

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at [www.epa.gov/ttn/chief/ap42/](http://www.epa.gov/ttn/chief/ap42/)

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02\_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.



P.O. Box 48 Aurora, North Carolina 27806

**W.A. Schimming**  
Manager  
Environmental Affairs  
(919) 322-4111

December 9, 1991

Mr. Jim Mulligan  
Regional Supervisor  
Division of Environmental Management  
N. C. Department of EHNR  
P. O. Box 1507  
Washington, North Carolina 27889

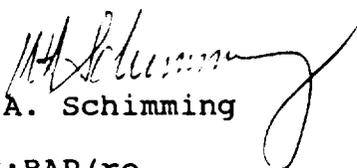
Re: **Texasgulf Inc.**  
**Permit No. 4492R5**

Dear Jim:

As per the requirements of Air Quality Permit No. 4492R5, Performance Testing No. 10 and 10 Part 1, the Diammonium Phosphate Plant No. 2 has been compliance tested for total fluoride emissions. A copy of the compliance test results are attached for your review.

If I may provide you any additional information on this subject, please let me know.

Sincerely,



W. A. Schimming

WAS:BAP/re

Enclosure

pc: Mike Aldridge - DEM, Raleigh (w/encl)  
W. T. Cooper (w/encl)  
W. K. Thornton (w/encl)  
J. C. Carrere (w/encl)  
00-12-000 (w/o encl)  
15-09-018 (w/encl)

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**SOURCE PERFORMANCE TEST**  
**DIAMMONIUM PHOSPHATE PLANT NO. 2**  
**TEXASGULF INC.**  
**PHOSPHATE OPERATIONS**  
**AURORA, NC**  
**NOVEMBER 13, 1991**

**PREPARED BY:**

**JOHN C. CARRERE, JR.**  
**ENV. DATA COORDINATOR**

**12/05/91**

**REVIEWED BY:**

**MIKE L. ASBY**  
**SUPERVISOR, ENV. LAB**

**REVIEWED BY:**

**JIMMY A. HARDY**  
**SR. ENV. TECHNICIAN**

**REVIEWED BY:**

**BRAD A. PEACOCK**  
**SR. ENV. ENGINEER**

# TEXASGULF, INC. PHOSPHATE OPERATIONS

## Summary

On November 13, 1991 sampling and analyses were conducted to determine the total fluoride emissions using EPA approved Method 13-B: Determination of Total Fluoride Emissions from Stationary Sources; Specific Ion Electrode Method, on Diammonium Phosphate Plant No. 2. The sample analyses were performed using an Orion 901 Specific Ion Electrode Analyzer. The instrument has the ability to compute a calibration slope from the calibration samples and display the output directly as parts per million total fluoride. A hand drawn calibration curve is attached to certify the accuracy of the instrument.

Senior Environmental Technicians Phillip Forest and Jimmy Hardy performed the sampling and Environmental Technician Jack Taylor performed the workdown and analyses.

The results showed the average total fluoride emission rate to be 0.024 lbs of F-/Ton of P<sub>2</sub>O<sub>5</sub> Input. The NSPS allowable emission rate is 0.06 lbs of F-/Ton of P<sub>2</sub>O<sub>5</sub> Input.

The normal (average) production rate since the last Source Performance Test (11/15/90) was 832 Tons of P<sub>2</sub>O<sub>5</sub> Input/Day. The average production rate during this testing was 856 Tons of P<sub>2</sub>O<sub>5</sub> Input/Day. The average production rate during this testing was 82% of the permitted production rate.

Mr. David Daniel of the North Carolina Division of Environmental Management was present during the testing as an official observer.

