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STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR & WASTE MANAGEMENT
89 KINGS HIGHWAY
P.O. BOX 1401
DOVER, DELAWARE 19903

AIR RESOURCES
SECTION

TELEPHONE: (302) 736-4791

April 7, 1988

RECEIVED

APR 14 1988

Enforcement Policy &
State Coordination Section

Bernard Turlinsky
EPA - Region III
841 Chestnut Street
Philadelphia, PA 19107

Dear Mr. Turlinsky:

Attached is a report of the H₂SO₄/SO₂ testing at General Chemical's Claymont, Delaware Sulfuric Acid Plant. The test runs were witnessed and the report has been reviewed. Runs 1, 9, and 10 are considered to be representative of the H₂SO₄ emissions. The relative accuracy of the SO₂ monitor is acceptable.

If there are any questions regarding the report, I can be reached at (302) 323-4542.

Sincerely yours,

Handwritten signature of Charles S. Krick

Charles S. Krick, P.E.
Environmental Engineer

CSK:blt
csk88036

Attachment

cc: A. Mirzakhali

RECEIVED

APR 13 1988

AIR QUALITY BRANCH
EPA Region III

General Chemical Corporation

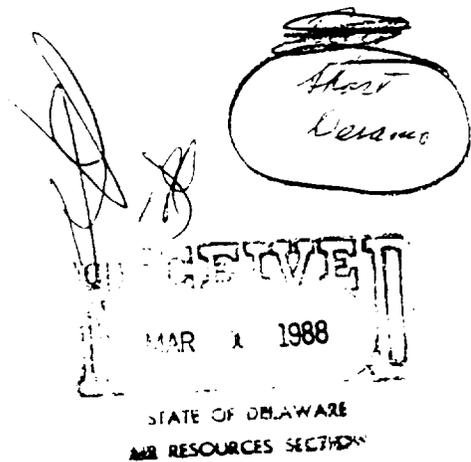
6300 Philadelphia Pike
Claymont, DE 19703-2712
(302) 792-8500



CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. French
Manager-Air Resources Section
Division of Environmental Control DNREC
89 Kings Highway
P O Box 1401
Dover DE 19901

**RE: SULFURIC ACID PLANT
ANNUAL STACK TEST
DELAWARE VALLEY WORKS**



Dear Mr. French:

Enclosed are the results of the 1987 Compliance Stack Test which was performed on November 10-12, 1987.

The average acid mist emission was 0.11 pounds/ton (expressed as 100% H₂SO₄) and the average Sulfur Dioxide emission was 135.60 pounds/hour.

If you have any questions or require additional information please contact Don Eros at (302) - 792-8502.

