COMPOSTION	% WT.	*100% MAP (10-50-0) with 2.1 % F*	
FLUORINE LOADING Gaseous/Total	gr/ft3 (stp)	*traces/0.018*	
SCRUBBING LIQUID			*MAP Solution*
FLOW	gals/min @ FT	*265*	
FEED TEMPERATURE	°F	*121*	
SPECIFIC GRAVITY @ FT		*1.1 - 1.2*	
VISCOSITY @ FT	cP	*1-2*	
COMPOSITION	by% WT.	*5-15% P2O5*	
		1500 ppm F	

PERFORMANCE

PARTICULATE REMOVAL	*97.92%*	GAS TURNDOWN RATIO	
FLUORINE REMOVAL	*94.78%*		

DESIGN AND CONSTRUCTION

OPERATING PRESSURE	*(-17)* psig (in WATER) @ *171°F*		
DESIGN PRESSURE (INTERNAL)	*(-25)* psig (in WATER) @ *180 °F*		
(EXTERNAL)	*14.7* psia (in WATER) @ *180 °F*		
CORROSION ALLOWANCE: SHELL	*None*	HEADS *None*	INTERNALS *None*
[ ] STRESS RELIEVE	[ ] X-RAY		
WIND LOAD: UBC MAP AREA			
SEISMIC ZONE:			
FIREPROOFING: THICKNESS	*None*		ft²
INSULATION: THICKNESS	*None*		ft²
SURFACE PREPARATION SPECIFICATION	*Carbon Steel Surfaces**		
PAINTING SPECIFICATION	*Carbon Steel Surfaces**		

FAB WT *2300 lb.*	OPERATING WT *	TEST WT

REMARKS: * INDICATES INFORMATION TO BE FURNISHED/CONFIRMED BY VENDOR
Note 1.Scrubber outlet discharges into Cyclonic Separator Item no.10.130
Note 2.Particulates size are 99% > 1 micron.

REV/DATE	A / 6/22/95	B / 11/14/9	0 / 1-29-96	/	
PREP/DATE	DMI / 6/22/95	JME / 11/14/9	JME / 1/14/96	/	
CHK'D/DATE	DRK / 6/30/95	DMI / 11/14/9	EAE / 1/29-96	/	
APP'D/DATE	/	/	/	/	
APP'D/DATE	/	/	/	/	

10120

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10. 120

SPECIFICATION No. 10000-2

FOR *US Agri-Chemicals* SERVICE *Cooler scrubber*

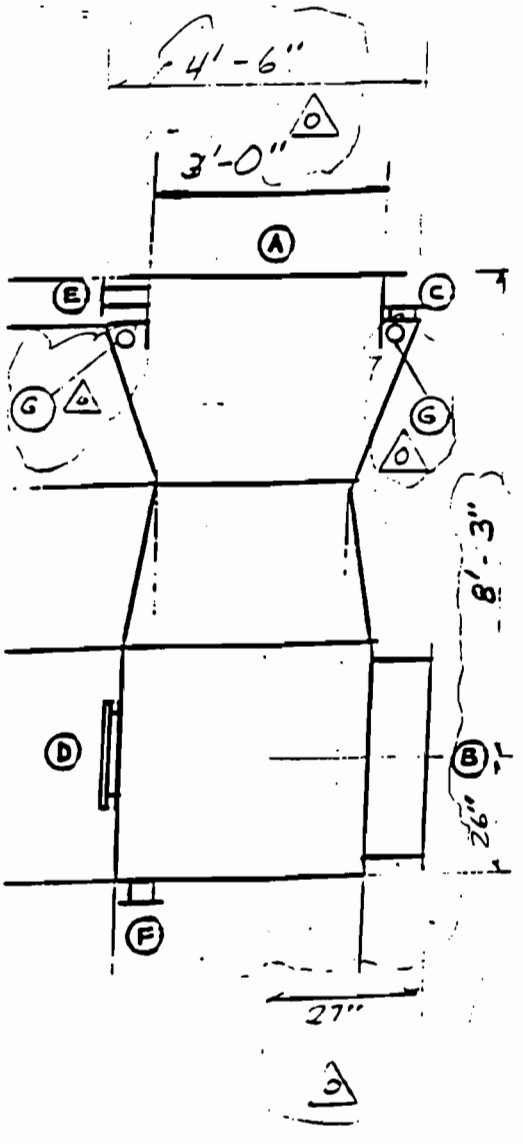
SITE *Fort Meade, Florida* MANUFACTURER *D.R. Technology*

DESIGN AND CONSTRUCTION

PART	MATERIAL	DESCRIPTION
SHELL	*316 L SS*	*See Remarks*
HEADS		[ ] SEMIELLIP [ ] DISHED
LINING	*None*	
MANHOLES	*316 L SS*	[X] HINGE [ ] DAVIT
NOZZLES	*316 L SS*	*See Remarks*
COUPLINGS		
INTERNALS	*316 L SS*	*See Remarks*
CLIPS		
LUGS		
RINGS		[ ] INSULATION
DAVIT		LOADING

NOZZLES

MARK	SERVICE	QTY	SIZE	RATING	FACING
A	*Gas Inlet*	*1*	*36"*		
B	*Gas Outlet*	*1*	*30"x36"*		
C	*Inspection hatches*	*4*	*4"x6"*		
D	*Manway*	*1*	*24"*		
E	*Liquor In*	*1*	*3"*		
F	*Drain*	*1*	*4"*		
G	*Liquor In (tangential)*	*4*	*1"*		



REMARKS: * INDICATES INFORMATION TO BE FURNISHED BY VENDOR

1. Minimum plate thickness 3/16".

REV/DATE	*A* / *6/22/95*	*B* / *11/14/9*	*C* / *1-27-9*	/
PREP/DATE	*DMI* / *6/22/95*	*JME* / *11/10/9*	*JME* / *1-19-96*	/
CHK'D/DAT	*DRK* / *6/30/95*	*DMI* / *11/14/9*	*AH* / *1-29-96*	/
APP'D/DATE	/	/	/	/
APP'D/DATE	/	/	/	/

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10. 130
SPECIFICATION No. 23031-1

FOR *US Agri-Chemicals* SERVICE *Cyclonic Separator*
SITE *Fort Meade, Florida* MANUFACTURER *D.R. Technology* /0
NUMBER REQUIRED *1* TYPE *Cyclonic*
DESIGN: [X] API 650 [ ] PS 15-69 [ ] ASTM D3299 [ ] OTHER

OPERATING CONDITIONS

GAS HANDLED *Saturated air containing traces of MAP dust and fluorine*

		INLET	OUTLET
FLOW	lb/hr	*see note 1*	*451,364*
	SCFM		*105,357*
	ft3/min @ T,P		*123,739*
PRESSURE	psig (in WATER)		*(-25)* /0
TEMPERATURE	°F		*125*
DENSITY	lb/ft3		*0.0608*
MOLECULAR WEIGHT			
HUMIDITY	lb WATER/lb DRY GAS		*0.088*
PARTICULATE LOADING	gr/ft3 (stp)		*<0.0177*
PARTICULATE COMPOSTION	% WT.	*100% MAP (10-50-0) with 2.1% F*	
FLUORINE LOADING Total	gr/ft3 (stp)		*<0.00094*
SCRUBBING LIQUID	*see note 2*	*MAP Solution*	
FLOW	galls/min @ FT	/0 *380@20 psig* 3.07	*galls / 1000 ft³*
FEED TEMPERATURE	°F	*122*	
SPECIFIC GRAVITY @ FT		*1.1 - 1.2*	
VISCOSITY @ FT	cP	*1-2*	
COMPOSITION	by WT.	*5-15% P2O5*	
		1500 ppm F	

PERFORMANCE

PARTICULATE REMOVAL GAS TURNDOWN RATIO
FLUORINE REMOVAL

DESIGN AND CONSTRUCTION

OPERATING PRESSURE /0 *(-25)* psig (in WATER) @ *125 °F*
DESIGN PRESSURE (INTERNAL) *(-28)* psig (in WATER) @ *185 °F*
(EXTERNAL) *14.7* psia (in WATER) @ *185 °F*
CORROSION ALLOWANCE: SHELL *None* HEADS *None* INTERNALS *None*
[ ] STRESS RELIEVE [ ] X-RAY
WIND LOAD: UBC MAP AREA
SEISMIC ZONE:
FIREPROOFING: THICKNESS *None* ft²
INSULATION: THICKNESS *None* ft²
SURFACE PREPARATION SPECIFICATION
PAINTING SPECIFICATION

FAB WT /0 *40000 lb.* OPERATING WT * TEST WT

REMARKS: * INDICATES INFORMATION TO BE FURNISHED/CONFIRMED BY VENDOR
Note 1.Cyclonic Separator inlets are from the discharge of Venturi Scrubbers item nos.10.110 & 10.120
Note 2.Vendor to recommend flow , duration and frequency of washing Mist Eliminator with Process water(165 gpm @ 40 psig ,intermittent))

REV/DATE	*A / 6/29/95*	*B / 11/14/9*	*0 / 1-27-96*	/	/0	
PREP/DATE	*DMI / 6/29/95*	*JME / 11/14/9*	*JME / 1-19-96*	/		
CHK'D/DATE	*DRK / 6/30/95*	*DMI / 11/14/9*	*ERK / 1-29-96*	/		
APP'D/DATE	/	/	/	/		

10130

SCRUBBER DATA SHEET

PROJECT No. 28-J697-00 ITEM No. 10. 130

SPECIFICATION No. 23031-1

FOR *US Agri-Chemicals* SERVICE *Cyclonic Separator*

SITE *Fort Meade. Florida* MANUFACTURER *D. R. Technology*

DESIGN AND CONSTRUCTION

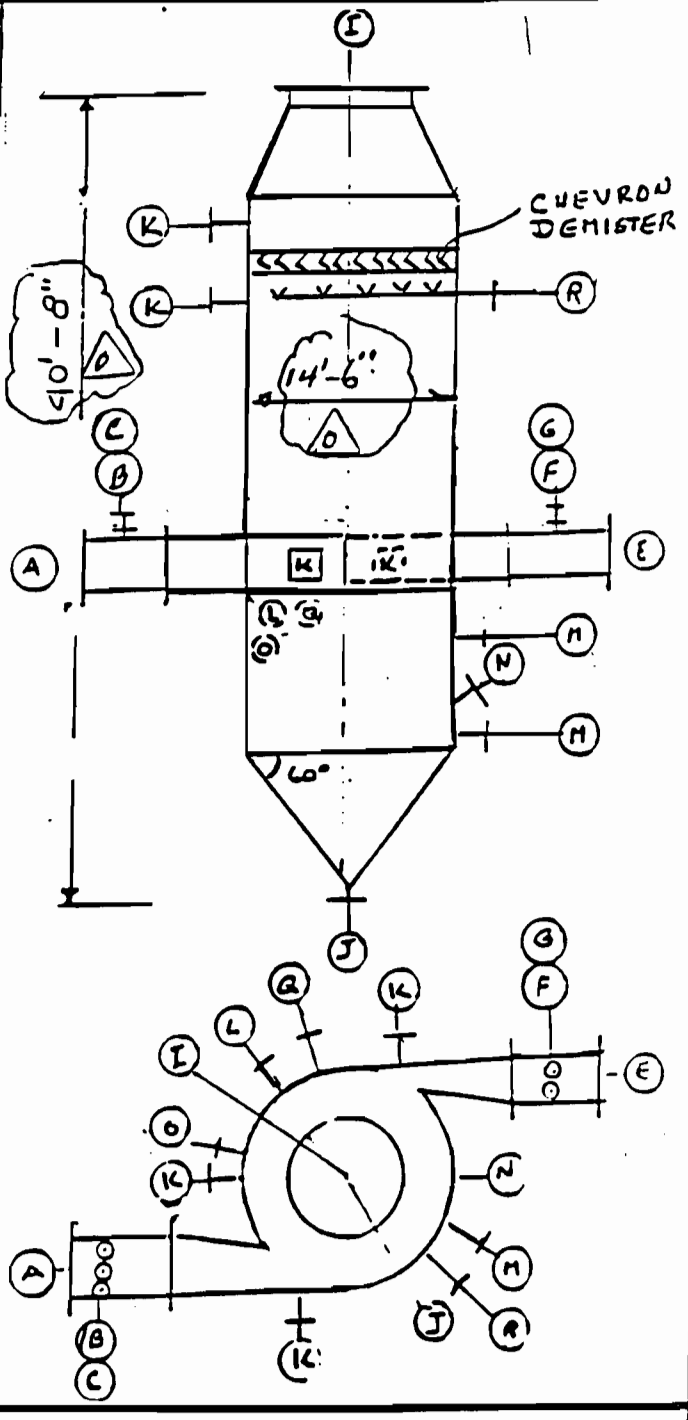
PART	MATERIAL	DESCRIPTION
SHELL	*Carbon Steel*	
HEADS	*Carbon Steel*	[ ] SEMIELLIP [ ] DISHED
LINING	*Rubber*	*3/16" Triflex or equivalent*
MANHOLES	*Carbon Steel*	[X] HINGE [ ] DAVIT
NOZZLES	*Carbon Steel*	
COUPLINGS		
INTERNALS	*316 L SS*	*Spray Nozzles*
	PP with glass reinforcing	*Chevron demister*
LUGS		
RINGS		[ ] INSULATION [ ] VACUUM
DAVIT		LOADING

NOZZLES

MARK	SERVICE	QTY	SIZE
A	*Gas Inlet*	*1*	*54" W x 68" H*
B	*Mount for nozzles C*	*3*	*4"*
C	*Liquor Inlets*	*3*	*1½"*
E	*Gas Inlet*	*1*	*30" W x36" H*
F	*Mount for nozzles G*	*2*	*3"*
G	*Liquor Inlets*	*2*	*1"*
I	*Gas Outlet*	*1*	*78"*
J	*Liquor Outlet*	*1*	*14"*
K	*Manholes*	*4*	*24"*
L	*Process Water Inlet*	*1*	*2"*
M	*Level Transmitter*	*2*	*3"*
N	*Temperature Probe*	*1*	*2"*
O	*Overflow*	*1*	*8"*
Q	*Effluent Sump Inlet*	*1*	*2"*
R	*Demister Wash Water*	*1*	*4"*

NOTES

1. *Full cone spray nozzles will be fitted in each of the gas inlet throats to the separator.*
   Nozzles selected should operate at pressure of 20 psig. or less.
2. *Rubber lining to be in accordance with Spec. No. 66200-3 &66200-2.*



REMARKS: * INDICATES INFORMATION TO BE FURNISHED BY VENDOR

REV/DATE	A	6/30/95	B	11/14/9	O	11-09-96			
PREP/DATE	DMI	6/30/95	JME	11/14/9	JME	11-26-96			
CHK'D/DATE	DRK	6/30/95	DMI	11/14/9	DRK	11-19-96			
APP'D/DATE									
APP'D/DATE									

10130A

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

July 3, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick, P.E.
General Manager
US Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, Florida 33841-9799

RE: Prilled MAP Construction Permit PSD-FL-222 (AC53-260190)

Dear Mr. Susick:

This is in response to the June 4 letters from Koogler & Associates (K&A) and Jacobs Engineering Group, Inc. (JEGI), providing additional information concerning PSD-FL-222 for the US Agri-Chemicals (USAC) Prilled MAP Plant to be constructed in Ft. Meade. These letters were requested to provide the Department with proper time for review of new information that was presented at the May 21 meeting.

The Department reviewed the information submitted and found that the venturi scrubber system as proposed by USAC will achieve only about half of the 5.3 transfer units claimed. The claim was made that the proposed venturi scrubber would achieve 5.3 mass transfer units using unneutralized scrubber water. To achieve that level of mass transfer at the assumed inlet concentration, a venturi scrubber must be capable of achieving an approach to equilibrium of about 3% of the equilibrium vapor concentration for fluoride, which is not possible for this device. (Mass transfer units provide a method of expressing the closeness to equilibrium concentrations that a gas-contacting device is capable of achieving relative to the pollutant concentration of the inlet gas stream). A published technical paper disproving USAC's mass transfer units claim is enclosed and is discussed in detail later.

Also, USAC did not follow the Department's BACT requirement for use of neutralized scrubbing water for the venturi-only option. Scrubber water neutralization is a demonstrated technology in the phosphate industry and is required in the BACT determination for the venturi-only option.

Scrubber water will contain fluorides principally as fluosilicic acid along with sodium and potassium fluosilicates and hydrofluoric acid. If untreated, the fluoride concentrations will build to high levels at low pH. Lime treatment of the water to a pH level of 3.5 to 4.0 allows the fluorides to precipitate out of solution, mainly

as calcium fluoride. At this point the water would contain as low as 30-60 ppm fluoride. With second-stage lime treatment to a pH of 6.0 or more, the calcium compounds (mainly dicalcium phosphate) precipitate out along with additional calcium fluoride. Upon settling, the clear neutralized water would contain as low as 15 ppm fluoride, depending on the quality of the neutralization facilities and the mixing efficiency.

In an effort to install a control system with low maintenance requirements, USAC has proposed a scrubber system with high energy requirements and less than optimum capability for removal of gaseous fluorides. The claim that a venturi scrubber will achieve results comparable to that of phosphoric acid plant packed scrubbers in terms of transfer units is invalid. The 5.3 transfer units calculated by JEGI correspond to 87% removal of gaseous fluorides. The Department's calculations show that the actual transfer units are less than 3 at a gaseous fluoride removal efficiency just barely over 80%. Gaseous fluoride removal in wet process phosphoric acid plants typically exceeds 99% with 7-8 NTUs. Therefore, the number of transfer units for USAC's proposed scrubber is not comparable to the number typically used in wet process phosphoric acid plants. (We should point out that the wrong limit was used for a new phosphoric acid plant. It is 0.012 lb F/ton P_2O_5 and not 0.016. The BACT determination for Cargill Fertilizer (PSD-FL-224) states that the 0.016 limit applies only to Cargill since they were combining new and existing sources).

It should be pointed out also that JEGI's drawing of the packed scrubber depicts it as being a countercurrent packed tower. A countercurrent tower is a poor design and will not work for this application. There are numerous technical articles in the literature referring to plugging problems with countercurrent operation. This was never proposed by the Department.

Environmental impacts of fluoride emissions are characterized by K&A as being so minimal as to render the expenditure for the second stage BACT control as pointless. They cited a statement in an EPA guideline document to the effect that fluorides are not a health related pollutant and they refer to the very low estimated ambient air impact. The Department's calculations show that K&A's estimate of 1.53 tons F/yr removed by the second stage actually could exceed the PSD significance level of 3 tons per year based on the inlet concentrations assumed. The Department cannot ignore the equivalent of a PSD source. The EPA set the fluoride PSD-significance level at a low figure because gaseous fluorides diffuse and are carried for much greater distances than particulates and have a far greater potential for deleterious impact.

In its answers to comments submitted when the phosphate industry new source performance standards were promulgated in 1975, the EPA addressed the arguments of fluoride emissions being localized and of minimal ambient impact by pointing out that fluoride, due to its documented toxic effects on plants and animals, was the only pollutant other than the criteria pollutants that was specifically named as requiring federal action by the 91st Congress.

As discussed above, the Department found that the mass transfer capability of USAC's venturi scrubber for fluoride removal was overstated. An authoritative technical article that we have used before in pointing out the limitations of a venturi scrubber was published in the November 1978 issue of Chemical Engineering Progress. It describes a gas-atomized venturi scrubber that was designed for high efficiency fluoride removal from the off-gases of a phosphoric acid reactor. A copy of that article is enclosed for your review. The initial objective was to achieve a level of mass transfer approaching that of packed scrubbers, i.e. 6-7 NTUs, while dealing with a limited water supply such as was mentioned by JEGI and USAC during our meeting.

A pilot plant was constructed to evaluate performance under well-monitored conditions and resulted in an empirical model describing the fluoride absorption process. It was found that the pilot plant venturi achieved only about 3.5 NTUs with fully neutralized scrubber water. (This 3.5 limitation on NTUs achievable with a venturi scrubber was also indicated by Dr. Teller in his article). A full scale system was then designed for 3.5 NTUs handling a gas flow about 12% above that for the USAC MAP plant with a fluoride concentration of about 500 mg/m^3 (the pilot plant concentrations varied from 10 to 500 mg/m^3). Recirculated scrubber water was neutralized to a constant pH of 7.

Results from the commercial plant closely paralleled the pilot plant data and validated the empirical model which showed that gas viscosity has the most influential effect on the NTUs, which vary inversely with the gas viscosity. This explains to a large extent why a venturi scrubber is not the most effective mass transfer device. The gas film resistance limits the amount of fluoride gas that can be transferred from the gas-liquid film interface to such an extent that sufficient contact cannot be provided by only one highly turbulent exposure which the venturi scrubber provides. A venturi simply cannot do the scrubbing job on a gaseous pollutant that a properly designed packed scrubber is capable of. (We should point out an error in the Becker textbook, p. 402, concerning the lower end of the range where the Henry's Law shift begins - it should be 0.005% instead of 0.05% F).

The Department disagrees with the JEGI conclusion that the packed scrubber removes only 10% of the particulates left by the venturi/cyclonic scrubber. Actual field data show otherwise as discussed in the following excerpt from "Particulate Collection with Packed Crossflow Scrubbers", Journal of the Air Pollution Control Association, April 1972, p. 281:

> "Theoretical particulate removal efficiency by inertial impaction as calculated from the equation presented by Langmuir and Blodgett indicate 95% removal of 3 microns and larger particles at a superficial gas velocity of 9 ft/sec through the scrubber. Data obtained from cross-flow scrubbers under actual field conditions indicate high removal efficiency on 1-2 micron particulate and as high as 20% removal of submicron particulate. Obviously, mechanisms other than inertial impaction enter into the removal of particulate in this system."

JEGI's assumption was apparently based on the comment in the 1977 article in Chemical Engineering that they enclosed which stated:

> "Several important types of scrubbers have performance characteristics such that a particle whose aerodynamic diameter is half the cut diameter would be collected at about 10% efficiency, whereas a particle with an aero-dynamic diameter twice the cut diameter would be collected at about 90% efficiency."

JEGI evidently assumed that the aerodynamic diameter downstream of the venturi would be half of the 2 micron cut diameter derived from Curve 2 of the chart in the article, i.e. 1 micron, collected at 10% efficiency. However, we note that Curve 2 was obtained with 1-inch rings or saddles (extended surface packing) and not fila-mentous packings such as Tellerettes. The impact of this error can be seen from the following discussion in the aforementioned article on crossflow scrubber particulate efficiency (p.280):

> "Particulate removal efficiency and solids handling capacity of a crossflow scrubber are dependent to a great degree on the type of packing used. Two basic types of packing are in use today for wet packed scrubbers - extended surface packings (such as Rasching Rings, Pall Rings, and Intalox Saddles), and filamentous packings (such as Tellerettes).
>
> As reported by Calvert and Jackson,, extended surface pack-ings can efficiently remove particles down to 3-5 microns at high pressure drops of 20-30 in. w.c. The high energy loss is due to the fact that extended surface packings remove part-icles by centrifugal force. Good collection efficiency must therefore be obtained by using relatively high velocities which results in high pressure drop characteristics. Filament

size of extended surface packings is too large for efficient removal of particles by impingement or impaction.

A filamentous packing removes liquid and solid particles by the mechanism of inertial impaction. This packing offers a series of ribbons with small width to keep deviation of the gas stream and the resultant energy consumption to a minimum. The cross section of the filament is square giving it sharp edges and, as reported by Langmuir and Blodgett, a higher target efficiency than spherical or cylindrical shapes of the same width."

The Department found also that the claimed performance of USAC's scrubber for particulate removal was overstated. Since all of JEGI's calculations were not shown, we checked the performance against their assumptions. First, it is required that "cut diameter" be properly defined. JEGI referred to it as the average particle size removed by the device. In theory, it is the diameter at which the removal efficiency for all larger particles is 100%, and that for all smaller particles is 0%. In practice, it is the diameter of a particle for which the efficiency curve has a value of 0.50, i.e., 50% removal.

