SOURCE TEST REPORT
ON MEASUREMENT OF EMISSIONS FROM
OCCIDENTAL CHEMICAL COMPANY
WHITE SPRINGS, FLORIDA
FOR
THE ENVIRONMENTAL PROTECTION AGENCY
UNITED STATES GOVERNMENT
REPORT NO. 73-ROC-3

environmental science and engineering, inc.

SOURCE TEST REPORT

REPORT NO: 73-ROC-3

PLANT TESTED: OCCIDENTAL CHEMICAL COMPANY
WHITE SPRINGS, FLORIDA

EMISSIONS FROM: PHOSPHATE ROCK DRYING
AND GRINDING PROCESSES

TESTOR: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
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CONTRACT NO: 68-02-0232, Task Order 12, Task Change No. 3

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INTRODUCTION

Rock Drying

Fluoride and particulate emission tests were performed at the phosphate rock drying operation located at the Occidental Chemical Company, White Springs, Florida. Environmental Science and Engineering, Inc. of Gainesville, Florida performed the emission tests while EPA personnel gathered plant process data. The purpose of the tests was to obtain data for the use of both the Industrial Studies Branch and the Performance Standards Branch of the EPA.

All emission tests were performed simultaneously at the inlet and outlet of the Dorrco Cyclonic Wet Scrubber. Fluoride emissions were determined by a method currently being studied by the EPA, and particulate emissions were determined by the EPA Method No. 5 (Federal Register, Vol. 36, No. 59, August 17, 1971, Wash., D.C.). Triplicate tests were performed at all sampling sites. The fluoride tests were performed on December 19 and 20, 1972; and the particulate tests on December 21, 1972 and January 9, 1973.

Grab samples of the scrubbing liquids, the process reactants, and the process products were analyzed for fluoride and P_2O_5 content by the EPA.

Rock Grinding

Particulate emission tests were performed at the phosphate rock grinding operation located at the Occidental Chemical Company, White Springs, Florida. Environmental Science and Engineering, Inc. performed

the emission tests while EPA personnel gathered plant process data. The purpose of the test was to obtain data for the use of both the Industrial Studies Branch and the Performance Standards Branch of the EPA.

All particulate emission tests were performed simultaneously at the inlet and outlet of the Micro-Pulsaire Bag Collector on the K.V.S. Ball Mill. The test method used was EPA Method 5 (Federal Register, Vol. 36, No. 59, August 17, 1971). Triplicate tests were performed at all sampling sites. The tests were performed on January 11 and 12, 1973.

Grab samples of the process reactants and process products were analyzed for trace metals, mercury, and fluoride content by the EPA.

SUMMARY OF RESULTS

Rock Drying

Summarized results of the fluoride and particulate emission tests are shown in Tables 1 through 4. Complete results are included in Appendix A-1.

During the preliminary investigation of stack gas velocity profiles, an attempt was made to determine the magnitude of tangential flow in the outlet stack. To do this, a standard and S-type pitot tube were rotated 180^{o} at several points across the stack diameter to measure the maximum velocity head reading. No appreciable difference could be detected whether the pitot tube was parallel to the gas flow or at some angle to the flow.

Based upon the difference in inlet and outlet gas flow calculations, there possibly was some effect from tangential flow in the outlet. A comparison of the two average flow rates indicates that the outlet was approximately 38 percent greater than the inlet.

The velocity measurements for the inlet seemed fairly uniform; therefore, the emission rates for the outlet were also calculated on the basis of the flow rates calculated from inlet measurements (see Appendix A-1.

Fluoride emission rates were calculated by using the sample recovered from the nozzle through the filter portion of the sampling train. The emissions were separated into insoluble and soluble fluoride emissions.

Particulate emission rates were calculated by using the sample recovered from the following portions of the sample train: 1) acetone rinse of nozzle through front half of filter holder (Front Half); 2) in some cases, a water rinse of the front half; 3) filter; 4) impinger contents plus a water rinse of the back half of the filter holder through the dry impinger that precedes the impinger with the silica gel (Back Half); 5) ether and chloroform extraction of organic matter contained in No. 4 mentioned above; 6) acetone rinse of the back half after the water rinse has been made.

A water rinse of the front half was made, in some cases, after the acetone rinse and brushing was performed. The reason for this was to remove particulate matter that was visible after the acetone rinsing and brushing. This procedure was acceptable to the EPA test officer since it followed the acetone rinse.

Grab samples of the stack gases at each sampling site were obtained by an Orsat analyzer, and the concentrations of carbon dioxide, oxygen, and carbon monoxide were determined. Analyses were made while the dryer was on natural gas and while it was on fuel oil.

Tables 5 and 6 contain the results of the laboratory analyses performed on the grab samples from the process reactants and products, and the scrubbing liquid respectively.

TABLE - 1

SOURCE EMISSION TEST DATA

TEST NUMBER	-	73-ROC-3
PLANT NAME	-	OCCIDENTAL CHEMICAL CO.
SOURCE TESTED	-	DRYER SCRUBBER INLET
TYPE OF PLANT	-	PHOSPHATE ROCK DRYING
CONTROL EQUIPMENT	-	LIQUID SCRUBBER
POLLUTANT SAMPLED	-	FLUORIDES AND P_2O_5

	1	2	3	Average
1) RUN NUMBER	12/19/72	12/20/72	12/20/72	-
2) DATE	14:22	09:53	14:45	-
3) TIME BEGAN	17:21	12:13	17:05	-
4) TIME END	120	120	120	120
5) T - NET TIME OF TEST, MINUTES	29.9	29.9	29.9	29.9
6) PB - BAROMETRIC PRESSURE, IN HG	29.6	29.6	29.6	29.6
7) PS - STACK PRESSURE, IN HG	0.350	0.480	0.410	0.413
8) ΔH - GAS MTR ORIFICE PRESS DROP, "H2O	81.7	74.3	85.5	80.5
9) TM - GAS METER AVG TEMP, DEG F	263	553	460	425
10) VC - TOTAL H2O COLLECTED, ML	12.47	26.22	21.79	20.2
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	41.160	49.640	48.180	46.327
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	40.277	49.263	46.823	45.454
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	23.6	34.7	31.8	30.0
14) W(PCT) - STACK GAS MOISTURE, PCT VOL	169	173	171	171
15) TS - AVG STACK GAS TEMPERATURE, DEG F	2.00	2.00	2.00	2.00
16) CO2 - STACK GAS CO2, PCT VOL	17.4	17.4	17.4	17.4
17) O2 - STACK GAS O2, " "	0.00	0.00	0.00	0.00
18) CO - STACK GAS CO, " "	80.6	80.6	80.6	80.6
19) N2 - STACK GAS N2, " "	N.A.	N.A.	N.A.	-
20) EA - STACK GAS EXCESS AIR, PCT VOL	29.0	29.0	29.0	29.0
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	26.4	25.2	25.5	25.7
22) MS - STACK GAS MOLECULAR WGHT, STK COND	0.911	0.870	0.880	0.887
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.834	0.825	0.817	0.825
24) H - AVG SQUARE ROOT VEL HEAD, " H2O	20.9	20.8	20.5	20.7
25) AVG SQUARE ROOT (STK TEMP × VEL HEAD)	0.830	0.830	0.830	0.830
26) CP - PITOT TUBE CORRECTION FACTOR	3180	3230	3180	3200
27) U - STACK GAS VELOCITY, FT/MIN	33.75	33.75	33.75	33.75
28) AS - STACK AREA, SQUARE FEET	33.75	33.75	33.75	33.75
29) AS' - EFFECTIVE STACK AREA, SQ FEET	107,500	109,300	107,350	108,000
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	68,400	59,000	61,000	62,800
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	0.188	0.188	0.188	0.188
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.000192	0.000192	0.000192	0.000192
33) AN - SAMPLING NOZZLE AREA, SQ FT	80.4	122	113	105
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT				
35) FEED RATE, TONS/HOUR	285	280	285	283
36) FLUORIDE EMISSIONS, WATER SOLUBLE				
MILLIGRAMS	14.4	1.50	1.30	5.73
GRAINS/SCF	0.00552	0.000547	0.000428	0.00217
GRAINS/ACF	0.00351	0.000254	0.000240	0.00133
LBS/HOUR'	3.22	0.260	0.210	1.23
LBS/TON OF FEED	0.0113	0.000929	0.000737	0.00432
37) FLOURIDE EMISSIONS, TOTAL				
MILLIGRAMS	34.3	40.4	36.1	36.9
GRAINS/SCF	0.0131	0.0127	0.0119	0.0126
GRAINS/ACF	0.00837	0.00684	0.00674	0.00732
LBS/HOUR	7.68	6.43	6.20	6.77
LBS/TON OF FEED	0.0269	0.0229	0.0218	0.0239
38) FLOURIDE EMISSIONS, % INSOLUBLE	58.0	96.3	96.4	83.6
39) P_2O_5, WATER SOLUBLE, MG	86.4	7.4	4.2	32.7
40) P_2O_5, TOTAL, MG	236.4	347.4	291.7	291.8
41) P_2O_5, % INSOLUBLE	63.5	97.9	98.6	86.7

*** S.T.P. - DRY, 70°F, 29.92 in Hg

TABLE - 2

SOURCE EMISSION TEST DATA

TEST NUMBER	-	73-ROC-3
PLANT NAME	-	OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA.
SOURCE TESTED	-	ROCK DRYER SCRUBBER OUTLET (FLUORIDES)
TYPE OF PLANT	-	PHOSPHATE ROCK DRYING
CONTROL EQUIPMENT	-	LIQUID SCRUBBER
POLLUTANT SAMPLED	-	FLUORIDES AND P_2O_5

	1	2	3	Average
1) RUN NUMBER	12/19/72	12/20/72	12/20/72	N.A.
2) DATE	14:20	09:30	14:40	N.A.
3) TIME BEGAN	17:18	12:18	17:13	N.A.
4) TIME END	132	132	132	132
5) T - NET TIME OF TEST, MINUTES	29.9	29.9	29.9	29.9
6) PB - BAROMETRIC PRESSURE, IN HG	29.9	29.9	29.9	29.6
7) PS - STACK PRESSURE, IN HG	0.620	0.490	0.560	0.557
8) ΔH - GAS MTR ORIFICE PRESS DROP, ''H2O	77.6	76.8	82.9	79.1
9) TM - GAS METER AVG TEMP, DEG F	423	393.5	424.9	414
10) VC - TOTAL H2O COLLECTED, ML	20.05	18.65	20.14	19.61
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	59.486	51.449	56.373	55.8
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	58.693	50.813	55.069	54.9
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	25.5	26.8	26.8	26.4
14) W(PCT) - STACK GAS MOISTURE, PCT VOL	154.0	154.4	154.7	154.4
15) TS - AVG STACK GAS TEMPERATURE, DEG F	2.00	2.00	2.00	2.00
16) CO2 - STACK GAS CO2, PCT VOL	17.5	17.5	17.5	17.5
17) O2 - STACK GAS O2, '' ''	0.00	0.00	0.00	0.00
18) CO - STACK GAS CO, '' ''	80.5	80.5	80.5	80.5
19) N2 - STACK GAS N2, '' ''	N.A.	N.A.	N.A.	N.A.
20) EA - STACK GAS EXCESS AIR, PCT VOL	29.02	29.02	29.02	29.02
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	26.21	26.06	26.07	26.1
22) MS - STACK GAS MOLECULAR WGHT, STK COND	0.904	0.899	0.899	0.900
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.507	0.445	0.48	0.477
24) H - AVG SQUARE ROOT VEL HEAD, '' H2O	12.567	11.033	11.905	11.8
25) AVG SQUARE ROOT (STK TEMP×VEL HEAD)	0.830	0.830	0.830	0.830
26) CP - PITOT TUBE CORRECTION FACTOR	1910	1680	1810	1800
27) U - STACK GAS VELOCITY, FT/MIN	77.24	77.24	77.24	77.24
28) AS - STACK AREA, SQUARE FEET	77.24	77.24	77.24	77.24
29) AS' - EFFECTIVE STACK AREA, SQ FEET	147,500	129,800	140,000	139,100
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	94800	81800	88,400	88300
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	0.250	0.250	0.250	0.250
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.000341	0.000341	0.000341	0.000341
33) AN - SAMPLING NOZZLE AREA, SQ FT	106.1	106.5	106.9	106.5
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT				
35) FEED RATE, TONS/HOUR	285	280	285	283
36) FLUORIDE EMISSIONS, WATER SOLUBLE				
MILLIGRAMS	1.20	0.50	0.40	0.70
GRAINS/SCF	0.000315	0.000152	0.000112	0.000193
GRAINS/ACF	0.000203	0.0000958	0.0000706	0.000123
LBS/HOUR'	0.260	0.106	0.085	0.150
LBS/TON OF FEED	0.000912	0.000379	0.000298	0.000530
37) FLOURIDE EMISSIONS, TOTAL				
MILLIGRAMS	12.6	1.10	0.80	4.83
GRAINS/SCF	0.000331	0.000334	0.000224	0.000296
GRAINS/ACF	0.000213	0.000206	0.000141	0.000187
LBS/HOUR	0.273	0.232	0.170	0.225
LBS/TON OF FEED	0.000958	0.000829	0.000596	0.000794
38) FLOURIDE EMISSIONS, % INSOLUBLE	4.76	54.5	50.0	36.4
39) P_2O_5, WATER SOLUBLE, MG	2.4	2.3	2.1	2.27
40) P_2O_5, TOTAL, MG	2.46	2.6	6.5	3.85
41) P_2O_5, % INSOLUBLE	2.44	11.5	67.7	27.2

*** S.T.P. - DRY, 70°F, 29.92 in Hg

TABLE - 3

SOURCE EMISSION TEST DATA

TEST NUMBER - 73-ROC-3
PLANT NAME - OCCIDENTAL CHEMICAL CO. WHITE SPRINGS FLA.
SOURCE TESTED - DRYER SCRUBBER INLET (PARTICULATES)
TYPE OF PLANT - PHOSPHATE ROCK DRYING
CONTROL EQUIPMENT- LIQUID SCRUBBER
POLLUTANT SAMPLED- PARTICULATES

	1	2	3	Average
1) RUN NUMBER	12/22/72	1/9/73	1/9/73	N.A.
2) DATE	9:25	10:00	15:10	N.A.
3) TIME BEGAN	11:58	13:12	17:55	N.A.
4) TIME END	120	120	120	120
5) T - NET TIME OF TEST, MINUTES	29.9	29.9	29.9	29.9
6) PB - BAROMETRIC PRESSURE, IN HG	29.6	29.6	29.6	29.6
7) PS - STACK PRESSURE, IN HG	0.300	0.390	0.450	0.380
8) ΔH - GAS MTR ORIFICE PRESS DROP, ''H2O	73.6	43.8	51.0	56.1
9) TM - GAS METER AVG TEMP, DEG F	429	212	408	350
10) VC - TOTAL H2O COLLECTED, ML	20.33	10.05	19.34	16.5
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	40.180	43.590	46.500	43.400
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	39.911	45.868	48.246	44.675
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	33.8	18.0	28.6	26.8
14) W(PCT) - STACK GAS MOISTURE, PCT VOL	172	165	168	168
15) TS - AVG STACK GAS TEMPERATURE, DEG F	2.00	4.20	4.20	3.47
16) CO2 - STACK GAS CO2, PCT VOL	17.4	15.0	15.0	15.8
17) O2 - STACK GAS O2, '' ''	0.00	0.00	0.00	0.00
18) CO - STACK GAS CO, '' ''	80.6	80.8	80.8	80.7
19) N2 - STACK GAS N2, '' ''	N.A.	N.A.	N.A.	N.A.
20) EA - STACK GAS EXCESS AIR, PCT VOL	29.02	29.27	29.27	29.19
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	25.30	27.25	26.05	26.20
22) MS - STACK GAS MOLECULAR WGHT, STK COND	0.873	0.940	0.899	0.904
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.827	0.826	0.841	0.831
24) R - AVG SQUARE ROOT VEL HEAD, '' H2O	20.789	20.648	21.058	20.8
25) AVG SQUARE ROOT (STK TEMP×VEL HEAD)	0.830	0.830	0.830	0.830
26) CP - PITOT TUBE CORRECTION FACTOR	3230	3090	3230	3180
27) U - STACK GAS VELOCITY, FT/MIN	33.75	33.75	33.75	33.75
28) AS - STACK AREA, SQUARE FEET	33.75	33.75	33.75	33.75
29) AS' - EFFECTIVE STACK AREA, SQ FEET	109,000	104,400	108,900	107,400
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	59,900	71,800	64,900	65,500
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	0.188	0.188	0.188	0.188
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.000192	0.000192	0.000192	0.000192
33) AN - SAMPLING NOZZLE AREA, SQ FT	97.6	93.6	108	99.7
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT				
35) FEED RATE, TONS/HOUR	280	215	235	243
36) PARTICULATE EMISSIONS; PROBE, CYCLONE, AND FILTER CATCH				
MILLIGRAMS	1278.9	490.2	1337.7	1035.6
GRAINS/SCF	0.494	0.165	0.428	0.362
GRAINS/ACF	0.271	0.113	0.255	0.213
LBS/HOUR	253.89	101.51	238.09	197.83
LBS/TON OF FEED	0.907	0.472	1.013	0.797
37) PARTICULATE EMISSIONS, TOTAL				
MILLIGRAMS	1318.0	555.2	1419.9	1097.7
GRAINS/SCF	0.510	0.187	0.454	0.384
GRAINS/ACF	0.280	0.128	0.271	0.226
LBS/HOUR	261.65	114.97	252.72	209.78
LBS/TON OF FEED	0.934	0.535	1.075	0.848
38) PARTICULATE EMISSIONS, % IMPINGER CATCH	3.00	11.7	5.80	6.83

*** S.T.P. - DRY, 70°F, 29.92 in. Hg

TABLE - 4

SOURCE EMISSION TEST DATA

TEST NUMBER	-	73-ROC-3
PLANT NAME	-	OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA.
SOURCE TESTED	-	DRYER SCRUBBER OUTLET (PARTICULATES)
TYPE OF PLANT	-	PHOSPHATE ROCK DRYING
CONTROL EQUIPMENT	-	LIQUID SCRUBBER
POLLUTANT SAMPLED	-	PARTICULATES

	1	2	3	Average
1) RUN NUMBER	12/22/72	1/9/73	1/9/73	N.A.
2) DATE	9:30	10:00	15:10	N.A.
3) TIME BEGAN	12:23	12:12	17:22	N.A.
4) TIME END	132	138	132	134
5) T - NET TIME OF TEST, MINUTES	29.9	29.9	29.9	29.9
6) PB - BAROMETRIC PRESSURE, IN HG	29.9	29.9	29.9	29.9
7) PS - STACK PRESSURE, IN HG	0.500	0.710	0.520	0.577
8) ΔH - GAS MTR ORIFICE PRESS DROP, ''H2O	69.4	42.4	47.4	53.1
9) TM - GAS METER AVG TEMP, DEG F	431	365.5	353	383
10) VC - TOTAL H2O COLLECTED, ML	20.43	17.32	16.73	18.16
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	50.394	59.950	48.710	53.000
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	50.512	63.310	50.908	54.900
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	28.8	21.5	24.7	25.0
14) M(PCT) - STACK GAS MOISTURE, PCT VOL	150	144	149	148
15) TS - AVG STACK GAS TEMPERATURE, DEG F	2.00	3.70	3.70	3.13
16) CO2 - STACK GAS CO2, PCT VOL	17.5	15.5	15.5	16.2
17) O2 - STACK GAS O2, '' ''	0.00	0.00	0.00	0.00
18) CO - STACK GAS CO, '' ''	80.5	80.8	80.8	80.6
19) N2 - STACK GAS N2, '' ''	N.A.	N.A.	N.A.	N.A.
20) EA - STACK GAS EXCESS AIR, PCT VOL	29.02	29.21	29.21	29.1
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	25.9	26.8	26.4	26.4
22) MS - STACK GAS MOLECULAR WGHT, STK COND	0.893	0.924	0.910	0.911
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.440	0.527	0.446	0.471
24) R - AVG SQUARE ROOT VEL HEAD, '' H2O	10.862	12.964	11.001	11.6
25) AVG SQUARE ROOT(STK TEMP×VEL HEAD)	0.830	0.830	0.830	0.830
26) CP - PITOT TUBE CORRECTION FACTOR	1660	1950	1660	1760
27) U - STACK GAS VELOCITY, FT/MIN	77.24	77.24	77.24	77.24
28) AS - STACK AREA, SQUARE FEET	77.24	77.24	77.24	77.24
29) AS' - EFFECTIVE STACK AREA, SQ FEET	128,000	150,500	128,600	135,700
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	79,200	103,600	84,200	89,000
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	0.250	0.250	0.250	0.250
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.000341	0.000341	0.000341	0.000341
33) AN - SAMPLING NOZZLE AREA, SQ FT	109.4	104.9	103.8	106.0
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT				
35) FEED RATE, TONS/HOUR	280	215	235	243
36) PARTICULATE EMISSIONS; PROBE, CYCLONE, AND FILTER CATCH				
MILLIGRAMS	220.6	75.6	45.7	113.9
GRAINS/SCF	0.0674	0.0185	0.0139	0.0333
GRAINS/ACF	0.0417	0.0127	0.00907	0.0212
LBS/HOUR	45.73	16.35	9.99	24.0
LBS/TON OF FEED	0.163	0.0760	0.0425	0.0938
37) PARTICULATE EMISSIONS, TOTAL				
MILLIGRAMS	239.6	129.1	*	*
GRAINS/SCF	0.0732	0.0315	*	*
GRAINS/ACF	0.0453	0.0217	*	*
LBS/HOUR	49.67	27.92	*	*
LBS/TON OF FEED	0.177	0.130	*	*
38) PARTICULATE EMISSIONS, % IMPINGER CATCH	7.90	41.4	*	*

* No data because sample bottle broke during shipment.

*** S.T.P. - DRY, 70°F, 29.92 in. Hg

TABLE 5

FLUORIDE, TRACE METALS, AND MERCURY CONTENT
IN ROCK DRYER PROCESS REACTANTS AND PRODUCTS

Fluoride Content

	FEED IN		PRODUCT OUT	
	Insol	Total	Insol	Total
Run 1	39.1 mg/gm	39.1 mg/gm	42.5	42.5
Run 2	42.9 mg/gm	42.9 mg/gm	44.7	44.7
Run 3	42.2 mg/gm	42.2 mg/gm	39.9	39.9

COOLING POND ROCK	
Insol	Total
192 mg/gm	192 mg/gm

NOTE: EMB has not received Mercury and Trace Metals results at this time.

TABLE 6

FLUORIDE CONTENT IN ROCK DRYER SCRUBBING LIQUID

		F^- Total	P_2O_5 Total
Run 1	Inlet	0.4 mg/L	<0.01 mg/ml
	Outlet	0.4 mg/L	<0.15 mg/ml
Run 2	Inlet	0.4 mg/L	<0.01 mg/ml
	Outlet	2.9 mg/L	0.72 mg/ml
Run 3	Inlet	0.4 mg/L	0.00 mg/ml
	Outlet	1.5 mg/L	0.52 mg/ml

Rock Grinding

Summarized results of the particulate emission tests are shown in Tables 7 and 8. Complete results are included in Appendix A-2.

EPA Method No. 5 for particulate emission testing was used in all tests except Run No. 3 of the inlet tests. The particulate loading was so great that the filter was placed after the impingers instead of in front of them.

Particulate emission rates were calculated by using the sample recovered from the following portions of the sample train: 1) acetone rinse of nozzle through front half of filter holder (Front Half); 2) in some cases, a water rinse of the front half; 3) filter; 4) impinger contents plus a water rinse of the back half of the filter holder through the dry impinger that precedes the impinger with the silica gel (Back Half); 5) ether and chloroform extraction of organic matter contained in No. 4 mentioned above; 6) acetone rinse of the back half after the water rinse has been made.

A water rinse of the front half was made, in some cases, after the acetone rinse and brushing was performed. The reason for this was to remove particulate matter that was visible after the acetone rinsing and brushing. This procedure was acceptable to the EPA test officer since it followed the acetone rinse.

The lab results for Run No. 3 - Inlet were corrected for the rearrangement of the sample train. Values obtained from lab analyses for Runs No. 1 and 2 were used to correct the values obtained from Run No. 3.

TABLE - 7

SOURCE EMISSION TEST DATA

TEST NUMBER	-	73-ROC-3
PLANT NAME	-	OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA.
SOURCE TESTED	-	K.V.S. BAG HOUSE INLET (PARTICULATES)
TYPE OF PLANT	-	PHOSPHATE ROCK GRINDING
CONTROL EQUIPMENT	-	BAG COLLECTOR
POLLUTANT SAMPLED	-	PARTICULATES

	1	2	3	*Average
1) RUN NUMBER				
2) DATE	1/11/73	1/11/73	1/12/73	N.A.
3) TIME BEGAN	10:05	16:35	10:10	N.A.
4) TIME END	14:06	20:23	13:02	N.A.
5) T - NET TIME OF TEST, MINUTES	132	132	132	132
6) PB - BAROMETRIC PRESSURE, IN HG	30.0	30.0	30.0	30.0
7) PS - STACK PRESSURE, IN HG	29.3	29.3	29.3	29.3
8) ΔH - GAS MTR ORIFICE PRESS DROP, ''H2O	1.65	1.81	2.30	1.73
9) TM - GAS METER AVG TEMP, DEG F	59.8	62.6	57.7	61.2
10) VC - TOTAL H2O COLLECTED, ML	65.0	78.0	125	71.5
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	3.08	3.70	5.93	3.39
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	89.510	104.200	114.600	96.855
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	91.860	106.399	118.287	99.130
14) W(PCT) - STACK GAS MOISTURE, PCT VOL	3.30	3.40	4.80	3.35
15) TS - AVG STACK GAS TEMPERATURE, DEG F	122	123	124	123
16) CO2 - STACK GAS CO2, PCT VOL	0.00	0.00	0.00	0.00
17) O2 - STACK GAS O2, '' ''	21.0	21.0	21.0	21.0
18) CO - STACK GAS CO, '' ''	0.00	0.00	0.00	0.00
19) N2 - STACK GAS N2, '' ''	79.0	79.0	79.0	79.0
20) EA - STACK GAS EXCESS AIR, PCT VOL	N.A.	N.A.	N.A.	N.A.
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	28.84	28.84	28.84	28.84
22) MS - STACK GAS MOLECULAR WGHT, STK COND	28.49	28.48	28.32	28.49
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.983	0.992	0.977	0.986
24) H - AVG SQUARE ROOT VEL HEAD, '' H2O	0.598	0.589	0.585	0.594
25) AVG SQUARE ROOT (STK TEMP × VEL HEAD)	14.409	14.217	14.143	14.313
26) CP - PITOT TUBE CORRECTION FACTOR	0.830	0.830	0.830	0.830
27) U - STACK GAS VELOCITY, FT/MIN	2120	2090	2090	2105
28) AS - STACK AREA, SQUARE FEET	7.88	7.88	7.88	7.88
29) AS' - EFFECTIVE STACK AREA, SQ FEET	7.88	7.88	7.88	7.88
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	16,700	16,500	16,500	16,600
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	14,400	14,200	14,000	14,300
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.375	0.375	0.375	0.375
33) AN - SAMPLING NOZZLE AREA, SQ FT	0.000767	0.000767	0.000767	0.000767
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT	49.5	58.3	66.1	53.9
35) FEED RATE, TONS/HOUR	121	131	120	126
36) PARTICULATE EMISSIONS; PROBE, CYCLONE, AND FILTER CATCH				
MILLIGRAMS	272,944	244,071	402,087.8	258,507
GRAINS/SCF	45.847	35.395	52.450	40.701
GRAINS/ACF	39.562	30.443	44.347	35.071
LBS/HOUR	5667.34	4306.47	6260.65	4996.72
LBS/TON OF FEED	46.84	32.87	52.17	39.94
37) PARTICULATE EMISSIONS, TOTAL				
MILLIGRAMS	273,057	244,121	402,154	258,589
GRAINS/SCF	45.866	35.402	52.458	40.714
GRAINS/ACF	39.578	30.449	44.381	35.082
LBS/HOUR	5669.71	4307.35	6261.68	4998.34
LBS/TON OF FEED	46.86	32.88	52.18	39.95
38) PARTICULATE EMISSIONS, % IMPINGER CATCH	0.04	0.03	0.02	0.035

* Only Run No. 1 & 2 were used for Average Values.
** Run No. 3 are corrected values resulting from Sample Train Rearrangement.
*** S.T.P. DRY 70°F, 29.92 in. Hg

TABLE - 8

SOURCE EMISSION TEST DATA

TEST NUMBER	-	73-ROC-3
PLANT NAME	-	OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA.
SOURCE TESTED	-	K.V.S. BAG HOUSE OUTLET (PARTICULATES)
TYPE OF PLANT	-	PHOSPHATE ROCK GRINDING
CONTROL EQUIPMENT	-	BAG HOUSE
POLLUTANT SAMPLED	-	PARTICULATES

	1	2	3	Average
1) RUN NUMBER	1/11/73	1/11/73	1/12/73	N.A.
2) DATE	10:00	16:35	10:10	N.A.
3) TIME BEGAN	13:39	20:19	12:59	N.A.
4) TIME END	128	128	128	128
5) T - NET TIME OF TEST, MINUTES	30.0	30.0	30.0	30.0
6) PB - BAROMETRIC PRESSURE, IN HG	30.0	30.0	30.0	30.0
7) PS - STACK PRESSURE, IN HG	0.460	0.630	0.650	0.580
8) ΔH - GAS METR ORIFICE PRESS DROP, ''H2O	47.5	48.6	42.7	46.3
9) TM - GAS METER AVG TEMP, DEG F	67.5	82.0	74.0	74.5
10) VC - TOTAL H2O COLLECTED, ML	3.20	3.89	3.51	3.53
11) VWV - VOL H2O VAPOR COLL., CU FT, STP	49.900	57.390	59.220	55.503
12) VM - VOL DRY GAS SAMPLED, CU FT, MTR COND	52.305	60.057	62.699	58.354
13) VSTPD - VOL DRY GAS SAMPLED, CU FT, STP	5.80	6.10	5.30	5.70
14) W(PCT) - STACK GAS MOISTURE, PCT VOL	115	115	118	116
15) TS - AVG STACK GAS TEMPERATURE, DEG F	0.00	0.00	0.00	0.00
16) CO2 - STACK GAS CO2, PCT VOL	21.0	21.0	21.0	21.0
17) O2 - STACK GAS O2, '' ''	0.00	0.00	0.00	0.00
18) CO - STACK GAS CO, '' ''	79.0	79.0	79.0	79.0
19) N2 - STACK GAS N2, '' ''	N.A.	N.A.	N.A.	N.A.
20) EA - STACK GAS EXCESS AIR, PCT VOL	28.84	28.84	28.84	28.84
21) MD - STACK GAS MOLECULAR WEIGHT, DRY	28.22	28.18	28.27	28.22
22) MS - STACK GAS MOLECULAR WGHT, STK COND	0.973	0.972	0.975	0.973
23) GS - STACK GAS SPECIFIC GRAV, REF AIR	0.444	0.432	0.436	0.437
24) H - AVG SQUARE ROOT VEL HEAD, '' H2O	10.647	10.354	10.491	10.497
25) AVG SQUARE ROOT(STK TEMP×VEL HEAD)	0.830	0.830	0.830	0.830
26) CP - PITOT TUBE CORRECTION FACTOR	1560	1510	1530	1530
27) V - STACK GAS VELOCITY, FT/MIN	9.74	9.74	9.74	9.74
28) AS - STACK AREA, SQUARE FEET	9.74	9.74	9.74	9.74
29) AS' - EFFECTIVE STACK AREA, SQ FEET	15,200	14,700	14,900	14,900
30) QS - STK GAS FLOW RT, CU FT/MIN, STK CND	13,200	12,800	13,000	13,600
31) QSTPD - STK GAS FLOW RATE, CU FT/MIN, STP	0.250	0.250	0.250	0.250
32) DN - SAMPLING NOZZLE DIAMETER, IN	0.000341	0.000341	0.000341	0.000341
33) AN - SAMPLING NOZZLE AREA, SQ FT	88.4	104.6	101	98.0
34) PCT ISO - ISOKINETIC SAMPLING, PERCENT				
35) FEED RATE, TONS/HOUR	121	131	120	124
36) PARTICULATE EMISSIONS; PROBE, CYCLONE, AND FILTER CATCH				
MILLIGRAMS	34.6	45.0	31.7	37.1
GRAINS/SCF	0.0102	0.0115	0.00780	0.00983
GRAINS/ACF	0.00888	0.0100	0.00679	0.00729
LBS/HOUR	1.154	1.270	0.869	1.098
LBS/TON OF FEED	0.00954	0.00969	0.00724	0.00880
37) PARTICULATE EMISSIONS, TOTAL				
MILLIGRAMS	44.7	60.5	40.6	48.6
GRAINS/SCF	0.0132	0.0155	0.00999	0.0129
GRAINS/ACF	0.0114	0.0134	0.00870	0.00953
LBS/HOUR	1.49	1.70	1.11	1.43
LBS/TON OF FEED	0.0123	0.0130	0.00928	0.0115
38) PARTICULATE EMISSIONS, % IMPINGER CATCH	22.8	25.3	21.6	23.2

*** S.T.P. DRY, 70°F, 29.92 in Hg.

The impinger contents plus the water washings, and the organic extractions were the two categories that were corrected. The calculations for these corrections are shown in Appendix A-2.

Grab samples of the stack gases at each sampling site were obtained by an Orsat analyzer, and the concentrations of carbon dioxide, oxygen, and carbon monoxide were determined.

Table 9 contains the results of the laboratory analyses performed on the grab samples from the rock grinding process reactants and products.

TABLE 9

FLUORIDE TRACE METALS, AND MERCURY CONTENT IN
ROCK GRINDING PROCESS REACTANTS AND PRODUCTS

FEED IN		PRODUCT OUT	
Insol F	Total	Insol F	Total F
40.6 mg/gm	40.6 mg/gm	41.0 mg/gm	41.0 mg/gm

NOTE: EMB has not received Hg and Trace Metals results at this time.

PROCESS DESCRIPTION

Rock Drying

Mined phosphate rock is separated from impurities by a flotation process which yields concentrated phosphate rock containing about 15% water. During storage the moisture is further reduced to as low as 10%. Before shipping, the rock is dried to 1.5% to 3% moisture in a fluidized-bed drier.

Natural gas is burned except for about 30 days per year when fuel oil is fired because of gas curtailment. The fuel oil used is a high-sulfur blend of #6 residual and #2 distillate.

Combustion gases along with moisture from the drier flow into a cyclone separator which removes the bulk of the particulates and returns them to the product belt conveyor. The gases then flow to a cyclonic scrubber using once-through fresh water as the scrubbing medium.

The EPA did not furnish any process schematic diagrams of the rock drying operation for this report.

Rock Grinding

Dried phosphate rock is ground into a fine powder in a ball mill. Air is used to convey the ground material out of the mill. Exhaust air containing the mill output flows to a classifier which separates and returns the oversize particles to the mill. The classifier outlet is ducted to a cyclone separator which removes sufficiently ground rock from the air stream and routes it to the storage bins. In order to close the air-flow circuit, conveying air is returned to the mill except for a small bleed portion. To prevent the conveying air from becoming sat-

urated with moisture, this bleed air is vented and replaced with ambient air. The vented stream flows to a bag collector before exiting a stack to the atmosphere.

The EPA did not furnish any process schematic diagrams of the rock grinding operation for this report.

LOCATION OF SAMPLING POINTS

Rock Drying

Sampling points were selected by using the guidelines stated in Method No. 1 of the Federal Register (Vol. 36, No. 59, August 17, 1971, Wash., D.C.). The points selected for the control inlet and outlet are shown in Table 10. Complete field data sheets are included in Appendix B-1.

The work area surrounding the control inlet sampling site was satisfactory, and a minimal amount of difficulty was incurred while sampling.

On the other hand, the work area surrounding the control outlet sampling site was less desirable. The walkway around the stack was only 41 inches wide, and the stack diameter was 119 inches. Since an EPA sampling train was being used (rigid connection between probe outlet and sample box), this situation necessitated the use of two probes of different lengths during each test.

Figures 1 and 2 are schematic diagrams of the sampling sites tested at the rock drying operation.

Rock Grinding

Sampling points were selected by using the guidelines stated in Method 1 of the Federal Register (Vol. 36, No. 59, August 17, 1971, Wash., D.C.). The points selected for the control inlet and outlet are shown in Table 11. Complete field data sheets are included in Appendix B-2.

The work area surrounding the inlet sampling site was such that it was physically impractical, according to the EPA Test Officer, to sample from more than one sampling port.

The work area surrounding the outlet sampling site was adequate for a EPA sampling train, therefore the required two sampling ports were used during each test run.

Figures 3 and 4 are schematic diagrams of the sampling sites tested at the rock grinding operation.

