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Emission Test Report

FMC
Pocatello, Idaho

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EMISSION TEST REPORT
FMC ELEMENTAL PHOSPHORUS PLANT
POCATELLO, IDAHO

VOLUME I

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1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION/BACKGROUND

The Environmental Protection Agency is currently developing additional data on the quantities of radionuclide emissions released during the phosphate rock processing operation (calcining). The data generated during this program will form the basis for a National Emission Standard for Hazardous Air Pollutants (NESHAP) which will limit the quantities of radionuclide emissions from this industry. EPA's Office of Radiation Programs (ORP) and Office of Air Quality Planning and Standards (OAQPS) are jointly participating in this regulatory effort.

Emission tests at two elemental phosphorus plants were performed for this program. The results from the second of these tests, which was conducted at the FMC, Pocatello, Idaho, plant are the subject of this report. The results of the first site test, which was conducted at Monsanto in Soda Springs, Idaho, is reported separately (88-EPP-01).

Since the radionuclides in the offgas streams are associated with the particulate matter, emission testing procedures involved collection of PM from these streams and subsequent analyses of these samples for their radionuclide content. The emissions that are being studied include particulate matter (PM), particulate size distribution (PSD) and two particular radionuclides: Polonium-210 (Po-210) and lead-210 (Pb-210).

1.1.1 Test Program Objectives

The purpose of this document is to present the results from the August test program at the FMC phosphorus plant in Pocatello, Idaho. The focus of this report is on the presentation of measured emissions. No attempt is made to perform rigorous analyses of these data such as are commonly performed in support of NESHAP development. The Industrial Studies Branch (ISB) and their contractors will analyze the data generated during this test program to develop the specific information needed to support the

regulatory development. The primary objectives of the FMC test program were:

- to quantify the particulate matter, polonium-210, and lead-210 emission rates in the calciner offgases at both the inlet and outlet venturi scrubber sampling locations, and
- to determine the distribution of particulate matter, polonium-210, and lead-210 by particle size in the offgases at both inlet and outlet locations.

These pollutants were quantified at two venturi pressure drops: the maximum operable (10.5 in. W.C.) and the typical (6.5 in. W.C.). The outlet stacks were sampled at both pressure drops. The inlet location was sampled only during the first test condition since the uncontrolled flue gas is not affected by the venturi scrubber and the calciner operating conditions were equivalent. In addition, grab samples were collected to quantify the concentration of polonium-210 and lead-210 in the calciner feedstock.

1.1.2 Overview of Testing Activities

On-site activities began on August 22 and were completed on August 27, 1988. The sampling and analysis matrix as planned and presented in the project test plan is included in Table 1-1. During the test program, slight deviations from the planned approach were made to compensate for sampling difficulties encountered during the first and second day of testing. These difficulties and the corrective actions taken are discussed in detail in Sections 3.0 and 4.0 of this document.

During runs 1-4, samples were collected simultaneously at both the venturi scrubber inlet and each of the plant's two stack outlet locations. Thus, for each run, three samples were collected; one at the inlet and one at each of the two outlet stacks. During runs 5-7, samples were collected only at each of the two outlet stacks.

The sampling intervals are summarized for each test run in Table 1-2. In order to collect at least two MM 111 samples at each location that met isokinetic QA requirements, an additional test run was conducted. An

TABLE 1-1. SAMPLING AND ANALYSIS MATRIX FOR FMC ELEMENTAL PHOSPHOROUS PLANT

Sampling Location/ Conditions	Sampling Method	Target Emission or Stack Parameter	Analytical Method	Number of Test Runs	Number of Sample Fractions Per Test Run	Number of Radionuclide Samples
Scrubber Inlet	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	3	2 (front/back)[c]	6
- Operating Condition A[f]	Andersen Impactor	Particulate size Radionuclides[b]	Gravimetric alpha spec.	3	6[d]	18
Outlet Stack #1-1	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	3	2 (front/back)[c]	6
- Operating Condition A[f]	Andersen Impactor	Particulate size Radionuclides[b]	Gravimetric alpha spec.	3	6[d]	18
Outlet Stack #1-2	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	3	2 (front/back)[c]	6
- Operating Condition A[g]	Andersen Impactor	Particulate size Radionuclides[b]	Gravimetric alpha spec.	3	6[d]	18
Outlet Stack #1-1	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	3	2 (front/back)[c]	6
- Operating Condition B[g]						
Outlet Stack #1-2	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	3	2 (front/back)[c]	6
- Operating Condition B[g]						
Process Feed	Grab	Radionuclides[b]	Alpha spec.	6	1	6
- Operating Conditions A & B						
Field Blanks	Modified Method 111[a]	Particulate Radionuclides[b]	Gravimetric alpha spec.	1	2 (front/back)[c]	2
	Andersen Impactor	Particulate size Radionuclides[b]	Gravimetric alpha spec.	1	6[d]	6

TABLE 1-1. SAMPLING AND ANALYSIS MATRIX FOR FMC ELEMENTAL PHOSPHOROUS PLANT (Continued)

Sampling Location/ Conditions	Sampling Method	Target Emission or Stack Parameter	Analytical Method	Number of Test Runs	Number of Sample Fractions Per Test Run	Number of Radionuclide Samples
Reagent Blanks	Modified Method 111[a] Filters, Acetone, Nitric Acid	Radionuclides	Alpha spec.	NA	NA	0[e]
	Andersen Impactor Filters	Radionuclides	Alpha spec.	NA	NA	0[e]
TOTAL						103

[a]Impinger solutions of the Method 111 train were nitric acid.

[b]Target radionuclides included Polonium-210 and Lead-210.

[c]Front half consisted of filter and probe and nozzle rinses, back half consisted of impinger contents and rinses.

[d]Andersen impactor stages were combined into 5 fractions as follows: No. 1 - precutter stages 0 and 1; No. 2 - stages 2, 3, 4, and 5; No. 3 - stage 6; No. 4 - stage 7; and No. 5 - stage 8.

[e]Reagent blanks (filters and solvents) were collected and archived. Radionuclide analysis could be performed on these samples in the event that field blanks show contamination.

[f]Condition A: normal production rate (80-100 percent capacity) and venturi scrubber $\Delta p \approx 10$ in. H_2O.

[g]Condition B: normal production rate (80-100 percent capacity) and venturi scrubber $\Delta p \approx 6.5$ in. H_2O.

TABLE 1-2. SUMMARY OF THE SAMPLING INTERVALS FOR THE FMC TEST PROGRAM (August 1988)

(24-hour clock)

Date	Test Condition	Run	Inlet	Outlet A	Outlet B	Comments
Method 111						
8/24/88	A	1	09:50-11:46	09:42-11:31	11:00-12:15	The inlet train did not meet iso-kinetic requirements.
8/24/88	A	2	16:26-18:16	16:21-17:33	16:20-17:30	The inlet train did not meet iso-kinetic QA requirements.
8/25/88	A	3	11:30-13:20	11:22-12:32	11:25-12:33	
8/25/88	A	4	17:30-19:26	17:22-18:34	17:20-18:25	
8/26/88	B	5	---	08:30-10:39	09:43-10:48	
8/26/88	B	6	---	12:38-13:48	12:35-13:40	
8/26/88	B	7	---	15:50-16:59	15:50-16:54	
Particle Sizing						
8/23/88	A	1	12:17-12:21	11:50-13:05	11:40-13:22	
8/24/88	A	2	13:32-13:36	12:53-14:08	13:21-14:51	
8/25/88	A	3	14:33-14:37	14:06-15:21	14:10-15:40	Substrates wet on outlet B train. Outlet B train invalidated.
8/25/88	A	4	---	---	19:30-21:00	
8/25/88	A	Blank	08:34-08:38	---	08:40-10:10	

additional outlet B PSD sample was collected after run 3 when the substrate was determined to be wet and the outlet B run 3 PSD sample was invalidated. The inlet and outlet particle size samples were collected simultaneously using in-stack Andersen impactors.

Particulate emissions and associated radionuclides were collected from the streams using a modification of EPA Method 111. The specific sampling portion of Method 111 is identical to those procedures described in EPA Method 5.

The modifications made to the Method 111 train for this program included using 0.1 N nitric acid for impinger solutions instead of water, and recovery and analysis of all sampling train fractions. The purpose of the nitric acid impinger solutions was to minimize surface effects that might inhibit recovery of radionuclides and metals from sampling train glassware.

The purpose for analyzing all train components was to quantify total radionuclide content of the offgas streams. The MM 111 sampling trains were recovered in two fractions (front and back halves). The front half consisted of the filter and rinses from the probe, nozzle and filter holder; whereas, the back half consisted of the impinger contents and rinses. Both front and back half sample fractions were analyzed separately by EPA's Eastern Environmental Radiation Facility (EERF) for radionuclide content.

Particle sizing samples were collected using heated Andersen MK-III in-stack cascade impactors and were collected during test condition A only. Particle size operating parameters were selected to optimize the separation of the fine particulate fraction (less than 2 microns). Particle size distributions were determined for each of the nine inlet and outlet samples. For the radioactivity analyses, stages 2 through 5 were combined into one sample for analysis. Stages 1, 6, 7, 8 and the backup filter were each analyzed individually.

Process feed samples were collected during the testing and composited to determine the activity in the feedstock briquettes. Field blanks and reagent blanks were collected during the FMC test program and are presented and discussed in the Quality Assurance/Quality Control (QA/QC) section of this document.

Due to the low concentration of lead-210 in the sample aliquots analyzed, the precision of the lead-210 measurements was fairly low and was estimated at 50 percent at the 95 percent confidence interval. For the polonium-210 measurements, there is a high degree of confidence in the data. The analytical precision in the polonium-210 measurement was less than 10 percent at the 95 percent confidence level.

1.2 SUMMARY OF EMISSION RESULTS

1.2.1 PM and Radionuclides (MM 111)

Emission testing was performed while operating the process at two different test conditions. At test condition A, the venturi scrubber pressure drop was set at 10.5 inches water column. At test condition B, the pressure drop across the venturi scrubber was set at 6.5 inches water column.

Table 1-3 contains a summary of the particulate and radionuclide emissions measured during the program. As seen in the table, particulate matter concentrations at the inlet for the two valid test runs (runs 3 and 4) averaged 1,088 mg/dscm (0.4755 gr/dscf). The outlet particulate matter concentration during condition A averaged 94.76 mg/dscm (0.04142 gr/dscf). During condition B, the outlet particulate matter concentration averaged 81.50 mg/dscm (0.03562 gr/dscf). On a mass emission rate basis, particulate matter emission rates at the inlet averaged 245.9 kg/hr (540.8 lbs/hr). At the outlet, the particulate emission rates averaged 20.75 kg/hr (45.75 lbs/hr) at test condition A and 21.93 kg/hr (48.34 lb/hr) at test condition B. The outlet particulate matter emission rate represent the emission rate for calciner #1, which has two stacks.

Polonium-210 (Po-210) and lead-210 (Pb-210) concentrations in the inlet stream averaged 4,755 and 195.0 pCi/dscm (134.7 and 5.526 pCi/dscf), respectively, for the two valid test runs. The concentration of Po-210 and Pb-210 in the outlet streams at test condition A averaged 4,895 and 118.8 pCi/dscm (138.6 and 3.336 pCi/dscf), respectively. At test condition B, the concentrations of Po-210 and Pb-210 in the outlet streams

TABLE 1-3. SUMMARY OF PARTICULATE MATTER AND RADIONUCLIDE EMISSION RESULTS: CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Location	Run Number	Particulate Matter Concentration (gr/dscf)	Particulate Matter Concentration (mg/dscm)	Particulate Matter Mass Rate (lb/hr)	Particulate Matter Mass Rate (kg/hr)	Polonium-210 Concentration (pCi/dscf)	Polonium-210 Concentration (pCi/dscm)	Polonium-210 Emission Rate (uCi/hr)	Polonium-210 Activity: PM (nCi/g PM)	Lead-210 Concentration (pCi/dscf)	Lead-210 Concentration (pCi/dscm)	Lead-210 Emission Rate (uCi/hr)	Lead-210 Activity: PM (nCi/g PM)
Inlet	1	0.3849	880.8	461.2	209.2	166.5	5880	1397	6.676	3.361	118.7	28.19	0.1347
	2	0.4983	1140	617.0	279.9	173.9	6140	1507	5.385	2.274	80.27	19.71	0.0704
	3	0.4549	1041	527.7	240.6	143.7	5074	1167	4.875	2.834	100.1	23.01	0.0961
	4	0.4962	1135	553.9	251.3	125.7	4433	982.0	3.907	8.217	290.0	64.22	0.2555
	Average[a] (Runs 3-4)	0.4755	1088	540.8	245.9	134.7	4755	1075	4.391	5.526	195.0	43.62	0.1758
Outlet[b] (Scrubber ΔP = 10.5 in. W.C.)	1	0.03918	89.64	41.46	18.81	166.5	5880	1234	64.75	1.233	43.53	9.134	0.4706
	2	0.04584	104.9	49.76	22.57	168.8	5958	1283	55.78	2.486	87.78	18.90	0.8655
	3	0.04120	94.28	46.57	21.12	123.6	4365	978.0	46.95	8.596	303.5	68.00	3.429
	4	0.03944	90.24	45.21	20.51	95.63	3377	767.4	37.40	1.027	36.27	8.244	0.4012
	Average (Runs 1-4)	0.04142	94.76	45.75	20.75	138.6	4895	1065	51.22	3.336	118.8	26.07	1.291
Outlet[b] (Scrubber ΔP = 6.5 in. W.C.)	5	0.03362	76.93	45.88	20.81	108.7	3840	1039	49.83	0.8112	28.64	7.749	0.3947
	6	0.03776	86.40	50.68	22.99	144.2	5093	1355	60.11	7.965E-05[c]	2.813E-03[c]	7.483E-04[c]	2.978E-05[c]
	7	0.03548	81.18	48.46	21.98	128.7	4544	1230	55.92	0.4656[c]	16.44[c]	4.451[c]	0.2036[c]
	Average (Runs 5-7)	0.03562	81.50	48.34	21.93	127.2	4492	1208	55.29	0.4256	15.03	4.067	0.1995
Outlet Mass Emission Rate (lb/yr, ΔP = 6.5 in W.C.)				141 tons/yr				7.05 Ci/yr				0.0237 Ci/yr	

[a]Average inlet values from runs 3 and 4.

[b]Outlet concentration values for each run are the averages of the two outlet locations weighted for the different stack gas flow rates. The mass rates are the sum of the mass rates for the two outlet locations.

[c]Lead-210 was not detected in either the Outlet A or Outlet B samples. The values presented are an average minimum detection limit.

averaged 4,492 and 15.03 pCi/dscm (127.2 and 0.4256 pCi/dscf), respectively. On an emission rate basis, Po-210 and Pb-210 emissions at the inlet averaged 1,075 and 43.62 uCi/hr. At the outlet, the emission rates for Po-210 and Pb-210 at condition A averaged 1,065 and 26.07 uCi/hr and at condition B averaged 1,208 and 4.067 uCi/hr, respectively. For several of the test runs, the Pb-210 concentrations were below minimum detection limits and for many of the test runs, the Pb-210 concentrations were within ten times the minimum detection limit. Thus, although the Pb-210 concentrations for condition B appear to be lower than for condition A, these concentrations are actually near minimum detection limits in both cases and may be considered to agree within analytical precision.

1.2.2 Particulate Size Distribution

Particle size analysis quantifies the particulate mass in a given size range. The mass collected on each stage are presented for each run in Table 1-4. For a given location, the data show consistency between test runs.

The particle size results are presented in two ways in this report. The first is a plot of the cumulative mass fraction versus the interval endpoint (Dp_{50}) as shown in Figure 1-1. Dp_{50} represents the effective stage cut diameter calculated for the specified sampling run. Ideally, each impactor stage collects all particles having an aerodynamic diameter greater than the stage cut diameter (Dp_{50}). In reality, the effective stage cut diameter (Dp_{50}) is assumed to be equal to the particle diameter for which the stage collection efficiency is 50 percent. The stage cut diameter is calculated from the sampling run conditions, the physical dimensions of the impactor, and a theoretical calibration value (Stokes number). This curve is used to estimate the fraction of the particulate less than a specific particle diameter.

For the inlet location, 30 percent of the particulate mass is composed of particles that are less than 0.5 microns in diameter. For the outlet locations, 80 percent of the particulate mass comprises particles that are less than 0.5 microns in diameter. The particulate mass at the inlet

TABLE 1-4. MASS COLLECTED BY STAGE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

	Mass Collected per stage (grams per sample)								
	Inlet			Outlet A			Outlet B		
Stage	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
1[a]	0.03190	0.03240	0.04549	0.00060	0.00100	0.00062	0.00170	0.00100	0.00066
2	0.00080	0.00103	0.00129	0.00037	0.00056	0.00054	0.00121	0.00070	0.00027
3	0.00099	0.00094	0.00115	0.00113	0.00076	0.00072	0.00140	0.00092	0.00052
4	0.00460	0.00069	0.00035	0.00015	0.00103	0.00069	0.00139	0.00088	0.00091
5	0.00028	0.00052	0.00023	0.00191	0.00107	0.00138	0.00184	0.00164	0.00130
6	0.00128	0.00038	0.00030	0.00264	0.00156	0.00187	0.00168	0.00221	0.00196
7	0.00014	0.00011	0.00000	0.00340	0.00214	0.00349	0.00276	0.00252	0.00519
8	0.00040	0.00019	0.00000	0.00744	0.00337	0.01252	0.00447	0.00598	0.01309
Back-up	0.00106	0.00149	0.00116	0.06493	0.04316	0.04888	0.05845	0.05827	0.05131
Total	0.04145	0.03775	0.04997	0.08257	0.05465	0.07071	0.07490	0.07412	0.07521

[a]Stage 1 includes the pre-impactor stage.

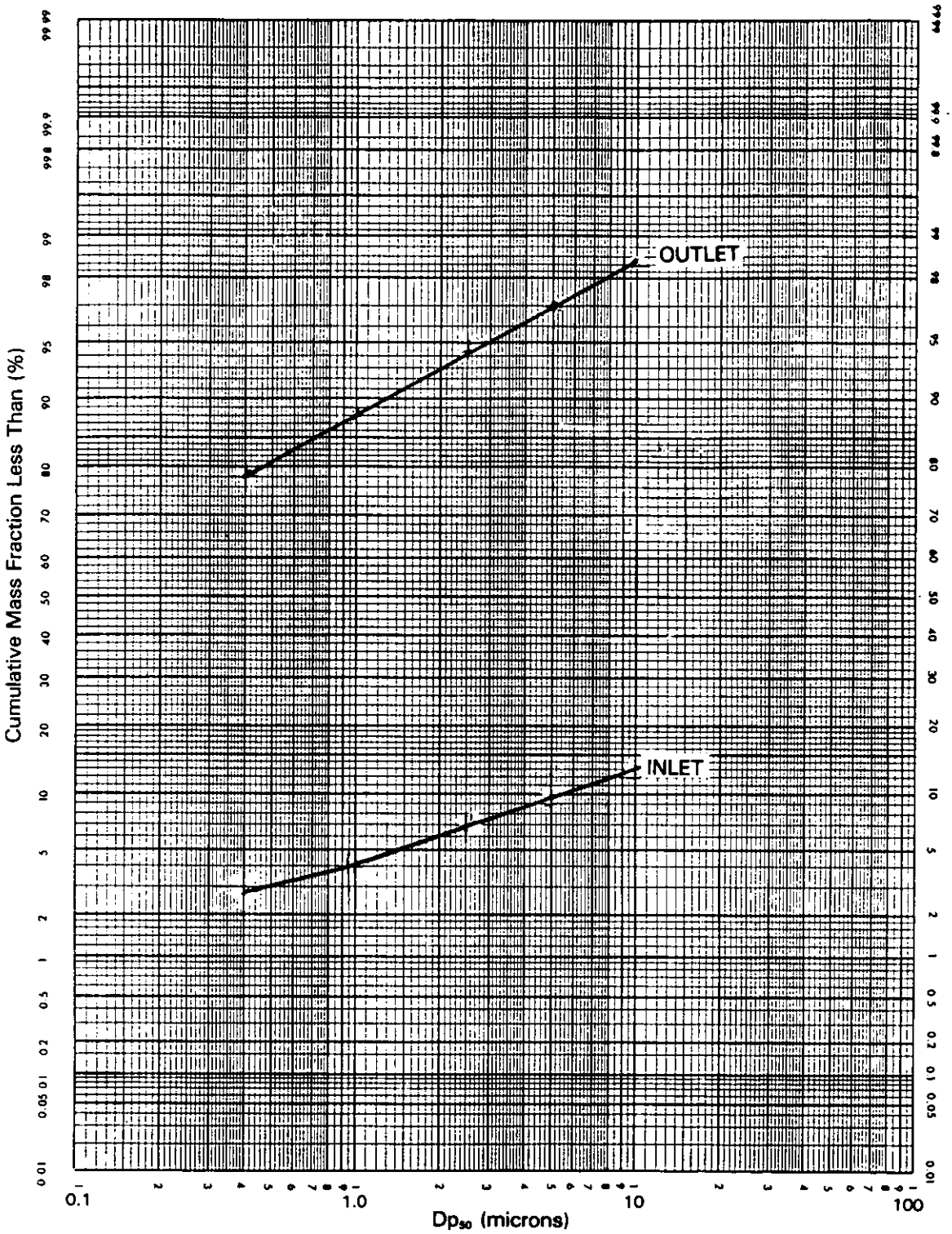

Figure 1-1. Composite curves of mass fractions as a function of particle size Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

consists of approximately 13 percent PM_{10} (i.e., particulate matter less than 10 microns in diameter). At the outlet, PM_{10} accounts for about 98.4 percent of the particulate mass. The cumulative mass fraction data are presented in tabular form in Table 1-5.

The second presentation method is to plot differential mass concentration versus the particle geometric mean diameter as shown in Figure 1-2. The differential mass concentration is the particulate concentration in the flue gas normalized per unit of particle size. This curve is used to estimate the particulate concentration in the flue gas for a specific particle size interval.

For the inlet location, the differential mass concentration ranged from 0.0650 gr/dscf for 7.5 to 50 micron particles to 0.0040 gr/dscf for 0.7 to 2.0 micron particles. The majority (87%) of the uncontrolled particulate is above 10 microns.

For the outlet location, the differential mass concentration ranged from 0.0015 gr/dscf for 7.5 to 50 micron particles to 0.0190 gr/dscf for 0.1 to 0.7 micron particles. The majority (80%) of the controlled particulate is below 0.5 microns.

Figure 1-2 also provides an indication of venturi scrubber removal efficiency by particle size fraction. The data used to prepare these curves are presented in Table 1-6.

Radionuclide activity was measured for the samples collected from the inlet and outlet. For each test run, stages 2 through 5 were combined into one sample for analysis. Stages 1, 6, 7, 8 and the backup filter were each analyzed individually. The activity results are summarized as pico Curies per sample in Tables 1-7 and 1-8.

In order to evaluate the radionuclide data, the cumulative activity fraction was plotted against the interval endpoint (Dp_{50}) determined from the PSD run. The cumulative activity fraction is plotted in Figure 1-3 for polonium-210 and in Figure 1-4 for lead-210. The data plotted in these figures are summarized in Table 1-9.

These data indicate that the radioactivity is associated with small particles. Controlled particles less than 1 micron contained 82 percent of the radioactivity for Po-210 and 70 percent of the radioactivity for Pb-210.