It is often expressed in "aerodynamic diameters" which means that the particle diameter has been adjusted to reflect its aerodynamic behavior for control system design. In air pollution control engineering terminology, the "aerodynamic particle diameter" is the square root of the term $(D^2)(\rho)(C)$ which appears in the equation for "Stokes Stopping Distance", which is the distance required for a particle to settle out of an air stream under given conditions ("D" is the actual diameter, ρ is the particle density, and "C" is a constant). Thus, if the constant "C" has a value of 2.0, and we have a 1 micron particle with a density of 2.5 g/cm^3, the diameter in "aerodynamic" units is $(1)(2.5 \times 2.0)^{0.5} = 2.24$ microns$_a$. Any two particles with this value, though structurally different, would exhibit the same behavior in different kinds of control devices.

Empirical aerodynamic cut diameter and pressure drop data are available for typical venturi scrubbers so that cut diameter can be predicted at a given pressure drop and liquid to gas ratio. These curves typically show a venturi cut diameter of 0.5 microns aerodynamic at a pressure drop of about 80 in. w.c. or above as opposed to the 0.47 microns at 19 in. w.c. claimed for USAC's venturi. The curves showing the cut diameter on a logarithmic ordinate and the liquid to gas ratio on a logarithmic abcissa are essentially flat at volumetric liquid to gas ratios between 0.6 and 2.0, indicating that within that range a 25% decrease in pressure drop would correspond to a 12% increase in the aerodynamic cut diameter. The effect is slightly higher at ratios below 0.6. One of these graphs for a typical venturi scrubber is enclosed.

No single method is infallible for predicting the effect of reduced venturi pressure drop on collection efficiency. However, a method that usually gives good results involves another form of transfer unit analogous to the mass transfer unit for gases. It is defined as $N_t = \ln(1/1-E)$ where E is the fractional removal. It provides a better method of correlating the energy expended in the scrubber with its collection efficiency. The value obtained for N_t at a given pressure drop, or vice versa, will vary over an order of magnitude depending on the type of scrubber and the particulate.

For a given scrubber and particulate, a distinct relationship between N_t and pressure drop usually appears and can be plotted linearly on log-log paper according to the equation $N_t = a(\text{delta P})^b$ where a and b are constants. For a venturi scrubber in an application involving an aerosol-sized particulate such as talc dust, values of a and b have been published as 2.97 and 0.362, respectively. Therefore, if the pressure drop is reduced by 25%, N_t is reduced by 9.9% and the collection efficiency is reduced by 3.3%. Specific parameters for MAP dust are not available to the Department, so the difference of 4.5% in JEGI's calculations cannot be verified.

Since no particle size distribution data are available for MAP dust, we calculated efficiencies for assumed mean diameters using a log-normal distribution. The efficiency vs. diameter ratio relationship was assumed to follow the conventional empirical equation: $\text{Eff.} = (D/D_{cut})^2 / 1 + (D/D_{cut})^2$. Based on JEGI's statements about substantial aerosol formation, we started out with a "worst case" assumed mean particle diameter of 1 micron with a standard deviation of 1.25.

The following table shows how this was done. The particle distribution was divided into size fractions; those from 0 to 0.1 of the total mass, from 0.1 to 0.2, etc. The second column shows "z", the number of standard deviations (sigma) from the mean, that will correspond to "C", the cumulative distribution fraction at the end of each interval. The next column shows the value of D/D_{mean} at the end of the size interval, found by $D/D_{mean} = e^{z(\text{sigma})}$. For example, at the 0.1 size fraction, 10% of the particles have diameters less that 0.2014 x 1.0 micron = 0.2014 micron. The next column gives the average diameter ratio for the interval. The fifth column shows the collection efficiency for the midrange diameter calculated by the above equation where $D/D_{cut} = (D/D_{mean})(D_{mean}/D_{cut})$. The sixth column shows the fraction of mass for each interval that is uncollected. The last column shows the cumulative fraction uncollected.

C	z	$(D/D_{mean})_{end}$	$(D/D_{mean})_{mid}$	Eff.	$p\Delta C$	$\Sigma p\Delta C$
0.1	-1.282	0.2014	0.1007	0.0439	0.0956	0.0956
0.2	-0.842	0.3491	0.2752	0.2553	0.0744	0.1700
0.3	-0.524	0.5194	0.4343	0.4606	0.0539	0.2239
0.4	-0.253	0.7289	0.6242	0.6382	0.0362	0.2601
0.5	0	1.0000	0.8644	0.7718	0.0228	0.2829
0.6	0.253	1.3720	1.1860	0.8643	0.0136	0.2965
0.7	0.524	1.9251	1.6486	0.9248	0.0075	0.3040
0.8	0.842	2.8648	2.3950	0.9629	0.0037	0.3077
0.9	1.282	4.9654	3.9151	0.9858	0.0014	0.3091
1.0		1.0000	4.9654	0.9911	0.0009	0.3100

We see that the total fraction collected is 0.69 which is the result of the very low mean diameter assumed. Therefore, it can be concluded that the actual mean diameter is much larger, while the actual cut diameter may be larger as well.

After more trials it was found that a mean particle diameter of 10 microns provides results that match the 96+% design efficiency while assuming the same cut diameter of 0.47 micron. From these calculations, it is reasonable to assume that the particle mass distribution ahead of the packed scrubber would be indicated by the fifth column for the case with D_{mean} = 10 microns:

$p\Delta C$
0.0318
0.0028
0.0012
0.0006
0.0003
0.0002
0.0001
--
--
0.0370

The mass mean diameter of the particulate ahead of the packed scrubber is the diameter that corresponds to half of the above total, or 0.0185, which is near the front end of the first size range interval from 0 to 0.1. Therefore, the mass mean diameter would be about 1 micron (0.0185/0.2014 x 10) if the venturi cut diameter has been correctly assigned at 0.47.

On the other hand, if the venturi cut diameter is equal to 1 micron as indicated on the aforementioned enclosed chart from A.C. Stern's Air Pollution, 3rd Edition (at about 50 cm H_2O or 19.7 in. w.c.), the results are dramatically different as shown below:

Cut Diameter = 0.47 micron		Cut Diameter = 1 micron	
Venturi D_{mean}	10 microns	Venturi D_{mean}	10 microns
Venturi p ΔC	0.0370	Venturi p ΔC	0.0714
Packed $D_{m(mass)}$	1 micron	Packed $D_{m(mass)}$	2 microns

Our staff's experience in scrubber design, testing and operation suggests to us that the true performance would prove to be closer to the 1 micron case. That is more in line with what we have seen from venturis operating in the 19-20 in. w.c. range. For a cut diameter in the 0.5 micron range, a pressure drop in the range of 30-32 in. w.c. across the venturi throat would usually be required for 97-99% collection efficiency.

In the absence of actual particle size information for MAP prill tower dust, and specific information on scrubber guarantees, we must conclude that the published cut diameter data are more appropriate since they appeared in an article by Dr. Seymour Calvert, the same expert that JEGI refers to.

Our assessment of the best attainable performance using the USAC-proposed recirculated water system for the venturi and a crossflow scrubber with an independent supply of once-through pond water is presented in the next table. Consistent with the prior discussion, we have assumed an overall venturi particulate removal efficiency of 93% vs. 96+% (cut diameter of 1 vs. 0.47 $micron_a$), and venturi scrubbing at 81% gaseous fluoride efficiency (2.67 NTUs using unneutralized water with Beker's equilibrium data).

We have assumed crossflow scrubber results consistent with those presented in the aforementioned articles; i.e., about 75% removal of particulate fluorides, considering solubility, and 65% efficiency with about 5 NTUs on gaseous fluorides based on 2.0 mg/m^3 at equilibrium. Our fluoride inlet estimate is higher than USAC's and is based on 113,330 lb/hr of 54% H_3PO_4 @ 1.2% F coming in. With 1,360 lb/hr of fluorides entering the tower, it is conceivable that it may be higher than USAC assumed as indicated below:

	Combined Inlet	Venturi Exit 18"	Venturi Exit "24"	Crossflow Exit 18"	Crossflow Exit 24"
P	743.00	81.73	52.01	20.43	13.00
PF	29.54	3.24	2.04	0.81	0.51
GF	10.46	1.36	1.36	0.47	0.47
TF	40.00	4.60	3.40	1.28	0.98

For the venturi-only approach, the BACT determination calls for a dedicated scrubber pond with neutralization and fresh water makeup. The results expected on gaseous fluorides using a venturi with fully neutralized water would be about 3.5 NTUs (95.8% removal assuming 0.5 mg/m^3 at equilibrium). The performance in lb/hr would be approximately:

	Venturi Exit
P	52.01
PF	2.04
GF	0.43
TF	2.47

The above results are contrasted with the original BACT concept in the following analysis. The original two-stage control strategy contemplated a design goal of 99+% removal of gaseous fluorides, assuming Dr. Teller's equilibrium concentration of 0.7 mg/m^3 for once-through pond water (allows for cooling effect of scrubber air on pond water), and 99% removal of particulate over 5 microns. The goal was to maximize gaseous fluoride control while removing particulate sufficiently to avoid plugging problems with a packed cross-flow scrubber. Assuming a mean particle diameter of 10 microns and a cut diameter of about 2.0 $micron_a$ at a pressure drop far below 50 cm w.c. according to the chart by Dr. Calvert, the particle distribution would be approximately:

C	z	(D/D_{mean}) end	(D/D_{mean}) mid	Eff.	p ΔC	%>5u Removed
0.1	-1.282	0.2014	0.1007	0.2022	0.0797	-
0.2	-0.842	0.3491	0.2752	0.6544	0.0346	-
0.3	-0.524	0.5194	0.4343	0.8250	0.0175	-
0.4	-0.253	0.7289	0.6242	0.9069	0.0093	99.07
0.5	0	1.0000	0.8644	0.9492	0.0051	99.49
0.6	0.253	1.3720	1.1860	0.9723	0.0028	99.72
0.7	0.524	1.9251	1.6486	0.9855	0.0015	99.85
0.8	0.842	2.8648	2.3950	0.9930	0.0007	99.93
0.9	1.282	4.9654	3.9151	0.9974	0.0003	99.97
1.0		1.0000	4.9654	0.9983	0.0002	99.98
					0.1517	

As shown, the low energy venturi under these conditions will have an overall particulate efficiency of 85% while accomplishing greater than 99% removal of particulate above 5 microns. The performance of the low energy venturi (about 8 in. w.c.) on gaseous fluorides using unneutralized water is assumed to be about 2 NTUs on the basis of the article discussed previously:

Gas Flow Rate = 110,014 m^3/hr
Gaseous F @ Inlet = 10.46 lb/hr
Inlet Concentration =

$$\frac{10.46 \times 454 \times 1000}{110{,}014} = 43.17 \text{ mg/m}^3$$

Dr. Teller's Eq. Conc. = 0.70 mg/m^3
Outlet Conc. @ 2 NTUs: ln 43.17-0.70/"c"-0.70 = 2
"c" = 6.45 mg/m^3 = 1.55 lb/hr
Gaseous F Eff. = (43.17 - 6.45)/43.17 = 85%

Performance of the packed crossflow scrubber under this scenario is determined likewise:

Gaseous F @ Inlet = 6.45 mg/m^3 = 1.55 lb/hr
Dr. Teller's Eq. Conc. = 0.70 mg/m^3
Dr. Teller's Max. NTUs = 8 - 2 (venturi) = 6
Outlet Conc. @ 6 NTUs: ln 6.45-0.70/"c"-0.70 = 6
"c" = 0.714 mg/m^3 = 0.17 lb/hr
Gaseous F Eff. = (6.45 - 0.714)/6.45 = 89%
Total System Gaseous F Eff. = (43.17 - 0.714)/43.17
= 98.4%

The performance would be 0.9% less than the 99.3% design goal set for gaseous fluorides in the BACT determination, but 11.4% better than the 87% that USAC proposes. The lb/hr performance chart then becomes:

	Combined Inlet	Venturi Exit	Crossflow Exit
P	743.00	111.45	27.86
PF	29.54	4.43	1.11
GF	10.46	1.55	0.17
TF	40.00	5.98	1.28

Results of the above analyses are summarized in the following table of emissions along with a comparison of USAC's scrubber performance claims vs. the Department's assessment of those claims. The Department's BACT calculations assume 87% more fluoride in the scrubber inlet stream than USAC assumed.

	USAC's Claims	DEP's Review	DEP's BACT Calculations @ Higher F In 24"Venturi Only	8"Venturi/Crossflow
P (lb/hr)	24.00	52.01	52.01	27.86
PF " "	0.55	1.10	2.04	1.11
GF " "	0.72	1.03	0.43	0.17
TF " "	1.27	2.13	2.47	1.28
lb F/ton	0.04	0.07	0.08	0.04
GF NTUs	5.30	2.67	3.50	8.00
GF Eff.	86.96	81.35	95.80	98.40
TF Eff.	94.05	90.02	93.83	96.80
TPY GF	3.15	4.51	1.88	0.74
TPY TF	5.56	9.33	10.82	5.61

In regard to the cost effectiveness issues, we could not do a complete analysis because we never received the breakdown of the installation costs that we requested through K&A on several occasions. These costs appear to have been highly inflated based on other cost information we have. Also, the incremental costing approach that was used in this instance is clearly problematical as indicated by the following excerpt from the EPA's New Source Review Workshop Manual, (Draft 1990), p. B.43:

> "As a precaution, differences in incremental costs among dominant alternatives cannot be used by itself to argue one dominant alternative is preferred to another. For example, suppose dominant alternatives B, D, and F on the least-cost envelope (see Figure B-1) are identified as alternatives for a BACT analysis. We may observe the incremental cost effectiveness between dominant alternative B and D is $500 per ton whereas between dominant alternative D and F it is $1000 per ton. Alternative D does not dominate alternative F. Both alternatives are dominant and hence on the least-cost envelope. Alternative D cannot legitimately be preferred to F on grounds of incremental cost effectiveness." (emphasis added)

This means that for a situation where two devices are required because each is the most efficient for a different pollutant, the total cost of control should be applied to every ton removed instead of pitting one device against the other incrementally.

We contacted Ceilcote Air-Cure Dynamics, Inc., to see if they had any data on prilled MAP or similar processes generating fine particulate emissions. Ceilcote's Air Cure Gmbh Division in Germany sent us information on a system they designed for a granular NPK plant in Greece. They used an ionizing wet scrubber (IWS) designed for 99.7% removal of total fluorides based on 200 kg/hr (441 lb/hr)

of total fluorides entering the IWS from the 95,000 Nm^3/hr reactor off-gas stream. No actual test results are available, however, and the scrubbing medium was not described.

All of the foregoing analyses regarding the proper BACT emission limits for USAC are based on assumptions and calculations rather than actual test data from a prilled MAP plant. While reviewing this permit application originally, the Department considered using test data for IMC-Agrico's New Wales Prilled MAP plant as a basis for USAC's BACT limits. That idea was rejected due to the age of the plant and IMC-Agrico's use of a low energy venturi. Now, after reexamining the IMC-Agrico test data, the Department is at a loss to resolve the discrepancy between the USAC calculations and the test data. The only explanation that can be reasonably presumed is that IMC-Agrico is using partially defluorinated acid, or, there is not as much fluoride coming off as has been assumed by USAC. Whatever the reason, the IMC-Agrico results are lower than for any of the calculated USAC scenarios. The IMC-Agrico data for the last five years are tabulated below:

Test Date	Tons P_2O_5/hr	Lb F/hr	lb F/ton P_2O_5
11/2/95	24.0	0.10	0.0042
4/12/95	24.0	0.14	0.0058
11/1/94	24.0	0.30	0.0125
5/2/94	24.0	0.20	0.0083
11/9/93	24.0	0.20	0.0083
4/22/93	24.0	0.10	0.0042
10/28/92	23.0	0.18	0.0078
4/28/92	24.0	0.08	0.0033
12/26/91	22.2	0.24	0.0108
4/24/91	24.0	0.15	0.0063

The Department was contacted by Mr. Edward M. Newberg, a Vice President of IMC-Agrico, on May 31, 1996, at USAC's request. Mr. Newberg told us that the MAP plant's fluoride emissions tested lower after replacement of the original two-stage venturi/packed scrubber with a low energy venturi/cyclonic unit. When we replied that our calculations show this would not be possible, Mr. Newberg insisted that emissions have decreased compared to those from the original packed scrubber. Since these results have now been certified by IMC-Agrico as accurately representing prilled MAP emissions, the Department can no longer disregard them.

The Department's usual practice involves setting the limit marginally above the highest representative test result thus providing a margin for compliance. With a 50% margin above the highest result, the BACT fluoride limit would be 0.0125 x 1.50 = 0.019 lb F/ton P_2O_5. The limit would be 0.019 x 30.46 = 0.58 lb/hr and 2.54 tons/yr which would end PSD applicability for fluoride emissions and resolve the impasse over the packed scrubber issue. A particulate limit of 24 lb/hr as requested by USAC will be proposed along with a visible emission limit of 15% opacity.

USAC will be allowed to proceed with its design plans for the venturi scrubber since we have assurance that the emissions from this project will not exceed PSD-significant amounts and will be substantially less than they would have been had USAC selected the granulation process.

We will wait for comments from USAC before issuing any changes to reflect a lower achievable emission rate. If there are any questions regarding this letter, please call me or John Reynolds at (904) 488-1344.

Sincerely,

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

AAL/JR

Enclosures

c: B. Thomas, SWD
R. Harwood, Polk Co.
J. Harper, EPA
J. Bunyak, NPS
J. Koogler, K&A
B. Blythe, JEGI

P 339 251 121

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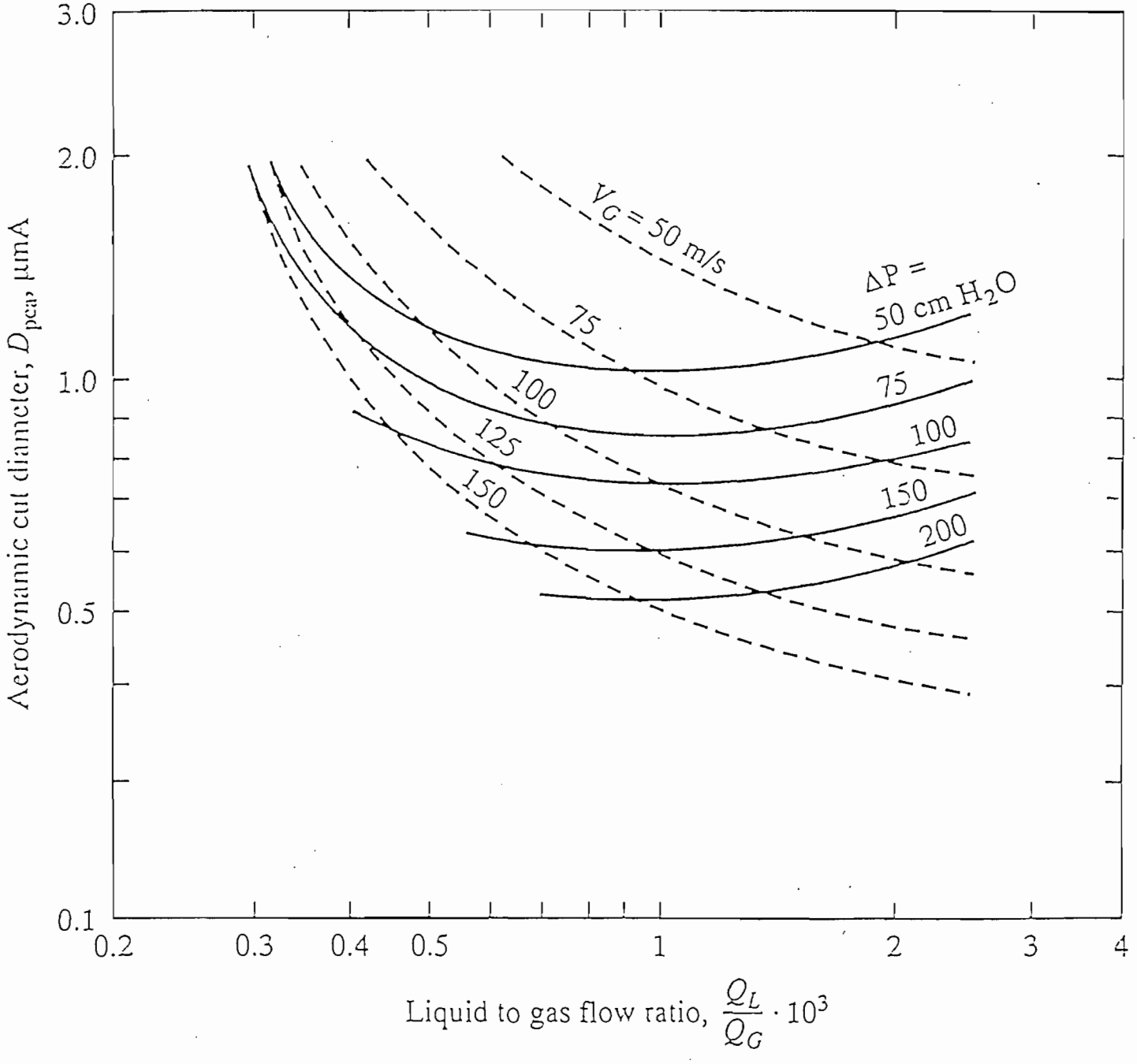
Aerodynamic cut diameter and pressure drop predictions for a typical venturi scrubber. V_G is the velocity at the throat. (From Ref. 19.)



Calvert, S.: "Scrubbing," in A. C. Stern (ed.), *Air Pollution,* 3d ed., Vol. 5, Academic Press, New York, 1977.

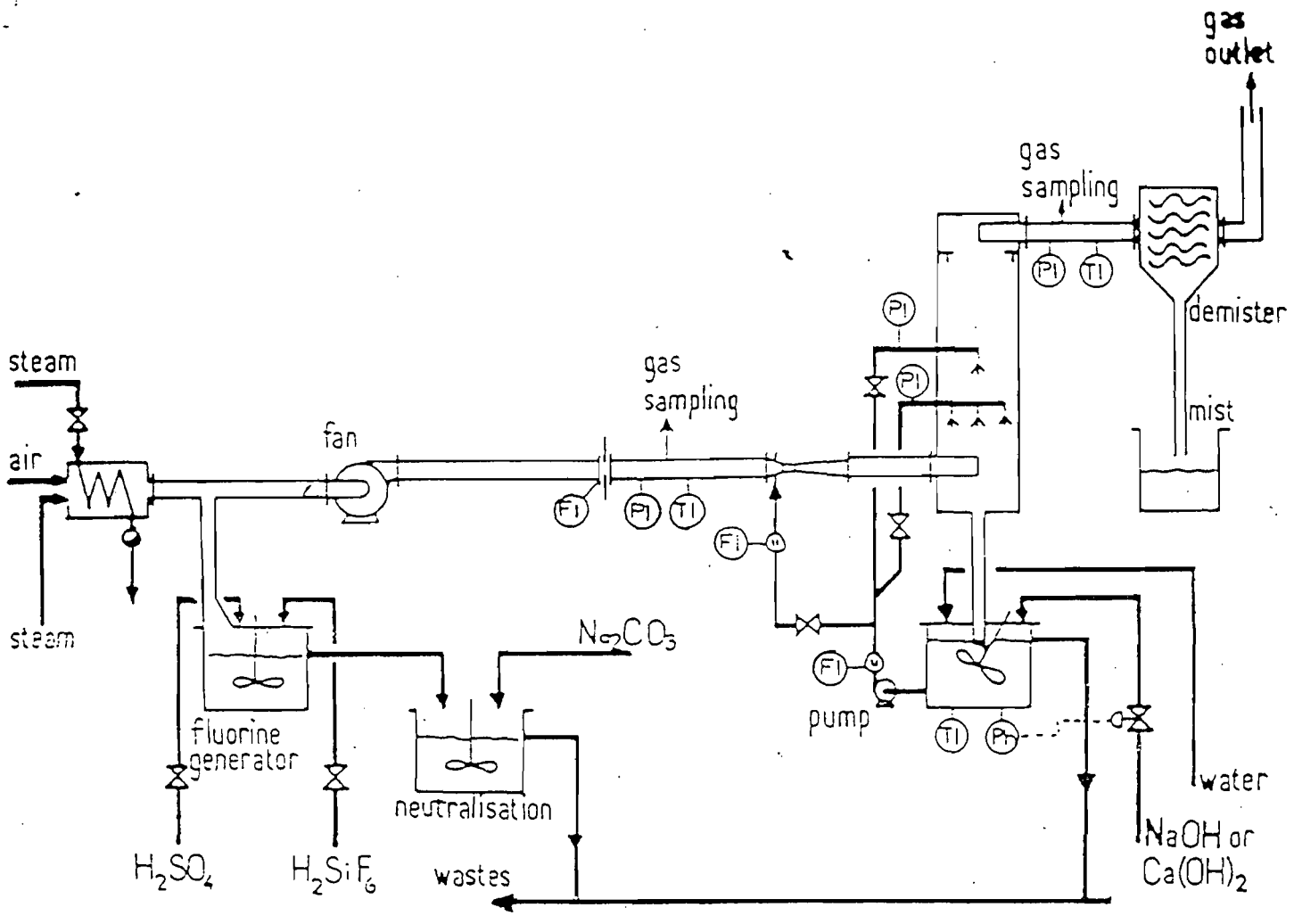


Figure 1. Pilot plant flow scheme.