TABLE 10

LOCATION OF SAMPLING POINTS USED AT ROCK DRYER SITES

Traverse Point No.	Distance From Inside Stack Wall, in.	
	Inlet	Outlet
1	5 1/4	Too Close To Wall
2	11 1/4	3 13/16
3	17 1/4	6 9/16
4	23 1/4	9 3/8
5	29 1/4	12 1/2
6	35	15 11/16
7		19 5/32
8		23 3/32
9		27 3/8
10		32 3/8
11		38 7/16
12		47 3/8
13		71 5/8
14		80 9/16
15		86 5/8
16		91 5/8
17		95 7/8
18		99 13/16
19		103 5/16
20		106 1/2
21		109 5/8
22		112 7/16
23		115 3/16
24		Too Close To Wall

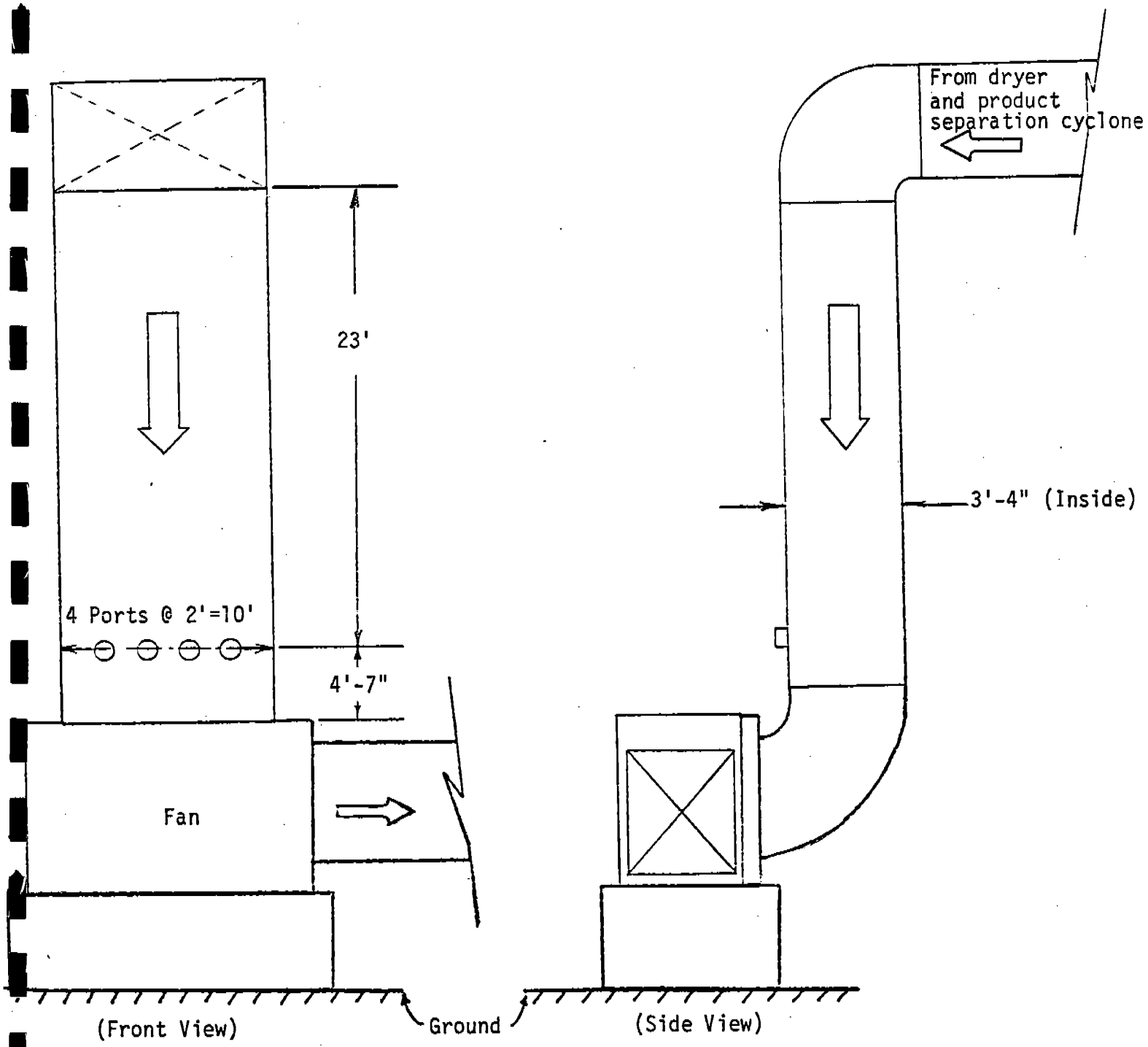


FIGURE 1: INLET TO SCRUBBER FOR ROCK DRYER

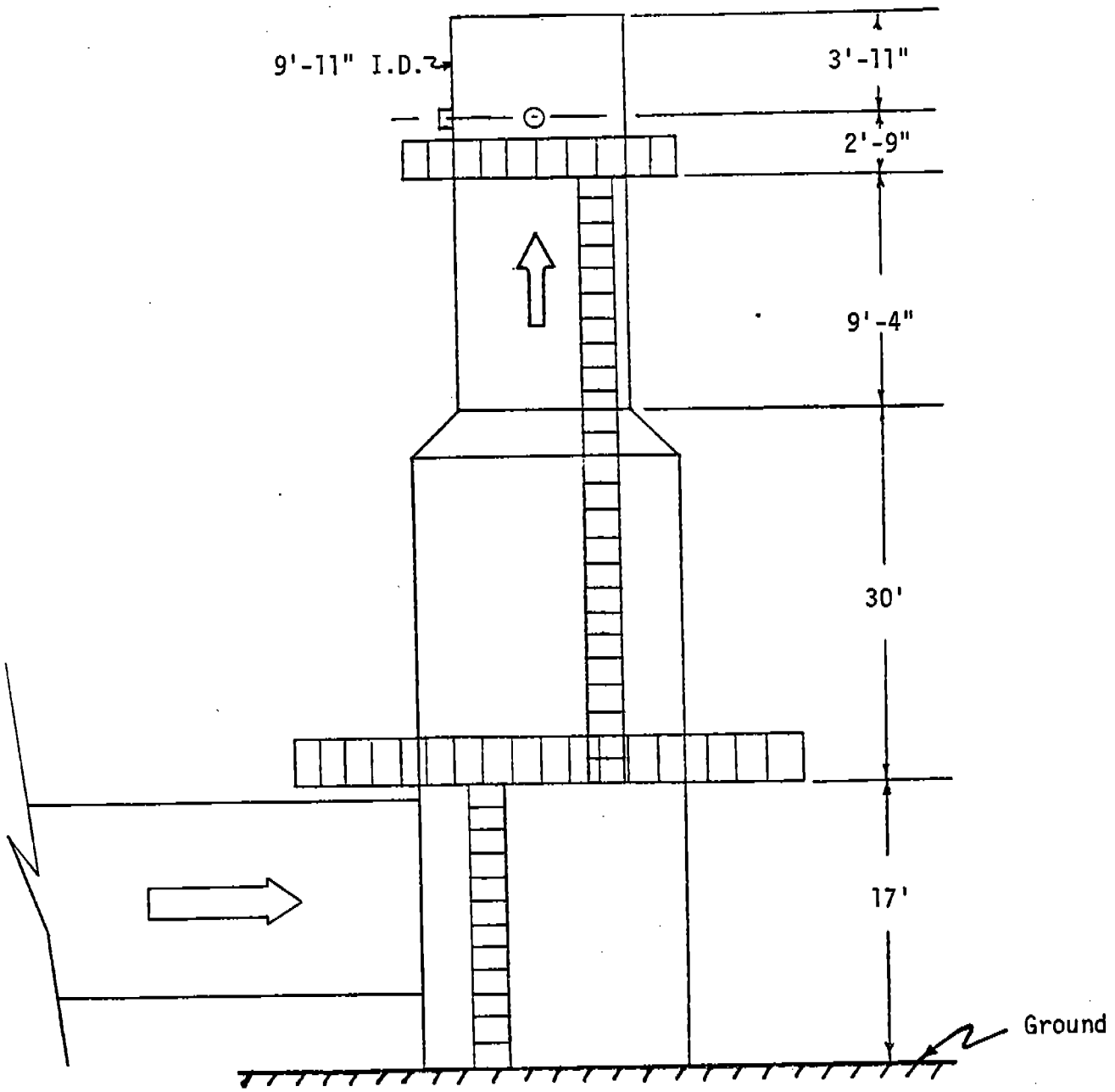


FIGURE 2: OUTLET FROM SCRUBBER FOR ROCK DRYER

TABLE 11

LOCATION OF SAMPLING POINTS USED AT ROCK GRINDING SITES

Traverse Point No.	Distance From Inside Stack Wall, in.	
	Inlet	Outlet
1	Too Close to Wall	Too Close to Wall
2	1 1/4	1 7/8
3	2 1/8	3 1/8
4	3	4 5/8
5	4	6 1/8
6	5	8
7	6 1/8	10
8	7 3/8	12 1/2
9	8 3/4	16 1/8
10	10 3/8	26 1/8
11	12 1/4	29 3/4
12	15 1/8	32 1/4
13	22 7/8	34 3/8
14	25 3/4	36 1/8
15	27 5/8	37 5/8
16	29 1/4	39 1/8
17	30 5/8	40 3/8
18	31	Too Close to Wall
19	33	
20	34	
21	35	
22	35 7/8	
23	36 3/4	
24	Too Close to Wall	

FIGURE 3

INLET TO BAGHOUSE FOR K.V.S. BALL MILL

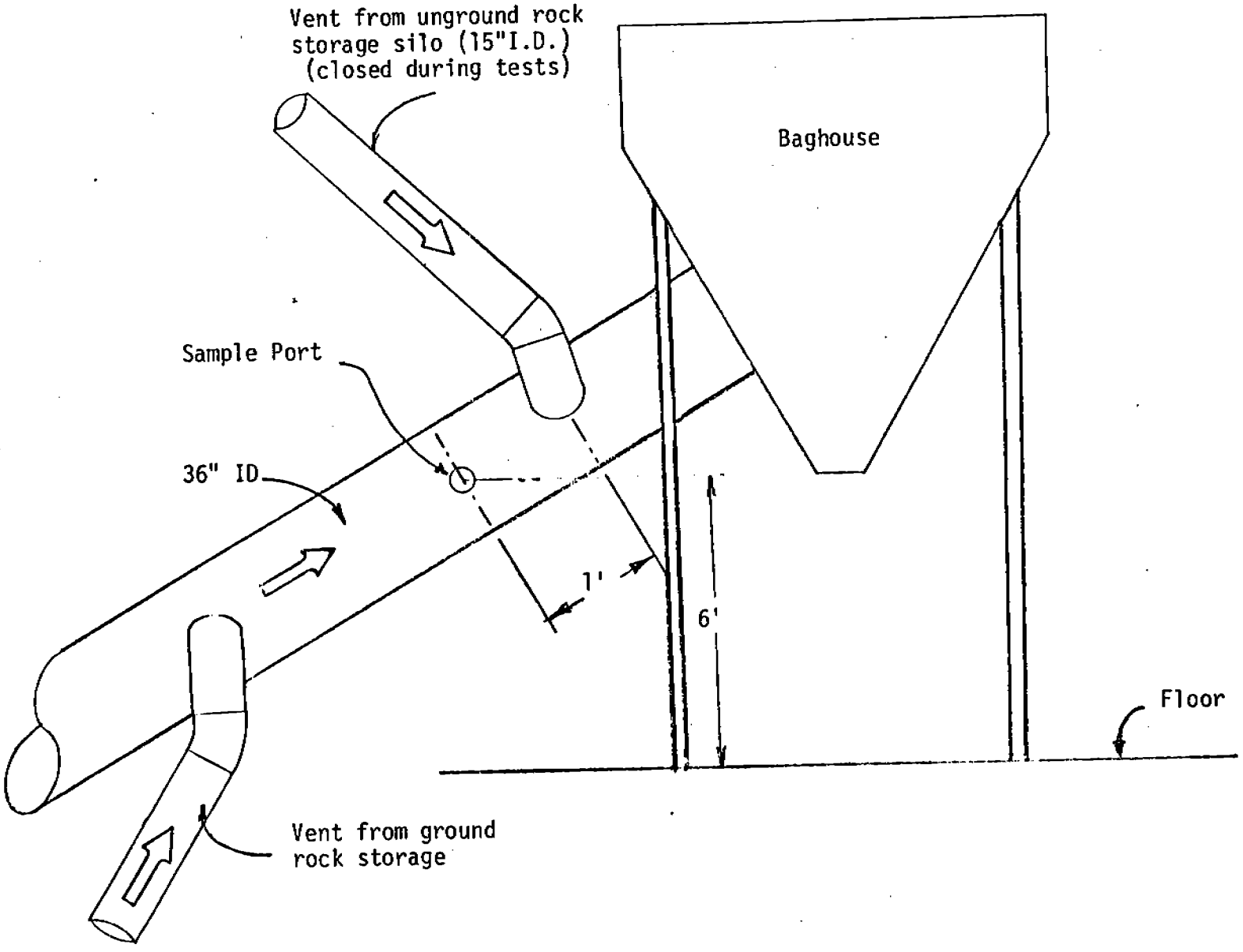
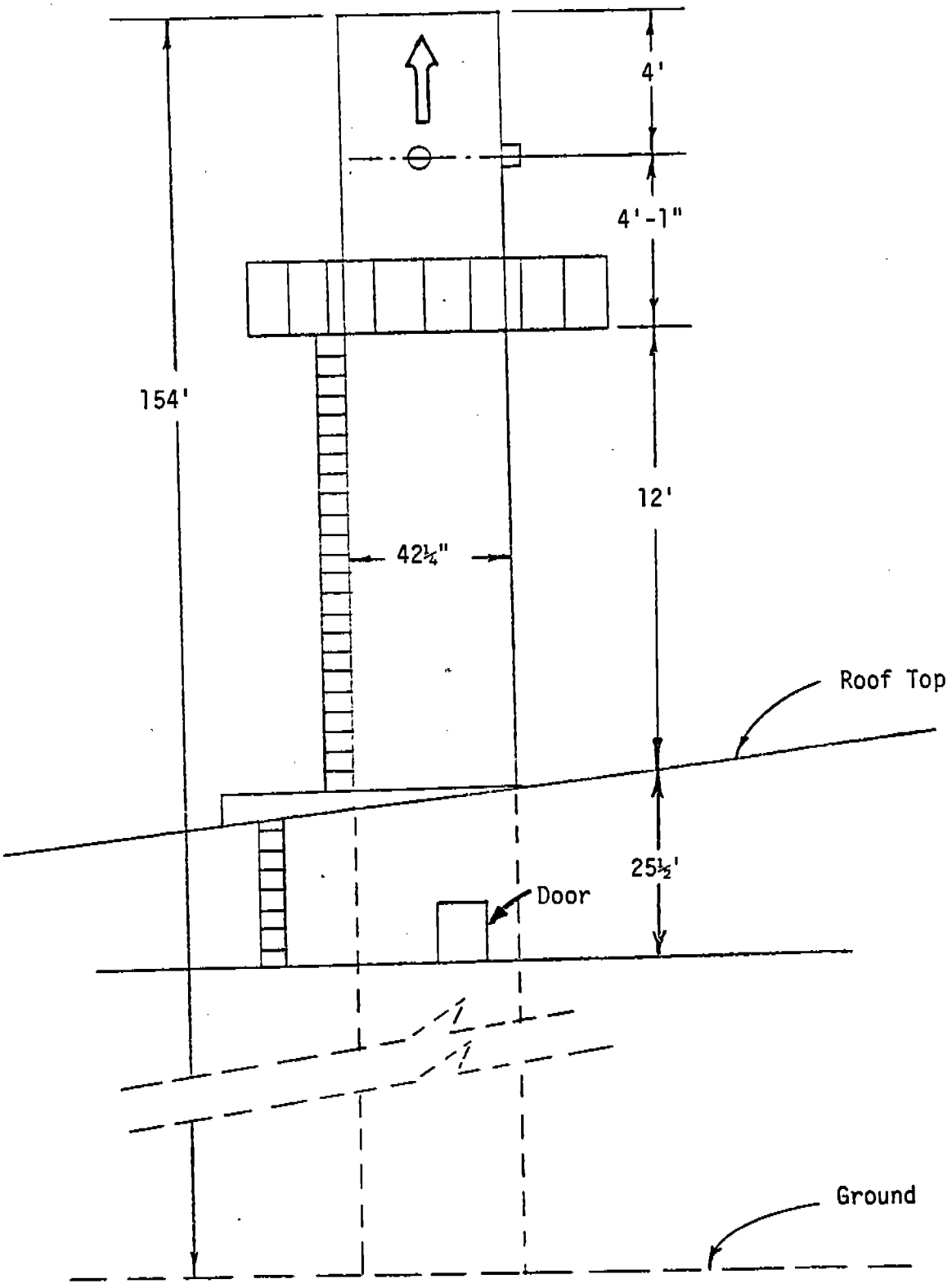


FIGURE 4

OUTLET FROM BAGHOUSE FOR K.V.S. BALL MILL



PROCESS OPERATION DURING TEST

Rock Drying

The first fluoride run was conducted on December 19, 1972, from 2:30 to 5:25 p.m. Process operation was normal for the duration of the run except that fuel oil was burned due to a natural gas curtailment. Conversion of some of the sulfur in the fuel oil to sulfuric acid in the scrubber may explain the low scrubber water outlet pH for this run.

Run #2 was begun at 9:35 a.m. and completed at 12:15 p.m. on December 20. Process operation was normal with no difficulties encountered. Natural gas was burned in place of fuel oil. Production rates were slightly lower than for Run #1 because of the high moisture content of the rock feed. Run #3 was conducted from 2:30 to 5:10 p.m. with no difficulties.

Due to inclement weather, particulate sampling was delayed until December 22, 1973. The first particulate run was conducted from 11:00 a.m. to 2:00 p.m. under normal operating conditions. When weather conditions worsened, it was decided to reschedule the remaining two runs for the week of January 8, 1973.

The second particulate run was conducted on January 9, 1973, from 10:00 a.m. to 1:15 p.m. Process operation was normal except that it was discovered 60 minutes into the test that fuel oil was being burned instead of natural gas; and the fan seemed to be performing below par about half-way through the test.

Particulate run #3 was begun at 3:10 p.m. and completed at 6:00 p.m. on January 9, 1973. Process operation was normal except for the burning of fuel oil and the use of a wetter than normal grade of rock.

Rock Grinding

Run No. 1 was conducted on January 11, 1973, from 10:00 a.m. to 2:18 p.m. Excessive humidity resulted in moisture concentrations of 5 - 6 percent in the air to the baghouse. The plant operator indicated that the moisture content is usually maintained around two percent. Except for the high moisture content of the conveying air, process conditions were normal for the duration of the run.

The remaining two runs were completed under normal process conditions with no difficulties. Run No. 2 was begun at 4:35 p.m. on January 11, 1973, and completed at 8:24 p.m. Run No. 3 was conducted from 10:10 a.m. to 1:00 p.m. on January 12. During Run No. 3 the weather was wet and cold.

SAMPLING AND ANALYTICAL PROCEDURES

Rock Drying

Preliminary stack parameter data such as the number and location of sampling points, stack gas velocities, stack gas molecular weights, and stack gas moisture contents were determined by the EPA Method Nos. 1, 2, 3, and 4, respectively (Federal Register, Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

The stack gas velocity at the control outlet posed a problem of obtaining an accurate velocity head measurement because of the tangential flow within the stack. A standard pitot tube was used to traverse the stack, and it was rotated from side to side to try and locate the direction of flow. No appreciable difference in velocity head could be detected during each rotation; therefore, sampling was conducted by traversing the S-type pitot tube and sampling nozzle in a vertical position during all fluoride and particulate emission tests. After the velocity and gas flow rates were calculated from the emission tests, it was evident that there had been some influence of tangential at the control outlet because of discrepancies in the gas flow rate entering and leaving the control device. The outlet gas flow rates were approximately 38 percent greater than the inlet gas flow rates.

Since there was no evidence of diffusion air being injected into the system following the scrubber, the difference in the inlet and outlet flows was probably attributable to the tangential flow.

Grab samples of the stack gases were collected in plastic bags, and then analyzed for carbon dioxide, oxygen, and carbon monoxide content by an Orsat analyzer. All sampling sites were analyzed while the dryer was burning both natural gas and fuel oil.

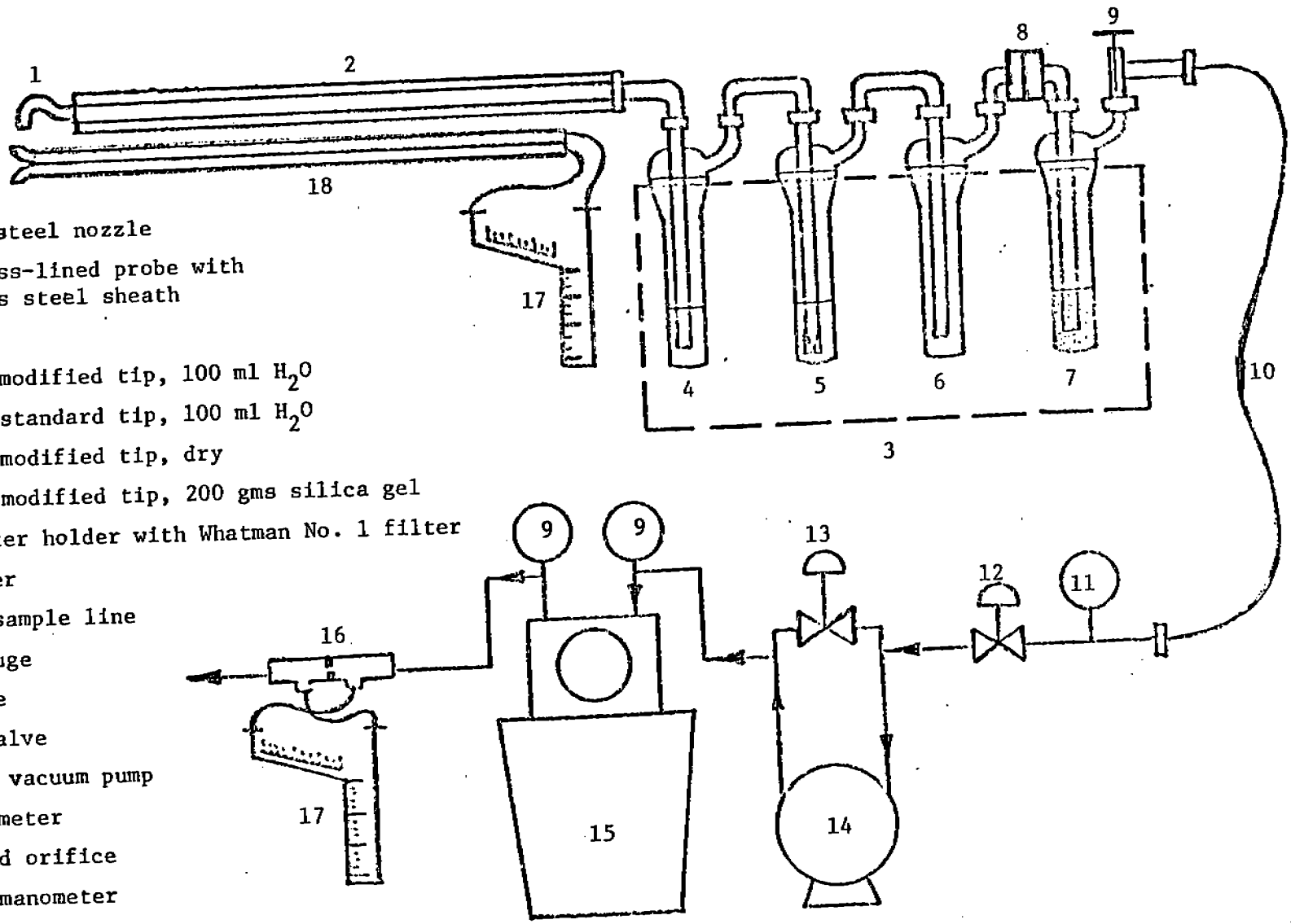
On the day prior to performing the first emission tests, the preliminary moisture test at the control inlet was made while the dryer was burning natural gas. After the first emission tests had been completed, it was learned that the dryer was operating on fuel oil. This resulted in a greater moisture content than had been estimated, which made the isokinetic sampling rate deviate considerably.

Fluoride emissions were determined by a method specified by the EPA project test officer. This method is currently being evaluated by the EPA, and has been temporarily designated as a proposed EPA Method No. 13, "Determination of Total Fluoride Emissions From Stationary Sources."

A schematic diagram of the fluoride sampling train is shown in Figure 5.

A sample train leak check was inadvertently excluded for Run No. 3 of the outlet tests.

The analysis for the one sample taken as the water blank contained a sizeable amount of fluorides. Based upon fluoride analyses of the same water by Environmental Science and Engineering, Inc., the only explanation for the high fluoride content of the blank must be that it was contaminated after it was taken from the water supply at the test site.



1. Stainless steel nozzle
2. Heated glass-lined probe with stainless steel sheath
3. Ice bath
4. Impinger, modified tip, 100 ml H_2O
5. Impinger, standard tip, 100 ml H_2O
6. Impinger, modified tip, dry
7. Impinger, modified tip, 200 gms silica gel
8. Glass filter holder with Whatman No. 1 filter
9. Thermometer
10. Flexible sample line
11. Vacuum Gauge
12. Main valve
13. By-pass valve
14. Air-tight vacuum pump
15. Dry test meter
16. Calibrated orifice
17. Inclined manometer
18. S-type pitot tube

FIGURE 5

PROPOSED EPA METHOD 13 FLUORIDE SAMPLING TRAIN

During each fluoride emission test, grab samples of the process reactants and products, and inlet and outlet scrubbing liquid were taken. The pH and temperature of each scrubbing liquid grab sample was recorded at the test site. Also, several samples of the cooling pond water and rock were collected during the tests.

Particulate emissions were determined by the EPA Method No. 5, described in the Federal Register (Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

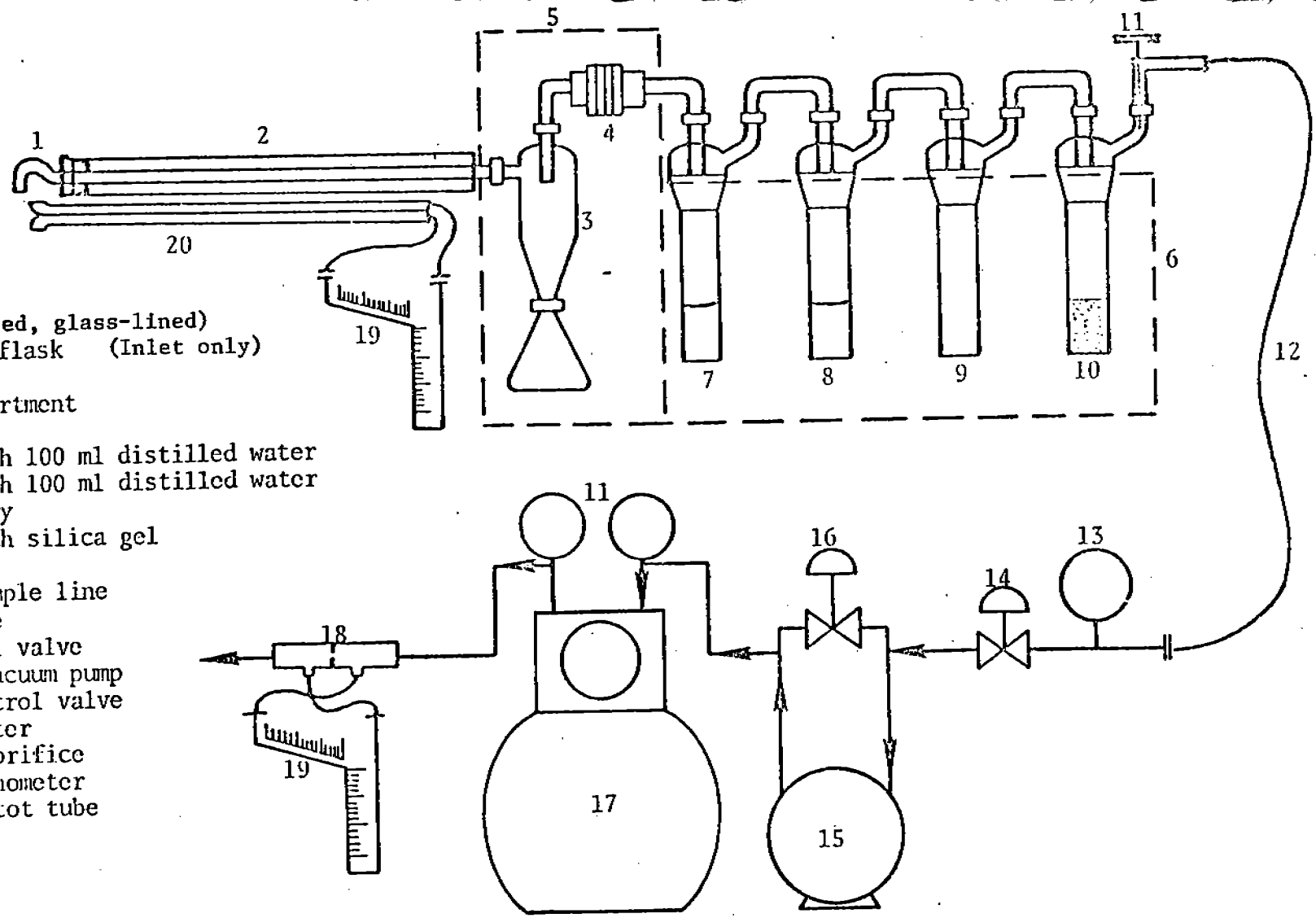
Figure 6 is a schematic diagram of the particulate sampling train used.

Inadvertently, the sample train leak check was excluded for Run No. 3 - Inlet, and Run No. 2 - Outlet. The sample train vacuum gauge reading for these two tests were about the same as the other tests for which leak checks were made.

A water rinse of the particulate train "front half" was made after the acetone rinse, because the EPA project test officer deemed it necessary to remove the water soluble particulate material from the nozzle, probe, and cyclone. This was performed for each run with the exception of Run No. 2 - Inlet and Run No. 3 - Outlet. Only acetone was used on the front half following these two runs.

All samples collected were analyzed by the EPA. Laboratory results for fluorides, particulates, and P_2O_5 are included in Appendix D-1. Results of the trace metals and mercury data can be found in the EPA's Emission Measurement Branch report file No. 73-ROC-3.

Complete sampling procedures are included in Appendix C-1.



1. Nozzle
2. Probe (heated, glass-lined)
3. Cyclone and flask (Inlet only)
4. Filter
5. Heated compartment
6. Ice bath
7. Impinger with 100 ml distilled water
8. Impinger with 100 ml distilled water
9. Impinger, dry
10. Impinger with silica gel
11. Thermometer
12. Flexible sample line
13. Vacuum gauge
14. Main control valve
15. Air tight vacuum pump
16. By-pass control valve
17. Dry test meter
18. Calibrated orifice
19. Inclined manometer
20. "S" type pitot tube

EPA PARTICULATE SAMPLING TRAIN

FIGURE 6

Rock Grinding

Preliminary stack parameter data such as the number and location of sampling points, stack gas velocities, stack gas molecular weights, and stack gas moisture contents were determined by the EPA Method Nos. 1, 2, 3, and 4, respectively (Federal Register, Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

Grab samples of the stack gases were collected in plastic bags and then analyzed for carbon dioxide, oxygen, and carbon monoxide content by an Orsat analyzer. All sampling sites were analyzed prior to any emission tests.

Particulate emissions were determined by the EPA Method No. 5, described in the Federal Register (Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

Figure 6 is a schematic diagram of the sampling train used for all tests except Run No. 3 at the inlet sampling site.

Because of the high particulate load at the inlet sampling site, the nozzle and probe were continually plugging up. As a result, the sample train had to be shut down many times during the first two test runs. At the beginning of Run No. 1, the plugging of the nozzle was so severe that the EPA test officer suggested that we switch to a 3/8-inch nozzle to try and eliminate the problem. As a result of this switch, the isokinetic sampling rate could not be maintained.

Since simultaneous sampling was being conducted at the inlet and outlet, each time the inlet train shut down, the outlet train was also

shut down. As a result of much confusion during the first test run, the outlet train was inadvertently excluded from the leak check for Run No. 2. The sample train vacuum readings for the Run No. 2 - Outlet tests were about the same as the previous tests, which indicates no gross leakage.

Also as a result of the confusion created by the frequent stopping and starting of the sample train for Run No. 1 - Outlet, the isokinetic sampling rate was not maintained.

The sample recovery procedure for Run No. 1 - Inlet was altered somewhat from the EPA Method No. 5. The front half was rinsed with water, following the acetone rinse. The water removed some of the water soluble particulate matter.

The configuration of the sampling train was changed for Run No. 3-Inlet at the request of the EPA test officer. This change resulted in the filter holder being placed just ahead of the last impinger, which contained silica gel. The plugging up of the filter from the excessive particulate emissions was essentially eliminated.

Since the configuration of the sampling train used for Run No. 3-Inlet was changed from the normal EPA Method No. 5 train, the laboratory data had to be corrected for the change. Basically, the laboratory data from the first two tests were used to determine corrected values for the third test. The complete procedure used for calculating the corrected values is included in Appendix A-2.

Grab samples of the rock entering the grinder, and the final rock product leaving the grinder were taken periodically during each test.

All samples collected were analyzed by the EPA. Laboratory results for fluorides and particulates are included in Appendix D-2. Results of the trace metals and mercury data can be found in the EPA's Emission Measurement Branch report file No. 73-ROC-3.

Complete sampling procedures are included in Appendix C-2.

APPENDICES

APPENDIX A-1

COMPLETE FLUORIDE AND PARTICULATE EMISSION CALCULATIONS FOR ROCK DRYING

NOMENCLATURE OF TERMS USED IN SOURCE SAMPLING CALCULATIONS

T - Net time of testing, minutes

PB - Barometric pressure, inches Hg

PS - Stack pressure, inches Hg

ΔH - Average pressure differential at gas meter orifice, inches Hg

PO - Pressure at the gas meter orifice outlet, inches Hg, $PB + \frac{\Delta H}{13.6}$

TM - Average gas meter temperature, °F

VC - Total net increase of moisture collected in the impingers, ml

VWV - Total volume of water vapor collected, cubic feet, S.T.P.

VM - Volume of dry gas sampled, cubic feet, meter conditions

VSTPD - Volume of dry gas sampled, cubic feet, S.T.P.

W(PCT) - Stack gas moisture, % volume

W - Fraction of moisture in stack gas

FDA - Fraction of dry stack gas

TS - Average stack gas temperature

CO_2 - Amount of carbon dioxide in stack gas, % volume

O_2 - Amount of oxygen in stack gas, % volume

CO - Amount of carbon monoxide in stack gas, % volume

N_2 - Amount of nitrogen in stack gas, % volume

EA - Amount of excess air in stack gas, % volume

MD - Stack gas molecular weight, $\frac{\text{lbs}}{\text{lb-mole}}$, dry basis

MS - Stack gas molecular weight, $\frac{\text{lbs}}{\text{lb-mole}}$, stack conditions

GS - Stack gas specific gravity, referred to air

H - Average square root of all velocity head readings, $\sqrt{\text{inches } H_2O}$

CP - Pitot tube correction factor

$\underline{U}$ - Average stack gas velocity, feet per minute

AS - Inside stack area, square feet

AS' - Effective inside stack area, square feet

QS - Average stack gas flow rate, cubic feet per minute, stack conditions

QD - Average stack gas flow rate, cubic feet per minute, dry basis

QSTPD - Average stack gas flow rate, cubic feet per minute, S.T.P.

DN - Inside diameter of the sampling nozzle, inches

AN - Inside area of the sampling nozzle, square feet

PISO - Average percent of theoretical isokinetic sampling rate maintained during test

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S.T.P. - standard conditions, dry, 70°F, 29.92 inches Hg

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/19/72
DRYER SCRUBBER INLET (FLUORIDES) RUN 1 14:22 - 17:21
PP- 29.9 IN HG PS- 29.6 IN HG
IPP CONDITIONS- CLEAR
3.75 SQ. FEET TS- 628.7 DEGREES R TM- 541.7 DEGREES R H- 0.834 IN H2O
35 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VM- 41.16 CF VC- 263 ML
L TIME- 120 MIN NPTS- 24 ORSAT: CO2- 2 O2-17.40 CO- 0 N2-80.60

= (0.0474)×(VC)	1)	12.47 SCF
PD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2)	40.277 SCF
= (VWV) + (VSTPD)	3)	52.748 SCF
= (VWV) ÷ (VT)	4)	0.236
= (1.0 - W)	5)	0.764
MED MOISTURE FRACTION	6)	0.125
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7)	29.02
= (MD×FDA) + (18×W)	8)	26.41
= (MS) ÷ (28.99)	9)	0.91
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10)	NA %
G(√(H×TS)) = (1÷W)×SUM(√(H×TS))	11)	20.000
= (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS))	12)	3180.4 PPM
= (U) × (AS')	13)	107339 LBS/HR
= (QS) × (FDA)	14)	81968 SCFM
PD= (QD) × (530÷TS) × (PS÷29.92)	15)	68365 SCFMD
D = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16)	50.4 %
TP = (15.43×Y) ÷ (VSTPD)	UNITS : GRAINS/SCF	
2 = (12×ESTP) ÷ (%CO2)	UNITS : GRAINS/SCF	
= (ESTP×(100+EA)) ÷ (150)	UNITS : GRAINS/SCF	
= (0.00857)×(ESTP)×(QSTPD)	UNITS : POUNDS/HOUR	

[redacted] LAB ANALYSIS(GM) (Y)	[redacted] CONCENTRATIONS(GR/SCF) (ESTP)		EMISSION RATE (EM) (LBS/HR)
INSOLUBLE F⁻ 0.0199	0.00762 GR/SCF	0.00486 GR/ACF	4.46
SOLUBLE F⁻ 0.0144	0.00552	0.00351	3.22
TOTAL F⁻ 0.0343	0.01314	0.00837	7.68
NSOL. P_2O_5 0.1500			
L. P_2O_5 0.0864			
TAL P_2O_5 0.2364			

COMMENTS : Feed Rate = 235 Tons/hr
For 10 minutes, a 0.375 inch nozzle was used. This
is isokinetic rate reflects the weighted average

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

PL- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/20/72
CK- DRYER SCRUBBER INLET (FLUORIDES) RUN 2 09:53 - 12:13
EMP CONDITIONS- CLEAR AND SUNNY PB- 29.9 IN HG PS- 29.6 IN HG
33.75 SQ. FEET TS- 633 DEGREES R MW- 534.3 DEGREES R H- 0.825 IN H2O
0.48 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VW- 49.64 CF VC- 553.1 ML
AL TIME- 120 MIN NPTS- 24 ORSAT: CO2- 2 O2-17.40 CO- 0 N2-80.60

VV = (0.0474)×(VC)
STPD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)
= (VWV) + (VSTPD)
= (VWV) ÷ (VT)
DA = (1.0 - W)
SUMED MOISTURE FRACTION
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))
S = (MD×FDA) + (18×W)
= (MS) ÷ (28.99)
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))
VG(√(H×TS)) = (1÷N)×SUM(√(H×TS)))
= (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS))
= (U) × (AS')
= (QS) × (FDA)
STPD= (QD) × (530÷TS) × (PS÷29.92)
SO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)
TP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
12 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
0 = (ESTP×(100+EA)) ÷ (150) UNITS : POUNDS/HOUR
= (0.00857)×(ESTP)×(QSTPD)

1)	29.22 SCF
2)	49.263 SCF
3)	75.49 SCF
4)	0.347
5)	0.653
6)	0.24
7)	22.02
8)	25.19
9)	0.87
10)	NA %
11)	20.756
12)	3232.7 EPV
13)	109106 ACFM
14)	71209 QSTD
15)	58985 QSTDM
16)	122.3%

LAB ANALYSIS(GM) (Y)	CONCENTRATIONS(GR/SCF) (ESTP)		EMISSION RATE (EM) (LBS/HR)
INSOLUBLE F⁻ 0.0367	0.0122 GR/SCF	0.00659 GR/ACF	6.17
SOLUBLE F⁻ 0.0015	0.00047	0.000254	0.36
TOTAL F⁻ 0.0404	0.01267	0.006844	6.43
INSOL. P_2O_5 0.3400			
SOL. P_2O_5 0.0074			
TOTAL P_2O_5 0.3474			

COMMENTS : Feed Rate = 280 Tons/hr

TEST CONDUCTED BY :

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/20/72
- DRYER SCRUBBER INLET (FLUORIDES) RUN 3 14:45 - 17:05
HER CONDITIONS- CLEAR AND SUNNY PB- 29.9 IN HG PS- 29.6 IN HG
33.75 SQ. FEET TS- 631.1 DEGREES R TM- 545.5 DEGREES R H- 0.817 IN H2O
.41 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VM- 48.18 CF VC- 459.7 ML
AL TIME- 120 MIN NPTS- 24 ORSAT: CO2- 2 O2-17.40 CO- 0 N2-80.60

$V = (0.0474)\times(VC)$ — 1) 21.79 SCF
$QSTPD = ((530)\times(VM)\times(PB+(\Delta H \div 13.6))) \div (29.92\times TM)$ — 2) 46.823 SCF
$= (VWV) + (VSTPD)$ — 3) 68.613 SCF
$= (VWV) \div (VT)$ — 4) 0.318
$= (1.0 - W)$ — 5) 0.682
DRY MOLE FRACTION — 6) 0.30
$= (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$ — 7) 29.02
$= (MD\times FDA) + (18\times W)$ — 8) 25.52
$= (MS) \div (28.99)$ — 9) 0.88
$= (100)\times(O2-0.5\times CO)\div((0.266\times N2)-(O2-0.5\times CO))$ — 10) NA %
$AVG(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)}) \times AVG(\sqrt{(H\times TS)})$ — 11) 20.521
$= (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)}))$ 3175.5 — 12) ~~3175.5~~ SCFM
$= (U) \times (AS')$ 107174 — 13) ~~107174~~ ACFM
$QD = (QS) \times (FDA)$ 73139 — 14) ~~73139~~ SCFD
$QSTPD = (QD) \times (530\div TS) \times (PS\div 29.92)$ 60767 — 15) ~~60767~~ SCFM
$ESO = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM)) \div (TIME\times U\times PS\times AN)$ — 16) ~~111.6~~ 112.9
$ESTP = (15.43\times Y) \div (VSTPD)$ UNITS : GRAINS/SCF
$E12 = (12\times ESTP) \div (\%CO2)$ UNITS : GRAINS/SCF
$EA = (ESTP\times(100+EA)) \div (150)$ UNITS : GRAINS/SCF
$EM = (0.00857)\times(ESTP)\times(QSTPD)$ UNITS : POUNDS/HOUR

~~PARTICULATE~~ LAB ANALYSIS(GM) (Y)	~~PARTICULATE~~ CONCENTRATIONS(GR/SCF) (ESTP)	(E12)	(EA)	EMISSION RATE (EM) (LBS/HR.)
INSOLUBLE F^- 0.0348	0.011463 GR/SCF	0.00650 GR/ACF		5.99
SOLUBLE F^- 0.0013	0.000428	0.00024		0.21
TOTAL F^- 0.0361	0.011896	0.00674		6.20
INSOL. P_2O_5 0.2875				
SOL. P_2O_5 0.0042				
TOTAL P_2O_5 0.2917				

COMMENTS : Feed Rate = 285 Tons/Hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/19/72
Y- ROCK DRYER SCRUBBER OUTLET (FLUORIDES) RUN 1 14:20 - 17:18
ER CONDITIONS- CLEAR PB- 29.9 IN HG PS- 29.9 IN HG
7.24 SQ. FEET TS- 614 DEGREES R TM- 537.5 DEGREES R H- 0.507 IN H2O.
0.62 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VW- 59.486 CF VC- 423 ML
L TIME- 132 MIN NPTS- 44 ORSAT: CO2- 2 O2-17.50 CO- 0 N2-80.50

$V = (0.0474)\times(VC)$ 1) 22.05 SCF
$QD = ((530)\times(VM)\times(PB+(\Delta H\div 13.6)))\div(29.92\times TM)$ 2) 52.822 SCF
$= (VWV) + (VSTPD)$ 3) 72.782 SCF
$= (VWV) \div (VT)$ 4) 0.255
$= (1.0 - W)$ 5) 0.745
MED MOISTURE FRACTION 6) 329
$= (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$ 7) 28.02
$= (MD\times FDA) + (18\times W)$ 8) 25.21
$= (MS) \div (28.99)$ 9) 0.9
$= (100)\times(O2-0.5\times CO)\div((0.266\times N2)-(O2-0.5\times CO))$ 10) NA %
$G(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)})$ 11) 12.567
$= (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)})$ 1909.0 12) 1909.0 FPM
147454 13) 140245 ACFM
$= (V) \times (AS')$ 109908 14) 106245 QSTD
$= (QS) \times (FDA)$ 94808 15) 90000 SCFM
$PD = (QD) \times (530\div TS) \times (PS\div 29.92)$ 16) 106.1 %
$O = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM)) \div (TIME\times V\times PS\times AN)$
$TP = (15.43\times Y) \div (VSTPD)$ UNITS : GRAINS/SCF
$2 = (12\times ESTP) \div (\%CO2)$ UNITS : GRAINS/SCF
$= (ESTP\times(100+EA)) \div (150)$ UNITS : GRAINS/SCF
$= (0.00857)\times(ESTP)\times(QSTPD)$ UNITS : POUNDS/HOUR