TABLE 1-5. COMPOSITE CUMULATIVE MASS FRACTION RESULTS, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Interval[a] Endpoint Dp_{50} (microns)	Mass Fraction Less Than (%)	
	Inlet	Outlet
0.5	3	80
1	4	88
2.5	7	95
5	10	97
10	13	98.4

[a]Dp_{50} = the theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

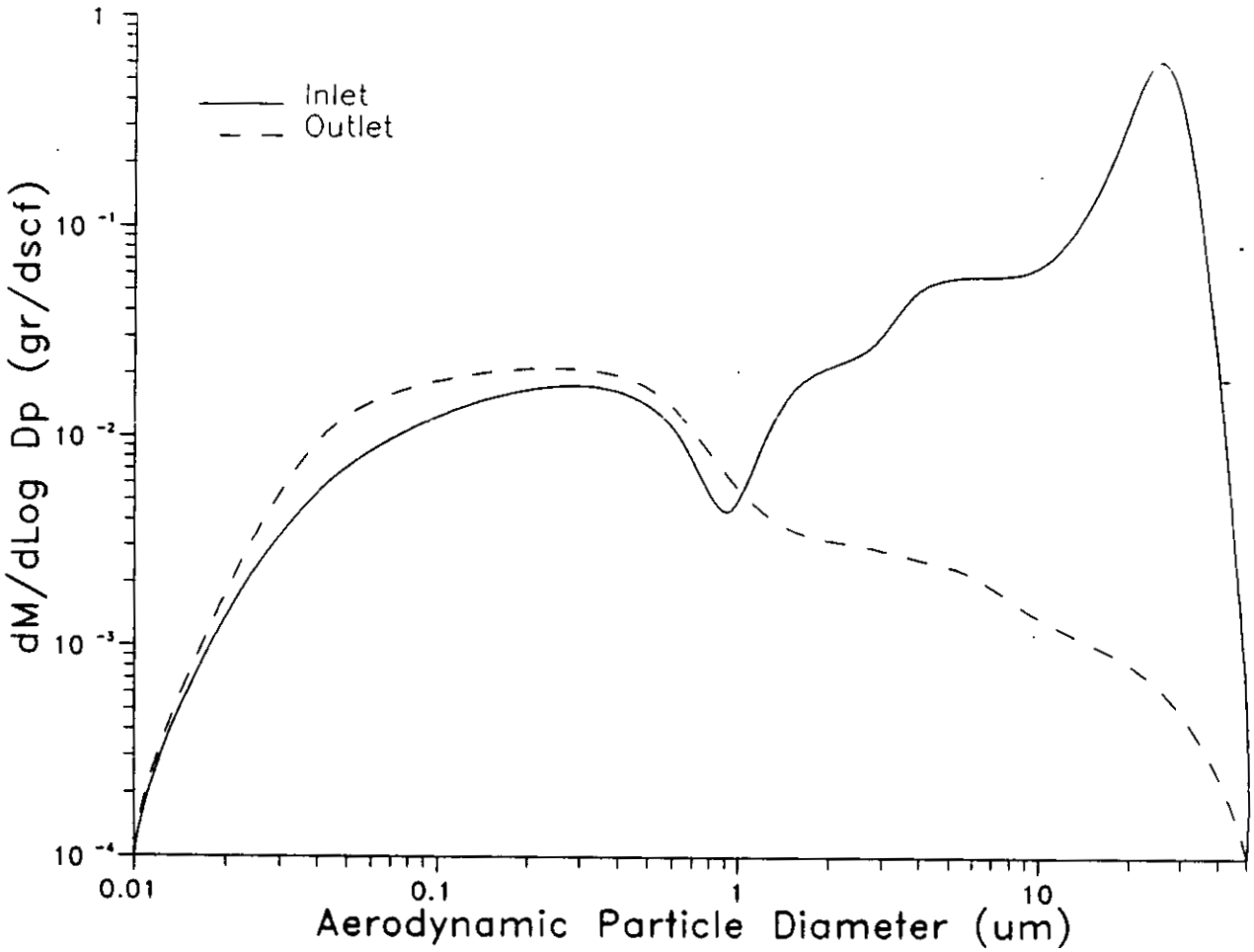

Figure 1-2. Composite curves of differential mass concentration as a function of particle size. Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988)

TABLE 1-6. COMPOSITE DIFFERENTIAL MASS CONCENTRATION, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Geometric Mean (microns)	Interval range (microns)	Differential Mass Concentration (gr/dscf)	
		Inlet	Outlet
0.5	0.1-0.7	0.0013	0.0190
1	0.7-2.0	0.0040	0.0050
2.5	2.0-3.5	0.0200	0.0030
5	3.5-7.5	0.0500	0.0020
10	7.5-5.0	0.0650	0.0015

TABLE 1-7. INLET RADIONUCLIDE ACTIVITY PER STAGE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1
FMC-POCATELLO, IDAHO (August 1988)[a]

	Radioactivity per stage (pico Curies per sample)					
	Inlet - Run 1		Inlet - Run 2		Inlet - Run 3	
Stage	Po-210	Pb-210	Po-210	Pb-210	Po-210	Pb-210
1	11.955	0.878	10.17	1.439	35.02	2.978
2-5	17.532	1.774	18.19	3.580	64.76	ND [1.336]
6	8.684	ND [0.781][b]	7.899	ND [0.712]	12.83	0.8781
7	9.147	ND	11.01	ND [1.219]	10.896	1.681
8	10.250	ND	13.94	1.978	13.252	ND [0.453]
Back-up	112.560	ND	82.64	3.284	147.04	3.1088
Total	170.128	3.433	143.8	12.21	77.58	2.214

[a]The data should be considered significant to three figures.

[b]ND = Not detected. Value in brackets is the minimum detection limit. When no value is presented in brackets, the minimum detection limit was essentially zero.

TABLE 1-8. OUTLET RADIONUCLIDE ACTIVITY PER STAGE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1
FMC-POCATELLO, IDAHO (August 1988)[a]

	Radioactivity per stage (pico Curies per sample)											
	Outlet A - Run 1		Outlet A - Run 2		Outlet A - Run 3		Outlet B - Run 1		Outlet B - Run 2		Outlet B - Run 3	
Stage	Po-210	Pb-210	Po-210	Pb-210	Po-210	Pb-210	Po-210	Pb-210	Po-210	Pb-210	Po-210	Pb-210
1	101.5	ND [0.5158][b]	96.03	ND [0.9248]	21.66	1.985	63.26	ND	101.3	ND	77.10	ND
2-5	275.0	2.670	327.5	ND [3.317]	112.6	2.304	199.0	2.579	335.2	ND [0.2253]	240.7	ND
6	87.05	16.75	88.98	ND [0.7925]	51.58	2.137	44.17	ND [0.3147]	120.7	ND [0.6223]	90.21	ND [0.1105]
7	150.56	3.0656	122.2	ND [0.9781]	121.7	2.370	91.60	2.592	215.9	27.92	269.2	ND
8	256.7	ND	122.2	2.297	345.9	4.997	201.8	6.429	472.7	10.66	728.7	6.557
Back-up	1999	ND [13.36]	1942	ND [9.788]	2115	ND [13.67]	2590	ND [3.894]	4222	105.7	2566	ND
Total	2830	201.9	2699	18.10	2769	27.46	3190	15.81	5468	145.2	3972	6.668

[a]The should be considered significant to three figures.

[b]ND = Not detected. Value in brackets is the minimum detection limit. When no value is presented in brackets, the minimum detection limit was essentially zero.

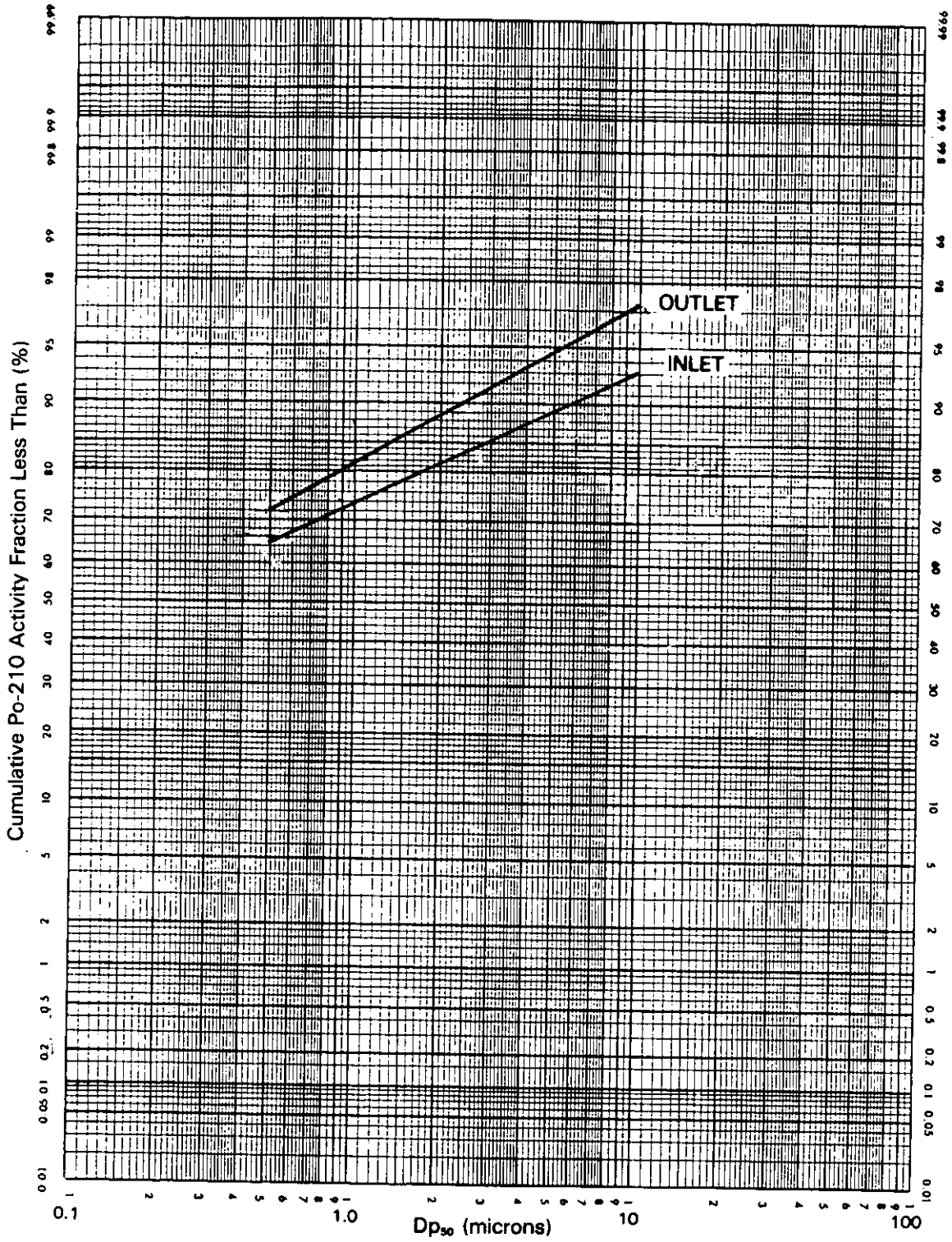

Figure 1-3. Composite curves of cumulative Polonium-210 activity fraction as a function of particle size, Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

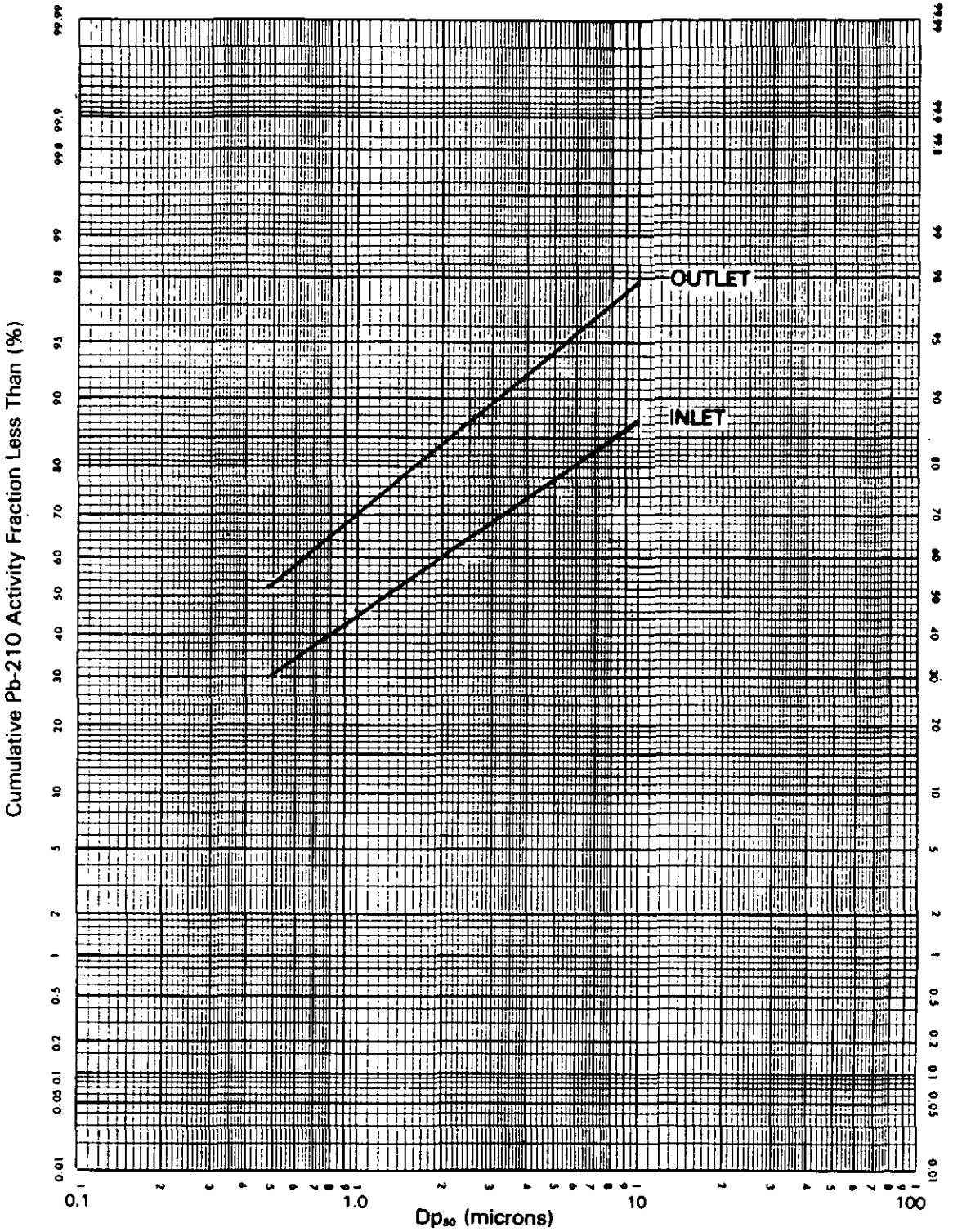

Figure 1-4. Composite curves of cumulative Lead-210 activity fraction as a function of particle size, Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August).

TABLE 1-9. COMPOSITE CUMULATIVE ACTIVITY FRACTION RESULTS, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Interval[a] Endpoint Dp_{50} (microns)	Mass Fraction Less Than (%)			
	Po-210		Pb-210	
	Inlet	Outlet	Inlet	Outlet
0.5	64	72	30	54
1	74	82	46	70
2.5	84	90	64	87
5	89	95	78	94
10	93	97	87	98

[a]Dp_{50} = the theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

Particles less than 0.5 micron contained 72 percent of Po-210 and 54 percent of Pb-210 radioactivity.

The curves presented in this section were fitted to the test run data presented in Section 3.0. Thus, these curves are a composite representing the typical characteristics of the particulate.

1.3 TEST REPORT ORGANIZATION

This emission test report is presented in two volumes. Information presented in this document (Volume I) is organized as follows: Section 2.0 contains a brief description of the calcining process and the air pollution control systems at the plant; Section 3.0 presents a summary and discussion of the results; Section 4.0 describes the specific sampling locations and the sampling and analysis procedures that were used; and Section 5.0 describes the specific quality assurance and quality control measures that were taken to ensure useful and valid data.

The supporting data for the results presented in this volume are included in Volume II as appendices. Volume II contains sampling and analytical protocols, all field and lab data sheets, data reduction summaries, and calibration data.

2.0 DESCRIPTION OF PROCESS AND AIR POLLUTION CONTROL SYSTEMS

2.1 PROCESS DESCRIPTION

The FMC, Pocatello, Idaho, plant produces elemental phosphorus from phosphate ore (shale). The calcining process, which is the focus of this emission study, is discussed in more detail in the following paragraphs. Phosphate rock is crushed, screened, and formed into briquettes, before being fed into the calciner. The phosphate rock is heated to remove organic material and to form heat-hardened nodules that withstand further processing without disintegrating. The nodules are cooled and passed through a proportioning building, where they are blended with sized coke and silica into a material called the burden, which is fed into an electric-arc reducing furnace. High temperature reactions in the furnace drive off gaseous phosphorus and carbon monoxide and leave molten residues of slag and ferrophosphorus. The furnace offgases pass through electrostatic precipitators to remove dust before entering a condenser, where the phosphorus is condensed, collected in a sump, and pumped to storage. The carbon monoxide is fed to the calciner as fuel.

The FMC facility has two moving-grate calciners, designated as Unit 1 and Unit 2. A simple schematic overview of the process, showing feed and offgas streams around each of the calcining units is shown in Figure 2-1. Prior to entering the calciner, the ore is formed into briquettes using a mechanical process. These briquettes are fed by a vibratory feeder onto the pallets of the calciner grate. The calciner is divided into three sections. The first section, the calcining section, has six overflow burners that heat the bed. Carbon monoxide (CO) from the electric furnace exhaust gas streams is the primary fuel, with natural gas as an auxiliary fuel source. The second section is a cooling section that is open to the atmosphere. The down-draft air from this section is drawn through a fan and used as combustion air in the CO burners. The final section is a cooling section. The cooling air is drawn down through the bed and exhausted out a stack.

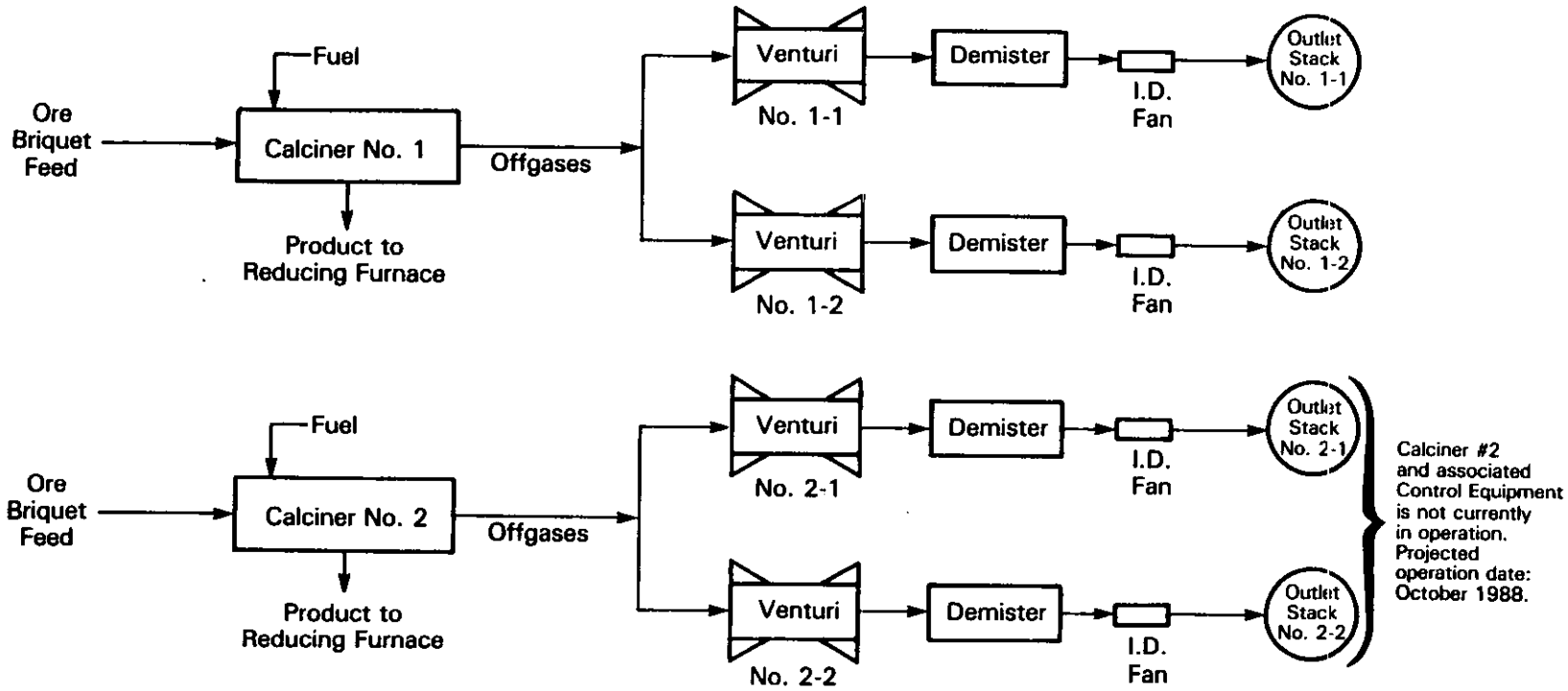

Figure 2-1. Schematic of the FMC calcining operation and pollution control system

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The cooled nodules are discharged through a hopper to a conveyor belt and transported to the furnace area.

2.2 AIR POLLUTION CONTROL EQUIPMENT (CALCINING OPERATION)

The offgases are vented to separate pollution control systems. As seen in the figure, offgases enter a common inlet and are split into two parallel streams, each containing a venturi scrubber, a demister, and an induction fan. After passing through their respective ID fans, the exhaust gases from each calcining unit are discharged through two similar 22.9 m (75 ft) tall stacks. These outlet stacks were scheduled to be rebuilt in October of 1988. The height of each of the rebuilt stacks is expected to be approximately 30.5 m (100 ft.).

2.3 PROCESS AND POLLUTION CONTROL DATA

The emission test program at FMC was performed during two periods of different scrubber operating conditions, Δp = 10.5 in. and Δp = 6.5 in. of H_2O. Process conditions for each set of tests were within "normal" operating ranges. Operational ranges for process parameters were established by ISB and FMC personnel prior to testing based on historical plant data and full production capacity. Key parameters were monitored throughout the testing period by FMC's automated data acquisition system. Additionally, Radian personnel periodically monitored these data from the plant's control room for the purpose of coordinating sample collection activities with process/control device conditions. Key parameters monitored and reported for this test program are, with a few additions, the same as those measurements monitored during the November 1983 test program at FMC.

The averages for the emission testing period (August 23-26) represent the average of instantaneous values recorded by Radian personnel during each test period. The average values presented are not intended to represent daily averages. The intention is to indicate consistent and normal plant operation during the emission testing. The key operating parameters monitored during the emission test period are discussed below and data which has been claimed confidential by the facility have been indicated.

2.3.1 Process Rate

The process rate was monitored in the control room in terms of calciner speed. The "normal" range for calciner speed was reported to be [claimed confidential] meters per minute (m/min also equivalent to [claimed confidential] feet per minute [ft/min]). Table 2-1 is a summary of the process rate information recorded by Radian personnel during the test period. A plant supplied conversion chart in the control room was used to convert the calciner speed to a process rate based upon the bed depth. A bed depth of [claimed confidential] inches was maintained throughout the test period. Calciner grate speed was controlled manually by an operator who watches the feed unit through a window. Calciner grate speed varied due to availability of feed material and burner temperature during the testing. Calciner grate speed was calculated upon the pallet count per elapsed time. The grate speed recorded during short time periods had a greater variability than reported previously.

2.3.2 Burner Temperatures

The burner temperatures appeared on a digital readout in the control room. All six burner temperatures were monitored for Unit No. 1. During testing operations, burner temperatures were within normal operating range. Burner temperatures recorded during the emissions testing are summarized in Table 2-2.