Phosphoric Acid Plant Problems:

Absorbing Fluorine Compounds From Waste Gases

The atomizing agent of this venturi scrubbing system is a gas, which eliminates the corrosive and plugging risks of a liquid sprinkler.

C. Djololian and D. Billaud, Rhone-Poulenc-Chimie Minerrale, Paris, France

Rhone-Pouleuc has designed a venturi scrubber system that deals with the problem of fluorine absorption in the cooling gases of phosphoric acid plant reactors. Our intent was to design a unit with the following characteristics:

1. A high efficiency rate, the number of transfer units (NTU) required frequently being in the range of 6-7.
2. Total energy expenditure limited on both the gas and liquid sides.
3. A low rate of water consumption and in-plant water recycling.

Our aim was to build an apparatus of reasonable size to keep investment costs down and to reduce space problems, and a unit that had few internal parts given the fouling property of the gas in question.

The venturi scrubber was found to meet all these requirements. It is connected to a cyclone column fitted with sprays that continue the absorption process, and that

Did not achieve it. See p. 55

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neutralize misting.

The pilot plant apparatus shown in Figure 1 has been designed to operate up to a maximum of 6,000 cu.m./hr. Column diameter is 0.785 m. and its performance can be observed in a given range of overall velocities between 3 and 4 m./sec. A system of shutters is used to vary the entry velocity of the gases and modify the shape of the entry in terms of height and width. A series of full jet sprays working at low pressure (0.5 to 1 bar.) are fitted in the column.

The venturi, which precedes the column, is adaptable to three different sizes of throat. Hence the throat velocity is within a range from 20 to 80 m./sec., at the same time maintaining the same operating characteristics for the column. The washing liquid is fed through small tubes fitted at right angles to the axis of the apparatus just before the throat. Pressure varies between 0.2 to 1 bar., optimum pressure being about 0.5 bar. A mist eliminator fitted with baffles, giving a reading of the mist eliminating capacity of the column, is located after the cyclonic column. A diaphragm flowmeter measuring gas-flow is inserted in a length of straight pipe ahead of the venturi. An air heater and a steam jet regulate air humidity and temperature. The quantity of fluorine in the gas is controlled separately in the production process of $HF + SiF_4$.

The phosphoric acid production plant at Rhone-Poulenc's Les Roches de Condrieu factory, Figure 2, was equipped with a gas cleaning unit based on the first results indicated by the pilot plant. Operating requirements of the plant are 60 ton/hr. of phosphate rock, giving a gas-flow of 124,000 cu.m./hr. at 65°C. Total bulk concentration of fluorine in the gas leaving the reactor is close to 500 mg./N cu.m. dry air.

If total bulk concentration of fluorine in the gas released into the atmosphere is to be kept below 15 mg./N cu.m. dry air, then the NTU should be at 3.5 which is a figure fairly easy to obtain with only one venturi and cyclonic column. The basic design specifications are: venturi throat diameter, 0.540 m.; column diameter, 3.6 m.; and column height, 15 m.

Two-stage hydrodynamic study

The hydrodynamic study of the pilot apparatus was carried out in two different stages: the cyclonic column first, and then the entire apparatus, including the venturi. Factors determining pressure loss as well as mist eliminating efficiency of the cyclonic column were thus identified. Experimentation on the cyclonic column will not be described in detail here, but the main results will be presented. The study of the whole of the apparatus (venturi and column) has, of course, taken into account the results of trials on the column by itself.

The following observations can be made. To reduce excessive entrainment, it is necessary to: reduce overall gas velocity; increase inlet gas velocity; reduce spraying pressure; increase height of area of activity of the mist eliminator; increase height/width ratio of the inlet port; and fix an anti-creep ring at the upper part of the mist deposition area.

To reduce pressure loss, one must: reduce overall gas velocity; reduce inlet speed; and reduce flow of scrubbing liquid.

Each of these parameters has been studied separately and thus their relative importance has been evaluated. The hydrodynamic study of the whole apparatus (venturi plus column) required the same sort of testing.

On the other hand, the inlet port of the column remained permanently at the same setting throughout the trials so as to give a high rate of mist eliminating efficiency, irrespective of the flow of gas moving through the apparatus. The influence of the ratio L/G (inlet flow of liquid in cu.m./hr. per 1,000 cu.m./hr. of gas) and of velocity at

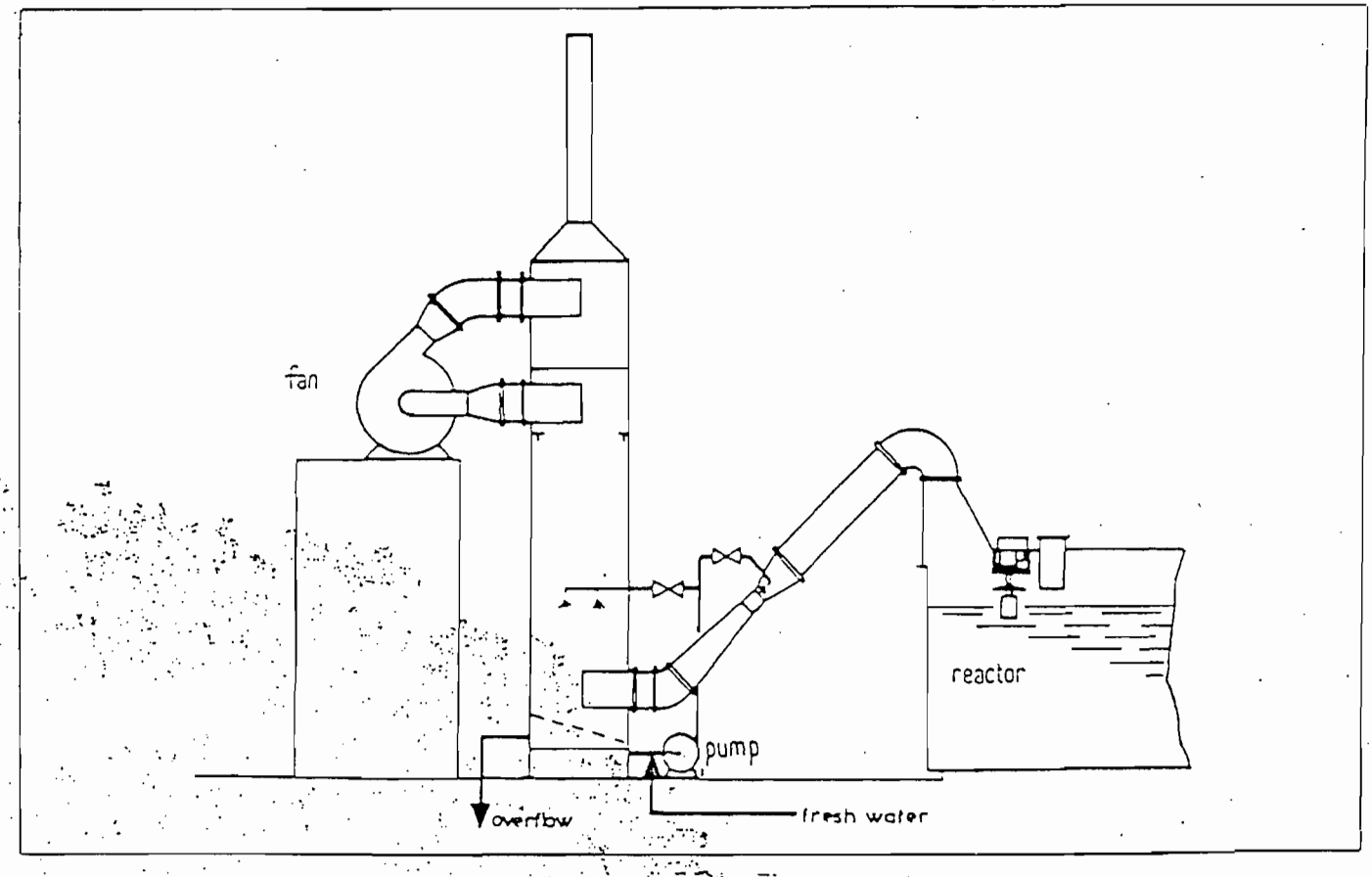

Figure 2. Commercial scale unit at the Les Roches de Condrieu factory.

the throat of the venturi on pressure loss has thus been established.

In addition, readings taken on the commercial plant during the test run can be compared to data obtained with the pilot apparatus, and furthermore can be used to check the validity of the empirical model, which has been established in the light of results given by the pilot apparatus.

The supply of fluorine, in a molecular ratio HF/SiF_4 close to 2, is produced by the action of sulfuric acid on a diluted solution of fluosilicic acid.

Readings were taken of the absorption process in a range of concentration running from 10 to 500 mg./N cu.m. dry air. If the molecular ratio of HF/SiF_4 is above 2 results are less favorable, as HF has a low level of solubility. This peculiarity can be frequently observed in later stages when gas scrubbers are connected in series.

The main parameters considered were throat velocity, L/G ratio, inlet gas temperature, relative humidity, liquid temperature, and fluorine content.

During tests, the scrubbing liquor was neutralized either by lime or by soda, and the pH of the scrubbing liquor was held at 7.

The findings set out below are expressed in NTU thus: $NTU = \ln Y_e/Y_t$. Given the low partial pressure of water and fluorine this equation is hence expressed as follows: NTU = ln (inlet fluorine in mg./N cu.m. dry air)/(outlet fluorine in mg./N cu.m. dry air).

The following equation was retained to explain pressure loss throughout the venturi (subscript 1) and the column (subscript 2):

$$\Delta P = (\rho_{G_1} V_{G_1}^2/2g) \cdot C_1 + (\rho_{G_2} V_{G_2}^2/2g) \cdot C_2 \qquad (1)$$

The column's geometry being constant throughout tests, and since the ratio L/G was known to have had a negligible influence on the column's pressure loss, C_2 may therefore be said to remain constant. C_2 was found to have a value of 2.1. The venturi pressure loss (ΔP_1) can thus be calculated, and consequently the value C_1 can be known.

A significant difference between the venturi ϕ 200 and ϕ 250 is shown by the curves obtained and shown in Figure 3. Though different in value, the initial and final curves describe a similar pattern. It should be pointed out, however, that when larger venturi are used, this phenomenon is rarely observed, and the curve normally describes a similar pattern to that of the ϕ 250's.

In the commercial scale plant operations, scrubbing liquor flow rate remains constant at about 100 cu.m./hr. Gas flow rate varies from 20,000 to 124,000 cu.m./hr. Figures obtained from the pilot and industrial units compared well. They can be expressed thus: when $L/G \leq 2$, then $C_1 = (0.2 + 1.4 \times L/G)$; and when $L/G > 2$, then $C_1 \simeq 2.5$.

In the correlation analysis of fluorine absorption in the venturi scrubber, the technique employed involved the correlation of the NTU as a function of the following controlled variables: gas density, gas viscosity, liquid density, liquid velocity, liquid surface tension, throat velocity (of gas), L/G, characteristic value of condensation or of evaporation, and fluorine concentration in inlet gases.

Correlation based on packed tower method

A stepwise correlation method, to keep the essential controlled variables, has been used and is based on the prin-

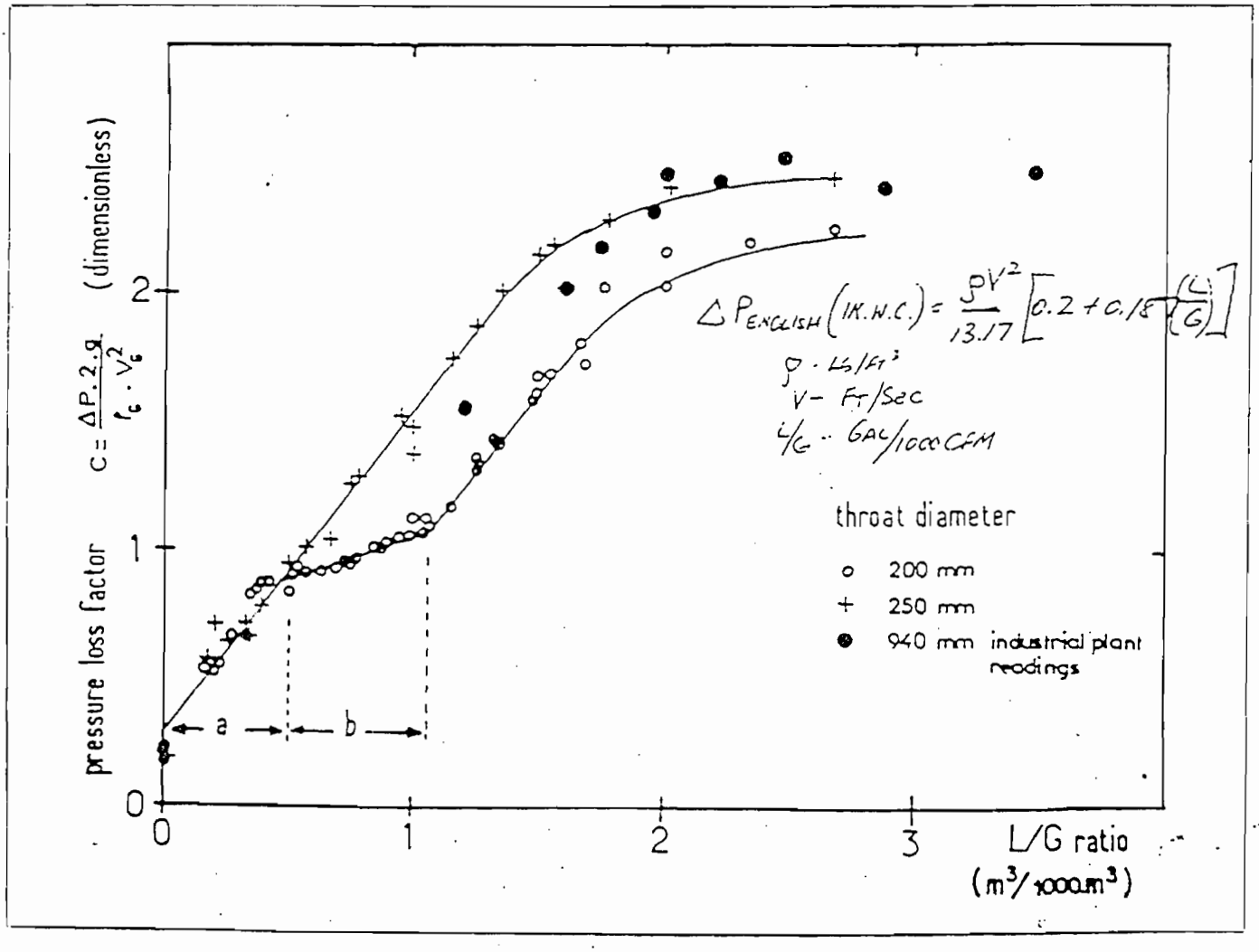

Figure 3. Pressure loss factor vs. L/G ratio.

ciples described below: The NTU concept was developed to provide the design specification of packed columns. There is no reason why this technique should not be applied to other types of absorbers.

It is known that

$$\mathrm{NTU} = \frac{h_t}{\mathrm{HUT}} = \frac{K_G P Y_{BM} a_v}{G} \times h_t \qquad (2)$$

$a_v \times h_t$ symbolizes the effective mass transfer surface, and if we suppose that the droplets are spherical in shape, and are of the same diameter, then we may say that:

$$a_v \times h_t = 6 \times \frac{L}{dp} \qquad (3)$$

therefore:

$$\mathrm{NTU} = \frac{K_G \cdot P \cdot Y_{BM}}{G} \times 6 \frac{L}{dp} \qquad (4)$$

which could also be written as follows:

$$\mathrm{NTU} = (cste) \times \rho_{G_1}^m \times \mu_{G_1}^n \times D_c^p \times V_{G_1}^q \times \left(\frac{L}{G}\right)^r \times \left(\frac{1}{dp}\right)^s \qquad (5)$$

Average diameter of droplet can be expressed by a formula of the type suggested by Nukiyama and Tanasawa, (*1*) who introduced the following parameters:

$$V_{G_2}, \rho_L, \mu_L, \sigma_L, \frac{L}{G}$$

Finally, the dimensions of the apparatus are also a factor influencing mass transfer and are expressed in terms of the relationship of the total length of the venturi L_V (convergent, throat, divergent) and the diameter of the throat Dc. Hence the formula describing NTU

$$\mathrm{NTU} = (cste) \times \rho_{G_1}^m \times \mu_{G_1}^n \times \rho_L^p \times \mu_L^q \times \sigma_L^r \times \left(\frac{L_V}{Dc}\right)^s \times \left(\frac{L}{G}\right)^t \times (V_{G_1})^u \qquad (6)$$

Analysis has shown that the main controlled variables in descending order of importance are μ_{G_1}, ρ_{G_1}, (L_V/Dc), (L, G), ρ_L, V_{G_1}, σ_L, μ_L.

The best correlation obtained was:

$$\mathrm{NTU} = e^{11.9647} \cdot V_{G_1}^{1.8} \cdot (L_V/Dc)^{-0.9572} \cdot (L/G)^{0.3699} \cdot \rho_{G_1}^{-5.9201} \cdot \mu_{G_1}^{3.4131} \qquad (7)$$

This would seem to confirm known information about the NTU performance of absorbers in general. The NTU is directly proportional to gas velocity and L/G ratio and inversely proportional to gas density. It is also worth pointing out the importance of the L_V/Dc ratio. This ratio should be seen as the key factor in determining acceleration of the gas during flow through the venturi. Energy loss is kept down when the gas is not accelerated; hence in these conditions the liquid can be atomized into finer or more numerous droplets.

For a given L flow-rate, the diameter and number of droplets depend on the operating conditions of the venturi. If condensation occurs, the droplets increase either in size or in number. Hence the mass transfer surface increases, improving the NTU. The reverse process takes place when evaporation occurs.

Condensation is favorable during absorption of fluorine ($HF + SiF_4$). Figure 4 shows the variations of the NTU as a function of inlet gas humidity at different temperatures (TGE). The other variables were given the following values:

$$V_{G_1} = 50 \text{ m./sec.}$$

$$L/G = 1$$

$$\frac{L_V}{Dc} = 8.5$$

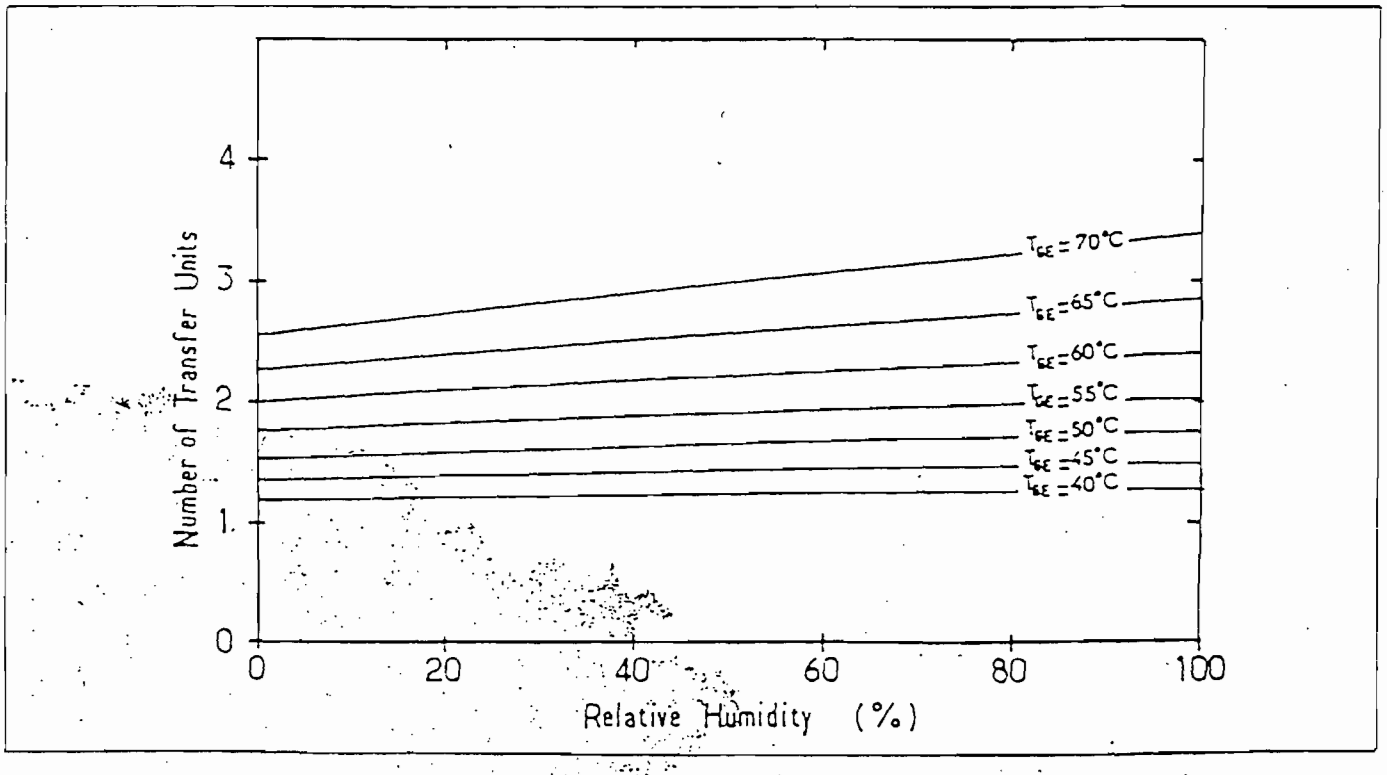

Figure 4. Influence of gas saturation on the absorption efficiency from the correlation using V_G = 50 m./sec.; L/G = cu. m./1,000 cu. m.; Lv/Dc = 8.5.

