

AMAX Chemical Corporation

A SUBSIDIARY OF AMAX INC.

P. O. BOX 790 ♦ PLANT CITY, FLORIDA 34289 ♦ (813) 752-1161

March 7, 1985

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BAQM

Mr. C. H. Fancy, P.E.
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301-8241

Dear Mr. Fancy:

In response to the letter of incompleteness, dated January 28, 1985, concerning file no. A029-091316, we are submitting the following. The responses are in the order the questions were presented.

1. For a clarification of drawing D-1, please see Attachment A of this letter. The process vessels in the phosphoric acid defluorinating area are also shown in Attachment A.
2. There is only one diatomaceous earth (D.E.) slurry tank.
3. We feel that a 180 day period from the date of issuance would be sufficient time to complete the project.
4. To clarify the statement referred to in section II: A, it should have read: Maximum particulate emissions occur during the slurring of the D.E. This slurring takes place only in the D.E. slurry tank, not in the acid tanks. The D.E. slurry is prepared using fresh water. The slurring of D.E. would take place for approximately $\frac{1}{2}$ hour twice a day.
5. The D.E. slurry tank discharges into one of the first 12,000 gallon acid tanks, and while the first defluorination tank is being sparged the D.E. slurry tank is refilled and then dumps into the second 12,000 gallon acid tank.
6. See Attachment B (section VI of the permit application).

7. The basis of Mr. Lamb's calculations of 1.825 gr/ft³ of fluoride was the amount of total fluoride removed during an actual defluorinating cycle. Although Mr. Lamb's final fluoride determination is labeled lbs. HF/hr., it is in fact total fluoride which includes HF and SiF₄. The reactions between the phosphoric acid, caustic solution, diatomaceous earth (86% SiO₂-0.6% CaO), and the fluoride contaminants are as follows:
1. $\text{H}_3\text{PO}_4 + \text{NaOH} \rightarrow 2\text{H}_2\text{O} + \text{SiF}_4$
 2. $4\text{HF} + \text{SiO}_2 \rightarrow 2\text{H}_2\text{O} + \text{SiF}_4$
 3. $3\text{SiF}_4 + 2\text{H}_2\text{O} \rightarrow 2\text{H}_2\text{SiF}_6 + \text{SiO}_2$
 4. $\text{H}_2\text{SiF}_6 + 2\text{NaOH} \rightarrow \text{Na}_2\text{SiF}_6 + 2\text{H}_2\text{O}$
8. The feed prep acid storage, dikal acid storage, and dikal and sales acid storage tanks and all tanks shown in Attachment A are existing tanks.
9. Precipitated fluoride compounds are removed from the acid by gravity settling. Nearly all of the precipitated sludge is pumped to the feed prep plant and used in the manufacturing process. However, a small percentage may be sluiced to the holding ponds.
10. The proposed scrubber will not recirculate water. The holding pond system is more than adequate, some 350 acres, to contain the potential 20,000 tons of water. If during the rainy season pond volumes require it, we are permitted under EPA-NPDES and DER-Industrial Wastewater permits to discharge treated process water.
11. Fluoride emissions are based on actual test data of the total amount of fluoride removed during the defluorination of one tank of phosphoric acid. The total amount of fluoride removed was then equated to the airflow of 1,000 SCFM.
12. The correct stack diameter is 1.33' and the correct velocity is 35.81 FPS.

Should you have any questions concerning the information provided, please call me at (813) 752-1161.

Sincerely,

George Townsend

George Townsend
Environmental Supervisor

GT:cr

cc: Bill Thomas, DER
Steve Gyrog, HCEPC
J. J. Lewis
F. G. Mullins

9. An application fee of \$20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

- A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
 Yes No

Contaminant	Rate or Concentration
Fluoride	3.650 Grains/ft. ³
Particulate	0.42 Grains/ft. ³

- B. Has EPA declared the best available control technology for this class of sources (if yes, attach copy) Yes No

Contaminant	Rate or Concentration
The state of Florida has declared BACT for a similar source.	

- C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Fluoride	0.86 lbs./hr.
Particulate	0.39 Lbs./Hr.

- D. Describe the existing control and treatment technology (if any).