2.3.3 Fan Amperage

Amperage for the calciner cooling and scrubber ID fans were monitored during the test period as a relative indicator of calciner exhaust air. The fan amperage is summarized in Table 2-3. The fan amperage values recorded during the test period are within the expected range, with the exception of scrubber 1-1 induced draft fan on August 24th, during MM 111 test runs 1 and 2. The fan amperage during this period was 10-15 percent lower, which resulted from the insert being raised too far in the variable throat venturi for the scrubber 1-1 train. The resultant scrubber pressure

TABLE 2-1. CALCINER FEED RATE SUMMARY AT FMC-POCATELLO, IDAHO (August 1988)

Date	Time	Grate Speed	Pallet (counts)	Elapsed Time (min)	Feed Rate (tons/hr)
8/23/88	11:23				
8/23/88	12:23				
8/23/88	12:38				
8/23/88	12:50				
8/23/88	13:02				
8/23/88	13:17				
8/23/88	16:00				
8/24/88	09:44				
8/24/88	10:00				
8/24/88	11:10				
8/24/88	11:52				
8/24/88	12:39				
8/24/88	13:14				
8/24/88	14:18				
8/24/88	14:45				
8/24/88	16:48				
8/24/88	17:27				
8/24/88	17:42				
8/24/88	18:06				
8/24/88	18:20				
8/24/88	18:30				
8/25/88	11:30				
8/25/88	11:45				
8/25/88	12:05		[CLAIMED CONFIDENTIAL]		
8/25/88	13:12				
8/25/88	14:00				
8/25/88	14:15				
8/25/88	14:30				
8/25/88	15:00				
8/25/88	15:15				
8/25/88	15:30				
8/25/88	15:45				
8/25/88	16:00				
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8/26/88	08:15				
8/26/88	08:30				
8/26/88	09:15				
8/26/88	09:30				
8/26/88	09:45				
8/26/88	10:00				
8/26/88	10:15				
8/26/88	10:30				
	10:45				

TABLE 2-1. (Continued)

Date	Time	Grate Speed	Pallet (counts)	Elapsed Time (min)	Feed Rate (tons/hr)
8/26/88	12:15				
8/26/88	12:30				
8/26/88	12:45				
8/26/88	13:00				
8/26/88	13:15				
8/26/88	13:30				
8/26/88	13:45		[CLAIMED CONFIDENTIAL]		
8/26/88	15:50				
8/26/88	16:00				
8/26/88	16:15				
8/26/88	16:30				
8/26/88	16:45				
8/26/88	17:00				

TABLE 2-2. CALCINER BURNER TEMPERATURE SUMMARY FOR FMC-POCATELLO, IDAHO (AUGUST 1988)

Date	Time	Burner Temperature (deg. F) #1	#2	#3	#4	#5	#6	Windbox #13 Temp (deg. F)
8/23/88	08:00							
8/23/88	09:00							
8/23/88	10:00							
8/23/88	10:36							
8/23/88	11:00							
8/23/88	11:15							
8/23/88	12:00							
8/23/88	12:30							
8/23/88	12:45							
8/23/88	13:00							
8/23/88	13:15							
8/23/88	14:00							
8/23/88	15:15							
8/23/88	16:00							
Average								
8/24/88	09:30							
8/24/88	09:45							
8/24/88	10:00							
8/24/88	11:08							
8/24/88	11:50							
8/24/88	12:38							
8/24/88	13:11							
8/24/88	13:50							
8/24/88	14:16							
8/24/88	14:44							
8/24/88	16:15							
8/24/88	16:45							
8/24/88	17:20							
8/24/88	17:40							
8/24/88	18:00							
8/24/88	18:18							
8/24/88	18:30			[CLAIMED CONFIDENTIAL]				
Average								
8/25/88	11:24							
8/25/88	11:45							
8/25/88	12:00							
8/25/88	12:30							
8/25/88	12:45							
8/25/88	13:11							
8/25/88	14:00							
8/25/88	14:15							
8/25/88	14:30							
8/25/88	15:00							
8/25/88	15:15							
8/25/88	15:30							
8/25/88	15:45							
8/25/88	16:00							
8/25/88	17:20							
8/25/88	17:46							
8/25/88	18:00							
8/25/88	18:20							
8/25/88	18:35							
8/25/88	18:50							
8/25/88	19:05							
8/25/88	19:20							
8/25/88	19:35							
8/25/88	19:50							
8/25/88	20:05							
8/25/88	20:20							
8/25/88	20:35							
8/25/88	20:50							
Average								

TABLE 2-2. (Continued)

Date	Time	Burner Temperature (deg. F) #1	#2	#3	#4	#5	#6	Windbox #13 Temp (deg. F)
8/26/88	08:15							
8/26/88	08:30							
8/26/88	09:15							
8/26/88	09:30							
8/26/88	09:45							
8/26/88	10:00							
8/26/88	10:15							
8/26/88	10:30							
8/26/88	10:45							
8/26/88	12:15							
8/26/88	12:30							
8/26/88	12:45							
8/26/88	13:00				[CLAIMED CONFIDENTIAL]			
8/26/88	13:15							
8/26/88	13:30							
8/26/88	13:45							
8/26/88	14:00							
8/26/88	15:50							
8/26/88	16:00							
8/26/88	16:15							
8/26/88	16:30							
8/26/88	16:45							
8/26/88	17:00							
Average								

TABLE 2-3. FAN AMPERAGE FOR FMC-POCATELLO, IDAHO (August 1988)

Date	Time	Primary Cooling Fan (amps)	ID Fan (amps) #1-1	ID Fan (amps) #1-2
8/23/88	08:00	520	NR	NR
8/23/88	09:00	460	NR	NR
8/23/88	10:00	500	NR	NR
8/23/88	10:36	500	452	458
8/23/88	11:00	500	457	462
8/23/88	11:15	500	449	461
8/23/88	12:00	500	454	462
8/23/88	12:30	500	444	448
8/23/88	12:45	500	451	459
8/23/88	13:00	500	454	462
8/23/88	13:15	500	445	450
8/23/88	14:00	520	NR	NR
8/23/88	15:15	480	453	458
8/23/88	16:00	NR	445	456
Average		498	450	458
8/24/88	09:30	460	424	470
8/24/88	09:45	480	415	468
8/24/88	10:00	460	417	465
8/24/88	11:08	500	409	464
8/24/88	11:50	500	411	454
8/24/88	12:38	500	405	454
8/24/88	13:11	500	411	460
8/24/88	13:50	460	413	456
8/24/88	14:16	500	409	457
8/24/88	14:44	500	409	457
8/24/88	16:15	480	411	458
8/24/88	16:45	480	411	464
8/24/88	17:20	480	413	461
8/24/88	17:40	480	404	457
8/24/88	18:00	500	401	451
8/24/88	18:18	490	403	450
8/24/88	18:30	490	407	456
Average		486	410	459
8/25/88	11:24	490	445	449
8/25/88	11:45	490	444	448
8/25/88	12:00	NR	451	447
8/25/88	12:30	490	447	456
8/25/88	12:45	495	NR	NR
8/25/88	13:11	490	NR	NR
8/25/88	14:00	495	NR	NR
8/25/88	14:15	490	NR	NR
8/25/88	14:30	490	444	449
8/25/88	15:00	485	NR	NR
8/25/88	15:15	485	NR	NR
8/25/88	15:30	485	NR	NR
8/25/88	15:45	480	NR	NR
8/25/88	16:00	480	444	455
8/25/88	17:20	480	456	448
8/25/88	17:46	480	445	452
8/25/88	18:00	445	NR	NR
8/25/88	18:20	445	456	453
8/25/88	18:35	445	449	454
8/25/88	18:50	445	454	451
8/25/88	19:05	450	445	458
8/25/88	19:20	445	454	452
8/25/88	19:35	450	447	458
8/25/88	19:50	450	459	458
8/25/88	20:05	150	451	456
8/25/88	20:20	150	464	450
8/25/88	20:35	445	446	454
8/25/88	20:50	NR	457	453
Average		447	450	453

TABLE 2-3. (Continued)

Date	Time	Primary Cooling Fan (amps)	ID Fan (amps) #1-1	ID Fan (amps) #1-2
8/26/88	08:15	485	497	491
8/26/88	08:30	500	490	480
8/26/88	09:15	520	493	485
8/26/88	09:30	495	485	487
8/26/88	09:45	480	490	488
8/26/88	10:00	485	491	483
8/26/88	10:15	500	484	488
8/26/88	10:30	485	487	482
8/26/88	10:45	485	495	479
8/26/88	12:15	460	485	479
8/26/88	12:30	460	483	483
8/26/88	12:45	480	485	483
8/26/88	13:00	465	480	482
8/26/88	13:15	470	485	480
8/26/88	13:30	470	483	483
8/26/88	13:45	470	477	472
8/26/88	15:50	470	504	494
8/26/88	16:00	480	491	491
8/26/88	16:15	480	499	493
8/26/88	16:30	475	496	494
8/26/88	16:45	480	503	491
8/26/88	17:00	475	499	489
Average		480	490	485

drop of the scrubber 1-1 was greater than the 10.5 in. W.C. desired during this period.

2.3.4 Pressure Drop (Δp) Across Each Venturi Scrubber

Two scrubber pressure drop conditions were tested. These were 10.5 and 6.5 in. W.C. Condition A was 10.5 in. W.C. and condition B was 6.5 in. W.C. The pressure drop across each venturi was monitored during the emission test period and recorded in Notebook #20880. Due to the consistency of the recorded values, the pressure drop is not reproduced for this document.

The only anomaly noted during the test period was the incorrect venturi setting noted above. The incorrect setting was discovered during the pressure sensor calibration on August 25th, prior to testing.

2.3.5 Scrubber Liquid Flow Rate for Each Scrubber

The liquid flow rate for each scrubber was monitored during each test period. The liquid flow rates are summarized in Table 2-4. The total liquid flow rate in gallons per minute (gpm) for each scrubber is the sum of the two recorded values. The plant data acquisition system monitors the water to both the main scrubber body and the demister (separator) section.

TABLE 2-4. VENTURI SCRUBBER WATER FLOW SUMMARY FOR FMC-POCATELLO, IDAHO (August 1988)

(Calciner #1)

Date	Time	Water Flow (gpm) #1	Seperator	#2	Seperator
8/23/88	10:36	1524	183	1684	185
8/23/88	11:00	1490	180	1692	191
8/23/88	11:15	1490	182	1721	185
8/23/88	12:00	1563	179	1716	189
8/23/88	12:30	1495	180	1779	192
8/23/88	12:45	1454	181	1715	192
8/23/88	13:00	1449	188	1684	201
8/23/88	13:15	1501	183	1764	192
8/23/88	15:15	1403	184	1663	191
8/23/88	16:00	1494	194	1758	196
Average		1486	183	1718	191
8/24/88	09:30	1516	182	1743	190
8/24/88	09:45	1523	197	1761	189
8/24/88	10:00	1533	180	1779	191
8/24/88	11:08	1549	180	1749	190
8/24/88	11:50	1562	193	1800	194
8/24/88	12:38	1527	184	1791	186
8/24/88	13:11	1556	183	1763	185
8/24/88	13:50	1556	195	1794	193
8/24/88	14:16	1576	184	1723	187
8/24/88	14:44	1551	181	1741	187
8/24/88	16:15	1533	194	1818	188
8/24/88	16:45	1551	181	1839	188
8/24/88	17:20	1517	195	1818	201
8/24/88	17:40	1501	186	1774	188
8/24/88	18:00	1493	182	1769	189
8/24/88	18:18	1484	196	1746	188
8/24/88	18:30	1486	193	1783	193
Average		1530	187	1776	190
8/25/88	11:24	1493	195	1818	195
8/25/88	11:45	1444	193	1822	190
8/25/88	12:00	1487	182	1781	189
8/25/88	12:30	1456	182	1833	197
8/25/88	14:30	1460	207	1776	186
8/25/88	16:00	1491	193	1771	192
8/25/88	17:20	1471	181	1557	186
8/25/88	17:46	1512	184	1771	184
8/25/88	18:20	1531	190	1723	191
8/25/88	18:35	1411	181	1623	184
8/25/88	18:50	1513	185	1756	193
8/25/88	19:05	1538	182	1731	184
8/25/88	19:20	1516	193	1767	191
8/25/88	19:35	1539	179	1733	185
8/25/88	19:50	1534	179	1733	192
8/25/88	20:05	1499	183	1751	182
8/25/88	20:20	1491	178	1726	192
8/25/88	20:35	1543	196	1731	184
8/25/88	20:50	1519	193	1776	194
Average		1497	187	1746	189

TABLE 2-4. (Continued)

(Calciner #1)

Date	Time	Water Flow (gpm) #1	Seperator	#2	Seperator
8/26/88	08:15	1473	181	1748	206
8/26/88	08:30	1437	182	1684	186
8/26/88	09:15	1485	192	1737	194
8/26/88	09:30	1466	181	1722	186
8/26/88	09:45	1455	198	1788	194
8/26/88	10:00	1546	180	1760	186
8/26/88	10:15	1458	192	1690	198
8/26/88	10:30	1416	180	1730	189
8/26/88	10:45	1439	179	1773	199
8/26/88	12:15	1473	188	1749	197
8/26/88	12:30	1443	191	1711	191
8/26/88	12:45	1455	191	1733	199
8/26/88	13:00	1499	180	1786	188
8/26/88	13:15	1522	198	1774	197
8/26/88	13:30	1500	177	1761	188
8/26/88	13:45	1454	192	1690	197
8/26/88	15:50	1509	176	1795	188
8/26/88	16:00	1500	180	1837	187
8/26/88	16:15	1532	192	1826	195
8/26/88	16:30	1485	183	1799	188
8/26/88	16:45	1431	196	1717	197
8/26/88	17:00	1478	179	1792	188
Average		1475	186	1755	193

3.0 SUMMARY AND DISCUSSION OF RESULTS

The results of the August 1988 test program conducted at the FMC facility are presented in this section. Radionuclide data that are presented are not blank corrected. Field blanks were collected on both inlet and outlet MM 111 trains and the results are presented and discussed in Section 5.0 of this document. For reference purposes, the radionuclide activities in the field blank collected at the inlet location were less than 2 percent of the average activities of the samples collected at that location (1.5% for Po-210, 0.2% for Pb-210). At the outlet, the field blank activities for Po-210 and Pb-210 were approximately 1.2 percent and 2.2 percent, respectively, of the average outlet sample activities.

Dual units (metric and English) are presented in each table where applicable. The supporting data for the results are included in the appendices (Volume II) of this report.

3.1 RESULTS FOR TEST CONDITION A: VENTURI PRESSURE DROP = 10.5 in. W.C.

3.1.1 Particulate Matter and Radionuclide Results

Particulate matter and associated radionuclide emissions were collected simultaneously at each of the inlet/outlet offgas sampling locations using a modification of EPA Method 111. An overview of results from the four inlet/outlet test runs at test condition A is presented in Table 3-1. Specific sampling measurements from each individual test run at condition A are presented in Tables 3-2 through 3-5 for runs 1 through 4, respectively. Slight deviations from the planned test matrix were made to compensate for sampling difficulties encountered during testing. Two MM 111 sampling runs were nonisokinetic at the inlet location. Also, the venturi scrubber pressure drop was incorrectly set too high for scrubber 1-1 on 8/24/88. The incorrect pressure drop was discovered during process instrumentation calibration prior to testing on 8/25/88.

TABLE 3-1. SUMMARY OF PARTICULATE MATTER AND RADIONUCLIDE EMISSION RESULTS: CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Location	Run Number	Particulate Matter				Polonium-210				Lead-210			
		Concentration		Mass Rate		Concentration		Emission Rate	Activity: PM	Concentration		Emission Rate	Activity: PM
		(gr/dscf)	(mg/dscm)	(lb/hr)	(kg/hr)	(pCi/dscf)	(pCi/dscm)	(uCi/hr)	(nCi/g PM)	(pCi/dscf)	(pCi/dscm)	(uCi/hr)	(nCi/g PM)
Inlet	1	0.3849	880.8	461.2	209.2	166.5	5880	1397	6.676	3.361	118.7	28.19	0.1347
	2	0.4983	1140	617.0	279.9	173.9	6140	1507	5.385	2.274	80.27	19.71	0.0704
	3	0.4549	1041	527.7	240.6	143.7	5074	1167	4.875	2.834	100.1	23.01	0.0961
	4	0.4962	1135	553.9	251.3	125.7	4433	982.0	3.907	8.217	290.0	64.22	0.2555
	Average[a] (Runs 3-4)	0.4755	1088	540.8	245.9	134.7	4755	1075	4.391	5.526	195.0	43.62	0.1758
Outlet[b] (Scrubber ΔP = 10.5 in. W.C.)	1	0.03918	89.64	41.46	18.81	166.5	5880	1234	64.75	1.233	43.53	9.134	0.4706
	2	0.04584	104.9	49.76	22.57	168.8	5958	1283	55.78	2.486	87.78	18.90	0.8655
	3	0.04120	94.28	46.57	21.12	123.6	4365	978.0	46.95	8.596	303.5	68.00	3.429
	4	0.03944	90.24	45.21	20.51	95.63	3377	767.4	37.40	1.027	36.27	8.244	0.4012
	Average (Runs 3-4)	0.04142	94.76	45.75	20.75	138.6	4895	1065	51.22	3.336	118.8	26.07	1.291
Outlet[b] (Scrubber ΔP = 6.5 in. W.C.)	5	0.03362	76.93	45.88	20.81	108.7	3840	1039	49.83	0.8112	28.64	7.749	0.3947
	6	0.03776	86.40	50.68	22.99	144.2	5093	1355	60.11	7.965E-05[c]	2.813E-03[c]	7.483E-04[c]	2.978E-05[c]
	7	0.03548	81.18	48.46	21.98	128.7	4544	1230	55.92	0.4656[c]	16.44[c]	4.451[c]	0.2036[c]
	Average (Runs 5-7)	0.03562	81.50	48.34	21.93	127.2	4492	1208	55.29	0.4256	15.03	4.067	0.1995

[a]Average inlet values from runs 3 and 4, the two valid inlet runs.

[b]Outlet concentration values for each run are the averages of the two outlet locations weighted for the different stack gas flow rates. The mass rates are the sum of the mass rates for the two outlet locations.

[c]Lead-210 was not detected in either the Outlet A or Outlet B samples. The values presented are an average minimum detection limit.

TABLE 3-2. SUMMARY OF MM 111 RESULTS FOR RUN 1, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Run 1 (8/24/88)	Inlet	Outlet A[a]	Outlet B	Average[b] Outlets A & B
Sampling Parameters				
Volume gas sampled (dscf)	34.71	35.06	40.78	--
Volume gas sampled (dscm)	0.983	0.993	1.155	--
Stack gas flow rate (dscfm)	139,788	55,401	68,067	123,468
Stack gas flow rate (dscmm)	3,959	1,569	1,928	3,497
Stack gas flow rate (acfm)	323,010	87,874	111,444	199,318
Stack gas flow rate (acmm)	9,148	2,489	3,156	5,645
Stack temperature (°F)	465.9	131.5	140.5	136.0
Stack temperature (°C)	241.1	55.3	60.3	57.8
Moisture (percent by volume)	10.64	17.36	18.72	18.04
Isokinetics (percent)	119.2	97.9	92.7	--
Particulate Emission Results				
Particulate concentration (gr/dscf)	0.3849	0.03961	0.03883	0.03918
Particulate concentration (mg/dscm)	880.8	90.63	88.84	89.64
Particulate rate (lb/hr)	461.2	18.81	22.65	41.46
Particulate rate (kg/hr)	209.2	8.532	10.28	18.81
Radionuclide Emission Results				
Polonium-210				
(pCi/dscf)	166.5	142.8	185.8	166.5
(pCi/dscm)	5,880	5,044	6,560	5,880
(uCi/hr)	1,397	474.8	758.8	1,234
(nCi/g particulate)	6.676	55.65	73.84	64.75
Lead-210				
(pCi/dscf)	3.361[c,d]	0.7932[c,e]	1.591[c,f]	1.233
(pCi/dscm)	118.7[c,d]	28.01[c,e]	56.17[c,f]	43.53
(uCi/hr)	28.19[c,d]	2.637[c,e]	6.497[c,f]	9.134
(nCi/g particulate)	0.1347[c,d]	0.3090[c,e]	0.6323[c,f]	0.4706

[a]Pressure drop across the venturi was 13 in. W.C. for the "A" side. For the "B" side, the pressure drop was 10.5 in. W.C., which was the target level.

[b]Average concentrations weighted for stack gas flow for each stack. Stack gas flows and pollutant mass flows are the total from both stacks.

[c]Lead-210 was not detected in either the front half or back half fraction.

[d]The inlet-Run 1 sample contained Pb-210 in the back half fraction at less than 0.0677 pCi/dscf.

[e]The outlet A-Run 1 sample contained Pb-210 in the front half fraction at less than 0.200 pCi/dscf.

[f]The Outlet B-Run 1 sample contained Pb-210 in the front half fraction at less than 1.52 pCi/dscf.

TABLE 3-3. SUMMARY OF MM 111 RESULTS FOR RUN 2, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Run 2 (8/24/88)	Inlet	Outlet A[a]	Outlet B	Average[b] Outlets A & B
Sampling Parameters				
Volume gas sampled (dscf)	35.73	34.81	42.12	--
Volume gas sampled (dscm)	1.012	0.986	1.193	--
Stack gas flow rate (dscfm)	144,456	57,019	69,639	126,658
Stack gas flow rate (dscmm)	4,091	1,615	1,972	3,587
Stack gas flow rate (acfm)	327,672	90,039	111,292	201,331
Stack gas flow rate (acmm)	9,280	2,550	3,152	5,702
Stack temperature (°F)	466.3	133.1	136.2	134.6
Stack temperature (°C)	241.3	56.16	57.87	57.01
Moisture (percent by volume)	8.65	16.74	17.33	17.04
Isokinetics (percent)	118.8	94.5	93.6	--
Particulate Emission Results				
Particulate concentration (gr/dscf)	0.4983	0.04491	0.04660	0.04584
Particulate concentration (mg/dscm)	1,140	102.8	106.6	104.9
Particulate rate (lb/hr)	617.0	21.95	27.82	49.76
Particulate rate (kg/hr)	279.9	9.956	12.62	22.57
Radionuclide Emission Results				
Polonium-210				
(pCi/dscf)	173.9	137.0	194.7	168.8
(pCi/dscm)	6,140	4,838	6,876	5,958
(uCi/hr)	1,507	468.8	813.7	1,283
(nCi/g particulate)	5.385	47.08	64.48	55.78
Lead-210				
(pCi/dscf)	2.274	3.225[c,d]	1.882[c,e]	2.486
(pCi/dscm)	80.27	113.8[c,d]	66.44[c,e]	87.78
(uCi/hr)	19.71	11.03[c,d]	7.863[c,e]	18.90
(nCi/g particulate)	0.07039	1.108[c,d]	0.6231[c,e]	0.8655

[a]Pressure drop across the venturi was 13 in. W.C. for the "A" side. For the "B" side, the pressure drop was 10.5 in. W.C., which was the target level.

[b]Average concentrations weighted for stack gas flow rates. Stack gas flows and pollutant mass flows are the total from both stacks.

[c]Lead-210 was not detected in the back half fraction.

[d]The Outlet A-Run 2 sample contained Pb-210 in the back half fraction at less than 0.040 pCi/dscf.

[e]The Outlet B-Run 2 sample contained Pb-210 in the back half fraction at less than 0.019 pCi/dscf.

TABLE 3-4. SUMMARY OF MM 111 RESULTS FOR RUN 3, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Run 3 (8/25/88)	Inlet	Outlet A	Outlet B	Average[a] Outlets A & B
Sampling Parameters				
Volume gas sampled (dscf)	29.37	40.51	41.59	--
Volume gas sampled (dscm)	0.832	1.147	1.178	--
Stack gas flow rate (dscfm)	135,330	66,524	65,328	131,852
Stack gas flow rate (dscmm)	3,853	1,884	1,850	3,734
Stack gas flow rate (acfm)	321,407	109,624	109,183	218,807
Stack gas flow rate (acmm)	9,102	3,105	3,092	6,197
Stack temperature (°F)	474.9	136.7	140.5	138.6
Stack temperature (°C)	246.0	58.15	60.28	59.21
Moisture (percent by volume)	11.63	19.60	20.13	19.87
Isokinetics (percent)	104.2	94.2	99.3	--
Particulate Emission Results				
Particulate concentration (gr/dscf)	0.4549	0.04388	0.03848	0.04120
Particulate concentration (mg/dscm)	1041	100.4	88.04	94.28
Particulate rate (lb/hr)	527.7	25.02	21.55	46.57
Particulate rate (kg/hr)	240.6	11.35	9.773	21.12
Radionuclide Emission Results				
Polonium-210				
(pCi/dscf)	143.7	108.8	138.7	123.6
(pCi/dscm)	5,074	3,843	4,898	4,365
(uCi/hr)	1,167	434.3	543.8	978.0
(nCi/g particulate)	4.875	38.27	55.63	46.95
Lead-210				
(pCi/dscf)	2.834[b,c]	1.769	15.55[b,d]	8.596
(pCi/dscm)	100.1[b,c]	62.49	548.9[b,d]	303.5
(uCi/hr)	23.01[b,c]	7.062	60.94[b,d]	68.00
(nCi/g particulate)	0.09612[b,c]	0.6223	6.235[b,d]	3.429

[a]Average concentrations weighted for stack gas flow rates. Stack gas flows and pollutant mass flows are the total from both stacks.

[b]Lead-210 was not detected in the back half fraction.

[c]The inlet-Run 3 sample contained Pb-210 in the back half fraction at less than 0.033 pCi/dscf.

[d]The Outlet B-Run 3 sample contained Pb-210 in the back half fraction at less than 0.013 pCi/dscf.

TABLE 3-5. SUMMARY OF MM 111 RESULTS FOR RUN 4, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Run 4 (8/25/88)	Inlet	Outlet A	Outlet B	Average[a] Outlets A & B
Sampling Parameters				
Volume gas sampled (dscf)	26.93	40.50	42.12	--
Volume gas sampled (dscm)	0.763	1.147	1.193	--
Stack gas flow rate (dscfm)	130,246	66,661	67,085	133,746
Stack gas flow rate (dscmm)	3,689	1,888	1,900	3,788
Stack gas flow rate (acfm)	296,961	107,682	109,488	217,170
Stack gas flow rate (acmm)	8,410	3,050	3,101	6,151
Stack temperature (°F)	446.0	133.5	138.0	135.8
Stack temperature (°C)	230.0	56.39	58.89	57.64
Moisture (percent by volume)	10.45	17.94	18.16	18.05
Isokinetics (percent)	99.3	94.0	97.9	--
Particulate Emission Results				
Particulate concentration (gr/dscf)	0.4962	0.04012	0.03876	0.03944
Particulate concentration (mg/dscm)	1135	91.80	88.69	90.24
Particulate rate (lb/hr)	553.9	22.92	22.29	45.21
Particulate rate (kg/hr)	251.3	10.40	10.11	20.51
Radionuclide Emission Results				
Polonium-210				
(pCi/dscf)	125.7	99.62	91.67	95.63
(pCi/dscm)	4,435	3,517	3,237	3,377
(uCi/hr)	982.0	398.4	369.0	767.4
(nCi/g particulate)	3.907	38.32	36.49	37.40
Lead-210				
(pCi/dscf)	8.217	ND [1.183][b]	0.8727	1.027
(pCi/dscm)	290.0	ND [41.77][b]	30.81	36.27
(uCi/hr)	64.22	ND [4.732][b]	3.513	8.244
(nCi/g particulate)	0.2555	ND [0.4550][b]	0.3474	0.4012

[a]Average concentrations weighted for stack gas flow rates. Stack gas flows and pollutant mass are the total from both stacks.