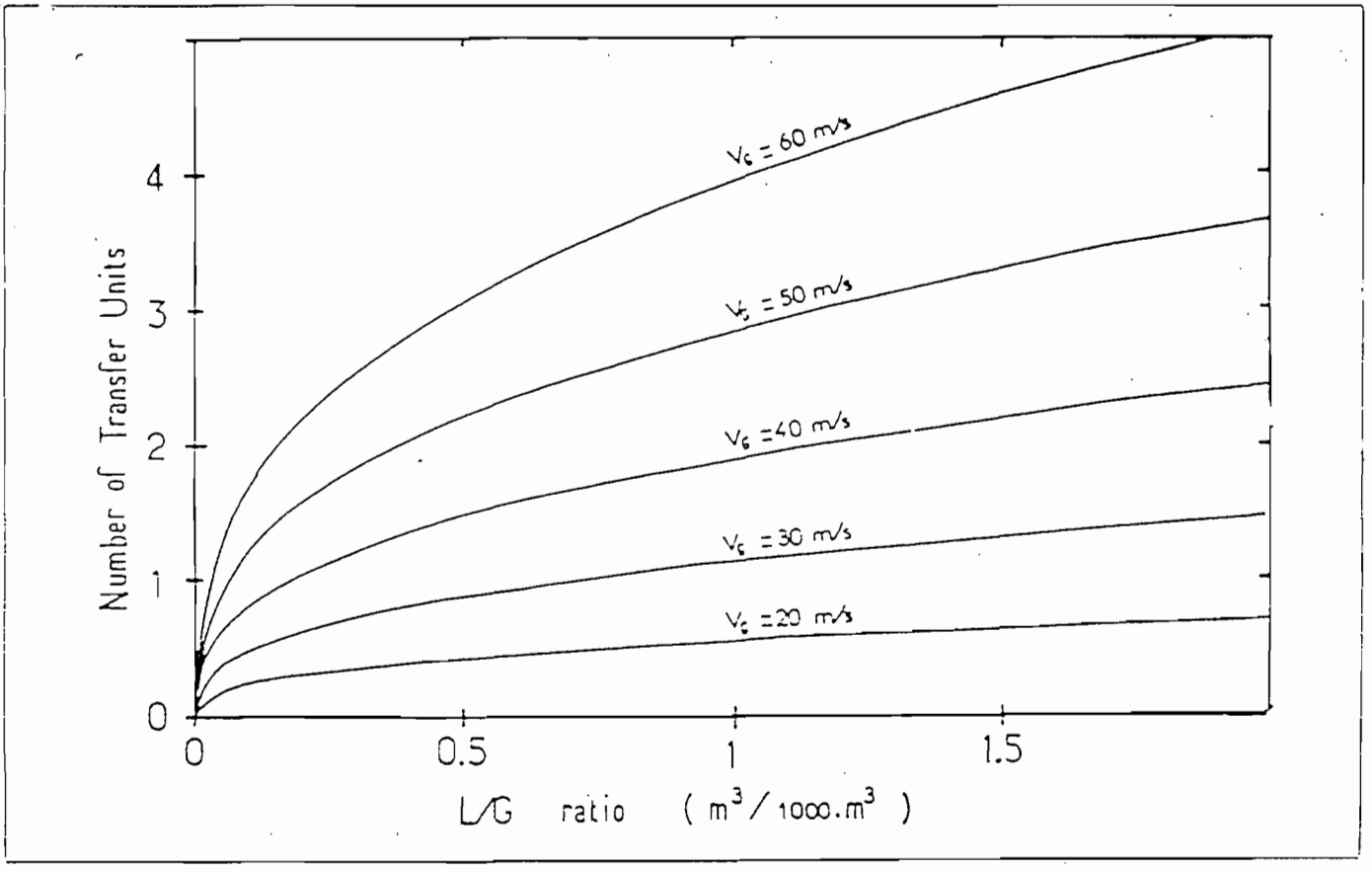

Figure 5. Variation of NTU with L/G ratio and V_G calculated from the empirical law. Using T_{GE} = 60°C and saturated gases; Lv/Dc = 8.5.

Figure 5 shows the NTU as a function of the gas velocity at the throat and of the L/G ratio. Let the temperature of the inlet gas be 60°C and the relative humidity 100%. Figure 6 shows the NTU as a function of pressure loss when gases are at 60°C and when relative humidity is at 100%.

Suppose that we need to design a venturi scrubber capable of treating 150,000 cu.m./hr. of saturated gas at 60°C. Assume that the gas throat velocity is 60 m./sec. and that the L/G ratio is equal to 1.

The pressure loss in the venturi will therefore be:

$$(0.2 + 1.4 \times 1) \times \frac{0.981 \cdot (60)^2}{2 \times 9.81} = 288 \text{ mm. water column}$$

Inlet gas density, gas viscosity, and L_v/Dc ratio have respectively the following values: 0.981 kg./cu.m.; 0.0184 cp.; 8.5. These operating conditions will give NTU = 3.21.

When throat velocity is 50 m./sec., results obtained will be ΔP_1 = 200 mm. water column, and NTU = 2.31.

If the operating results of the commercial plant are compared to the empirical laws established statistically by the results of the pilot scheme, the figures for the former are noticeably better. The commercial plant was designed to produce a NTU = 3.5. Design specifications were: throat velocity = 50 m./sec.; scrubbing liquid on arrival in the venturi = 100 cu.m./hr.; and scrubbing liquid atomized in the column = 120 cu.m./hr. Thus the L/G ratio is about 1.1 cu.m./1,000 cu.m.

The following data have been obtained by testing at the commercial plant. At indicated throat velocities, in m./sec., the NTU measured (venturi only) is shown in parentheses: 38 m./sec. (3.6); 24 m./sec. (3); 20 m./sec. (2.6); and 18 m./sec. (2.4).

Heat loss that occurred in the Les Roches de Condrieu plant is very high compared to that of the pilot apparatus. The difference observed between measured and calculated values of NTU can be explained by the resulting condensation; and this becomes more obvious when the throat velocity falls due to the rather low mass transfer efficiency of the venturi in such conditions.

In conclusion

We have found the venturi scrubber system to be very efficient for absorbing fluorine (HF + SiF_4), The NTU achieved is sometimes higher than a value of 3.5, Pressure loss ranges from 150 to 200 mm. water column, cyclonic column included.

This type of equipment is highly suitable, therefore, for the treatment of phosphoric acid plant reactor gas cooling. The simplicity of design is of particular merit. The atomizing agent is gas, thus eliminating the corrosive and plugging risks of a liquid sprinkler.

The apparatus has also proved to be extremely adaptable to different operating conditions. The rate of flow of the liquid can be kept constant and even if the gas flow drops, operating efficiency remains much the same.

From a theoretical viewpoint it is worth pointing out that the statistical analysis shows that gas viscosity is the most important variable, which supports the theory that the gas-side resistance film controls mass transfer. Finally, statistical evidence would seem to suggest that the effect of condensation is one of the determining parameters in the absorption of fluorine.

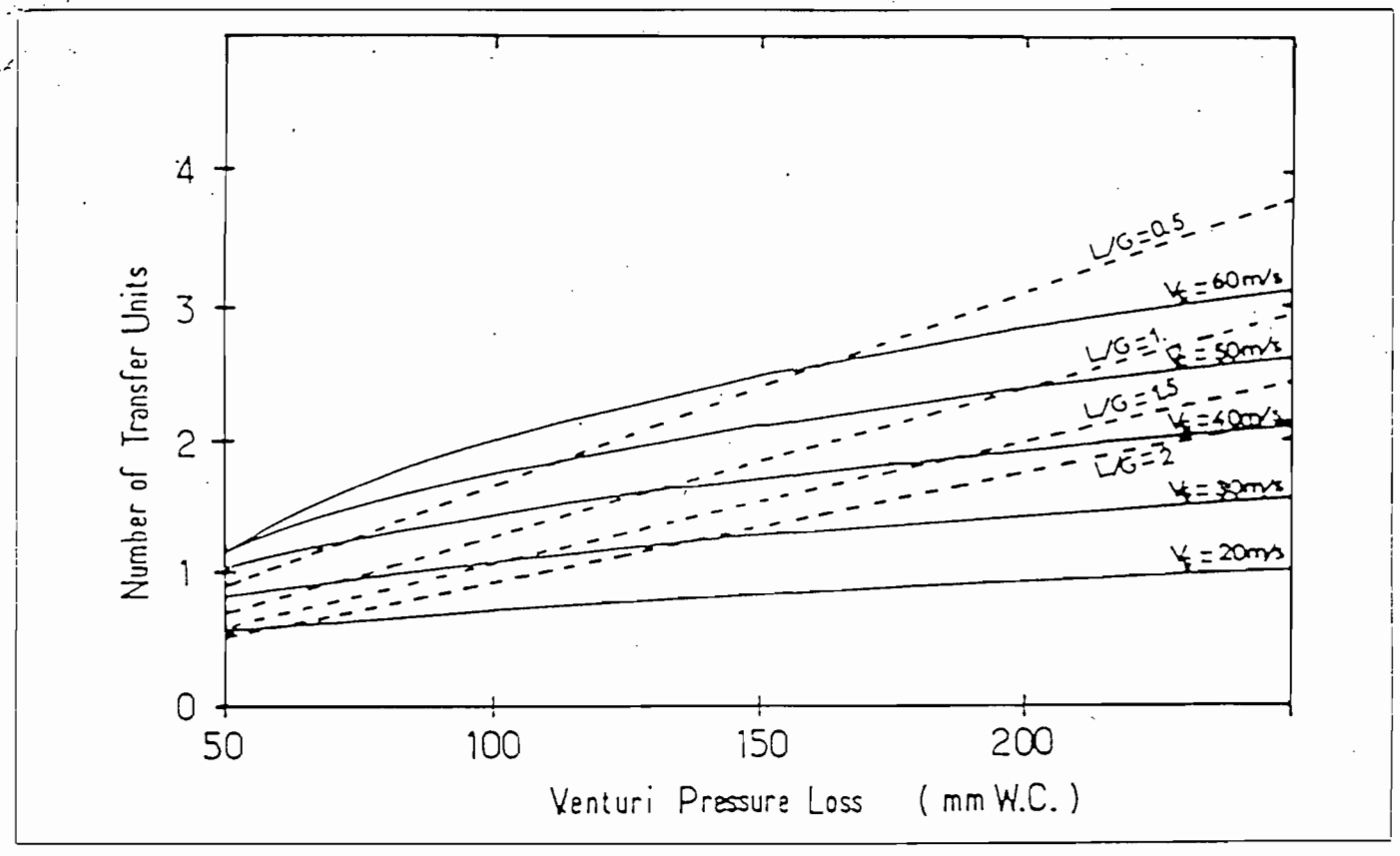

Figure 6. NTU vs. pressure loss. L/G and V_G are taken as parameters. T_{GE} = 60°C and Lv/Dc = 8.5.

Nomenclature

a_v = effective mass transfer surface per unit packed height, sq.m./m.

C = pressure loss factor $\frac{\Delta P \times 2 \times g}{\rho_G V_G^2}$

d = pipe diameter, m.

dp = droplets diameter, m.

D = molecular diffusion coefficient, sq.m./sec.

Dc = venturi throat diameter, m.

g = gravitational acceleration, m./sec./sec.

G = volumic gas flow, cu.m./hr.

h_t = absorber total height, m.

HTU = height of a transfer unit, m.

K = pressure drop coefficient

K_G = overall gas-phase mass transfer coefficient, mole/(hm2atm)

l = pipe length, m.

L = liquid flowrate, cu.m./hr.

L_V = venturi overall length (convergent + throat + divergent), m.

NTU = number of transfer unit

P = total pressure, mm. water column

T = temperature, °C

V = velocity, m./sec.

Y = mole fraction in the gas

Y_{BM} = Log-mean mole fraction of inert component in gas

Greek

α = characteristic length, m.

ΔP = pressure drop, mm. water column

λ = friction factor

μ = viscosity, cp.

ρ = fluid density, kg./cu.m.

σ = liquid surface tension, dyne/sq.cm.

Subscripts

$_G$ = gas

$_L$ = liquid

$_e$ = inlet

$_s$ = outlet

$_1$ = at venturi throat

$_2$ = at cyclonic column inlet

Literature cited

1. Nukiyama and Tanasawa, *Trans. Soc. Mech. Engr.* (Tokyo) 4, 5, 6 (1938–40), cited in Perry "Chemical Engineers' Handbook" 4th ed., Section 18, McGraw-Hill, New York (1968).

D. Billaud, a process engineer in the Inorganic Div. of Rhône-Poulenc, graduated from Conservatoire National des Arts-et-Métiers in 1973. At his present position, he specializes in gas purification.

C. Djololian, a graduate of the Institut de Genie Chimique, Toulouse, France, has worked with Rhône-Poulenc since 1967. At present, he is responsible for the development of processes related to phosphoric acids and its derivatives.

407-691-0894

49 St. James Dri
Palm Beach Gardens, F
33418

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

June 10, 1996

Dr. A. J. Teller
c/o Cooper Union
7th Floor
30 Cooper Square
New York, NY 10003

Dear Dr. Teller:

You probably don't remember me but I worked with you briefly at Wellman-Lord when you were consulting with them in the 60's and I met with you in your Worcester office in 1973. I was with EPA at that time and you provided me with information that proved very helpful in developing the federal new source performance standards for the phosphate industry.

I presume you are now in retirement enjoying the well earned rewards of a very distinguished career. It is understandable that you would not want to be bothered by requests such as this, but I thought I would ask since we cannot locate the precise information we need from the early 70's.

We would be interested in knowing if you have any recollection of the design basis of the IMC Prilled MAP scrubber (TESI Venturi/ Crossflow) that was installed in 1975 at the New Wales facility. Records indicate this scrubber was replaced in 1980 with a venturi/cyclonic after alleged plugging problems with the packed section. The issue of the moment concerns a permit application submitted by US Agri-Chemicals, Ft. Meade, for a new prilled MAP plant. They are strongly opposing our BACT determination which requires either a venturi/crossflow, as IMC had initially, or a venturi/cyclonic scrubber using neutralized pond water.

Specifically, we are trying to establish what the proper design goal should be for fluoride removal from Prilled MAP plants. The 24" w.c. venturi/cyclonic scrubber USAC has proposed is only 83% efficient on gaseous fluorides. We believe it should be above 98%. If you can recall anything about this, we would greatly appreciate it. If you have time to discuss it over the phone, please call or FAX us your phone number and I'll call you at your convenience. Our phone number is 904-488-1344; our FAX number is 904-922-6979.

Sincerely,

John Reynolds

John Reynolds
Permitting Engineer
New Source Review Section

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
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KA 173-94-04

June 4, 1996

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

Subject: USAC Prilled MAP Plant
AC53-260190 (PSD-FL-222)
BACT Determinations

Dear Mr. Fancy:

On behalf of Steve Susick of U.S. Agricultural Chemicals, Inc. (USAC) and the others present at our meeting on May 21, 1996, I would like to express our appreciation for your time and your consideration of the information we presented. Attached hereto are two documents; (1) a letter from Bryan Blythe of the Jacobs Engineering Group, Inc. (Jacobs) summarizing the scrubber performance information that he presented during our meeting and (2) a summary of refined scrubber cost information prepared by Koogler & Associates (K&A) that I presented during the meeting.

At issue are the Departments BACT determinations for particulate matter/PM10 (PM/PM10) and total gaseous fluoride from USAC's prilled MAP plant. The BACT determinations for the combined tower and cooler emissions address both emission limits and control technology. The emission limits for both PM/PM10 and fluorides are to be established after a series of performance tests once the plant is constructed and operating. The control technology establishes "target" control efficiencies for PM/PM10 (99.0 percent) and total gaseous fluorides (99.3 percent).

When the subject permit was drafted, we discussed the BACT determination with John Reynolds (9/17/95) and confirmed the conversation by letter dated September 12, 1995. In that letter, we stated:

1. We were not opposed to emission limits being set at a later date if the limits were based on plant performance over a reasonable period of time, and

2. It was our understanding that the control technology efficiencies stated by the Department were "target" efficiencies for design purposes only as there are no relevant data from other prilled MAP plants.

We received no correspondence, written or oral, from the Department stating the efficiencies were anything other than what we stated in our September 12, 1996, letter. In fact, we received later correspondence from the Department (March 4, 1996) referring to the 99.3 percent fluoride removal efficiency as a "goal".

It should be recognized that if USAC had any reason to believe the removal efficiencies stated in the BACT determinations were anything other than "targets" or "goals", the permit would not have been accepted and/or an Administrative Hearing would have been requested.

The Jacobs document summarizes (in Table 1) why it is possible to achieve a 99+ percent fluoride control efficiency on a wet process phosphoric acid plant and why it is not practical to achieve this control efficiency on a prilled MAP plant. The efficiencies are purely a function of the amount of fluoride in the gas stream approaching the scrubber and the equilibrium fluoride concentration in the gas stream leaving the scrubber. The latter is a function of natural laws and, as a result, the addition of more scrubber transfer units is not going to reduce the concentration of gaseous fluoride in the gas stream leaving the scrubbing system below the equilibrium vapor pressure. Thus, with the gaseous fluoride concentration at the scrubber exit set by natural laws, the scrubber efficiency is dictated by the fluoride concentration in the gas stream approaching the scrubber. As pointed out in the Jacobs document, the fluoride (gaseous and particulate) generated by a prilled MAP plant is inherently low. Thus, the scrubbing efficiency that can be achieved in a prilled MAP plant is low when compared to the efficiency that can be achieved by scrubbers on phosphoric acid plants and when compared with the efficiency quoted by Teller in his 1967 paper in Chemical Engineering Progress (Vol. 63, No. 3, pg. 75-79).

In Exhibit 2 of the Jacobs document, it is demonstrated that on a phosphoric acid plant, a fluoride scrubbing efficiency of 99.7 percent can be achieved with 6.1 scrubber transfer units. In this same Exhibit, it is demonstrated that the 24-inch pressure drop venturi-cyclonic scrubber system (without a packed scrubber) as proposed for the USAC plant, will achieve a total fluoride (gaseous and particulate) scrubbing efficiency of 94.0 percent with 5.3 scrubber transfer units. This number of transfer units is comparable to the number typically used in wet process phosphoric acid plant scrubber design to achieve BACT.

If the number of transfer units proposed by USAC is doubled to about 10.6 by installing a packed scrubber following the 24-inch pressure drop venturi-cyclonic scrubber, the total fluoride scrubbing efficiency would only be increased to 95.7 percent (from 94.0 percent). And, this assumes no aerosol mist formations or droplet carry-over (see Jacobs letter).

Thus, while keeping in line with scrubber performance (in terms of transfer units) typically designed for other fluoride sources in the phosphate fertilizer industry, the 99.3 percent "target" efficiency stated in Permit AC53-260190 (PSD-FL-222) cannot be achieved.

Aside from the natural laws that govern scrubber performance, one must consider the cost of scrubbing systems. Updated scrubber system cost data are presented in the attached K&A memo dated May 30, 1996. Data are presented for three scrubber systems; a 24-inch pressure drop venturi-cyclonic system; an 18-inch pressure drop venturi-cyclonic system followed by a packed scrubber, and a 24-inch pressure drop venturi-cyclonic system followed by a packed scrubber. The 18-inch pressure drop venturi-cyclonic system followed by a packed scrubber resulted in higher total fluoride emissions and higher particulate matter emissions than the 24-inch pressure drop venturi-cyclonic system with no packed scrubber at a significantly higher cost. As a result, this system was rejected as impractical (see K&A cost data and the Jacobs performance analysis).

The two remaining systems both begin with the same 24-inch pressure drop venturi-cyclonic scrubber system. In both cases, the venturi-cyclonic scrubber system will remove 96.5 percent (66.6 tpy) of the particulate fluoride, 87.1 percent (21.3 tpy) of gaseous fluoride, and 94.0 percent (87.9 tpy) of the total fluoride. The installed cost of this system is $1,750,000 and the annual cost is $557,947/yr (see K&A cost data). The unit cost of total fluoride removal by the 24-inch pressure drop venturi-cyclone scrubber system is $6,348/ton.

The addition of the packed scrubber to the 24-inch pressure drop venturi-cyclonic scrubber system will increase the installed cost to $3,227,000 and the annual cost to $786,126/yr (see K&A cost data). The system scrubbing efficiency will be 96.8 percent (66.8 tpy removal) for particulate fluoride, 92.5 percent (22.6 tpy removed) for gaseous fluoride and 95.7 percent (89.4 tpy removed) for total fluoride. The unit cost of total fluoride removal for the entire system (venturi-cyclonic-packed scrubber) is $8,793/ton.

However, as the packed scrubber is an add-on to the originally designed venturi-cyclonic scrubber system, one must look at the incremental efficiency and cost effectiveness of the added section. Of the total fluoride leaving the venturi-cyclone scrubber, the packed scrubber will remove a conservatively estimated 9.1 percent (0.22 tpy) of particulate fluoride, 41.7 percent (1.31 tpy) of gaseous fluoride and 27.6 percent

(1.53 tpy) of total fluoride. The annual incremental cost of removing the 1.53 tpy of total fluoride is $148,845/ton - a cost far beyond any reasonable effective cost.

To spend this amount of money and the attendant energy resources is especially pointless when one considers that EPA has stated that fluorides are not a health related pollutant (see USEPA, Final Guideline Document, Control of Fluoride Emissions from Existing Phosphate Fertilizer Plants, Research Triangle Park, NC, November 1976)

Considering the welfare related effects of fluorides in the environment, the 1.53 tpy (0.35 lb/hr) of the fluorides that could be removed by the packed scrubber would result in an annual ambient air concentration of about 0.01 micrograms per cubic meter. This is only 0.5 percent of the fluoride levels measured in the vicinity of the USAC plant during the gypsum stack expansion study and 0.02 percent of the Florida Air Reference Concentration for fluorides.

Truly, the expenditure of $148,845 to remove a ton of fluoride is control for the sake of control when one considers there will be no benefit to human health and an insignificant reduction in ambient fluoride levels affecting welfare related values.

The data in the attached Jacob's letter demonstrates the problems associated with the attempt to achieve the targeted 99.3 percent total fluoride control level and the cost analysis in the attached K&A memo demonstrates the inordinate cost of reducing fluoride emissions below the proposed limit of 0.0417 pounds per ton of P_2O_5 (the limit achievable with a 24-inch pressure drop venturi-cyclonic scrubber with no packed scrubber). From the data presented by Jacobs, it is apparent that a reduction in the venturi-cyclonic system pressure drop will result in an increase in fluoride emissions, regardless of what type of packed scrubber is added after this system, because of the increase in particulate fluoride emissions. It is also apparent from the Jacobs data that whatever improvements are made to the 24-inch pressure drop venturi-cyclonic system will result in a marginal increase in fluoride removal efficiency and a marginal reduction in fluoride emissions because of the very low emission rate (1.27 lb/hr and 5.6 tpy) from the proposed system. The cost data in the K&A memo demonstrates that whatever improvements are made to the 24-inch pressure drop venturi-cyclonic scrubber system will be made at a prohibitively high incremental cost.

As a result of the data presented herein and the engineering conclusions that are apparent from these data, it is urged that the Department accept the proposed and designed scrubber system consisting of 24-inch pressure drop venturi scrubbers followed by a cyclonic separator as a technology that represents BACT. This could be approved under Provision No. 3 of the Department's BACT Determination that allows for "other systems with

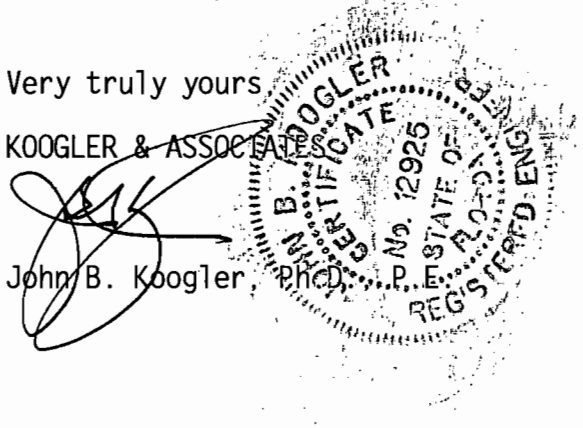
equivalent removal efficiencies approved by the Department." As pointed out previously, the system is designed with a number of transfer units that is equivalent with the number of transfer units required to meet BACT emission limits for other fluoride sources in the phosphate fertilizer industry. As discussed during our meeting, the emission rate from the plant is designed at 0.0417 pounds of total fluoride per ton of P_2O_5. The plant is expected to perform better than designed (see Jacobs letter) and, as stated in the permit, the final permitted emission limit will be based on a series of tests conducted after the plant is operating.