Very truly yours,


James M. Shepard
Plant Manager

md

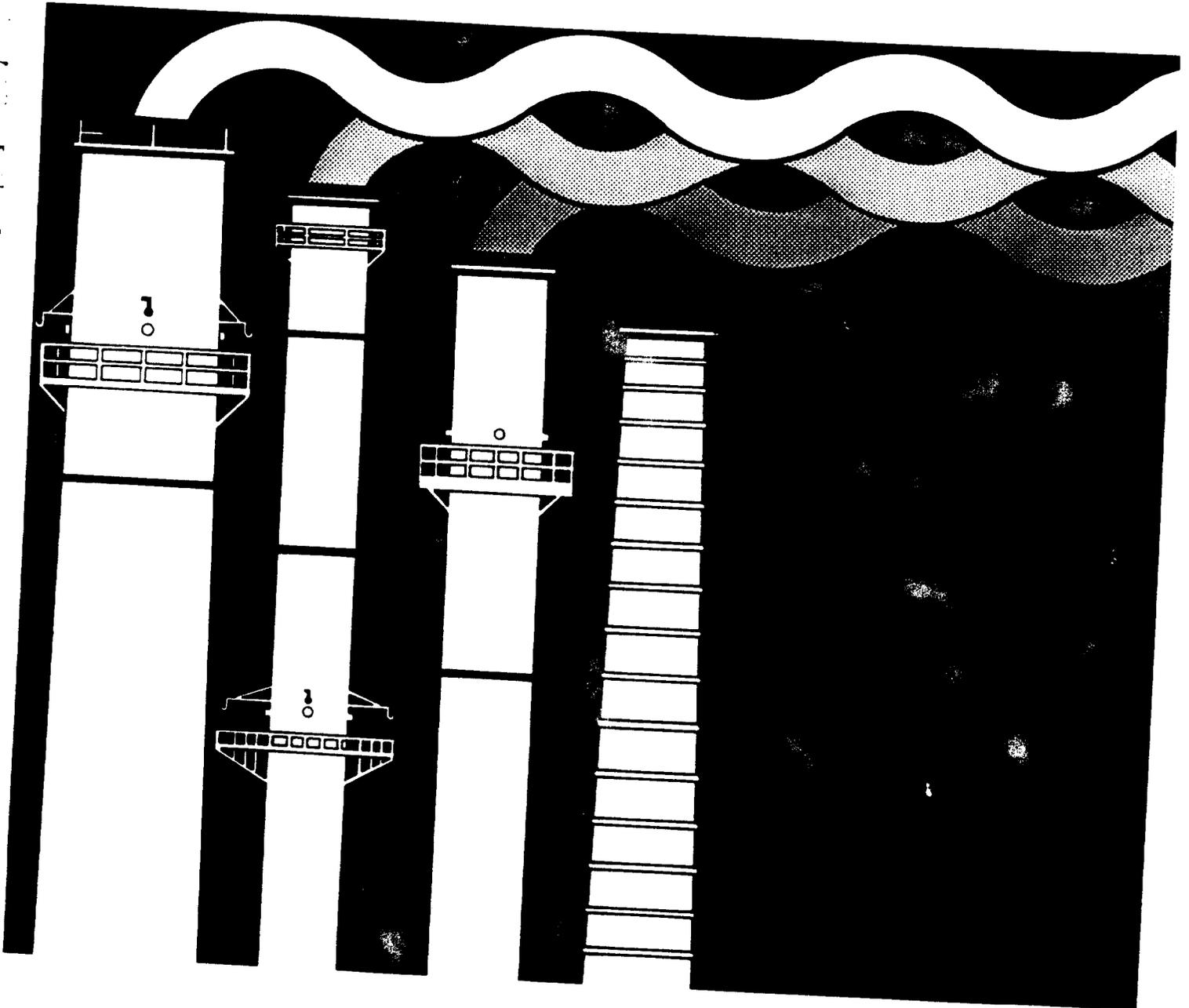
cc: C. S. Krick

Enclosure



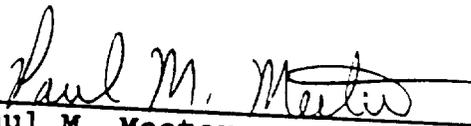
SOURCE EMISSIONS COMPLIANCE
TEST REPORT
SULFURIC ACID STACK

GENERAL CHEMICAL CORPORATION
CLAYMONT, DELAWARE



SOURCE EMISSIONS COMPLIANCE
TEST REPORT
SULFURIC ACID STACK

GENERAL CHEMICAL CORPORATION
CLAYMONT, DELAWARE



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WESTON Project Number
2373-01-02-0024

February 1988

215-692-3030

Prepared By

ROY F. WESTON, INC.
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SUMMARY

General Chemical Corporation retained Roy F. Weston, Inc. (WESTON) to perform a source compliance testing and analysis program at its sulfuric acid production facility in Claymont, Delaware.

The objective of the program was to determine the compliance status of the sulfuric acid stack relevant to sulfuric acid mist and sulfur dioxide emissions in accordance with the permit issued by the State of Delaware Department of Natural Resources and Environmental Control (DNREC). Also, additional SO₂ measurements were obtained to demonstrate the relative accuracy of the sulfuric acid stack SO₂ continuous emission monitor (CEM) and to verify the concentration of the SO₂ CEM calibration gas cylinder.

Testing and analytical procedures specified by the U.S. Environmental Protection Agency (EPA), as approved by the DNREC, were used throughout the test program. A total of four (4) EPA Method 8 and six (6) EPA Method 6 tests were conducted on the sulfuric acid stack during the program.

An additional six (6) Method 6 tests were performed on the SO₂ CEM calibration gas cylinder. A representative of DNREC was present during all test periods.

A summary of the sulfuric acid mist and sulfur dioxide test results is presented in Table 1. A summary of the CEM relative accuracy for SO₂ is presented in Table 2. Table 3 presents a summary of the analysis of the standard gas cylinder and Table 4 presents a summary of EPA Method 6 and 8 SO₂ test results. Detailed test data and test results summaries are included in Table 5 through 9 of the test results and discussion section.

GENERAL CHEMICAL CORPORATION
TABLE 1

SUMMARY OF SULFURIC ACID MIST
AND SULFUR DIOXIDE TEST RESULTS
SULFURIC ACID PLANT
DELAWARE VALLEY WORKS

TEST #	CALCULATED H ₂ SO ₄ PRODUCTION TON/HR(1)	EMISSION TEST RESULTS ACID MIST		SO ₂ LB/HR	SO ₂ MASS EMISSIONS RATE FROM RECORDING MONITOR LB/HR
		LB/HR	LB/TON H ₂ SO ₄ PRODUCED		
1	44.8	6.25	0.14	0.07	179.51
2	46.4	3.82	0.08	0.04	128.58
9	42.1	4.04	0.10	0.05	113.82
10	42.1	4.52	0.11	0.05	120.50
AVG.	43.9	4.66	0.11	0.05	135.60
					172.5
					110.9
					103.4
					107.7
					123.6

(1) A summary of production rates is provided in Appendix C.