# TEXASGULF PHOSPHATE OPERATIONS

Test Summary - Method 13-B Compliance DAP No. 2

11/13/91

	Run 1	Run 2	Run 3
Stack Volumetric Flow Rate, TSCFM	156,100	153,629	153,534
Sample Volume, DSCF	39.45	38.19	38.82
Fluoride Concentration, mg/DSCF	0.04	0.06	0.07
Fluoride Emission Rate, Lbs./Hour	0.61	0.88	1.14
F- Emission Rate Lbs F/Ton of P2O5 Input	0.018	0.025	0.030
Percent Isokinetic Sampling Rate	93.59	94.47	94.67
Avg Emission Rate, Lbs. Fluoride/Hr.			0.88
Avg. Emission Rate Lbs F-/Ton of P2O5 Input			0.024
Allowable Emission Rate, Lbs. F-/Ton of P2O5 Input			0.06
Calculated Tons of P2O5 Input/Day	798	856	914
Average Tons of P2O5 Input/Day for Test			856
Normal Production Rate in Tons of P2O5 Input/Day Since Last *			832
Permitted Tons of P2O5 Input/Day			1045
% of Test Production Rate vs Permitted Production Rate			82

\* Last Source Performance 11/15/90.

# TEXASGULF PHOSPHATE OPERATIONS

## Production Information

Diammonium Phosphate Plant No. 2 Method 13-B Compliance Test

11/13/91

	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
% P2O5 54 Acid	50.23	50.14	51.54
Sp. Gr. 54 Acid	1.671	1.669	1.688
G.P.H. 54 Acid	5113	5471	5598
% P2O5 30 Acid	26.03	26.12	26.27
Sp. Gr. 30 Acid	1.263	1.263	1.265
G.P.H. 30 Acid	11,201	12,057	12,842
Production Rate T.P.D.	1680	1802	1925
P2O5 Input, T.P.D.	798	856	914

# TEXASGULF PHOSPHATE OPERATIONS

## Compliance Summary

Method 13-B

11/13/91

<b>Run</b>	<b>Lbs. F-/Ton of P2O5 Input</b>	<b>Production Rate Tons/Day</b>
1	0.018	1680
2	0.025	1802
3	0.030	1925
<b>Averages</b>	0.024	1803
<b>Allow. Fluoride Emission Rate Lbs/Ton of P2O5 Input</b>		0.06

# TEXASGULF PHOSPHATE OPERATIONS

## Calculations

- 1) Total Mg Fluoride =  $(A \times B \times C) / 1000 / N$
- 2) Mg Fluoride/DSCF =  $(D / E)$
- 3) Mg Fluoride/TSCF =  $(D / F)$
- 4) Lbs. Fluoride/Hour =  $((G \times H) / 453600) \times 60$
- 5) P2O5 Input Tons/Day =  $(8.34 \times I \times J \times K \times 60 \times 24) / 2000$
- 6) Lbs. Fluoride/Ton of P2O5 Input =  $(L / M)$

Where	A =	Orion 901 Meter Readout PPM
	B =	Liquid Sample Volume
	C =	Sample Aliquot
	D =	Total Mg Fluoride
	E =	Gas Sample Volume DSCF
	F =	Gas Sample Volume TSCF
	G =	Mg Fluoride TSCF
	H =	Volumetric Flow Rate of Stack, SCFM
	I =	Specific Gravity of Feed Acid
	J =	% P2O5 of Feed Acid
	K =	Acid Feed G.P.M.
	L =	Pounds of Fluoride/Day
	M =	P2O5 Input Tons/Day
	N =	Sample Dilution

# TEXASGULF memo

Date: 11/27/91  
To: Fertilizer Superintendent  
From: Environmental Affairs  
Subject: EPA Method 13-B Isokinetic Sample: DAP No. 2  
Compliance Test: Run 1

Sample Date	Time	Production Rate DAP TPD
11/13/91	09:38	1680

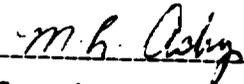
  

Mg Fluoride/SCF	Stack Volumetric Flow Rate TSCFM
Dry 0.04	156,100
Total 0.03	

Lbs. Fluoride/Hr.	Lbs. Fluoride/Ton of P2O5 Input
0.61	0.018

The permitted emission rate is 0.06 Lbs. F/Ton of P2O5 Input.