- | | |
|---------------------------|----------------------|
| 1. Control Device/System: | 4. Capital Costs: |
| 2. Operating Principles: | 6. Operating Costs: |
| 3. Efficiency: * | 8. Maintenance Cost: |
| 5. Useful Life: | |
| 7. Energy: | |
| 9. Emissions: | |

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

10. Stack Parameters

- | | | | |
|---------------|------|-----------------|-----|
| a. Height: | ft. | b. Diameter: | ft. |
| c. Flow Rate: | ACFM | d. Temperature: | °F |
| e. Velocity: | FPS | | |

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

- a. **Control Device:** Packed Bed Scrubber
- b. **Operating Principles:** Mass Transfer/Particle Collection
- c. **Efficiency*:** 98+
- d. **Capital Cost:** \$24,000
- e. **Useful Life:** 20 Years
- f. **Operating Cost:** \$9,186
- g. **Energy*:** 10 KWH
- h. **Maintenance Cost:** \$3,030/year
- i. **Availability of construction materials and process chemicals:**
Package scrubbers are available through various manufacturers.
- j. **Applicability to manufacturing processes:** Compatible with process
- k. **Ability to construct with control device, install in available space, and operate within proposed levels:**
The available space is limited; for horizontal configuration.

2.

- a. **Control Device:** Venturi
- b. **Operating Principles:** Mass Transfer/Particle Collection
- c. **Efficiency*:** 98+
- d. **Capital Cost:** \$46,000
- e. **Useful Life:** 20 Years
- f. **Operating Cost:** \$8,423/year
- g. **Energy**:** 12 KWH
- h. **Maintenance Costs:** \$1,600/year
- i. **Availability of construction materials and process chemicals:**
Package scrubbers are available through various manufacturers.
- j. **Applicability to manufacturing processes:** Compatible with process
- k. **Ability to construct with control device, install in available space, and operate within proposed levels:**
Moderate space available

*Explain method of determining efficiency. Manufacturer's design guarantee

**Energy to be reported in units of electrical power - KWH design rate.

3.

- a. **Control Device:**
- b. **Operating Principles:**
- c. **Efficiency*:**
- d. **Capital Cost:**
- e. **Life:**
- f. **Operating Cost:**
- g. **Energy:**
- h. **Maintenance Cost:**

*Explain method of determining efficiency above.

- i. Availability of construction materials and process chemicals:
 - j. Applicability to manufacturing processes:
 - k. Ability to construct with control device, install in available space and operate within proposed levels:
- 4.
- a. Control Device
 - b. Operating Principles:
 - c. Efficiency*:
 - d. Capital Cost:
 - e. Life:
 - f. Operating Cost:
 - g. Energy:
 - h. Maintenance Cost:
 - i. Availability of construction materials and process chemicals:
 - j. Applicability to manufacturing processes:
 - k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

- 1. Control Device: Spray Chamber (this scrubber is already owned)
- 2. Efficiency*: 99+
- 3. Capital Cost: \$5,000 (to recoat inside)
- 4. Life: 20 Years
- 5. Operating Cost: \$8,186
- 6. Energy: 10 KWH
- 7. Maintenance Cost: \$1,000
- 8. Manufacturer: Rigidome
- 9. Other locations where employed on similar processes: None known

- a.
 - (1) Company:
 - (2) Mailing Address:
 - (3) City:
 - (4) State:
 - (5) Environmental Manager:
 - (6) Telephone No.:

*Explain method of determining efficiency above. Fluoride emissions calculated from test data

(7) Emissions*:

Contaminant	Rate or Concentration
Fluoride	0.86 Lbs./Hr.
Particulate	0.39 Lbs./Hr.

