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REPORT CERTIFICATION

The sampling and analysis performed for this report was carried out under my direction and supervision.

Date October 6, 1987

Signature B. Duain Ritchie

B. Duain Ritchie

I have reviewed all testing details and results in this test report and hereby certify that the test report is authentic and accurate.

Date October 6, 1987

Signature D. James Grove

D. James Grove, P.E.

ENTROPY

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INTRODUCTION

1.1 Outline of Test Program. Stationary source sampling was performed for Texasgulf Chemicals Company at their phosphoric acid plant in Aurora, North Carolina, August 17 through 22, 1987. Units No. 1 and No. 4 were tested as they are representative of all units at the plant. Unit No. 1 processed calcined ore and Unit No. 4 processed uncalcined ore.

EPA Method 16A was followed to determine the total reduced sulfur (TRS) emissions. This included three 1-hour TRS runs plus 30-minute pretest and posttest performance checks. Flash cooler and vacuum pump discharge water analysis was performed during Unit No. 1 testing, using Standard Method 427 D (Iodometric Method, a modified EPA Method 11) to determine fugitive TRS for a total system emission rate.

A test log is presented in Table 1-1. The run numbers identify the locations, with suffix PCA used to identify pretest performance checks and suffix PCB used to identify post test performance checks

1.2 Test Participants. Table 1-2 lists the personnel present during the test program.

TABLE 1-1
PHOSPHORIC ACID PLANT TEST LOG

<u>Unit</u>	<u>Sampling Location</u>	<u>Test Date</u>	<u>Run Numbers</u>
1	Belt Filter Fume Scrubber Exhaust Stack	8/19	1-BS-1, 1-BS-2, 1-BS-3, 1-BS-PCA, 1-BS-PCB
1	Belt Filter Vacuum Pump Exhaust Stack	8/20	1-BV-1, 1-BV-2, 1-BV-3, 1-BV-PCA, 1-BV-PCB
1	Cross Flow Fume Scrubber Main Stack	8/21	1-CFS-1, 1-CFS-2, 1-CFS-3, 1-CFS-PCA, 1-CFS-PCB
4	Belt Filter Fume Scrubber Exhaust Stack	8/17	4-BS-1, 4-BS-3, 4-BS-4, 4-BS-PCA, 4-BS-PCB
4	Belt Filter Vacuum Pump Exhaust Stack	8/18	4-BV-1, 4-BV-2, 4-BV-3, 4-BV-PCA, 4-BV-PCB
4	Cross Flow Fume Scrubber Main Stack	8/22	4-CFS-1, 4-CFS-2, 4-CFS-3, 4-CFS-PCA, 4-CFS-PCB

TABLE 1-2
TEST PARTICIPANTS

Texasgulf Chemicals Company	Wayne Powell Test Coordinator
North Carolina Department of Natural Resources and Community Development	Arthur Smoot Test Observer Victor Copelan Test Observer Robert Wooten Test Observer
United States Environmental Protection Agency, Region V	Paul Reiner mann Test Observer
Entropy Environmentalists, Inc.	B. Dwain Ritchie Project Supervisor Timothy M. Brice Sampling Team Leader Mary Ellen Jackson Laboratory Technician

SUMMARY OF RESULTS

2.1 Presentation. Tables 2-1 through 2-7 present the TRS emissions from the testing performed August 17 through 22, 1987, for Unit No. 1 (calcined ore) and Unit No. 4 (uncalcined ore). Table 2-1 includes the degassing headspace fugitive emissions for Unit No. 1. Tables 2-2 and 2-3 include the total emissions for Unit No. 1 and Unit No. 4, respectively. Tables 2-4 and 2-5 include the stack emissions for Unit No. 1 and Unit No. 4, respectively. Table 2-6 includes the fugitive emissions for Unit No. 1. Tables 2-7 and 2-8 include the pretest and posttest performance checks for Unit No. 1 and Unit No. 4, respectively.

Detailed test results are given in Appendix A; field and analytical data are presented in Appendix B.

2.2 Stack Emissions

2.2.1 Aborted Run. Run 4-BS-2 was aborted due to an unacceptable leak in the sampling train. An additional run was performed to complete the three runs. No data from the aborted run is included in this report.

2.2.2 Pretest/Posttest Performance Checks. The average efficiency (comparison to allowable) of the pretest and posttest performance checks was 6.7 percent, which is well within the 20 percent allowed by EPA Method 16A. Post performance check 1-BS-PCB was cut off at 20 minutes due to high H₂S concentrations and the attendant danger. This was approved by Mr. Paul Reinermann of the United States Environmental Protection Agency.

2.3 Fugitive Emissions

2.3.1 Discussion. Fugitive emissions are those not emitted to the atmosphere through a stack. To determine the fugitive H₂S emissions at the collection pond, Texasgulf personnel collected water samples at the flash cooler and barometric condenser discharges. Due to the nature of the sampling and analysis, the results varied by more than can be considered reasonable. Because of this variability, Texasgulf personnel elected to have the sampling and analysis continue beyond the original scope and accepted protocol. The continued testing showed more reasonable results.

A rough calculation of the concentration emitted from the water in the analysis of run No. 1 at the flash cooler barometric condenser showed 1.36 pounds H_2S per ton of P_2O_5 input, a lethal presence. This probably was an erroneous result as there was no distinct odor of H_2S and there were no casualties. This result is not considered accurate and has been eliminated from the average.

2.3.2 Additional Analysis. Texasgulf also analyzed the off gas H_2S directly. The results of this analysis were consistent and reasonable. This analysis was added to the job scope as a result of discussions at the pretest meeting. The results are reported as corroboration that some of the direct water analyses were erroneous.

2.3.3 H_2S Degassing Gain. Zero emissions are reported for several runs because there was a gain during degassing. The reporting of zero emissions for the samples was approved by Mr. Robert Wooten of the North Carolina Department of Natural Resources and Community Development.

2.4 Sulfur Dioxide Audit Samples. In conjunction with the analysis of the sulfate samples, two unknown SO_2 audit samples, submitted by Mr. Victor Copelan of the North Carolina Department of Natural Resources and Community Development, were analyzed. For audit samples A02585 and A03725, the concentrations were 786.2 and 1,689.0 milligrams per dry standard cubic meter, respectively. These results were reported to, and accepted by, Mr. Robert Wooten.