It is further urged that the Department base the permitted fluoride emission limit and demonstration of BACT on emission measurements only and not on scrubber system inlet/outlet tests and an evaluation of the number of transfer units actually achieved. The reason for this request is that the actual fluoride emission rate is expected to be lower than the design emission rate of 0.0417 lb F/ton P_2O_5 and 1.27 lb F/hr (see Jacobs letter). This being the case, the data presented in the two attachments (Jacobs and K&A) demonstrate that any reduction in the fluoride emission rate below what is proposed will be prohibitively costly regardless of how many transfer units actually exist in the scrubber system at the time of testing.

We appreciate your review and consideration of the information provided herein and request that the information presented herein be reviewed as expeditiously as possible so that USAC can meet the construction schedule that has been established. If there are any questions regarding this information, please contact Bryan Blythe of Jacobs (941-665-1511) or Pradeep Raval or me (352-377-5822).

Very truly yours,

KOOGLER & ASSOCIATES



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

JBK:wa

c: Mr. Al Linero, FDEP, Tallahassee
Mr. John Reynolds, FDEP, Tallahassee
Mr. Steve Susick, USAC
Mr. Ron Brunk, USAC
Mr. Bryan Blythe, Jacobs
Mr. Larry Curtin, Holland & Knight
Mr. Pradeep Raval, K&A

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June 4, 1996

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

Subject: USAC Micro Prill MAP Plant
Total Fluoride Emission Limit

Dear Mr. Fancy:

It was a pleasure to meet you in Tallahassee on May 21, 1996. This letter provides the slides that I showed you in this meeting and summarizes our presentation on the scrubbing system for particulates and fluorides at U.S. Agri-Chemicals.

Gaseous Fluoride Removal Efficiencies

An inherent feature of the Micro Prill MAP plant is that it produces less pollutants than conventional methods of fertilizer manufacturer. Table 1 shows the typical gaseous fluoride inlet concentrations for gas streams passing to scrubbers on phosphoric acid, conventional granular DAP, and USAC's Micro Prill MAP plant.

- The vigorous attack of sulfuric acid on phosphate rock in phosphoric acid reactors liberates a gas containing high concentrations of gaseous fluoride, 700 mg/Nm^3 is typical.

- Conventional granular DAP production involves sparging part of the ammonia feed stock through a tumbling bed of granules in an ammoniator granulator. The resulting effluent stream contains large quantities of ammonia which must be removed and these are conventionally removed by scrubbing the outlet gases from the ammoniator granulator system and other areas of the granular DAP plant with phosphoric acid. The phosphoric acid is effective in removing the ammonia, but the airstream may strip fluoride from the phosphoric acid in the venturi cyclonic systems used and leaves a gas which contains typically 65 mg/Nm^3 gaseous fluoride.

- The pipe reactor in a Micro Prill MAP plant is very effective in reacting ammonia and phosphoric acid and the amount of ammonia slip is much lower than in conventional DAP plants. It is therefore only necessary to scrub the gas stream with water to remove the small amount of residual ammonia that remains, the considerable

amount of particulate generated by the production of a prill, and a small amount of fluoride.

The recirculated water that is used to scrub fluoride from the spray tower and cooler effluents in the USAC plant exhibits an equilibrium back pressure of about 3 mg/Nm^3 of dry air. This equilibrium vapor pressure, together with a scrubbing system which incorporates 5.4 transfer units, is used to illustrate the relative ease of achieving high efficiencies in the phosphoric acid systems that are being used to predicate a removal efficiency for the USAC prill MAP plant.

- In the case of the phosphoric acid reactor, which starts with pollutant fluoride concentrations almost two orders of magnitude higher than the prill MAP plant, it is possible to achieve a 99% removal efficiency.

- In the case of the granular DAP plant, the efficiency that it is possible to achieve is reduced to 95%, because the outlet concentration approaches the equilibrium vapor pressure over the solution.

- In the case of the prill MAP plant venturi cyclonic, it is only possible to achieve an 87% gaseous removal efficiency because of the very low inlet concentration of the pollutant and the approach of the outlet concentration to the equilibrium vapor pressure.

- If one adds an additional packed tower to the first scrubbing system with the same number of transfer units, in other words, twice the amount of scrubbing, it is only possible to remove 42% of the remaining fluoride, again because of equilibrium vapor pressure.

Effect of Adding A Packed Tower Scrubber To The Venturi Cyclonic System Presently Incorporated In The Design

Figure 1 shows the venturi cyclonic scrubber as designed with the addition of a packed tower scrubber. Effluent gases from the spray tower and from the cooler cyclone pass through individual venturi systems, large amounts of energy are dissipated out over the venturi and the majority of the particulate and its associated fluoride and the gaseous fluoride are removed.

The overall efficiency of the venturi cyclonic scrubber on total fluoride removal is 94%.

In the present design, the gas from the cyclonic separator passes directly to the scrubber fan and stack.

The packed tower suggested by FDEP is shown following the venturi cyclonic system. The effluent gases pass from the venturi cyclonic through the packed tower and then to the scrubber fan and stack.

Approximately 16,000 lb/hr. of process water make-up is fed to the packed tower and because of the large gas volumes involved, this is arranged in a pump-around system so that there is sufficient water to irrigate the packing. The recirculated water then advances to the venturi cyclonic system which is fitted with a similar pump-around system and the water stream containing the removed particulates and fluoride is then blown down from the system as make-up to the process. Three sets of economics of the cost of fluoride removal have been calculated.

- Venturi cyclonic scrubber alone with a 24 in. pressure drop. (current design)
- Venturi cyclonic scrubber with 24 in. pressure drop, packed tower, auxiliary fan, scrubber fan and stack.
- Venturi cyclonic scrubber with 18 in. pressure drop, packed tower, scrubber fan and stack.

Reduction of the pressure drop across the venturi system more than doubles the amount of particulate leaving the venturi and results in a commensurate increase in particulate fluoride.

The particulate cut-off for the venturi cyclonic scrubber and packed tower are also shown on Figure 1. This is the average particle diameter removed by the device. The cut-off for the venturi cyclonic scrubber is just under half a micron and for the packed tower is 2 microns. As a result, the packed tower recovers only a small percentage of the particulate leaving the venturi cyclonic scrubber (10% recovery has been assumed).

The particulate, particulate fluoride, gaseous fluoride, and total fluoride concentrations are shown on Figure 1 at both the exit of the venturi scrubber system and at the exit of the packed tower. The addition of the packed tower system results in a reduction in particulate from 24 lb/hr. to 21.82 lb/hr. and a reduction in total fluoride from 1.27 to 0.92 lb/hr, if a venturi pressure drop of 24 in. is maintained.

However, if the venturi pressure drop is reduced to 18 in. to remove the necessity for an auxiliary fan and its commensurate power consumption, the overall system results in an increase in particulate from 24 lb/hr. to 51.39 lb/hr. and of total fluoride from 1.27 lb/hr. to 1.55 lb/hr. over the venturi cyclonic system currently proposed.

Cut Diameter vs. Gas Phase Pressure Drop For Various Types of Scrubbers

Figure 2 is reproduced from an article by Dr. Seymour Calvert in *Chemical Engineering*, August 29, 1977, which was provided to you at the meeting. Dr. Calvert was an air pollution control officer for Brookpark, Ohio, Chairman of the Cleveland Advisory Board on Air and Water Pollution, Dean of Engineering at the University of California (Riverside), and Director of the Air Pollution Control Association. Figure 2 provides the "cut diameter" against pressure drop for a number of different types of particulate removal systems. The pressure drop across the venturi cyclonic separator at USAC as designed is 24 in. with 5 in. being consumed by the cyclonic section. This leaves 19 in. for the spray tower venturi which corresponds to a cut diameter of approximately 0.5 microns on curve 4. With a 1 in. allowance for ductwork pressure drop, 5 in. of pressure drop is available for the packed tower which corresponds to a cut diameter of 2 microns on curve 2. Mr. Calvert says the following on the fourth page of his article,

> "The reason cut diameter is so useful a parameter is that a curve of collection efficiency vs. particle diameter for collection by inertial impaction is fairly steep. Several important types of scrubbers have performance characteristics such that a particle whose aerodynamic diameter is half the cut diameter would be collected at about 10% efficiency whereas a particle with an aerodynamic diameter twice the cut diameter would be collected at about 90% efficiency.
>
> Because the cut is fairly sharp, one can use as a rough approximation, a concept that the scrubber collects everything larger than the cut diameter and passes everything smaller."

As stated above, we have assumed that the packed tower is capable of removing 10% of the particulates left in the gas stream by the venturi cyclonic separator.

Venturi Cyclonic Quoted Removal Efficiencies vs. Pressure Drop

Table 2 and Figure 3 are a tabulation and curve for the removal efficiencies of venturi cyclonic scrubbers against venturi pressure drop provided to Jacobs by DR Technologies, the scrubber vendor, in a letter on January 9, 1995. This data plus a performance allowance were used to generate the particulate value shown on Figure 1.

Limitations in Gaseous Fluoride Removal Capability

Exhibit 1 and Figure 4 are an extract from Pierre R. Becker's recent textbook on phosphates and phosphoric acid (Marcell Decker 1989), the most recent and definitive work on phosphoric acid and phosphate manufacture. Becker, on Exhibit 1, describes the reasons for low scrubbing efficiencies when fluoride scrubbing is attempted.

- High Operating Temperatures with Recirculated Water Systems resulting in high H_2SiF_6 equilibrium partial pressures (the recirculated liquor in the USAC scrubber system will be at about 50°C.)

- Mist formation and droplet entrainment. Sub-micron mists act very much like particles and require a high energy venturi type of scrubber to remove.

- Precipitation of silica and potential plugging of the scrubbing system.

- Dissociation of fluosilicic acid to hydrogen fluoride at low fluosilicic acid concentrations in the 4 g/liter to 0.05 g/liter range.

Maximum Possible Packed Tower Performance

Figure 4 which plots fluoride equilibrium partial pressure in milligrams per cubic meter of dry air against fluoride concentration in the liquid phase in g/liter demonstrates the effect of fluosilicic acid dissociation on the fluoride vapor pressures which remain essentially constant in the concentration range 4 g/liter to .05 g/liter.

The performance of the packed scrubber was evaluated using this most recent fluoride equilibrium vapor pressure data in Table 3 and Figure 5.

Table 3 shows the effect of fluoride absorption from 0 to 0.7 lb/hr. on the residual fluoride left in the gas phase and on the equilibrium fluoride partial pressure which is shown in grams per cubic meter of dry air and converted to lb/hr.

Fluoride left in the gas stream and the equilibrium fluoride quantity in the gas stream are plotted against fluoride absorbed in Figure 5. This data shows that the fluoride left in the gas stream and the equilibrium fluoride quantity meet at an approximate absorption of 0.3 lb/hr. of fluoride and this is further emphasized by the number of stages required in Table 3. The #NUM! values given by the spreadsheet show that for these amounts of fluoride absorption, the tower is acting as an absorber at the inlet and a stripper at the exit. At an absorption of 0.7 lb/hr., the number of stages is shown as -2.25 and this indicates that the tower becomes a stripper throughout its length.

In other words, the maximum possible removal of gaseous fluoride is 0.3 lb/hr. no matter how many transfer units are installed in the packed tower. This maximum fluoride removal is used to calculate the gaseous fluoride removal across the packed tower shown on Figure 1.

Actual Plant Operating Data

Table 4 shows data from the Namhae Chemical, Korea, DAP/NPK plant. Jacobs added an additional scrubber to this granular fertilizer plant in a very similar attempt to reduce the final concentrations of fluoride in the fertilizer plant effluent gases. From the results, one can conclude that:

- Very little fluoride is removed at low levels when scrubbing with fresh water. In fact, in the first set of data from July 31, 1995, the analyses show an actual fluoride increase which is, of course, not possible.

- The remaining data shows a reduction in fluoride concentration of only about 15% compared with the 40% reduction calculated from the Becker data for USAC.

Effect of Aerosol Mists and Carry Over

It should be emphasized that the removal of 0.3 lb/hr. of gaseous fluoride estimated from vapor pressure data above assumes that none of this gaseous fluoride is bound up as an aerosol, which will probably not be the case. Because submicron aerosol mists act like particulates in scrubber systems, any fluoride that is present in this form entering the packed scrubber will not be removed and it is quite probable that the fluoride removal achieved by the additional packed scrubber would fall to the 0.1 lb/hr. range and mimic the performance that we have seen in Korea.

If there is any carry over of scrubbing solution in the form of droplets, this will also reduce the removal capabilities of the scrubber.

Equivalent Transfer Units

The scrubbing system for the U.S. Agri-Chemicals Prill MAP plant has been designed according to standards comparable with other plants in the phosphate industry using the number of theoretical equilibrium stages or transfer units of its scrubbing system as a basis for comparison.

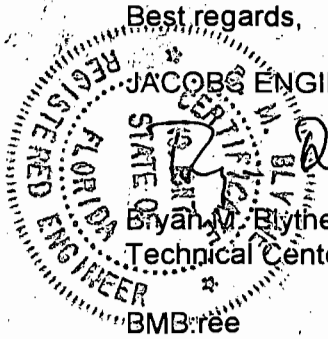
In order to achieve the new BACT emission standard for fluoride of 0.016 lb/ton P_2O_5 fed for phosphoric acid plants, approximately 6 transfer units are necessary. The calculations to demonstrate this are shown in Exhibit 2.

The scrubbing system to be provided for U.S. Agri-Chemicals can be shown to require at least 5.4 transfer units to achieve the permitted emissions of 0.4 lbs. particulate/ton MAP and 0.0417 lbs. total fluoride/ton P_2O_5. We are confident that scrubbing system to be installed will perform better than the permit levels. Calculations for the number of

transfer units for a typical phosphoric acid plant and for the USAC micro prill MAP plant are attached in Exhibit 2.

Best regards,

JACOBS ENGINEERING GROUP INC.



Bryan M. Blythe
Technical Center Director

BMB:ree

Enclosures

Table 1

GASEOUS FLUORIDE SCRUBBING

Assumptions

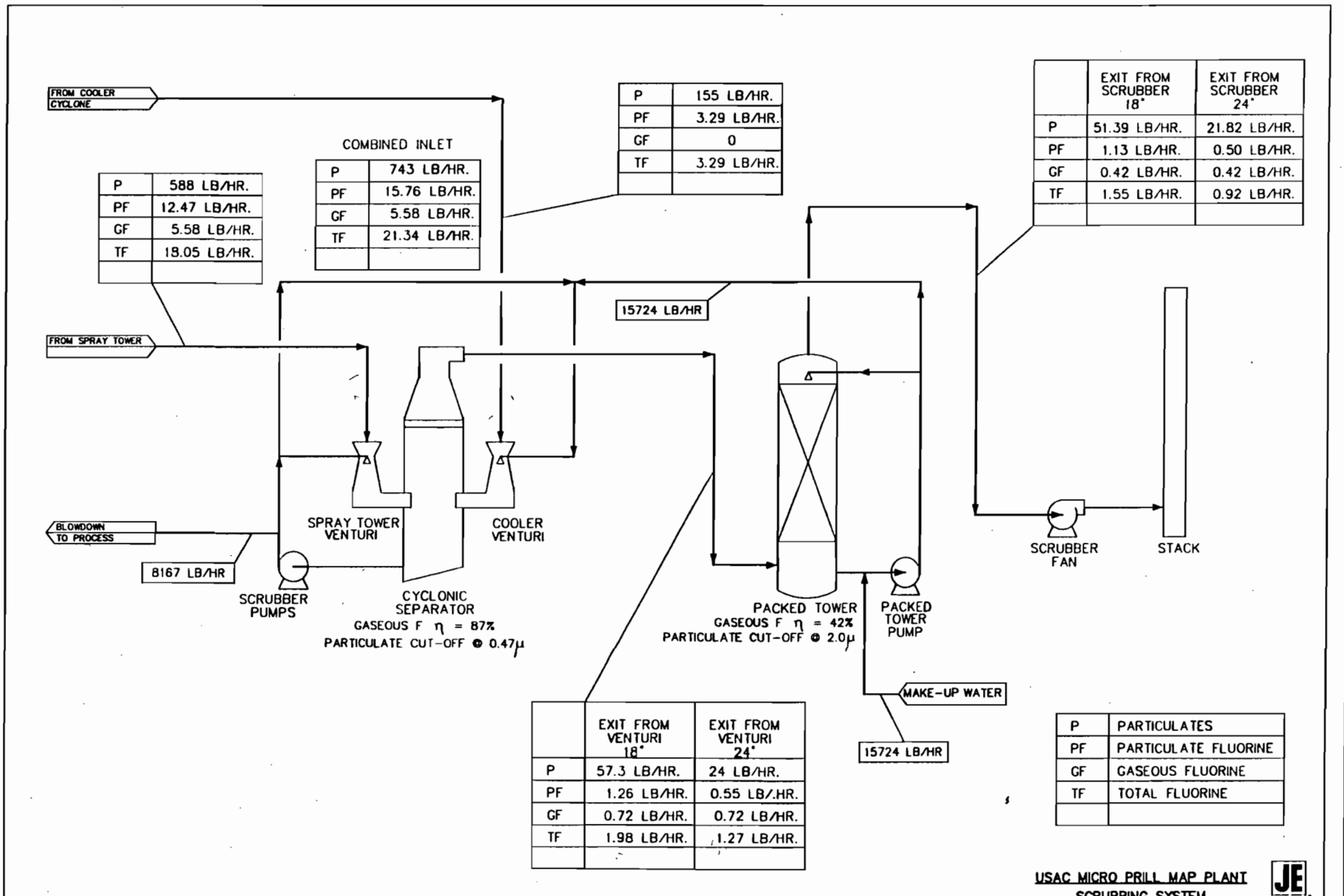
1. Equilibrium vapor pressure is 3 mg/Nm3
2. Scrubbing system has 5.4 transfer units

Plant	Inlet Conc. mg/Nm3 (mg/scf)	Outlet Conc. mg/Nm3 (mg/scf)	Efficiency %
Phos. Acid	700 (18.75)	6.15 (0.165)	99.1
Gran. DAP	65 (1.74)	3.28 (0.086)	95.0
Powder MAP - Venturi Cyclonic	23 (0.62)	3.09 (0.081)	86.6
Powder MAP - Packed Tower	2.24 (0.060)	1.31 (0.034)	41.7

Conclusions

1. Much easier to obtain high efficiencies with phos acid because driving force is considerably higher.
2. Packed tower efficiency is very low because driving force is very small.

Figure 1


FROM COOLER CYCLONE
P 155 LB/HR.
PF 3.29 LB/HR.
GF 0
TF 3.29 LB/HR.
EXIT FROM SCRUBBER 18°
EXIT FROM SCRUBBER 24°
P 51.39 LB/HR. 21.82 LB/HR.
PF 1.13 LB/HR. 0.50 LB/HR.
GF 0.42 LB/HR. 0.42 LB/HR.
TF 1.55 LB/HR. 0.92 LB/HR.
COMBINED INLET
P 743 LB/HR.
PF 15.76 LB/HR.
GF 5.58 LB/HR.
TF 21.34 LB/HR.
P 588 LB/HR.
PF 12.47 LB/HR.
GF 5.58 LB/HR.
TF 18.05 LB/HR.
15724 LB/HR
FROM SPRAY TOWER
BLOWDOWN TO PROCESS
8167 LB/HR
SPRAY TOWER VENTURI
COOLER VENTURI
SCRUBBER PUMPS
CYCLONIC SEPARATOR
GASEOUS F η = 87%
PARTICULATE CUT-OFF @ 0.47μ
PACKED TOWER
GASEOUS F η = 42%
PARTICULATE CUT-OFF @ 2.0μ
PACKED TOWER PUMP
SCRUBBER FAN
STACK
MAKE-UP WATER
15724 LB/HR
EXIT FROM VENTURI 18°
EXIT FROM VENTURI 24°
P 57.3 LB/HR. 24 LB/HR.
PF 1.26 LB/HR. 0.55 LB/.HR.
GF 0.72 LB/HR. 0.72 LB/HR.
TF 1.98 LB/HR. 1.27 LB/HR.
P PARTICULATES
PF PARTICULATE FLUORINE
GF GASEOUS FLUORINE
TF TOTAL FLUORINE
USAC MICRO PRILL MAP PLANT
SCRUBBING SYSTEM
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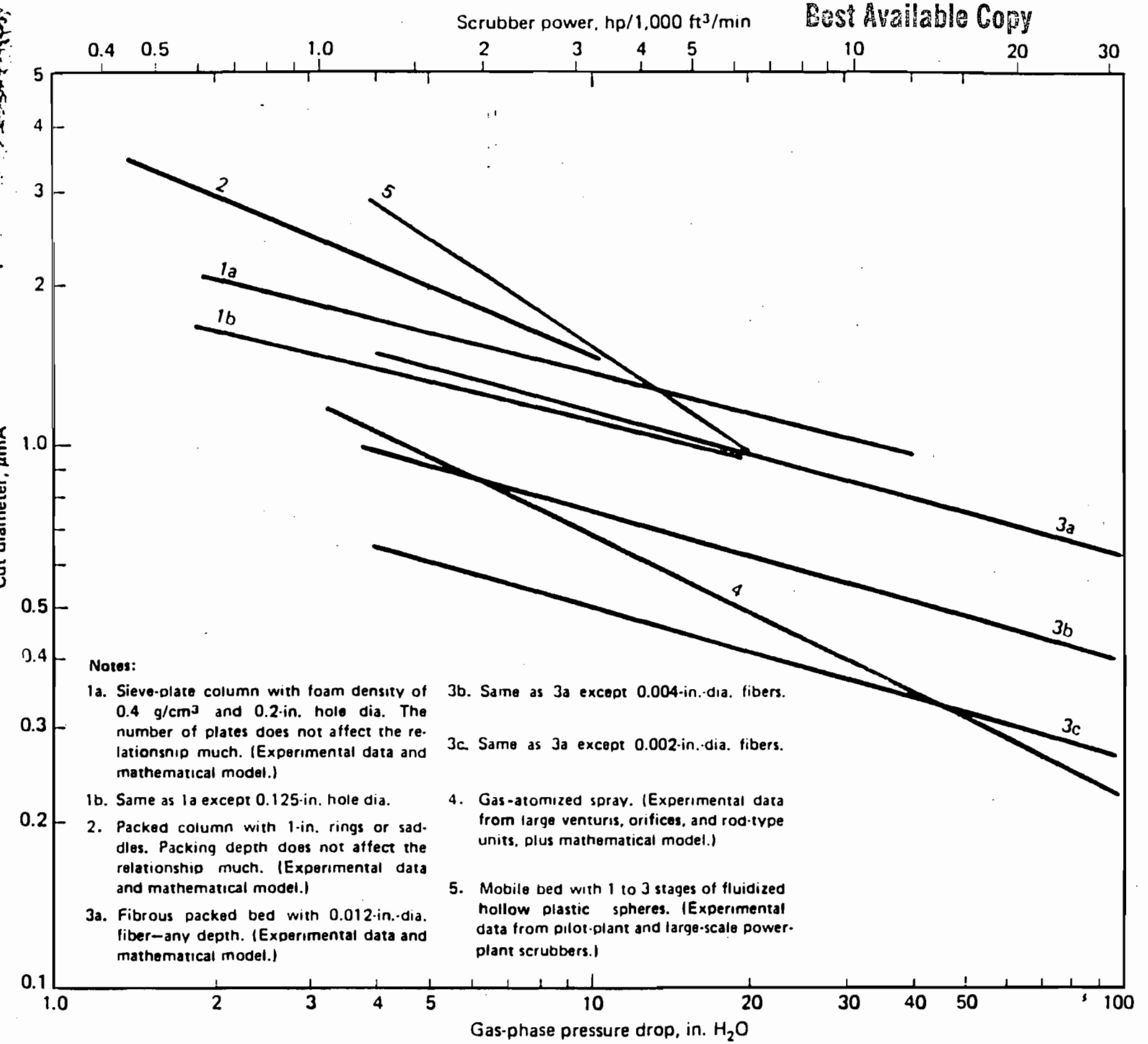


Notes:

1a. Sieve-plate column with foam density of 0.4 g/cm³ and 0.2-in. hole dia. The number of plates does not affect the relationship much. (Experimental data and mathematical model.)