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TABLE 2

RELATIVE ACCURACY OF THE SO₂ MONITOR

RUN #	DATE & TIME	RM(1)	M(2)	DIFFERENCE	
		PPM	PPM	(D)	(D) ²
1	11/10/87 1348-1625	305	294	11	121
2	11/11/87 0845-1007	228	197	31	961
3	11/11/87 1140-1200	271	246	25	625
4	11/11/87 1250-1310	234	216	18	324
5	11/11/87 1340-1400	223	190	33	1089
6	11/11/87 1422-1442	236	205	31	961
7	11/11/87 1508-1528	241	209	32	1024
8	11/11/87 1600-1620	238	216	22	484
9	11/12/87 1009-1140	196	178	18	324
10	11/12/87 1315-1436	<u>212</u>	<u>190</u>	<u>22</u>	<u>484</u>
TOTALS		2384	2141	243	6397
AVERAGE		238	214	24.3	

Standard Deviation(3) = 7.39

Confidence Coefficient = 5.57

Monitor Relative Accuracy (percent) = 12.6

- (1) RM = Measured sulfur dioxide concentration by Method 6 and 8 test train (ppm/v)
- (2) M = Average concentration measured by SO₂ monitor during test period (ppm/v)
- (3) See Appendix C for example calculation

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TABLE 3
ANALYSIS OF STANDARD GAS CYLINDER

<u>METHOD 6 TEST NUMBER</u>	<u>MEASURED SO₂ CONCENTRATION (PPM)</u>	<u>CERTIFIED VALUE (PPM)</u>
1	447 ¹	-
2	604	-
3	618	-
4	641	-
5	668	-
6	645	-
AVERAGE	635*	702

¹ Test 1 results discounted in determination of average SO₂ Concentration

GENERAL CHEMICAL CORPORATION
CLAYMONT DELAWARE
TABLE 4

SUMMARY OF EPA METHOD 6 AND METHOD 8
SULFUR DIOXIDE TEST RESULTS

TEST RUN NO.	TEST LOCATION	TEST DATE	TEST PERIOD	MEASURED SULFUR DIOXIDE CONCENTRATION (PPM/V)
One	Stack	11-10-87	1438-1625	305.
Two	Stack	11-11-87	0845-1007	228.
Three	Stack	11-11-87	1140-1200	271.
Four	Stack	11-11-87	1250-1310	234.
Five	Stack	11-11-87	1340-1400	223.
Six	Stack	11-11-87	1422-1442	236.
Seven	Stack	11-11-87	1508-1528	241.
Eight	Stack	11-11-87	1600-1620	238.
Nine	Stack	11-12-87	1009-1140	196
Ten	Stack	11-12-87	1315-1436	212.
Series Average	--	--	--	238.
One	Cylinder Gas	11-12-87	1113-1133	447.
Two	Cylinder Gas	11-12-87	1210-1230	604.
Three	Cylinder Gas	11-12-87	1324-1344	618.
Four	Cylinder Gas	11-12-87	1410-1430	641.
Five	Cylinder Gas	11-12-87	1459-1519	668.
Six	Cylinder Gas	11-12-87	1514-1600	645.
Series Average ²	--	--	--	635

¹ ppm/v = parts per million by volume dry basis at standard conditions of 68°F and 29.92 inches Hg.

² Note: Although no sampling or analytical problems were noted with cylinder gas test run one, the result is viewed as suspect and has not been included in the series average, the cylinder gas value for SO₂ was 702 ppm/v.

INTRODUCTION

General Chemical Corporation retained WESTON to conduct a source testing and analysis program at its Claymont, Delaware sulfuric acid production facility.

The primary objective of the survey was to determine the sulfuric acid mist and sulfur dioxide compliance status of the sulfuric acid stack with DNREC limits. Additional SO₂ test runs were performed on the sulfuric acid stack and SO₂ calibration gas cylinder for the purpose of determining the relative accuracy of the SO₂ CEM. These results are summarized in Tables 1 thru 4 of the summary section.

State of Delaware approved test methods were used throughout the program. All tests were performed during the period 10 through 12 November 1987 by WESTON Air Quality Testing Services personnel.

Detailed test data and test result summaries are presented in Tables 5 through 9 of this report. Descriptions of the test location, test equipment, test procedures, sample recovery techniques and analytical methods used during the survey are also included herein. Raw test data, laboratory reports, process conditions and sample calculations, equipment calibration records and a list of WESTON project participants are provided in Appendices A through E, respectively.