



**CARGILL  
FERTILIZER, INC.**

8813 Highway 41 South - Riverview, Florida 33569 - Telephone 813-677-9111 - TWX 810-876-0648 - Telex 52666 - FAX 813-671-6146

CERTIFIED MAIL: 7000 0520 0017 6469 4700

June 27, 2001

**RECEIVED**

**JUL 02 2001**

Mr. Al Linero, P. E.  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

**BUREAU OF AIR REGULATION**

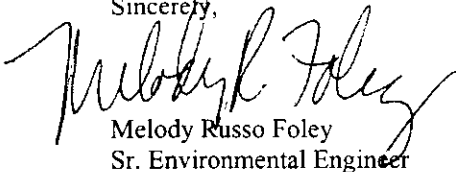
Dear Mr. Linero:

RE: Cargill Fertilizer Riverview Facility, AIRS ID No. 0570008  
DEP File No. 0570008-026-AC (PSD-FL-251)

Please find enclosed the scrubber design (revised) for the MAP permit referenced above. This revision reflects changes agreed upon in a September 2000 meeting between the Department and Cargill Fertilizer.

If you have any questions or require additional information, please call me at 813/671-6369 or David Jellerson at 813/671-6297.

Sincerely,



Melody Russo Foley  
Sr. Environmental Engineer

Enclosure: Tailgas Scrubber Information for #3 & #4 MAP Plant, KEMWorks Technology, Inc.  
June 2001

cc: File P-30-34-4  
Jellerson



**KEMWORKS**  
**TECHNOLOGY INC**

5925 Imperial Parkway, Suite 105  
Mulberry, FL 33860-7621, USA  
Voice: (863) 648-5369  
Fax: (863) 647-5219  
mwalters@kemworks.com  
www.kemworks.com

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# **Tailgas Scrubber Information for #3 & #4 MAP Plant**

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Prepared for:



***CARGILL FERTILIZER, INC.***

**Riverview, Florida**

# TAILGAS SCRUBBER SYSTEM INFORMATION DOCUMENT

**Project Description:** Addition of a packed crossflow tailgas scrubber to the existing #3 & #4 MAP Plant scrubbing system.

**Plant Name:** Cargill Fertilizer, Inc.  
8813 Hwy 41 South  
Riverview, FL 33569

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# 1. Design Basis

## 1 REFERENCE INFORMATION

- 1.1 Project Number: 1443
- 1.2 Client: Cargill
- 1.3 Plant Location: Riverview, Florida
- 1.4 Contact: Kathy Edgemon
- 1.5 Type and Capacity of Plant
  - 1.5.1 2016 tpd MAP
  - 1.5.2 Vent 165,000 acfm at 142° F to the existing stack
  - 1.5.3 Vent 56,000 acfm from Cooler Scrubber to stack

## 2 DESIGN BASIS

- 2.1 Design ambient temperature: 90° F
- 2.2 Design humidity: 75° F wet bulb temperature
- 2.3 Average barometric pressure: 14.696 psia
- 2.4 Emissions:
  - Fluoride emissions: 0.041 lb F / ton P<sub>2</sub>O<sub>5</sub> (max)  
= 1.72 lb/hr total from stack
  - Particulate Matter: 0.06 lb PM / ton MAP Product (max)  
= 5.0 lb/hr total particulate matter from stack

## 3 SITE DETAILS

- 3.1 Elevation above sea level: 15' nominal
- 3.2 Earthquake category: Seismic zone 0
- 3.3 Design wind load: 120 mph

## 4 OPERATING REQUIREMENTS

- 4.1 Type of operation: continuous
- 4.2 Design loading: 109,000 acfm to Tailgas Scrubber, 165,000 acfm to stack
- 4.3 Process streams
  - 4.3.1 Vent from Cooler Scrubber to stack
  - 4.3.2 Vent from #3 ARCO Scrubber
  - 4.3.3 Vent from #4 ARCO Scrubber
  - 4.3.4 Pond water

## 5 EQUIPMENT SPECIFICATIONS

### 5.1 Scrubber specifications

#### 5.1.1 New Tailgas Scrubber

- 5.1.1.1 Flowrate (nominal): 109,000 acfm total
- 5.1.1.2 54,500 acfm from #3 ARCO Scrubber & 54,500 acfm from #3 ARCO Scrubber
- 5.1.1.3 Material: RLCS or 317 L SS
- 5.1.1.4 Design -Similar to Bartow #5 Scrubber, simplified where possible

## 5.2 **Stack Specifications**

5.2.1 Use existing stack as is.

## **2. Process Description**

### **Tailgas Scrubber System**

An additional scrubbing step is being added to the #3 & #4 MAP Plant to control plant emissions for an increased production rate of 2016 tpd MAP.