1b. Same as 1a except 0.125-in. hole dia.

2. Packed column with 1-in. rings or saddles. Packing depth does not affect the relationship much. (Experimental data and mathematical model.)

3a. Fibrous packed bed with 0.012-in.-dia. fiber—any depth. (Experimental data and mathematical model.)

3b. Same as 3a except 0.004-in.-dia. fibers.

3c. Same as 3a except 0.002-in.-dia. fibers.

4. Gas-atomized spray. (Experimental data from large venturis, orifices, and rod-type units, plus mathematical model.)

5. Mobile bed with 1 to 3 stages of fluidized hollow plastic spheres. (Experimental data from pilot-plant and large-scale power-plant scrubbers.)

ut/power relationship simplifies process design for many scrubber configurations

Fig. 20

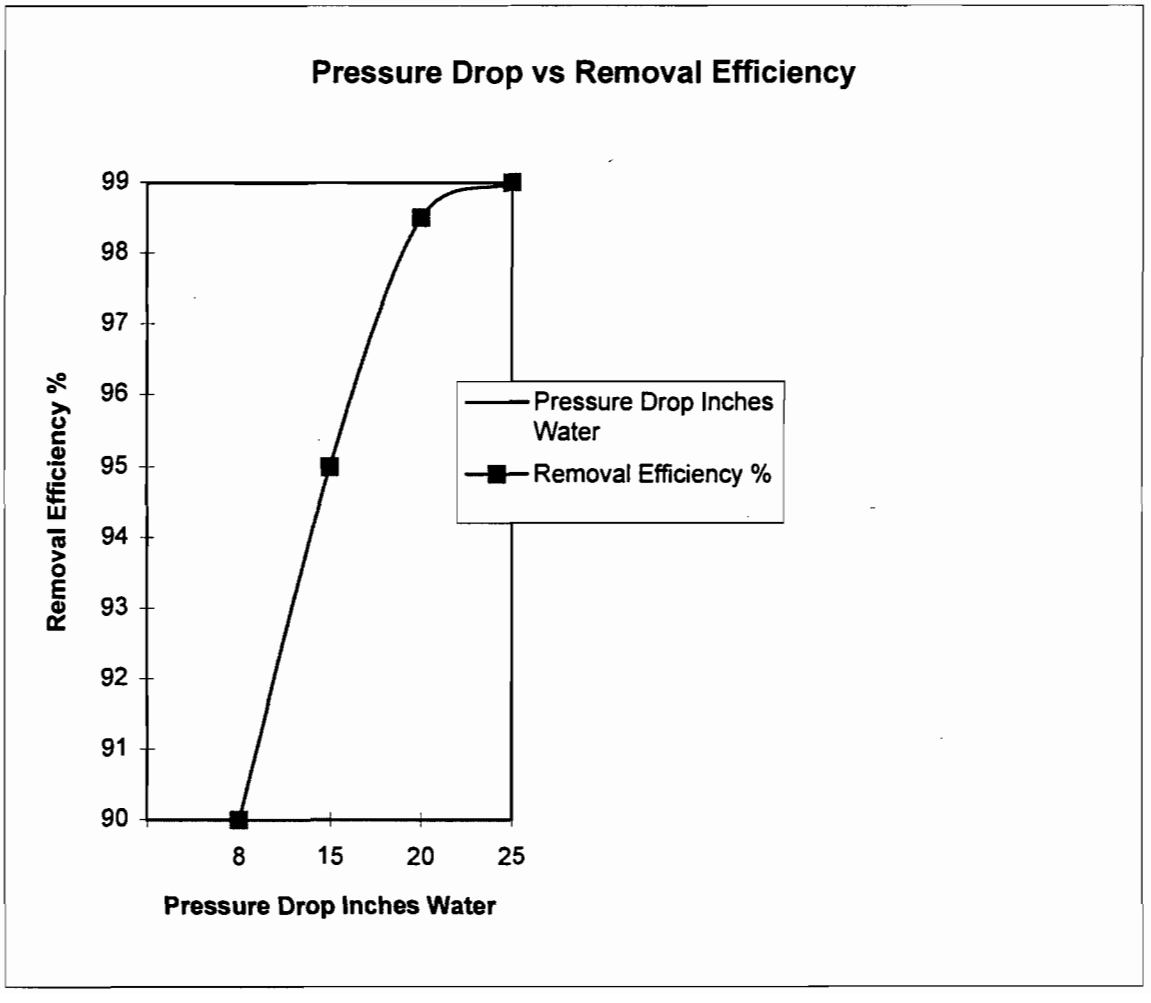
Figure 2

Table 2

D.R. Technology Venturi Cyclonic Scrubbers
Quoted Removal Efficiencies vs Pressure Drop

Pressure Drop Inches Water	Removal Efficiency %
8	90
15	95
20	98.5
25	99

Figure 3



Several reasons for low scrubbing efficiencies can be listed:

1. The effluent gases leaving the reactor are moist and warm (65–70°C), almost saturated, and consequently difficult to cool. Unless very large amounts of scrubbing water within an open cycle can be used (with large quantities of contaminated water leaving the plant) the system will necessarily operate at temperatures close to 60–65°C. Partial pressures of H_2SiF_6 liquors are very sensitive to the effect of temperature.
2. Scrubbing wash liquors containing hydrofluoric and hydrofluosilicic acids are readily subject to droplet entrainment and mist formation.
3. There is a tendency to precipitate silica at the front end of the system, possibly plugging the scrubbing system. This precipitation increases the F/SiO_2 ratio and subsequently the partial pressure of F in the following stages.
4. At lower H_2SiF_6 concentrations in the wash liquor, there is an increase in the F in gas/F in liquor partial pressure ratio. The ratio is subject to a 100-fold increase within the F in liquor concentration of about 0.4–0.05%. To overcome this phenomenon, highly efficient scrubbing systems with several stages must be used [29]. There are two explanations for this phenomenon:
   a. With increasing pH values when the H_2SiF_6 concentration drops in the wash liquor, the equilibrium

$$4H_2O + H_2SiF_6 \rightleftharpoons 6HF + Si(OH)_4 \qquad (71)$$

   is pushed to the right. When the concentration of F is below 0.05% F in the liquor, all of F can be considered as HF.
   b. Hydrofluosilicic acid in solution presents a more complex composition, such as $H_2SiF_6(SiF_4)_n$, n being affected by the concentration of F in the liquor. A lower concentration would favor low n values with consequent higher F vapor pressure due to HF release:

$$H_2SiF_6(SiF_4)_n + 4H_2O \longrightarrow H_2SiF_6(SiF_4)_{n-2} + H_2SiF_6 + 2HF + Si(OH)_4 \qquad (72)$$

Whatever the explanation, the scrubbing system has to cope with the fact of a 100-fold increase in the relative F vapor/F liquor ratio, disturbing Henry's law. The empirical partial pressure diagram (Fig. 5.23) demonstrates a shift from H_2SiF_6 lines to HF lines between 0.4 and 0.05% F in liquor.

Figure 4

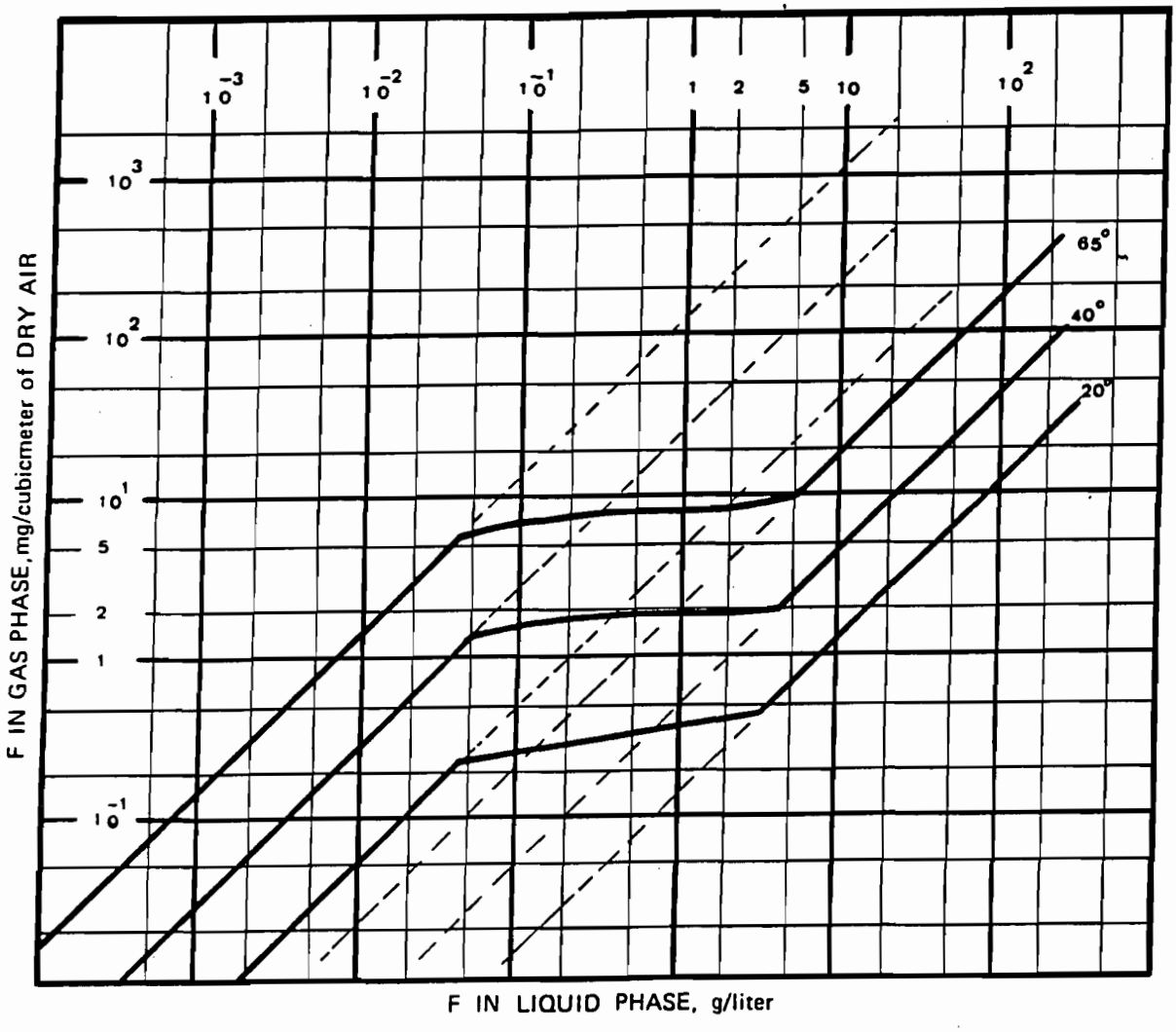


FIG. 5.23 Effect of fluoride concentration in H_2SiF_6 liquor on fluorides in gas phase.

These effects explain why many of the fluorine scrubbers operate far below the rated yield of efficiency. Hihg-efficiency effluent gas washing can be achieved only when we rely on proven equipment, systems, and operating conditions.

Table 3 USAC Micro Prill MAP Plant
Packed Scrubber
Fluorine Absorbed vs Equilibrium Fluorine

Fluorine Absorbed Lb/Hr	Fluorine Left Lb/Hr	Equilibrium Fluorine Lb/Hr	Fluorine Concentration Gm/Litre	Fluorine mg/cm Dry Air	Number of Stages
0	0.72	0	0	0.00	0.00
0.1	0.62	.1284	.0064	0.40	0.19
0.2	0.52	.2729	.0127	0.85	0.59
0.3	0.42	.3692	.0191	1.15	1.93
0.4	0.32	.4816	.0254	1.50	#NUM!
0.5	0.22	.5779	.0318	1.80	#NUM!
0.6	0.12	.6421	.0382	2.00	#NUM!
0.7	0.02	.8026	.0445	2.50	-2.25

Blowdown = 15724 Lb/Hr

Dry Air = 145628 Cm/Hr

Gaseous F exit Venturi 0.72 Lb/Hr

Figure 5

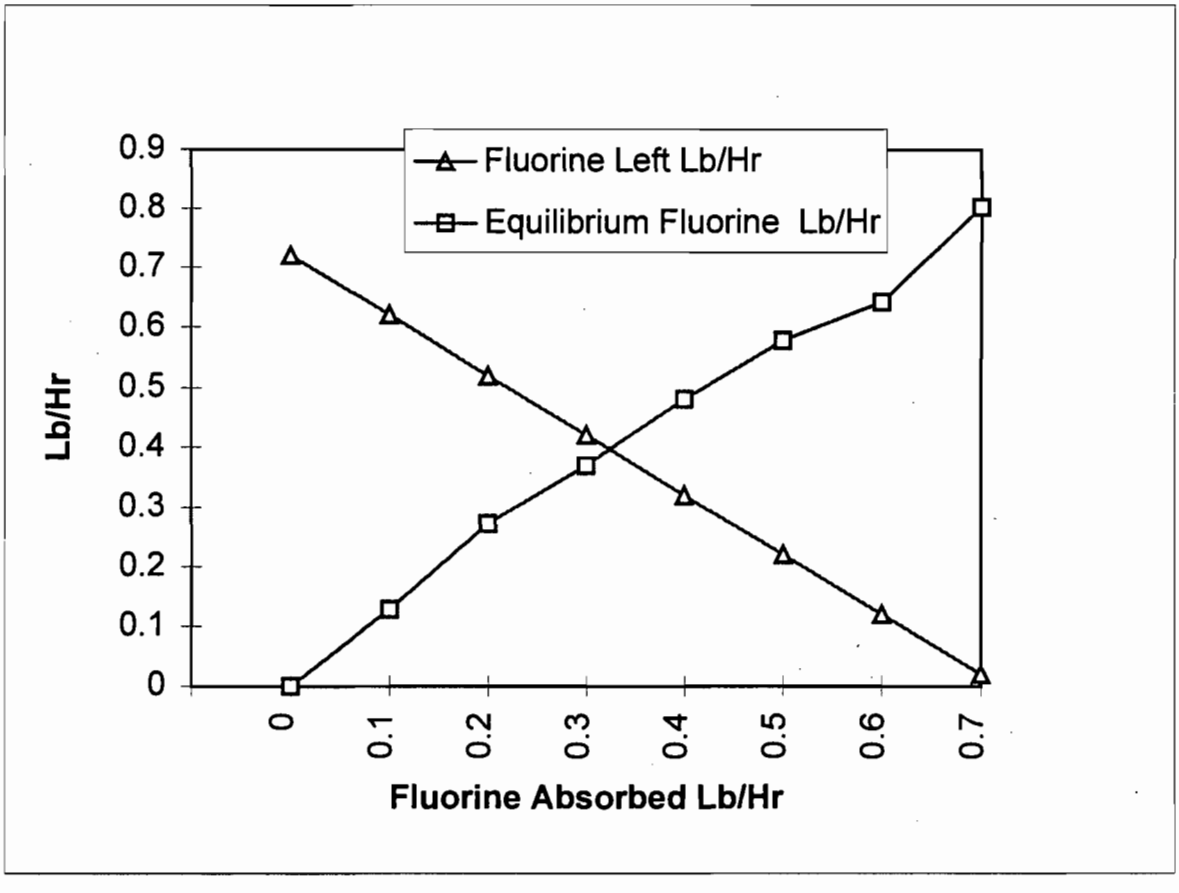


Table 4

Data From Namhae Chemical - Korea DAP/NPK plant

Capacity 90 tph

Venturi Cyclonic Followed by Kimre Scrubber

Date	Fluorine In ppm	Fluorine Out ppm
7/31/95	2.80	3.75
8/2/95	1.43	1.15
8/3/95	1.15	1.00
Scrubbing Medium	Fresh Water	

Exhibit 2

Number of Transfer Units (NTU's) Required in a Phosphoric Acid Plant for Fluorine Removal

From the article by Teller a typical phosphoric acid plant scrubbing system uses once-through pond water to treat the following airstreams.

	acfm	mgF / ft^3
Digestion	20,000	150
Filtration	20,000	10
Sumps & Vents	25,000	3
Overall	65,000	50.4 = 1,780 mg/m^3

BACT emissions from a modern day 1891.2 tpd P_2O_5 phosphoric acid plant would be about:

65,000 acfm (55,300 dry acfm)
30.3 lb/day fluorine
0.016 lb/ton P_2O_5
0.173 mg/ft^3 = 6.10 mg/m^3

The latest available information on equilibrium vapor pressure in weak fluosilicic acid solutions is provided by Becker (Figure 4). Typical pond water leaving a once through scrubber would have a concentration of 3000-5000 ppm (3-5 g/l), according to the Teller article, at 110°F. From the Becker data, equilibrium vapor pressure is approximately 2 mg/m^3:

Number of transfer units is defined as

$$\text{Ln } (P_1 - P^*/P_2 - P^*)$$

Where P_1 = Inlet Fluorine Pressure in gas phase
P_2 = Outlet Fluorine Pressure in gas phase
P^* = Equilibrium Fluorine Pressure

The number of transfer units required is therefore:

$$\text{Ln } (1780 - 2 / 6.10 - 2) = 6.07$$

Gaseous Fluoride Emission at USAC

Spray Tower Venturi Airflow		110,014 m^3/h dry air
Gaseous F at Venturi Inlet		5.58 lb/h
Concentration at Inlet	=	$\frac{5.58 \times 454}{110{,}014} \times 1000$
	=	23.03 mg/m^3 dry air
Scrubber Liquor Concentration		0.59 g/litre
Scrubber Liquor Temperature		120°F (49°C)
From Becker the equilibrium vapor pressure		2.9 mg/ m^3 dry air
Gaseous F at Exit	=	0.72 lb/hr
	=	$\frac{0.72 \times 454 \times 1000}{110{,}014}$
	=	3 mg/m^3
Number of Transfer Units (NTU)	=	$\ln \frac{23 - 2.9}{3 - 2.9} = 5.3$
Max particulates permitted	=	24 lb/h (0.4 lb/ton MAP)
	=	0.55 lb/h fluoride
Total fluoride Emission	=	0.72 + 0.55 = 1.27 lb/h (0.0417 lb/ton P_2O_5)

USAC MAP PROJECT - BACT CALCULATIONS
Dated 5-30-96

This updated BACT analysis includes the most recent cost/emissions information gathered on the three scrubbing system configurations evaluated for USAC's proposed prilled MAP plant. The cost and performance data represent the most recent cost information provided by the scrubber vendor and refinements to the performance calculations based on the Becker fluoride (F) vapor pressure data. The data presented herein supersede previous data submitted to the Department and are consistent with data submitted during our meeting with FDEP in Tallahassee on May 21, 1996.

Jacobs projects a total F emission rate as low as 0.92 lb/hr for a high energy venturi-cyclonic and cross flow scrubbing system combination; 1.27 lb/hr for a high energy venturi cyclonic scrubbing system; and, 1.55 lb/hr for a low energy venturi-cyclonic and cross flow scrubbing system combination. Jacobs Engineering, for reasons stated during our meeting and in the attached letter from Jacobs, are not in a position to guarantee the emission rates.

A. Low energy venturi-cyclonic and cross flow scrubber:

The following analysis pertains to a two-stage system with low energy venturi-cyclonic followed by a cross flow scrubber. The total F emission rate is 1.55 lb/hr (1.13 lb/hr particulate F and 0.42 lb/hr gaseous F).

Fluorides Control

The total F to scrubber of 21.33 lbs/hr represents 5.58 lbs/hr gaseous F and 15.75 lbs/hr particulate F.

Total F removed = (21.33 - 1.55) lb/hr x 8760 hrs x ton/2000 lbs
= 86.6 tpy

Scrubber F eff. = (21.33 lb/hr - 1.55 lb/hr)/21.33 lb/hr
= 92.7 percent

The total costs, submitted previously to FDEP (letter 5-7-96) are as follows:

Total installed costs = $ 2,888,000

Total annual costs = $ 671,054

The annual cost of control, based on expected F removal:

Annual cost of control = $671,054/86.6 tpyF
= $7749/ton F removed

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COMPARISON OF SYSTEM "A" TO THE PROPOSED SYSTEM

The incremental cost analysis presented below is simplified by evaluating the difference in annual costs to the difference in F removal for the two arrangements, assuming equivalent O&M costs and proportional capital (direct and indirect) costs.

Total annual cost = $557,947
(24 inch pressure drop Venturi, updated)

Total annual cost = $671,054
(Two-stage scrubber)

Annual Cost Difference = $113,107

Added Fluoride Removal = (1.27-1.55)lb/hr x 8760 hr/yr x ton/2000lbs
= - 1.2 tpy

The above analysis indicates that both cost and F emissions are expected to be higher for the low venturi-cross flow scrubber arrangement than for the 24 inch pressure drop venturi system.

B. High energy venturi-cyclonic and cross flow scrubber:

The following analysis pertains to a two-stage system with high energy (24 inch pressure drop) venturi-cyclonic followed by a cross flow scrubber. This arrangement requires a $98,000 additional booster fan (200 HP), adding to the capital and operating costs of scrubbing arrangement "A" discussed above. The total F emission rate is 0.92 lb/hr (0.50 lb/hr particulate F and 0.42 lb/hr gaseous F).

Fluorides Control

The total F to scrubber of 21.33 lbs/hr represents 5.58 lbs/hr gaseous F and 15.75 lbs/hr particulate F.