  
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Supervisor, Environmental Laboratory

B. A. Peacock  
File: ec-15-09-018

The stack sample was taken isokinetically according to EPA Method 13-B. The isokinetic sampling rate was 93.59 %.

# TEXASGULF INC. PHOSPHATE OPERATIONS

## SOURCE PERFORMANCE TEST

Method 13-B		Rpt. Date	11/27/91		
Run 1		Smple Date	11/13/91		
DAP 2		Smple Time	09:38		
Barometric Pressure	30.26	Initial Dry Gas Mtr		222.202	
Stack Static Pressure	-1.2	Final Dry Gas Mtr		263.016	
Stack Diameter	84	Dry Gas Factor		0.9930	
Nozzle Diameter	0.2033	Dry Mole Wt Stk Gas		28.832	
Pitot Tube Corr	0.84	Stack Pressure		30.17	
Sampling Time in Minutes	60				
30% Acid Analyses		54% Acid Analyses			
T.P.A. Decimal Equiv.	0.2603	T.P.A. Decimal Equiv.		0.5023	
Sp. Gr. at avg 140 oF	1.263	Sp. Gr. at 140 oF		1.671	
30% Acid Production		54% Acid Production			
09:30 30% Acid Reading	26758019	09:30 54% Acid Reading		9135438	
11:30 30% Acid Reading	26780420	11:30 54% Acid Reading		9145664	
Minutes Between Reads	120				
Gallons per minute 30%	186.68	Gallons per minute 54%		85.22	
30% Acid P2O5 Inpt TPD	368.62	54% Acid P2O5 Inpt TPD		429.53	
Total P2O5 Input TPD	798.15	Production TPD DAP		1680.31	
	Stk oF	Delta P	Delta H	oF In	oF Out
Pt 1	165	1.35	1.22	93	80
Pt 2	168	1.55	1.40	98	80
Pt 3	168	1.50	1.36	99	81
Pt 4	164	1.90	1.72	99	81
Pt 5	166	1.85	1.67	98	82
Pt 6	167	1.50	1.36	99	83
Pt 7	170	1.45	1.31	96	82
Pt 8	172	1.45	1.31	99	82
Pt 9	172	1.45	1.31	100	83
Pt 10	172	1.75	1.58	101	83
Pt 11	172	1.70	1.54	102	83
Pt 12	172	1.35	1.22	102	85
Averages	169	1.57	1.42	99	82
Stack oR	629		Average Meter Temp oR		550

Page 2  
Run 1  
DAP 2

Gas Volume Collected	40.814
Corrected Gas Volume	40.528
Gas Volume STP	39.452

Impinger Volumes/Weights

	No. 1 (mls) (water)	No. 2 (mls) (water)	No. 3 (mls) (water)	No. 4 (g) (silica gel)
Initial	100	100	0	629.29
Final	283	153	3	642.90
Total msl of water collected		239		
Increase in grams of silica gel		13.61		
Total Gas Volume		51.343		
Bws		0.2316		
One - Bws		0.7684		
Wet Molecular Weight of Stack Gas		26.32		
Stack Pressure		30.17		
Stack Velocity FPS		79.863		
Stack Volumetric Flow Rate TSCFM		156100		
Fluoride Result				
Orion 901 Meter Reading (mVolts)		102.1		
Concentration (ppm)		0.76		
Liquid Sample Volume (mls)		2000		
Sample Aliquot		50		
Sample Dilution		50		
Total Mg Fluoride		1.5200		
Mg Fluoride/DSCF		0.0385		
Mg Fluoride/TSCF		0.0296		
Pounds Fluoride/Hour		0.61		
Pounds of Fluoride/Ton P2O5 Input		0.018		
Isokinetic Sampling Rate		93.59		
Allow. Lbs. Fluoride/Ton of P2O5 Input		0.06		