~~PARAMETERS~~	LAB ANALYSIS(GM) (Y)	~~PARAMETERS~~ CONCENTRATIONS(GR/SCF) (ESTP)	(EA)	EMISSION RATE (EM) (LBS/HR.
INSOLUBLE F^-	0.00006	0.000016 GR/SCF	0.00001 GR/ACF	0.013 (0.009)
SOLUBLE F^-	0.0012	0.000315	0.000203	0.260 (0.188)
TOTAL F^-	0.00126	0.000331	0.000213	0.273 (0.197)
INSOL. P_2O_5	0.00006			
SOL. P_2O_5	0.00240			
TOTAL P_2O_5	0.00246			

COMMENTS : Emission rates based upon a scrubber inlet gas flow of 68,365 SCFMD are shown in parentheses.
Feed Rate = 285 Tons/Hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

F- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/20/72
CK- ROCK DRYER SCRUBBER OUTLET (FLUORIDES) RUN 2 9:30 - 12:18
ER CONDITIONS- CLEAR PP- 29.9 IN HG PS- 29.9 IN HG
77.24 SQ. FEET TS- 614.4 DEGREES R TM- 536.8 DEGREES R H- 0.445 IN H2O
0.49 IN H2O AN- 0.000341 SQ. FEET CP- 0.88 VM- 51.441 CF VC- 393.5 ML
L TIME- 132 MIN NPTS- 44 ORSAT: CO2- 2 O2-17.50 CO- 0 N2-80.50

$WV = (0.0474)\times(VC)$

$VSTPD = ((530)\times(VM)\times(PB+(\Delta H \div 13.6)))\div(29.92\times TM)$

$VT = (VWV) + (VSTPD)$

$W = (VWV) \div (VT)$

$FDA = (1.0 - W)$

ASSUMED MOISTURE FRACTION

$MD = (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$

$MS = (MD\times FDA) + (18\times W)$

$AS = (MS) \div (28.99)$

$\%EA = (100)\times(O2-0.5\times CO)\div((0.266\times N2)-(O2-0.5\times CO))$

$AVG(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)})$

$QS = (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)})$

$Q = (U)\times(AS')$

$QD = (QS)\times(FDA)$

$QSTPD = (QD)\times(530\div TS)\times(PS\div 29.92)$

$ESTP = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM))\div(TIME\times U\times PS\times AN)$

$\%CO2 = (15.43\times Y)\div(VSTPD)$ UNITS : GRAINS/SCF

$ESTP = (12\times ESTP)\div(\%CO2)$ UNITS : GRAINS/SCF

$E12 = (12\times ESTP)\div(100+EA)\div(150)$ UNITS : GRAINS/SCF

$E50 = (ESTP\times(100+EA))\div(150)$ UNITS : POUNDS/HOUR

$EM = (0.00857)\times(ESTP)\times(QSTPD)$

1)	18.552	SCF	
2)	50.818	SCF	
3)	50.455	SCF	
4)	0.259		
5)	0.732		
6)	0.28		
7)	29.22		
8)	26.06		
9)	0.9		
10)	NA	%	
11)	11.033		
12)	1680.9	EEM	
13)	129833	ACEM	
14)	94978	CEMD	
15)	81876	ECEMD	
16)	105.5%		

LAB ANALYSIS (GM) (%)	PARTICULATE CONCENTRATIONS (GR/SCF) (ESTP)	(ESTP)	EMISSION RATE (EM) (LBS/HR)
INSOLUBLE F 0.0006	0.000182 GR/SCF	0.00011 GR/ACF	0.126 (0.091)
SOLUBLE F 0.0005	0.000152	0.0000958	0.106 (0.076)
TOTAL F 0.0011	0.000334	0.0002055	0.232 (0.167)
INSOL. P_2O_5 0.0003			
SOL. P_2O_5 0.0023			
TOTAL P_2O_5 0.0026			

COMMENTS : Emission rates based upon a scrubber inlet flow of 58,985 SCFM as given in acrobat sheet. Fess Rate = 2.90 Tons/Hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/20/72
- ROCK DRYER SCRUBBER OUTLET (FLUORIDES) RUN 3 14:40 - 17:13
ER CONDITIONS- CLEAR PR- 29.9 IN HG PS- 29.9 IN HG
7.24 SQ. FEET TS- 614.7 DEGREES R TM- 542.9 DEGREES R DH- 0.48 IN H2O
0.56 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VM- 56.373 CF VC- 424.9 ML
L TIME- 132 MIN NPTS- 44 ORSAT: CO2- 2 O2-17.50 CO- 0 N2-80.50

= (0.0474)×(VC)	1) 20.14	SCF
= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2) 55.069	SCF
= (VWV) + (VSTPD)	3) 75.209	SCF
= (VWV) ÷ (VT)	4) 0.268	
= (1.0 - W)	5) 0.732	
ED MOISTURE FRACTION	6) 0.27	
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7) 29.02	
= (MD×FDA) + (18×W)	8) 28.07	
= (MS) ÷ (28.99)	9) 0.0	
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10) NA	%
(√(H×TS)) = (1÷N)×SUM(√(H×TS)) ×AVG(√(H×TS))	11) 11.205	
= (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS))	12) 1813.5	FPM
= (U) × (AS')	13) 140072	ACFM
= (QS) × (FDA)	14) 102561	QSTD
D= (QD) × (530÷TS) × (PS÷29.92)	15) 83377	QSTD
= ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16) 106.9%	

TP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
2 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
= (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF
= (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR

~~PARTICULATE~~ LAB ANALYSIS(GM) (Y)	~~PARTICULATE~~ CONCENTRATIONS(GR/SCF) (ESTP)	(EA)	EMISSION RATE (EM) (LBS/HR)
INSOLUBLE F 0.0004	0.000113 GR/SCF	0.0000706 GR/SCF	0.035 (0.057)
SOLUBLE F 0.0004	0.000113	0.0000706	0.085 (0.057)
TOTAL F 0.0008	0.000224	0.0001412	0.170 (0.114)
INSOL. P_2O_5 0.0044			
SOL. P_2O_5 0.0021			
TOTAL P_2O_5 0.0065			

COMMENTS : Emission rates based upon a scrubber inlet flow of 60,767 SCFM D as shown in parentheses
Feed Rate = 285 Tons/Hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

T- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/22/72
SY- DRYER SCRUBBER INLET (PARTICULATES) RUN 1 FROM 9:25-11:53
ER CONDITIONS- CLOUDY PB- 29.9 IN HG PS- 29.5 IN HG
33.75 SQ. FEET TS- 632.3 DEGREES R TM- 533.6 DEGREES R H- 0.827 IN H2O
0.3 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VM- 40.18 CF VC- 42.8 ML
TIME- 120 MIN NPTS- 24 ORSAT: CO2- 2 O2-17.40 CO- 0 N2-80.60

1)	29.29	SCF
2)	29.211	SCF
3)	29.340	SCF
4)	0.922	
5)	0.852	
6)	0.22	
7)	29.99	
8)	25.9	
9)	15.37	
10)	NA	%
11)	29.999	
12)	3991.4	FPM
13)	199950	ACFM
14)	72949	CFMD
15)	53917	SCFMD
16)	97.5	%

V = (0.0474)×(VC)
PD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)
= (VWV) + (VSTPD)
= (VWV) ÷ (VT)
A = (1.0 - W)
UMED MOISTURE FRACTION
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))
= (MD×FDA) + (18×W)
= (MS) ÷ (28.99)
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))
VG(√(H×TS)) = (1÷W)×SUM(√(H×TS)))
= (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS))
= (U) × (AS')
D = (QS) × (FDA)
STPD= (QD) × (530÷TS) × (PS÷29.92)
SO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)
STP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
12 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
D = (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF
= (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR

PARTICULATE LAB ANALYSIS(GM)	(Y)	PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)	(ESTP)	EMISSION RATE (EM) (LBS/HR)
Front Half (Cyclone H_2O Wash)	0.0822	0.0318 GR/SCF	0.2713 GR/ACF	16.32
Front Half (Acetone)	1.0541	0.4075		209.26
ter	0.1426	0.0551		28.31
Plus H_2O Wash	0.0189	0.0073	—	3.75
t. Back Half (Acetone)	0.0065	0.0025		1.29
ic Extraction	0.0137	0.0053		2.72
tal	1.3180	0.5095	0.2796	261.65

COMMENTS : Feed Rate = 280 tons/hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/9/73
DRYER SCRUBBER INLET (PARTICULATES) RUN 2 PRO" 10:00-13:12
WEATHER CONDITIONS- CLEAR PB- 29.9 I" HG PS- 29.8 I" HG
33.75 SQ. FEET TS- 625 DEGREES R TM- 503.8 DEGREES R H- 0.826 I" H2O
0.39 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VM- 43.59 CF VC- 212 ML
L TIME- 120 MIN NPTS- 24 ORSAT: CO2- 4.20 O2-15.00 CO- 0 N2-80.80

V = (0.0474)×(VC)	1) 10.05	SCF
VSTPD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2) 45.862	SCF
= (VWV) + (VSTPD)	3) 55.912	SCF
= (VWV) ÷ (VT)	4) 0.18	
= (1.0 - W)	5) 0.82	
MED MOISTURE FRACTION	6) 0.25	
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7) 29.27	
= (MD×FDA) + (18×W)	8) 27.25	
= (MS) ÷ (28.99)	9) 0.94	
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10) NA	%
G(√(H×TS)) = (1÷N)×SUM(√(H×TS))	11) 20.648	
= (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS))	12) 3282.5	FPM
= (U) × (AS')	13) 104378	ACFM
= (QS) × (FDA)	14) 85816	CFMD
QPD= (QD) × (530÷TS) × (PS÷29.92)	15) 71826	SCFMD
D = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16) 83.6	%
P = (15.43×Y) ÷ (VSTPD)	UNITS : GRAINS/SCF	
2 = (12×ESTP) ÷ (%CO2)	UNITS : GRAINS/SCF	
= (ESTP×(100+EA)) ÷ (150)	UNITS : GRAINS/SCF	
= (0.00857)×(ESTP)×(QSTPD)	UNITS : POUNDS/HOUR	

PARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)		[redacted]		EMISSION RATE (EM) (LBS/HR)
Front Half (Acetone)	0.4155	0.1398	GR/SCF	0.1134	GR/ACF	86.04
	0.0747	0.0251				15.47
Plus H_2O Wash	0.0584	0.0196		—		12.09
Back Half (Acetone)	0.0050	0.0017				1.04
nic Extraction	0.0016	0.0005				0.33
al	0.5552	0.1867		0.1284		114.97

COMMENTS : Feed Rate = 215 tons/hr

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

P- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/9/73
DRYER SCRUBBER INLET (PARTICULATES) RUN 3 FROM 15:10-17:55
ER CONDITIONS- CLEAR PB- 29.9 IN HG PS- 29.9 IN HG
33.75 SQ. FEET TS- 627.5 DEGREES R TM- 511 DEGREES R H- 0.841 IN H2O
0.45 IN H2O AN- 0.000192 SQ. FEET CP- 0.83 VM- 46.5 CF VC- 400 ML
TIME- 120 MIN NPTS- 24 ORSAT: CO2- 4.20 O2-15.00 CO- 0 N2-80.80

1)	12.24	SCF
2)	49.245	SCF
3)	67.505	SCF
4)	0.286	
5)	0.714	
6)	0.18	
7)	29.37	
8)	26.05	
9)	0.9	
10)	NA	%
11)	21.058	
12)	3205.7	FPM
13)	100868	ACFM
14)	77716	CFM
15)	64838	SCFM
16)	100.9	%

/ = (0.0474)×(VC)
PD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)
= (VWV) + (VSTPD)
= (VWV) ÷ (VT)
= (1.0 - W)
MED MOISTURE FRACTION
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))
= (MD×FDA) + (18×W)
= (MS) ÷ (28.99)
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))
G(√(H×TS)) = (1÷N)×SUM(√(H×TS))
= (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS))
= (U) × (AS')
= (QS) × (FDA)
PD= (QD) × (530÷TS) × (PS÷29.92)
D = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)
TP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
2 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
= (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF
= (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR

TICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)		[redacted]		EMISSION RATE (EM) (LBS/HR)
. Front Half (H_2O)	0.0895	0.0286	GR/SCF	0.2552	GR/ACF	15.93
Front Half (Acetone)	1.1352	0.3631				202.05
cer	0.1130	0.0361				20.11
Plus H_2O Wash	0.0749	0.0240				13.33
t. Back Half (Acetone)	0.0023	0.0007		—		0.41
nic Extraction	0.0050	0.0016				0.89
tal	1.4199	0.4541		0.2709		252.72

COMMENTS : Feed Rate = 235 Tons/hr

ST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 12/22/72
- DRYER SCRUBBER OUTLET (PARTICULATES) RUN 1 FROM 9:30-12:23
P CONDITIONS- BAR PB- 29.92 IN HG PS- 29.92 IN HG
7.24 SQ. FEET TC- 610 DEGREES R TM- 520.4 DEGREES R H- 0.44 IN H2O
0.5 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VM- 50.304 CF VC- 421 ML
- STVR- 132 MIN NPTS- 44 ORSAT: CO2- 2 O2-17.50 CO- 0 N2-80.50

= (0.0474)×(VC)	1)	20.82 SCF
PD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2)	50.512 SCF
= (VWV) + (VSTPD)	3)	70.942 SCF
= (VWV) ÷ (VT)	4)	0.293
= (1.0 - W)	5)	0.712
MED MOISTURE FRACTION	6)	0.29
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7)	29.02
= (MD×FDA) + (18×W)	8)	25.85
= (MS) ÷ (28.99)	9)	0.9
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10)	NA %
÷(√(H×TS)) = (1÷N)×SUM(√(H×TS))	11)	10.000
= (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS))	12)	1687.3 RPM
= (U) × (AS')	13)	120000 ACFM
= (QS) × (FDA)	14)	91185 CFMD
QPD= (QD) × (530÷TS) × (PS÷29.92)	15)	78122 SCFM
= ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16)	102.4 %
= (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF		
2 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF		
= (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF		
= (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR		

PARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)			EMISSION RATE (EM) (LBS/HR)
Front Half (H_2O)	0.0150	0.0046	GR/SCF		3.11 (2.35)
Front Half (Acetone)	0.1823	0.0557		0.0417 GR/ACF	37.79 (28.59)
	0.0233	0.0071			4.83 (3.65)
Plus H_2O Wash	0.0086	0.0026			1.78 (1.35)
Back Half (Acetone)	0.0063	0.0019		—	1.31 (0.99)
Ac Extraction	0.0041	0.0013			0.85 (0.64)
al	0.2396	0.0732		0.0453	49.67 (37.57)

MMENTS : Feed Rate = 280 tons/hr. Emission rates based upon a scrubber inlet flow of 59,917 SCFMD are shown in parentheses

T CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/9/73
- DRYER SCRUBBER OUTLET (PARTICULATES) RUN 2 FROM 10:00-12:12
WEB CONDITIONS- CLEAR PB- 29.9 IN HG PS- 29.9 IN HG
7.24 SQ. FEET TS- 603.9 DEGREES R TM- 502.4 DEGREES R H- 0.527 IN H2O
.71 IN H2O AH- 0.000341 SQ. FEET CP- 0.83 VM- 59.05 CF VC- 385.5 ML
L TIME- 138 MIN NPTS- 46 ORSAT: CO2- 3.70 O2-15.50 CO- 0 N2-80.80

1)	17.22	SCF
2)	62.21	SCF
3)	80.625	SCF
4)	0.215	
5)	0.785	
6)	0.26	
7)	29.21	
8)	25.8	
9)	0.88	
10)	NA	%
11)	12.99	
12)	1047.8	FPM
13)	150448	ACFM
14)	113108	CFMD
15)	102508	SCFMD
16)	~~60.6~~ 60.3	%

V = (0.0474)×(VC)
PD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)
= (VWV) + (VSTPD)
= (VWV) ÷ (VT)
A = (1.0 - W)
MED MOISTURE FRACTION
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))
= (MD×FDA) + (18×W)
= (MS) ÷ (28.99)
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))
G(√(H×TS)) = (1÷N)×SUM(√(H×TS))
= (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS))
= (U) × (AS')
= (QS) × (FDA)
STPD= (QD) × (530÷TS) × (PS÷29.92)
O = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)
P = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
12 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
= (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF
= (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR

ARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)			EMISSION RATE (EM) (LBS/HR)
Front Half (H_2O)	0.0093	0.0023	GR/SCF	0.0127 GR/ACF	2.01 (1.40)
Front Half (Acetone)	0.0312	0.0076			6.75 (4.68)
ter	0.0351	0.0086			7.59 (5.27)
Plus H_2O Wash	0.0473	0.0115		—	10.23 (7.10)
t. Back Half (Acetone)	0.0044	0.0011			0.95 (0.66)
anic Extraction	0.0018	0.0004			0.39 (0.27)
tal	0.1291	0.0315		0.0217	27.92 (19.38)

COMMENTS : Feed Rate = 215 tons/hr. Emission rates based upon a scrubber inlet gas flow rate of 71,526 SCFMD are shown in parentheses.

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/9/73
DRYER SCRUBBER OUTLET (PARTICULATES) RUN 3 FROM 15:10-17:22
BER CONDITIONS- CLEAR PB- 29.9 IN HG PS- 29.9 IN HG
7.24 SQ. FEET TS- 608.9 DEGREES R TM- 507.4 DEGREES R H- 0.446 IN H2O
0.52 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VM- 48.71 CF VC- 353 ML
L TIME- 132 MIN NPTS- 44 ORSAT: CO2- 3.70 O2-15.50 CO- 0 N2-80.80

$V = (0.0474)\times(VC)$	1) 16.72	SCF
$VSTPD = ((530)\times(VM)\times(PB+(\Delta H\div 13.6)))\div(29.92\times TM)$	2) 50.909	SCF
$VWV = (VWV) + (VSTPD)$	3) 67.64	SCF
$W = (VWV) \div (VT)$	4) 0.247	
$S = (1.0 - W)$	5) 0.753	
MED MOISTURE FRACTION	6) 0.26	
$MD = (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$	7) 29.21	
$MS = (MD\times FDA) + (18\times W)$	8) 26.44	
$MS = (MS) \div (28.99)$	9) 0.91	
$EA = (100)\times(O2-0.5\times CO)\div((0.266\times N2)-(O2-0.5\times CO))$	10) NA	%
$AVG(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)})$	11) 11.021	
$QSTD = (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)})$	12) 1564.3	FPM
$QS = (U)\times(AS')$	13) 129550	ACFM
$QSTPD = (QD)\times(530\div TS)\times(PS\div 29.92)$	14) 95750	CFMD
$ESTP = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM))\div(TIME\times U\times PS\times AN)$	15) 84162	SCFMD
$Y = (15.43\times Y)\div(VSTPD)$ UNITS : GRAINS/SCF	16) 100.5	%
$2 = (12\times ESTP)\div(\%CO2)$ UNITS : GRAINS/SCF		
$= (ESTP\times(100+EA))\div(150)$ UNITS : GRAINS/SCF		
$= (0.00857)\times(ESTP)\times(QSTPD)$ UNITS : POUNDS/HOUR		

PARTICULATE LAB ANALYSIS (GM) (Y)		PARTICULATE CONCENTRATIONS (GR/SCF) (ESTP)		EMISSION RATE (EM) (LBS/HR)
Front Half (Acetone)	0.0407	0.0123	0.00907 GR/ACF	8.90 (6.87)
	0.0050	0.0015		1.09 (0.84)
Plus H_2O Wash	*	*		*
Back Half (Acetone)	0.0020	0.0006	—	0.44 (0.34)
anic Extraction	*	*		*
tal	—	—	—	—

mple bottle broke during shipment.

COMMENTS : Feed Rate = 235 tons/hr. Emission rates based upon a scrubber inlet gas flow rate of 64,938 SCFMD are shown in parentheses.

TEST CONDUCTED BY : _____

environmental engineering, inc.

APPENDIX A-2

COMPLETE PARTICULATE EMISSION CALCULATIONS FOR ROCK GRINDING

NOMENCLATURE OF TERMS USED IN SOURCE SAMPLING CALCULATIONS

T - Net time of testing, minutes

PB - Barometric pressure, inches Hg

PS - Stack pressure, inches Hg

ΔH - Average pressure differential at gas meter orifice, inches Hg

PO - Pressure at the gas meter orifice outlet, inches Hg, $PB + \frac{\Delta H}{13.6}$

TM - Average gas meter temperature, °F

VC - Total net increase of moisture collected in the impingers, ml

VWV - Total volume of water vapor collected, cubic feet, S.T.P.

VM - Volume of dry gas sampled, cubic feet, meter conditions

VSTPD - Volume of dry gas sampled, cubic feet, S.T.P.

W(PCT) - Stack gas moisture, % volume

W - Fraction of moisture in stack gas

FDA - Fraction of dry stack gas

TS - Average stack gas temperature

CO_2 - Amount of carbon dioxide in stack gas, % volume

O_2 - Amount of oxygen in stack gas, % volume

CO - Amount of carbon monoxide in stack gas, % volume

N_2 - Amount of nitrogen in stack gas, % volume

EA - Amount of excess air in stack gas, % volume

MD - Stack gas molecular weight, $\frac{\text{lbs}}{\text{lb-mole}}$, dry basis

MS - Stack gas molecular weight, $\frac{\text{lbs}}{\text{lb-mole}}$, stack conditions

GS - Stack gas specific gravity, referred to air

H - Average square root of all velocity head readings, $\sqrt{\text{inches } H_2O}$

CP - Pitot tube correction factor

$\underline{U}$ - Average stack gas velocity, feet per minute

AS - Inside stack area, square feet

AS' - Effective inside stack area, square feet

QS - Average stack gas flow rate, cubic feet per minute, stack conditions

QD - Average stack gas flow rate, cubic feet per minute, dry basis

QSTPD - Average stack gas flow rate, cubic feet per minute, S.T.P.

DN - Inside diameter of the sampling nozzle, inches

AN - Inside area of the sampling nozzle, square feet

PISO - Average percent of theoretical isokinetic sampling rate maintained during test

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S.T.P. - standard conditions, dry, 70°F, 29.92 inches Hg

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/11/73
RUN 1 10:05 - 14:06
CK- K.V.S. BAGHOUSE INLET (PARTICULATES)
PB- 30 IN HG PS- 29.3 IN HG
HER CONDITIONS- CLEAR TM- 519.8 DEGREES R H- 0.598 IN H2O
7.88 SQ. FEET TS- 581.5 DEGREES R CP- 0.83 VM- 89.510 CF VC- 65 ML
1.65 IN H2O AN- 0.000767 SQ. FEET ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79
AL TIME- 132 MIN NPTS- 22

1)	3.081	SCF
2)	91.940	SCF
3)	94.941	SCF
4)	0.033	
5)	0.967	
6)	6	
7)	28.84	
8)	28.49	
9)	0.08	
10)	NA	%
11)	14.409	
12)	~~21.1~~	EPM
13)	~~16705~~	ACFM
14)	~~16162~~	CFMD
15)	~~14424~~	SCFMD
16)	~~49.5~~ 49.5	%

WV = (0.0474)×(VC)
TPD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)
= (VWV) + (VSTPD)
= (VWV) ÷ (VT)
DA = (1.0 - W)
SUMED MOISTURE FRACTION
= (.44×CO2) + (.32×O2) + (.28×(CO+N2))
D = (MD×FDA) + (18×W)
S = (MS) ÷ (28.99)
= (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))
VG(√(H×TS)) = (1÷N)×SUM(√(H×TS)) 2121.1
= (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS)) 16705
= (U) × (AS') 16162
D = (QS) × (FDA) 14424
STPD= (QD) × (530÷TS) × (PS÷29.92)
ISO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)
STP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF
C12 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF
50 = (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF
M = (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR

PARTICULATE LAB ANALYSIS (GM) (Y)		PARTICULATE CONCENTRATIONS (GR/ACF) (ESTP) (GR/SCF)		EMISSION RATE (EM) (LBS/HR)
t. Front Half (H_2O)	2.9239	0.4911	45.8471 GR/SCF	39.5617 GR/ACF	60.71
t. Front Half (Acetone)	269.9498	45.3443			5605.17
	0.0699	0.0117			1.45
ther					
. Plus H_2O Wash	0.0129	0.0022	—		0.27
t. Back Half (Acetone)	0.0995	0.0167			2.07
onic Extraction	0.0014	0.0002			0.03
tal	273.0574	45.8662	39.5782 GR/ACF		5669.71

COMMENTS : ¼" nozzle used during first 6 min of sampling then ⅜" nozzle used during remainder of test. Since the first sample with the ⅜" nozzle was less than 5% of total time tested, the composite percent sampling rate was not a weighted average for both ¼ & ⅜, but only the ⅜".

TEST CONDUCTED BY :

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

[redacted] OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/11/73
[redacted]K- K.V.S. BAGHOUSE INLET (PARTICULATES) RUN 2 16:35 - 20:23
[redacted]ER CONDITIONS- CLEAR PB- 30 IN HG PS- 29.3 IN HG
[redacted]7.88 SQ. FEET TS- 582.8 DEGREES R TM- 522.6 DEGREES R P- 0.589 IN H2O
1.81 IN H2O AN- 0.000767 SQ. FEET CP- 0.83 VM- 104.17 CF VC- 78 ML
[redacted]L TIME- 132 MIN NPTS- 22 ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79

[redacted]V = (0.0474)×(VC)	1)	3.7 SCF
[redacted]MSTPD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2)	106.399 SCF
[redacted] = (VWV) + (VSTPD)	3)	110.096 SCF
[redacted] = (VWV) ÷ (VT)	4)	0.034
[redacted]A = (1.0 - W)	5)	0.966
[redacted]SUMED MOISTURE FRACTION	6)	6
[redacted] = (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7)	28.24
[redacted] = (MD×FDA) + (18×W)	8)	28.48
[redacted] = (MS) ÷ (28.99)	9)	0.98
[redacted] = (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10)	NA %
[redacted]VG(√(H×TS)) = (1÷N)×SUM(√(H×TS))	11)	14.217
[redacted] = (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS))	12)	2093.3 FPM
[redacted]S = (U) × (AS')	13)	16495 ACFM
[redacted]D = (QS) × (FDA)	14)	15940 CFMD
[redacted]STPD= (QD) × (530÷TS) × (PS÷29.92)	15)	14197 SCFMD
[redacted]IO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16)	58.3 %
[redacted]STP = (15.43×Y) ÷ (VSTPD)	UNITS : GRAINS/SCF	
[redacted]12 = (12×ESTP) ÷ (%CO2)	UNITS : GRAINS/SCF	
[redacted]S = (ESTP×(100+EA)) ÷ (150)	UNITS : GRAINS/SCF	
[redacted]R = (0.00857)×(ESTP)×(QSTPD)	UNITS : POUNDS/HOUR	

[redacted]RTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS([redacted]) (ESTP)		[redacted]	EMISSION RATE (EM) (LBS/HR)
[redacted]t. Front Half (Acetone)	242.7333	35.2012	35.3951 GR/SCF	30.4430 GR/ACF	4282.87
[redacted]er	1.3373	0.1939			23.60
[redacted] Plus H2O Wash	0.0142	0.0021			0.25
[redacted]t. Back Half (Acetone)	0.0352	0.0051		-	0.62
[redacted]anic Extraction	0.0007	0.0001			0.01
[redacted]tal	244.1207	35.4024		30.4492 GR/ACF	4307.35

COMMENTS : _____

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/11/73
CK- K.V.S. BAGHOUSE INLET (PARTICULATES) RUN 3 10:10 - 13:02
ER CONDITIONS- CLEAR PB- 30 IN HG PS- 29.3 IN HG
7.88 SQ. FEET TS- 583.9 DEGREES R TM- 517.7 DEGREES R H- 0.585 IN H20
2.3 IN H20 AN- 0.000767 SQ. FEET CP- 0.83 VW- 114.59 CF VC- 125 ML
TIME- 132 MIN NPTS- 22 ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79

$VV = (0.0474)\times(VC)$

$QSTPD = ((530)\times(VM)\times(PB+(\Delta H \div 13.6))) \div (29.92\times TM)$

$= (VWV) + (VSTPD)$

$= (VWV) \div (VT)$

$= (1.0 - W)$

UMED MOISTURE FRACTION

$= (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$

$= (MD\times FDA) + (18\times W)$

$= (MS) \div (28.99)$

$= (100)\times(O2-0.5\times CO) \div ((0.266\times N2)-(O2-0.5\times CO))$

$AVG(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)})$

$= (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)})$

$= (U) \times (AS')$

$QD = (QS) \times (FDA)$

$QSTPD = (QD) \times (530\div TS) \times (PS\div 29.92)$

$ISO = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM)) \div (TIME\times U\times PS\times AN)$

$ESTP = (15.43\times Y) \div (VSTPD)$ UNITS : GRAINS/SCF

$E12 = (12\times ESTP) \div (\%CO2)$ UNITS : GRAINS/SCF

$E50 = (ESTP\times(100+EA)) \div (150)$ UNITS : POUNDS/HOUR

$= (0.00857)\times(ESTP)\times(QSTPD)$

1)	5.22 SCF
2)	118.287 SCF
3)	124.212 SCF
4)	0.982
5)	0.952
6)	5
7)	28.84
8)	28.22
9)	0.98
10)	NA %
11)	14.142
12)	~~2087.9~~ PEW
13)	~~16455~~ ACFM
14)	~~15669~~ CFMD
15)	~~13928~~ SCFMD
16)	~~66.1~~ 66.1 %

PARTICULATE LAB ANALYSIS(GM) (Y)	PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)	(GR/SCF)	EMISSION RATE (EM) (LBS/HR)
Pt. Front Half (Acetone) 392.3997	51.1868 GR/SCF	–	6109.80
Filter 0.5008	0.0653	–	7.80
Imp. Plus H_2O Wash 8.2755	1.0795	–	128.85
Pt. Back Half (Acetone) 0.0338	0.0044	–	0.53
Organic Extraction 0.9438	0.1231	–	14.70
Total 402.1536	52.4591	44.3819 GR/ACF	6261.68

COMMENTS : Sample train was rearranged such that filter was after impingers.
See next page for additional emission calculations due to sample train rearrangement.

TEST CONDUCTED BY : _____

environmental engineering, inc.

Corrected Emission Calculations for Run No. 3-Inlet

	Run No. 1	Run No. 2	Ave.
Vol. Sampled @ S.T.P.	91.543 ft^3	106.399 ft^3	98.971 ft^3
Lab Analysis			
Impingers + H_2O Rinse	0.0255 $\frac{mg}{ml}$	0.0287 $\frac{mg}{ml}$	0.0271 $\frac{mg}{ml}$
Back Half (Acetone)	1.0474 $\frac{mg}{ml}$	0.1853 $\frac{mg}{ml}$	0.6164 $\frac{mg}{ml}$
Organic Ext. of Back Half	0.0028 $\frac{mg}{ml}$	0.0041 $\frac{mg}{ml}$	0.0035 $\frac{mg}{ml}$

Using the above average values, Run No. 3-Inlet was corrected as follows:

Recovered Sample And Volume	Uncorrected Lab Analysis (mg)	Corrected Lab Analysis (mg)	Corrected Emissions ($\frac{grains}{SCF}$)	($\frac{Lbs}{Hr}$)
Front Half (1075 ml)	392,399.7	401,587.0	52.385	6252.85
Filter	500.8	500.8	0.065	7.80
Impinger H_2O (960 ml)	8,275.5	30.7	0.004	0.48
Back Half (290 ml)	33.8	33.8	0.004	0.53
Organic Ext. (320 ml)	943.8	1.3	0.0002	0.02
TOTAL	402,153.6	402,153.6	52.4582	6261.68

Corrected Emissions (Continued)

Impinger H_2O Correction Factor $= (0.0271 \frac{mg}{ml}) \times (\frac{118.287 ft^3}{98.971 ft^3})$

" " " " $= 0.032$ mg/ml

No correction for "Back Half" acetone rinse.

Organic Extraction Corr. Factor $= (0.0035 \frac{mg}{ml}) \times (\frac{118.287}{98.971})$

" " " " $= 0.004$ mg/ml

Assuming that the process would have been the same; and the filter as efficient during Run No. 3 as they were for Run Nos. 1 & 2, then the following calculations would apply:

Imp. H_2O : $(0.032 \frac{mg}{ml}) \times (960 ml) = 30.7$ mg

Back Half: No correction factor, thus = 33.8 mg

Organic Ext: $(0.004 \frac{mg}{ml}) \times (320 ml) = 1.3$ mg

Front Half And Filter : No correction factor, thus = 392,900.5 mg

TOTAL : 392,966.3 mg

Corrected Emissions (Continued)

The difference between the corrected and uncorrected data is the following:

$$\begin{array}{r} 402,153.6 \text{ mg} \\ -392,966.3 \text{ mg} \\ \hline 9,187.3 \text{ mg} \end{array}$$

Assuming that the amount of 9,187.3 mg can be classified as very fine suspended insoluble particulate matter, then it can be classified as filterable matter. For the calculations in the previous table, this amount was classified as "Front Half" particulate matter.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

PLANT- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/11/73
STACK- K.V.S. BAGHOUSE OUTLET (PARTICULATES) RUN 1 10:00 - 13:39
WEATHER CONDITIONS- CLEAR PP- 30 IN HG PS- 30 IN HG
AS'- 9.74 SQ. FEET TS- 574.6 DEGREES R TM- 507.5 DEGREES R H- 0.444 IN H2O
DH- 0.46 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VM- 49.9 CF VC- 67.5 ML
TOTAL TIME- 128 MIN NPTS- 32 ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79

VWV = (0.0474)×(VC)		1) 3.2	SCF
VSTPD= ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)		2) 52.305	SCF
VT = (VWV) + (VSTPD)		3) 55.505	SCF
W = (VWV) ÷ (VT)		4) 0.058	
FDA = (1.0 - W)		5) 0.942	
6) ASSUMED MOISTURE FRACTION		6) 5	
MD = (.44×CO2) + (.32×O2) + (.28×(CO+N2))		7) 28.84	
MS = (MD×FDA) + (18×W)		8) 28.22	
9) GS = (MS) ÷ (28.99)		9) 0.97	
EA = (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))		10) NA	%
AVG(√(H×TS)) = (1÷N)×SUM(√(H×TS))		11) 10.647	
12) V = (174×CP×(√(29.92÷PS×GS))×AVG(√(H×TS)))	1556.5	12) ~~1556.5~~	FPM
QS = (U) × (AS')	15154	13) ~~15154~~	ACFM
QD = (QS) × (FDA)	14281	14) ~~14281~~	CFM
QSTPD= (QD) × (530÷TS) × (PS÷29.92)	13207	15) ~~13207~~	SCFM
16) PISO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)		16) ~~87.3~~ 88.4	%
ESTP = (15.43×Y) ÷ (VSTPD)	UNITS : GRAINS/SCF		
C12 = (12×ESTP) ÷ (%CO2)	UNITS : GRAINS/SCF		
19) E50 = (ESTP×(100+EA)) ÷ (150)	UNITS : GRAINS/SCF		
EM = (0.00857)×(ESTP)×(QSTPD)	UNITS : POUNDS/HOUR		

PARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(~~GR/SCF~~) (ESTP)	(DSE)	(~~GR/ACF~~) (ESE)	EMISSION RATE (EM) (LBS/HR
Ft. Front Half (Acetone)	0.0210	0.0062	0.0102 Gr/SCF	0.0089 Gr/ACF	0.70
Filter	0.0136	0.0040			0.45
Imp. Plus H_2O Wash	0.0066	0.0019			0.22
Ft. Back Half (Acetone)	0.0035	0.0010			0.12
Organic Extraction	0.0000	0.0000			
Total	0.0447	0.0131		0.0114 Gr/ACF	1.49

COMMENTS : _____

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

PLANT- OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/11/73
STACK- K.V.S. BAGHOUSE OUTLET (PARTICULATES) RUN 2 16:35 - 20:19
WEATHER CONDITIONS- CLEAR PB- 30 IN HG PS- 30 IN HG
AS- 9.74 SQ. FEET TS- 575 DEGREES R TM- 508.6 DEGREES R H- 0.432 IN H2O
DH- 0.63 IN H2O AN- 0.000341 SQ. FEET CP- 0.83 VM- 57.39 CF VC- 82 ML
TOTAL TIME- 128 MIN NPTS- 32 ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79

VWV = (0.0474)×(VC)	1) 3.89	SCF
VSTPD = ((530)×(VM)×(PB+(ΔH÷13.6)))÷(29.92×TM)	2) 60.057	SCF
VT = (VWV) + (VSTPD)	3) 63.944	SCF
W = (VWV) ÷ (VT)	4) 0.061	
WFDA = (1.0 - W)	5) 0.939	
ASSUMED MOISTURE FRACTION	6) 5	
MD = (.44×CO2) + (.32×O2) + (.28×(CO+N2))	7) 28.84	
MS = (MD×FDA) + (18×W)	8) 28.18	
GS = (MS) ÷ (28.99)	9) 0.97	
EA = (100)×(O2-0.5×CO)÷((0.266×N2)-(O2-0.5×CO))	10) NA	%
AVG(√(H×TS)) = (1÷N)×SUM(√(H×TS))	11) 10.354	
U = (174×CP×(√(29.92÷PS×GS)))×AVG(√(H×TS)) 1514.4	12) ~~1430.8~~	FPS
QS = (U) × (AS') 14751	13) ~~14096~~	ACFM
QD = (QS) × (FDA) 13854	14) ~~13099~~	CFMD
QSTPD = (QD) × (530÷TS) × (PS÷29.92) 12304	15) ~~12050~~	SCFM
PISO = ((0.00267×VC×TS)+(PO×TS×VM÷TM)) ÷ (TIME×U×PS×AN)	16) ~~102.4~~ 104.6	%
ESTP = (15.43×Y) ÷ (VSTPD) UNITS : GRAINS/SCF		
ES12 = (12×ESTP) ÷ (%CO2) UNITS : GRAINS/SCF		
ES50 = (ESTP×(100+EA)) ÷ (150) UNITS : GRAINS/SCF		
EM = (0.00857)×(ESTP)×(QSTPD) UNITS : POUNDS/HOUR		

PARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(~~GR/SCF~~) (ESTP)	(~~ES12~~)	(~~ES50~~)	EMISSION RATE (EM) (LBS/HR
Front Half (Acetone)	0.0273	0.0070	0.0115 Gr/SCF	0.0100 Gr/ACF	0.77
Filter	0.0177	0.0045			0.50
Imp. Plus HCl Wash	0.0074	0.0019	—		0.21
Front Back Half (Acetone)	0.0062	0.0016			0.17
Organic Extraction	0.0019	0.0005			0.05
Total	0.0605	0.0155		0.0134 Gr/ACF	1.70

COMMENTS : _____

TEST CONDUCTED BY : _____

environmental engineering, inc.