The hot vapors from the existing #3 & #4 ARCO Scrubbers will be vented to the new Tailgas Scrubber. The Tailgas Scrubber will consist of a packed, cross-flow design scrubber. Pond water will be used to scrub fluoride, in void sprays on the packed scrubber inlet, and on each stage of packing within the scrubber itself. An additional stage of packing or mesh pad will be provided to serve as a mist eliminator at the back end of the scrubber.

The gas will be pulled through the scrubber by the Tailgas Scrubber Fan. The gas from the discharge of the fan will vent to atmosphere via the Scrubber Stack. Pond water and condensed scrubber liquor collected in the scrubber will be collected in a sump and pumped to the pond water return system by the Tailgas Pond Return Pump.

The total emissions from the new Tailgas Scrubber and the Cooler Scrubber will be a maximum of 1.72 lb/hr fluoride and 5.0 lb/hr of particulate matter.

### **3. Fume Scrubber Calculations**

This scrubbing system will achieve the following emissions:

1.72 lb/hr fluoride

5.0 lb/hr of particulate matter

## **4. Process Flow Diagram Drawings**

1443-F-001	#3 & #4 Plant Scrubber System - Process Flow Diagram
1443-F-101	Tailgas Scrubber P&ID



**KEMWORKS  
TECHNOLOGY INC**

**RECEIVED**

MAY 31 2001

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Voice: (863) 648-5369  
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mwalters@kemworks.com  
www.kemworks.com

BUREAU OF AIR REGULATION

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# **Tailgas Scrubber Information for #3 & #4 MAP Plant**

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Prepared for:



**CARGILL FERTILIZER, INC.**

Riverview, Florida

# TAILGAS SCRUBBER SYSTEM INFORMATION DOCUMENT

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**Plant Name:** Cargill Fertilizer, Inc.  
8813 Hwy 41 South  
Riverview, FL 33569

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  - Fluoride emissions: 0.041 lb F / ton P<sub>2</sub>O<sub>5</sub> (max)
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  - = 7.0 lb/hr total particulate matter from stack

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- 3.3 Design wind load: 120 mph

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**Cargill Fertilizer, Inc.**  
**MAP Plant Permit**  
**DEP File No. 0570008-026-AC (PSD-FL-251)**  
**OGC Case Number 99-0708**

Proposed revised permit language based on the 9/19/00 meeting held at the DEP, Tallahassee offices:

**Permit Cover Page** - Change expiration date to June 1, 2003.

**Specific Condition 5** - Particulate matter emissions shall not exceed 5.0 lb/hr and 22.08 TPY based on 0.06 lb/ton MAP product.

**Specific Condition 6** - Visible emissions from the stack shall not exceed 15% opacity.

**Specific Condition 8** - Prior to installation of the pollution control equipment, the permittee shall submit to the Department the proposed design information along with a manufacturer's guarantee that the equipment is capable of meeting the emission limitations established by the particulate BACT determination. The permittee shall install, calibrate, operate and maintain monitoring devices that continuously measure and record the total pressure drop across the scrubbing system. Accuracy of the devices shall be +/- 5% over the operating range.

**Specific Condition 9** - Before this construction permit expires, and semi-annually for 5 years following completion of construction, the subject emissions units shall be tested for compliance with the emission limits in Specific Conditions 4, 5, and 6. The initial performance test shall be conducted with the scrubbing system operating within the design pressure drop range as specified by the manufacturer. For the duration of all tests the emission units 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 permitted capacity (i.e., 90% of the 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.

In addition, the emissions tests shall be used to establish pressure drop limitations in the operating permit. These pressure drop limits shall not be more than 10% below the lowest average pressure drop at which compliance has been demonstrated. In addition, if the particulate matter emissions in such compliance tests exceed 0.05 lb PM/ton MAP, then the lowest average pressure drop during that compliance test shall be the minimum operating level allowed. Once the pressure drop is so limited, the operation at a lower pressure drop is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to demonstrate compliance at the lower pressure drop.

**PM BACT Analysis** - Change PM BACT determination to establish the emission limit of 0.06 lb PM/ton MAP produced without establishing a specific pressure drop as part of the BACT.





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FERTILIZER, INC.**

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BUREAU OF AIR REGULATION

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CERTIFIED MAIL: 7000 0520 0014 8871 3985

May 29, 2001

Mr. Al Linero, P.E.  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dear Mr. Linero:

Re: Cargill Fertilizer Riverview Facility, AIRS ID No. 0570008  
DEP File No. 0570008-026-AC (PSD-FL-251)

Please find enclosed the scrubber design requested for the MAP permit referenced above. If you have any questions or require additional information please call me at (813) 671-6369 or David Jellerson at (813) 671-6297.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kathy Edgemon', is written over a horizontal line.