[b]Lead-210 was not detected in the Outlet A-Run 4 sample. The value in brackets is the minimum detection limit.

To compensate for these difficulties, a fourth MM 111 test run was performed at each of the inlet and outlet locations.

Data from all test runs are presented in the summary tables of this report, although only those runs meeting the specified quality assurance criteria were used in the reported average results.

3.1.1.1 Inlet. Particulate matter concentrations at the inlet to the venturi scrubber averaged 1,088 mg/dscm (0.476 gr/dscf) for the two valid test runs. These values represent uncontrolled emissions from the calciner.

Po-210 concentrations in flue gases at the inlet location averaged 4,755 pCi/dscm (135 pCi/dscf) for the two valid test runs. On an activity per gram of particulate basis, values for the two inlet runs averaged 4.39 nCi/g PM.

Pb-210 concentrations in flue gases at the inlet location averaged 195 pCi/dscm (5.53 pCi/dscf). On an activity per gram of particulate basis, values for the two inlet runs averaged 0.176 nCi/g PM.

3.1.1.2 Outlet. As shown in Table 3-1, particulate matter concentration at the outlet during Test Condition A averaged 94.8 mg/dscm (0.0414 gr/dscf). For all of the runs, particulate matter emissions were evenly distributed between the outlet's two locations. Even during MM 111 runs 1 and 2, where the pressure drop across scrubber 1-1 was approximately 3 inches greater than that for scrubber 1-2, the distribution was fairly even.

Po-210 concentrations in flue gases at the outlet location averaged 4,895 pCi/dscm (139 pCi/dscf) for the four test runs. On an activity per gram of particulate basis, Po-210 activity for the outlet runs averaged 51.2 nCi/g PM. The Po-210 concentration was also evenly distributed between the outlet's two locations.

Pb-210 concentrations in flue gases at the outlet location averaged 119 pCi/dscm (3.34 pCi/dscf). On an activity per gram of particulate basis, Pb-210 activity averaged 1.29 nCi/g PM. The Pb-210 concentrations were at or near the minimum detection limit where the analytical precision is less. Thus, although the concentrations at the two outlet locations appear to differ, they are actually agreeing within analytical precision.

3.1.1.3 Venturi Scrubber Efficiencies - Method 111. Table 3-6 summarizes the removal efficiencies of the venturi scrubber control systems for removal of particulate, Po-210, and Pb-210. Although removal efficiencies are reported for all four runs, the average values are based on the results from runs 3 and 4. The removal efficiencies for each run were calculated from the inlet and total outlet emission rates. Removal efficiency for PM was consistent for all the runs, averaging above 91 percent. The scrubber removed an average of 19 percent of the inlet Po-210, with the removal relatively consistent for the different runs.

The Pb-210 concentrations were at or near the minimum detection limit for both the inlet and outlet. Although the calculated Pb-210 removal efficiencies ranged from -195 to 87.2 percent, the actual removal efficiency was near zero.

3.1.1.4 Front/Back Half Distribution of Emissions in MM 111 Trains. Table 3-7 presents a summary of the distribution of emissions as collected in the MM 111 sampling trains during test condition A. As seen in the table, 97 to 99 percent of the Po-210 collected was present in the front half of the train. This percentage was consistent for samples collected at both inlet and outlet locations. The distribution for Pb-210 was similar; about 95 to 98 percent was collected in the front half. A distribution of Po-210 and Pb-210 between front half sampling train components was beyond the scope of this test project, due to analysis volume and regulatory schedule.

The distribution of PM between the front half components was evaluated. As seen in the footnotes to Table 3-7, the average distribution of PM among the front half components varied by the sampling location as expected. On average, 16 percent of the PM collected at the inlet was found on the filter, while the remaining 84 percent was collected in the probe and nozzle. At the outlet, the average distribution was approximately 86 percent on the filter and 14 percent in the probe and nozzle.

TABLE 3-6. VENTURI SCRUBBER REMOVAL EFFICIENCY FOR PM, Po, AND Pb: PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

	Concentration		Removal Efficiency[a] (percent)
	Inlet	Outlet	
Run 1			
Particulate (gr/dscf)	0.3849	0.03918	91.01
Po-210 (pCi/dscf)	166.5	166.5	11.67
Pb-210 (pCi/dscf)	3.361	1.233	67.60
Run 2			
Particulate (gr/dscf)	0.4983	0.04584	91.93
Po-210 (pCi/dscf)	173.9	168.8	14.91
Pb-210 (pCi/dscf)	2.274	2.486	4.112
Run 3			
Particulate (gr/dscf)	0.4549	0.04120	91.18
Po-210 (pCi/dscf)	143.7	123.6	16.21
Pb-210 (pCi/dscf)	2.834	8.596	-195.5[b]
Run 4			
Particulate (gr/dscf)	0.4962	0.0394	91.84
Po-210 (pCi/dscf)	125.7	95.63	21.85
Pb-210 (pCi/dscf)	8.217	1.028	87.16
Average			
Particulate (gr/dscf)	0.4755[c]	0.04142	91.51[c]
Po-210 (pCi/dscf)	134.7[c]	138.6	19.03[c]
Pb-210 (pCi/dscf)	5.526[c]	3.336	43.58[c]

[a]Removal efficiencies calculated based on mass flow rates of PM, Po, and Pb.

[b]If the removal efficiency is less than zero, the inlet and outlet values should be considered equal taking into account the precision of the sampling and analytical methods. The removal efficiency should be considered zero.

[c]Average of runs 3 and 4.

TABLE 3-7. SUMMARY OF FRONT/BACK HALF DISTRIBUTION OF EMISSIONS: MM 111 SAMPLING TRAINS, PRESSURE DROP = 10.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Location	Parameter	Front Half	Back Half
Inlet	Particulate	100[a]	NA[b]
	Po-210	96.6	3.4
	Pb-210	98.2	1.8
Outlet	Particulate	100[c]	NA
	Po-210	99.2	0.8
	Pb-210	95.1	4.9

[a]On average, 16 percent of the particulate matter collected at the inlet was found on the filter, while the remaining 84 percent was collected in the probe and nozzle.

[b]NA = Not applicable. The addition of 0.1 N HNO_3 in the impingers prevented drying and weighing of the impinger catch.

[c]On average, 86 percent of the particulate matter collected at the outlet was found on the filter, and 14 percent was collected in the probe and nozzle.

3.1.2 Particle and Radionuclide Size Distribution Data

The PSD samples were analyzed for both particulate mass and Po-210/Pb-210 radioactivity. For the particulate mass analyses, each of the nine individual stages were analyzed separately. For the radionuclide analyses, stages 2-5 were combined and stages 1, 6, 7, 8, and 9 were analyzed individually. The particulate and radionuclide results are discussed below.

3.1.2.1 Particle Size Distribution Data. The mass collected on each stage was presented previously in Table 1-4 in Section 1.0. These data were presented two ways: first as a plot of cumulative mass fraction versus the particle interval endpoint (Dp_{50}) and second as a plot of differential mass concentration versus the geometric mean particle diameter. The individual data points were plotted and curves were fitted to the data to represent the characteristics of the particulate matter at each sampling location. From the composite curves, cumulative mass fractions could be determined for the particle sizes of interest: 0.5, 1, 2.5, 5, and 10 microns. The composite curves were presented previously in Figures 1-1 and 1-2.

For the cumulative mass fraction results, the individual inlet data are shown in Figure 3-1 and outlet data are shown in Figure 3-2. The inlet test runs agreed well and formed a linear curve. The outlet data show that particle characteristics were similar at the two outlet locations and also formed a linear curve. The data are presented in tabular form in Tables 3-8 and 3-9.

For the differential mass concentrations, the individual inlet data are plotted in Figure 3-3 and the outlet data pairs are plotted in Figure 3-4. The data are presented in tabular form in Tables 3-10 and 3-11.

3.1.2.2 Radionuclide Distribution Data. The radioactivity collected on each stage was presented previously in Table 1-8. In order to evaluate the radionuclide data, the cumulative activity fraction was plotted against the interval endpoint (Dp_{50}) determined from the PSD data.

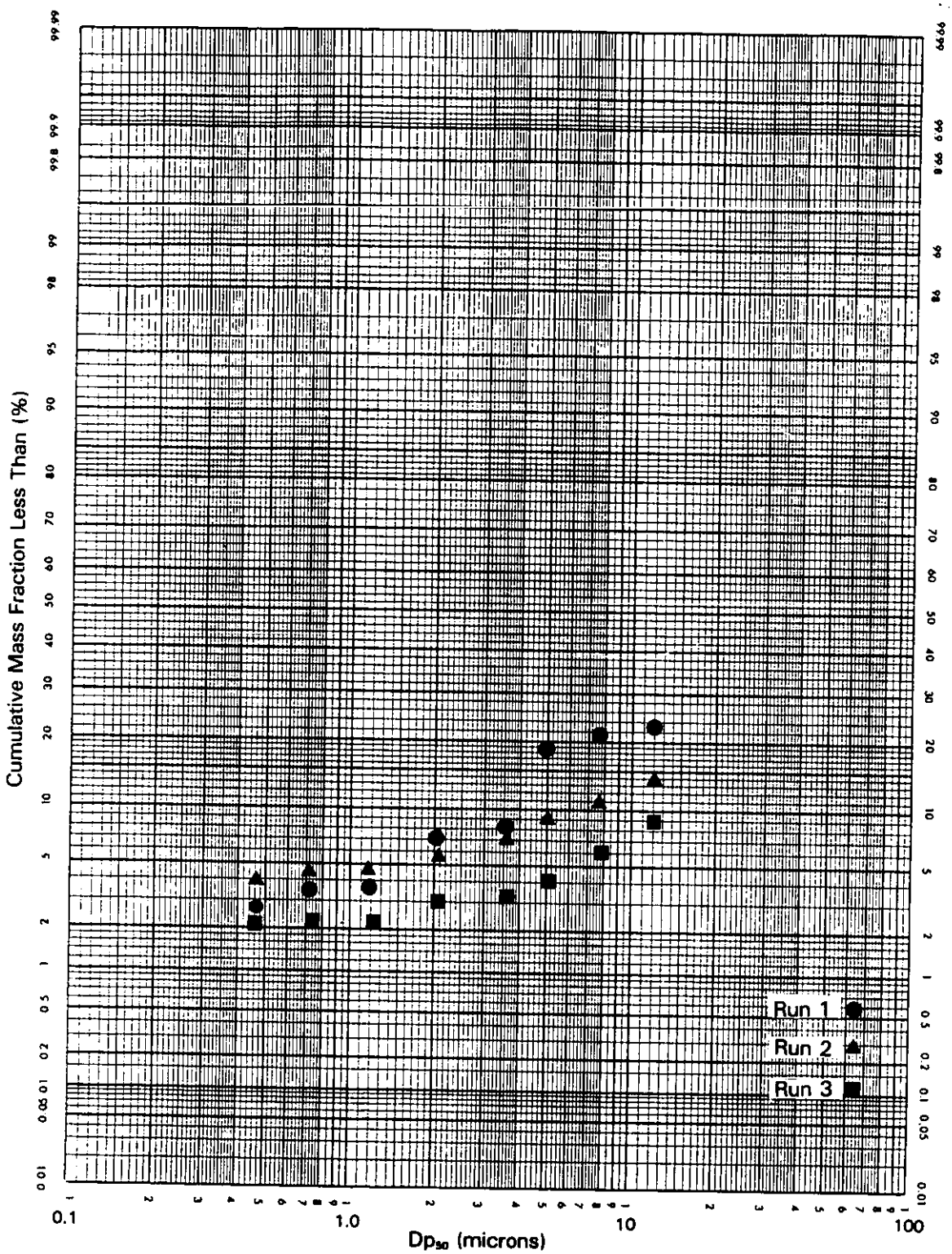


Figure 3-1. Cumulative mass fraction as a function of particle size for particulate matter at the venturi scrubber inlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

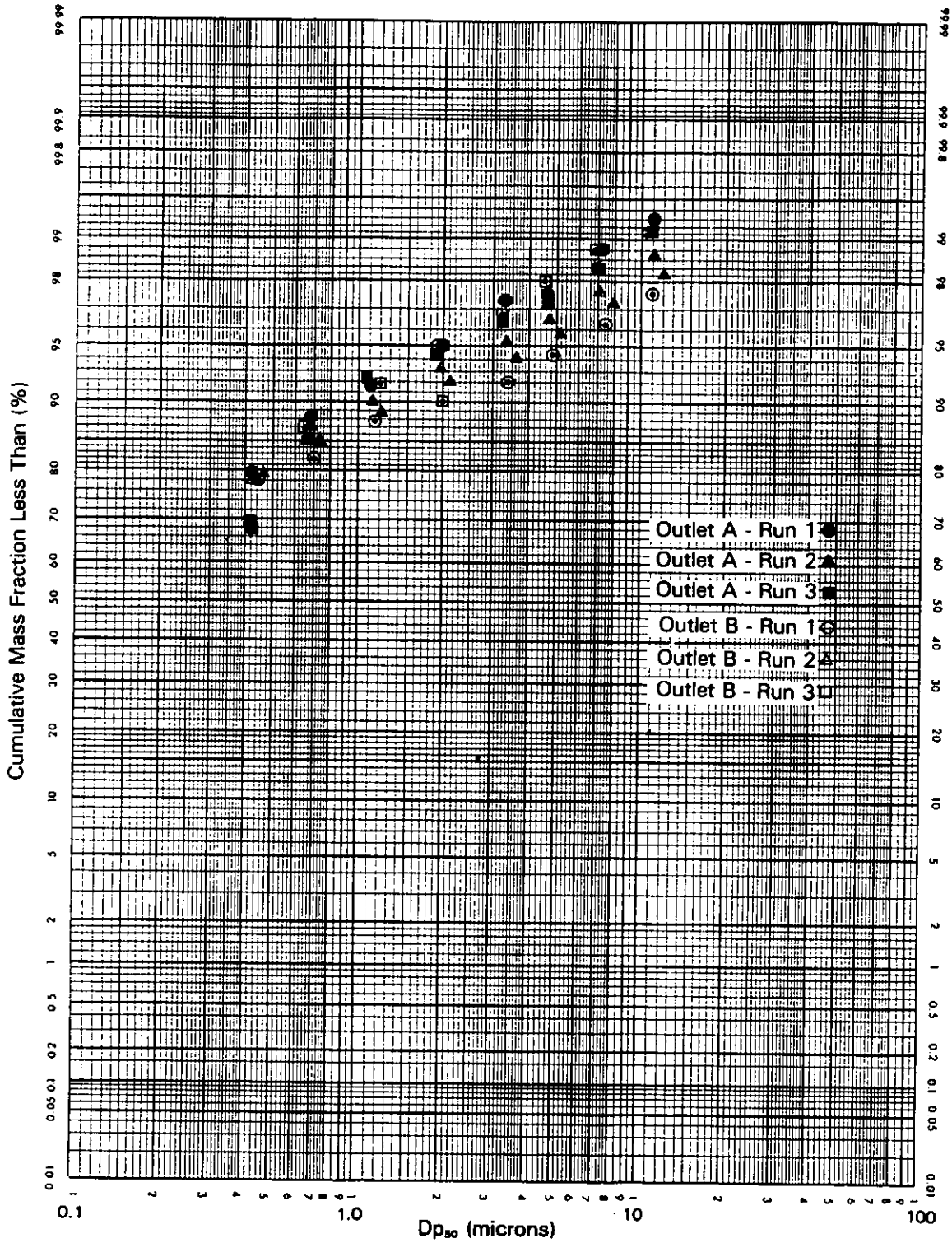


Figure 3-2. Cumulative mass fraction as a function of particle size for particulate matter at the venturi scrubber outlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

TABLE 3-8. CUMULATIVE MASS FRACTION VS. PARTICLE SIZE FOR SCRUBBER INLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

	Inlet - Run 1		Inlet - Run 2		Inlet - Run 3	
Stage	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than
1	11.70	0.2304	11.69	0.1417	11.96	0.0397
2	7.639	0.2111	7.637	0.1144	7.814	0.0538
3	4.984	0.1872	4.983	0.0895	5.099	0.0408
4	3.520	0.0762	3.519	0.0713	3.600	0.0338
5	2.084	0.0695	2.084	0.0575	2.131	0.0292
6	1.183	0.0386	1.184	0.0474	1.209	0.0232
7	0.7246	0.0352	0.7267	0.0445	0.7385	0.0232
8	0.4576	0.0256	0.4611	0.0395	0.4636	0.0232

[a] Dp_{50} = The theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

[b] The cumulative mass fraction equals the mass fraction of particulate collected less than a given interval endpoint.

TABLE 3-9. CUMULATIVE MASS FRACTION VS. PARTICLE SIZE FOR SCRUBBER OUTLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

	Outlet A - Run 1		Outlet A - Run 2		Outlet A - Run 3		Outlet B - Run 1		Outlet B - Run 2		Outlet B - Run 3	
Stage	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than	Dp_{50}[a]	Mass Fraction[b] Less Than
1	11.10	0.9927	12.07	0.9817	10.84	0.9912	11.29	0.9773	10.94	0.9865	10.60	0.9912
2	7.251	0.9883	7.881	0.9715	7.079	0.9836	7.373	0.9611	7.144	0.9771	6.923	0.9876
3	4.731	0.9746	5.141	0.9575	4.619	0.9734	4.811	0.9425	4.662	0.9647	4.517	0.9807
4	3.340	0.9728	3.630	0.9387	3.261	0.9637	3.398	0.9239	3.292	0.9528	3.190	0.9686
5	1.977	0.9496	2.148	0.9191	1.930	0.9441	2.012	0.8993	1.949	0.9307	1.889	0.9513
6	1.121	0.9176	1.217	0.8906	1.094	0.9177	1.143	0.8769	1.107	0.9008	1.074	0.9253
7	0.6840	0.8765	0.7414	0.8514	0.6676	0.8683	0.7010	0.8401	0.6792	0.8668	0.6597	0.8563
8	0.4282	0.7864	0.4622	0.7898	0.4178	0.6913	0.4441	0.7804	0.4304	0.7862	0.4194	0.6822

[a] Dp_{50} = The theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

[b] The cumulative mass fraction equals the mass fraction of particulate collected less than a given interval endpoint.

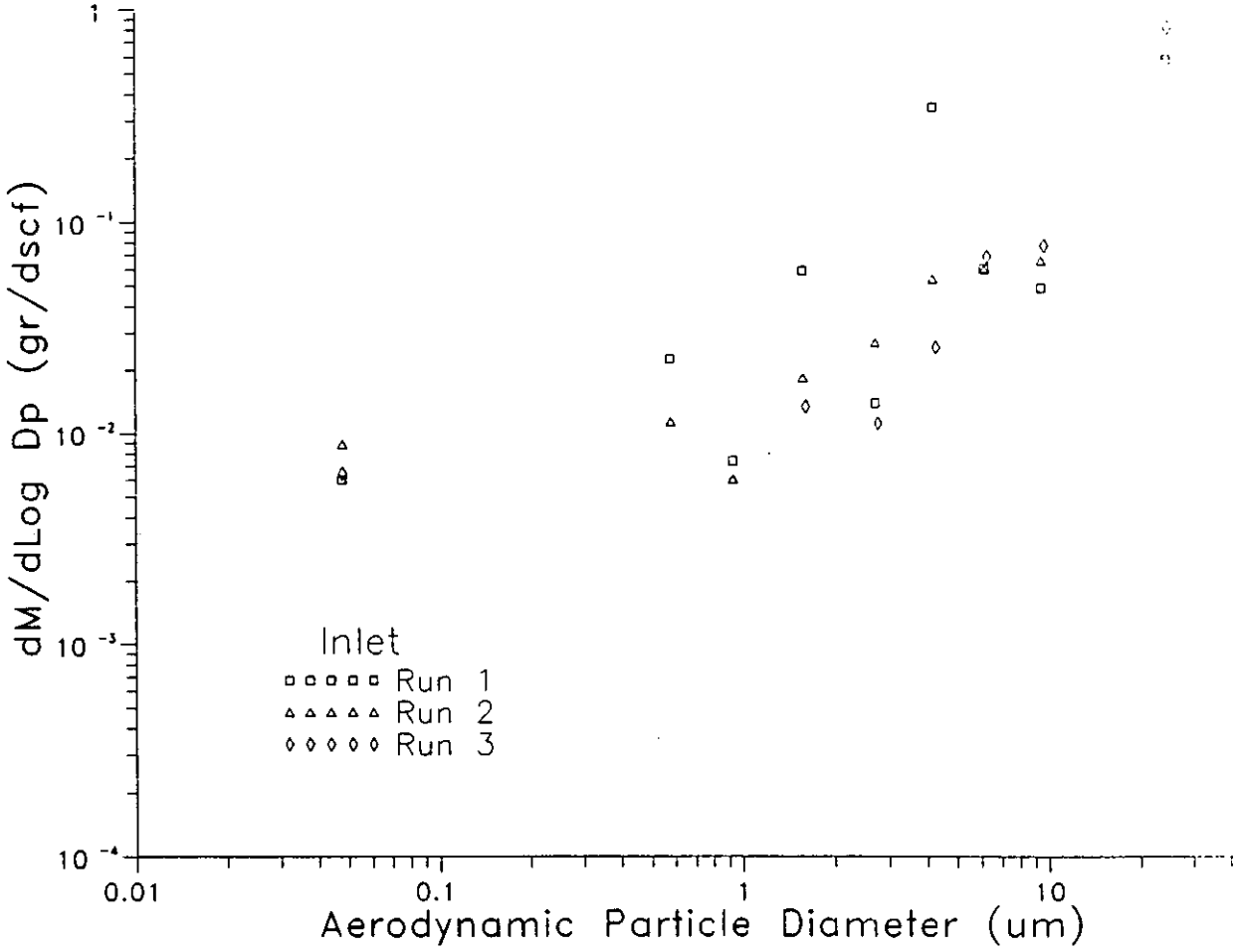
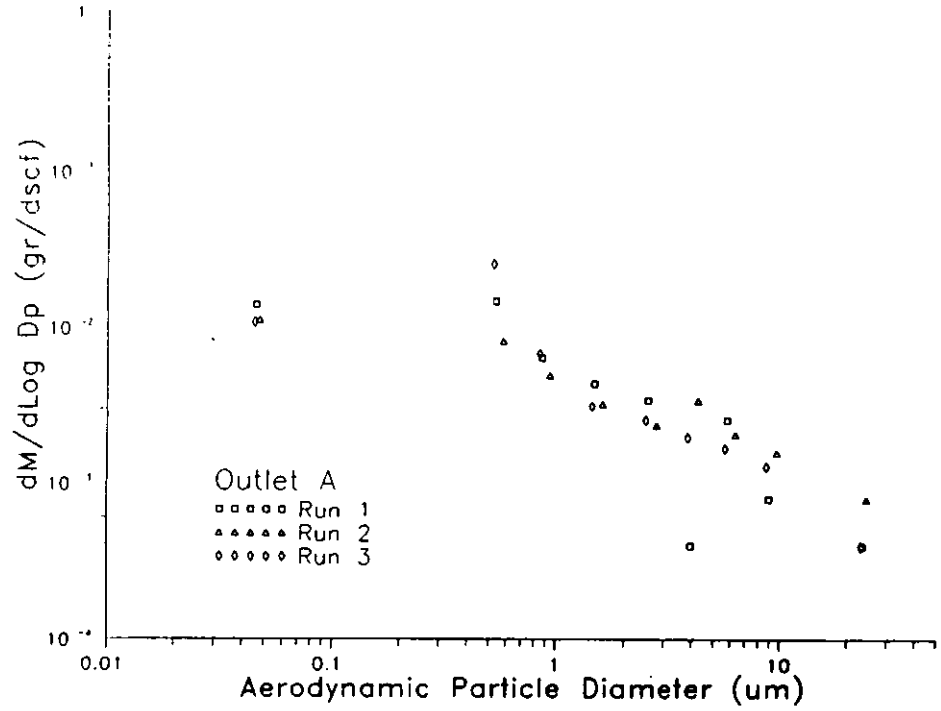