Total F removed = (21.33 - 0.92) lb/hr x 8760 hrs x ton/2000 lbs
= 89.4 tpy

Scrubber F eff. = (21.33 lb/hr - 0.92 lb/hr)/21.33 lb/hr
= 95.7 percent

Fixed Capital Costs

Venturi-Cyclonic Equipment Capital Costs:
(Updated venturi-cyclonic costs from Jacobs)

Cooler Cyclone	=	$ 37,000
Cooler Venturi, Spray Tower Venturi, Cyclonic Separator	=	$ 248,000
Fans	=	$ 220,000
Pumps	=	$ 24,000
Stack	=	$ 73,000
Total Equipment Cost	=	$ 602,000
Installation, including structural work, etc	=	$ 1,487,000
Subtotal (Installed Cost)	=	$ 2,089,000

Cross Flow W/Kimre Packing Equipment Capital Costs:

Scrubber	=	$ 270,000
Pumps	=	$ 22,000
Total Equipment Cost	=	$ 292,000
Installation including structural work, etc	=	$ 846,000
Subtotal (Installed Cost)	=	$ 1,138,000
Total Installed Cost	=	$ 3,227,000
Total Equipment Cost	=	$ (602,000 + 292,000)
	=	$ 894,000

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Operation and Maintenance Costs

Operating Costs:		
Electricity	=	(617+50+200)BHP x 0.746 kw/hp x 8760 hrs/yr x $0.059/kw
	=	$334,283
Water	=	32 gpm x 60 min/hr x 8760 hrs/yr x $0.20/1000 gals
	=	$3,364
Total operating costs	=	$337,647
Maintenance Costs:		
Operating labor	=	2 hrs/shift x shift/8 hrs x 8760 hrs/yr x $12.96/hr
	=	$28,382
Supervisory labor	=	$28,382 x 0.15 (EPA factor)
	=	$4,257
Maintenance labor	=	1 hr/shift x shift/8 hrs x 8760 hrs/yr x $14.26/hr
	=	$15,615
Maintenance materials	=	$15,615 x 1.0 (EPA factor)
	=	$15,615
Total maintenance costs	=	$63,869
Total annual O&M costs	=	$337,647 + $63,869
	=	$401,516

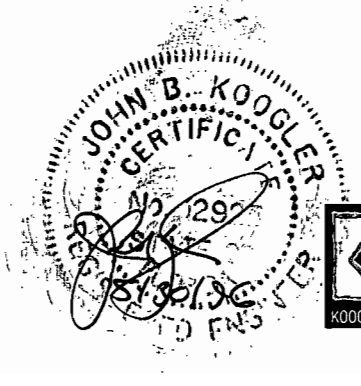
Indirect Costs

Overhead	=	$63,869 x 0.6 (EPA factor)
	=	$38,321
Administration	=	$894,000 x 1.91 (EPA factor) x 0.02 (EPA factor)
	=	$34,151
Insurance	=	$894,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$17,075
Property tax	=	$894,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$17,075

Capital recovery	=	$894,000 x 1.91 (EPA factor) x 0.1628 (EPA factor)
	=	$277,988
Total indirect costs	=	$38,321 + $34,151 + $17,075 + $17,075 + $277,988
	=	$384,610
Total annual costs	=	$384,610 + $401,516
	=	$786,126
Annual cost of control	=	$786,126/89.4 tpyF
	=	$8793/ton F removed

COMPARISON TO PROPOSED SYSTEM

Total annual cost (Venturis, updated)	=	$557,947
Total annual cost (Two-stage scrubber)	=	$786,126
Annual Cost Difference	=	$228,179
Added Fluoride Removal	=	(1.27-0.92)lb/hr x 8760 hr/yr x ton/2000lbs
	=	1.5 tpy
INCREMENTAL COST	=	**$228,179/1.5 tpyF**
	=	**$148,845 per ton of additional F removed.**

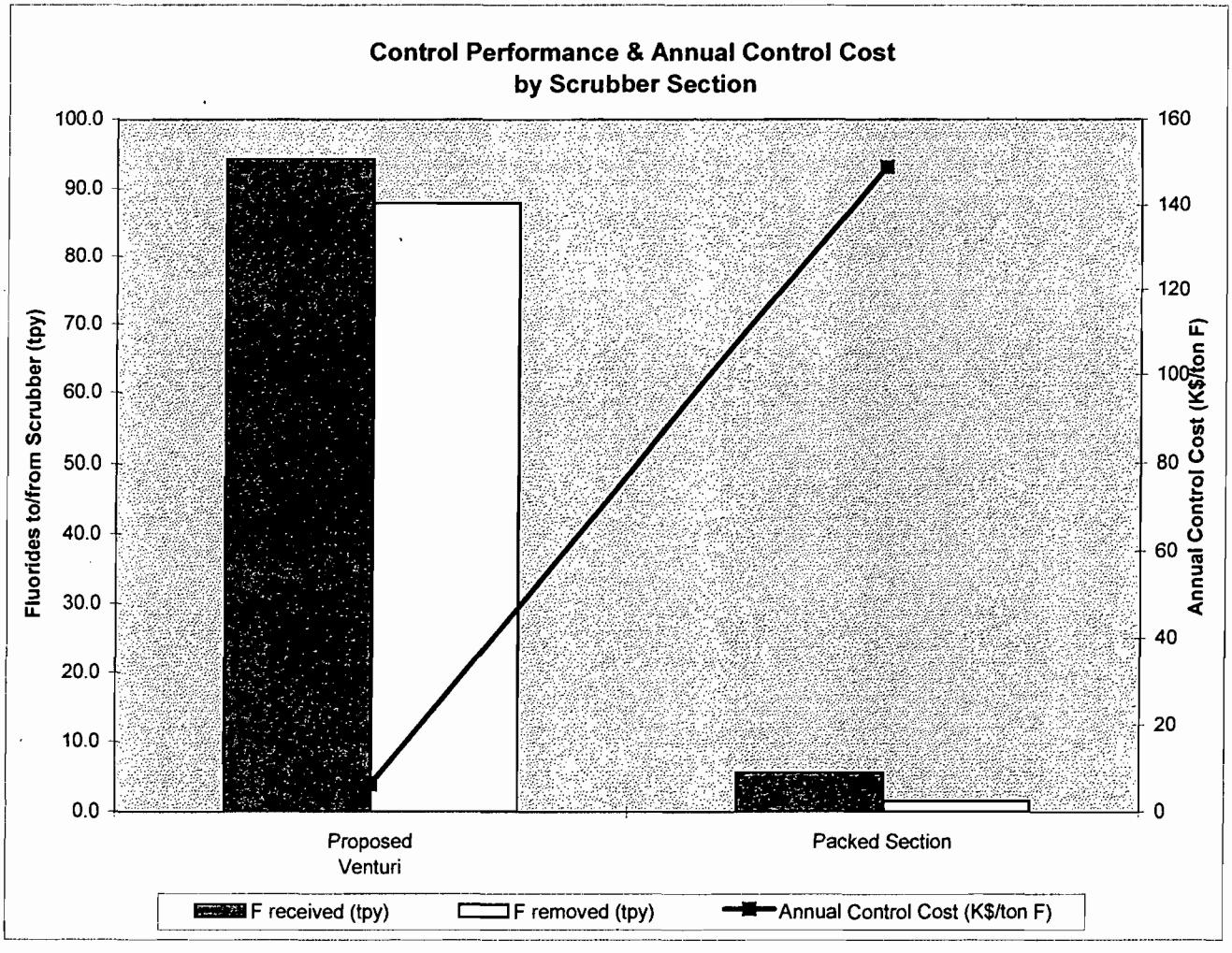


Summary of Cost and Scrubber Performance Data								
USAC Microprilled MAP Plant								
			Proposed	Dual-Medium Venturi		Dual-High Venturi		Expected Performance
Exit streams	units	From Process	24" Venturi	18" Venturi	Packed	24" Venturi	Packed	24" Venturi
Particulates	lbs/hr	743	24	57.3	57.3	24	24	
Particulate F	lbs/hr	15.75	0.55	1.26	1.13	0.55	0.55	0.44
Gaseous F	lbs/hr	5.58	0.72	0.72	0.42	0.72	0.42	0.53
Total F	lbs/hr	21.33	1.27	1.98	1.55	1.27	0.92	0.97
Efficiency			94.05	92.73		95.69		95.45
F emitted	lbs F/ton P2O5		0.042	0.052		0.031		0.032
F emitted	tpy		5.6	6.8		4.0		4.2
F removed	lbs/hr		20.1	19.8		20.4		20.4
F removed	tpy		87.9	86.6		89.4		89.2
Installed cost	K$		1,750	2,888		3,227		
Annual cost	K$/yr		558	671		786		
Annual Control Cost	K$/ton F		6.35	7.75		8.79		
Incremental Control Cost	K$/ton F			*		149		
* Increased total fluoride emissions at an increased annual cost								

Incremental Venturi/Cyclonic and Packed Section Cost and Performance Data

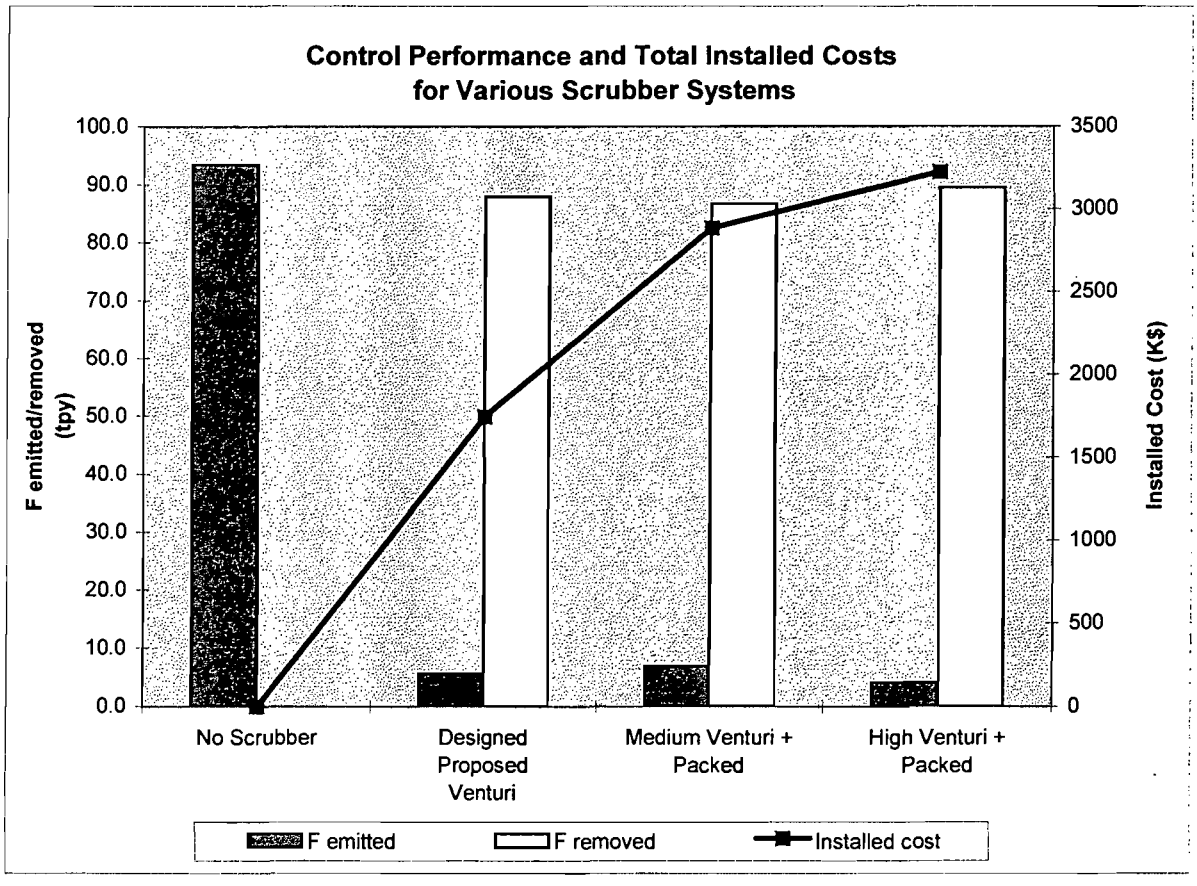
USAC Microprilled MAP Plant

Exit streams	Proposed Venturi	Packed Section
F received (tpy)	94.2	5.6
F removed (tpy)	87.9	1.5
Annual Control Cost (K$/ton F)	6.35	149



Exit streams	No Scrubber	Designed Proposed Venturi	Medium Venturi + Packed	High Venturi + Packed	Expected Proposed Venturi	units
F emitted	93.4	5.6	6.8	4.0	4.2	tpy
F removed	0	87.9	86.6	89.4	89.2	tpy
Installed cost	0	1,750	2,888	3,227	1,750	K$
Annual cost	0	558	671	786	558	K$/yr
Annual Control Cost	0	6.35	7.75	8.79	6.35	K$/ton F
Incremental Control Cost			*	149		K$/ton F
F emitted	0.711	0.042	0.052	0.031	0.032	lbs F/ton P2O5

* Increased total fluoride emissions at an increased annual cost



IMC AGRICO

EDWARD M. NEWBERG
Vice President
Chemicals - Florida

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AIR REGULATION

May 31, 1996

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

RE: U.S. Agri-Chemicals Corporation
Prill MAP Plant Air Permit Modification
Permit No. PSD-FL-222, AC53-260190

Dear Mr. Linero:

This letter is pursuant to your request for information regarding our experience with venturi-cyclonic scrubber systems. We understand that the intended use by the Department is to consider an air permit modification request by U.S. Agri-Chemicals Corporation, 3225 State Road 630 West, Fort Meade, Florida, for the construction of their new Prilled MAP Plant. We hope that the following is helpful to FDEP for that purpose.

The IMC-Agrico New Wales Prill MAP Plant was originally constructed with a scrubbing system that incorporated both venturi and packed scrubber technology. During operation it was discovered that excessive maintenance was required to maintain the packed scrubber resulting in downtime each month while the packing was cleaned or replaced. Soon after construction the production capacity was increased. During the permitting process for this modification, IMC-Agrico proposed and received approval for replacing the combination scrubber with a venturi-cyclonic scrubber system. Since that time, both emissions and maintenance have decreased.

We believe this information should be helpful in your deliberations.

Very truly yours,

Edward M. Newberg

EMN/d

cc: J. Reynolds, BAR

C: E. E. Helms - USAC

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KA 173-94-04
May 7, 1996

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

Subject: Prilled MAP Plant BACT Determination
US Agri-Chemicals Corporation
Permit No. PSD-FL-222, AC53-260190

Dear Mr. Linero:

This is in response to your letter dated April 9, 1996 regarding the scrubbing system for the above referenced project.

The design engineers, Jacobs Engineering Group, Inc., have assessed FDEP's suggested two-stage scrubbing system and had specific comments, discussed below.

For granular DAP or MAP plants, two stage scrubbing is the norm and is justifiable. These plants are required to use phosphoric acid in the first stage scrubbers in order to recover ammonia. In so doing, fluorine is stripped from the acid and a further scrubbing stage, using water, is necessary to reduce the fluoride emissions to acceptable levels. USAC, however, is proposing to construct a powder MAP plant. In this process, ammonia slip is negligible because the reaction is carried out at a mole ratio of only 1.0 with no further ammoniation required. Scrubbing with phosphoric acid is therefore not necessary. To our knowledge, there are no powder MAP plants operating anywhere in the world with two stage scrubbing.

The scrubbing duty in a powder MAP plant is predominantly particulate recovery. As stated before, packed towers are not suitable for this duty due to their tendency to plug. By far, the best and most widely used arrangement in the fertilizer industry is venturi-cyclonic scrubbers. Packed towers are considered only when the duty is purely one of gaseous pollutant removal. The fertilizer industry has generally had problems with recirculating packed tower scrubber operations. For example, the powder MAP plant at IMC-Agrico, New Wales Plant, originally utilized a packed tail gas scrubber and had to replace it with a venturi-cyclonic scrubber. Jacobs own experience with packed towers has been unfavorable to the extent that vertical packed towers are no longer recommended, even on tail gas scrubbing duties, due to the excessive downtime associated with them.

In the case of the powder MAP process, the particulate matter loading to the scrubbing system is high and the gaseous fluoride is relatively low (estimated at 743 lb/hr and 5.58 lb/hr, respectively). The vast majority of the gaseous fluoride can be recovered in the proposed venturi-cyclonic system. The amount of total fluoride being emitted from the proposed system is estimated at only 1.27 lb/hr. The incremental cost associated with adding another stage (packed scrubber) is enormous in relation to the theoretical potential benefits.

The suggestion of reducing the pressure drop across the venturi scrubbers, and using an additional packed tower with little or no increase in overall pressure drop, would result in a doubling of the particulates in the exhaust from the first stage scrubbers. It is expected that this arrangement would lead to frequent plugging in a second stage vertical packed tower. Based on Jacobs experience, the cleaning frequency would reflect perhaps once per month with a duration of two days. Consequently, a horizontal cross-flow scrubber with Kimre packing would be more operationally feasible because it has less tendency to block and is less difficult to clean. A capital cost breakdown for this type of scrubber system is attached.

If such a system were to be installed, it would not be possible to quantify or warrant an expected reduction in emissions during actual operation. This is because the quantity of fluoride leaving the first stage scrubber would already be very low, meaning that the concentration of fluoride in the second stage scrubber liquor would be very low. Accurate vapor pressure data, at these low levels of concentration, are not available and considerable interpolation is required. There would probably be some improvement in gaseous fluoride emissions due to the use of two stage scrubbing, however, it is not possible to quantify it.

The arrangement suggested for consideration under Item 6 of FDEP's letter would not be feasible for the following reasons:

1. The venturis would be of the flooded elbow type to avoid erosion problems and the scrubbing liquor from both venturis would pass into the packed cyclonic section. As the same scrubber liquor would be used in both venturi and packed sections, there would be no reduction in vapor pressure to enhance gaseous fluoride control.

2. The scrubber liquor would have a high concentration of particulates and would cause rapid plugging in the packed section. The plugging would result in channeling through the packing which would result in increasing emissions with time up to the regular cleaning session.

Jacobs would, therefore, not be able to warrant either the production rate from the plant, due to the frequent stoppages, or the emissions, due to channeling.

For all the reasons mentioned above, FDEP should approve the 1.27 lbF/hr emission limit proposed by USAC, consistent with BACT criteria, using two venturi scrubbers in parallel, followed by a cyclonic separator.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:par
Enc.

c: R. Brunk, USAC
B. Thomas, FDEP, SW District

cc: J. Reynolds, BAR
R. Harwood, Polk Co
J. Harper, EPA
J. Bunyak, NPS

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BACT CALCULATIONS
Dated 5-7-96

For purposes of this analysis, it is assumed that a fluoride emission rate as low as 0.9 lb/hr can be achieved by a low energy venturi-cyclonic and cross flow scrubbing system combination (based on vapor pressure loss addressed in letter to FDEP dated 3-22-96). Jacobs Engineering, for reasons stated in this letter, are not in a position to guarantee this emission rate.

The following analysis pertains to a two-stage system with low energy venturis followed by a cross flow scrubber. More recent cost information on the venturi system has been included herein to update the analysis.

Fluorides Control

The total F to scrubber of 21.33 lbs/hr represents 5.58 lbs/hr gaseous F and 15.75 lbs/hr particulate F.

Total F removed = (21.33 - 0.9) lb/hr x 8760 hrs x ton/2000 lbs
= 89.5 tpy

Scrubber F eff. = (21.33 lb/hr - 0.9 lb/hr)/21.33 lb/hr
= 95.8 percent

Fixed Capital Costs

Venturi-Cyclonic Equipment Capital Costs:
(Updated venturi-cyclonic costs from Jacobs)

Cooler Cyclone	=	$ 37,000
Cooler Venturi, Spray Tower Venturi, Cyclonic Separator	=	$ 248,000
Fan	=	$ 122,000
Pumps	=	$ 24,000
Stack	=	$ 73,000
Total Equipment Cost	=	$ 504,000
Installation, including structural work, etc	=	$ 1,246,000
Subtotal (Installed Cost)	=	$ 1,750,000

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Cross Flow W/Kimre Packing Equipment Capital Costs:

Scrubber	=	$ 270,000
Pumps	=	$ 22,000
Total Equipment Cost	=	$ 292,000
Installation including structural work, etc	=	$ 846,000
Subtotal (Installed Cost)	=	$ 1,138,000
Total Installed Cost	=	$ 2,888,000

Operation and Maintenance Costs

Assume no significant change in operation and maintenance costs from those previously submitted to FDEP as the small reduction in power requirement on the primary scrubber is offset by additional power requirement for the secondary scrubber. Also, the make up water requirement will not vary significantly from the previously submitted information.

Operating costs	=	$ 260,534
Maintenance costs	=	$ 63,869
Total annual O&M costs	=	$ 324,403

Indirect Costs

Overhead	=	$63,869 x 0.6 (EPA factor)
	=	$38,321

Equipment costs are estimated at $504,000 for the venturi-cyclonic system (updated cost) and $292,000 for the cross flow system, or a total of $796,000.

Administration	=	$796,000 x 1.91 (EPA factor) x 0.02 (EPA factor)
	=	$30,407
Insurance	=	$796,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$15,204

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Property tax	=	$796,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$15,204
Capital recovery	=	$796,000 x 1.91 (EPA factor) x 0.1628 (EPA factor)
	=	$247,515
Total indirect costs	=	$346,651
Total annual costs	=	$324,403 + $346,651
	=	$671,054
Annual cost of control	=	$671,054/89.5 tpyF
	=	$7499/ton F removed

INCREMENTAL COSTS FOR SECONDARY SCRUBBER

The following analysis addresses the incremental costs for removal of fluorides by the additional packed cross flow scrubber in comparison to the proposed high energy venturi-cyclonic arrangement.

The analysis presented below is simplified by evaluating the difference in annual costs to the difference in fluoride removal for the two arrangements, assuming equivalent O&M costs and proportional capital (direct and indirect) costs.

Total annual cost (Venturis, updated)	=	$557,947
Total annual cost (Two-stage scrubber)	=	$671,054
Annual Cost Difference	=	$113,107
Added Fluoride Removal	=	(1.27-0.9)lb/hr x 8760 hrs/yr x ton/2000lbs
	=	1.6 tpy
Incremental cost	=	$113,107/1.6 tpy
	=	$ 70,692 per ton additional F removed

It is apparent that while the proposed venturi scrubbing system cost is already in the upper range of BACT cost criteria, using a secondary cross flow scrubber would be well beyond the BACT cost range and is definitely not cost effective. Too large a cost would be incurred for too small a quantity of additional fluoride emission reduction (which can not be guaranteed due to the scientific uncertainty associated with the already low fluoride emissions). Further, as previously discussed, the potential for significant downtime with it's associated loss of production and increasing fluoride emissions due to channeling gas streams through the scrubber packing would still be problematic. Please note that neither of these issues have been reflected in this cost/benefit analysis.

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

April 9, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick, P.E.
General Manager
US Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Dear Mr. Susick:

The Department has the following concerns about the information in Koogler & Associates' March 22 letter regarding the proposed scrubbing system for the prilled MAP plant (PSD-FL-222).

1. Our March 4 letter asked for itemized equipment cost estimates. The March 22 response did not itemize capital costs.

2. While we agree on the need for a venturi scrubber installed ahead of the packed scrubber to reduce particulate loading, we can not agree that the venturi should be designed to remove the bulk of the fluoride emissions followed by a packed scrubber as an "incremental" system. A logical design approach dictates removing the bulk of the fluorides in the most efficient device, i.e. the packed scrubber, thus requiring only a low to medium energy venturi upstream for solids knockdown.

3. The Department is well aware of the industry's long standing concerns about higher maintenance efforts required to operate packed scrubbers vs. venturis. Nonetheless, the industry's long history of successful packed scrubber operation convinces us that packed scrubbers are justified, especially in view of their much higher fluoride removal efficiencies and lower energy requirements.

4. Regarding USAC's proposed emission limit of 0.0417 lb F/ton P2O5 on grounds that the EPA's proposed MACT limit for granular MAP is 0.058 lb F/ton P2O5, emissions from the prilled MAP process cannot be compared directly to those from the granular process. Also, for new sources, MACT cannot be less stringent than BACT, so it is BACT that "drives" MACT, and not the reverse. The Department is not required to set a BACT limit based on or "in line with" MACT.

5. The comments regarding the lack of ambient air impact-related benefits attributable to advanced fluoride controls are perhaps best addressed by pointing out that the primary element of BACT determinations is the control system efficiency. Although costs and other factors such as ambient benefits are considered in the analysis, they seldom override this primary one.

6. Since this is a BACT installation, the control efficiency and cost effectiveness of a packed scrubber must be evaluated as the primary spray tower control device. This design would involve both of the venturis discharging to the inlet of the packed tower with the possibility of eliminating the cyclonic separator.

Upon the receipt and analysis of the above information, we will reach a decision on BACT for this process and advise you promptly so that USAC can proceed without further delay. If there are any questions regarding this letter, please call me at 904-488-1344.

Sincerely,

John Reynolds

John Reynolds
Permit Engineer
New Source Review Section

c: B. Thomas, SWD
R. Harwood, Polk Co.
J. Harper, EPA
J. Bunyak, NPS
P. Raval, K&A

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PS Form **3800**, March 1993

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 • FAX 377-7158

KA 173-94-04
March 22, 1996

Mr. A. A. Linero
New Source Review Section
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Prilled MAP Plant BACT Determination
US Agri-Chemicals Corporation
Permit No. PSD-FL-222, AC53-260190

Dear Mr. Linero:

This is in response to your letter dated March 4, 1996 regarding the BACT determination for the above referenced project.

The design engineers, Jacobs Engineering Group, Inc., have identified a scrubbing system for the proposed prilled MAP plant consisting of two venturi scrubbers in parallel, followed by a cyclonic separator. The scrubbing medium will be recirculated water. This option, discussed in our letter to the Department dated February 15, 1996, represents the optimum scrubber design for control of fluorides from the proposed plant combined with on-line reliability. The resulting estimated cost of control, based on recent additional information, is $6308 per ton of fluorides removed.

The overall design system efficiency for fluorides, associated with the proposed design of the process and scrubbing system combined, is about 99.95 percent. However, in response to your suggestion, a packed scrubber to increase the projected fluoride removal efficiency for the proposed prilled MAP plant, has been evaluated.