ENVIRONMENTAL ENGINEERING, INCORPORATED
SOURCE SAMPLING CALCULATIONS

OCCIDENTAL CHEMICAL CO. WHITE SPRINGS, FLA. DATE- 1/12/73
K- K.V.S. BAGHOUSE OUTLET (PARTICULATES) RUN 3 10:10 - 12:59
ER CONDITIONS- RAIN PP- 30 IN HG PS- 30 IN HG
9.74 SQ. FEET TS- 578 DEGREES R TM- 502.7 DEGREES R H- 0.436 IN H2O
0.65 IN H2O AN- 0.000341 SQ. FEET CP- 0.85 VM- 59.22 CF VC- 74 ML
TIME- 128 MIN NPTS- 32 ORSAT: CO2- 0 O2-21.00 CO- 0 N2- 79

$V = (0.0474)\times(VC)$ 1) 3.51 SCF
$PD = ((530)\times(VM)\times(PB+(\Delta H\div 13.6)))\div(29.92\times TM)$ 2) 62.609 SCF
$= (VWV) + (VSTPD)$ 3) 66.207 SCF
$= (VWV) \div (VT)$ 4) 0.053
$= (1.0 - W)$ 5) 0.947
UMED MOISTURE FRACTION 6) 2
$= (.44\times CO2) + (.32\times O2) + (.28\times(CO+N2))$ 7) 28.84
$= (MD\times FDA) + (18\times W)$ 8) 28.27
$= (MS) \div (28.99)$ 9) 0.98
$= (100)\times(O2-0.5\times CO)\div((0.266\times N2)-(O2-0.5\times CO))$ 10) NA %
$VG(\sqrt{(H\times TS)}) = (1\div N)\times SUM(\sqrt{(H\times TS)})\times AVG(\sqrt{(H\times TS)})$ 11) 10.491
$= (174\times CP\times(\sqrt{(29.92\div PS\times GS)})\times AVG(\sqrt{(H\times TS)})$ 1532.2 12) ~~1560.8~~ FPM
$= (U) \times (AS')$ 14924 13) ~~1.05~~ ACFM
$D = (QS) \times (FDA)$ 14132 14) ~~1.0004~~ CFMD
$PD = (QD)\times(530\div TS)\times(PS\div 29.92)$ 12993 15) ~~1.51~~ SCFMD
$SO = ((0.00267\times VC\times TS)+(PO\times TS\times VM\div TM))\div(TIME\times U\times PS\times AN)$ 16) ~~1.06~~ 107.7 %
$STP = (15.43\times Y)\div(VSTPD)$ UNITS : GRAINS/SCF
$12 = (12\times ESTP)\div(\%CO2)$ UNITS : GRAINS/SCF
$0 = (ESTP\times(100+EA))\div(150)$ UNITS : GRAINS/SCF
$= (0.00857)\times(ESTP)\times(QSTPD)$ UNITS : POUNDS/HOUR

PARTICULATE LAB ANALYSIS(GM) (Y)		PARTICULATE CONCENTRATIONS(GR/SCF) (ESTP)	(GR2)	(ESO)	EMISSION RATE (EM) (LBS/HR)
+ Front Half (Acetone)	0.0139	0.0034	0.0078 Gr/SCF	0.0068 Gr/ACF	0.38
ter	0.0178	0.0044			0.49
. Plus H_2O Wash	0.0056	0.0014		—	0.15
t. Back Half (Acetone)	0.0021	0.0005			0.06
anic Extraction	0.0012	0.0003			0.03
tal	0.0406	0.0100		0.0087 Gr/ACF	1.11

COMMENTS : _____

TEST CONDUCTED BY : _____

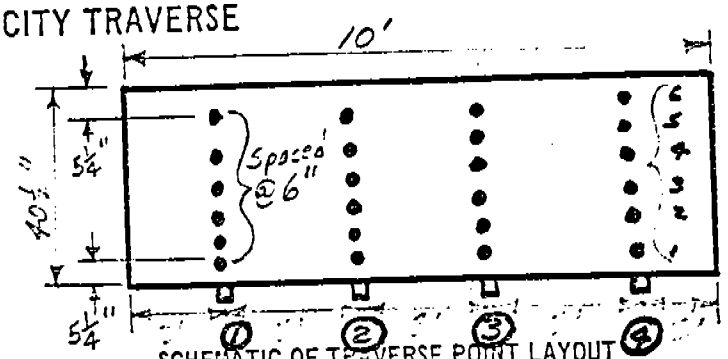
environmental engineering, inc.

APPENDIX B-1

FIELD DATA SHEETS FOR ROCK DRYING TESTS

PRELIMINARY VELOCITY TRAVERSE

PLANT Occidental Chem. Co.
DATE Dec. 18, 1972
LOCATION Rock Dryer Scrubber Inlet
STACK I.D. 120" X 40.5"
BAROMETRIC PRESSURE, in. Hg 30
STACK GAUGE PRESSURE, in. H_2O -4
OPERATORS J. Doller, S. Heck



SCHEMATIC OF TRAVERSE POINT LAYOUT (TOP VIEW)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port #1		
Pt. 1	0.74	166
2	0.74	
3	0.77	
4	0.73	
5	0.74	
6	0.70	
Port #2		
Pt. 1	0.65	166
2	0.66	
3	0.70	
4	0.65	
5	0.62	
6	0.60	
Port #3		
Pt. 1	0.56	166
2	0.58	
3	0.56	
4	0.54	
5	0.54	
6	0.50	
AVERAGE		

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port #4		
Pt. 1	0.45	166
2	0.46	
3	0.45	
4	0.49	
5	0.46	
6	0.41	
AVERAGE		

TRAVERSE POINT LOCATION FOR ~~CIRCULAR~~ RECTANGULAR DUCTS

PLANT Occidental Chem. Co.
DATE Dec. 18, 1972
SAMPLING LOCATION Rock Dryer Scrubber Inlet
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE. (DISTANCE A) 44"
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE. (DISTANCE B) 3½"
STACK [redacted] 120" X 40½"
NEAREST UPSTREAM DISTURBANCE 23'
NEAREST DOWNSTREAM DISTURBANCE 4½'
CALCULATOR J. Dollar

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
Port 4, Pt. 1			5¼	3½	
2			11¼		
3			17¼		
4			23¼		
5			29¼		
6			35¼		
Port 3, Pt. 1			5¼		
2			11¼		
3			17¼		
4			23¼		
5			29¼		
6			35¼		
Port 2, Pt. 1			5¼		
2			11¼		
3			17¼		
4			23¼		
5			29¼		
6			35¼		
Port 1, Pt. 1			5¼		
2			11¼		
3			17¼		
4			23¼		
5			29¼		
6			35¼		

PRELIMINARY MOISTURE CHECK

PLANT Occidental Chem Co.

STACK Rock Dryer Scrubber Inlet

DATE Dec. 18, 1972 SAMPLE TIME 1520 - 1550

METHOD 1

Dry Bulb Temp. 166 °F, Wet Bulb Temp. ____ °F, Dew Point Temp. ____ °F.

Vapor Pressure of H_2O @ DP ____ "Hg. Stack Pressure ____ "Hg.

Moisture Fraction ____, Dry Air Fraction ____ "Hg.

METHOD 2

Final Dry Test Meter Reading 101.55 Ft^3

Initial Dry Test Meter Reading 95.50 Ft^3

Dry Test Meter Volume Sampled 6.05 Ft^3

Average Meter Temp 74 °F

Average Orifice ΔH 0.04 "H_2O

Barometric Pressure @ Orifice Meter 30 "Hg

Dry Gas Volume Sampled @ STP 6.02 Ft^3

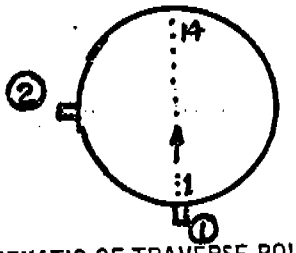
Volume of Condensate 14 ml

Water Vapor Volume @ STP 0.664 Ft^3

Moisture Fraction 0.124, Dry Air Fraction 0.876.

PRELIMINARY VELOCITY TRAVERSE

PLANT Occidental Chem. Co.
DATE Dec. 18, 1972
LOCATION Rock Dryer Scrubber Outlet
STACK I.D. 119 in.
BAROMETRIC PRESSURE, in. Hg 30
STACK GAUGE PRESSURE, in. H_2O -
OPERATORS J. Doller, R. Durgan



SCHEMATIC OF TRAVERSE POINT LAYOUT
(TOP VIEW)

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
Port #1		
Pt. 1	0.30	154
2	0.28	
3	0.25	
4	0.20	
5	0.13	
6	0.07	
7	0.06	
8	0.05	
9	0.06	
10	0.06	
11	0.17	
12	0.25	
13	0.40	
14	0.40	
AVERAGE		

Spaced @ 8"

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

NOTE: Pitot tube was rotated clockwise and counter clockwise to determine the magnitude of tangential flow. No

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Occidental Chem. Co.
DATE Dec. 18, 1972
SAMPLING LOCATION Rock Dryer Scrubber Outlet
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE A) 119"
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE B) —
STACK I.D., (DISTANCE A - DISTANCE B) 119"
NEAREST UPSTREAM DISTURBANCE 12'
NEAREST DOWNSTREAM DISTURBANCE 4'
CALCULATOR J. Dollar

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1 8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
1	0.011	119"	1 5/16	—	
2	0.032		3 13/16	—	
3	0.055		6 9/16	—	
4	0.079		9 3/8	—	
5	0.105		12 1/2	—	
6	0.132		15 11/16	—	
7	0.161		19 5/32	—	
8	0.194		23 3/32	—	
9	0.230		27 3/8	—	
10	0.272		32 3/8	—	
11	0.323		38 7/16	—	
12	0.398		47 3/8	—	
13	0.602		71 5/8	—	
14	0.677		80 9/16	—	
15	0.728		86 3/8	—	
16	0.770		91 5/8	—	
17	0.806		95 7/8	—	
18	0.839		99 13/16	—	
19	0.868		103 5/16	—	
20	0.895		106 1/2	—	
21	0.921		109 5/8	—	
22	0.945		112 7/16	—	
23	0.968		115 3/16	—	
24	0.989		117 11/16	—	

SAME AS COLUMN 4

EPA (Dun) 232
4 72

PRELIMINARY MOISTURE CHECK

PLANT Occidental Chem. Co.

STACK Rock Dryer Scrubber Outlet

DATE Dec. 18, 1972 SAMPLE TIME 1530 - 1550

METHOD 1

Dry Bulb Temp. 154 °F, Wet Bulb Temp. 151 °F, Dew Point Temp. 150 °F.

Vapor Pressure of H_2O @ DP 7.569 "Hg. Stack Pressure 30 "Hg.

Moisture Fraction 0.25, Dry Air Fraction 0.75 "Hg.

METHOD 2

Final Dry Test Meter Reading 84.329 Ft^3

Initial Dry Test Meter Reading 81.710 Ft^3

Dry Test Meter Volume Sampled 2.619 Ft^3

Average Meter Temp 71 °F

Average Orifice ΔH 0.10 "H_2O

Barometric Pressure @ Orifice Meter 30 "Hg

Dry Gas Volume Sampled @ STP 2.62 Ft^3

Volume of Condensate 19 ml

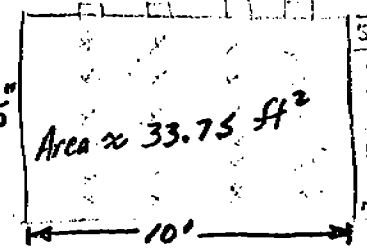
Water Vapor Volume @ STP 0.90 Ft^3

Moisture Fraction 0.26, Dry Air Fraction 0.74.

FIELD DATA

PLANT OCCIDENTAL
DATE 12-10-72
SAMPLING LOCATION #1 INLET
SAMPLE TYPE FLOURIDE
RUN NUMBER 1
OPERATOR [illegible]
AMBIENT TEMPERATURE 70
BAROMETRIC PRESSURE [illegible]
STATIC PRESSURE, (P_s) 29.6
FILTER NUMBER (s) 455
SILICA GEL # 240

FUEL OIL → Using Nat'l Gas for fuel.



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 6'
NOZZLE I.D. .618 .75
ASSUMED MOISTURE, % 12.5
SAMPLE BOX NUMBER 6
METER BOX NUMBER 6
METER $\Delta H_@$ 1.57
C FACTOR .95
PROBE HEATER SETTING 10 → 10
HEATER BOX SETTING
REFERENCE Δp .3

200ml in first 2 impingers + stem

ORSAT
2.0 % CO_2
17.4 % O_2
0.0 % CO
80.6 % N_2

WET CONDENSATE = 242 ml
SILICA GEL WT = 21 ml

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
			START 102.24									
1-1	[illegible]	1422	104.10	.90	.67	.60	168	80	[illegible]	20	—	63
1-2	10	1427	106.10	.95	.72	.50	166	82	[illegible]	25		
1-3	15	1432	107.770	.110	.72	.40	166	82	81	25		
1-4	20	1437	109.620	.95	.72	.40	168			26		
1-5	25	1513	111.510	.87	10.+	.35	168	[illegible]	32	27		
1-6	[illegible]	1518	113 200	.85	10.+	.32	167	85	83			
2-1	35	1531	115.215	.75	.59	.45	161	85	83	15		
2-2	40	[illegible]	117.100	.77	.61	.90	166			17		
2-3	45	1541	118.850	.80	.63	.34	169	85	82	20		
2-4	50	1546	120.570	.80	.63	.32	169	85	82	20		
2-5	55	1551	122.240	.75	.60	.32	169	85	82	22		
2-6	60	1556	123.870	.70	.55	.32	169	84	82	22		
3-1	65	1607	125.860	.61	.47	.47	169	84	81	15		65
3-2	70	1612	127.720	.65	.50	.42	169	83	81	15		
3-3	75	1617	129.460	.67	.53	.32	169	83	80	15		
3-4	80	1622	131.070	.67	.53	.30	169	82	80	15		
3-5	85	1627	132.715	.62	.47	.30	169	82	79	15		
3-6	90	[illegible]	139.300	.55	.42	.21	169	82	79	17		
4-1	95	1641	136 140	.49	.37	.36	169	82	77	15		68
4-2	100	1646	137. 860	.52	.40	.32	169	81	79	15		
4-3	105	1651	139. 190	.57	.43	.20	169	81	79	15		
4-4	110	1656	140.140	.41	.43	.13	169	81	79	20		
4-5	115	1716	141.910	.98	.21	.35	169	82	80	13		
4-6	120	1721	143.510	.144	.34	.28	169	82	80	15		70

STOP

COMMENTS

EPA (Out) 235
4-72

* PTS. (1-5 & 1-6) were done using 5/8" nozzle. ALL OTHERS 3/16"

FLUORIDE

SOURCE SAMPLING FIELD DATA SHEET

Plant OCCIDENTAL

Sampling Location Rock Dry Scr. Inlet F

Date 12-20-72 Run No. 2

Time Start 1153 Time End 1213

Sampling Time/Point 24 @ 5 min: 120 min

DB 162 °F, WB ____ °F, VF @ DP ____ "Hg

Moisture 2.4 %, FDA ___, Gas Density Factor ___

Barometric Press 29.7 "Hg, Stack Press 29.6 "Hg

Weather Clear Cool

Temp. 65 °F, W/D ____, W/S ____

Sample Box No. ____ Meter Box No. 6

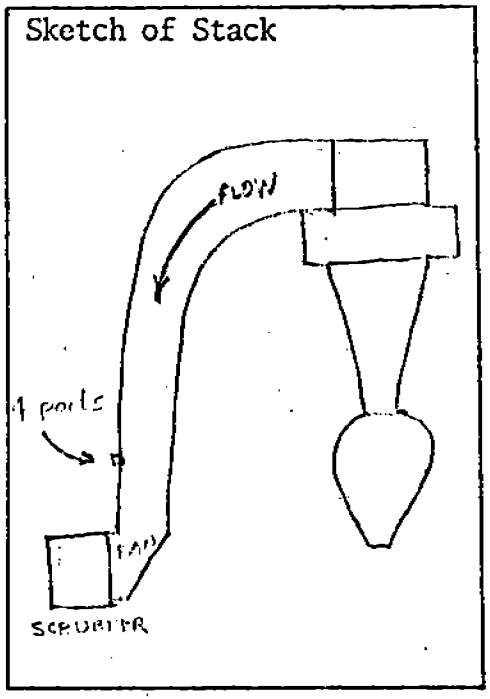
Meter ΔH@ 1.59 Pitot Corr. Factor 0.83

Nozzle Dia. .187 in., Probe Length 4 ft

Probe Heater Setting 30%

Stack Dimensions: Inside Diameter ____ in
Inside Area 33.75 ft²
Height ____ ft
40.5" × 120"

Sketch of Stack



Mat'l Processing Rate ____

Final Gas Meter Reading 194.340 ft³

Initial Gas Meter Reading 144.700 ft³

Total Condensate in Impingers 540 ml

Moisture in Silica Gel 13.1 gm

Silica Gel Container No. 360 231 Filter No. 456

Orsat:

CO_2	2.0				
O_2	17.4				
CO	0.0				
N_2	80.6				

Excess Air ____

Test Conducted By: S. NECK - B. WINGATE

Remarks: NATURAL GAS
200 mil in 1st impinger (2) at start
Fluoride Sampling

Port and Traverse Point No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O) Calc.	Actual	Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F) In	Out	Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
1-1	5¼	1151	147.92	.90	.625	.625	174	73	70		62	10
1-2	11¼	1003	149.38	1.00	.69	.69	176	73	70		62	10
1-3	17¼	1004	151.73	.87	.61	.61	174	73	70		62	
1-4	23¼	1013	153.63	.88	.61	.61	174	73	70		64	
1-5	29¼	1018	156.90	.88	.61	.61	176	73	70		66	
1-6	35¼	1025	158.64	.80	.55	.55	176	73	70		66	
2-1	5¼	1031	160.72	.72	.50	.50	174	74	71		69	
2-2	11¼	1037	162.60	.75	.52	.52	174	74	71		69	
2-3	17¼	1042	165.050	.79	.548	.548	174	74	71		69	

rt and averse int No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press.Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Cal.	Actual		In	Out			
1	23 1/4	1047	167.20	.77	.54	.54	174	76	72		65	10
2-5	29 1/4	1052	169.39	.73	.51	.51	174	75	73		65	
2-6	35 1/4	1057	171.44	.67	.46	.46	174	76	72		65	
3-1	5 1/4	1114	173.38	.60	.42	.42	173	76	74		66	
3-2	11 1/4	1119	175.36	.63	.44	.44	173	76	73		66	
3-3	17 1/4	1124	177.40	.65	.46	.46	172	77	74		66	
3-4	23 1/4	1129	179.43	.65	.46	.46	172	77	74		66	
3-5	29 1/4	1134	181.39	.60	.42	.42	172	77	74		64	
3-6	35 1/4	1139	183.27	.55	.39	.39	172	77	75		64	
4-1	5 1/4	1148	185.05	.48	.34	.34	168	78	75		65	
4-2	11 1/4	1153	186.97	.54	.38	.38	168	79	76		65	
4-3	17 1/4	1158	188.860	.55	.39	.39	172	79	76		65	
4-4	23 1/4	1203	190 730	.54	.38	.38	172	77	76		65	
4-5	29 1/4	1208	192.600	.52	.37	.37	172	79	76		65	
4-6	35 1/4	1213	194 340	.44	.31	.31	172	79	77		65	

Nat'l Processing [redacted]

nt OCCIDENTAL

pling Location ROCK DRY SCR. INLET

te 12-20-72 Run No. 3

me Start 1445 Time End 1705

mpling Time/Point 24 @ 5min = 120min

170 °F, WB ____ °F, VF @ DP ____ "Hg

isture 30%, FDA ___, Gas Density Factor ___

rometric Press 27.1 "Hg, Stack Press 29.6 Hg

eather CLEAR

emp. 75 °F, W/D ____, W/S ____

ample Box No. ____ Meter Box No. 6

eter ΔH@ 1.59 Pitot Corr. Factor 0.83

ozzle Dia. .375 in., Probe Length 4 ft

Probe Heater Setting 30%

Stack Dimensions: Inside Diameter ____ in
Inside Area 3375 ft2
Height ____ ft
(40.5" x 120")

Sketch of Stack

Final Gas Meter Reading 244.0 ft3

Initial Gas Meter Reading 175.82 ft3

Total Condensate in Impingers 448 ml

Moisture in Silica Gel 11.7 gm

Silica Gel Container No. 227 Filter No. 445

Orsat: CO_2 2.0; O_2 17.4; CO 0.0; N_2 80.6

Excess Air ____

Test Conducted By: S. NECK - B. WRIGHTER

Remarks: NATURAL GAS
(Gas meter 1st 2 impingers in front)
Fluoride Sampling

Port and Traverse Point No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O) Calc.	Meter Orifice Press. Diff. ("H_2O) Actual	Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F) In	Gas Sample Temp. @ Dry Gas Meter (°F) Out	Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
											69	10
4-1	5¼	1450	197.61	.48	.29	.29	170	86	85		69	
4-2	11¼	1455	199.49	.52	.32	.32	172	86	85		69	
4-3	17¼	1500	201.30	.54	.33	.33	172	87	85		69	
4-4	23¼	1505	203.21	.51	.31	.31	173	87	85		65	
4-5	29¼	1510	205.160	.50	.30	.30	173	87	85		65	
4-6	35¼	1515	206.870	.43	.26	.26	173	87	85		65	
3-1	5¼	1520	208.62	.53	.35	.35	170	87	85		65	
3-2	11¼	1530	210.52	.64	.37	.37	170	87	85		65	
3-3	17¼	1535	212.43	.64	.39	.39	170	87	85		65	

t and verse at No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft3)	Stack Velocity Head ("H_2O)	Meter Orifice Press.Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Cal.	Actual		In	Out			
3-4	23¼	1540	214.33	.64	.39	.31	170	87	84		65	
3-5	29¼	1545	216.19	.59	.36	.36	172	87	84		65	
3-6	35¼	1550	218.00	.54	.33	.33	172	86	84		65	
2-1	5¼	1605	220.03	.74	.45	.45	170	76	74		65	
2-2	11¼	1610	222.12	.77	.47	.47	170	86	84		65	
2-3	17¼	1615	224.20	.78	.48	.48	170	86	84		65	
2-4	23¼	1620	226.35	.78	.48	.48	172	86	84		70	
2-5	29¼	1625	228.36	.72	.44	.44	170	86	84		65	
2-6	35¼	1630	230.33	.67	.41	.41	170	86	84		65	
1-1	5¼	1640	232.49	.82	.50	.50	170	86	84		65	
1-2	11¼	1645	235.32	.90	.56	.55	170	86	84		65	
1-3	17¼	1650	237.57	.90	.55	.55	173	87	85		65	
1-4	23¼	1655	239.81	.86	.53	.53	172	87	85		65	
1-5	29¼	1700	241.86	.79	.45	.45	171	87	85		65	
1-6	35¼	1705	244.00	.85	.52	.52	171	87	85		65	

ENVIRONMENTAL ENGINEERING, INC.
Gainesville, Florida

SOURCE SAMPLING FIELD DATA SHEET

Plant Occidental Chem. Co.
Sampling Location Rock Dryer Scrubber Outlet
Date 12-19-72 Run No. 1
Time Start 1430 Time End 1718
Sampling Time/Point 3 min. Each - 15 min.
DB 154 °F, WB 151 °F, VP @ DP 7.57 "Hg
Bar. Press. 29.9 "Hg, Stack Press. 29.9 "Hg
Moisture 2B %, FDA 0.72, Gas Density Factor
Weather Clear
Temp. °F, W/D , W/S
Sample Box No. - Meter Box No. 3
Meter ΔH@ 1.75 Pitot Corr. Factor 0.8[illegible]
Nozzle Dia. 1/4 in., Probe Length 6 & 10 ft
Probe Heater Setting 70% Nomograph Cf
Stack Dimensions 119 in
Stack Area 77.197 ft²
Stack Height 63 ft

Sketch of Stack

Mat'l Processing Rate
Final Gas Meter Reading 195.586 ft³
Initial Gas Meter Reading 135.900 ft³
Condensate Increase in Impingers 405 ml
Moisture in Silica Gel 15 gm
Silica Gel Container No. Filter No.

Orsat:					
CO_2	2.0				
O_2	17.5				
CO	0.0				
N_2	80.5				
Excess Air					

Test Conducted by: R. Duncan
K. McFall

Remarks: Sampling for fluorides.
Used fuel oil instead of nat'l gas

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Point #1		1420	135.950									
24	Too close to wall	—	—	—	—	—	—	—	—	—	—	—
23		1423	—	0.40	0.90	0.90	154	75	76	200	70	4.5
22		1426	—	0.45	1.00	1.00	↓	75	76	↓	↓	4.5
21		1429	—	0.45	1.00	1.00	↓	75	76	↓	↓	4.5
20		1432	—	0.45	1.00	1.00	↓	76	77	↓	↓	4.5
19		1435	—	0.45	1.00	1.00	↓	76	77	↓	↓	4.5

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1												
A. 18		1438	151.0	0.40	0.90	0.90	154	76	77	200	70	4.5
17		1441	—	0.35	0.79	0.79		76	77			4.5
16		1444	—	0.30	0.68	0.68		76	77			4.5
15		1447	—	0.25	0.56	0.56		76	78			4.5
14		1450	—	0.20	0.45	0.45		76	78			4.5
13		1453	—	0.10	0.23	0.23		76	78			4.5
12		1505	—	0.05	0.11	0.11		76	79			4.5
11		1508	—	0.10	0.23	0.23		77	78			4.5
10		1511	159.3	0.15	0.35	0.35		77	78			4.5
9		1514	—	0.20	0.45	0.45		77	78			4.5
8		1517	—	0.20	0.45	0.45		77	78			4.5
7		1520	—	0.25	0.56	0.56		77	78			4.5
6		1523	—	0.25	0.56	0.56		78	79			4.5
5		1526	—	0.25	0.56	0.56		78	79			4.5
4		1529	—	0.25	0.56	0.56		78	79			4.5
3		1532	—	0.20	0.45	0.45		78	79			4.5
2		1535	168.6	0.20	0.45	0.45		78	79			4.5
1	TOO CLOSE TO WALL			—	—	—	—	—	—	—	—	—
Port #2		1600										
A.24	TOO CLOSE TO WALL			—	—	—	—	—	—	—	—	—
23		1603	—	0.45	1.00	1.00	154	77	78	200	68	4.5
22		1606	—	0.45	1.00	1.00		77	78			4.5
21		1609	173.6	0.45	1.00	1.00		77	78			4.5

Probe
Inside

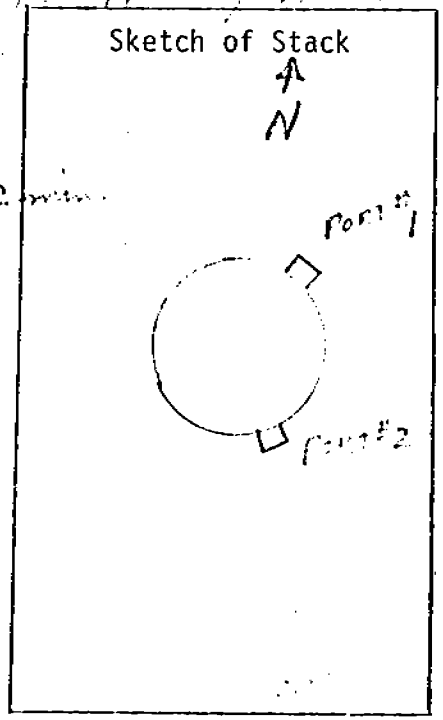
Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
PORT #2												
A.20		1615	—	0.45	1.00	1.00	154	77	78	200	68	4.5
19		1618	—	0.45	1.00	1.00		77	78			5
18		1621	—	0.45	1.00	1.00		77	78			5
17		1624	—	0.45	1.00	1.00		77	78			5
16		1627	—	0.45	1.00	1.00		77	79			5
15		1630	—	0.90	0.90	0.90		77	79			5
14		1633	—	0.30	0.68	0.68		77	79			5
13		1636	186.0	0.20	0.45	0.45		77	79			5
12		1648	—	0.05	0.11	0.11		77	80			5
11		1651	—	0.10	0.23	0.23		77	79			5
10		1654	—	0.10	0.23	0.23		77	79			5
9		1657	—	0.15	0.35	0.35		77	79			5
8		1700	—	0.15	0.35	0.35		77	80			5
7		1703	—	0.15	0.35	0.35		77	80			5
6		1706	—	0.20	0.45	0.45		77	80			5
5		1709	—	0.20	0.45	0.45		77	80			5
4		1712	—	0.20	0.45	0.45		77	80			5
3		1715	—	0.20	0.45	0.45		78	80			5
2		1718	195.386	0.20	0.45	0.45		78	80			5
1	TOO CLOSE TO WALL			—	—	—	—	—	—	—	—	—

ENVIRONMENTAL ENGINEERING, INC.
Gainesville, Florida

SOURCE SAMPLING FIELD DATA SHEET

Plant [illegible] CHEM CO. [illegible]
Sampling Location OUTLET, Cool tower
Date 12-22-77 Run No. 2
Time Start 9:30 Time End 12:18
Sampling Time/Point 4 pts @ 3 min = 132 min
DB 154 °F, WB — °F, VP @ DP — "Hg
Bar. Press. 29.9 "Hg, Stack Press. 29.9 "Hg
Moisture 28%, FDA 72, Gas Density Factor —
Weather Cloudy - warm
Temp. 70's °F, W/D —, W/S —
Sample Box No. — Meter Box No. 3
Meter ΔH@ 1.75 Pitot Corr. Factor 0.83
Nozzle Dia. 1/4 in., Probe Length 6'-12' ft
Probe Heater Setting 70 Nomograph Cf 0.61
Stack Dimensions 119 in
Stack Area 77.197 ft²
Stack Height approx. 60 ft

Sketch of Stack



Mat'l Processing Rate —
Final Gas Meter Reading 195.404 ft³
Initial Gas Meter Reading 143.955 ft³
Condensate Increase in Impingers 3x0 ml
Moisture in Silica Gel 246.7-233.2=13.5 gm
Silica Gel Container No 261 Filter No. [illegible]

Orsat:					
CO_2	2.0				
O_2	17.5				
CO	0.0				
N_2	80.5				
Excess Air					

Test Conducted by: R. Duggan

Remarks: Fluoride Survey

#: Assumed Moisture

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1		9:30	143.955				154					
Port #2	—	—	Leak check				154	—	—	—	—	—
21	115 3/16	9:38	—	0.25	0.56	0.56	154	69	70	—	70	4.5
21	112 7/16	9:46	—	0.22	0.47	0.53	154	69	70	—	68	4.4
21	101 1/2	9:54	147.8	0.28	0.60	0.62	154	68	70	—	66	4.4
20	90 1/2	10:02	—	0.25	0.79	0.79	154	69	70	—	66	4.0
19	79 5/16	10:10	150.8	0.28	0.87	0.75	154	71	72	—	62	4.0

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H$_2$O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1												
Pt #18	99 13/16	10:04	—	0.35	0.79	0.79	154	69	75	—	64	5.0
17	95 7/8	10:07	153.5	0.27	0.63	0.63	154	69	77	"	62	4.5
16	91 5/8	10:10	—	0.23	0.51	0.51	154	69	73	—	62	4.5
15	86 3/4	10:13	155.2	0.15	0.34	0.34	154	70	73	"	60	4.5
14	80 1/16	10:16	—	0.10	0.23	0.23	154	70	73	"	60	4.5
13	71 3/8	10:19	157.691	0.07	0.16	0.16	154	70	73	"	60	4.5
12	47 7/8	10:22	159.5	0.05	0.11	0.11	154	71	74	"	64	4.5
11	26 7/16	10:31	—	0.04	0.11	0.11	154	71	74	"	65	4.5
10	35 3/4	10:34	161.9	0.15	0.34	0.34	154	71	75	"	65	4.5
9	27 3/4	10:37	—	0.15	0.34	0.34	154	71	75	"	65	4.5
8	23 3/32	10:40	167.0	0.15	0.34	0.34	154	71	76	"	65	4.5
7	19 5/32	10:43	—	0.15	0.34	0.34	154	72	76	"	65	4.5
6	15 11/16	10:46	164.2	0.12	0.40	0.40	154	73	75	"	65	4.5
5	12 1/2	10:49	—	0.12	0.40	0.40	154	74	76	"	65	4.5
4	9 3/8	10:52	166.4	0.18	0.40	0.40	154	74	77	"	65	4.5
3	6 3/16	10:55	—	0.18	0.40	0.40	154	75	77	"	65	4.5
2	3 5/32	10:58	168.571	0.15	0.34	0.34	154	76	79	"	65	4.5
1	—	—	700	CLOSE TO								
Port #2												
Pt #24	—	—	700	CLOSE	TO							
23	115 3/16	11:07	—	0.35	0.79	0.79	154	76	80	—	65	4.5
22	112 7/16	11:11	171.7	0.40	0.90	0.90	154	76	80	—	65	4.5
21	109 5/8	11:14	—	0.40	0.90	0.90	154	77	80	—	65	5.0

10" Probe

6" Probe

ENVIRONMENTAL ENGINEERING, INC.
Gainesville, Florida

SOURCE SAMPLING FIELD DATA SHEET

Plant [illegible] CHEM. CO. [illegible]
Sampling Location OUTLET - Rock dryer
Date 1-20-72 Run No. 3
Time Start 2:40 PM Time End 5:13 PM
Sampling Time/Point 44 points x 3 min = 132 min.
DB 151 °F, WB — °F, VP @ DP — "Hg
Bar. Press. 29.9 "Hg, Stack Press. 29.7 "Hg
% Moisture 28%, FDA 72, Gas Density Factor —
Weather [illegible]
Temp. 70's °F, W/D —, W/S —
Sample Box No. — Meter Box No. 3
Meter ΔH@ 1.75 Pitot Corr. Factor 0.83
Nozzle Dia. 1/4 in., Probe Length 6 1/2 ft
Probe Heater Setting 70 Nomograph Cf 0.61
Stack Dimensions 119 in
Stack Area 77.197 ft²
Stack Height approx. 63 ft
* Estimated minimum

Sketch of Stack

Mat'l Processing Rate
Final Gas Meter Reading 251.780 ft³
Initial Gas Meter Reading 195.407 ft³
Condensate Increase in Impingers 405 ml
Moisture in Silica Gel 247.1 - 227.2 19.9 gm
Silica Gel Container No. 234 Filter No. [illegible]

Orsat:					
CO_2	2.0				
O_2	17.5				
CO	0.0				
N_2	80.5				
Excess Air					

Test Conducted by: [illegible]
[illegible]
Remarks: Particle Sampling

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ($"H_2O$)	Meter Orifice Press. Diff. ($"H_2O$)		Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1		2:40	195.407									
Point #24	—	—	TOO	CLOSE	TO	STACK	WALL	—	—	—	—	—
21	115 1/16	2:43	—	0.35	0.79	0.79	154	83	85	—	70	4.5
21	112 1/16	2:46	—	0.38	0.85	0.85	155	84	85	—	70	4.5
21	109 1/16	2:49	200.7	0.38	0.85	0.85	155	84	85	—	70	4.5
20	[illegible]	2:52	—	0.45	1.00	1.00	155	84	85	—	70	4.5
19	[illegible]	2:55	203.9	0.45	1.00	1.00	155	84	85	—	68	4.5

1" PROBE

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
PORT #1												
POINT #18	99 13/16	2:58	—	0.38	0.85	0.85	155	84	85	—	68	4.5
17	95 7/8	3:01	207.2	0.35	0.79	0.79	155	84	85	—	68	4.5
16	91 5/8	3:04	—	0.30	0.68	0.68	155	84	85	—	66	4.5
15	86 5/8	3:07	209.9	0.20	0.45	0.45	155	84	85	—	66	4.5
14	80 9/16	3:10	—	~~0.07~~ 0.20	~~0.16~~ 0.45	~~0.16~~ 0.45	155	83	85	—	67	4.5
13	71 5/8	3:13	—	0.07	0.16	0.16	155	84	85	—	67	4.5
12	47 3/8	3:20 3:23	—	0.05	0.11	0.11	154	84	85	—	68	4.5
11	38 7/16	3:26	213.1	0.07	0.16	0.16	154	84	85	—	68	4.5
10	32 3/8	3:29	—	0.10	0.23	0.23	154	84	85	—	70	4.5
9	27 3/8	3:32	215.1	0.15	0.34	0.34	154	84	85	—	70	4.5
8	23 3/32	3:35	—	0.20	0.45	0.45	155	83	85	—	70	4.5
7	19 5/32	3:38	—	0.20	0.45	0.45	155	83	85	—	68	4.5
6	15 11/16	3:41	218.7	0.20	0.45	0.45	155	83	85	—	68	4.5
5	12 1/2	3:44	—	0.20	0.45	0.45	154	83	84	—	67	4.5
4	9 3/8	3:47	221.1	0.20	0.45	0.45	154	82	84	—	67	4.5
3	6 9/16	3:50	—	0.20	0.45	0.45	154	82	84	—	67	4.5
2	3 13/16	3:53	223.421	0.18	0.40	0.40	154	82	84	—	66	4.5
1	—	TOO CLOSE TO STACK WALL					—	—	—	—	—	—
Port #2												
point #24	—	4:00 TOO CLOSE TO STACK WALL					—	—	—	—	—	—
23	Same as port #1	4:03	225.1	0.40	0.90	0.90	154	82	83	—	68	4.5
22		4:06	—	0.40	0.90	0.90	154	82	83	—	67	4.5
21		4:09	228.3	0.35	0.79	0.79	154	82	83	—	67	4.5

10' PROBE

6' PROBE

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
PORT #2 POINT #20		4:12	—	0.40	0.90	0.90	154	81	83	—	67	5.0
19		4:15	231.7	0.45	1.00	1.00	154	81	83	—	67	5.0
18		4:18	—	0.45	1.00	1.00	154	81	83	—	66	5.0
17		4:21	235.2	0.45	1.00	1.00	155	82	83	—	66	5.0
16		4:24	—	0.45	1.00	1.00	155	82	83	—	67	5.0
15		4:27	238.6	0.38	0.85	0.85	155	82	82	—	67	4.5
14		4:30	—	0.28	0.63	0.63	155	82	82	—	67	4.5
13		4:33	241.2	0.20	0.45	0.45	155	82	82	—	68	4.5
12		4:43	—	0.05	0.11	0.11	155	82	82	—	68	4.5
11		4:46	242.5	0.07	0.16	0.16	155	82	82	—	68	4.5
10		4:49	—	0.07	0.16	0.16	155	82	82	—	68	4.5
9		4:52	244.1	0.13	0.30	0.30	155	81	81	—	68	4.5
8		4:55	245.1	0.13	0.30	0.30	155	81	81	—	68	4.5
7		4:58	—	0.15	0.34	0.34	155	80	81	—	70	4.5
6		5:01	247.3	0.18	0.40	0.40	155	80	81	—	70	4.5
5		5:04	—	0.18	0.40	0.40	155	81	81	—	70	4.5
4		5:07	249.5	0.18	0.40	0.40	155	81	81	—	70	4.5
3		5:10	—	0.18	0.40	0.40	155	81	81	—	70	4.5
2		5:13	251.780	0.18	0.40	0.40	155	81	81	—	70	4.5
1	—	TOO CLOSE TO STACK WALL					—	—	—	—	—	—

12' probe

6' probe

Port #1 and Port #2 same

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Orifice Press. Diff. ("H O)		Stack Temp. (°F)	Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Impinger Temp. (°F)	on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #2												
point #20		4:12	—	0.40	0.90	0.90	154	81	83	—	67	5.0
19		4:15	231.7	0.45	1.00	1.00	154	81	83	—	67	5.0
18		4:18	—	0.45	1.00	1.00	154	81	83	—	66	5.0
17		4:21	235.2	0.45	1.00	1.00	155	82	83	—	66	5.0
16		4:24	—	0.45	1.00	1.00	155	82	83	—	67	5.0
15		4:27	238.6	0.38	0.85	0.85	155	82	82	—	67	4.5
14		4:30	—	0.28	0.63	0.63	155	82	82	—	67	4.5
13		4:33	241.2	0.20	0.45	0.45	155	82	82	—	68	4.5
12		4:43	—	0.05	0.11	0.11	155	82	82	—	68	4.5
11		4:46	242.5	0.07	0.16	0.16	155	82	82	—	68	4.5
10		4:49	—	0.07	0.16	0.16	155	82	82	—	68	4.5
9		4:52	244.1	0.13	0.30	0.30	155	81	81	—	68	4.5
8		4:55	245.1	0.13	0.30	0.30	155	81	81	—	68	4.5
7		4:58	—	0.15	0.34	0.34	155	80	81	—	70	4.5
6		5:01	247.3	0.18	0.40	0.40	155	80	81	—	70	4.5
5		5:04	—	0.18	0.40	0.40	155	81	81	—	70	4.5
4		5:07	249.5	0.18	0.40	0.40	155	81	81	—	70	4.5
3		5:10	—	0.18	0.40	0.40	155	81	81	—	70	4.5
2		5:13	251.780	0.18	0.40	0.40	155	81	81	—	70	4.5
1	—	TOO CLOSE TO STACK WALL					—	—	—	—	—	—

18' probe

6' probe

Same as Port #2

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #2												
Point #20	106 1/2	11:17	—	0.50	1.10	1.10	154	78	80	—	65	6.5
19	103 3/16	11:20	176.9	0.45	1.00	1.00	155	80	80	—	65	6.5
18	99 15/16	11:23	—	0.48	1.08	1.08	155	80	80	—	65	6.5
17	95 7/8	11:26	180.4	0.45	1.00	1.00	153	81	81	—	66	6.5
16	91 5/8	11:29	—	0.35	0.79	0.79	155	81	81	—	66	6.5
15	86 5/8	11:32	—	0.25	0.56	0.56	155	81	81	—	66	5.0
14	80 1/4	11:35	—	0.18	0.40	0.40	155	81	81	—	66	4.5
13	71 3/8	11:38	185.440	0.10	0.23	0.23	155	81	81	—	65	4.5
12	47 3/8	11:48	186.1	0.05	0.11	0.11	155	81	82	—	70	4.5
11	38 7/16	11:51	—	0.05	0.11	0.11	155	81	82	—	70	4.5
10	32 3/8	11:54	187.4	0.07	0.16	0.16	155	81	83	—	70	4.5
9	27 5/8	11:57	—	0.10	0.23	0.23	155	81	84	—	70	4.5
8	23 3/16	12:00	189.2	0.15	0.34	0.34	155	81	84	—	65	4.5
7	19 1/16	12:03	—	0.15	0.34	0.34	155	82	85	—	65	4.5
6	14 11/16	12:06	191.2	0.15	0.34	0.34	155	82	85	—	65	4.5
5	12 1/2	12:09	—	0.15	0.34	0.34	155	82	85	—	65	4.5
4	9 3/8	12:12	193.3	0.15	0.34	0.34	155	81	84	—	65	4.5
3	6 5/16	12:15	—	0.15	0.34	0.34	155	81	84	—	65	4.5
2	3 1/8	12:18	195.404	0.15	0.34	0.34	155	81	84	—	65	4.5
1	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	—	

Velocities	Port #1		Port #2	
	point #1	0.53	point #1	0.60
	2	0.53	2	0.48
	3	0.38	3	0.28

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

nt [redacted] CHEM. CO.
KRK
pling Location DRYER SCRUB. INLET (P)
e 12-22-72 Run No. 1
e Start 0925 Time End 1153
pling Time/Point 24@5min = 120 min
170 °F, WB ____ °F, VF @ DP ____ "Hg
isture 32 %, FDA ___, Gas Density Factor ___
rometric Press 27.1 "Hg, Stack Press ___ "Hg
ather Cloudy
mp. ____ °F, W/D ____, W/S ____
mple Box No. 6 Meter Box No. 6
eter ΔH@ 1.59 Pitot Corr. Factor .83
ozzle Dia. .187 in., Probe Length 4 ft
robe Heater Setting 30%
tack Dimensions: Inside Diameter ____ in
Inside Area ____ ft2
Height ____ ft
40.5" x 120"

Sketch of Stack

Mat'l Processing Rate [redacted]
Final Gas Meter Reading 285.580 ft3
Initial Gas Meter Reading 246.400 ft3
Total Condensate in Impingers 619 - 211 = 408 ml
Moisture in Silica Gel 15 gm
Silica Gel Container No. 258 Filter No. 5025

Orsat: CO_2 2.0
O_2 17.4
CO 0.0
N_2 80.6
Excess Air ____

Test Conducted By: J. DOLLINS, R. WRIGHTER

Remarks: Portland - FOMS Test
With Cyclone.