Figure 3-3. Differential mass concentration as a function of particle size for venturi scrubber inlet particulate matter. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988)



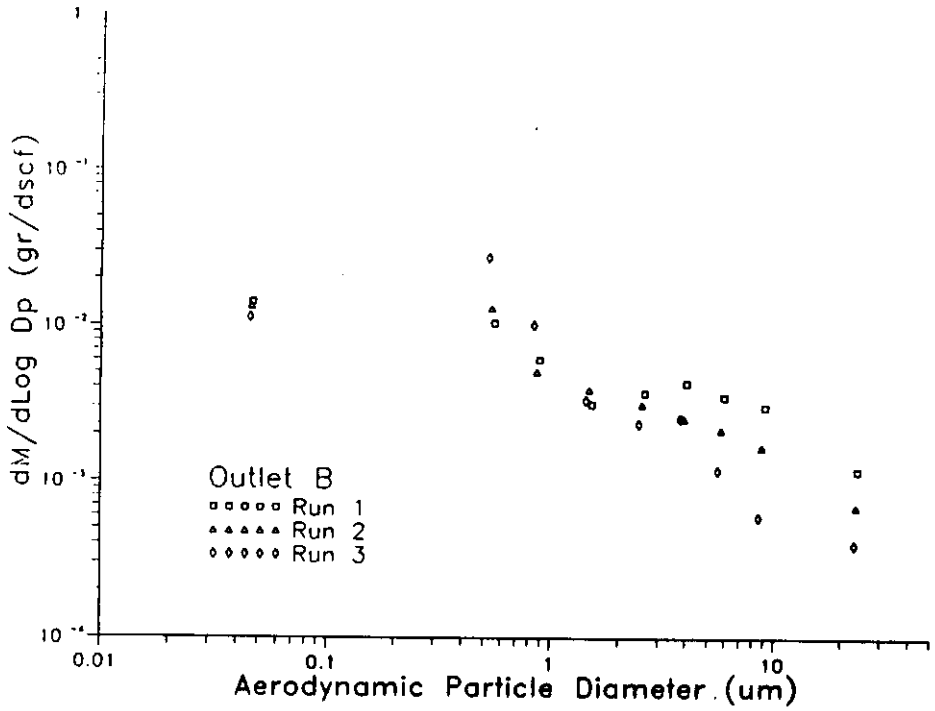


Figure 3-4. Differential mass concentration as a function of particle size for venturi scrubber outlet particulate matter. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

TABLE 3-10. DIFFERENTIAL MASS CONCENTRATION VS. PARTICLE SIZE FOR SCRUBBER INLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

	Inlet - Run 1		Inlet - Run 2		Inlet - Run 3	
Stage	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass
1	24.18	0.5613	24.18	0.5957	24.46	0.7960
2	9.452	0.0480	9.449	0.0646	9.669	0.0758
3	6.170	0.0593	6.169	0.0588	6.312	0.0674
4	4.188	0.3380	4.188	0.0530	4.284	0.0352
5	2.708	0.0137	2.708	0.0265	2.770	0.0110
6	1.570	0.0578	1.571	0.0180	1.605	0.0132
7	0.9259	0.0073	0.9277	0.0060	0.9447	0.0000
8	0.5758	0.0222	0.5789	0.0112	0.5851	0.0000
Back-up	0.0478	0.0060	0.0480	0.0088	0.0481	0.0064

[a]Geometric midpoint is defined as:

$$[(Dp_{50})_{n+1} * (D_{50})_n]^{1/2}$$

[b]Differential mass concentration (gr/dscf) is defined as:

$$\frac{\text{mass on stage "n"}}{\log (Dp_{50})_{n+1} - \log (Dp_{40})_n} = \frac{\Delta M}{\Delta(\log Dp_{50})}$$

TABLE 3-11. DIFFERENTIAL MASS CONCENTRATION VS. PARTICLE SIZE FOR SCRUBBER OUTLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

	Outlet A - Run 1		Outlet A - Run 2		Outlet A - Run 3		Outlet B - Run 1		Outlet B - Run 2		Outlet B - Run 3	
Stage	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass	Geometric[a] Midpoint	Differential[b] Mass
1	23.56	0.0004	24.56	0.0008	23.28	0.0004	23.76	0.0012	23.39	0.0007	23.02	0.0004
2	8.973	0.0008	9.751	0.0016	8.760	0.0013	9.124	0.0031	8.840	0.0017	8.566	0.0006
3	5.857	0.0026	6.365	0.0021	5.718	0.0017	5.956	0.0036	5.771	0.0022	5.592	0.0012
4	3.975	0.0004	4.320	0.0035	3.881	0.0020	4.043	0.0044	3.917	0.0026	3.796	0.0026
5	2.570	0.0035	2.792	0.0024	2.509	0.0026	2.614	0.0038	2.533	0.0032	2.455	0.0024
6	1.488	0.0045	1.617	0.0033	1.453	0.0032	1.516	0.0032	1.469	0.0040	1.424	0.0034
7	0.8755	0.0066	0.9498	0.0051	0.8546	0.0070	0.8951	0.0062	0.8673	0.0052	0.8417	0.0104
8	0.5412	0.0153	0.5854	0.0085	0.5281	0.0263	0.5580	0.0107	0.5407	0.0133	0.5260	0.0283
Back-up	0.0463	0.0141	0.0481	0.0113	0.0457	0.0109	0.0471	0.0142	0.0464	0.0133	0.0458	0.0113

[a]Geometric midpoint is defined as:

$$[(Dp_{50})_{n+1} * (D_{50})_n]^{1/2}$$

[b]Differential mass concentration (gr/dscf) is defined as:

$$\frac{\text{mass on stage "n"}}{\log (Dp_{50})_{n+1} - \log (Dp_{40})_n} = \frac{\Delta M}{\Delta(\log Dp_{50})}$$

The polonium-210 and lead-210 data were plotted separately. The inlet and outlet polonium-210 cumulative activities are plotted in Figures 3-5 and 3-6, respectively. The data showed good agreement between runs and formed a linear curve.

The inlet and outlet lead-210 cumulative activities are plotted in Figures 3-7 and 3-8, respectively. The inlet and outlet data are presented in tabular form in Tables 3-12 and 3-13. The Pb-210 data contained considerably more variability than the Po-210 data, although the data still formed linear curves. The variability is believed to be due to the fact that the Pb-210 concentrations were at or near the minimum detection limits.

3.1.3 Process Samples

Table 3-14 presents the measured concentrations of Po-210 and Pb-210 in the feedstock samples. The average concentrations of these radionuclides in the feedstock samples were 23.271 and 24.000 pCi/g, respectively. The concentrations varied between runs by 2.9 percent for Po-210 and 13 percent for Pb-210, indicating a constant level of radioactivity in the feedstock.

3.2 RESULTS FOR TEST CONDITION B: VENTURI PRESSURE DROP = 6.5 in. W.C.

Particulate matter and associated radionuclide emissions were measured at the outlet stacks for three runs at test condition B. No Method 111 samples were collected at the inlet. No particle sizing samples were collected during test condition B, either. The results from condition B are summarized in Table 3-1. The specific sampling results for each of the test runs are presented in Tables 3-15 through 3-17.

3.2.1 Outlet Particulate Matter and Radionuclide Results

As shown in Table 3-1, particulate matter concentration at the outlet averaged 81.5 mg/dscm (0.0356 gr/dscf). For all of the runs, particulate matter and Po-210 emissions were evenly distributed between the outlet's two locations.

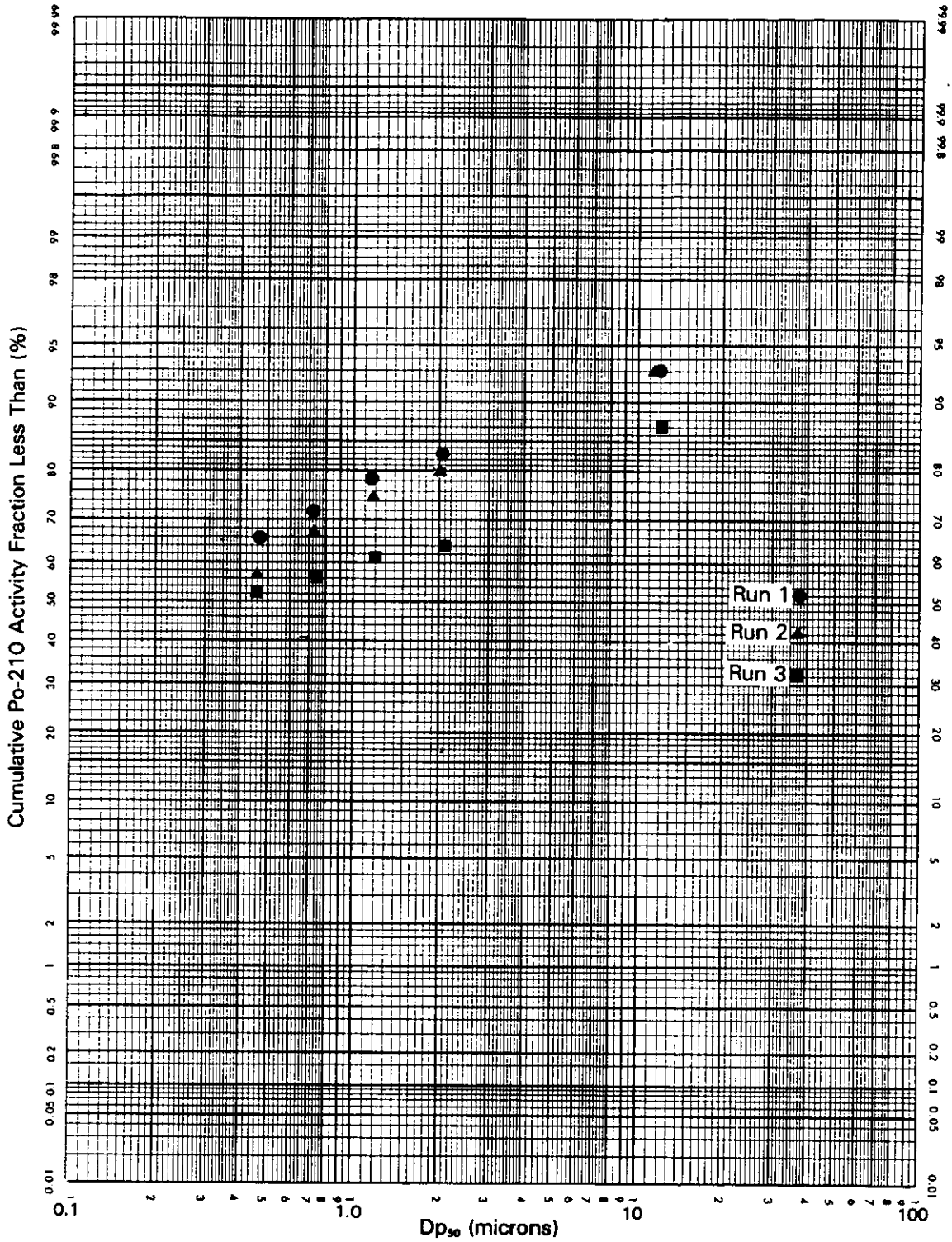


Figure 3-5. Cumulative Polonium-210 activity fraction as a function of particle size for particulate matter at the venturi scrubber inlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

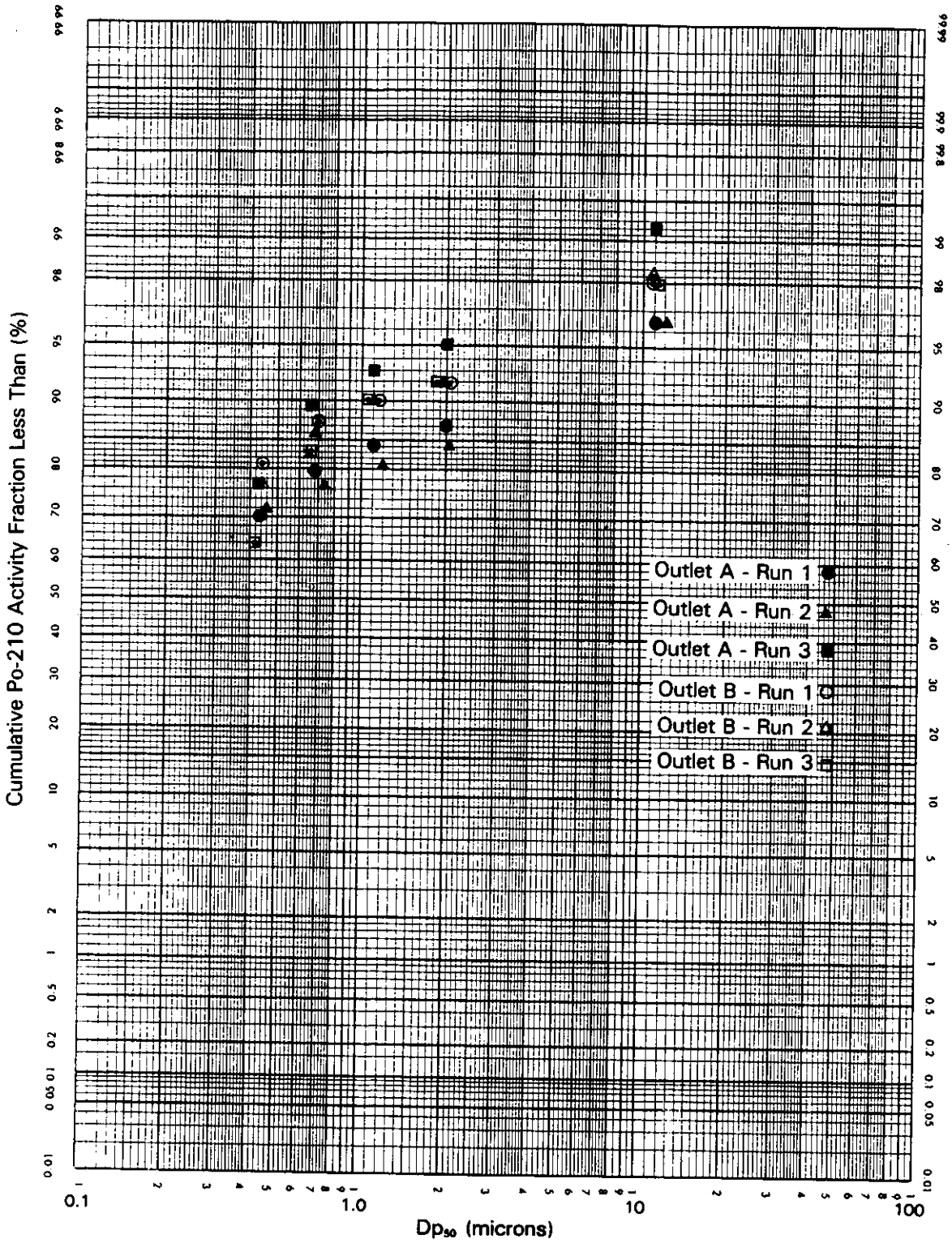


Figure 3-6. Cumulative Polonium-210 activity fraction as a function of particle size for particulate matter at the venturi scrubber outlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

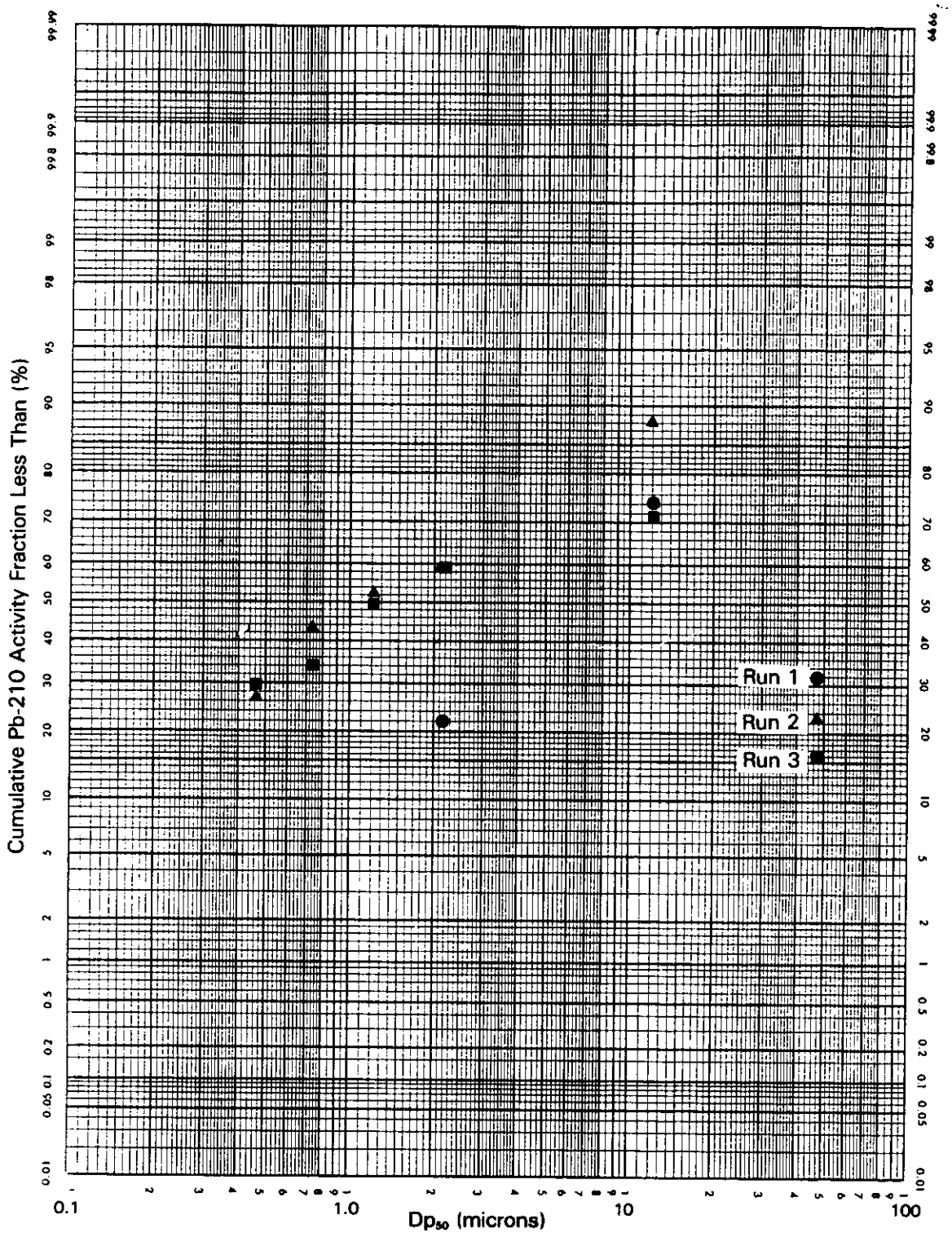


Figure 3-7. Cumulative Lead-210 activity fraction as a function of particle size for particulate matter at the venturi scrubber inlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

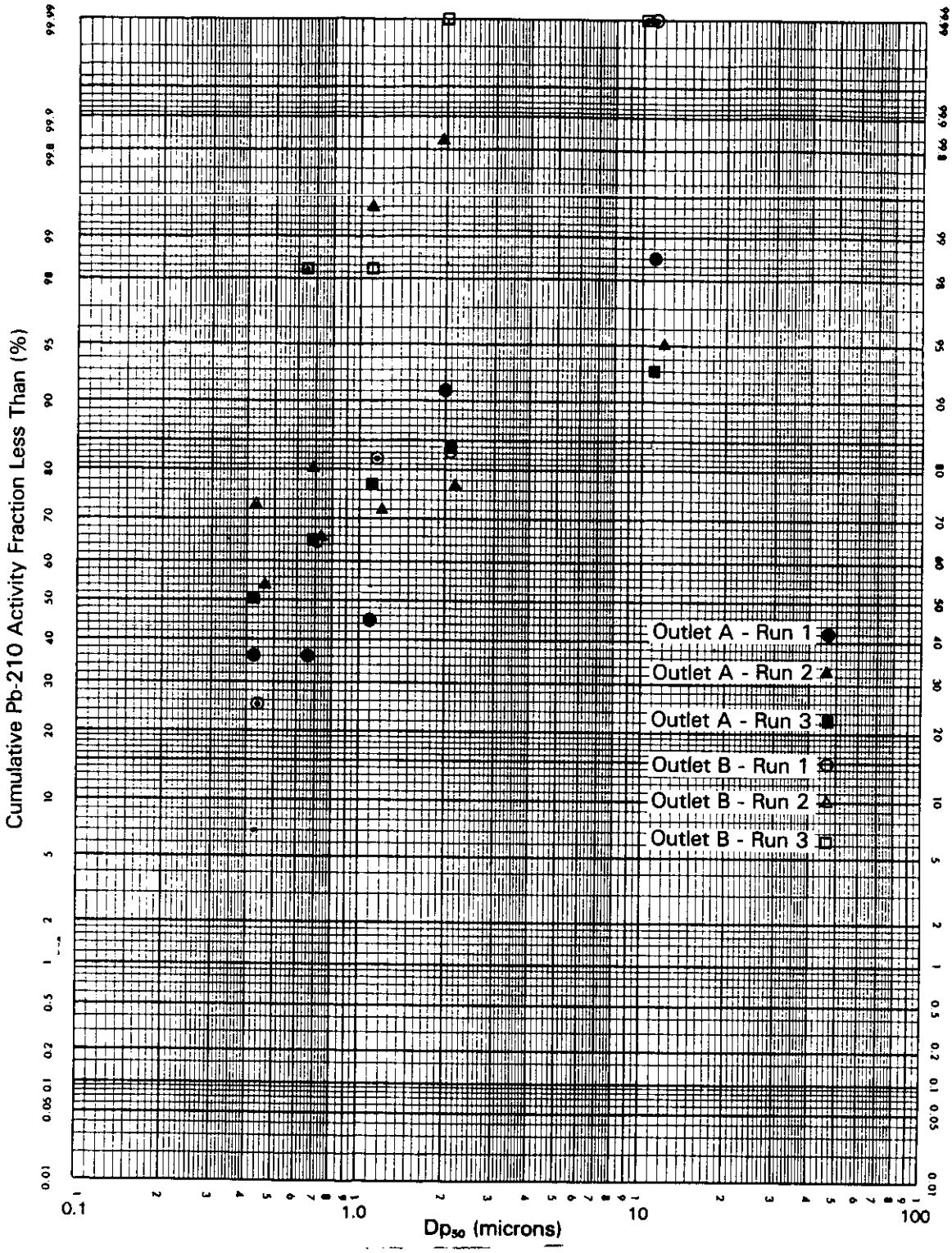


Figure 3-8. Cumulative Lead-210 activity fraction as a function of particle size for particulate matter at the venturi scrubber outlet. Probability-Log plot, Calciner 1 offgases. FMC, Pocatello, Idaho (August 1988).

TABLE 3-12. CUMULATIVE ACTIVITY FRACTION FOR SCRUBBER INLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C., CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Stage	Inlet - Run 1			Inlet - Run 2			Inlet - Run 3		
	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]
1	11.70	0.9297	0.7443	11.69	0.9293	0.8822	11.96	0.8766	0.7146
2-5	2.084	0.8267	0.2275	2.084	0.8028	0.5890	2.131	0.6484	0.5866
6	1.183	0.7756	0.0000	1.184	0.7479	0.5307	1.209	0.6032	0.5025
7	0.7246	0.7219	0.0000	0.7267	0.6714	0.4308	0.7385	0.5648	0.3414
8	0.4576	0.6616	0.0000	0.4611	0.5745	0.2689	0.4636	0.5181	0.2979

[a] DP_{50} = The theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

[b] The cumulative activity fraction is the fraction of activity emitted by particles less than or equal to the given interval endpoint (Dp_{50}).

TABLE 3-13. CUMULATIVE ACTIVITY FRACTION FOR SCRUBBER OUTLET PARTICULATE, VENTURI PRESSURE DROP = 10.5 in. W.C.
CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Stage	Outlet A - Run 1			Outlet A - Run 2			Outlet A - Run 3			Outlet B - Run 1			Outlet B - Run 2			Outlet B - Run 3		
	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]	Dp_{50}	Po-210[b]	Pb-210[b]	Dp_{50}[a]	Po-210[b]	Pb-210[b]
1	11.10	0.9646	0.9858	12.07	0.9644	0.9489	10.84	0.9922	0.9277	11.29	0.9802	1.0000	10.94	0.9815	1.0000	10.60	0.9806	1.0000
2-5	1.977	0.8688	0.9124	2.148	0.8431	0.7656	1.930	0.9515	0.8438	2.012	0.9178	0.8369	1.949	0.9202	0.9984	1.889	0.9200	1.0000
6	1.121	0.8385	0.4517	1.217	0.8101	0.7218	1.094	0.9329	0.7660	1.143	0.9039	0.8170	1.107	0.8981	0.9942	1.074	0.8973	0.9834
7	0.6840	0.7860	0.3674	0.7414	0.7648	0.6678	0.6676	0.8889	0.6797	0.7010	0.8752	0.6530	0.6792	0.8586	0.8018	0.6597	0.8295	0.9834
8	0.4282	0.6965	0.3674	0.4622	0.7196	0.5409	0.4178	0.7640	0.4977	0.4441	0.8119	0.2463	0.4304	0.7722	0.7284	0.4194	0.6460	0.0000

[a] DP_{50} = The theoretical stage endpoint (interval endpoint) is the aerodynamic diameter of the smallest particles collected on a stage with an efficiency of 50 percent.