Jacobs indicated that a packed tower alone would not be technically feasible for control of fluorides as the particulate loading from the process would result in excessive scrubber plugging. However, another option would be to add a packed tower in series after most of the particulates have been removed by the scrubbing system proposed by Jacobs. The installed cost of a packed tower is estimated at $950,000, or about half again of the cost of the proposed venturi scrubber system. Assuming that the operating and maintenance costs would also be halved (conservative estimate), the total annual cost of that unit would be half again that of the venturi scrubber system; about $275,000 per year. The annual cost for a packed cross-flow scrubber would be higher as the equipment cost would be much higher than that for a packed tower.

Jacobs indicated that even with an infinite number of transfer units, only an additional 0.51 lbF/hr (2.3 tpy at 8760 hrs/yr) could be removed due to the equilibrium vapor pressure of the fluorides in the scrubbing medium. This would mean an incremental control cost of about $125,000 per ton of fluorides removed for the additional packed scrubber. Obviously, this incremental cost is orders of magnitude above typical BACT control cost criteria.

Also, this cost estimate does not take into consideration the usual particulate matter related maintenance problems associated with packed scrubbers, nor the loss of production associated with down time. This MAP manufacturing process generates fine particulates which would cause chronic maintenance problems for packed scrubbers. The phosphate industry in general is very concerned about the on-line reliability and maintenance intensive aspects of packed scrubbers in such applications. Equipment down time significantly affects product costs. This is a sensitive issue which has to be considered in determining the BACT. It would not be prudent to install a high efficiency but high maintenance/low reliability oriented pollution control equipment. A situation, where excessive time is spent keeping the air pollution control equipment working properly rather than producing MAP, would not be economically viable.

Another alternative to improve fluorides removal, which is not viable for this project, is the use of once-through fresh water or treated water as the scrubbing medium. As discussed previously with FDEP staff, fresh water cannot be used due to stringent water use practices pursuant to an agreement with the South West Florida Water Management District and, further, additional fresh water use will adversely affect the plant's water balance. Regarding treated water, an applicant for a granular MAP plant recently submitted to FDEP a water treatment system cost estimate (using lime treatment and a dedicated pond) in excess of $70,000 per ton of fluoride removed.

Another consideration for determining what is reasonable as BACT is the fact that the proposed emission limit of 0.0417 lbsF/ton P2O5 is significantly below the proposed MACT standard of 0.058 lbF/ton P2O5; and, EPA expects MACT to be more stringent than BACT. FDEP should consider a BACT which is in line with, rather than more stringent than, a corresponding MACT.

Furthermore, it should be noted that there are no ambient air impact-related benefits to be gained by additional extravagant expenses on control equipment for fluorides. As you are well aware, there are no ambient air quality standards for fluorides and there are no health or welfare related concerns on the part of EPA or FDEP associated with the proposed project at an emissions level of 1.27 lbsF/hr.

KOOGLER & ASSOCIATES

For all the reasons mentioned above, FDEP should approve the 1.27 lbF/hr emission limit proposed by USAC, consistent with BACT criteria, using two venturi scrubbers in parallel, followed by a cyclonic separator.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:par
Enc.

c: R. Brunk, USAC
B. Thomas, FDEP, SW District
R. Harwood, Polk Co.,
EPA
NPS
~~J. Koogler, KA~~

KOOGLER & ASSOCIATES

BACT CALCULATIONS

The following calculations indicate how the costs associated with fluoride control were estimated.

PROPOSED SCRUBBING SYSTEM

MAP Plant Production Rate	:	60 tph Prilled MAP; 30 tph P2O5
P2O5 Feed Rate	:	30.6 tph P2O5 input
Fluorides input	:	83 lbF/ton P2O5
Water makeup	:	32 gpm
Fan	:	617 BHP
Pump	:	50 BHP
Gaseous fluorides to scrubber	:	5.58 lbs/hr
Particulate fluorides to scrubber	:	15.75 lbs/hr
Total fluorides to scrubber	:	21.33 lbs/hr
Gaseous fluorides to stack	:	0.76 lb/hr
Particulate fluorides to stack	:	0.51 lb/hr
Total fluorides to stack	:	1.27 lbs/hr; 0.0417 lb/ton P2O5 input; 5.6 tpy
Total fluorides removed by scrubber	:	20.1 lbs/hr; 87.9 tpy

Fluorides Control Efficiencies

Scrubber F eff. = (21.33 lb/hr - 1.27 lb/hr)/21.33 lb/hr
= 94.05 percent

Overall Plant F eff. = ((83 lb/ton P2O5 x 30.6 tph P2O5) - 1.27)/(83 lb/ton P2O5 x 30.6 tph P2O5)
= 99.95 percent

The following estimates pertain to the proposed venturi scrubbing system.

Fixed Capital Costs

Equipment Capital Costs = $495,000

Total Installed Cost = $1,720,000

Operation and Maintenance Costs

Operating Costs:
Electricity = (617 + 50)BHP x 0.746 kw/hp x 8760 hrs/yr x $0.059/kw
= $257,170

Water = 32 gpm x 60 min/hr x 8760 hrs/yr x $0.20/1000 gals
= $3,364

Total operating costs = $260,534

KOOGLER & ASSOCIATES

Maintenance Costs:		
Operating labor	=	2 hrs/shift x shift/8 hrs x 8760 hrs/yr x $12.96/hr
	=	$28,382
Supervisory labor	=	$28,382 x 0.15 (EPA factor)
	=	$4,257
Maintenance labor	=	1 hr/shift x shift/8 hrs x 8760 hrs/yr x $14.26/hr
	=	$15,615
Maintenance materials	=	$15,615 x 1.0 (EPA factor)
	=	$15,615
Total maintenance costs	=	$63,869
Total annual O&M costs	=	$260,534 + $63,869
	=	$324,403

Indirect Costs

Overhead	=	$63,869 x 0.6 (EPA factor)
	=	$38,321
Administration	=	$495,000 x 1.91 (EPA factor) x 0.02 (EPA factor)
	=	$18,909
Insurance	=	$495,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$9,455
Property tax	=	$495,000 x 1.91 (EPA factor) x 0.01 (EPA factor)
	=	$9,455
Capital recovery	=	$495,000 x 1.91 (EPA factor) x 0.1628 (EPA factor)
	=	$153,919
Total indirect costs	=	$38,321 + $18,909 + $9,455 + $9,455 + $153,919
	=	$230,059

Total annual costs	=	$230,059 + $324,403
	=	$554,462
Annual cost of control	=	$554,462/87.9 tpyF
	=	$6308/ton F removed

ADDITIONAL SCRUBBER

The following analysis addresses the incremental costs for removal of fluorides by adding a packed scrubber to the above discussed arrangement.

Additional capital cost	=	$950,000
Additional annual cost	=	$554,462/2
	=	$277,231
Additional F removed	=	0.51 lb/hr x 8760 hrs/yr x ton/2000 lbs
	=	2.23 tpy

The overall cost of an arrangement of the proposed venturi scrubbing system followed by a packed scrubber can be estimated as follows:

Overall total cost	=	($554,462 + $277,231)/(87.9 + 2.23)tpyF
	=	$9228/ton F removed

The incremental cost of fluorides control can be estimated as follows:

Cost of added control	=	$277,231/2.23 tpyF
	=	$124,319/ton additional F removed

It is apparent that while the proposed venturi scrubbing system cost is already in the upper range of BACT cost criteria, the additional packed scrubber cost is well beyond the range and is not cost effective. Too large a cost is involved for too small a quantity of emission reduction.

Ceilcote Air Pollution Control
Air-Cure Dynamics, Inc.

March 12, 1996

Bureau of Air Regulations
Department of Environmental Protection
111 S. Magnolia Drive
Tallahassee, FL 32301

Attention : Mr. John Reynolds, Mail Station 5505

Reference : SiF4 Scrubbing

Per our phone conversation last week Ceilcote Air Pollution Control provides the following for your information. When scrubbing SiF4 with water hydrofluorsilic acid and silicon dioxide is formed as shown in the following reaction:

$$3\ SiF_4 + 2\ H_2O \rightarrow 2\ H_2SiF_6 + SiO_2$$

The hydrofluosilic acid can then be scrubbed and neutralized by the following reaction:

$$H_2SiF_6 + 2\ NaOH \rightarrow Na_2SiF_6 + 2\ H_2O$$

During this reaction silicon dioxide often precipitates from the solution as a white solid. When a packed tower is used as the only control device the system often requires periodic maintenance to remove, clean and / or replace the tower packing. Our recommendation when inlet loadings are high is to install a prescrubber consisting of a low pressure drop venturi prior to the packed tower.

The venturi promotes the hydrolysis reaction and minimizes the solids that accumulate in the packed tower scrubber. Use of only a venturi scrubber limits the achievable removal to 1-2 transfer units or 80 to 90 wt% for soluble gases. Multiple venturis installed in series would be required to achieve 95 to 99 wt% removal.

The packed tower can then be used to achieve the required acid removal without unusually high maintenance. A packed tower can easily achieve better than 99 wt% removal when using a caustic solution as the scrubbing media. Recycling a water solution can also be considered. However, the packing depths and water blowdown rates may be greater in order to achieve the same removal efficiency.

If we can be of further service please feel free to contact us.

Regards,

Steven A. George
Business Manager
Industrial Process Systems

P.O. Box 811630 ■ Cleveland, OH 44181-1630 ■ Tel: 216/243-0700 Fax: 216/243-9854 or 216/234-3486

File

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 4, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick, P.E.
General Manager
US Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Dear Mr. Susick:

This is in response to the February 15 letter from Koogler & Associates providing scrubber calculations pursuant to Specific Condition No. 5 of PSD-FL-222 (Prilled MAP Plant).

The Department does not agree that a total of 3.5 mass tranfer units (90.5% removal) is representative of BACT for fluoride control. Nor do we agree with Jacobs Engineering's inference that 90.5% is the maximum feasible removal due to the gas stream being dilute. A packed scrubber providing sufficient packing depth will do a far better job of fluoride control than a venturi/cyclonic system regardless of inlet concentration, and at significantly lower power cost.

Before U.S. Agrichem commits to a particular control system, the Department must agree that it is the best available technology. U.S. Agrichem should investigate packed scrubbing as the top choice and show the design details and itemized cost estimates for equipment and operation, using 99.3% fluoride removal as the goal.

If there are any questions concerning this letter, please call John Reynolds at 904-488-1344.

Sincerely,

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

AAL/JR

c: B. Thomas, SWD
L. Novak, Polk Co.
J. Harper, EPA
J. Bunyak, NPS
J. Koogler, K&A

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KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

KA 173-94-04
February 15, 1996

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Rd
Tallahassee, FL 32399-2400

Subject: PSD-FL-222 (AC53-260190) Prilled MAP Plant

Dear Mr. Reynolds:

This is a follow-up to our previous discussions regarding BACT determination for the above referenced project.

In accordance with Specific Condition No. 5 of the above referenced permit, please find the attached information from the scrubber designer indicating gaseous fluoride and particulate matter scrubbing efficiency. It should be noted that at a total fluoride emission rate of 0.04 lbs/ton of P2O5 and an estimated annual cost of $553,202, the cost of fluoride control would be $9,809 per ton of fluoride. It is our understanding that this "per ton" control cost is far above typical BACT control cost criteria. As a result, additional technical analysis on scrubber design is not warranted. Scrubber drawings will be submitted to you upon completion, in order to satisfy the remaining requirement under Specific Condition No. 5.

In addition, an emission rate of about 0.04 lbs F/ton P_2O_5 is significantly below the 0.058 lb/ton MACT proposed during the December 11th, 1995, pre-MACT meeting/teleconference between TFI and EPA which FDEP staff (including yourself) and U.S. Agri-Chemicals personnel (Steve Susick and Ron Brunk) participated in.

If you have any questions, please do not hesitate to call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:par
enc.

c: Ron Brunk, USAC

JACOBS ENGINEERING GROUP INC.

POST OFFICE BOX 2008 LAKELAND, FL 33806-2008 HIGHWAY 98S AT STATE ROAD 640 LAKELAND, FL 33[illegible]
TELEPHONE (813) 665-1511 TELEX 52-2466 JACOBSENG LKL TELECOPIER (813) 665-5323

February 5, 1996 Fax No. 285-9776

Mr. Ming Lei Chen
Project Manager
U.S. Agri-Chemicals Corporation
3225 State Road 630 West
Fort Meade, FL 33841-9799

Reference: JEG-USAC 029 (28-J697-00)

Subject: Gaseous Emissions

Dear Mr. Chen:

We refer to the USAC internal memo from Ron Brunk dated October 31, 1995 and to our telephone conversation last month. We are unable to give you either the completed venturi scrubber calculation sheets, or the exact capital cost of the equipment, as we have not yet selected the successful bidder for the scrubbers. However, we have attempted to explain below the calculations that we have carried out to enable the pollution control system to be specified. We have also attempted to give you the capital and operating costs (estimated) of the system.

Emissions

Both particulates and fluorides are discharged to the atmosphere. The total fluoride emissions consist of both gaseous fluoride and fluoride associated with the particulates. There are two major airflows in the processing train - one coming from the MAP spray tower and the other from the rotary drum cooler. Each airstream is scrubbed in a separate venturi scrubber. Each venturi scrubber discharges to a common cyclonic separator fitted with a demister. Scrubber liquor is also sprayed into each of the two inlets to the cyclonic separator. The cooler airstream passes through dry cyclones prior to the venturi scrubber.

The design pressure drops in the various sections are as follows:

Cooler Cyclones:	5.85"
Cooler Venturi	12"
Spray Tower Venturi	16"
Cyclonic Separator	5"

The pressure drops across the venturis can be controlled on-line by adjusting the throat area. Fan static pressure is 26".

Efficiency Estimates

Particulates

Spray Tower Venturi efficiency	97.8% (theoretical)
Cooler Cyclone efficiency	97.8% (theoretical)
Cooler Venturi efficiency	95.0% (theoretical)

The above estimates are based on theoretical cyclone and scrubber efficiencies. Efficiency of both the cyclones and the scrubber are related to pressure drop. The only way efficiencies can be increased further is at the expense of increased power consumption on the fan.

Fluorides

Gaseous fluorides are evolved in the reaction of phosphoric acid and ammonia. Efficiency estimates are based on the partial pressures of HF and SIF4 above the scrubbing solution and the NTU's in the scrubbing system.

NTU's	3.5
% F in acid that finishes up in the product	99.96
% gaseous F recovery in scrubbers	90.54
% gaseous F recovery taking out the vapor pressure loss	97.10
% total F recovery in scrubbers	95.46

The 99.95%+ referred to by Teller in the 1967 article refers to phosphoric acid production where very much larger amounts of fluorine are evolved in comparison to MAP. Much higher efficiencies can therefore be achieved because the effect of the vapor pressure is much lower on a percentage basis.

The emissions can only be reduced further either by adding more scrubbing stages (more capital and power expenditure) or by reducing the vapor pressure of the scrubbing solution (either by cooling or neutralization). Both of these alternatives would add considerably to the capital and operating costs.

Costs

The pollution control system consists of the following equipment:

Cooler cyclones
Cooler venturi
Spray tower venturi
Cyclonic separator
Scrubber fan
Scrubber pumps
Stack

The approximate capital cost for the equipment only is $495,000. The total installed cost including steelwork, concrete, instrumentation, electrical, piping, painting, erection etc is estimated to be approximately $1,720,000.

The operating costs that Jacobs are able to provide are limited to electricity and water consumptions as follows:

Water	21 gpm
Electricity	Fan 617 BHP
	Pump 50 BHP

We hope that this information is sufficient for you to prepare your submission to the state.

Sincerely Yours,

JACOBS ENGINEERING GROUP INC.

D. Ivell

D M Ivell
Senior Process Engineer

cc: VELeón
File: 28-J697-00

Z 333 612 482

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Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date PSD-Fl-222 1050059	11-5-98

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

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

to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Steven J. Swick, Gen Mgr
US Agri-Chemicals
3225 State Rd 630 West
Ft. Meade, Fl 33841-9799

4a. Article Number 2 333 612 491

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

7. Date of Delivery 11-10-98

5. Received By: *(Print Name)*

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

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

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Best Available Copy

P 265 659 318

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

Sent to Steven Susick	
Street & Number US Agri Chem	
Post Office, State, & ZIP Code FT Meade FL	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	PSO-FL-222 MAP Plant 3-18-98

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

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

1. ☐ Addressee's Address
2. ☐ Restricted Delivery
Consult postmaster for fee.

3. Article Addressed to:
Steven J. Susick, Gen. Mgr
US Agri Chemicals
3225 State Rd-630 West
Ft. Meade, FL 33841-9799

4a. Article Number P 265 659 318

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

7. Date of Delivery 3-23-98

5. Received By: *(Print Name)*

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

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

PS Form [illegible] December 1994 Domest[illegible]eceipt

Thank you for using Return Receipt Service.

Department of Environmental Protection

Lawton Chiles
Governor

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

December 8, 1997

no green card 7/98
P 339 251 197
US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Steven J Susick
Street & Number	US Agri Chem
Post Office, State, & ZIP Code	Ft. Meade, Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	12-9-97

PS Form 3800, April 1995

PSD-Fl-222
MAP Pl. Ext.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Steven J. Susick
General Manager
U.S. Agri-Chemicals, Inc.
3225 State Road 630 West
Fort Meade, Florida 33841-9799

Re: AC53-260190 (PSD-FL-222)
MAP Plant - Permit Extension

Dear Mr. Susick:

The Department received your request on September 9, 1997 to extend the referenced permit until December 30, 1998. We have been advised not to act on the requested extension while there is a pending modification of that same permit and which is under challenge by U.S. Agrichem.

If you have any questions regarding this matter please call me at (850)488-1344 or Douglas Beason at (850)488-9730.

Sincerely,

12/8

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

AAL/kt

cc: J. Koogler, P.E.
D. Beason, OGC

Post-it® Fax Note 7671	Date 12/8	# of pages ▶ 1
To John Koogler	From A. Linero	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

(John: I forgot to give this to you today!)

STEAM
SCREENS
CYCLONE
TOWER
MILL
HOPPER
GRANULATOR
RECLAIM
DRYER
AIR
FUEL
AIR
M
G
STEAM
NH3
PHOS. ACID
CONDENS.
VAPORIZER
pH
WATER
SCRUBBER
STACK
SUMP
CYCLONE
AIR
COOLER
MAP

USAC			
MAP PLANT			
PROCESS FLOW DIAGRAM			
NONE	28-J697-00	KD-001-2	1

P 265 659 190

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

Sent to Steven Susick	
Street & Number US Agri Chem	
Post Office, State & ZIP Code Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date P.E. Recert. AC53-260190 PSO-FI-222	5-23-97

PS Form **3800**, April 1995

Is your **RETURN ADDRESS** completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Steven J. Susick, Gen Mgr
US Agri-Chemicals
3225 State Road 630 West
Ft. Meade, Fl
33841-9799

4a. Article Number P 265 659 190

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

7. Date of Delivery 5-28-97

5. Received By: *(Print Name)*

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

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

PS Form **3811**, December 1994

Thank you for using Return Receipt Service.

P 265 659 180

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to Steven Swick	
Street & Number US Agri Chemicals	
Post Office, State, & ZIP Code Fort Meade, FL	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 3-5-97	

PS Form 3800, April 1995

AC53-260190
PSD-FL-222

[redacted]

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Steven D. Swick, Gen. Mgr.
US Agri Chemicals
3225 State Rd 630 W
Fort Meade, FL
33841-9779

4a. Article Number P 265 659 180

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

7. Date of Delivery 3-10-97

5. Received By: *(Print Name)*

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

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

PS Form 3811, December 1994 Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

P 265 659 119

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

Sent to Mr. Steven J. Susick	
Street & Number 3225 SR 630 West	
Post Office, State, & ZIP Code Fort Meade, FL 33841-9799	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 12-26-96 Permit: AC53-260190 PSD-FL-222	

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional service.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered. AC53-260190 PSD-FL-222

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Steven J. Susick
General Manager
US Agrichemicals, Inc.
3225 State Road 630 West
Fort Meade, FL 33841-9799

4a. Article Number
P 265 659 119

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

7. Date of Delivery
12-30-96

5. Received By: *(Print Name)*

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

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

PS Form 3811, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 339 251 171

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to: Steven Susick	
Street & Number: US Agri-Chem	
Post Office, State, & ZIP Code: Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 10-18-96	
PSD-FI-222	

PS Form 3800, April 1995

Fold at line over top of envelope to [illegible] of the return address

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Steven Susick, Gen. Mgr
US Agri-Chemicals Corp
3225 State Rd 630 West
Ft. Meade, Fl 33841-9799

4a. Article Number
P 339 251 171

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

7. Date of Delivery
10-22-96

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

4 Oct 1996

Mr. John Reynolds
Dept of Environmental Protection
Twin Towers office Bldg
2600 Blair Stone Rd.
Tallahasse, FL 32399-2400

Dr. Mr. Reynolds,

It was indicated that a claim for achievement of 5.3 Transfer units was made for a fluoride scrubbing process using a venturi.

It should be noted that the venturi is inherently a particulate collection device and is used only as a scrubber of last resort. The reason is that the mass transfer is limited because of minimal surface renewal. The deficiency can be overcome by decreasing the partical size of the spray and increasing the L/G, provided cost of operation is not restrictive.

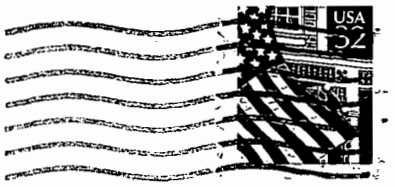
Inasmuch as a venturi is generally followed by a cyclone separator, an additional transfer unit can be attained due to wetted wall action

A comparison of performance of venturi-cyclone systems is attached (Table I). As noted, the rational range of operation will provide in the region of 3.5 transfer units. The 5 transfer unit range can be achieved if the client will accept an energy consumption of 370 HP/10000 CFM.

Sincerely

DR. AARON J. TELLER
47 ST. JAMES DRIVE
PALM BEACH GARDENS, FL 33418

WEST PALM BEACH, FL 334
PM
8 OCT
1996



Mr. John Reynolds
Dep't of Environmental Protection
Twin Towers Office Bldg.
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

32399/2364

P 339 251 121

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to: Steven Swick	
Street & Number: US Agri Chem	
Post Office, State, & ZIP Code: Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: PSD-FI-222 7-5-96	

PS Form 3800, April 1995

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Steven Swick, PE
US Agri Chem Corp.
3225 State Rd 636 West
Ft. Meade, Fl
33841-9799

4a. Article Number: P 339 251 121

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

7. Date of Delivery: 7-9-96

5. Signature (Addressee)

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

6. Signature (Agent): R B Beckett

Thank you for using Return Receipt Service.

ur RETURN ADDRESS completed on the reverse side?

1 RETURN RECEIPT

Best Available Copy

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Steven J. Susick, P.E.
US Agri Chemicals Corp
3225 State Road 630 W.
Ft. Meade, Fl 33841-9799

4a. Article Number
Z 127 633 197

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

7. Date of Delivery
4-12-96

5. Signature (Addressee)
M Washington

6. Signature (Agent)

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

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Z 127 633 197

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Steven Susick	
Street and No. US Agri Chem	
P.O., State and ZIP Code Ft. Meade, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 4-10-96	

PS Form **3800**, March 1993

PSD-Fl-222

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Steven J. Susick, PE
US Agri-Chemicals Corp
3225 State Rd 630 W.
Ft. Meade, Fl 33841-9799

4a. Article Number
Z 127 633 176

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

7. Date of Delivery
3-7-96

5. Signature (Addressee)
U Washington

6. Signature (Agent)

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

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 127 633 176

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to
Steven Susick
Street and No.
US Agri Chem
P.O., State and ZIP Code
Ft. Meade, Fl

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	3-4-96

PS Form **3800**, March 1993

PSD-FL-222
Pulled Map Plant