Port and Traverse Point No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O) Calc.	Meter Orifice Press. Diff. ("H_2O) Actual	Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F) In	Gas Sample Temp. @ Dry Gas Meter (°F) Out	Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
			246.400									
Port # 1		0925	246.400									5
H. 1		0930	247.3	0.87	0.39	0.39	174	72	70	300	55	6
2		0935	249.3	0.92	0.40	0.40	174	72	70			6
3		0940	251.2	0.90	0.39	0.39	174	72	70			5.5
4		0945	253.0	0.88	0.38	0.38	174	71	70			5.5
5		0950	254.9	0.87	0.38	0.38	174	71	70			5.5
6		0955	256.8	0.87	0.38	0.38	174	71	70			5.5
Port # 2		1000										
H. 1			258.4	0.75	0.33	0.33	170	72	72	300	55	5

t and verse nt No.	Distance from End of Port (in)	Clock Time	Gas Meter Reading (ft3)	Stack Velocity Head ("H_2O)	Meter Orifice Press.Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Probe Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Cal.	Actual		In	Out			
[illegible]												
[illegible]		1010	260.3	0.77	[illegible]	[illegible]	172	72	71	200	55	5
3		1015	262.0	0.78	0.24	0.24	172	73	72	"	55	5
4		1020	263.5	0.75	0.23	0.23	172	73	73	"	55	5
5		1025	265.5	0.73	0.22	0.22	172	74	73	"	55	5
6		1030	267.2	0.68	0.20	0.20	172	74	73	"	55	5
Port 3		[illegible]										
H.1		1100	268.8	0.65	0.21	0.21	172	75	74	200	55	5
2		1105	270.4	0.65	0.23	0.23	172	76	75	"	55	5
3		1110	—	0.65	0.23	0.23	172	76	75	"	55	5
4		1115	273.8	0.63	0.21	0.21	172	76	75	"	55	5
5		1120	275.3	0.60	0.26	0.26	172	76	75	"	55	5
6		1125	276.8	0.55	0.24	0.24	172	76	75	"	55	5
Port 4		[illegible]										
H.1		1133	278.2	0.45	0.20	0.20	172	76	76	200	55	6
2		1138	279.7	0.53	0.23	0.23	172	76	75	"	55	6.5
3		1143	—	0.55	0.24	0.24	172	76	75	"	55	7
4		1148	282.7	0.54	0.24	0.24		76	75	"		6.5
5		1153	284.2	0.53	0.23	0.23		76	75	"		6.5
6		1158	285.580	0.50	0.22	0.22		[illegible]	75	"		6.5

PLANT Occidental — 120 min

DATE 1-9-73

SAMPLING LOCATION Scr Inlet (Final Design)

SAMPLE TYPE Particulate

RUN NUMBER 2

OPERATOR J. Peters

AMBIENT TEMPERATURE [illegible]

BAROMETRIC PRESSURE [illegible]

STATIC PRESSURE, (P_s) [illegible]

FILTER NUMBER (s) 0074 (0.3741 gm)

Area = 40.5" x 120"

PROBE LENGTH AND TYPE [illegible]

NOZZLE I.D. 0.1875

ASSUMED MOISTURE, % 25 ± 15

SAMPLE BOX NUMBER 5

METER BOX NUMBER 5

METER $\Delta H_@$ [illegible]

C FACTOR [illegible]

PROBE HEATER SETTING 35%

HEATER BOX SETTING [illegible]

REFERENCE Δp [illegible]

4.2% CO_2
15.0% O_2
0.0% CO
80.8% N_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

[illegible] wgt = 8 gm

[illegible] = 204 ml

→ [illegible] oil to fuel

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0	267.510									
1-1	1005	269.5	0.72	0.33	0.33	165	40	[illegible]	3	220	50
1-2	1010	272.0	0.79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]
1-3	1015	274.5	0.93	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1-4	1020	276.2	0.90	0.53	0.55	165	[illegible]	41	[illegible]	[illegible]	[illegible]
1-5	1025	278.3	[illegible]	0.40	0.40	[illegible]	40	41	3	[illegible]	[illegible]
1-6	[illegible]	[illegible]	0.71	0.43	0.43	[illegible]	40	41	3	[illegible]	[illegible]
2-1	1038	281.8	0.72	0.35	0.35	165	41	42	3	[illegible]	[illegible]
2-2	1043	283.6	0.80	0.38	0.38	165	41	42	3	[illegible]	[illegible]
2-3	1048	285.5	0.87	0.42	0.41	[illegible]	[illegible]	42	3	[illegible]	[illegible]
2-4	[illegible]	287.3	0.82	[illegible]	0.37	165	[illegible]	[illegible]	3	[illegible]	[illegible]
2-5	1058	[illegible]	0.83	0.37	0.37	165	42	[illegible]	[illegible]	[illegible]	[illegible]
2-6	1103	290.7	0.89	[illegible]	[illegible]	165	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3-1	1150	292.4	[illegible]	0.32	0.32	[illegible]	43	45	3	220	40
3-2	1205	294.1	0.60	0.37	0.37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3-3	1210	296.3	0.65	[illegible]	[illegible]	166	45	46	3	[illegible]	[illegible]
3-4	[illegible]	[illegible]	0.57	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3-5	[illegible]	[illegible]	0.57	0.31	0.31	165	44	46	3	[illegible]	[illegible]
3-6	1225	301.4	[illegible]	[illegible]	[illegible]	165	46	46	3	[illegible]	[illegible]
4-1	1247	303.2	0.45	0.24	0.24	165	47	48	3	[illegible]	[illegible]
4-2	1252	304.9	0.50	0.30	0.30	165	47	48	3	[illegible]	[illegible]
4-3	1257	306.6	0.55	0.33	0.33	165	47	48	3	[illegible]	[illegible]
4-4	1302	[illegible]	0.55	[illegible]	[illegible]	165	47	48	3	[illegible]	[illegible]
4-5	1307	309.6	0.50	0.30	0.30	165	47	48	3	[illegible]	[illegible]
4-6	1312	311.400	0.52	0.32	0.32	165	47	48	3	[illegible]	[illegible]

COMMENTS:

EPA (Dur) 235
4-72

Assumed 25 ± 15 (Wet/Gas)

Assumed 120 min

Isokinetic Rate Switched to Sub Fit.

FAN NOT [illegible] UP TO [illegible] (RPM)

PLANT Oxidation Ditch (Ditch Depths) 120 inches

DATE 1-9-13

SAMPLING LOCATION Secondary Effluent

SAMPLE TYPE Particulate

RUN NUMBER 3

OPERATOR J. Potter

AMBIENT TEMPERATURE

BAROMETRIC PRESSURE 29.9

STATIC PRESSURE, (P_s) 29.6

FILTER NUMBER (s) 00220

Area = 40.5" x 120"

PROBE LENGTH AND TYPE

NOZZLE I.D. 0.375

ASSUMED MOISTURE, % 78.5

SAMPLE BOX NUMBER

METER BOX NUMBER 3

METER $\Delta H_@$

C FACTOR

PROBE HEATER SETTING 350°F

HEATER BOX SETTING

REFERENCE Δp

4.2
15.0
0.0
80.8 % 11.2

wt = 13 gm

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES → 1500 01/09/13

Condensate = 395 ml

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0 / 1510	311.200									
4-1	1515	313.0	0.45	0.26	0.26	170	51	52	3	250	70
4-2	1520	314.5	0.45	0.28	0.28		51	52	3	"	
4-3	1525	316.2	0.52	0.30	0.30		51	52	3		
4-4	1530	—	0.46	0.31	0.31		51	52	3		
4-5	1535	319.1	0.50	0.28	0.28		51	52	3		
4-6	1540	320.7	0.45	0.24	0.24		51	52	3		
3-1	1552	322.5	0.52	0.32	0.32		51	52	3		
3-2	1557	324.5	0.58	0.36	0.36		51	52	3		
3-3	1602	326.2	0.63	0.39	0.39		51	52	3		
3-4	1607	327.9	0.55	0.34	0.34		51	52	3		
3-5	1612	329.0	0.60	0.37	0.37		51	52	3		
3-6	1617	331.5	0.58	0.36	0.36	↓	51	52	3		↓
2-1	1651	333.7	0.68	0.42	0.42	165	51	52	4		35
2-2	1656	335.7	0.75	0.47	0.47		51	52	4		
2-3	1701	337.400	0.63	0.39	0.39		50	52	5		
2-4	1706	—	0.53	0.33	0.33		50	52	5		
2-5	1711	339.1	0.57	0.35	0.35		50	52	5		
2-6	1716	340.9	0.65	0.40	0.40						
1-1	1730	342.1	0.61	0.38	0.38		51	51	6		
1-2	1735	343.5	0.55	0.34	0.34		51	51	6		
1-3	1740	345.0	1.10	0.68	0.68		51	51	6		
1-4	1745	346.8	1.20	0.74	0.74		51	51	6.5		
1-5	1750	348.3	1.10	0.70	0.70		51	51	6.5		
COMMENTS: 1-6	1755	349.400	1.10	0.70	0.70	↓	51	51	6.5	↓	↓

EPA (Dur) 235
4-72

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1												
Port #18	99 13/16	9:48	258.4	0.20	0.45	0.45	150	67	66	200	58	4.5
17	95 7/8	9:51	—	0.25	0.56	0.56	150	67	66		58	4.5
16	91 5/8	9:54	—	0.25	0.56	0.56	150	67	66		58	4.5
15	86 7/8	9:57	262.4	0.20	0.45	0.45	150	67	66		58	4.5
14	80 9/16	10:00	—	0.20	0.45	0.45	150	67	67		58	4.5
13	71 5/16	10:03	264.711	0.25	0.56	0.56	150	67	67		58	4.5
12	47 3/8	10:18	—	0.10	0.23	0.23	150	68	71		60	5.0
11	38 7/16	10:21	—	0.10	0.23	0.23	150	68	71		60	5.0
10	32 5/8	10:24	—	0.10	0.23	0.23	150	66	71		60	5.0
9	27 7/8	10:27	268.3	0.15	0.34	0.34	150	70	71		60	5.0
8	23 1/2	10:30	—	0.18	0.40	0.40	150	70	71		60	5.0
7	19 1/2	10:33	—	0.18	0.40	0.40	150	71	71		60	5.0
6	15 11/16	10:36	271.6	0.18	0.40	0.40	150	71	71		60	5.0
5	12 1/2	10:39	—	0.18	0.40	0.40	150	71	71		60	5.0
4	9 3/8	10:42	273.8	0.15	0.34	0.34	150	72	71		60	5.0
3	6 9/16	10:45	—	0.15	0.34	0.34	150	72	71		60	5.0
2	3 13/16	10:48	275.630	0.10	0.23	0.23	150	72	72		60	5.0
1	—	—	TOO CLOSE TO STACK WALL				—	—	—	—	—	—
Port #2												
Point #24		11:05	TOO CLOSE TO STACK WALL				—	—	—	—	—	—
23	Port #1	11:06	—	0.65	1.45	1.45	150	71	72	200	60	8.0
22		11:11	279.7	0.65	1.45	1.45	150	71	72		60	8.0
21		11:14	—	0.65	1.45	1.45	150	71	72		60	8.0

10' Probe

6' Probe

[redacted]

SOURCE SAMPLING FIELD DATA SHEET

Plant OCCIDENTAL CHEM. CO. [redacted] Sampling Location Rock Dryer - Outlet
Date 12-22-72 Run No. 1
Time Start 9:30 Time End 12:23
Sampling Time/Point 44 pt. 1.0 3 min = 132 min
DB 154 °F, WB — °F, VP @ DP — "Hg
Bar. Press 29.92 "Hg, Stack Press 29.92 "Hg
* Moisture 28 %, FDA 72, Gas Density Factor —
Weather Overcast Showers
Temp. 60's °F, W/D —, W/S —
Sample Box No. — Meter Box No. 3
Meter ΔH@ 1.75 Pitot Corr. Factor 0.83
Nozzle Dia. 1/4 in., Probe Length 6'-10' ft
Probe Heater Setting 70% Nomograph Cf 0.61
Stack Dimensions 119 in
Stack Area 77.197 ft²
Stack Height approx. 63 ft
* Assumed Moisture

Sketch of Stack

Mat'l Processing Rate Using Nat'l Gas
Final Gas Meter Reading [redacted] ft³
Initial Gas Meter Reading 251.560 ft³
Condensate Increase in Impingers 1110 ml
Moisture in Silica Gel 21.0 gm
Silica Gel Container No. 25% Filter No 6376

Orsat:

CO_2	2.0				
O_2	17.5				
CO	0.0				
N_2	80.5				
Excess Air					

Test Conducted by: R. Quigley, K. Wenzel

Remarks: Particulate Sampling

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
Port #1		9:30	251.560					—	—	—	—	—
Port #2	—	—	Too close to stack bend									
1	1 1/2	9:33	—	0.20	0.45	0.45	150	66	67	200	58	4.5
2	10 7/8	9:36	254.2	0.20	0.45	0.45		66	66		58	4.5
2	10 7/8	9:39	—	0.16	0.36	0.36		66	66		58	4.5
2	10 1/8	9:42	256.3	0.16	0.36	0.36		66	66		58	4.5
2	10 1/2	9:45	—	0.16	0.36	0.36		67	66		58	4.5
1	10 1/16											

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Orifice Press. Diff. ("H O) Calc.	Orifice Press. Diff. ("H O) Actual	Stack Gas Temp. (°F)	Temp.@ Dry Gas Meter (°F) In	Temp.@ Dry Gas Meter (°F) Out	Probe Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
Port #2												
Point #20		11:17	283.7	0.68	1.50	1.50	150	71	71	200	60	9.0
19		11:20	—	0.60	1.35	1.35	150	71	71		60	8.5
18		11:23	—	0.60	1.35	1.35	150	71	71		60	8.5
17		11:26	291.3	0.45	1.00	1.00	150	71	71		62	6.0
16		11:29	—	0.35	0.78	0.78	150	71	71		63	5.5
15		11:32	298.6	0.27	0.63	0.63	150	71	71		62	4.5
14		11:35	—	0.22	0.49	0.49	150	71	71		65	4.0
13		11:38	304.608	0.10	0.23	0.23	150	71	71		65	4.5
12		11:53	—	0.05	0.11	0.11	150	70	71		68	4.5
11		11:56	—	0.05	0.11	0.11	150	70	71		68	4.5
10		11:59	—	0.07	0.16	0.16	150	70	71		68	4.5
9		12:02	—	0.07	0.16	0.16	150	69	70		68	5.0
8		12:05	312.2	0.15	0.34	0.34	150	69	70		68	5.0
7		12:08	—	0.10	0.23	0.23	150	69	69		68	5.0
6		12:11	—	0.07	0.16	0.16	150	69	69		70	5.0
5		12:14	—	0.07	0.16	0.16	150	68	69		70	5.0
4		12:17	—	0.05	0.11	0.11	150	68	69		70	5.0
3		12:20	—	0.07	0.16	0.16	150	68	69		70	5.0
2		12:23	320.251	0.05	0.11	0.11	150	68	69		70	5.0
1	—	TOO CLOSE TO STACK WALL					—	—	—	—	—	—

10' probe

6' probe

Port #1 50 pt

PLANT Occidental Chem. Co
DATE 1-7-73
SAMPLING LOCATION Outlet
SAMPLE TYPE Particulate
RUN NUMBER 2
OPERATOR G.F.A.
AMBIENT TEMPERATURE [redacted]
BAROMETRIC PRESSURE 29.9
STATIC PRESSURE, (P_s) 29.9
FILTER NUMBER (s) 23

silica gel #306
15.5 gm
Condensate = 350ml

PROBE LENGTH AND TYPE 5 ft
NOZZLE I.D. 0.25
ASSUMED MOISTURE, % 26
SAMPLE BOX NUMBER
METER BOX NUMBER 3
METER $\Delta H_@$ 1.93
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp

ORSAT
3.7% CO_2
15.5% O_2
0.0% CO
80.8% N_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

Using fuel oil

READ AND RECORD ALL DATA EVERY 3 MINUTES 138 MIN

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
Port 1	3 / 10:40	[illegible]									
2	6	303.3	0.18	0.44	0.44	145	37	37	5	220	35
2	3	304.4	0.18	0.44	0.44	145	37	37	5	220	35
3	6	305.5	0.17	0.415	0.415	145	38	36	5.5	220	35
4	9	306.6	[illegible]	[illegible]	0.415	142	38	36	5.5	220	35
5	12	307.7	0.17	0.40	0.40	145	38	37	5	220	35
6	15	308.8	0.18	0.44	0.44	145	38	37	5	220	35
7	3	309.8	0.15	0.35	0.35	145	39	37	5	225	35
8	6	310.8	0.15	0.35	0.35	142	39	37	5	225	35
9	9	311.8	0.16	0.375	0.375	145	39	37	5	220	35
10	12	312.7	0.15	0.35	0.35	145	39	37	5	220	35
11	15	313.6	0.10	0.23	0.23	145	39	37	5	220	38
12	3	314.2	0.08	0.19	0.19	145	39	37	5	230	38
13	0	314.8	0.07	0.166	0.166	145	39	39	5	220	38
14	3	315.6	0.07	0.166	0.166	145	39	39	5	220	38
15	6	316.7	0.23	0.52	0.52	145	40	39	5	225	38
16	9	318.0	0.33	0.76	0.76	143	40	39	5	225	37
17	12	319.6	0.44	1.0	1.0	144	40	39	5	225	37
18	15	321.4	0.55	1.25	1.25	145	41	39	5	225	37
19	3	323.2	0.55	1.25	1.25	145	42	39	5	225	37
20	6	325.2	0.60	1.35	1.35	145	42	39	5	225	37
21	9	327.0	0.66	1.50	1.50	145	42	39	6	225	37
22	12	329.2	0.66	1.50	1.50	145	42	39	7	225	37
23	15	331.1	0.66	1.50	1.50	145	42	39	7	225	37
23	3	332.80	0.60	1.35	1.35	145	42	39	7	225	37

Changed Probes

1 end

EPA (Dur) 235
4-72

[redacted] [redacted]

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	[redacted] PRESSURE DIFFERENTIAL (ΔH), in H_2O		[redacted] TEMPERATURE (T_s), °F	[redacted] DRY GAS METER TEMPERATURE		[redacted] PUMP VACUUM, in Hg	[redacted] SAMPLE TEMPERATURE, °F	[redacted] NOZZLE TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
Port 2											
1		332.804	To close to wall								
2	0	334.0	.18	0.42	0.42	142	44	48	6	220	40
3	3	335.0	.19	0.44	0.44	142	45	48	6	220	45
4	6	336.2	0.21	0.47	0.47	142	45	48	6	225	45
5	9	337.3	0.20	0.46	0.46	142	46	48	7	225	45
6	12	338.5	0.18	0.42	0.42	142	46	48	6	225	45
7	15	339.6	0.18	0.42	0.42	142	46	48	6	225	45
8	3	340.6	0.15	0.35	0.35	142	46	48	5	225	45
9	6	341.5	0.15	0.35	0.35	142	46	48	5	225	45
10	9	342.4	0.12	0.28	0.28	142	46	48	5	220	45
11	12	343.2	0.09	0.21	0.21	142	46	48	5	225	45
12	15	343.8	0.04	0.10	0.10	142	46	48	5	225	45
13	20	344.8	0.12	0.28	0.28	142	45	49	5	225	45
14	3	345.8	0.20	0.46	0.46	144	45	47	5	225	45
15	6	347.2	0.31	0.70	0.70	144	45	46	5	225	45
16	9	348.8	0.47	1.07	1.07	144	45	46	5	225	45
17	12	350.6	0.54	1.21	1.21	144	45	46	5	225	45
18	15	352.5	0.60	1.35	1.35	145	46	46	5	225	45
19	3	354.3	6.62	1.39	1.39	145	46	46	5	225	45
20	6	356.2	0.65	1.46	1.46	145	46	46	5	225	45
21	9	358.2	0.68	1.53	1.53	145	46	46	5	225	45
22	12	360.5	0.73	1.60	1.60	145	46	46	6	225	45
23	(1212) 15		0.60	1.35	1.35	145	46	46	8	225	45
24	To close to wall	362.205									

Change Probes

EPA (Dur) 236
4/72

FIELD DATA

PLANT Occidental chem
DATE 1-9-72
SAMPLING LOCATION outlet
SAMPLE TYPE Part.
RUN NUMBER 3
OPERATOR JEA
AMBIENT TEMPERATURE 30°
BAROMETRIC PRESSURE 29.9
STATIC PRESSURE, (P_s) 29.9
FILTER NUMBER (s) .0017

Silica gel #295
18.5 gm
Condensate = 335ml

PROBE LENGTH AND TYPE 6'10'
NOZZLE I.D. 0.25
ASSUMED MOISTURE, % 26
SAMPLE BOX NUMBER
METER BOX NUMBER 3
METER $\Delta H_@$ 1.75
C FACTOR
PROBE HEATER SETTING 409
HEATER BOX SETTING ON
REFERENCE Δp

ORSAT
3.7 % CO_2
15.5 % O_2
0.0 % CO
80.8 % N_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

Using fuel oil

READ AND RECORD ALL DATA EVERY 3 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
Port 2	15:10	362.785									
2	0	364.3	.21	0.48	0.48	150	48	48	5		
3	3	365.1	.11	.26	0.26	150	48	48	7		
4	6	366.1	.11	.26	0.26	150	48	48	7		
5	9	366.9	.14	.33	0.33	150	48	48	5		
6	12	368.0	.15	.35	0.35	150	48	48	5.5		
7	15	369.0	.16	.37	0.37	150	48	48	6		
8	3	369.9	.16	.37	0.37	150	48	48	6		
9	6	371.0	.17	.395	0.395	150	48	48	6		
10	9	372.2	.17	.395	0.395	150	48	48	6		
11	12	373.3	.18	.412	.412	150	48	48	6		
12	15	374.3	.18	.412	.412	150	47	47	6		
13	0	375.3	.18	.412	.412	150	47	47	5		
14	3	376.4	.17	.395	.395	150	47	47	5		
15	6	377.7	.35	0.80	0.80	150	47	47	5		
16	9	379.3	.45	1.03	1.03	149	47	47	5		
17	12	381.2	.52	1.18	1.18	150	48	48	6		
18	15	382.6	.60	1.37	1.37	150	48	47	9		
19	2	384.8	.65	1.48	1.48	150	49	47	23		
20	6	386.1	.60	1.37	1.37	150	49	47	22		
21	9	388.3	.65	1.48	1.48	15-	48	47	15		
22	12	390.3	.60	1.37	1.37	150	48	47	18		
23	15		.60	1.37	1.37	150	48	47	18		
	3										

Closest Probe

COMMENTS:

EPA (Rev.) 235

TRAVERSE POINT NUMBER	CLOCK TIME (24 hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
Port (		392.2									
2	0	393.2	.18	.41	0.41	150	48	47	5		
3	3	394.3	.18	.41	0.41	150	48	47	3		
4	6	395.3	.20	.46	0.46	150	46	42	6		
5	9	396.5	.18	.41	.41	150	47	47	6		
6	12	397.7	.20	.46	.46	147	47	47	6		
7	15	398.8	.19	.435	.435	148	48	47	6		
8	3	400.0	.17	.40	.40	148	48	47	6		
9	6	401.1	.17	.40	.40	149	48	47	6		46
10	9	402.0	.12	.28	.28	148	48	47	5		
11	12	402.8	.08	.14	.19	147	48	47	4		
12	15	—	.08	.19	.19	147	48	47	4		
13	30	404.1	.05	.15	.15	147	48	47	4		
14	3	404.9	.10	.225	.225	147	47	47	5		
15	6	—	.10	.225	.225	147	47	47	5		
16	9	406.3	.10	.225	.225	147	47	47	5		
17	12	406.9	.10	.225	.225	147	47	47	5		
18	15	407.7	.10	.225	.225	147	47	47	5		
19	3	408.5	.10	.225	.225	147	47	47	5		45
20	6	409.5	.10	.225	.225	147	47	47	5		
21	9	409.5	.10	.225	.225	147	47	47	5		
22	12	410.8	.10	.225	.225	147	47	47	5		
23	15 (1722)		.10	.225	.225	147	47	47	5		
	3 END	411.495									

could setting 2 minutes sooner

GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM. CO. (ROCK DRYING)

EPA Sample No.	OXY-9	→	→	→
Run No.	1	→	→	→
Date	12-19-72	→	→	→
Time	1530	1620	1725	COMPOSITE
Sampling Point	SCRUBBER LIQUID IN	→	→	→
Temperature, °F	68	68	67	
pH	7.0	7.0	7.1	
Fluorides				
P_2O_5				
Trace Metals				

Remarks

GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM. CO. (ROCK DRYING)

EPA Sample No.	OXY-10	→	→	→
Run No.	2	2	2	2
Date	12-20-72	→	→	→
Time	1010	1115	1210	COMPOSITE
Sampling Point	SCRUBBER LIQUID - IN	→	→	→
Temperature, °F	70	71	71	
pH	7.2	7.2	7.2	
Fluorides				
P_2O_5				
Trace Metals				

Remarks

GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM Co (PORT INDUS)

EPA Sample No.	ORV-11	→	→	→
Run No.	3	→	→	→
Date	12-20-72	→	→	→
Time	14-55	1555	1655	SAME AS TE
Sampling Point	SCRUBBER LIQUID-IN	→	→	→
Temperature, °F	70	70	69	
pH	7.2	7.5	7.0	
Fluorides				
P_2O_5				
Trace Metals				

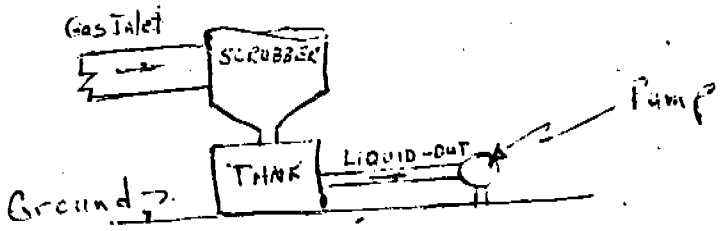
Remarks

GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM CO. (ROCK DRYING)

EPA Sample No.	OXY-12	→	→	→
Run No.	1	→	→	→
Date	12-19-72	→	→	→
Time	1530	1620		COMPOSITE
Sampling Point	SCRUBBER LIQUID OUT	→	→	→
Temperature °F	138	138	131	
pH	4.0	4.0	5.5	
Fluorides				
P_2O_5				
Trace Metals				

Remarks Liquid temperature of tank was 10°F cooler than liquid grab samples at pump.



GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM CO. (ROCK DRYING)

EPA Sample No.	OXY-13	→	→	→
Run No.	2	→	→	→
Date	12-20-72	→	→	→
Time	1010	1115	1210	COMPOSITE
Sampling Point	SCRUBBER LIQUID-OUT	→	→	→
Temperature, °F	145	141	145	
pH	7.0	7.5	7.5	
Fluorides				
P_2O_5				
Trace Metals				

Remarks

GRAB SAMPLE DATA SHEET

Plant OCCIDENTAL CHEM. Co (KICK DRYING)

EPA Sample No.	ORY-14	→	→	→
Run No.	3	→	→	→
Date	12-20-72	→	→	→
Time	1455	1555		COMPOSITE
Sampling Point	SCRUBBER LIQUID-OUT	→	→	→
Temperature °F	142	142	143	
pH	7.3	7.5	7.3	
Fluorides				
P_2O_5				
Trace Metals				

Remarks _____

APPENDIX B-2

FIELD DATA SHEETS FOR ROCK GRINDING TESTS

PRELIMINARY VELOCITY TRAVERSE

PLANT Occidental Chem. Co.
DATE 1-8-73
LOCATION KHS Ball Mill (Baghouse Inlet)
STACK I.D. 38"
BAROMETRIC PRESSURE, in. Hg 30
STACK GAUGE PRESSURE, in. H_2O
OPERATORS Dollar, Allen, & McFall

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
2"	1.35	135
4"	0.60	
6"	0.70	
8"	0.55	
10"	0.60	
12"	0.50	
14"	0.45	
16"	0.40	
18"	0.40	
20"	0.35	
22"	0.30	
24"	0.30	
26"	0.30	
28"	0.30	
30"	0.35	
32"	0.45	
34"	0.45	
36"	0.50	
37"	0.40	135
AVERAGE		

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

EPA (Dur) 233
4/72

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Occidental Chem Co.
DATE 1-8-73
SAMPLING LOCATION K.V.S. Ball Mill (Baghouse Inlet)
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE A) 41 1/2"
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE B) 3 1/2"
STACK I.D., (DISTANCE A - DISTANCE B) 38"
NEAREST UPSTREAM DISTURBANCE ≈ 6'
NEAREST DOWNSTREAM DISTURBANCE 6"
CALCULATOR J. Dollar

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
1	0.011	38"	1/2	3 1/2"	
2	0.032		1 1/4		
3	0.055		2 1/8		
4	0.079		3		
5	0.105		4		
6	0.132		5		
7	0.161		6 1/8		
8	0.194		7 3/8		
9	0.230		8 3/4		
10	0.272		10 3/8		
11	0.323		12 1/4		
12	0.398		15 1/8		
13	0.602		22 7/8		
14	0.677		25 3/4		
15	0.728		27 5/8		
16	0.770		29 1/4		
17	0.806		30 5/8		
18	0.839		31 7/8		
19	0.868		33		
20	0.895		34		
21	0.921		35		
22	0.945		35 7/8		
23	0.968		36 3/4		
24	0.989	38"	37 1/2		

PRELIMINARY MOISTURE CHECK

PLANT Occidental Chem. Co.

STACK K.V.S. Ball Mill (Bag House Inlet)

DATE 1-8-73 SAMPLE TIME 1039 - 1054

METHOD 1

Dry Bulb Temp. 135 °F, Wet Bulb Temp. 110 °F, Dew Point Temp. 106 °F.

Vapor Pressure of H_2O @ DP 2.31 "Hg. Stack Pressure 29.6 "Hg.

Moisture Fraction 0.07, Dry Air Fraction 0.93 "Hg.

METHOD 2

Final Dry Test Meter Reading 334.210 Ft^3

Initial Dry Test Meter Reading 332.210 Ft^3

Dry Test Meter Volume Sampled 2.000 Ft^3

Average Meter Temp 58 °F

Average Orifice ΔH - "H_2O

Barometric Pressure @ Orifice Meter 29.9 "Hg

Dry Gas Volume Sampled @ STP 2.05 Ft^3

Volume of Condensate ≈ 1 ml

Water Vapor Volume @ STP 0.0474 Ft^3

Moisture Fraction 0.02 + 0.025 = 0.045 Dry Air Fraction 0.955

PRELIMINARY VELOCITY TRAVERSE

PLANT Occidental Chem. Co.
DATE 1-8-73
LOCATION K.V.S. Ball Mill (Bag House Outlet)
STACK I.D. 42 1/2"
BAROMETRIC PRESSURE, in. Hg 30
STACK GAUGE PRESSURE, in. H_2O
OPERATORS Dollar, Allen, & McFall

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
2"	0.20	108
4"	0.20	
6"	0.15	
8"	0.20	
10"	0.25	
12"	0.22	
14"	0.22	
16"	0.22	
18"	0.20	
20"	0.20	
22"	0.20	
24"	0.20	
26"	0.22	
28"	0.22	
30"	0.22	
32"	0.25	
34"	0.20	
36"	0.20	
38"	0.20	108
AVERAGE		

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
AVERAGE		

EPA (Dur) 233
4/72

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT Occidental Chem. Co.
DATE 1-8-73
SAMPLING LOCATION K.V.S. Ball Mill (Bag House Outlet)
INSIDE OF FAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE A) 50 3/4"
INSIDE OF NEAR WALL TO OUTSIDE OF NIPPLE, (DISTANCE B) 8 1/2"
STACK I.D., (DISTANCE A - DISTANCE B) 42 1/4"
NEAREST UPSTREAM DISTURBANCE > 8 D
NEAREST DOWNSTREAM DISTURBANCE 4'
CALCULATOR J. Dollar

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1 8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
1	0.014	42.25"	5/8	8.5"	9 1/8
2	0.044		1 7/8		10 3/8
3	0.075		3 1/8		11 5/8
4	0.109		4 5/8		13 1/8
5	0.146		6 1/8		14 5/8
6	0.188		8		16 1/2
7	0.236		10		18 1/2
8	0.296		12 1/2		21
9	0.382		16 1/8		24 5/8
10	0.618		26 1/8		34 5/8
11	0.704		29 3/4		38 1/4
12	0.764		32 1/4		40 3/4
13	0.812		34 3/8		42 7/8
14	0.854		36 1/8		44 5/8
15	0.891		37 5/8		46 1/8
16	0.925		39 1/8		47 5/8
17	0.956		40 3/8		48 7/8
18	0.986		41 5/8		50 1/8

EPA (Dur) 232
4/72

PRELIMINARY MOISTURE CHECK

PLANT Occidental Chem Co.

STACK K.V.S. Ball Mill (Baghouse Outlet)

DATE 1-8-72 SAMPLE TIME 1145 - 1205

METHOD 1

Dry Bulb Temp. 108 °F, Wet Bulb Temp. 98 °F, Dew Point Temp. 95 °F.

Vapor Pressure of H_2O @ DP 1.66 "Hg. Stack Pressure 29.9 "Hg.

Moisture Fraction 0.06, Dry Air Fraction 0.94 "Hg.

METHOD 2

Final Dry Test Meter Reading 336.300 Ft^3

Initial Dry Test Meter Reading 334.300 Ft^3

Dry Test Meter Volume Sampled 2.000 Ft^3

Average Meter Temp 48 °F

Average Orifice ΔH — "H_2O

Barometric Pressure @ Orifice Meter 29.9 "Hg

Dry Gas Volume Sampled @ STP 2.085 Ft^3

Volume of Condensate 2 ml

Water Vapor Volume @ STP 0.0948 Ft^3

Moisture Fraction 0.04 + 0.025 = 0.065 Dry Air Fraction 0.935

Note: Pitot blown out at each readings

Note: Trouble bot 2-3 w/ ½" nozzle plugging. Switched to 3/8" nozzle, set flow & flow started

FIELD DATA

38" Stack I.D.

PLANT Occidental
DATE 1-11-73
SAMPLING LOCATION Four Stripping (Boiler)
SAMPLE TYPE Particulates
RUN NUMBER 1
OPERATOR RLS - [illegible]
AMBIENT TEMPERATURE 50
BAROMETRIC PRESSURE 30.0
STATIC PRESSURE, (P_s) 29.3
FILTER NUMBER (s) 1 [illegible]

Final Meter Reading 451.705

417.40 > diff.
419.00

PROBE LENGTH AND TYPE 5' Heated
NOZZLE I.D. 0.25 - 0.375
ASSUMED MOISTURE, % 6
SAMPLE BOX NUMBER
METER BOX NUMBER 5
METER $\Delta H_@$ 1.62
C FACTOR
PROBE HEATER SETTING 6
HEATER BOX SETTING
REFERENCE Δp

Filter # [illegible] 21

Impinger 200ml Initial 235 final

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 6 MINUTES, Total = (132 min)

Silica Gel = 279, wt = 35 gm
H_2O = 30 ml

362,000 > Δ
365,200

363,60 > Δ
364.25

"These volumes were used in parallel"

401,27 > Δ
404,90

T_1 in N_2

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
		358.110									
1	Too close to wall										
2	10[illegible]	358.115	.42	.69	.69	[illegible]/20	53.5	54.0	2.2		
3	[illegible]10	364.25	.5	2.1	2.7	120	57	55	2.3		
4	11[illegible]	[illegible]	.7	3.4	2.6	"	56	55	2.3	200	
5	[illegible]	371.55	.57		2.0	"	58	57	2.3+		
6	11[illegible]	375.[illegible]	.23	2.0	1.5	"	60	56	2.4	240F	<50F
7	12[illegible]	378.[illegible]	.13	2.3	1.3	122	62	56.5	2.4	210	<50
8	12[illegible]	382.[illegible]	.41	3.1	1.25	"	63	57	2.4+	210	<50
9	11[illegible]	387.5+	.40	3.0	1.15	"	64	57+	2.4+	265	<50
10	1[illegible]	391+	.35	2.6	1.10	122	64	58	2.4+	272	<50
11	1[illegible]	394.6	.33	2.5	1.00	122	65	58	2.4+	277	<50
12	1[illegible]	398+	.21	2.0	0.84	"	65	59	2.4+	290	<50
13	12[illegible]	401.100	.25	2.0	2.0	122	66	61	1.4	230	<50
14	[illegible]	404.7	.21	1.6	1.6	"	63	60	2.3.5	285	<50
15	[illegible]	410.9	.25	2.0	1.20	"	65	61	2.3.8	236	<50
16	[illegible]	[illegible]	.29	2.2	0.70	"	66	61	2.4+	299	<50
17	[illegible]	[illegible]	.55	2.7	2.3	"	—	—	6	170	<50
18	13[illegible]	423.4	.28	2.8	2.8	"	61	56	3.5	135	<50
19	13[illegible]	427.1	.4	3.1	3.1	122	61	57	1.9	145	<50
20	[illegible]	433.4	.30	2.3	2.1	"	65	61	2.3	142	<50
21	13[illegible]	437.3	.35	2.6	1.9	"	67	61	2.3+	120	<50
22	14[illegible]	[illegible]	.36	2.7	1.7	"	69	61	2.3.5	120	<50
23	[illegible]	[illegible]	.33	2.5	1.6	"	[illegible]	62	2.3.5	130	<50
24	[illegible]	[illegible]	.33	2.5	1.6	"	[illegible]	62	2.3.5	130	<50

Enough to a 3/8" nozzle

3/8 Noz

change

change

COMMENTS: 24 Too close to wall

Net Meter Volume Sampled = 89.51 ft^3 @ Meter Cond.

This test experienced a lot of trouble in plugging. Observe to wit:

1) Point 2 was run with 1/4" ID nozzle
2) All other points were run with 7/8" ID nozzle
3) Only occasionally was isokinetic conditions approached, due to flow stoppage in probe, filter, etc.
4) The apparent total flow is

451.705
358.115
93.590 CF

This must be corrected by

1.60
1.20
0.65
0.63
4.08 CF

— 4.08
89.51 CF

This correction is for volume drawn through system during the process of changing filter, cleaning probes, etc. This volume did not contain dust from the source.

Therefore the total uncorrected volume is 89.51 cubic feet

5) At about point 17, EPA project officer suggested reducing heat on sample box as an attempt to minimize probe plugging.