[b] The cumulative activity fraction is the fraction of activity emitted by particles less than or equal to the given interval endpoint (Dp_{50}).

TABLE 3-14. RADIONUCLIDE CONCENTRATIONS IN PROCESS FEEDSTOCK SAMPLES CALCINER 1, FMC-POCATELLO, IDAHO (August 1988)

Type of Sample	MM 111 Run No.	Date	Radionuclide Concentration Po-210	Pb-210
Feedstock	1	8/24/88	24.167	24.157
Feedstock	2	8/24/88	23.010	27.947
Feedstock	3	8/25/88	23.347	20.662
Feedstock	4	8/25/88	22.559	23.234
Average			23.271	24.000
Relative standard deviation (%)			2.9	13

TABLE 3-15. SUMMARY OF MM 111 RESULTS FOR RUN 5, VENTURI PRESSURE DROP = 6.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO

Run 5 (8/26/88)	Outlet A	Outlet B	Average[a] Outlet A & B
Sampling Parameters			
Volume gas sampled (dscf)	50.05	49.40	---
Volume gas sampled (dscm)	1.417	1.399	---
Stack gas flow rate (dscfm)	80,896	78,320	159,215
Stack gas flow rate (dscmm)	2,291	2,218	4,509
Stack gas flow rate (acfm)	131,443	127,900	259,342
Stack gas flow rate (acmm)	3,722	3,622	7,345
Stack temperature (^{o}F)	134.3	137.8	136.0
Stack temperature (^{o}C)	56.9	58.8	57.8
Moisture (percent by volume)	18.30	18.63	18.47
Isokinetics (percent)	95.7	98.4	---
Particulate Emission Results			
Particulate concentration (gr/dscf)	0.03499	0.03220	0.03362
Particulate concentration (mg/dscm)	80.07	73.69	76.93
Particulate rate (lb/hr)	24.26	21.62	45.88
Particulate rate (kg/hr)	11.01	9.807	20.81
Radionuclide Emission Results			
Polonium-210			
(pCi/dscf)	116.0	101.2	108.7
(pCi/dscm)	4,097	3,574	3,840
(uCi/hr)	563.0	475.6	1,039
(nCi/g particulate)	51.17	48.50	49.83
Lead-210			
(pCi/dscf)	0.01259[b]	1.636	0.8112
(pCi/dscm)	0.4447[b]	57.77	28.64
(uCi/hr)	0.06111[b]	7.688	7.749
(nCi/g particulate)	0.005554[b]	0.7839	0.3947

[a]Average concentrations weighted for stack gas flow for each stack. Stack gas flows and pollutant mass flows are the total from both stacks.

[b]Lead-210 was not detected in the back half fraction. The minimum detection limit was less than zero.

TABLE 3-16. SUMMARY OF MM 111 RESULTS FOR RUN 6, VENTURI PRESSURE DROP = 6.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO

Run 6 (8/26/88)	Outlet A	Outlet B	Average[a] Outlet A & B
Sampling Parameters			
Volume gas sampled (dscf)	49.58	49.44	---
Volume gas sampled (dscm)	1.404	1.400	---
Stack gas flow rate (dscfm)	78,000	78,584	156,583
Stack gas flow rate (dscmm)	2,209	2,225	4,434
Stack gas flow rate (acfm)	129,184	130,043	259,227
Stack gas flow rate (acmm)	3,658	3,683	7,341
Stack temperature (^{o}F)	136.3	140.5	138.4
Stack temperature (^{o}C)	57.92	60.28	59.10
Moisture (percent by volume)	19.59	18.95	19.27
Isokinetics (percent)	98.4	98.1	---
Particulate Emission Results			
Particulate concentration (gr/dscf)	0.04143	0.03412	0.03776
Particulate concentration (mg/dscm)	94.80	78.06	86.40
Particulate rate (lb/hr)	27.70	22.98	50.68
Particulate rate (kg/hr)	12.56	10.42	22.99
Radionuclide Emission Results			
Polonium-210			
(pCi/dscf)	127.7	160.5	144.2
(pCi/dscm)	4,511	5,670	5,093
(uCi/hr)	597.8	757.0	1,355
(nCi/g particulate)	47.58	72.63	60.11
Lead-210			
(pCi/dscf)	ND [1.599E-04][b]	ND[c]	ND [7.965E-05]
(pCi/dscm)	ND [5.646E-03][b]	ND[c]	ND [2.813E-03]
(uCi/hr)	ND [7.483E-04][b]	ND[c]	ND [7.483E-04]
(nCi/g particulate)	ND [5.956E-05][b]	ND[c]	ND [2.978E-05]

[a]Average concentrations weighted for stack gas flow for each stack. Stack gas flows and pollutant mass flows are the total from both stacks.

[b]Lead-210 was not detected in the Outlet A-Run 6 sample. The values presented are minimum detection limits.

[c]Lead-210 was not detected in the Outlet B-Run 6 samples. The minimum detection limit was below zero.

TABLE 3-17. SUMMARY OF MM 111 RESULTS FOR RUN 7, VENTURI PRESSURE DROP = 6.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO

Run 7 (8/26/88)	Outlet A	Outlet B	Average[a] Outlet A & B
Sampling Parameters			
Volume gas sampled (dscf)	50.75	49.28	---
Volume gas sampled (dscm)	1.437	1.396	---
Stack gas flow rate (dscfm)	81,082	78,254	159,336
Stack gas flow rate (dscmm)	2,296	2,216	4,512
Stack gas flow rate (acfm)	133,928	130,576	264,504
Stack gas flow rate (acmm)	3,793	3,698	7,491
Stack temperature (^oF)	135.9	141.2	138.5
Stack temperature (^oC)	57.73	60.65	59.19
Moisture (percent by volume)	19.42	19.53	19.48
Isokinetics (percent)	96.9	98.2	---
Particulate Emission Results			
Particulate concentration (gr/dscf)	0.03467	0.03632	0.03548
Particulate concentration (mg/dscm)	79.32	83.11	81.18
Particulate rate (lb/hr)	24.10	24.36	48.46
Particulate rate (kg/hr)	10.93	11.05	21.98
Radionuclide Emission Results			
Polonium-210			
(pCi/dscf)	105.1	153.1	128.7
(pCi/dscm)	3,713	5,404	4,544
(uCi/hr)	511.5	718.8	1,230
(nCi/g particulate)	46.82	65.02	55.92
Lead-210			
(pCi/dscf)	0.8930[b]	ND [0.02282][c]	0.4656
(pCi/dscm)	31.54[b]	ND [0.8055][c]	16.44
(uCi/hr)	4.344[b]	ND [0.1071][c]	4.451
(nCi/g particulate)	0.3976[b]	ND [0.009692][c]	0.2036

[a]Average concentrations weighted for stack gas flow for each stack. Stack gas flows and pollutant mass flows are the total from both stacks.

[b]Lead-210 was not detected in the back half fraction of the Outlet A-Run 7 sample. The minimum detection limit was below zero.

[c]Lead-210 was not detected in either the front half or back half fraction of the Outlet B-Run 7 sample. The values presented are minimum detection limits.

Po-210 concentrations in flue gases at the outlet location averaged 4,492 pCi/dscm (127 pCi/dscf) for the four test runs. On an activity per gram of particulate basis, Po-210 activity for the outlet runs averaged 55.3 nCi/g PM.

Pb-210 concentrations in flue gases at the outlet location were at or near the minimum detection limit and averaged 15.0 pCi/dscm (0.426 pCi/dscf). On an activity per gram of particulate basis, Pb-210 activity averaged 0.200 nCi/g PM. Although the Pb-210 results were more variable between the two outlet stacks, the results agree within the lower analytical precision found for results at or near the minimum detection limit.

3.2.2 Estimated Venturi Scrubber Efficiencies - Method 111

Table 3-18 summarizes the estimated removal efficiencies of the venturi scrubber control system for removal of particulate, Po-210, and Pb-210 at test condition B. Removal efficiency was estimated based on the average inlet results from runs 3 and 4 and the measured outlet results. There were no inlet measurements performed during test condition B. The outlet values at the two locations are combined as if the emissions were combined to a single stack to yield a single concentration. Estimated removal efficiency for PM was consistent for all the runs, averaging above 92 percent. The scrubber was estimated to remove less than 20 percent of the inlet Po-210 for all three runs. Estimated removal of Pb-210 across the scrubber was consistently high, with removal efficiencies from 85.3 to approximately 100 percent.

3.2.3 Front/Back Half Distribution of Emissions in MM 111 Trains

Table 3-19 presents a summary of the distribution of emissions as collected in the MM 111 sampling trains during test condition B. As seen in the table, approximately 99.5 percent of the Po-210 collected was present in the front half of the train. This percentage was consistent for samples collected at both outlet locations.

TABLE 3-18. ESTIMATED REMOVAL EFFICIENCIES FOR PM, Po, AND Pb, VENTURI PRESSURE DROP = 6.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

	Concentration		
	Inlet[a]	Outlet[b]	Removal Efficiency[c]
Run 5			
Particulate (gr/dscf)	0.4755	0.03362	92.93
Po-210 (pCi/dscf)	134.7	108.7	19.29
Pb-210 (pCi/dscf)	5.526	0.8112	85.32
Run 6			
Particulate (gr/dscf)	0.4755	0.03776	92.06
Po-210 (pCi/dscf)	134.7	144.2	-7.05[d]
Pb-210 (pCi/dscf)	5.526	7.965E-05	99.998
Run 7			
Particulate (gr/dscf)	0.4755	0.03548	92.54
Po-210 (pCi/dscf)	134.7	128.7	4.47
Pb-210 (pCi/dscf)	5.526	0.4656	91.57

[a]Inlet concentration assumed is the average of results from runs 3 and 4.

[b]Outlet concentration is the average of both stacks weighted for the different flows from each stack.

[c]Removal efficiency calculated assuming that the inlet concentration does not change with flow rate (i.e., the inlet concentration remains constant and the inlet gas flow rate is adjusted to equal the total outlet gas flow rate).

[d]If the removal efficiency is less than zero, the inlet and outlet values should be considered equal taking into account the precision of the sampling and analytical methods. The removal efficiency should be considered zero.

TABLE 3-19. SUMMARY OF FRONT/BACK HALF DISTRIBUTION OF EMISSIONS: MM 111 SAMPLING TRAINS, PRESSURE DROP = 6.5 in. W.C., CALCINER 1 OFFGASES, FMC-POCATELLO, IDAHO (August 1988)

Location	Parameter	Front Half	Back Half
Outlet	Particulate	100[a]	NA[b]
	Po-210	99.5	0.5
	Pb-210	98.4[c]	1.6[c]

[a]On average, 85 percent of the particulate matter collected at the outlet was found on the filter, and 15 percent was collected in the probe and nozzle.

[b]NA = Not applicable. The addition of 0.1 N HNO_3 in the impingers prevented drying and weighing of the impinger catch.

[c]Results from outlet B, run 5 only. For two samples, all of the Pb-210 activity was in the front half, for two samples, all of the Pb-210 activity was in the back half, and for one sample, no Pb-210 activity was detected in either fraction.

The distribution for Pb-210 was very inconsistent between the runs and the outlet locations. In only one sample was Pb-210 activity detected in both the front and back half fractions; for that sample, 98 percent of the activity was in the front half. For two samples, all of the detected Pb-210 activity was in the front half, while in two other samples, all of the measured activity was in the back half. For one other sample, no activity was detected in either fraction.

The distribution of PM between the front half fraction components was evaluated for the samples for condition B. As stated in the footnotes to Table 3-19, an average of 85 percent of the PM at the outlet was on the filter and 15 percent was in the probe and nozzle rinses.

4.0 SAMPLING AND ANALYSIS

This section describes specific sampling and analysis activities performed during the August 1988 test program at the FMC facility. As described in the Executive Summary of this document (see Table 1-2), emission samples were collected during periods of two separate scrubber operating conditions. At a pressure drop across the venturi of 10.5 in. H_2O, four test runs were conducted at the venturi scrubber inlet and each of the two outlet stacks to collect particulate matter and particulate size samples for subsequent radionuclide analysis. An additional three runs were conducted at a venturi scrubber pressure drop of 6.5 in. H_2O. Particulate matter and radionuclide samples were collected at the scrubber outlets only.

The following subsections describe the sampling locations at the FMC site (Section 4.1), the sampling procedures to be used (Section 4.2), the approach utilized for recovering and analyzing each of the collected samples (Section 4.3), and the sample custody procedures (Section 4.4).

4.1 SAMPLING LOCATIONS

Figure 4-1 identifies each of the sampling locations for the FMC test program. The following subsections present descriptions of each of these locations.

4.1.1 Scrubber Inlet

As seen in Figure 4-1, the scrubber inlet sampling location was downstream of the calciner just prior to the point where the offgas stream is split into the two parallel streams feeding the venturi scrubbers. The sampling was performed in a vertical duct which was rectangular with dimensions of 10 by 13 ft. (3.05 by 3.96 m). A schematic of the inlet sampling location is shown in Figure 4-2. The sampling location was

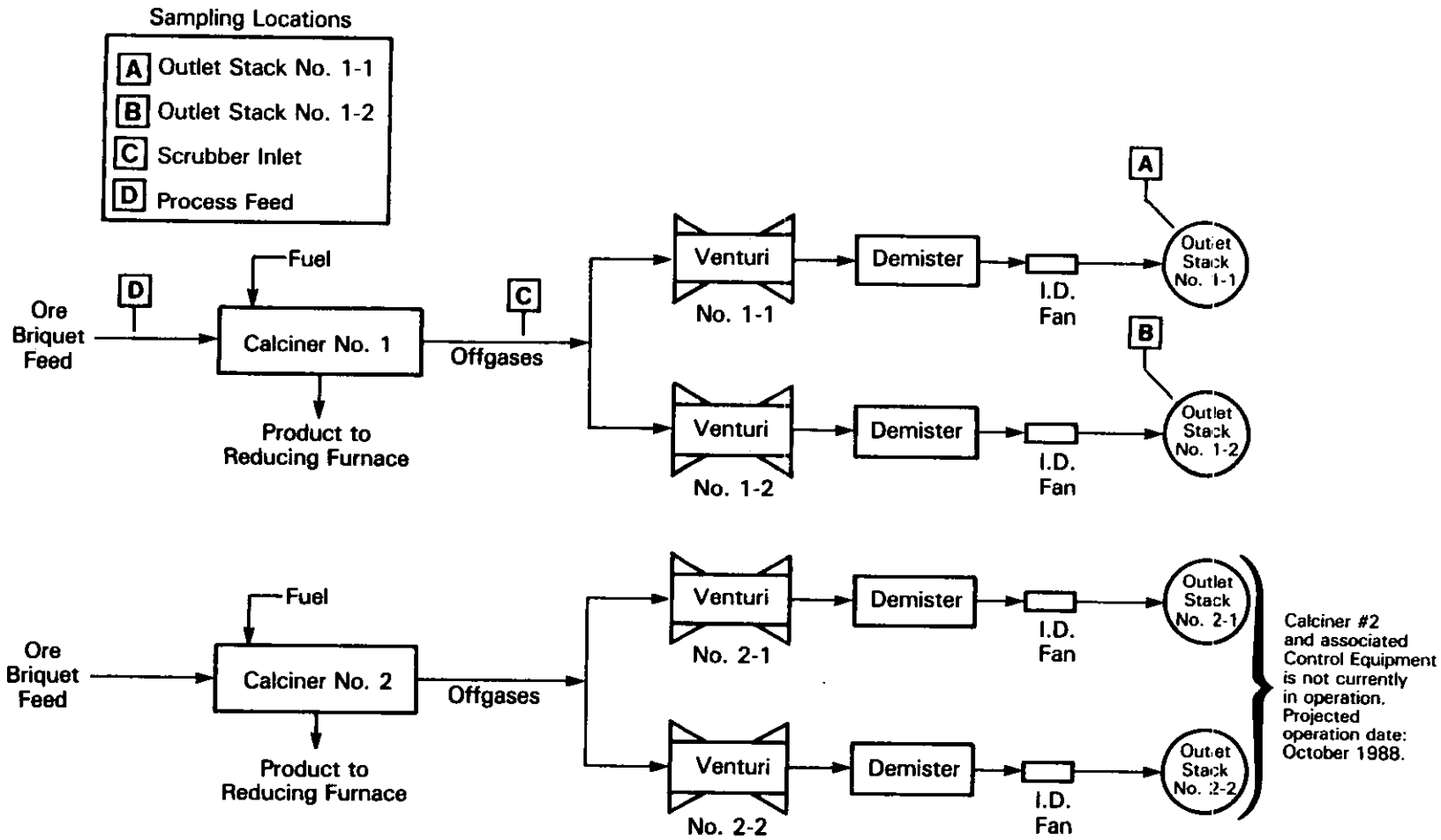


Figure 4-1. Schematic showing sampling locations at the FMC calcining operation and pollution control system

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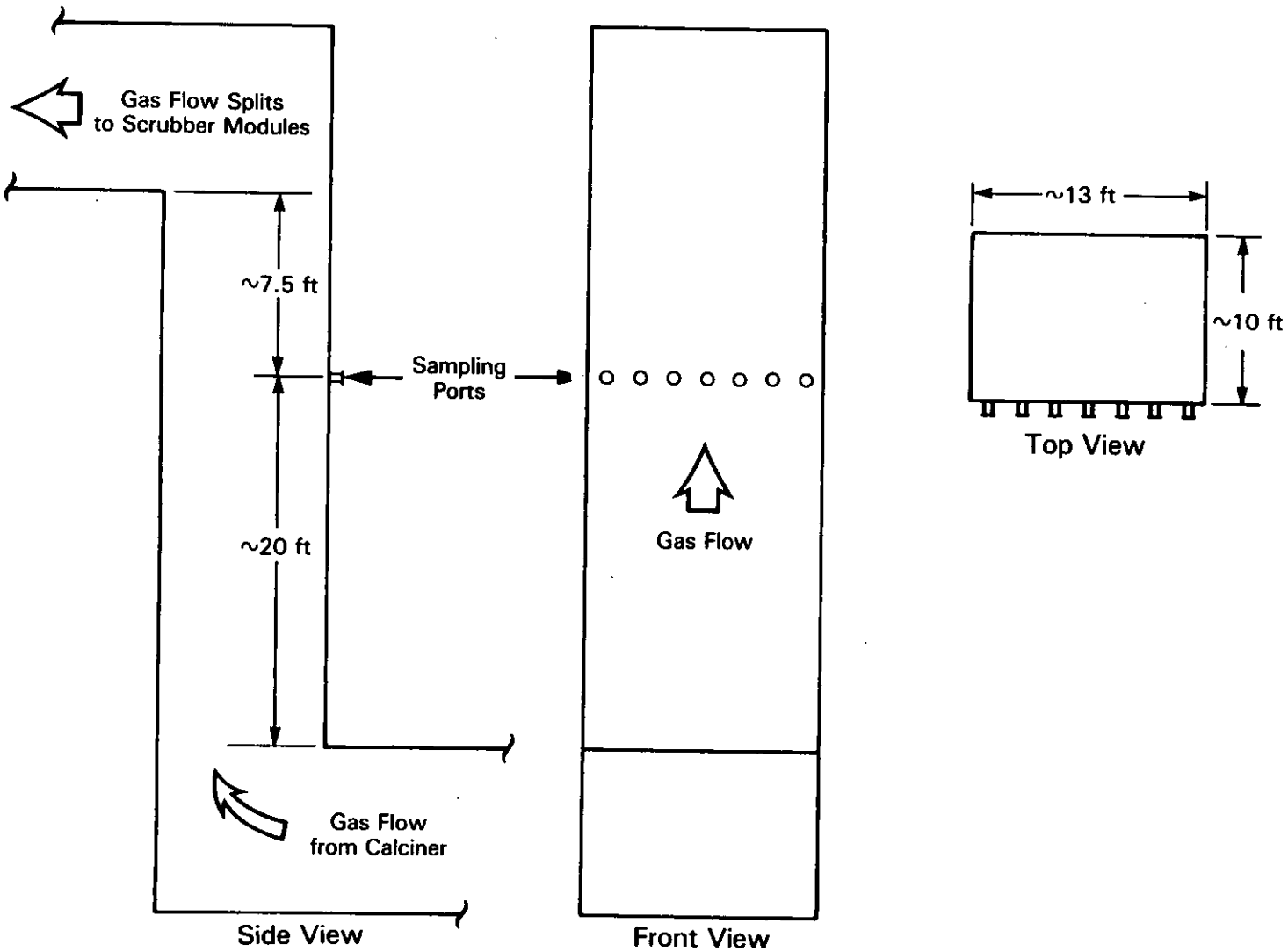

Figure 4-2. Schematic of the inlet sampling location at FMC

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recognized as a nonideal location due to flow disturbances both up and downstream. During each MM 111 test run the maximum number of traverse points were sampled in order to minimize the effect of these disturbances on sample representativeness. The EPA Method 1 criterion specified a maximum total of 49 traverse points, 7 in each of the 7 ports.

4.1.2 Outlet Stacks

Controlled flue gases from each calciner unit are discharged to the atmosphere through two separate scrubber stacks. Outlet sampling was performed at each of the two stacks. A schematic showing dimensions of the two similar outlet locations is shown in Figure 4-3. The diameter of the circular stacks was 76.5 inches. The outlet sampling location ports were ideal as defined by EPA Method 1 criteria, with each stack requiring 12 traverse points, 6 from each port. The outlet stacks were reduced in total height by 25-30 ft from their original design due to corrosion problems. The current stacks are scheduled for replacement in October 1988.

4.1.3 Process Feed Sampling Location

Phosphate rock feedstock (briquettes) was collected from a moving belt just prior to the vibrator feed conveyor just prior to where the briquettes were discharged onto the moving grate.

4.2 SAMPLING PROCEDURES

EPA reference sampling methods were used during this test program to collect flue gas samples for particulate matter and particulate size distribution. These particulate samples were analyzed for radiation from radionuclides, specifically polonium-210 and lead-210. EPA reference sampling methods were also used to measure stack gas velocity/volumetric flow, moisture content, and molecular weight.

Each sampling method used during the test program is described in detail in the following subsections.