- (8) Process Rate*:
- b.
 - (1) Company:
 - (2) Mailing Address:
 - (3) City:
 - (4) State:

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration
_____	_____
_____	_____
_____	_____

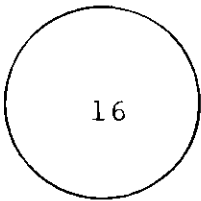
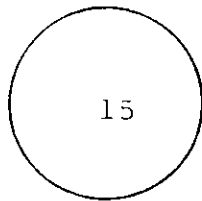
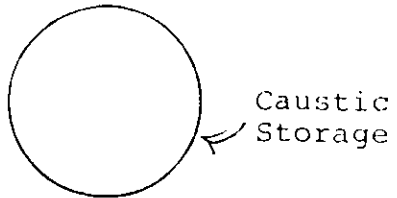
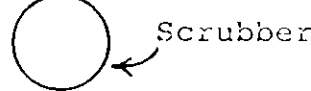
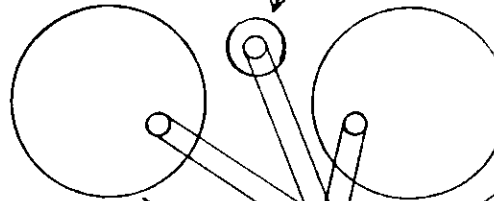
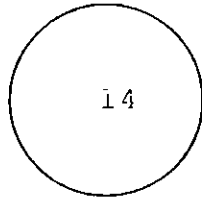
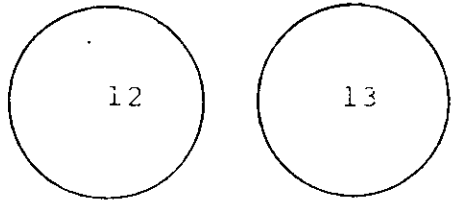
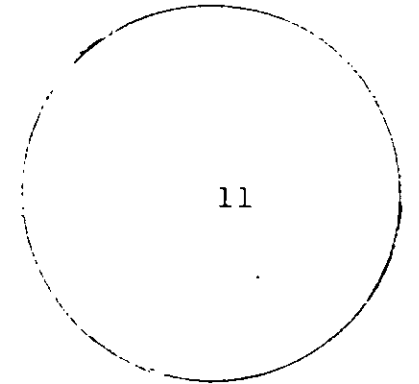
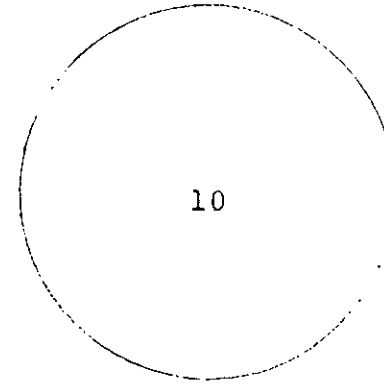
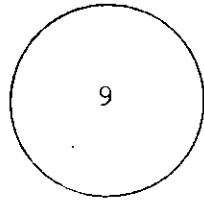
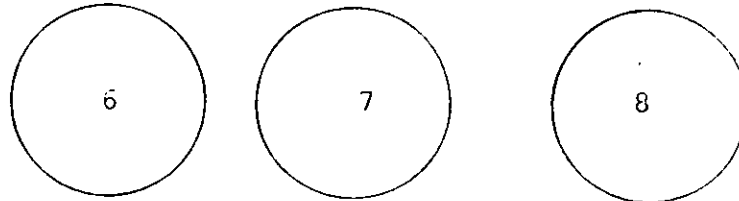
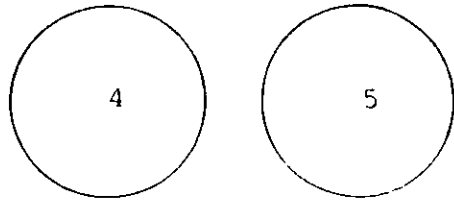
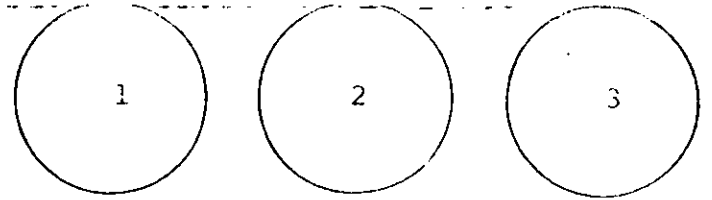
(8) Process Rate*:

10. Reason for selection and description of systems:

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ATTACHMENT A

PHOSPHORIC ACID DEFLUORINATION AREA



Tanks 1-16 are acid storage tanks