...TRO...ITAL ...GINE...NG, INC.
Gainesville, Florida

SOURCE SAMPLING FIELD DATA SHEET

Plant [illegible]
Sampling Location [illegible]
Date 1/[illegible]/12 Run No. 2
Time Start [illegible] Time End [illegible]
Sampling Time/Point 6 min.
DB ____ °F, WB ____ °F, VP @ DP ____ "Hg
Bar. Press. 30 "Hg, Stack Press 29.3 "Hg
Moisture 6 %, FBA ____, Gas Density Factor ____
Weather Cool - Clear
Temp. ____ °F, W/D ____, W/S ____
Sample Box No. 5 Meter Box No. ____
Meter ΔH@ 1.62 Pitot Corr. Factor 0.83
Nozzle Dia. 3/8" in., Probe Length [illegible] ft
Probe Heater Setting 25 Nomograph Cf ____
Stack Dimensions ____ in
Stack Area ____ ft²
Stack Height ____ ft

Sketch of Stack

Stop 473.50
476.60

Stop 507.00
511.57

Subtract

Mat'l Processing Rate ____
Final Gas Meter Reading 555.97 ft³
Initial Gas Meter Reading 451.80 ft³
Condensate Increase in Impingers 53 ml
Moisture in Silica Gel 25 gm
Silica Gel Container No. [illegible] Filter No. 153 [illegible]

Orsat:				
CO₂	0.0 %			
O₂	21.0			
CO	0.0			
N₂	79.0			
Excess Air				

Test Conducted by: [illegible]

Remarks: Used filter from [illegible]

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H₂O)	Meter Orifice Press. Diff. ("H₂O)		Stack Gas Temp. (°F)	Gas Sample Temp.@Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
1	Top Clock											
2 [illegible]		[illegible]	[illegible]	.35	2.1	2.1	121	61	56	125	<50F	5
3 [illegible]		1641	[illegible]	.5	3.2	3.2	"	61	57	125	<50	5+
4 [illegible]		1647	[illegible]	.47	3.5	3.5	"	61	61	[illegible]	<50	6
5 [illegible]		1653	[illegible]	.43	3.2	3.3	"	[illegible]	60	130	"	7
6 [illegible]		1724	[illegible]	.58	4.2	4.2	"			132	"	23

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp.@ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
7 6-12		1755	492.1	.52	3.7	1.7	12.1	62	60	110	<55	23.5
8 12-3		[illegible]	496.1	.42	3.3	1.6	120	63	60	95	"	23.5
9 3-9		1811	500.7	.27	2.10	1.4	"	63	60	95	"	23.5
10 9-6		1814	504.60	.27	2.10	1.35	"	66	60	105	"	23.5
11 6-12		1820	508.1	.30	2.3	1.5	"	67	60	95	"	23.5
12 12-3		1826	512.4	.28	2.1	1.5	"	68	60	120	"	23.5
13 3-9		1914	521.57	.25	2.0	1.7	125	62	62	95	"	23
14 9-6		1920	526.6	.25	2.0	1.6	"	63	61	100	"	23.5
15 6-12		1926	530.9	.29	2.1	1.55	"	63	61	85	"	23.5
16 12-3		1932	534.7	.33	2.5	1.35	"	63	61	115	"	23.5
17 3-9		1938	538.7	.31	2.4	1.20	"	65	61	100	"	24
18 9-15		1946	533*	.35	2.7	1.7	125	65	61	70	"	23.5
19 6-6		1953	537.7	.34	2.7	1.6	"	66	61	160	"	"
20 1-12		1959	541.7	.33	2.5	1.4	"	68	62	120	"	"
21 12-3		2005	545.7	.32	2.4	1.3	"	68	62	105	"	24
22 3-9		2011	549.2	.31	2.4	0.97	"	68	62	95	"	24
23 9-12		2017	552.7	.28	2.1	0.86	"	68	62	150	"	24
[illegible]	[illegible]											

Changed Pitot Tube Pitot Tube

* [illegible] probe downstream during change.

[redacted]IRONMENTAL ENGINEERING, INC.
Gainesville, Florida

SOURCE SAMPLING FIELD DATA SHEET

Plant Occidental Chemical
Sampling Location Reburner Inlet-Vak Gas
Date 1/12/73 Run No. 3
Time Start 1010 Time End 1312
Sampling Time/Point 6 min (Total = 132)
DB ____ °F, WB ____ °F, VP @ DP ____ "Hg
Bar. Press. 30 "Hg, Stack Press. 29.3 "Hg
Moisture 6 %, FDA ____, Gas Density Factor ____
Weather Cloudy - Industrial Location
Temp. ~40 °F, W/D ____, W/S ____
Sample Box No. 5 Meter Box No. ____
Meter ΔH@ 1.62 Pitot Corr. Factor 0.83
Nozzle Dia. 3/8 in., Probe Length 4 ft.
Probe Heater Setting 35 Nomograph Cf ____
Stack Dimensions ____ in
Stack Area ____ ft²
Stack Height ____ ft

Sketch of Stack

Inlet
552.27 Down
559.30

Sketch of train on next page

Mat'l Processing Rate ____
Final Gas Meter Reading 670.66 ft³
Initial Gas Meter Reading 556.51 ft³
Condensate Increase in Impingers 100 ml
Moisture in Silica Gel 25 gm
Silica Gel Container No. [illegible] Filter No. ____

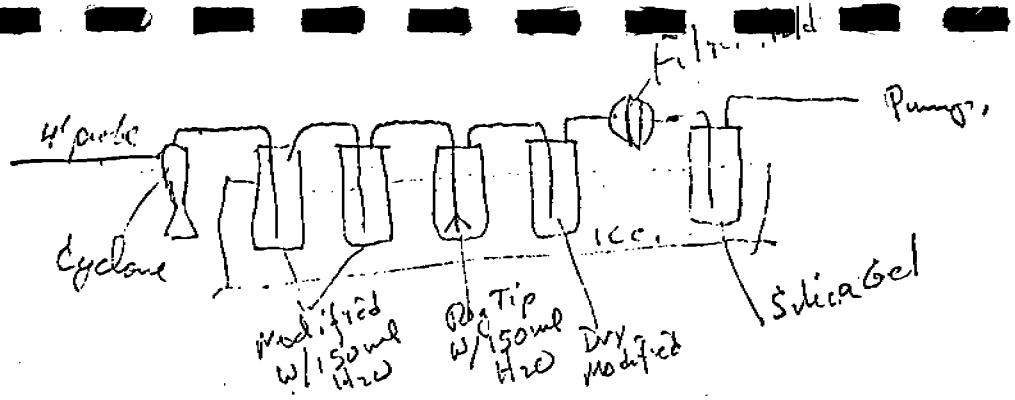
Orsat:					
CO_2	0.0 %				
O_2	21.0				
CO	0.0				
N_2	79.0				
Excess Air					

Test Conducted by: RSS - AJL

Remarks: Pitot checked before each reading of velocity
Filter # 00001 (A')
" # 00002 (B')

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft³)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H_2O)		Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
1	Too	Close										
2		1010	556.07	.52	3.2	1.75	120					
3 6-12		1031	~561	.3	2.2	2.3	120	52	52	73	<50	23
4 12-3		1027	~566	.27	2.1	2.11	"	52	52	170	"	22.5
5 3-9		1043	571	.38	2.9	2.9	"	55	51	120	"	17
6 9-6		1049	576	.4	3.1	3.1		57	51	140	"	19

Point 2



Points 3-12 Same but eliminate Regular Tip Impinger

Points 13-23 Add another modified impinger before trap where regular impinger was for point 2. Now 3 modified imp w/150 ml.

Port and Traverse Point No.	Distance From Inside Stack Wall (in.)	Clock Time	Gas Meter Reading (ft^3)	Stack Velocity Head ("H_2O)	Meter Orifice Press. Diff. ("H O)		Stack Gas Temp. (°F)	Gas Sample Temp. @ Dry Gas Meter (°F)		Sample Box Temp. (°F)	Last Impinger Temp. (°F)	Vacuum on Sample Train ("Hg)
					Calc.	Actual		In	Out			
7 0-6		1055	581	.10	3.1	2.9	125	62	51	190	<50F	23
8 6-12		1101	587	.50	3.7	2.6	"	64	52	130	"	23
9 12-3		1107	592	.48	3.7	2.1	"	65	52	110	"	23
10 3-9		1112	597	.38	2.9	1.9	"	65	53	110	"	23
11 9-12		1118	603	.39	3.0	2.0	"	65	53	130	"	23
12 12-0		1125	608 (612.72)	.36	2.7	1.95	"	66	54	170		23
13 0-6		1155	612.78	.2	1.6	1.6	125	59	55	100	<50	6
14 6-12		1201	617	.22	1.7	1.7	"	59	55	110	"	7
15 12-3		1207	622	.27	2.1	2.1	"	"	"	90	"	9
16 3-9		1213	627	.31	2.4	2.4	"	"	"	150	"	8
17 9-12		1219	632	.33	2.5	2.5	"	62	55	120	"	9
18 12-6		1225	638	.35	2.7	2.7	"	63	55	100	"	10.5
19 6-12		1231	643	.35	2.7	2.7	"	64	55	90	"	10.5
20 12-3		1237	649	.34	2.6	2.6	"	65	56	135	"	11
21 3-9		1244	655	.31	2.4	2.4	125	65	56	100	"	10
22 9-12		1250	660	.31	2.4	2.4	"	"	"	180	"	10
23 12-6		1256	665	.27	2.1	2.1	"	66	57	125	"	11.5
24	Too Close											

Area of III = 0.585

FIELD DATA

PLANT [redacted]
DATE [redacted]
SAMPLING LOCATION [redacted] K.V.S. Bull Mtl
SAMPLE TYPE [redacted]
RUN NUMBER 1
OPERATOR [redacted]
AMBIENT TEMPERATURE [redacted]
BAROMETRIC PRESSURE [redacted] 0
STATIC PRESSURE, (P_s) 30
FILTER NUMBER (s) [redacted]
Condensate = 54 ml

42 1/4" Stack I.D.

PROBE LENGTH AND TYPE 5' S-Type
NOZZLE I.D. [redacted]
ASSUMED MOISTURE, % [redacted]
SAMPLE BOX NUMBER [redacted]
METER BOX NUMBER [redacted]
METER $\Delta H_@$ [redacted]
C FACTOR [redacted]
PROBE HEATER SETTING [redacted]
HEATER BOX SETTING [redacted]
REFERENCE Δp [redacted]
Stack Gas T 300 F (Bar. = 13.5 in Hg)

ORSAT
0.0 % CO_2
21.0 % O_2
79.0 % N_2
0.0 % CO

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY [redacted] MINUTES [redacted] 8 min

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
		411.700									
1											
	4		0.12								
	8					110					
3						110					
4				0.15		110					
5	1121		0.11	0.18	0.18	112	42	44	3		
6						112					
7						112					
8						112					
9					0.16	114					
10						114					
11	1145	428.8	0.25			114					
12	1149	430.6	0.25	0.56	0.56	114	47	44	4		
13	1153	432.2	0.24	0.54	0.54	116	50	45	4		
14	1157	433.9	0.23	0.52	0.52	116	50	45	4		
15	1201	435.5	0.21	0.46	0.46	116	50	45	4	V	V
16	1205	437.1	0.19	0.43	0.43	116	51	46	3.5		

COMMENTS:

TRAVERSE POINT NUMBER	CLOCK TIME (24-hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	1235	437.1									
1	700 CLOSE	CLOSE 701.211									
2	1239	435.4	0.12	0.28	0.26	116	50	49	2.5	175	35
3	1243	439.7	0.14	0.32	0.32	116	50	49	3		
4	1247	444.3	0.16	0.37	0.37	116	50	47	3		
5	1251	448.6	0.18	0.41	0.41	116	51	50	3		
6	1255	453.3	0.20	0.46	0.46	116	51	52	5		
7	1259	—	0.21	0.48	0.46	116	51	53	3.5		
8	1303	462.5	0.23	0.53	0.53	117	51	50	3.5		
9	1307	467.2	0.24	0.55	0.55	117	51	49	4		
10	1311	471.7	0.23	0.53	0.53	117	51	50	4		
11	1315	476.3	0.22	0.53	0.53	117	51	48	4		
12	1319	480.8	0.23	0.53	0.53	116	51	49	4		
13	1323	—	0.21	0.48	0.48	116	51	49	4		
14	1327	490.2	0.19	0.44	0.44	116	51	49	3.5		
15	1331	494.8	0.18	0.41	0.41	116	51	49	3.5		
16	1335	499.3	0.16	0.37	0.37	116	51	49	3.5		
17	1339	461.600	0.12	0.28	0.28	116	51	49	3.5	Y	Y
18	700 CLOSE	CLOSE 461.600									

FIELD DATA

PLANT Occidental Chem. Co.
DATE 1-11-73
SAMPLING LOCATION Outlet
SAMPLE TYPE Multiwates
RUN NUMBER 2
OPERATOR J. Doller
AMBIENT TEMPERATURE 50
BAROMETRIC PRESSURE 30.20
STATIC PRESSURE, (P_s) 30
FILTER NUMBER (s) None
Condensate 2.1 ml

PROBE LENGTH AND TYPE 6'-Glass
NOZZLE I.D. 0.25
ASSUMED MOISTURE, % 5
SAMPLE BOX NUMBER 5
METER BOX NUMBER 3
METER $\Delta H_@$ 1.72
C FACTOR 0.68
PROBE HEATER SETTING 325
HEATER BOX SETTING
REFERENCE Δp 0.55
Silica Gel Wgt. = 18 gm

ORSAT
0.0% CO_2
21.0% O_2
0.0% CO
79% N_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 4 MINUTES, Total = 128 min.

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	1635	461.610									
1	Too close to port										
2	1639	464.9	0.17	0.29	0.28	115	50	49	4	175	35
3	1643	468.2	0.14	0.48	0.48	115	50	49	5		
4	1647	466.0	0.16	0.55	0.55	115	50	49	5		
5	1651	469.1	0.18	0.60	0.60	115	51	49	5		
6	1655	469.6	0.19	0.67	0.67	115	52	49	5		
7	1659	471.6	0.21	0.70	0.70	115	52	49	5		
8	1750	473.3	0.22	0.72	0.72	115	52	50	5		
9	1704	475.5	0.23	0.76	0.76	115	52	49	5		30
10	1708	477.3	0.24	0.80	0.80	115	52	49	5		
11	1712	479.4	0.23	0.76	0.76	115	50	49	5		
12	1806	481.5	0.24	0.80	0.80	115	51	49	5		
13	1810	483.7	0.23	0.76	0.76	115	51	49	5		
14	1814	485.9	0.21	0.70	0.70	115	51	49	5		
15	1818	488.3	0.20	0.67	0.67	115	51	49	4.5		
16	1822	490.1	0.15	0.51	0.50	115	51	49	4.5		
17	1826	490.8	0.14	0.48	0.45	115	51	48	4.5		
18	Too close to port										

COMMENTS: * Shut down. Inlet sample plugged. (1755)

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	[illegible]	[illegible]									
1	[illegible]	[illegible]	[illegible]								
[illegible]	1919	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2	[illegible]	[illegible]
3	[illegible]	423.6	0.[illegible]	[illegible]	[illegible]	115	[illegible]	[illegible]	4		
4	1927	[illegible]	[illegible]	0.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	1931	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	47	4		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.31	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	50[illegible].5	0.21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
10	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	1955	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
12	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4		
[illegible]	[illegible]	—	[illegible]	0.3[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	2011	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	—	[illegible]	0.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	2017	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]		[illegible]									

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FIELD DATA

PLANT
DATE
SAMPLING LOCATION
SAMPLE TYPE
RUN NUMBER
OPERATOR
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE 30.00
STATIC PRESSURE, (P_s) 30
FILTER NUMBER (s)
294 = 180
=56

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER
METER $\Delta H_@$
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp

0.0% O_2
21.0% Air
0.0% CO
79.0% N_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY ___ MINUTES

TRAVERSE POINT NUMBER	CLOCK TIME (24 hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
		514.100									
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

COMMENTS:

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	1155	549.7									
1	700 c	10									
2	1159	549.2	0.13	0.45		113					70
3	1203	551.0	0.18	0.62							
4	1207		0.18	0.60							
5	1211	554.7	0.21	0.72							
6	1215	556.7	0.23	0.78							
7	1219	558.9	0.24	0.81		115					
8	1223	560.3	0.15	0.52							
9	1227	563.2	0.23	0.78							
10	1231	—	0.24	0.81							
11	1235	567.1	0.24	0.81							
12	1239	569.1	0.23	0.78		116					
13	1243	—	0.23	0.78							
14	1247	573.0	0.20	0.69							
15	1251	575.0	0.19	0.64							
16	1255	577.3	0.15	0.51							
17	1259	579.320	0.15	0.51							
18	700 c										

APPENDIX C-1

SAMPLING PROCEDURES FOR ROCK DRYING TESTS

SAMPLING PROCEDURES FOR ROCK DRYING TESTS

Prior to performing the actual particulate emission tests, certain preliminary stack parameter data had to be determined for each source. This preliminary data included the stack diameter, number of sampling points, stack gas velocity, stack gas molecular weight, stack gas moisture, and stack gas temperature.

Sampling methods described in the Federal Register (Volume 36, Number 59, August 17, 1971, Washington, D.C.) were used as guidelines for determining stack parameter and stack emission data.

The number and location of the sample traverse points were selected according to Method No. 1 of the Federal Register. A maximum number of points had to be used for the inlet location.

Stack gas velocity measurements were determined across the stack diameter by using a calibrated S-type pitot tube with an inclined manometer (Method No. 2 of the Federal Register). Because of the apparent tangential flow in the discharge stack, preliminary velocity checks were made to try and determine the velocity magnitude. A standard and S-type pitot tube were both used to traverse the stack, and both were rotated 180° to detect any change in velocity head readings at each point. No appreciable difference could be detected; therefore, sampling was conducted by traversing the pitot tube and sampling nozzle in a vertical position during all tests.

The dry molecular weight of the stack gas was determined by collecting a grab sample in a plastic bag and then analyzing with an Orsat analyzer (Method No. 3 of the Federal Register).

The preliminary estimate of the stack gas moisture content was determined by using midget impingers for condensing the moisture (Method No. 4 of the Federal Register). On the day prior to performing the first emission tests, the preliminary moisture tests were made while the dryer was operating on natural gas. After the first emission tests had been completed, it was learned that the dryer was operating on fuel oil. This resulted in a greater moisture content than was estimated, and also a greater deviation from the isokinetic sampling rate. The remaining fluoride emission tests were performed while the dryer was using natural gas.

Fluoride emissions were determined by using the following train: stainless steel nozzle; a glass-lined, heated probe; three Greenburg-Smith impingers (the first one had a modified tip with 100 ml of H_2O, and the second one had a standard tip with 100 ml of H_2O, and the third one had a modified tip and dry); a Whatman No. 1 filter (90 mm diameter) in a glass holder; a Greenburg-Smith impinger with a modified tip and 200 grams of silica gel; and the remainder of the train was identical to the particulate train described later in this section. Figure C-1 is a schematic diagram of the fluoride train used.

Fluoride emissions captured in the sample train were recovered by putting the used impinger contents and filter into a 32 oz. polyethylene jar, along with a water rinse of the entire train between the nozzle tip and back half of the filter holder.

Before each test run, the particulate and fluoride sample trains were leak checked at a vacuum of 15 inches Hg for most tests. The flow rates in each leak test was well below the allowed 0.02 cubic feet per minute. The tests inadvertently excluded from the leak test were mentioned previously in the section entitled, "Sampling and Analytical Procedures."

Velocity measurements were conducted at each traverse point during all emission tests so that isokinetic sampling conditions could be maintained.

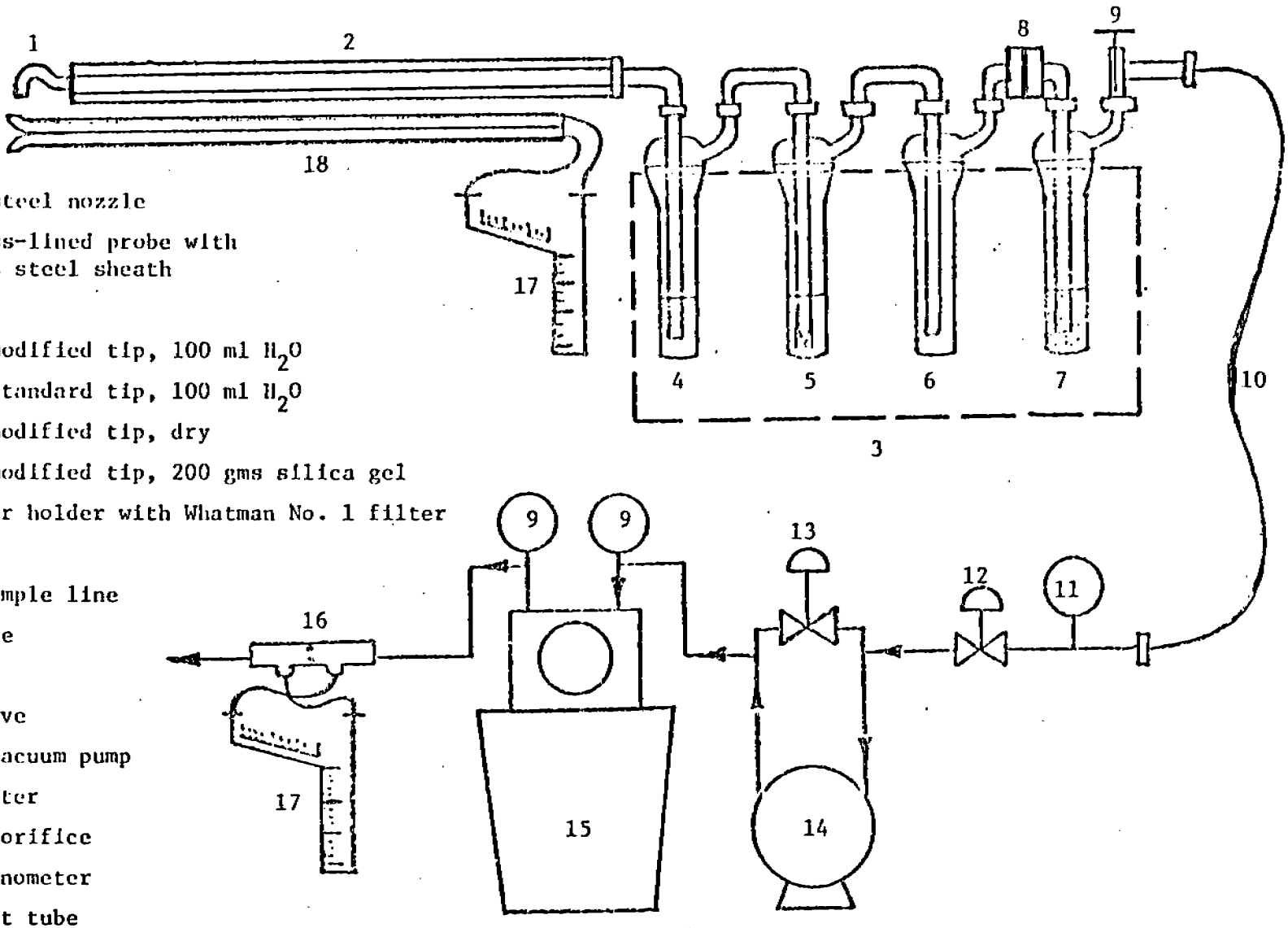
Periodically during each fluoride emission test run, grab samples were collected in polyethylene jars of the following: scrubber inlet liquid; scrubber outlet liquid; rock feed into drying process; finished rock product; and one sample of the cooling pond rock was collected. Data sheets for the scrubber liquid grab samples are contained in Appendix B-1.

The following sample train was used for determining particulate emissions: stainless steel nozzle; a glass-lined, heated probe; a glass cyclone and flask for the inlet only; a Gelman Type A glass-fiber filter in a glass holder; four Greenburg-Smith impingers (the first one had a modified tip with 100 ml of H_2O, the second one had a standard tip with 100 ml of H_2O, the third one had a modified tip and dry, and the fourth one had a modified tip with 200 grams of silica gel); a thermometer on the last impinger; a flexible sample line; an air-tight vacuum pump; a dry-test meter; and finally, a calibrated

orifice with an inclined manometer. The impinger portion of the train was iced down to collect the condensable moisture in the stack gas. A schematic diagram of the train is shown in Figure C-1.

The standard procedure for recovering the particulate captured in the front half of the train was to use a brush and then an acetone rinse. In addition to the brushing and acetone rinsing, the front half was also rinsed with water. The use of water was deemed necessary by the EPA project test officer to remove the water soluble particulate. The remainder of the train was treated as described in the August Federal Register.

EPA was responsible for conducting all laboratory analyses (see Appendix D-1).



1. Stainless steel nozzle
2. Heated glass-lined probe with stainless steel sheath
3. Ice bath
4. Impinger, modified tip, 100 ml H_2O
5. Impinger, standard tip, 100 ml H_2O
6. Impinger, modified tip, dry
7. Impinger, modified tip, 200 gms silica gel
8. Glass filter holder with Whatman No. 1 filter
9. Thermometer
10. Flexible sample line
11. Vacuum Gauge
12. Main valve
13. By-pass valve
14. Air-tight vacuum pump
15. Dry test meter
16. Calibrated orifice
17. Inclined manometer
18. S-type pitot tube

PROPOSED EPA METHOD 13 FLUORIDE SAMPLING TRAIN

FIGURE C-1

APPENDIX C-2

SAMPLING PROCEDURES FOR ROCK GRINDING TESTS

SAMPLING PROCEDURES FOR ROCK GRINDING TESTS

Prior to performing the actual particulate emission tests, certain preliminary stack parameter data had to be determined for each source. This preliminary data included the stack diameter, number of sampling points, stack gas velocity, stack gas molecular weight, stack moisture, and stack gas temperature.

Sampling methods described in the Federal Register (Volume 36, Number 59, August 17, 1971, Washington, D.C.) were used as guidelines for determining stack parameter and stack emission data.

The number and location of the sample traverse points were selected according to Method 1 of the Federal Register. A maximum number of points had to be used for the inlet location.

Stack gas velocity measurements were determined across the stack diameter by using a calibrated S-type pitot tube with an inclined manometer (Method 2 of the Federal Register).

The dry molecular weight of the stack gas was determined by collecting a grab sample of the stack gases in a plastic bag and then analyzing with an Orsat analyzer (Method 3 of the Federal Register).

The preliminary estimate of the stack gas moisture content was determined by using midget impingers for condensing the moisture (Method 4 of the Federal Register).

The following sample train was used for determining particulate emissions: stainless steel nozzle; a glass-lined, heated probe;

a glass cyclone and flask for the inlet only; a Gelman Type A glass-fiber filter in a glass holder; four Greenburg-Smith impingers (the first one had a modified tip with 100ml of H_2O, the second one had a standard tip with 100ml of H_2O, the third one had a modified tip and dry, and the fourth one had a modified tip with 200 grams of silica gel); a thermometer on the last impinger; a flexible sample line; an air-tight vacuum pump; a dry-test meter; and finally, a calibrated orifice with an inclined manometer. The impinger portion of the train was iced down to collect the condensable moisture in the stack gas. A schematic diagram of the train is shown in Figure C-2.

The velocity head at each traverse point was measured so that isokinetic sampling could be performed.

For the third test run on the inlet sampling, the train configuration modifications were the following:

1. Sample traverse point #2

   The cyclone was not heated, and was followed by two modified-tip impingers with 150ml H_2O in each, a standard-tip impinger with 150ml H_2O, a dry impinger with a modified tip, and then the filter.

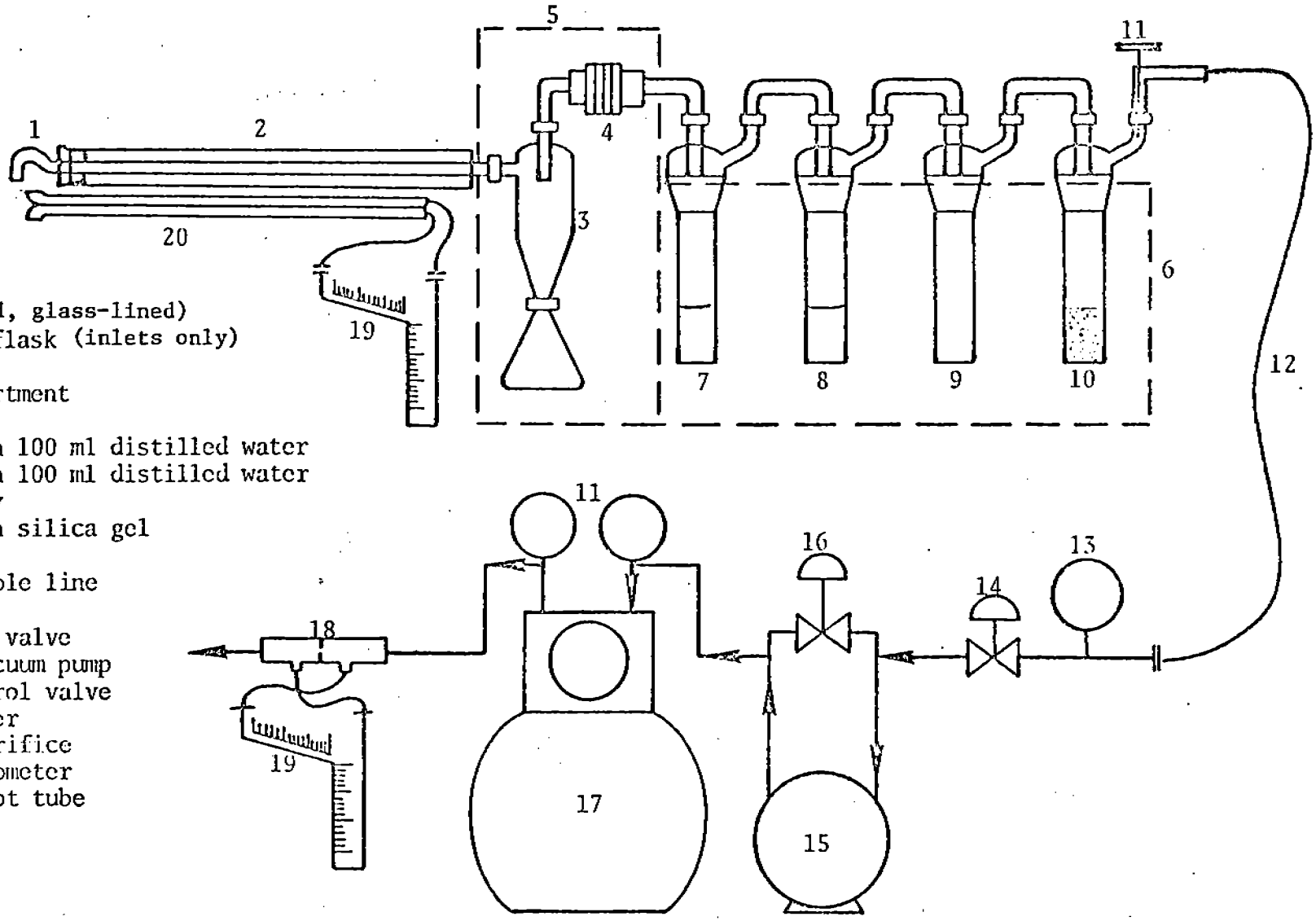
2. Sample traverse points #3 - #12

   Same as point #2, except the standard-tip impinger was removed.

3. Sample traverse points #13 - #23

   Another modified-tip impinger with 150ml H_2O was added in front of the dry impinger.

1. Nozzle
2. Probe (heated, glass-lined)
3. Cyclone and flask (inlets only)
4. Filter
5. Heated compartment
6. Ice bath
7. Impinger with 100 ml distilled water
8. Impinger with 100 ml distilled water
9. Impinger, dry
10. Impinger with silica gel
11. Thermometer
12. Flexible sample line
13. Vacuum gauge
14. Main control valve
15. Air tight vacuum pump
16. By-pass control valve
17. Dry test meter
18. Calibrated orifice
19. Inclined manometer
20. "S" type pitot tube



EPA PARTICULATE SAMPLING TRAIN

FIGURE C-2

The modified train configuration was suggested by the EPA test officer for the purpose of lessening the chance of plugging up the filter. The procedure for correcting the data so that a comparison could be made between Run Nos. 1 and 2 and Run No. 3 is included in Appendix A-2.

Because of the excessive emissions, severe plugging of the 1/4-inch nozzle being used for the inlet sampling location was a problem. A 3/8-inch nozzle was used, at the suggestion of the EPA test officer, after sampling only one traverse point for Run No. 1. After doing so, isokinetic sampling could not be maintained. During the inlet sampling, an attempt to loosen the material in the nozzle and probe was made by drawing ambient air through the sample train. This was the reason for subtracting the dry gas meter readings shown on the field data sheets for Run Nos. 1 and 2.

Grab samples of the rock feed in and the product out were collected in polyethylene jars during each test.

EPA was responsible for performing all laboratory analyses (see Appendix D-2).

APPENDIX D-1

LABORATORY REPORT FOR ROCK DRYING TESTS

(Must be filled out for each test run)

Sampling Date 72 | 12 | 19 (Yr. | Mo. | Day)

First Ident. No. Used 72-005-553

Last Ident. No. Used 72-005-554

Test No. [illegible]

Run No. 1

RECD.

RCRD: 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

UNIT PROCESS/OPERATION Rock Drying Operation

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Venturi scrubber

COPIES TO

ADDRESS White Springs, Fla.

FUEL USED Fuel Oil

P. O.

LAB.

SAMPLING METHOD Fluorides, P_2O_5

INLET ☒

OUTLET ☐

GAS VOLUME SAMPLED (METER VOL. IN FT^3)

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested - General Co... (approx. concentrations-possible inter... etc.) (Indicate specific analysis on bri...
72-005-553	Impinger Catch & Wash Water (2 Bottles)		1600	Fluorides, P_2O_5
554	Scrubber Water (Inlet)		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Laurel Sanders

REQUEST REVIEWED BY [signature] 1/30/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements

ppm - for solid samples

µg/ml - for liquid samples

Mark (X) for specific analysis requested

Mark (X) in block to left of Ident. No. requesting all analysis on that line

Ident. No.	Al	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg		

Analysis Method: 1-NAA, 2-GSMS, 3-OES, 4-AA, 5-ISV, 6-XRF, and 7- other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis

Ident. No.	SiO_2 (Sol)	SiO_2 (Insol)	SiO_2 (Tot)		P_2O_5 (Sol)	P_2O_5 (Insol)	P_2O_5 (Tot)				
X 553	X 14.4 mg	X 19.9 mg	X 34.3 mg		86.1 mg	150.0 mg	236.1 mg				
X 554			X 0.4 mg/L			<	< 0.01 mg/mL				
Analyst	AR + JM	AR + JM	AR + JM		[illegible]	[illegible]	[illegible]				
Checked											

Comments: _____

(Must be filled out for each test run)

Sampling Date 72 | 12 | 19 (Yr. | Mo. | Day)

First Ident. No. Used 72-005-555

Last Ident. No. Used 72-005-556

Test No. ~~72-FRT-~~

Run No.

RECD. 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

UNIT PROCESS/OPERATION Rock Drying Operation

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Venturi scrubber

FUEL USED Fuel Oil

ADDRESS White Springs, Fla.

INLET ☐

P. O.

LAB.

SAMPLING METHOD Fluorides, P_2O_5

OUTLET ☒

GAS VOLUME SAMPLED (METER VOL. IN FT^3)

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested - General Comments (approx. concentrations-possible interferences, etc.) (Indicate specific analysis on last run)
72-005-555	Impinger Contents + Wash H_2O (2 Bottles)		1190	Fluorides, P_2O_5
556	2 Scrubber H_2O		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Lamiel Sanders

REQUEST REVIEWED BY [signature] 1/31/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (x) for specific analysis requested
Mark (X) in block to left of Ident. No. requesting all analysis on that line

Ident. No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Mo	Analysis

Analysis Methods: 1-[illegible], 2-GSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7- other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis

	Ident. No.	SPhos (Sol)	SPhos (Insol)	SPhos (Tot)		P_2O_5 (Sol)	P_2O_5 (Insol)	P_2O_5 (Tot)					
X	555	X 1.2 mg	X <0.06 mg	X 1.2 mg		2.4 mg	0.06 mg	2.4 mg + 0.15 mg/ml					
X	556			X 0.4 mg/L									
	Init.	AR + JM	AR + JM	AR + JM		Error	Error	Error					
	Check												

Comments: _____

(Must be filled out for each test run)

Sampling Date Yr. 72 | Mo. 12 | Day 00

First Ident. No. Used 72-005-557

Last Ident. No. Used 72-005-558

Test No. 72-FRT-2

Run No. 2

RECD. 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD Fluorides, P_2O_5

UNIT PROCESS/OPERATION Rock Drying

AIR POLLUTION CONTROL Venturi scrubber

FUEL USED Natural Gas

INLET ☒

OUTLET ☐

GAS VOLUME SAMPLED (METER VOL. IN FT^3)

COPIES TO

P. O.

LAB.

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) gm	Sample Vol. (Liquid) ml	Analysis Requested - General Comments (approx. concentrations-possible interferences, etc.) (Indicate specific analysis on back)
72-005-557	Impinger Contents + Wash Water (2 Bottles)		2260	Fluorides, P_2O_5
558	Scrubber Water		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Launie Sanders

REQUEST REVIEWED BY [signature] 1/30/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (x) for specific analysis requested
Mark (X) in block to left of Ident. No. requesting all analysis on that line

Ident. No.	Hg	Ge	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	[illegible]	[illegible]

Analysis Method: 1-[illegible], 2-GCMS, 3-GMS, 4-AA, 5-[illegible]V, 6-XRF, and 7- other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis

Ident. No.	[illegible] (ppm)	[illegible] (ppm)	[illegible] (ppm)		[illegible] (Sol)	[illegible] (Insol)	[illegible] (Tot)				
Y 557	X 1.5 mg	X 38.7 mg	X 40.4 mg		7.10 mg	340.00 mg	347.10 mg				
Y 558			0.4 mg/L				<0.01 mg/ml				
[illegible]	AR + JM	AR + JM	AR + JM		[illegible]	[illegible]	[illegible]				
[illegible]											

Comments: _____

(Must be filled out for each test run)

Test No. ~~73-FRT-2~~

Sampling Date 72 | 12 | 20 (Yr. | mo. | day)

First Ident. No. Used 72-005-559

Last Ident. No. Used 72-005-560

Run No. 2

RECD.

RCPD.

INDUSTRY Phosphate Fertilizer (Use Table A)

UNIT PROCESS/OPERATION Rock Drying Operation

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Venturi scrubber

COPIES TO

ADDRESS White Springs, Fla

FUEL USED Natural Gas

P. O.

LAB.

SAMPLING METHOD Fluorides, P_2O_5

INLET ☐

OUTLET ☒

GAS VOLUME SAMPLED (METER VOL. IN FT³)

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested - General Comments (approx. concentrations-possible interferences, etc.) (Indicate specific analysis on back)
72-005-559	Impinger Catch and Wash H_2O (2 Bottles)		1210	Fluorides, P_2O_5
560	Scrubber H_2O		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Lamar Sanders

REQUEST REVIEWED BY GAL 1/3/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (x) for specific analysis requested
Mark (X) in block to left of Meat. ... requesting all analysis on that ...

Meat. No.	Hg	Ce	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg		

Analysis Method: 1-[illegible], 2-[illegible], 3-[illegible], 4-AA, 5-ICP, 6-XRF, and 7- other

Comments:

Other Analysis - Use Table B to fill analysis requested (above or ... column)

Mark (x) for specific analysis:

	Meat. No.	SPARUS (Sm)	SPARUS (Imm)	SPARUS (Ad)		BOs (Sol)	BOs (Imm)	BOs (Tot)				
X	559	☒ 0.5 mg	☒ 0.6 mg	☒ 1.1 mg		2.30 mg	0.30 mg	2.60 mg				
X	560			☒ 2.7 mg/L				0.72 mg/L				
	Analyst	AR + JM	AR + JM	AR + JM		[illegible]	[illegible]	[illegible]				
	Method											

Comments:

(Must be filled out for each test run)

Sampling Date 72 | 12 | 20 (Yr. | Mo. | Day)

First Ident. No. Used 72-005-561

Last Ident. No. Used 72-005-562

Test No. ~~72-FR-2~~

Run No. 3

RECD. 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD Florida, P2O5

UNIT PROCESS/OPERATION Rock Drying Operation

AIR POLLUTION CONTROL Venturi scrubber

FUEL USED Natural Gas

INLET ☒

OUTLET ☐

GAS VOLUME SAMPLED (METER VOL. IN FT^3)

COPIES TO

P. O.

LAB.

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested - General Comments (approx. concentrations-possible interferences, etc.) (Indicate specific analysis on back)
72-005-561	Impinger Contents + Wash Water (2 Bottles)		1910	Fluorides, P2O5
562	Impinger H2O		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Laurel Snider

REQUEST REVIEWED BY [illegible] 1/30/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (x) for specific analysis requested
Mark (X) in block to left of Client No. requesting all analysis on that line

Client No.	Hg	Ge	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg		Analysis Req'd

Analysis Methods: 1-ICP, 2-ICP/MS, 3-GFAA, 4-FAA, 5-HYDV, 6-CVAA, and 7- other

Comments:

Short Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis

Client No.	SPARUS (Sol)	SPARUS (Insol)	SPARUS (Tot)		B_2O_3 (Sol)	B_2O_3 (Insol)	B_2O_3 (Tot)				
X 561	X 1.3 mg	X 34.5 mg	X 36.1 mg		4.20 mg	287.50 mg	291.70 mg				
/ 562			X 0.4 mg/L				0.00 mg/mL				
H.G.	AR + JM	AR + JM	AR + JM		[signature]	[signature]	[signature]				

Comments: _____

(Must be filled out for each test run)

Sampling Date 72 | 12 | 20 (Yr. | Mo. | Day)

First Ident. No. Used 72-005-563

Last Ident. No. Used 72-005-564

Test No. ~~F3-FRL-2~~

Run No. 3

RECD. 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

COMPANY Occidental Chemical Co.