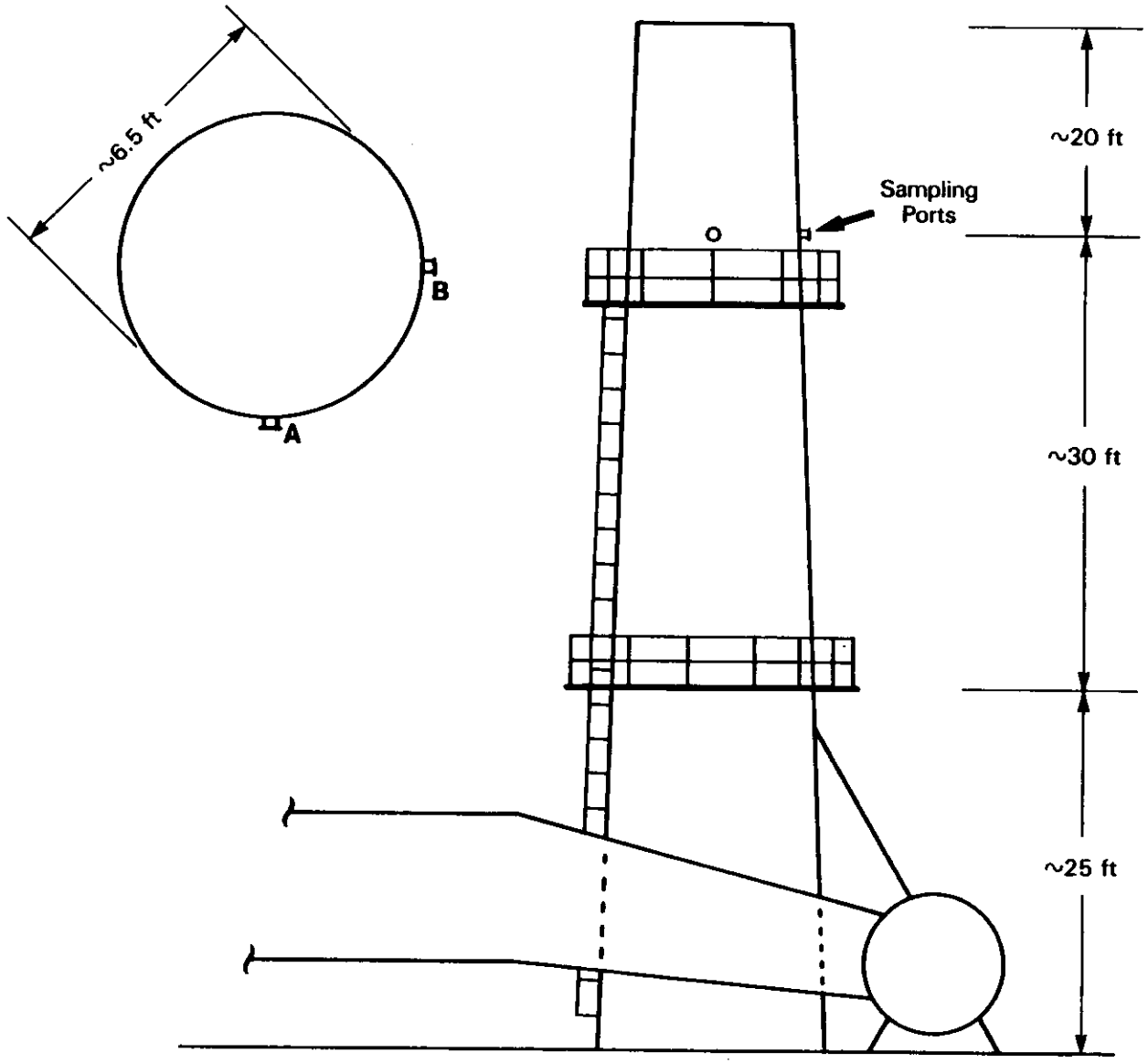

Figure 4-3. Schematic showing one of the two similar outlet sampling locations at FMC

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4.2.1 Particulate Matter and Radionuclides - Modified EPA Method 111

Particulate matter in both the inlet and outlet streams was collected using a modification of EPA Method 111. For reference purposes, EPA Method 111 is included in Appendix A of this document. The specific modifications included:

- use of 0.1 N HNO_3 in the impingers instead of water;
- insertion of an extra impinger (empty) following the filter and heater box (due to the high moisture content of the streams); and
- modification in recovery procedures (discussed in Section 4.3).

A schematic of the Modified Method 111 (MM 111) train that was used in this test program is shown in Figure 4-4. Flue gas was pulled from the stack through a stainless steel nozzle and a glass-lined probe. Particulate matter was removed from the gas stream by a glass fiber filter housed in a Teflon® sealed. The glass filter holder was maintained at 120 $\pm$ 14°C (248 $\pm$ 25°F). The filter holder contained a Teflon®-coated stainless steel screen to support the filter. After the heated filter box, an empty knockout condenser was used to remove excess moisture, followed by two impingers containing 0.1 N HNO_3, another empty knockout condenser, and a silica gel impinger.

4.2.2 Particle Size Distribution - Andersen MK III

Particle size distribution (PSD) measurements at both the inlet and outlet locations were made using in-stack Andersen MK III cascade impactors, equipped with right angle preseparators used to turn gas stream. The Andersen MK III impactor is an eight-stage cascade impactor which classifies particles according to their aerodynamic diameter. No buttonhook nozzles were used.

An example of the sampling train is shown in Figure 4-5. Many of the components are similar to those used in EPA Method 5 sampling. Stack gas velocity and temperature profiles were obtained from pretest stack gas

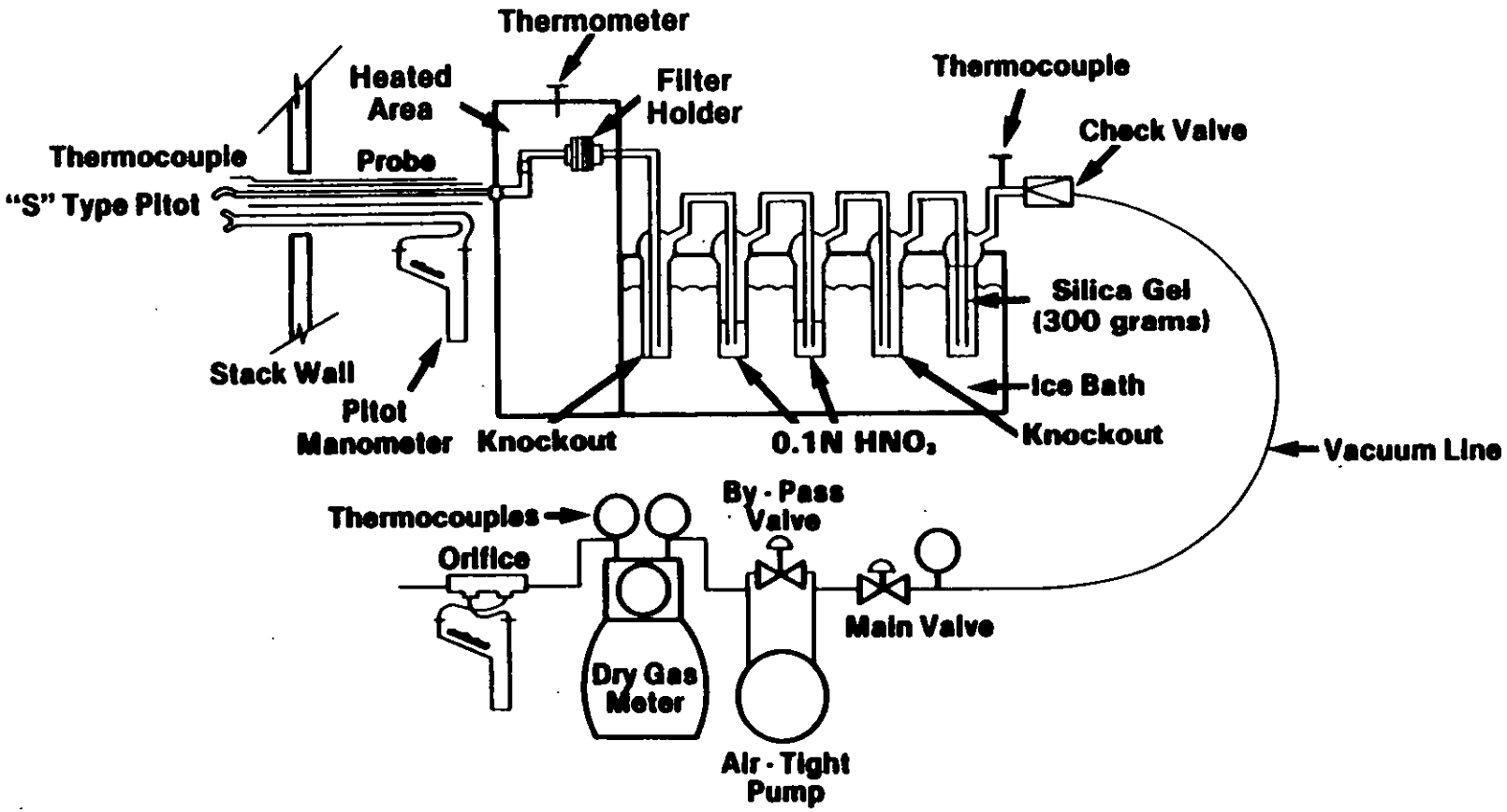

Figure 4-4. Schematic of the Modified Method 111 Sampling Train

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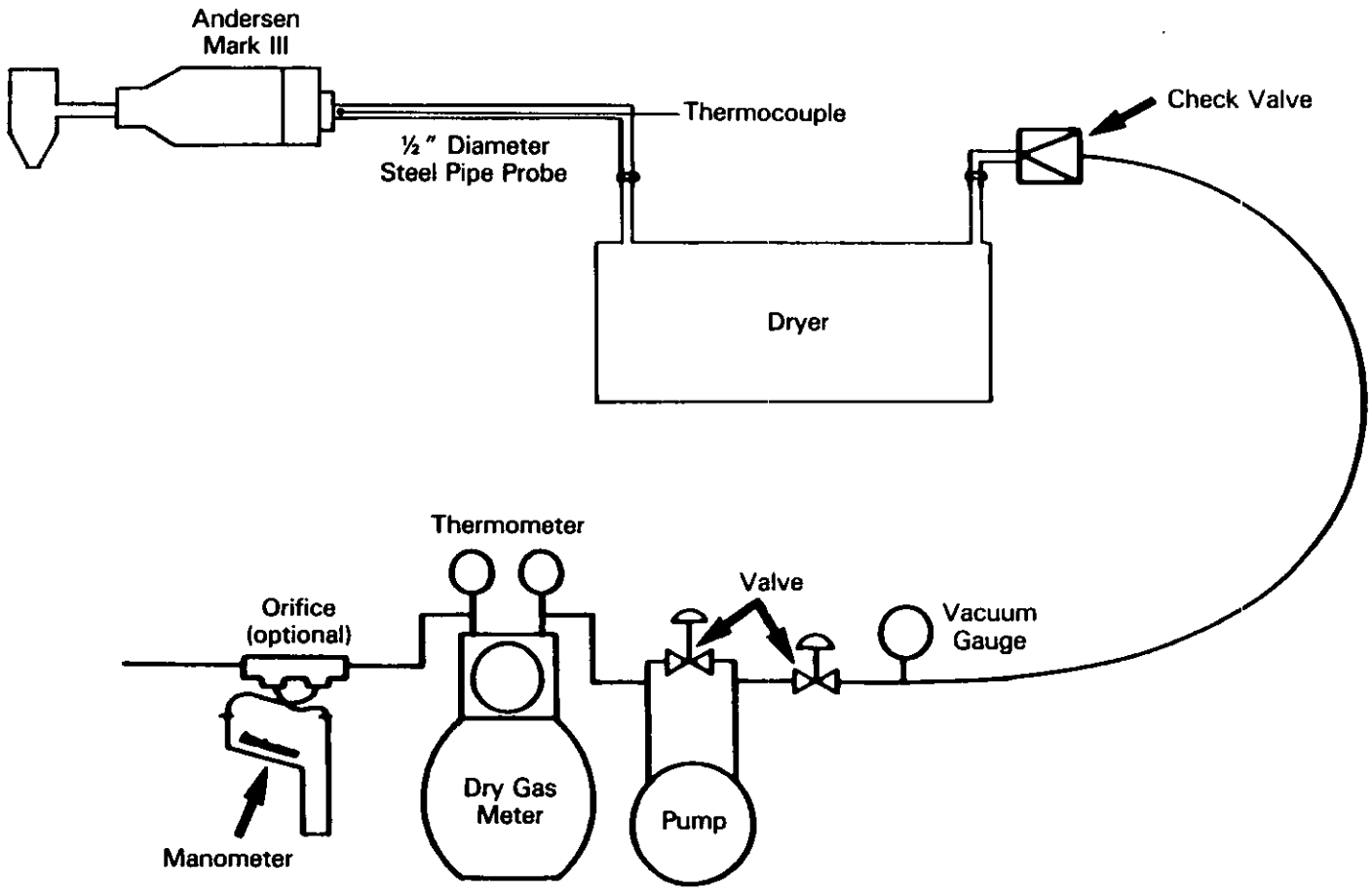

Figure 4-5. Schematic of the Andersen MK III Cascade Impactor Train

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traverses conducted at each sampling location prior to the particle size measurements. Based on the resulting profile data, two points that were representative of the stack gas velocity and temperature profile were selected for collecting the PSD sample. For each test run (both inlet and outlet), all traverse points were selected from a single port. Subsequent test runs were sampled using similar point selection criteria; although points were selected from the opposite port. Stack gas moisture content was based on data from the preceding MM 111 test runs. Sampling train flow rates were maintained at constant rates and were selected to optimize the particle size definitions for the lower size ranges (less than 2 microns). The goal of each PSD run was to achieve isokinetic sampling (100 $\pm$ 20%) and to achieve good size separation in the less than 2 microns particle size.

Due to the high moisture content at each of the outlet sampling locations, both the preseparator and the impactor were pre-heated above the flue gas dew point temperature prior to testing. During the test run, heating was accomplished by wrapping the impactor with heating tape, insulating the impactor body and waterproofing the entire assembly. Impactor temperatures during the test runs were maintained above the stack gas dew point using a variac to regulate electrical current to the heat tape. Impactor outlet temperatures were monitored and recorded throughout each run with a type K thermocouple. A condenser system was used to remove moisture and deliver dry gas to the metering system. Rieve Angel 934 AH glass fiber substrates were used to collect the samples. The final filter (back-up filter) met the requirements of ASTM Standard Method D (99.95% collection efficiency on 0.3 micron dioctylphthalate particles).

Preliminary PSD samples were collected at each location to determine and establish proper sampling collection parameters. These preliminary samples were evaluated for evidence of particle bounce, reentrainment, overloading or underloading. Based on analyses of these preliminary test runs, sampling rates and durations were established for each of the subsequent test runs.

4.2.3 Flue Gas Volumetric Flow Rate - EPA Method 2

The volumetric stack gas flow rate for both stack outlet and inlet locations was determined using procedures described in EPA Method 2. Based on this method, the volumetric flow rate is determined by measuring the cross-sectional area of the stack and average velocity of the flue gas through this cross-sectional area.

The average velocity of the flue gas was calculated from the average gas velocity pressure, the average flue gas temperature, the wet molecular weight, and the absolute static pressure. Pressure and temperature profiles were obtained by traversing the stack.

Pressure and temperature profiles were obtained by an S-type pitot tube and type K thermocouple at each of the traverse points. An inclined oil manometer was used to measure pressure differential across the S-type pitot tube. A calibrated aneroid barometer was used to obtain barometric pressure. Static gas pressure was measured by an S-type pitot tube with the face aligned at right angles to the gas stream flow. One side of the pitot was disconnected after proper placement and static pressure determined using an inclined manometer.

4.2.4 Flue Gas Molecular Weight Determination - EPA Method 3

The molecular weight of the flue gas at each location was determined during each MM 111 run using a single point grab sample collected in Tedlar® bags. The molecular weight analysis was performed using Orsat procedures as described in EPA Method 3.

4.2.5 Flue Gas Moisture Content - EPA Method 4

The moisture content of the flue gases at both the stack outlet and inlet locations was determined using procedures described in EPA Method 4. Based on this method, a known volume of particulate-free gas is pulled through a chilled impinger train. The quantity of condensed water is gravimetrically determined and then related to the volume of gas sampled.

The moisture content of the flue gas was determined simultaneously during the operation of the MM 111 trains. The impingers used with these trains were weighed before and after sampling. The mass increase in moisture was related to the volume of gas sampled to calculate the moisture content of the flue gas.

4.2.6 Process Feed Samples - Composite Grab

Grab samples of the shale briquette feedstock were collected periodically during each MM 111 flue gas sampling period. The samples were collected from the vibrator feed conveyor assembly just prior to discharging into the kiln. Approximately 1 kg (2.2 lbs) of sample was collected in each grab. At the end of each flue gas sampling period, the grab samples were combined, mixed and quartered. A single 1 kg (2.2 lbs) composite grab sample corresponding to each sampling period was retained for radionuclide analysis.

4.3 SAMPLE RECOVERY AND ANALYSIS

4.3.1 Particulate Matter and Radionuclides

Upon completion of each test run, the MM 111 trains were leak checked, disassembled and filter and impingers were transported to the on-site recovery trailer. The inlet probes and nozzles were recovered at the sampling platform, due to the probe length (15 ft). Care was taken to reduce sample contamination to the extent possible under the conditions encountered. The outlet probes and nozzles were recovered in the laboratory trailer.

Openings on each of the disassembled sampling train components were covered with Teflon® tape or parafilm® prior to transporting to the recovery site. As soon as possible after completion of the testing, the trains were recovered. The MM 111 recovery and analytical scheme is shown in Figure 4-6. The modifications from EPA Method 111 are as follows:

- the back half of the sampling train (impingers) were recovered for subsequent radionuclide analyses;

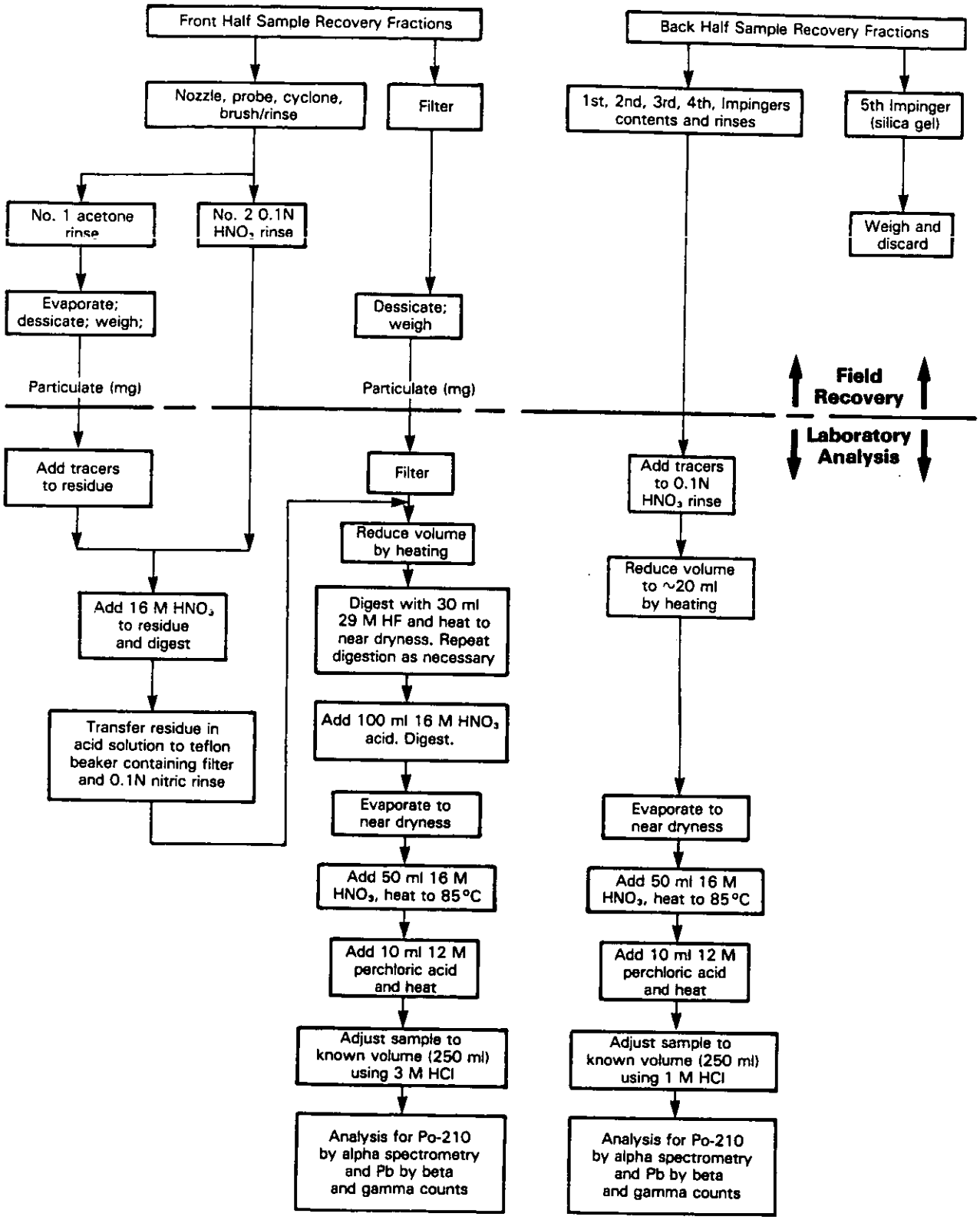

Figure 4-6. Modified Method 111 Recovery and Analysis Scheme

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- the front half (probe and filter holder) acetone rinses were followed by rinses with 0.1 N HNO_3; and
- radionuclide analyses were performed separately for front and back half train fractions. Front half consisted of both the filter and the probe, nozzle and filter holder rinses; back half consisted of impinger contents and rinses.

Train recovery and gravimetric determinations were performed by Radian. The gravimetric determinations were done on-site for the filter and probe rinse acetone (PRA) components of the sampling train. For each of the MM 111 trains, samples for radionuclide analyses were sent to EERF in four components. These four components are listed in Table 4-1. During the analytical digestion procedures the front half rinses (PRN) were combined with the dried acetone rinses (PRA) and both were combined with the filter (F) to provide a front half analysis. Radionuclide analyses were performed separately for front and back half train catches. The specific analytical protocol used by EERF for radionuclide analysis is included in Appendix B.

4.3.2 Particulate Size Distribution and Radionuclides

Upon completion of each test run, the impactors were removed from the duct, oriented vertically and purged for approximately 10 minutes to prevent water condensation in the impactor assembly. The nozzles were loosely covered with aluminum foil or Teflon® tape and the impactor placed in a vertical position where it would not be bumped. After the impactors had cooled, they were transported to the field laboratory for recovery.

Each stage was inspected for particles that might have accumulated on surfaces other than the stage collection substrate. By convention, any particles lost to surfaces upstream of a stage substrate were added to that substrate's catch. A camel hair brush was used to clean the surfaces.

The substrates were removed from the impactor and placed in their respective petri dishes using a flat-ended set of forceps and flat-bladed spatula. Particles from the preseparator were brushed onto the first stage collection substrate.

TABLE 4-1. MODIFIED METHOD 111 SAMPLING TRAIN COMPONENTS TO BE SENT TO EERF FOR RADIONUCLIDE ANALYSIS, FMC-POCATELLO, IDAHO (August 1988)

Container/Component	Code	Description
Component Number 1	F	Filter
Component Number 2	PRA	Acetone rinses of nozzle, probe, and front half of filter holder
Component Number 3	PRN	Nitric rinses of probe, and front half of filter holder
Component Number 4	IR	Nitric acid rinses of back half of filter holder, filter support; and first, second, third, and fourth impinger contents and rinses

After each test run, the substrates were closely examined to determine if the selected operating conditions were effective. The following criteria were used to determine if the test run was valid:

- no signs of particle bounce or reentrainment,
- no signs of overloaded deposits or secondary deposition,
- dry filters with no condensed water, and
- minimal particle catch (approximately 2-5 mg per lower stages).

Both reentrainment and overloaded deposits are typically characterized by increased internal losses to the inner surfaces of the impactor. When reentrainment and/or overloading occur, primary depositions (from impaction) are ill-defined and secondary deposition is evident around the primary deposits. Particle deposition on the substrate should be due to impaction only. Consequently, when reentrainment and/or overloading do not occur, deposits are uniform and well-defined (conical) with no evidence of disturbance. The collected particle size samples were uniform and well-defined.

Impactor recovery and gravimetric determinations were performed in the field by Radian. For each of the Andersen impactor trains, samples for radionuclide analyses were sent to EERF in six components. These six components are listed in Table 4-2. Radionuclide analyses were performed on each of these components separately. Analytical digestion procedures were identical to those described in Figure 4-6 for the MM 111 filters. The specific analytical protocol used by EERF for radionuclide analysis is included in Appendix B.

4.3.3 Analytical Errors in Radionuclide Measurements

The measurement errors associated with the radionuclide analysis for individual samples are shown in Appendix L. The results of duplicate and intercomparison samples are shown in Section 5.0, Tables 5-6 and 5-10. Measurement errors for polonium-210 analyses, as shown in Appendix L, were less than 10% at the 95% confidence level.

TABLE 4-2. ANDERSEN IMPACTOR SAMPLING TRAIN COMPONENTS FOR RADIONUCLIDE ANALYSIS, FMC-POCATELLO, IDAHO (August 1988)

Container/Component	Code	Description
Component Number 1	PSD-1	Preseparator Stages 0 and 1
Component Number 2	PSD-2	Stages 2, 3, 4, and 5
Component Number 3	PSD-3	Stage 6
Component Number 4	PSD-4	Stage 7
Component Number 5	PSD-5	Stage 8
Component Number 6	PSD-6	Stage 9 (back-up filter)

Measurement errors for lead-210, as shown in Appendix L, were relatively large (i.e., greater than 50%) with many of the samples near or below the detection level (i.e., errors of greater than 100%). The large errors in the lead-210 measurements were due to the low concentration of lead-210 in the sample aliquot analyzed. As shown in Apepndix B, lead-210 and polonium-210 were analyzed simultaneously from the same sample aliquot. The sample aliquot size was determined by the polonium-210 content of the sample. For the FMC plant, the lead-210 content of the samples was relatively low compared to the polonium-210 content; therefore, this resulted in very low amounts of lead-210 in the sample aliquot.