Kathy Edgemon, P.E.  
Environmental Superintendent

cc: Jellerson  
File P-30-34-4



**Arif, Syed**

---

**From:** Linero, Alvaro  
**Sent:** Tuesday, January 16, 2001 9:05 AM  
**To:** Arif, Syed  
**Subject:** FW: Cargill MAP Permit

ATT476.TXT

-----Original Message-----

**From:** David Jellerson  
**Sent:** Thursday, October 26, 2000 4:48 PM  
**To:** Alvaro.Linero  
**Subject:** Re: Cargill MAP Permit

Al,

I haven't received you call.

Regarding the need to provide scrubber details before the permit is issued, it was my understanding from the meeting that the permit could contain a condition requiring submittal of the design details for Department approval prior to installation.

Please give me a call to discuss. I'm sure you would like to get this off you desk as much as I would.

Thanks,  
David

-----Original Message-----

**From:** Alvaro.Linero@dep.state.fl.us  
[mailto:Alvaro.Linero@dep.state.fl.us]  
**Sent:** Tuesday, October 03, 2000 10:00 AM  
**To:** jellerson, david /rview  
**Cc:** Alvaro.Linero@dep.state.fl.us; Clair.Fancy@dep.state.fl.us  
**Subject:** Re: Cargill MAP Permit  
**Sensitivity:** Confidential

Dave. We received your write-up. I believe we will need the details and guarantee regarding the scrubber that Cargill will actually install prior to issuance of the permit.

I will call you soon to discuss what will satisfy reasonable assurance in the absence of the parameters that Cargill wants removed from the draft permit.

Thank you. Al Linero.









**VENTURI CHARACTERISTICS AT THROAT VELOCITY - 150 FPS**  
**As Function of L/G ( GPM/1000CFM )**  
**Example- Liquid Rate for 35000 ACFM**

L/G	GPM	$\Delta P$ - in wg from correlation Ref				PARTICLE		RELATIVE	
		TESI RC	REF 1	REF 2	REF 6	REM EFF Ref 3 1.5 $\mu$ 3 $\mu$	SIZE Ref 4	AREA Ref 5	
2	70	1.5	2.2	3.2					
4	140	3.1	3.7	4.2					
8	280	6.1	6.4		5.6	50	93	1 1960	
10	350	7.7	7.6					1.4 1750	
12	420	9.2	8.7		8.4	70	99	1.8 1633	
14	490	10.7	9.9						
16	560	12.2	10.9						
20	700	15.3	13.0						
32	1120	24.4	18.8					8.0 980	

TESI- RC - used as conservative design with  $\Delta P \propto L/G$

REF 1 - Hesketh, JAPCA, 24, (10) 939 (1974)

REF 2 - Byrd and Dewey, CEP, 53, (9) 45, (1957)

REF 3 - Cooper, EPA 600/2, 75-054 (1975) (does not factor in target size effect)

REF 4 - Nukiyama Tanasawa, Trans Soc Mech Eng (Japan), Summary 14 (1939)

REF 5 - Lewis etal, IEC 40, 67 (1956)

REF 6 - Brink and Contant, IEC, 52, 1157 (1958)

Z 333 612 583

US Postal Service  
**Receipt for Certified Mail**

No Insurance Coverage Provided.  
Do not use for International Mail (See reverse)

Sent to <i>David B. Jefferson PE.</i>	
Street & Number <i>1813 Hwy. 41 South</i>	
Post Office, State, & ZIP Code <i>Kinrossville TN 33569</i>	
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 <i>1-4-99</i>	
<i>0570008-026-AC</i> <i>PSD-FI-251</i>	

PS Form 3800, April 1995





# Department of Environmental Protection

Lawton Chiles  
Governor

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

Virginia B. Wetherell  
Secretary

December 31, 1998

## CERTIFIED MAIL - RETURN RECEIPT REQUESTED

David B. Jellerson, P.E.  
Environmental Superintendent  
Cargill Fertilizer, Inc.  
8813 Highway 41 South  
Riverview, Florida 33569

Re: DEP File 0570008-026-AC (PSD-FL-251)

Dear Mr. Jellerson:

On July 7, 1998 the Department requested submittal of additional information to process the referenced application request. To date we have not received a response. Please note that per Rule 62-4.055(1):

*"The applicant shall have ninety days after the Department mails a timely request for additional information to submit that information to the Department. If an applicant requires more than ninety days in which to respond to a request for additional information, the applicant may notify the Department in writing of the circumstances, at which time the application shall be held in active status for one additional period of up to ninety days. Additional extensions shall be granted for good cause shown by the applicant. A showing that the applicant is making a diligent effort to obtain the requested information shall constitute good cause. Failure of an applicant to provide the timely requested information by the applicable date shall result in denial of the application."*

Since the period for response to the request for additional information has expired, the Department must deny the application if the information cannot be timely provided. Therefore, we are providing Cargill 30 days from today to provide the requested information or show good cause for not denying the permit.

If you have any questions regarding this matter, please call John Reynolds at 850/921-9536.

Sincerely,

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

AAL/jr

cc: Bill Thomas, DEP/SWD  
Jerry Campbell, EPCHC  
David Buff, Golder Assoc.