ADDRESS Inlet Harbor, Fla.

SAMPLING LOCATION Florida, P2O5

SAMPLING METHOD

UNIT PROCESS/OPERATION Rock Dryers Operation

AIR POLLUTION CONTROL Venturi scrubber

FUEL USED

INLET ☐

OUTLET ☒

GAS VOLUME SAMPLED (METER VOL. IN FT³)

COPIES TO Natural Gas P. O.

LAB.

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested - General Comments (approx. concentrations-possible interferences, etc.) (Indicate specific analysis on back)
72-005-563	Impinger Contents + Wash (Water) (2 Bottles)		1100	Fluorides, P_2O_5
564	Desiccator H_2O		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Laurel Sanders

REQUEST REVIEWED BY [illegible] 1-30-73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (X) for specific analysis requested
Mark (X) in block to left of Ident. No. representing all analysis on that line

Ident. No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	~	[illegible]

Analysis Methods: 1-[illegible], 2-[illegible], 3-[illegible], 4-AA, 5-[illegible], 6-[illegible], and 7- other

Comments:

Other Analysis - Use Table 6 to fill analysis requested (above each column)

Mark (x) for specific analysis

Ident. No.	SPANS (Sol)	SPANS (Insol)	SPANS (Tot)		P_2O_5 (Sol)	P_2O_5 (Insol)	P_2O_5 (Tot)				
X 563	X 0.4 mg	X 0.4 mg	X 0.8 mg		2.10 mg	4.10 mg	6.50 mg				
X 564			X 1.5 mg/L				0.52 mg/ml				
Analyst	AR + JM	AR + JM	AR + JM		SJW	SJW	SJW				
Method											

Comments:

(Must be filled out for each test run)

Sampling Date 72 | 12 | 20 (Yr. | Mo. | Day)

First Ident. No. Used 72-005-572

Last Ident. No. Used 72-005-573

Test No. [redacted]

Run No. —

RECD.

RCRD 2-2-73

INDUSTRY Phosphate Fertilizer (Use Table A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD Fluorides – Bomb Dist.

UNIT PROCESS/OPERATION Rock Drying Operation

AIR POLLUTION CONTROL Venturi scrubber

FUEL USED

INLET ☐ N/A

OUTLET ☐

GAS VOLUME SAMPLED (METER VOL. IN FT³)

COPIES TO N/A

P. O.

LAB.

FILED

Ident. No.	Description of Sample or Sample Fraction	Sample Wt. (Solid) mg	Sample Vol. (Liquid) ml	Analysis Requested – General (approx. concentrations-possible in... etc.) (Indicate specific analysis on ...)
72-005-572	Distilled H_2O Blank		N/A	Fluorides, P_2O_5
573	Filter Blank		N/A	" "

COMMENTS:

SAMPLING CONTRACTOR Environmental Engineering (if applicable)

PROJECT OFFICER Laurel Sanders

REQUEST REVIEWED BY [signature] 1/30/73

DATE ANALYSIS REQUESTED 1-30-73

REPORT OF ANALYSIS

Trace Elements
ppm - for solid samples
µg/ml - for liquid samples

Mark (x) for specific analysis requested
Mark (X) in block to left of Ident. No. if requesting all analysis on that line

Ident. No.	Ag	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	—	Other (List)

Analysis Needed: 1-[illegible], 2-GFAA, 3-ICP, 4-AA, 5-HGA, 6-XRF, and 7- other

Comments:

Other Analysis - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident. No.	Sample (ml)		TLC Total									
1 592	X	<0.1mg	0.00mg/cm									
X 593	X	<0.06mg	0.05mg									
115	AR + JM		[illegible]									

Comments:

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

73-ROC-3

TEST NO ~~73-ROC-5~~

SAMPLING DATE 72 (YR) 12 (MO) 20 (DAY)

FIRST IDENT. NO. USED 72-005-565

LAST IDENT. NO. USED 72-005-570

RUN NO —

RECD.

RCRD. 2-2-73

INDUSTRY PHOSPHATE FERTILIZER (USE TABLE A)

COMPANY OCCIDENTAL CHEMICAL Co.

ADDRESS WHITE SPRINGS, FLA.

SAMPLING METHOD FLUORIDES - FEED & PRODUCT ROCKS

UNIT PROCESS OPERATION ROCK DRYING OPERATION

AIR POLLUTION CONTROL N/A

FUEL USED N/A

☐ INLET ☐ OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³) N/A

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FILE

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
72-005-565	ROCK DRYER FEED ROCK (RUN 1)		N/A	FLUORIDES, TRACE METALS, MERCURY
566	" " " " (RUN 2)		N/A	" " " "
567	" " " " (RUN 3)		N/A	" " " "
568	ROCK DRYER PRODUCT (RUN 1)		N/A	FLUORIDES, TRACE METALS, MERCURY
569	" " " (RUN 2)		N/A	" " " "
570	" " " (RUN 3)		N/A	" " " "
571	Cooling Pond Rock		N/A	FLUORIDES

COMMENTS:

SAMPLING CONTRACTOR ENVIRONMENTAL ENGINEERING (IF APPLICABLE)

PROJECT OFFICER LAUNEIL SANDERS

REQUEST REVIEWED BY GWS 1/30/73

DATE OF REQUEST

DATE ANALYSIS REQUESTED 1-30-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

[redacted] TRACE ELEMENTS

ppm - for solid samples
ug/ml - for liquid samples

Mark [redacted] specif [redacted]
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

	Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					Analyst's Initial
X	565																															
X	566																															
X	567																															
X	568																															
X	569																															
X	570																															

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments: Hg by NAA

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

	Ident No.		SPARK (mg/g)	SPARK (TOT)								
X	565		X 39.1 mg/gm	X 39.1 mg/gm								
X	566		X 42.9 mg/gm	X 42.9 mg/gm								
X	567		X 42.2 mg/gm	X 42.2 mg/gm								
X	568		X 42.5 mg/gm	X 42.5 mg/gm								
X	569		X 44.7 mg/gm	X 44.7 mg/gm								
X	570		X 39.4 mg/gm	X 39.4 mg/gm								
X	571		X 192 mg/gm	X 192 mg/gm								
Analyst			AR + JM	AR + JM								
Method												

Comments:

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

73-ROC-3

TEST NO [redacted]

RUN NO —

RECD. } 2-6-73
RCRD }

SAMPLING DATE: 73 (YR) | 1 (MO) | 11 (DAY)

FIRST IDENT. NO. USED: 73-003-059

LAST IDENT. NO. USED: 73-003-060

INDUSTRY: Phosphate Fertilizer (USE TABLE A)

COMPANY: Occidental Chemical Co.

ADDRESS: White Springs, Fla.

SAMPLING METHOD: N/A

UNIT PROCESS OPERATION: Rock Grinding

AIR POLLUTION CONTROL: Micro Pulsaire Baghouse

FUEL USED: N/A

☐ INLET ☐ OUTLET GAS VOLUME SAMPLED (METER VOL IN FT³): N/A

COPIES TO
P. O.
LAB.
FILE

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
73-003-059	Feed Phosphate Rock		N/A	Trace Metals, Hg, Fluorides
060	Ground Rock Product		N/A.	" " " "

COMMENTS:

SAMPLING CONTRACTOR: Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER: Samuel Sanders

REQUEST REVIEWED BY: [signature] 2/2/73

DATE OF REQUEST: 2-2-73

DATE ANALYSIS REQUESTED: 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

REPORT OF ANALYSIS
TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

Mark (x) for specific analysis
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Trace Metals Hg

	Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					Analyst's Initial
X	059																															
X	060																															

Analysis Method: 1-NAA, 2-SCMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments: Hg by CVAA

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	SPARKS - INSOL. F -	SPARKS - TOTAL F -										
13-003-059	X 46.0 mg/gm	X 46.0 mg/gm										
13-003-060	X 41.0 mg/gm	X 41.0 mg/gm										
Analyst —	AR + JM	AR + JM										
Method												

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

73-RCC-3

SAMPLING DATE 72 (YR) 12 (MO) 22 (DAY)

FIRST IDENT. NO. USED 72-005-575

LAST IDENT. NO. USED 72-005-580

TEST NO ~~73-RCC-2~~

RUN NO 1

RECD. 2-6-73

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD EPA 5 Mass

UNIT PROCESS OPERATION Rock Dryer

AIR POLLUTION CONTROL Wet Scrubber

FUEL USED Natural Gas

(X) INLET ( ) OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
72-005-575	Particulate Front Half (cyclone water wash)	16.7 (822)	470	Mass	Storage
576	Particulate Front Half Acetone	1,054.1	410	"	"
577	Filter	142.6	—	"	"
578	Impinger Contents plus H₂O wash	-7.2 (18.9)	790	"	"
579	Particulate Back Half Acetone	6.5	115	"	"
580	Organic Extraction (Train)	13.7	250	Mass	"

COMMENTS: #578 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride; #575 was not extracted but was simply evaporated at 70°C.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Lawrence Sanders

REQUEST REVIEWED BY [signature] 2/2/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA:OUR)245

[redacted]

PORT[illegible]ANAL
TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

...ark (x ... pecif... ysis
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					Analyst Initials

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5 ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	Mn	Org. Mn											
72-005-575	X	26.7 mg											
576	X	10.24.1 mg											
577	X	112.6 mg											
578	X	- 7.2 mg											
579	X	6.5 mg											
580			X	13.7 mg									
Analyst	J.T.K.		J.T.K.										
Method	[illegible]		#5										

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE: 72 (YR) 12 (MO) 22 (DAY)

FIRST IDENT. NO. USED: 72-005-581

LAST IDENT. NO. USED: 72-005-586

TEST NO 73-[illegible]

RUN NO 1

RECD. } 2-6-73
RCRD }

INDUSTRY: Phosphate Fertilizer (USE TABLE A)

UNIT PROCESS OPERATION: Rock Drying

COMPANY: Occidental Chemical Co.

AIR POLLUTION CONTROL: Wet Scrubber

COPIES TO

ADDRESS: White Springs, Fla.

FUEL USED: Natural Gas

P. O.

SAMPLING METHOD: EPA - 5 Mass

☐ INLET ☒ OUTLET

LAB.

GAS VOLUME SAMPLED (METER VOL IN FT³)

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
72-005-581	Particulate Front Half H_2O	5.3 ~~(150)~~	275	Mass	Storage
582	Particulate Front Half Acetone	182.3	420	"	"
583	Filter	23.3	—	"	"
584	Impinger Water plus Water Wash	-20.4 (20)	880	"	"
585	Particulate Back Half Acetone	6.3	145	"	"
586	Organic Extraction of Front	4.1	280	Mass	"

COMMENTS: *584 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride, *581 was not extracted but was simply evaporated at 70°C.

SAMPLING CONTRACTOR: Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER: Laurel Sanders

REQUEST REVIEWED BY: [signature] 4/3/73

DATE OF REQUEST: 2-2-73

DATE ANALYSIS REQUESTED: 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

[redacted]

'ORT HALY
TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

...k (x) ... specific ... ysis
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table II to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.																															
72-005-581	X	Mn 5.3 +2.4 mg	X	Org. Mass 4.1 mg.																											
582	X	182.3 mg																													
583	X	23.3 mg																													
584	X	-20.4 mg																													
585	X	6.3 mg.																													
586			X	4.1 mg.																											
[illegible]		J. T. X.		J. T. X.																											
[illegible]		#1-5		#5																											

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 (YR) 1 (MO) 9 (DAY)

FIRST IDENT. NO. USED 3-73-003-001

LAST IDENT. NO. USED 5-73-003-005

TEST NO 73-~~FPP~~-2

RUN NO 2

RECD. 2-6-73

INDUSTRY Phosphate Fertilizer (USE TABLE A)

UNIT PROCESS OPERATION Rock Drying

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Wet Scrubber

ADDRESS White Springs, Fla.

FUEL USED Fuel Oil

(X) INLET [ ] OUTLET

SAMPLING METHOD EPA 5 Mass

GAS VOLUME SAMPLED (METER VOL IN FT³)

COPIES TO
P. O.
LAB.
FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
3-003-001	Particulate Front Half Acetone	415.5	500	Mass Storage
002	Filter	74.7	—	" "
003	Impinger Contents plus H₂O Wash	34.5 (584)	725	" "
004	Organic Extraction	1.6	240	" "
005	Particulate Back Half Acetone	5.0	175	" "

COMMENTS: *003 was extracted in the usual manner, then evaporated at 20°C to prevent the loss of any fluoride.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Samuel Sanders

REQUEST REVIEWED BY [signature] 3/5/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA1DUR1245

[redacted] ORT [redacted] JALY

TRACE ELEMENTS

ppm - for solid samples

ug/ml - for liquid samples

[redacted] k (x) [redacted] ecific [redacted] sis

Mark (x) in block to left of Ident. No. when requesting all analysis on that line

* Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					[redacted]

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-AGV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.		Mass	Org Mass									
273002-001	X	115.5mg.										
002	X	74.7mg										
003	X	34.5mg										
004	X		X	1.6 mg								
005	X	5.0mg										
Project		G.T.X.	G.T.X.									
Method		4.5	4.5									

Comments:

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 | 1 | 9 (YR | MO | DAY)

FIRST IDENT. NO. USED S-73-003-006

LAST IDENT. NO. USED S-73-003-011

TEST NO 73 ~~FT~~ 2

RUN NO 2

RECD. } 2-6-73
RCRD }

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD EPA-5 Mass

UNIT PROCESS OPERATION Rock Drying

AIR POLLUTION CONTROL Wet Scrubber

FUEL USED Fuel Oil

☐ INLET (X) OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

COPIES TO

P.-O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
S-73-003-006	Particulate Front Half H₂O	0.2 (7.3)	275	Mass Strays
007	Particulate Front Half Acetone	3.3	220	" "
008	Fluoride	35.1	—	" "
009	Impingers and Water Wash	18.3 (47.3)	880	" "
010	Organics Extractable from Aq	1.8	280	" "
011	Particulate Back Half Acetone	4.4	155	" "

COMMENTS: #009 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride; #010 was not extracted but was simply evaporated at 70°C

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Launcil Sanders

REQUEST REVIEWED BY GS 2/2/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

[redacted] OF [redacted] YSIS [redacted]

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

[redacted] If [redacted] ic [redacted]
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Co	Si	Mg	Ba					Analyst Initials

Analysis Method: 1-NAA, 2-ISMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.		Mass		Org Mass																											
2-73-003-006	X	[illegible]																													
007	X	31.2 mg																													
008	X	35.1 mg																													
009	X	18.3 mg																													
010	[illegible]			X	1.8 mg																										
011	X	4.4 mg																													
Analyst		J.T.K.		J.T.K.																											
Method		[illegible] 1+5		#5																											

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 (YR) 1 (MO) 9 (DAY)

FIRST IDENT. NO. USED S-73-003-012

LAST IDENT. NO. USED S-73-003-017

TEST NO 73-~~FRT~~-3

RUN NO 3

RECD. } 2-6-73
RCRD. }

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD EPA 5 Mod

UNIT PROCESS OPERATION Rock Drying

AIR POLLUTION CONTROL Wet Scrubber

FUEL USED Fuel Oil

(X) INLET ( ) OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

COPIES TO
P. O.
LAB.
FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
-003-012	Particulate Front Half H2O	86.4 (89.5)	155	Mass Storage
013	Particulate Front Half Acetone	1,135.2	625	" "
014	Filter	113.0	—	" "
015	Impinger Contents and Water Wash	47.2 (74?)	340	" "
016	Organic Fraction	5.0	280	" "
017	Particulate Back Half Acetone	2.3	90	" "
	TOTAL	1419.9 mg		

COMMENTS: *Org was extracted in the usual manner then evaporated at 70°C to prevent the loss of any fluoride; *Inorg was not extracted but was simply evaporated at 70°C

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Samuel Sanders

REQUEST REVIEWED BY [illegible] 2/3/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA:DUR:245

[redacted] OF [redacted]YSIS [redacted]

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

[redacted]n F [redacted]c :
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					

Analysis Method: 1-NAA, 2-ICPMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	[illegible]	Org. Mass											
S-73-003-012	X	82.4 mg											
013	X	1,135.0 mg											
014	X	113.0 mg											
015	X	47.2 mg											
016	X		X	5.0 mg.									
017	X	2.3 mg.											
[illegible]:		G. T. K.		G. T. K.									
[illegible]:		[illegible]		#5									

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE: 73 (YR) | 1 (MO) | 9 (DAY)

FIRST IDENT. NO. USED: S-73-003-018

LAST IDENT. NO. USED: S-73-003-021

TEST NO: 73-~~FT-2~~

RUN NO: 3

RECD.: 2-6-73

RCRD.:

INDUSTRY: Phosphate Fertilizer (USE TABLE A)

COMPANY: Occidental Chemical Co.

ADDRESS: White Springs, Fla.

SAMPLING METHOD: EPA 5 Mass

UNIT PROCESS OPERATION: Rock Drying

AIR POLLUTION CONTROL: Wet Scrubber

FUEL USED: Fuel Oil

[ ] INLET (X) OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³):

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
73-003-018	Particulate Front Half Acetone	40.7	440	Mass Strays
019	Filter	5.0	—	Mass "
020	Impingers and Water Wash *	—	—	— "
021	Particulate Back Half Acetone	2.0	185	Mass "

COMMENTS: * This sample was lost due to breakage in its shipment from White Springs, Fla. to NEPC

SAMPLING CONTRACTOR: Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER: Samuel Sanders

REQUEST REVIEWED BY: [illegible] 3/4/73

DATE OF REQUEST: 2-2-73

DATE ANALYSIS REQUESTED: 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

[redacted] for [redacted]

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

Mark (x) in block to left of Ident. No. when requesting all analysis on that line -

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba				

Analysis Method: 1-NAA, 2-ICPMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.												
	Mass											
S-73-003-013	X 40.7 mg											
017	X 50 mg											
020	X [illegible]											
021	X 2.0 mg											
Project	J. T. K.											
[illegible]	# 5											

[illegible]

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 72 (YR) 12 (MO) 23 (DAY)

FIRST IDENT. NO. USED 72-005-587

LAST IDENT. NO. USED 72-005-589

TEST NO 73-~~[illegible]~~-2

RUN NO 1

RECD. 2-6-73

INDUSTRY Phosphate Fertilizer (USE TABLE A)

UNIT PROCESS OPERATION Rock Drying

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Wet Scrubber

ADDRESS White Springs, Fla.

FUEL USED N/A

P. O.

SAMPLING METHOD EPA 5 Mass

[ ] INLET [ ] OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³) N/A

LAB.

FILE

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
72-005-587-A	Filter & Wash Probe	15.5*	465	Mass/Strategy
588	Acetone Blank	3.8	510	" "
589	Filter Blank	—	—	" "
72-005-587-B	Chloroform-Ether Blank (extract of #587-A)	0.9	150	"

* This amount is three to four times the usual or average water blank - the residue appeared to be contaminated with many small fiber-particle, glass fibers - which did not appear to be in the water sample fractions. This high blank was subtracted from the sample weight. Filters were dried & both dried and after blank corrected.

COMMENTS: #587 was extracted in the usual manner, then evaporated at 25°C to be consistent with the other samples.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Lawrence Snyder

REQUEST REVIEWED BY [signature] 4/3/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)265

[redacted] OF [redacted]SIS

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

[redacted] for [redacted] or [redacted]
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					[redacted]

Analysis Method: 1-NAA, 2-SCMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	Mercury	Org. Mercury										
12-005-587A	X 15.5mg											
588	X 38mg											
12-005-587-B		X 0.9mg										
[redacted]	J.T.K.	J.T.K.										
[redacted]	[redacted]	#5										

[redacted] notes: 6

John Snyder

Note:

The distilled water blank for this set of samples was three to four times higher than the usual or normal value. The residue obtained from the blank appeared to contain many small fibers of some sort. These fibers were not visible in the water sample fractions; leading me to believe that the blank contained some sort of contamination not present in the samples. If this is true the high blank value, when subtracted from the sample weights, would give erroneously low results. In fact, about half of the water samples had less weight per unit volume of sample than did the blank; resulting in a negative value for the sample when the blank correction was applied.

Due to this problem the analysis report forms have been filled-out somewhat differently. All black ink values are the usually reported values which include the blank corrections. If this resulted in a negative number for the water fraction this negative number was recorded with the minus sign before it. Also, for each water fraction I have listed, in red ink, the sample weight before any blank correction.

If you have any further questions, give me a call.

Jim Kelly

Occidental Chemical 6/19/73
White Springs, Fla.
Rock Lagoon — Raw materials
Fluoride Results

Feed in		Product out	
Insol F	Total F	Insol F	Total F
Run 1 — 39.1 mg/gm	39.1 mg/gm	42.5 mg/gm	42.5 mg/gm
Run 2 — 42.9 mg/gm	42.9 mg/gm	44.7 mg/gm	44.7 mg/gm
Run 3 — 42.2 mg/gm	42.2 mg/gm	39.9 mg/gm	39.9 mg/gm

Cooling Pond Dam

Insol F	Total F
192 mg/gm	192 mg/gm

Note — EMB has not received the Hg and Phosphate results of this run (6-19-73).

73-ROC-3

Occidental Chemical 6/19/73
White Springs, Fla
Rock Augen Soluble H_2O
Fluoride and P_2O_5 Results

	Fluoride total	P_2O_5 total
Run 1 inlet	0.4 mg/L	< 0.01 mg/ml
outlet	0.4 mg/L	0.15 mg/ml
Run 2 inlet	0.4 mg/L	< 0.01 mg/ml
outlet	2.9 mg/L	0.72 mg/ml
Run 3 inlet	0.4 mg/L	0.00 mg/ml
outlet	1.5 mg/L	0.52 mg/ml

73-ROC-3

APPENDIX D-2

LABORATORY REPORT FOR ROCK GRINDING TESTS

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

RAC-3

SAMPLING DATE 73 (YR) 1 (MO) 11 (DAY)

FIRST IDENT. NO. USED S-73-003-022

LAST IDENT. NO. USED S-73-003-027

TEST NO 73-~~FH-3~~

RUN NO 1

RECD. } 2-6-73
RCRD. }

INDUSTRY Phosphate Fertilizer (USE TABLE A)

UNIT PROCESS OPERATION Rock Grinding

COMPANY Occidental Chemical Co.

AIR POLLUTION CONTROL Micro Pulsaire Baghouse

COPIES TO

ADDRESS White Springs Fla.

FUEL USED

P.O.

SAMPLING METHOD EPA 5 Moss

☒ INLET ☐ OUTLET

LAB.

GAS VOLUME SAMPLED (METER VOL IN FT³)

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
-073-022	Particulate From Hot H₂O	2,940.0 (13) (1,923.9)	330	Mass Storage
023	Particulate From Hot & Acetone	263,949.8	885	" "
024	Filter	69.9	—	" "
025*	Impinger plus Water wash	-3.8 (12.9)	505	" "
026	Organic extractable from 025	1.4	150	" "
027	Particulate Back Half Acetone	99.5	95	" "

COMMENTS: *025 was extracted in the usual manner, then evaporated at 20°C to prevent the loss of any fluoride; 022 was not extracted but was simply evaporated at 20°C

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Lamar Sanders

REQUEST REVIEWED BY [illegible] 2/5/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPAFORM1245

[redacted] OF [redacted]

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba				

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.		Mass		Org. Mass										
8-23-0003-022	X	2,4-D 3.0 mg												
023	X	2,4,5-T 8.8 mg												
024	X	6.2 mg												
025	X	3.8 mg												
026	X		X	1.4 mg										
027	X	92.5 mg												
Lab		J.T.X.		J.T.X.										
Method		Modified		±5										

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 | 1 | 11 (YR | MO | DAY)

FIRST IDENT. NO. USED S-73-003-028

LAST IDENT. NO. USED S-73-003-032

TEST NO 73-~~FRT-C~~

RUN NO 1

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD EPA 5 Mass

UNIT PROCESS OPERATION Rock Grinding

AIR POLLUTION CONTROL Micro Pulsaire Baghouse

FUEL USED

☐ INLET ☒ OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

RECD. / RCRD. 2-6-73

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
-003-028	Particulate Front Half Acetone	21.0	240	Mass	Storage
029	Filter	13.6	—	"	"
030	Impinger and Water Wash	-7.9(6.1)	440	"	"
031	Organic extraction	0.0	150	"	"
032	Particulate Back Half Acetone	~~73.5~~	85	"	"

COMMENTS: *one was extracted in the usual manner, then was evaporated at 70°C to prevent the loss of any fluoride

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Lauren Anderson

REQUEST REVIEWED BY [illegible] 4/4/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST

(TO BE FILLED IN BY SSFAB)

EPA/OUR/245

[redacted]

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

(x) f[illegible]
Mark (x) in block to left of Ident. No. when requesting elt analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Mo	K	Ca	Si	Mg	Ba					Other

Analysis Method: 1-NAA, 2-[illegible], 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.		Mass		Org. Mass											
S73-003003	X	21.0 mg													
004	X	13.6 mg													
030	X	~7.9 mg.													
031			X	0.0 mg.											
032	X	3.5 #1 mg.													
Analyst		J.T.K. #5		J.T.K. #5											
Method															

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 | 1 | 11 (YR | MO | DAY)

FIRST IDENT. NO. USED S-73-003-033

LAST IDENT. NO. USED S-73-003-039

TEST NO 73-~~111~~-

RUN NO. 2

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla

SAMPLING METHOD EPA 5 Mass

UNIT PROCESS OPERATION Rock Grinding

AIR POLLUTION CONTROL Micro Pulsaire Baghouse

FUEL USED

X INLET [ ] OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

RECD. RCRD 2-6-73

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
S-003-033	Particulate Front Half Acetone	242,033.3	1,055	Mass	Storage
034	Filter (4 fractions)	1,337.3		"	"
035	Impinger and Water Wash	-2.1(142)	495	"	"
036	Organic Extraction	0.7	170	"	"
039	Particulate Back Half Acetone	95.2	190	"	"

COMMENTS: #035 was extracted in the usual manner, then evaporated at 70°C, to prevent the loss of any fluoride.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Samuel Sanders

REQUEST REVIEWED BY GHS 2/6/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA(DUR)245

TRACE ELEMENTS
ppm - for solid samples
ug/ml - or liquid samples

Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					[illegible]

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	Mass	Org. Mass								
5-73-003 033	X 242,733.3 mg									
034	X 1,337.3 mg									
035	X -2.1 mg									
036	[illegible]	X 0.2 mg								
037	X 35.2 ~~[illegible]~~ mg									
Analyst	J.T.K.	J.T.K.								
Method	#5	#5								

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE 73 | 1 | 11 (YR | MO | DAY)

FIRST IDENT. NO. USED S-73-003-038

LAST IDENT. NO. USED S-73-003-042

TEST NO 73-~~FRT~~-2

RUN NO 2

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs Fla.

SAMPLING METHOD EPA 5 Mass

UNIT PROCESS OPERATION Rock Grinding

AIR POLLUTION CONTROL Micro Pulsaire Baghouse

FUEL USED —

☐ INLET ☒ OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

RECD. RCRD 2-6-73

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
3-003-038	Particulate Front half Acetone	27.3	130	Mass	Stangl
039	Filter	17.7	—	"	"
040	Impingers + H_2O wash	-8.6 (7.4)	485	"	"
041	Organic extraction	1.9	140	"	"
042	Particulate Back half Acetone	6.2	100	"	"

COMMENTS: #040 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Laurel Sanders

REQUEST REVIEWED BY [illegible] 4/4/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA-DURHAM

[redacted] TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

[redacted]
Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					[illegible]

Analysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	Mass	Org Mass								
5-73-003-033	X 27.3 mg									
037	X 17.7 mg									
040	X -8.6 [illegible]									
041	[illegible]	X 1.9 mg								
042	X 6.9 mg									
Analyst	J.T.K.	J.T.K.								
Method	#5	#5								

Comments:

SOURCE SAMPLE REQUEST & REPORT
(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE: YR 73 | MO 1 | DAY 12

FIRST IDENT. NO. USED: S-73-003-043

LAST IDENT. NO. USED: S-73-003-047

TEST NO: 73-~~EXT~~-3

RUN NO: 3

RECD. 2-6-73

RCRD.

INDUSTRY: Phosphate Fertilizer (USE TABLE A)

COMPANY: Occidental Chemical Co.

ADDRESS: White Springs, Fla.

SAMPLING METHOD: EPA 5 Mass

UNIT PROCESS OPERATION: Rock Grinding

AIR POLLUTION CONTROL: Micro Pulsaire Baghouse

FUEL USED:

[X] INLET [ ] OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³):

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FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
S-003-043	Phosphate Fertilizer Acetone	392,399.7	1,075	Mass	Assay
044	Filter	500.8	—	"	"
045	Evaporate + H₂O wash	8,243.8 (3,277.5)	960	"	"
046	Diethyl ether extraction	943.8	320	"	"
047	Water + Bicarbonate Acetone	33.8	290	"	"

NOTE:
#045 There was about ½ inch of solid material located in the bottom of this sample jar which accounts for the extremely high weight of the water fraction. Also some of this material got into the organic extract by gravitation rather than by dissolution. Therefore the high weight of the organic fraction does not represent the high organic content.

COMMENTS: #045 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride.

SAMPLING CONTRACTOR: Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER: Laurel Hanley

REQUEST REVIEWED BY: [signature] 2/2/73

DATE OF PROJECT: 2-2-73

DATE ANALYSIS REQUESTED: 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA/OAQPS/245

[redacted] KEYS

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

(x) f [redacted] STIC [redacted] S
Mark (x) in block to left of Ident. No. when requesting oil analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Co	Si	Mg	Ba					

Analysis Method: 1-NAA, 2-ISMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

Other Analyses - Use Table B to list analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.		Max		Orig. Mass											
S-23-003-043	X	332,329.2 mg													
044	X	100.3 mg													
045	X	3,243.8 mg													
046	X			X	943.8 mg										
047	X	32.8 mg													
Initial		J.T.K.		J.T.K.											
Date		5		5											

Comments:

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

ROC-3

SAMPLING DATE: YR 73 | MO 1 | DAY 12

FIRST IDENT. NO. USED: 5-73-003-048

LAST IDENT. NO. USED: 5-73-003-052

TEST NO 73-FF-2

RUN NO 3

RECD. 2-6-73

RCRD

INDUSTRY Phosphate Fertilizer (USE TABLE A)

COMPANY Occidental Chemical Co.

ADDRESS White Springs, Fla.

SAMPLING METHOD EPA 5 Mod

UNIT PROCESS OPERATION Rock Grinding

AIR POLLUTION CONTROL Micro Pulcaire Baghouse

FUEL USED

☐ INLET ☒ OUTLET

GAS VOLUME SAMPLED (METER VOL IN FT³)

COPIES TO

P. O.

LAB.

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)	
5-073-043	Particulate Emitted Half Acetone	13.9	285	Mass	Metals
044	Filter	17.8	—	"	"
050	Impinger + H2O rinse	-11.1(56)	505	"	"
051	Organic extraction	1.2	150	"	"
052	Particulate Probe Half Acetone	2.1	145	"	"

COMMENTS: *050 was extracted in the usual manner, then evaporated at 70°C to prevent the loss of any fluoride.

SAMPLING CONTRACTOR Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER Lauren Sanders

REQUEST REVIEWED BY [signature] 2/2/73

DATE OF REQUEST 2-2-73

DATE ANALYSIS REQUESTED 4-1-73

DATE OF REQUEST

(TO BE FILLED IN BY SSFAB)

EPA:DURI245

TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

Mark (x) in block to left of Ident. No. when requesting all analysis on that line

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Na	K	Ca	Si	Mg	Ba					Analyst

…lysis Method: 1-NAA, 2-SSMS, 3-OES, 4-AA, 5-ASV, 6-XRF, and 7-other

Comments:

…ther Analysis - Use Table B to fill analysis requested (above each column)

Mark (x) for specific analysis requested

Ident No.	Mass	Org. Mass								
3-73-003-048	[X] 139mg									
049	[X] 17.3mg									
050	[X] ~11.1mg									
051	[ ]	[X] 1.2 mg								
052	[X] 2.1mg									
…alyst	J.T.K.	J.T.K.								
Method	#5	#5								

…mments:

SOURCE SAMPLE REQUEST & REPORT

(MUST BE FILLED OUT FOR EACH TEST RUN)

SAMPLING DATE: 73 (YR) | 1 (MO) | 11 (DAY)

FIRST IDENT. NO. USED: 73-003-059

LAST IDENT. NO. USED: 73-003-060

TEST NO: 73-FRT-2

RUN NO: —

RECD.: 2-6-73

RCRD.:

INDUSTRY: Phosphate Fertilizer (USE TABLE A)

UNIT PROCESS OPERATION: Rock Grinding

COMPANY: Occidental Chemical Co.

AIR POLLUTION CONTROL: MicroPulsaire Baghouse

ADDRESS: White Springs, Fla.

COPIES TO

FUEL USED: N/A

P. O.

☐ INLET ☐ OUTLET

LAB.

SAMPLING METHOD: N/A

GAS VOLUME SAMPLED (METER VOL IN FT³): N/A

FILED

IDENT NO	DESCRIPTION OF SAMPLE OR SAMPLE FRACTION	SAMPLE WT (SOLID) MG	SAMPLE VOL (LIQUID) ML	ANALYSIS REQUESTED - GENERAL COMMENTS (APPROX CONCENTRATIONS - POSSIBLE INTERFERENCES ETC) (INDICATE SPECIFIC ANALYSIS ON BACKSIDE)
73-003-059	Feed Phosphate Rock		N/A	Trace Metals, Hg, Fluorides
060	Ground Rock Product		N/A	" " " "

COMMENTS:

SAMPLING CONTRACTOR: Environmental Engineering (IF APPLICABLE)

PROJECT OFFICER: Samuel Sanders

REQUEST REVIEWED BY: [illegible] 2/3/73

DATE OF REQUEST: 2-2-73

DATE ANALYSIS REQUESTED: 4-1-73

DATE OF REQUEST (TO BE FILLED IN BY SSFAB)

EPA/DUR/245

...ORT OF ANALYSIS
TRACE ELEMENTS
ppm - for solid samples
ug/ml - for liquid samples

Mark (x) for specific analysis
Mark (x) in block to left of Ident. No. if all
requesting all analysis on that line

Trans-Water-Hg

Ident No.	Hg	Be	Cd	As	V	Mn	Ni	Sb	Cr	Zn	Cu	Pb	Se	B	F	Li	Ag	Sn	Fe	Sr	Mo	K	Ca	Si	Mg	Ba					
A051																															
A052																															

Analysis Methods: 1 NAA, 2 PIXE, 3 OES, 4 AA, 5 ASV, 6 XRF, and 7-other

Comments: Hg by CVAA

Cold Analysis - Use Table 6 to list analysis requested (leave each column)

Mark (x) for specific analysis requested

Ident No.	[illegible] F	[illegible] F											
A051	X 40.4 ug/gm	X 40.4 ug/gm											
A052	X 41.0 ug/gm	X 41.0 ug/gm											
Analyst	NR + SM	NR + SM											
Method													

Comments:

Occidental Chemical 6/19/73
White Springs, Fla
Rock Grinder Raw Materials
Fluoride Results

Feed in		Product out	
Insol F	Total F	Insol F	Total F
40.6 mg/gm	40.6 mg/gm	41.0 mg/gm	41.0 mg/gm

Note - EMB has not received Hg and trace metals results at this time (6-19-73).

73-ROC-3

APPENDIX E-1

TEST LOG FOR ROCK DRYING TESTS

SOURCE SAMPLING LOG

Name of Plant: OCCIDENTAL CHEMICAL CO.

Location Of Plant: WHITE SPRINGS, FLA

Recorded By: J. DOLLAR

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
ROCK DRYER SCRUBBER INLET	FLUORIDES	1	12-19-73	1422	1721	179	Stopped sampling after 20 min. Changed to a 3/8" nozzle because we thought the 3/16" nozzle was plugging. Ran for 10 min. with 3/8" nozzle for 10 min. still plugging, but it turned out to be the 2nd impinger. the tip was too small. We change the 2nd impinger and everything was okay. Dryer used fuel oil. Leak check okay.
		2	12-20-73	0953	1213	140	EPA Test Officer suggested using 200 ml H_2O in each of the first two impingers. Dryer using Nat'l gas. Leak check okay.
		3	12-20-73	1445	1705	140	Dryer using Nat'l gas. Leak check okay.

SOURCE SAMPLING LOG

Name of Plant OCCIDENTAL CHEMICAL CO.

Location Of Plant WHITE SPRINGS, FLA.

Recorded By J. DOLLAR

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
ROCK DRYER SCRUBBER OUTLET	FLUORIDES	1	12-19-73	1420	1718	178	Having to use a 6' and 10' probe because of small scaffolding platform. Dryer used fuel oil. Leak check prior
		2	12-20-73	0930	1218	168	Dryer using nat'l gas. Leak check prior
		3	12-20-73	1440	1713	153	Dryer using nat'l gas. No leak check performed.

SOURCE SAMPLING LOG

Name of Plant OCCIDENTAL CHEMICAL CO.

Location Of Plant WHITE SPRINGS, FLA

Recorded By J. DOLLAR

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
ROCK DRYER SCRUBBER INLET	PARTICULATES	1	12-22-73	0925	1158	153	Using cyclone & flask. Dryer using Nat'l gas. Leak check okay.
		2	1-9-73	1000	1312	192	Stack gas exhaust fan was not performing up to par @ 1140. It continued to operate. Dryer using fuel oil. Leak check okay.
		3	1-9-73	1510	1755	165	Dryer using fuel oil. No leak check performed.

SOURCE SAMPLING LOG

Name of Plant OCCIDENTAL CHEMICAL CO.

Location Of Plant WHITE SPRINGS, FLA.

Recorded By J. DOLLAR

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
ROCK GRINDING BAGHOUSE OUTLET 	PARTICULATES 	1	1-11-73	1000	1339	219	Stopped @ 1016 while inlet sampling train was being unplugged. No difficulties. Leak check okay.
		2	1-11-73				Stopped @ 1701 while inlet sampling train was being unplugged. No difficulties. Forgot to leak check due to confusion at inlet. Should have been okay since the sample train in use was [illegible] Outlet
		3	1-12-73				RAIN & COLD! Leak check okay. No difficulties other than being very cold. [illegible]

Name of Plant [redacted]

Location Of Plant WHITE SPRINGS, FLA.

Recorded By J. DOLLAR

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
ROCK DRYER SCRUBBER OUTLET	PARTICULATES	1	12-22-73	0930	1223	163	Dryer using nat'l gas. Leak check okay.
		2	1-9-73	1000	1212	132	Dryer using fuel oil. Test run time was 138 minutes. Point # 2 and 23 at the North port (Port #1) were sampled an additional 3 minutes each. No leak check performed.
		3	1-9-73	1510	1722	132	Dryer using fuel oil. Leak check okay.

APPENDIX E-2

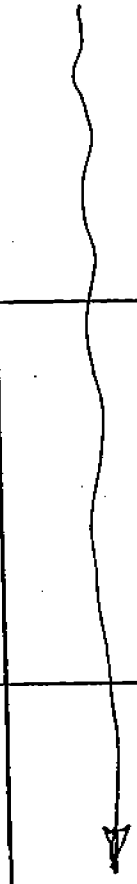
TEST LOG FOR ROCK GRINDING TESTS

STACK SAMPLING LOG

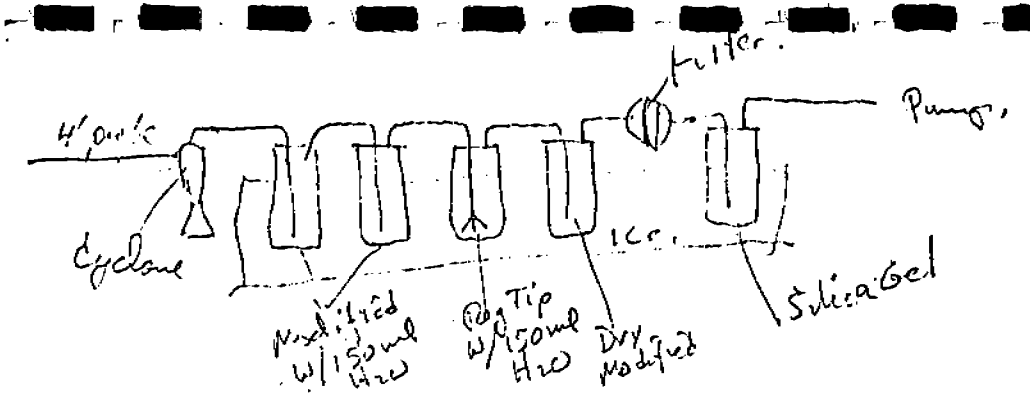
Name of Plant Occidental Chemical Co.

Location Of Plant White Springs, Fl.

Recorded By J. Collins

Sampling Location and Port	Pollutant	Run No.	Date	Clock Time			Comments
				Began	Ended	Elapsed Time (min)	
Rock Grinding Baghouse Inlet 	Particulates 	1	1-11-73	1005	1406	241	Many problems associated with plugging of train. After 6 min, nozzle was changed to a 3/8" so that the tip would not plug up. Could not sample isokinetically. Three filters and two probes were used. See data sheets. Tried to loosen matl in probe by drawing in ambient air. Leaking.
		2	1-11-73	1635	2023	228	Still having plugging problems. Used four filters & two probes. See data sheets. Leak check okay.
		3	1-12-73	1010	1302	172	Used a different sample train arrangement. See sketch on next page. Leak check okay.

Point 2



Points 3-12 Same but eliminate Regular Tip Impinger

Points 13-23 Add another modified impinger before trap where regular impinger was for point 2. Now 3 modified imp w/150 ml.

Baghouse Inlet — Run #3

APPENDIX F-1

SAMPLE IDENTIFICATION LOG FOR ROCK DRYING TESTS

SAMPLE LOG

Plant OCCIDENTAL CHEM. CO Location WHITE SPRINGS, FLA

Source Sampled ROCK DRYING OPERATION

Sample No.	Sample Description	Run No.	Date	Remarks
72-005-555	Fluoride Test - Rock Dryer - Scrubber - Out	1	12-19-72	
-559	" " " " " "	2	12-20-72	
-563	" " " " " "	3	12-20-72	
-553	" " " " " In	1	12-19-72	
-557	" " " " " "	2	12-20-72	
-561	" " " " " "	3	12-20-72	
-572	Impinger Water - Blank			CONTAINER
-573	Whatman No. 1 - Blank (illegible)			[redacted]
-554	Inlet Scrubber Liquid	1	12-19-72	
-558	" " "	2	12-20-72	
-562	" " "	3	12-20-72	
-556	Outlet " "	1	12-19-72	
-560	" " "	2	12-20-72	
-564	" " "	3	12-20-72	
-565	Rock (In)	1	12-19-72	
-566	" "	2	12-20-72	
-567	" "	3	12-20-72	
-568	" (Out)	1	12-19-72	
-569	" "	2	12-20-72	
-570	" "	3	12-20-72	
-574	Fuel Oil	1	12-19-72	

SAMPLE LOG

Plant OCCIDENTAL CHEM. CO. Location WHITE SPRINGS, FLA.

Source Sampled ROCK DRYING OPERATION

Sample No.	Sample Description	Run No.	Date	Remarks
72-005-575	Particulate Test - Front Half (Acetone)	1	12-22-72	SCRUBBER INLET
-576	Particulate Test - Front Half (Acetone)	1		SCRUBBER INLET
-577	" " - Filter	1		" INLET
-578	" " - Impinger H_2O	1		" INLET
-579	" " - Back Half (Acetone)	1		" INLET
-582	" " - Front Half (Acetone)	1		SCRUBBER OUTLET
-583	" " - Filter	1		" OUTLET
-584	" " - Impinger H_2O	1		" OUTLET
-585	" " - Back Half (Acetone)	1		" OUTLET
-587	Water Blank	-		-
-589	Filter Blank	-		-
-588	Acetone Blank	-		-
-581	Particulate Test - Cyclone Flask (Acetone)	1		[illegible]
-581	" " - Front Half (Acetone)	1		[illegible]
----	Feed Water	1		
----	Feed Water	1		
-571	Feed Rock	1	12-20-72	
-053	Rock (In)	2	1-9-73	
-054	" "	3	1-9-73	
-055	Rock (Out)	2	1-9-73	

SAMPLE LOG

Plant OCCIDENTAL CHEM. CO. Location WHITE SPRINGS, FLA

Source Sampled ROCK DRYING OPERATION

Sample No.	Sample Description	Run No.	Date	Remarks
73-003-056	ROCK (OUT)	3	1-9-73	
-057	FUEL OIL	2	1-9-73	
-058	" "	3	1-9-73	
73-003-007	Particulate Test - Front Half (Acetone)	2	1-9-73	SCRUBBER OUTLET
-006	" " - Front Rinse (H_2O)	2	"	"
-009	" " - Impingers - H_2O	2	"	"
-011	" " - Back Half (Acetone)	2	"	"
-008	" " - Filter #23	2	"	"
-018	" " - Front Half (Acetone)	3	"	"
-020	" " - Impingers - H_2O	3	"	"
-021	" " - Back Half (Acetone)	3	"	"
-019	" " - Filter #17	3	"	"
-001	" " - Front Half (Acetone)	2	"	SCRUBBER INLET
-003	" " - Impingers - H_2O	2	"	"
-005	" " - Back Half (Acetone)	2	"	"
-002	" " - Filter #16	2	"	"
-013	" " - Front Half (Acetone)	3	"	"
-012	" " - Cyclone Blank (H_2O)	3	"	"
-015	" " - Impingers - H_2O	3	"	"
-017	" " - Back Half (Acetone)	3	"	"
-014	" " - Filter #20	3	"	"

APPENDIX F-2

SAMPLE IDENTIFICATION LOG FOR ROCK GRINDING TESTS

APPENDIX G-1

PROJECT PARTICIPANTS ON ROCK DRYING TESTS

PROJECT PARTICIPANTS ON ROCK DRYING TESTS

Environmental Engineering, Inc.

John Dollar, E.I.T., M.S.	Project Manager
George Allen, C.E.T., Sr. Technician	Environmental Specialist
Robert Durgan, C.E.T., Sr. Technician	Environmental Specialist
Bill Wrighter, Technician	Environmental Specialist
Steve Neck, Technician	Environmental Specialist
Ken McFall, Technician	Environmental Specialist

Environmental Protection Agency

Neal Sanders	Project Test Officer
Gene Tison	Project Engineer

APPENDIX G-2

PROJECT PARTICIPANTS ON ROCK GRINDING TESTS

PROJECT PARTICIPANTS ON ROCK GRINDING TESTS

Environmental Engineering, Inc.

John Dollar, E.I.T., M.S.	Project Manager
Robert Sholtes, P.E., Ph.D.	Project Engineer
George Allen, C.E.T., Sr. Technician	Environmental Specialist
Allen Luther, Technician	Environmental Specialist
Monte Swann, Technician	Environmental Specialist

Environmental Protection Agency

Neal Sanders	Project Test Officer
Joe Peoples	Project Engineer

SAMPLE LOG

Plant Occidental Chem Co. Location White Springs, Fla.

Source Sampled K.V.S. Ball Mill (Rock Grinding)

Sample No.	Sample Description	Run No.	Date	Remarks
73-003-028	Particulate Test - Front Half (Acetone)	1	1-11-73	Baghouse Outlet
-030	" " - Impingers - H_2O	1	"	"
-032	" " - Back Half (Acetone)	1	"	"
-029	" " - Filter # 15	1	"	"
-038	" " - Front Half (Acetone)	2	"	"
-040	" " - Impingers - H_2O	2	"	"
-042	" " - Back Half (Acetone)	2	"	"
-039	" " - Filter # 24	2	"	"
-048	" " - Front Half (Acetone)	3	1-12-73	"
-050	" " - Impingers - H_2O	3	"	"
-052	" " - Back Half (Acetone)	3	"	"
-049	" " - Filter # 16	3	"	"
-023	" " - Front Half (Acetone) 2 JARS	1	1-11-73	Baghouse Inlet
-022	" " - Front Half (H_2O)	1	"	"
-025	" " - Impingers - H_2O	1	"	"
-027	" " - Back Half (Acetone)	1	"	"
-024	" " - Filters # 9, 5, 21	1	"	"
-033	" " - Front Half (Acetone) (1st Hour)	2	"	"
-033	" " - " (2nd Hour)	2	"	"
-035	" " - Impingers - H_2O	2	"	"

SAMPLE LOG

Plant Occidental Chem. Co Location White Springs, Fla.

Source Sampled K.I.S. Rock Mill (Rock Grinding)

Sample No.	Sample Description	Run No.	Date	Remarks
73-003-037	Particulate Test - Front Half (Acetone)	2	1-11-73	EPA House Inlet
-034	" " - Filters #1, 3, 8, 12	2	"	"
-043	" " - Front Half (Probe, cyclone) (Acetone) (2 Jars)	3	1-12-73	"
-045	" " - Impingers (2 Jars) - H_2O	3	"	"
-047	" " - Back Half (Acetone)	3	"	"
-044	" " - Filters # 2, 4	3	"	"
73-003-059	Rock (Unground)		1-11-73	
73-003-060	Rock (Product) Bin # 133		1-11-75	

EPA modified Train was not used. Filter after impingers.

Ref 2

Emission Test Report
Review Checklist

Reviewer: Michelle Ramsey
Review Date: 27 April 1992

A. Background Information

1. Facility name: Occidental Chemical Company
   Location: White Springs, Florida
2. Source category: Phosphate Rock
3. Test date: December 1972 ; January 1973
4. Test sponsor: US EPA
5. Testing contractor: Environmental Science & Engineering, Inc.
6. Purpose of test: obtain data for the use of ISB and the Performance Standards Branch of the EPA
7. Pollutants measured

   (PM) PM-10 CO SO_2 NO_x VOC Pb (CO_2)

   Others (list): fluorides, P_2O_5
8. Process overview: On an attached page provide a block diagram of the unit operations and associated air pollution control systems at the facility. Identify process tested with letters from the beginning of the alphabet (A, B, C, etc.) and APC systems with letters from end of alphabet (V, W, X, etc.). Also identify test locations with Arabic numerals (1,2,3, ...). Using the ID symbols from that sketch complete the table below that identifies processes or unit operations tested.

Test ID	Process	Process ID	Emissions tested		APCD (controlled emissions only)
			Uncontrolled	Controlled	
1, 2	Drying	A	✓	✓	cyclonic wet scrubber
3, 4	Grinding	B	✓	✓	bag collector

natural gas is burned except for about 30 days/yr when a high-sulfur blend of #6 residual and #2 distillate is fired because of gas curtailment.

B. Process Information

1. Provide a brief narrative description of the process. With as much detail as possible, (e.g., if a furnace or conveyor system is used, identify the type of unit) describe the equipment used for those operations tested. (Note: If process description provided in test report is adequate, attach copy or reproduce here.)

Attachments:

Process Description
no schematic available

PROCESS DESCRIPTION

Rock Drying

Mined phosphate rock is separated from impurities by a flotation process which yields concentrated phosphate rock containing about 15% water. During storage the moisture is further reduced to as low as 10%. Before shipping, the rock is dried to 1.5% to 3% moisture in a fluidized-bed drier.

Natural gas is burned except for about 30 days per year when fuel oil is fired because of gas curtailment. The fuel oil used is a high-sulfur blend of #6 residual and #2 distillate.

Combustion gases along with moisture from the drier flow into a cyclone separator which removes the bulk of the particulates and returns them to the product belt conveyor. The gases then flow to a cyclonic scrubber using once-through fresh water as the scrubbing medium.

The EPA did not furnish any process schematic diagrams of the rock drying operation for this report.

Rock Grinding

Dried phosphate rock is ground into a fine powder in a ball mill. Air is used to convey the ground material out of the mill. Exhaust air containing the mill output flows to a classifier which separates and returns the oversize particles to the mill. The classifier outlet is ducted to a cyclone separator which removes sufficiently ground rock from the air stream and routes it to the storage bins. In order to close the air-flow circuit, conveying air is returned to the mill except for a small bleed portion. To prevent the conveying air from becoming sat-

urated with moisture, this bleed air is vented and replaced with ambient air. The vented stream flows to a bag collector before exiting a stack to the atmosphere.

The EPA did not furnish any process schematic diagrams of the rock grinding operation for this report.

2. For each process tested list feedstock materials and products. Indicate if activity factors are for feed (F) rate or product (P) rate.

Process ID	Feedstock materials	Products	Basis for activity factor	F/P
A	MIXED PHOSPHATE ROCK	DRIED ROCK	ROCK FEED	F
B	DRIED PHOSPHATE ROCK	GROUND ROCK	ROCK FEED	F

Basis for data: _____

(Indicate page/table Nos. in test r

indicate type of fuel used in dryer
e.g. "drying / fuel oil

3. For each process or operation tested and each te note process capacity and operating rate during

Process ID	Capacity	Units	Test run	Process rate	Units
A			1	285	tons/hr
$CO_2 + P_2O_5 +$ fluorides			2	280	"
			3	285	"
			4		
A			1	280	"
$CO_2 + PM$			2	315	"
			3	235	"
			4		
B			1	121	"
$CO_2 + PM$			2	131	"
			3	120	"
			4		
			1		
			2		
			3		
			4		

fuel oil
natural gas
" "

natural gas
fuel oil
" "

Basis for data: Pgs. 5, 6, 7, 8, 12 & 13

C. Air Pollution Control Systems Tested

1. For each air pollution control system pollution control system identified in A.8, note the following

ID	Type of APCD	Manufacturer	Model No.
2	Cyclonic Wet Scrubber	Dorrco	
X	Bag Collector	Micro-Pulsaire	

Note: Be as specific as possible in identifying APCD. For example, indicate "pulse jet fabric filter" rather than simply "fabric filter."

2. For each system identified above, provide a narrative description. For fugitive systems describe capture techniques as well as the removal techniques (use a separate page if necessary)

3. Using the attached parameter list for guidance complete the table below. (Use additional pages as needed.)

APCD ID	Parameter	Units	Readings			
			Run 1	Run 2	Run 3	Run 4
Type of APCD: wet scrubber						
Type of APCD: bag collector						
Type of APCD:						

D. Sampling and Analysis Methods

1. Complete the following table

Test location	Pollutant	S & A method	Reference/ conditional method	Deviations noted
			Y/N	Y/N
Prior to entering wet scrubber of drying system	PM	EPA Method 5	(Y)/N	Y/N
	fluorides	test being studied	Y/N	Y/N
		by EPA =	Y/N	Y/N
	P_2O_5	(proposed Method 13)	Y/N	Y/N
			Y/N	Y/N
After wet scrubber of drying system	PM	EPA Method 5	(Y)/N	Y/N
	fluorides	test being studied	Y/N	Y/N
		by EPA =	Y/N	Y/N
	P_2O_5	(proposed Method 13)	Y/N	Y/N
			Y/N	Y/N
Prior to entering bag collector of grinding process	PM	EPA Method 5	(Y)/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
After bag collector of grinding process	PM	EPA Method 5	(Y)/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N
			Y/N	Y/N

2. If a method used was not a reference or conditional method, provide a narrative discussion including any data manipulation needed to make results correspond to reference or conditional method results.

See attached

3. Describe any deviations ~~identified above.~~

PM emission testing was performed on all runs except Run No. 3 using EPA Method No. 5. On Run No. 3 the particulate loading was so great that the filter was placed after the impingers instead of in front of them.

E. Emission Data Documentation

1. Tabulate the following stack gas data from the test report. (Use additional pages as needed.)

Test ID	Parameter	Units	Values reported Run 1	Run 2	Run 3	~~Run 4~~
1	Stack temperature	°F	169	173	171	
	Moisture	%	23.6	34.7	31.8	
	Oxygen	%	17.4	17.4	17.4	
	Volumetric flow, actual	cfm, stk	107,500	109,300	107,350	
	Volumetric flow, standard	cfm, stp	68,400	59,000	61,000	
	Percent isokinetic	%	80.4	122	113	
	Pollutant concentration:					
	fluorides*	g/scf	0.00758	0.012153	0.011472	
	P_2O_5 **	mg	150	340	287.5	
	CO_2+	%	2	2	2	
	fluorides, H_2O soluble	g/scf	0.00558	0.000547	0.000498	
	fluorides, total	g/scf	0.0131	0.0127	0.0119	
	P_2O_5, water soluble	mg	86.4	7.4	4.2	
	P_2O_5, total	mg	236.4	347.4	291.7	
2	Stack temperature	°F	154	154.4	154.7	
	Moisture	%	25.5	26.8	26.8	
	Oxygen	%	17.5	17.5	17.5	
	Volumetric flow, actual	cfm, stk	147,500	129,800	140,000	
	Volumetric flow, standard	cfm, stp	94,800	81,800	88,400	
	Percent isokinetic	%	106.1	106.5	106.9	
	Pollutant concentration:					
	fluorides *	g/scf	1.6×10^{-5}	1.82×10^{-4}	1.12×10^{-4}	
	P_2O_5 **	mg	0.06	0.3	4.4	
	CO_2+	%	2	2	2	
	fluorides, H_2O soluble	g/scf	0.000315	0.000159	0.000112	
	fluorides, total	g/scf	0.000331	0.000334	0.000224	
	P_2O_5, water soluble	mg	2.4	2.3	2.1	
	P_2O_5, total	mg	2.46	2.6	6.5	
3	Stack temperature	°F	122	123	124	
	Moisture	%	3.30	3.40	4.80	
	Oxygen	%	21.0	21.0	21.0	
	Volumetric flow, actual	cfm, stk	16700	16500	16500	
	Volumetric flow, standard	cfm, stp	14400	14200	14000	
	Percent isokinetic	%	49.5	58.3	66.1	
	Pollutant concentration:					
	PM***	g/scf	0.019	7×10^{-3}	8×10^{-3}	
	PM, front	g/scf	45.847	35.395	52.450	
	PM, total	g/scf	45.866	35.402	52.458	

* total fluoride emissions - water soluble fluoride emissions

** total P_2O_5 - water soluble P_2O_5

*** PM total - PM, front

+ = fluoride test

✓ = PM test

SAMPLING AND ANALYTICAL PROCEDURES

Rock Drying

Preliminary stack parameter data such as the number and location of sampling points, stack gas velocities, stack gas molecular weights, and stack gas moisture contents were determined by the EPA Method Nos. 1, 2, 3, and 4, respectively (Federal Register, Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

The stack gas velocity at the control outlet posed a problem of obtaining an accurate velocity head measurement because of the tangential flow within the stack. A standard pitot tube was used to traverse the stack, and it was rotated from side to side to try and locate the direction of flow. No appreciable difference in velocity head could be detected during each rotation; therefore, sampling was conducted by traversing the S-type pitot tube and sampling nozzle in a vertical position during all fluoride and particulate emission tests. After the velocity and gas flow rates were calculated from the emission tests, it was evident that there had been some influence of tangential at the control outlet because of discrepancies in the gas flow rate entering and leaving the control device. The outlet gas flow rates were approximately 38 percent greater than the inlet gas flow rates.

Since there was no evidence of diffusion air being injected into the system following the scrubber, the difference in the inlet and outlet flows was probably attributable to the tangential flow.

Grab samples of the stack gases were collected in plastic bags, and then analyzed for carbon dioxide, oxygen, and carbon monoxide content by an Orsat analyzer. All sampling sites were analyzed while the dryer was burning both natural gas and fuel oil.

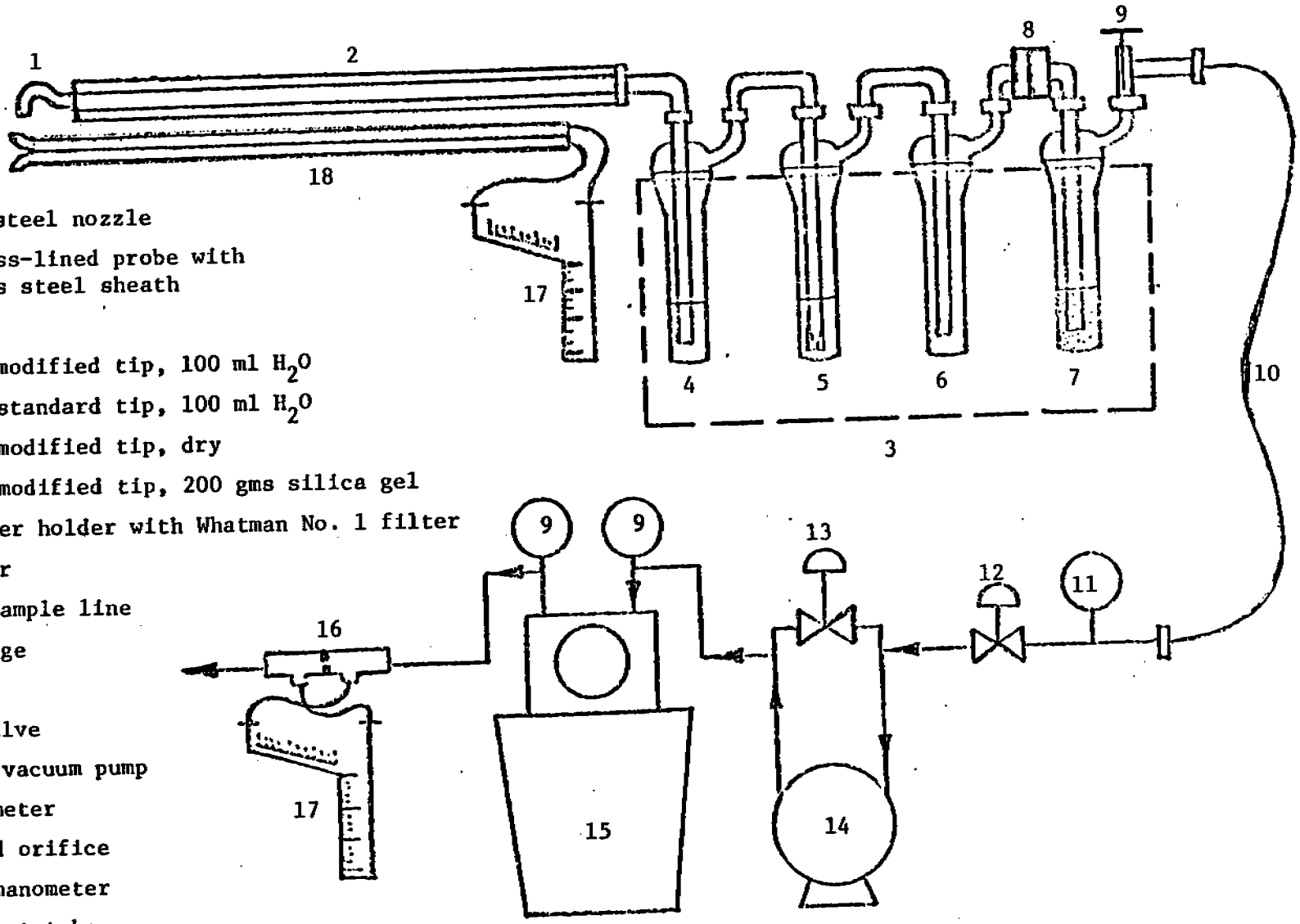
On the day prior to performing the first emission tests, the preliminary moisture test at the control inlet was made while the dryer was burning natural gas. After the first emission tests had been completed, it was learned that the dryer was operating on fuel oil. This resulted in a greater moisture content than had been estimated, which made the isokinetic sampling rate deviate considerably.

Fluoride emissions were determined by a method specified by the EPA project test officer. This method is currently being evaluated by the EPA, and has been temporarily designated as a proposed EPA Method No. 13, "Determination of Total Fluoride Emissions From Stationary Sources."

A schematic diagram of the fluoride sampling train is shown in Figure 5.

A sample train leak check was inadvertently excluded for Run No. 3 of the outlet tests.

The analysis for the one sample taken as the water blank contained a sizeable amount of fluorides. Based upon fluoride analyses of the same water by Environmental Science and Engineering, Inc., the only explanation for the high fluoride content of the blank must be that it was contaminated after it was taken from the water supply at the test site.



1. Stainless steel nozzle
2. Heated glass-lined probe with stainless steel sheath
3. Ice bath
4. Impinger, modified tip, 100 ml H_2O
5. Impinger, standard tip, 100 ml H_2O
6. Impinger, modified tip, dry
7. Impinger, modified tip, 200 gms silica gel
8. Glass filter holder with Whatman No. 1 filter
9. Thermometer
10. Flexible sample line
11. Vacuum Gauge
12. Main valve
13. By-pass valve
14. Air-tight vacuum pump
15. Dry test meter
16. Calibrated orifice
17. Inclined manometer
18. S-type pitot tube

FIGURE . 5

PROPOSED EPA METHOD 13 FLUORIDE SAMPLING TRAIN

During each fluoride emission test, grab samples of the process reactants and products, and inlet and outlet scrubbing liquid were taken. The pH and temperature of each scrubbing liquid grab sample was recorded at the test site. Also, several samples of the cooling pond water and rock were collected during the tests.

Particulate emissions were determined by the EPA Method No. 5, described in the Federal Register (Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

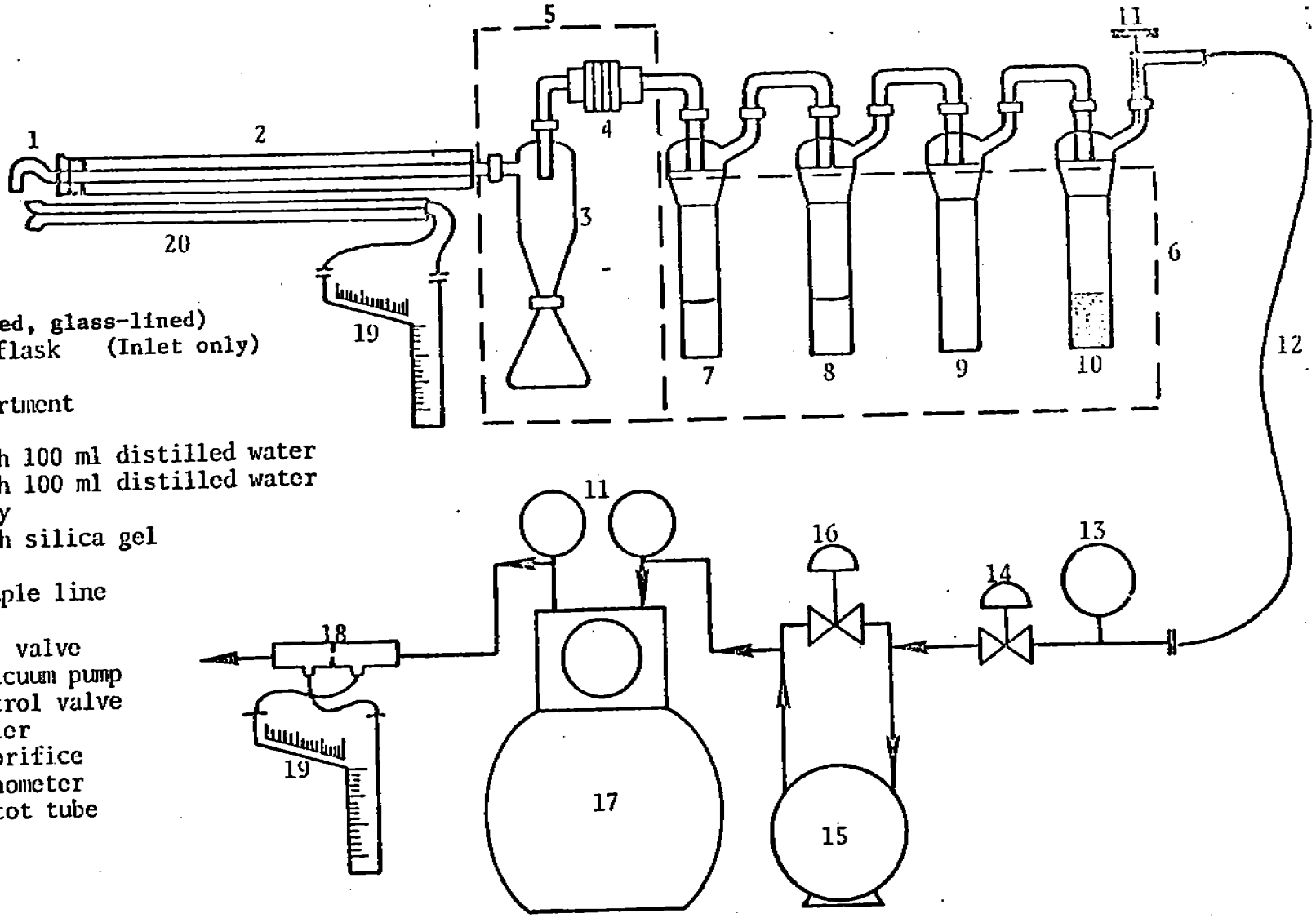
Figure 6 is a schematic diagram of the particulate sampling train used.

Inadvertently, the sample train leak check was excluded for Run No. 3 - Inlet, and Run No. 2 - Outlet. The sample train vacuum gauge reading for these two tests were about the same as the other tests for which leak checks were made.

A water rinse of the particulate train "front half" was made after the acetone rinse, because the EPA project test officer deemed it necessary to remove the water soluble particulate material from the nozzle, probe, and cyclone. This was performed for each run with the exception of Run No. 2 - Inlet and Run No. 3 - Outlet. Only acetone was used on the front half following these two runs.

All samples collected were analyzed by the EPA. Laboratory results for fluorides, particulates, and P_2O_5 are included in Appendix D-1. Results of the trace metals and mercury data can be found in the EPA's Emission Measurement Branch report file No. 73-ROC-3.

Complete sampling procedures are included in Appendix C-1.



1. Nozzle
2. Probe (heated, glass-lined)
3. Cyclone and flask (Inlet only)
4. Filter
5. Heated compartment
6. Ice bath
7. Impinger with 100 ml distilled water
8. Impinger with 100 ml distilled water
9. Impinger, dry
10. Impinger with silica gel
11. Thermometer
12. Flexible sample line
13. Vacuum gauge
14. Main control valve
15. Air tight vacuum pump
16. By-pass control valve
17. Dry test meter
18. Calibrated orifice
19. Inclined manometer
20. "S" type pitot tube

EPA PARTICULATE SAMPLING TRAIN

FIGURE 6

Rock Grinding

Preliminary stack parameter data such as the number and location of sampling points, stack gas velocities, stack gas molecular weights, and stack gas moisture contents were determined by the EPA Method Nos. 1, 2, 3, and 4, respectively (Federal Register, Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

Grab samples of the stack gases were collected in plastic bags and then analyzed for carbon dioxide, oxygen, and carbon monoxide content by an Orsat analyzer. All sampling sites were analyzed prior to any emission tests.

Particulate emissions were determined by the EPA Method No. 5, described in the Federal Register (Vol. 36, No. 59, August 17, 1971, Washington, D.C.).

Figure 6 is a schematic diagram of the sampling train used for all tests except Run No. 3 at the inlet sampling site.

Because of the high particulate load at the inlet sampling site, the nozzle and probe were continually plugging up. As a result, the sample train had to be shut down many times during the first two test runs. At the beginning of Run No. 1, the plugging of the nozzle was so severe that the EPA test officer suggested that we switch to a 3/8-inch nozzle to try and eliminate the problem. As a result of this switch, the isokinetic sampling rate could not be maintained.

Since simultaneous sampling was being conducted at the inlet and outlet, each time the inlet train shut down, the outlet train was also

shut down. As a result of much confusion during the first test run, the outlet train was inadvertently excluded from the leak check for Run No. 2. The sample train vacuum readings for the Run No. 2 - Outlet tests were about the same as the previous tests, which indicates no gross leakage.

Also as a result of the confusion created by the frequent stopping and starting of the sample train for Run No. 1 - Outlet, the isokinetic sampling rate was not maintained.

The sample recovery procedure for Run No. 1 - Inlet was altered somewhat from the EPA Method No. 5. The front half was rinsed with water, following the acetone rinse. The water removed some of the water soluble particulate matter.

The configuration of the sampling train was changed for Run No. 3-Inlet at the request of the EPA test officer. This change resulted in the filter holder being placed just ahead of the last impinger, which contained silica gel. The plugging up of the filter from the excessive particulate emissions was essentially eliminated.

Since the configuration of the sampling train used for Run No. 3-Inlet was changed from the normal EPA Method No. 5 train, the laboratory data had to be corrected for the change. Basically, the laboratory data from the first two tests were used to determine corrected values for the third test. The complete procedure used for calculating the corrected values is included in Appendix A-2.

Grab samples of the rock entering the grinder, and the final rock product leaving the grinder were taken periodically during each test.

All samples collected were analyzed by the EPA. Laboratory results for fluorides and particulates are included in Appendix D-2. Results of the trace metals and mercury data can be found in the EPA's Emission Measurement Branch report file No. 73-ROC-3.

Complete sampling procedures are included in Appendix C-2.

E. Emission Data Documentation

1. Tabulate the following stack gas data from the test report. (Use additional pages as needed.)

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	~~Run 4~~
4	Stack temperature	°F	115	115	118	
	Moisture	%	5.80	6.10	5.30	
	Oxygen	%	21.0	21.0	21.0	
	Volumetric flow, actual	cfm, stk	15200	14700	14900	
	Volumetric flow, standard	cfm, stp	13200	12800	13000	
	Percent isokinetic	%	88.4	104.6	101	
	Pollutant concentration:					
	PM ***	g/scf	0.003	0.004	0.00219	
	PM, front	g/scf	0.0102	0.0115	0.00780	
	PM, total	g/scf	0.0132	0.0155	0.00999	
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
	Pollutant concentration:					
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
	Pollutant concentration:					

* No data because sample bobble broke during shipment.

E. Emission Data Documentation

1. Tabulate the following stack gas data from the test report. (Use additional pages as needed.)

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	~~Run 4~~
1	Stack temperature	°F	172	165	168	
	Moisture	%	33.8	18.0	28.6	
	Oxygen	%	17.4	15.0	15.0	
	Volumetric flow, actual	cfm, stk	109,000	104,400	108,900	
	Volumetric flow, standard	cfm, stp	59,900	71,800	64,900	
	Percent isokinetic	%	97.6	93.6	108	
	Pollutant concentration:					
	PM ***	g/scf	0.016	0.022	0.026	
	PM, front	g/scf	0.494	0.165	0.428	
	PM, total	g/scf	0.510	0.187	0.454	
	CO_2 ✓	%	2	4.2	4.2	
2	Stack temperature	°F	150	144	149	
	Moisture	%	28.8	21.5	24.7	
	Oxygen	%	17.5	15.5	15.5	
	Volumetric flow, actual	cfm, stk	128,000	150,500	128,600	
	Volumetric flow, standard	cfm, stp	79,200	103,600	84,200	
	Percent isokinetic	%	109.4	104.9	103.8	
	Pollutant concentration:					
	PM ***	g/scf	5.0 x 10^{-3}	0.013	*	
	PM, front	g/scf	0.0674	0.0185	0.0139	
	PM, total	g/scf	0.0932	0.0315	*	
	CO_2 ✓	%	2	3.7	3.7	
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
	Pollutant concentration:					

* = no data because sample bottle broke during shipment

2. Tabulate pollutant mass flux rates

Test ID	Pollutant	Units	Mass flux rates			
			Run 1	Run 2	Run 3	~~Run 4~~
1	fluorides *	lb/hr	4.46	6.17	5.99	
	PM ***	lb/hr	7.76	13.46	14.63	
	CO_2 ✓	lb/hr	15303.6	30781.3	32108.1	
	fluorides, H_2O soluble	lb/hr	3.22	0.260	0.210	
	fluorides, total	lb/hr	7.68	6.43	6.20	
	PM, front	lb/hr	253.89	101.51	238.09	
	PM, total	lb/hr	261.65	114.97	252.72	
	CO_2 +	lb/hr	15093	15346	15072	
2	fluorides *	lb/hr	0.013	0.126	0.085	
	PM ***	lb/hr	3.94	11.57	*	
	CO_2 ✓	lb/hr	17971.2	39091	33403	
	fluorides, H_2O soluble	lb/hr	0.260	0.106	0.085	
	fluorides, total	lb/hr	0.273	0.232	0.170	
	PM, front	lb/hr	45.73	16.35	9.99	
	PM, total	lb/hr	49.67	27.92	*	
	CO_2 +	lb/hr	20709	18224	19656	
3	PM ***	lb/hr	2.37	0.88	1.03	
	PM, front	lb/hr	5667.34	4306.47	6260.65	
	PM, total	lb/hr	5669.71	4307.35	6261.68	
4	PM ***	lb/hr	0.336	0.43	0.241	
	PM, front	lb/hr	1.154	1.270	0.869	
	PM, total	lb/hr	1.49	1.70	1.11	

* = no data because sample bottle broke during shipments

3. Present example emission factor calculations below.

add lb/ton of feed for all 3 runs / 3 = average emission factor

total - water soluble = lb/ton of fluoride

$PM_{total} - PM_{front} =$ PM emission factors

4. Tabulate emission factors

Process	Pollutant	Units	Average emission factor	
			Uncontrolled	Controlled
A	fluorides *	lb/ton	0.01958	2.64×10^{-4}
	PM ***	lb/ton	0.051	*
	fluorides, H_2O soluble	lb/ton	0.004322	0.0005296
	fluorides, total	lb/ton	0.02386	0.0007943
	PM, front	lb/ton	0.7973	0.09383
	PM, total	lb/ton	0.848	*
B	PM ***	lb/ton	0.01	0.0027
	PM, front	lb/ton	43.96	0.0088233
	PM, total	lb/ton	43.973	0.0115266

b3006-4/971130

* = no data because sample bottle broke during shipment

— no production rate is listed to calculate emission factors for CO_2.

SEE ATTACHED PAGE

ATTACHMENT A
APCD PARAMETERS

Type of APCD	Parameters
Fabric filter	Cleaning mechanism Bag type Cleaning frequency Air to cloth ratio (A/C) Pressure drop Inlet temperature
ESP	Type (wet or dry) Number of fields Rapping cycle (if dry) Specific Collection Area (SCA) Particulate resistivity (if known) Spark rate Current and power levels
Venturi (or other high energy) scrubber	Pressure drop Liquid/gas (L/G) ratio Mist eliminator type
Packed-bed scrubber	Packing depth L/G ratio Caustic use (Y/N) pH Mist eliminator type
Carbon absorber	Bed depth Superficial gas velocity Bed temperature Desorption mechanism (media) Flue-gas moisture Cycle length Time-on-line after breakthrough

Emission Factors (lb/ton of feed)

A1	1	2	3
Fluoride Emissions, H_2O soluble	~~0.0113~~	~~0.000929~~	~~0.000237~~
Fluoride Emissions, Total	~~0.0269~~	~~0.0229~~	~~0.0218~~

ALL THREE INLET RUNS VOID FOR FLUORIDES

A2			
Fluoride Emissions, H_2O soluble	0.000912	0.000379	0.000298
Fluoride Emissions, Total	0.000958	0.000829	0.000596

A1			
$PM_{filterable}$	0.907	0.472	1.013
PM_{total}	0.934	0.535	1.075
$PM_{condensable}$	0.027	0.063	0.062

A2			
$PM_{filterable}$	0.163	0.0760	0.0425
PM_{total}	0.177	0.130	*
$PM_{condensable}$	0.014	0.054	*

B1			
$PM_{filterable}$	~~46.84~~	~~32.87~~	~~52.17~~
PM_{total}	~~46.86~~	~~32.88~~	~~52.18~~
$PM_{condensable}$	~~0.02~~	~~0.01~~	~~0.01~~

VOID INLET RUNS (GRINDING) NOT ISOKINETIC

	1	2	3
B2			
$PM_{filterable}$	0.00954	0.00969	0.00724
PM_{total}	0.0123	0.0130	0.00928
$PM_{condensable}$	2.76×10^{-3}	3.31×10^{-3}	2.04×10^{-3}
A1			
CO_2 (PM test)	~~0.011667~~ 54.66	~~0.05242~~ 143.17	~~0.050442~~ 136.63
CO_2 (Fluoride test)	~~0.011653~~ ~~53.92~~ 52.96	~~0.02681~~ ~~71~~ 54.81	~~0.01922~~ ~~52~~ 88
A2	Inlet Fluoride Runs VOID!!		
CO_2 (PM test)	~~0.019188~~ 64.18	~~0.055423~~ 181.82	~~0.042163~~ 142.14
CO_2 (Fluoride test)	~~0.02190~~ 72.66	~~0.01930~~ 65.09	~~0.02055~~ 68.97

54.44	141.17	139.03
53.76	54.81	53.98
18.81	181.93	141.34
73.44	45.04	44.37

Occidental Chemical Company Phosphate Rock Plant

Test	Process	In/out	Run No.	Valid?	Comments
F1, P2O5	drying	inlet	1	no	80% isokinetic
			2	no	122% isokinetic
			3	~~no~~	113% isokinetic
		outlet	1	yes	
			2	yes	
			3	yes	
PM		inlet	1	yes	
			2	yes	
			3	yes	
		outlet	1	yes	
			2	yes	
			3	yes	
PM	grinding	inlet	1	no	49.5% isokinetic
			2	no	58.3% isokinetic
			3	no	66% isokinetic; filter moved
		outlet	1	~~no~~ ?	88% isokinetic
			2	yes	
			3	yes	

Process Flow Diagram

Occidental Chemical Company Phosphate Rock Plant