4.3.4 Reporting of Lead-210 Data

The large errors associated with the lead-210 measuremnets present some problems in reporting, averaging, and summarizing this data. In presenting the data in this report, the following procedure was used. For all values greater than zero, the actual measured value was reported (even if the error was greater than 100%). However, values with errors greater than 100% at the 95% confidence level were identified as non-detectable in the summary tables. Negative values (i.e. values less than zero) were reported as 0.00 in the summary tables. The 0.00 values were used in determining average and sum total values. This procedure will results in a small positive bias in the data.

Because of the large uncertainties associated with the lead-210 data, any interpretation of the data should taken into consideration the high degree of uncertainty in these measurements.

4.4 SAMPLE CUSTODY

Sample custody procedures followed during this program were based on EPA recommended procedures. The custody procedures emphasized careful documentation of sample collection and field analytical data and the use of chain-of-custody records for sample being transportation. The team leader for the field testing effort was Mr. R. F. Jongleux. The team leader was

responsible for ensuring that proper custody and documentation procedures were followed for the field sampling and field analytical efforts.

A master sample logbook was used to document all sample collection activities (Notebook #21088). All sampling data, including information regarding sampling times, locations, and any specific considerations associated with sample acquisition were recorded on preformatted data sheets.

Following sample collection, all samples were given a unique alphanumeric (Radian) sample identification code. Figure 4-7 contains an example of the alphanumeric ID codes and abbreviations used for the FMC samples. Sample labels and integrity seals were completed and affixed to the sample container. As the samples were packed for shipment, chain-of-custody forms were completed for each shipment box specifying treatment of the samples.

FMC-082388-MM111-IN-1-F

Plant:

Date:

Sampling Method:
Modified Method 111
PSD = Particle Size Distribution
GR = Grab

Sampling Location:
Inlet
OTA = Outlet 1-1
OTB = Outlet 1-2

Run:

Sample Fraction:
Filter
PR = Probe Rinse
IR = Impinger Contents and Rinses
ST1 = PSD Stage 0,1 and Preseparator
ST2-5 = PSD Stages 2, 3, 4, and 5
ST6 = PSD Stage 6
ST7 = PSD Stage 7
ST8 = PSD Stage 8
ST9 = PSD Stage 9 (Back-up filter)

Figure 4-7. Example of alphanumeric ID codes for the FMC test program

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5.0 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Specific quality assurance and quality control procedures were incorporated into the FMC test program to ensure the production of useful and valid data. The overall quality assurance/quality control (QA/QC) objective was to ensure precision, accuracy, completeness, comparability, and representativeness for each parameter measured in this test program. The QA/QC procedures and results described in this section represent an integral part of the overall sampling and analysis scheme. The acceptance criteria, control limits and corrective action that were used for the test program and the results achieved are summarized in Table 5-1.

Section 5.1 presents QA/QC results for the particulate and PSD sampling activities, Section 5.2 presents QA/QC results for radionuclide analysis, and Section 5.3 presents QA/QC results for particulate analysis.

5.1 QUALITY ASSURANCE/QUALITY CONTROL FOR SAMPLING AND RECOVERY

The isokinetic results for the modified Method 111 (MM 111) and particle sizing sampling trains are summarized in Tables 5-2 and 5-3, respectively. Of the 27 PSD and MM 111 sampling trains operated, two MM 111 trains did not meet the QA/QC isokinetic objective of 100 $\pm$ 10 percent. For the MM 111 sampling trains, the isokinetics for Inlet-run 1 and Inlet-run 2 were 119.2 and 118.8, respectively. The high isokinetic values were due to an error in the nozzle diameter measurement. The error was not discovered until after the runs were completed. Thus, an additional run was conducted at all locations to ensure representative data.

The leak check results for the MM 111 and particle sizing sampling trains are summarized in Tables 5-4, 5-5 and 5-6. All of the final leak rates met the QA/QC leak rate criteria of less than 0.02 acfm for the particulate sampling trains. Particle size operating procedures dictate

TABLE 5-1. SUMMARY OF ACCEPTANCE, CRITERIA, CONTROL LIMITS AND CORRECTIVE ACTION AND ACHIEVED RESULTS

Criteria	Control Limits	Achieved (%)[a]	Corrective Action
Particulate Sampling			
Isokinetics			
- Method 111	100 ± 10%	88[b]	Performed additional test run.
- Particle Size	100 ± 20%	100	
Final leak rate (after each port)	≤ 0.02 acfm or 4% of sampling rate, whichever is less	100	None required, criteria met.
Dry gas meter calibration	Post average factor (γ) agree ± 5% of prefactor	100	None required, criteria met.
Individual correction factors (γ_i)	Agree within 2% of average factor	100	None required, criteria met.
Average correction factor	1.00 ± 1%	100	None required, criteria met.
Nozzles	Any two diameters should agree within 0.004 inches	100	None required, criteria met.
Radionuclide Analysis			
Duplicate analysis	80% should agree within 2σ as determined in EPA 620/5-82-012	88	Re-run sample, check reagents and procedure.
Performance standards	90% should agree within 2σ as determined in EPA 620/5-82-012	93	Re-run sample, check reagents and procedure, JMW 88.5355 rerun.
Analytical reagent blanks	Below MDL[c]	--	Check reagents and glassware.
Yield	50%	91	Re-run low yield samples to confirm yield and results. Twenty-two percent of the low yield samples were re-analyzed to confirm results. Time constraints limited the number of reruns.

[a]Percentage represents fraction of test runs for which the QA objective was achieved.

[b]Additional test runs were conducted to meet the quality objective, however, only two Method 111 inlet trains were within the isokinetic QA requirements.

[c]The minimum detectable level calculated for Po-210 was 1.2 pCi/analyses and for Pb-210 was 1.7 pCi/analysis.

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TABLE 5-2. SUMMARY OF ISOKINETIC RESULTS FOR MODIFIED METHOD 111 SAMPLING TRAINS, FMC-POCATELLO, IDAHO (August 1988)

Run	Date	Location	Isokinetics (%)[a]
1	8/24/88	Inlet	119.2[b]
		Outlet A	97.9
		Outlet B	92.7
2	8/24/88	Inlet	118.8[b]
		Outlet A	94.5
		Outlet B	93.6
3	8/25/88	Inlet	104.2
		Outlet A	94.2
		Outlet B	99.3
4	8/25/88	Inlet	99.3
		Outlet A	94.0
		Outlet B	97.9
5	8/26/88	Outlet A	95.7
		Outlet B	98.4
6	8/26/88	Outlet A	98.4
		Outlet B	98.1
7	8/26/88	Outlet A	96.9
		Outlet B	98.2

[a]Isokinetic QA/QC objective is 100 ± 10%.

[b]Isokinetics did not meet QA/QC criteria.

TABLE 5-3. SUMMARY OF ISOKINETIC RESULTS FOR PARTICLE SIZING SAMPLING TRAINS, FMC-POCATELLO, IDAHO (August 1988)

Run	Date	Location	Isokinetics (%)[a,b]
1	8/23/88	Inlet	104.4
		Outlet A	100.6
		Outlet B	95.8
2	8/24/88	Inlet	115.8
		Outlet A	99.8
		Outlet B	103.2
3	8/19/88	Inlet	112.5
		Outlet A	106.0
		Outlet B	104.2

[a]Isokinetic QA/QC objective is 100 ± 20%.

[b]Flow was maintained at a constant rate.

TABLE 5-4. SUMMARY OF LEAK CHECK RESULTS FOR THE OUTLET MODIFIED METHOD 111 SAMPLING TRAINS, CALCINER 1, FMC-POCATELLO, IDAHO[a] (August 1988)

Run	Date	Location	Initial - 1st Port		Final - 1st Port		Initial - 2nd Port		Final - 2nd Port	
			Leak Rate (acfm)	Vacuum (in. Hg)	Leak Rate (acfm)	Vacuum (in. Hg)	Leak Rate (acfm)	Vacuum (in. Hg)	Leak Rate (acfm)	Vacuum (in. Hg)
1	8/24/88	Outlet A[b]	0.010	5	0.010	5	0.010	5	0.002	8
		Outlet B[b]	0.010	8	NR	NR	NR	NR	0.010	9
2	8/24/88	Outlet A[b]	0.016	5	0.006	5	0.005	5	0.008	5
		Outlet B[b]	0.010	9	NR	NR	NR	NR	0.010	10
3	8/25/88	Outlet A[b]	0.013	5	0.010	5	0.010	5	0.001	8
		Outlet B[b]	0.010	8	NR	NR	NR	NR	0.010	9
4	8/25/88	Outlet A[b]	0.010	5	0.012	7	0.008	5	0.008	5
		Outlet B[b]	0.010	9	NR	NR	NR	NR	0.010	10
5	8/26/88	Outlet A[b]	0.011	5	0.012	6	0.010	5	0.008	5
		Outlet B[b]	0.010	9	NR	NR	NR	NR	0.010	10
6	8/26/88	Outlet A[b]	0.015	8	0.020	8	0.012	10	0.018	12
		Outlet B[b]	0.010	10	NR	NR	NR	NR	0.010	10
7	8/26/88	Outlet A[b]	0.012	6	0.008	6	0.006	6	0.012	6
		Outlet B[b]	0.010	10	NR	NR	NR	NR	0.010	9

[a]Leak rate QA/QC objective is less than 0.02 acfm or 4 percent of sampling rate, whichever is less.

[b]Values represent leak checks made at the beginning and the end of the test.

NR = Not recorded.

TABLE 5-5. SUMMARY OF LEAK CHECK RESULTS FOR THE INLET MODIFIED METHOD 111 SAMPLING TRAINS, FMC-POCATELLO, IDAHO[a] (August 1988)

Run	Date	Location	Initial[b] Leak Rate (acfm)	Initial[b] Vacuum (in. Hg)	Final[b] Leak Rate (acfm)	Final[b] Vacuum (in. Hg)
1	8/24/88	Inlet	0.010	10	0.010	NR
2	8/24/88	Inlet	0.010	NR	0.002	NR
3	9/25/88	Inlet	0.010	7	0.010	3
4	8/25/88	Inlet	0.001	6	0.020	4

[a]Leak rate QA/QC objective is less than 0.02 acfm or 4 percent of sampling rate, whichever is less.

[b]Values represent leak checks made at the beginning and the end of the test.

NR = Not recorded.

TABLE 5-6. SUMMARY OF LEAK CHECK RESULTS FOR PARTICLE SIZING SAMPLING TRAINS, FMC-POCATELLO, IDAHO (August 1988)

Run	Date	Location	Initial Leak Rate[a] (acfm)	Vacuum (in. Hg)
1	8/24/88	Inlet	0.001	NR
		Outlet A	0.010	10
		Outlet B	0.010	5
2	8/24/88	Inlet	0.020	10
		Outlet A	0.002	NR
		Outlet B	0.01o	NR
3	8/25/88	Inlet	0.001	NR
		Outlet A	0.020	10
		Outlet B	0.008	8

[a]Leak rate QA/QC objective is less than 0.02 acfm or 4 percent of sampling rate whichever is less. Only initial leakchecks are performed to prevent disturbance of the collected particulate on each stage in the impactor.

NR = Not recorded.

that no final leak check is performed on the impactor because to do so would dislodge the particles impacted on the individual substrates and bias the data. Therefore, only pretest leak checks were performed on PSD trains.

In addition to the isokinetics and the leak check criteria, the following QA/QC procedures were satisfied for the purpose of ensuring valid results:

- All sampling equipment passed a thorough visual and operation check prior to and after shipment to ensure clean and operable parts. Equipment which failed to pass this check was not used in the field.
- Manometers were leveled and zeroed before measuring the pressure across the S-type pitot tubes.
- The temperature measurement system was capable of measuring the ambient temperature prior to each traverse to within $\pm$ 2°C of the average measured ambient temperature.
- The field personnel reviewed sampling data forms daily on-site during testing.
- A Modified Method 111 field blank was collected for both the inlet and outlet locations during the test period to evaluate any background contamination. This field blank train (FB) was collected with glassware components that had been previously used to collect MM 111 samples at that location, and then recovered in the prescribed fashion. The purpose of the field blanks was to identify background contamination levels introduced to the sample from the glassware, recovery solvents, or from handling of the train and components in the field during typical situations.
- Blanks of filters and reagents were collected and archived. Filter and reagent blanks have not been analyzed at this time for radionuclides since field blanks did not contain unacceptable levels of contamination.
- The trains were assembled and recovered in a laboratory trailer with a controlled environment which controlled dust contamination.
- Ice was maintained in the impinger baths at all times, exit temperatures were maintained less than 20°C (< 68°F).
- Any unusual occurrences during testing were noted on the field data forms or recovery notebooks.

- Sampling nozzles and S-type pitot tubes were measured and passed the required inspection.

- The roll and pitch axis of the S-type pitot tube and the sampling nozzle were maintained at 90° to the flow during sampling.

- Each leg of the S-type pitot tube achieved the prescribed leak check criterion described in EPA Method 2.

- The entire sampling train was checked to ensure that the leakage rate was less than or equal to 0.02 cfm or 4 percent of the average sampling rate (whichever is less) before and after moves from one sampling port to another during a run.

- Readings of the dry gas meter, ΔP, ΔH, temperature, and vacuum pump were made during sampling at each traverse point.

- Filters were handled out of drafts and transferred with tweezers.

- Sample trains were disassembled and the samples recovered in clean areas to prevent contamination.

- The nozzle was capped prior to and following recovery.

- The samples were transferred to appropriate storage containers and clearly labeled.

- Reagent dispenser bottles were clearly labeled.

- Sampling glassware was routinely rinsed three times with each reagent to remove all of the sample.

- Reagent lot numbers were recorded.

- All sampling and recovery glassware was capped or covered when not in use.

- Probe and nozzle brushes, tweezers, and scrapers were rinsed before use with the proper reagent(s) to minimize any possible sample contamination.

The particle sizing results were of high quality because the following QA/QC procedures were implemented and achieved:

- All substrates were desiccated and weighed to a constant weight (to the nearest 0.05 mg).

- Each impactor stage was visually inspected for proper alignment and uniform seating by an experienced technician.

- Preliminary test runs were conducted at each location (inlet and outlet) to define operating conditions. Substrates from these runs were evaluated for evidence of particle bounce, or reentrainment and sampling parameters for subsequent runs were modified to reflect the necessary corrective actions.

- All impactor stages were visually inspected for proper substrate peak shape and loading by a qualified, experienced individual.

- The impactor stages were characterized by well-defined, tall peaks. There was little evidence of particle bounce on the impactor substrates.

- Impactors at the outlet location were heated and insulated specifically to prevent moisture condensation on the impactor substrates. The impactor exit temperature was maintained above the due point of the flue gas stream. Impactor runs with wet substrates were rejected if water condensation occurred and filter substrate recovery was compromised.

5.2 RADIONUCLIDE ANALYSIS QA/QC

Activities with errors greater than 100 percent at the 95 percent confidence level were considered non-detectable. If these activities were non-negative, they were used in calculating the flue gas concentrations. Negative activities were considered equivalent to zero.

During the radionuclide analyses, every tenth sample was analyzed in duplicate. The duplicate analyses should agree within 2σ and the duplicate results are presented in Table 5-7. Of the twenty-two duplicate analyses, seventeen agreed within 10 percent. Five duplicate analyses were above 20 percent. However, these samples contained radionuclides at a relatively low concentration, indicating that the analysis may be less reliable at very low concentrations.

In addition, the following QA/QC procedures were satisfied for the purpose of ensuring valid results:

- Internally prepared performance evaluation samples were analyzed according to the approved EERF Quality Assurance Plan.

- Externally prepared performance evaluation (if submitted by the plant) were analyzed along with the samples.

TABLE 5-7. DUPLICATE RESULTS FOR RADIONUCLIDE ANALYSES AT FMC-POCATELLO, IDAHO (August 1988)

		Po-210					Pb-210				
EERF No.	Run No.	Analysis 1 (pCi/sample)	2σ error (%)	Analysis 2 (pCi/sample)	2σ error (%)	Agree ?	Analysis 1 (pCi/sample)	2σ error (%)	Analysis 2 (pCi/sample)	2σ error (%)	Agree ?
88.05910	PSD-OTA-1 Stage 1	104.72	7.49	98.301	7.19	yes	1.0316	99.83	-0.75823	127.72	NC
88.05920	PSD-OTB-1 Stage 8	206.54	5.05	197.12	5.73	yes	4.0404	97.27	8.8175	42.41	yes
88.05940	PSD-IN-3 Stage 1	37.964	6.81	32.082	6.56	no	2.8380	41.62	3.1174	44.47	yes
88.05950	PSD-OTA-3 Stage 8	360.55	9.58	331.30	9.54	yes	4.8762	39.99	5.1170	38.20	yes
88.05930	PSD-OTA-2 Stage 6	61.783	6.34	53.570	6.92	yes	0.79968	175.52	0.78536	203.94	NC
88.05860	OTA-1	4716.4	9.35	5247.4	9.57	yes	7.0200	617.92	42.202	86.02	yes
88.05870	OTB-2	111.27	15.83	103.11	8.66	yes	1.0477	293.63	0.56173	326.21	NC
88.05880	IN-4	74.767	7.95	78.694	7.54	yes	2.6980	45.35	1.5813	67.01	yes
88.05890	OTA-6	6073.8	9.56	6540.1	8.86	yes	-4.3443	1081.46	-13.717	340.87	NC
88.05900	OUT-FB	58.629	7.80	59.243	7.58	yes	0.39779	830.14	0.48415	487.23	NC
88.05960	PSD-FB	0.66465	20.39	0.14933	53.95	no	-0.57882	282.54	-0.32206	423.49	NC

[a]NC = duplicate analyses, that have activities with errors over 100 percent, are not evaluated under the duplicate criteria.

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- Procedure background counts (analytical reagent blanks) were determined using analytical reagents, according to the EERF Quality Assurance Plan.

As described in the previous sections, a field blank was collected at each of the two sampling locations (inlet and outlet). A field blank is a complete sampling train that is equipped, prepared, and handled in a manner identical to those trains used to collect samples. The one difference between field blank trains and test sampling trains is that the field blank trains are not inserted into the stack and do not collect sample. The field blank trains for FMC were prepared using glassware and components previously used at that location during the test program to collect actual flue gas samples. The field blank train components were assembled and handled in the same fashion and recovery environment as the standard sampling train components. The field blank train components were then recovered using the same solvents and sample containers as the field samples.

Table 5-8 contains the field blank results from each location. As seen in the table, radionuclide activities in the inlet field blank were less than 2 percent of the average activities for that location. At the outlet, the field blank activities were approximately 1.1 percent for Po-210 and 2.2 percent for Pb-210. These results are within the acceptance criteria for this program.

5.3 QA/QC RESULTS FOR PARTICLE SIZE SAMPLING

A blank (substrate media interaction) impactor run was performed to assess the degree of substrate-flue gas interaction. The blank PSD train was operated for the same time interval as the sample trains. Flue gas constituents can react with filter materials and, therefore, bias the final filter weights. Where bias occurs, it may be either negative or positive. The flue gas interaction with filter substrate materials will be uniform; that is, it effects all filters not just one or two. This interaction ideally will be negligible. The criterion for determining if bias exists is that the average recorded blank substrate weight (loss or gain) should be no greater than 10 percent of the minimum acceptable substrate weight gain.

TABLE 5-8. SUMMARY OF MM 111 RADIONUCLIDE FIELD BLANK VALUES FOR THE TEST PROGRAM, FMC-POCATELLO, IDAHO (August 1988)

Description	Inlet		Outlet	
	Po-210 (pCi/train)	Pb-210 (pCi/train)	Po-210 (pCi/train)	Pb-210 (pCi/train)
Field Blank	73.7761	0.26874	62.6236	3.04937
Average Test Value	4,899.86	125.60	5,453.93	135.898
Minimum Test Value	3,384.03	81.233	3,861.22	27.8096
Field Blank Expressed as Percentage of Average Test Value	1.51	0.21	1.15	2.24
Field Blank Expressed as Percentage of Minimum Test Value	2.18	0.33	1.62	10.97

The desired minimum weight gain was 2-5 mg ± 0.05 mg per stage. Thus, a significant weight gain or loss would be 0.2 mg (0.0002 g) ± 0.05 mg. The actual minimum weight gain per stage was less than one milligram.

Substrate interaction impactor runs were performed at both the inlet and outlet locations. The run was performed identically to a standard run except that the nozzle of the train was oriented opposite of the flue gas flow direction and a regular filter (back-up filter) replaced the substrate on the zero stage. The weight gains for the blank interaction runs are presented in Table 5-9.

The average net gain was -0.00017 grams for the inlet blank and 0.0166 grams for the outlet blank. The inlet blank is below the weight gain criteria, indicating that there was no consistent positive or negative bias. Thus, the variability of the net weights is due to the imprecision of weighing and substrate handling. However, the outlet blank gain is greater than the QA criteria. For stages 1-8, since the net gain is distributed equally between negative and positive, the data indicate no bias but a large variability. The net gain in stage 9 is significantly positive, possibly due to a wet substrate. However, since the outlet PSD data correlate well, this variability may actually be specific to the blank sample. Thus, the outlet data are considered valid and the PSD data was not adjusted for flue gas interaction.

5.4 DUPLICATE ANALYSES BY AN INDEPENDENT LABORATORY

Extracts prepared by EERF for four samples were split into two aliquots and sent to TMA Norcal Laboratories for additional independent analyses. The samples were analyzed for polonium-210 only by TMA Norcal Laboratories. The results are presented in Table 5-10. The difference between the duplicate analyses ranged between 5 to 19 percent, indicating good agreement between the analyses performed by the two laboratories.

TABLE 5-9. FLUE GAS INTERACTION SAMPLE WEIGHT GAINS, FMC-POCATELLO, IDAHO (August 1988)

Filter Number	Sample Weight[a] (g)	Tare Weight[a] (g)	Net Gain[b] (g)
Inlet - Blank			
FN-1	0.78739	0.78734	0.00005
FN-2	1.39368	1.39371	-0.00003
FN-3	0.83817	0.83828	-0.00011
FN-4	0.76119	0.76149	-0.00030
FN-5	0.78778	0.78803	-0.00025
FN-6	0.78148	0.78173	-0.00025
FN-7	0.78194	0.78223	-0.00029
FN-8	0.75912	0.75945	-0.00033
FN-9	0.88943	0.88942	0.00001
Average (stages 1-9)			-0.00017
Outlet - Blank			
FM-1	0.77642	0.76212	0.01430
FM-2	0.76213	0.84924	-0.08711
FM-3	0.84928	0.76580	0.08348
FM-4	0.76589	0.78703	-0.02114
FM-5	0.78708	0.77100	0.01608
FM-6	0.77119	0.78960	-0.01841
FM-7	0.78975	0.76203	0.02772
FM-8	0.76197	0.89399	-0.13202
FM-9	0.89464	0.62824	0.26640
Average (stages 1-9)			-0.0166

[a]Weighed to a constant weight (± 0.00005 g).

[b]Net gain should be less than 0.0002 + 0.00005 g to meet the QA criteria.

TABLE 5-10. DUPLICATE ANALYSES FOR POLONIUM-210 PERFORMED BY AN INDEPENDENT LABORATORY

EERF No.	Run No.	pico Curies per sample: Analysis 1 (by EERF)	Analysis 2[a] (by TMA Norcal)	Difference[b] (%)
88.5659	OTA-2-FH	375	425	12.5
88.5661	OTB-3-FH	652	689	5.5
88.5663	OTC-3-FH	533	505	5.4
88.5665	OTD-3-FH	810	977	18.7

[a]Norcal Po-210 results at analysis (10/4/88) were decayed to collection date (8/17/88) for comparison with EERF data using this equation.

$$ACT_{Po@c} = ACT_{Po@a} \cdot e^{\lambda_{Po} T} - \left(ACT_{Pb@a} \cdot \frac{\lambda_{Po}}{\lambda_{Po} - \lambda_{Pb}} \cdot (e^{\lambda_{Po} T} - e^{\lambda_{Pb} T}) \right)$$

where:

$ACT_{Po@c}$ = Activity of Po at collection.

$ACT_{Po@a}$ = Activity of Po at analysis.

λ_{Po} = Radiological decay constant (fraction/day) of Po.

$ACT_{Pb@a}$ = Activity of Pb at analysis.

λ_{Pb} = Radiological decay constant (fraction/day) of Pb.

T = Time between analysis and collection (days). Since no Pb data was associated with the Norcal data, the EERF Pb data was decayed to 10/4/88 using the following equation and entered into the first equation for $ACT_{Pb@a}$.

$$A = A_o e^{-\lambda_{Pb} t}$$

A_o = Activity on EERF analysis date.

t = Days between EERF analysis and 10/4/88.

[b]

$$\text{Difference (\%)} = \frac{\text{First value - second value}}{0.5\ (\text{first + second value})} \times 100$$

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EMB Report No. 88-EPP-02
Volume II
January 1989

Air

EPA

Elemental Phosphorus Production - Calciner Off-Gases

Emission Test Report

FMC
Pocatello, Idaho

DRAFT/WP
d3006-4/971130
03/30/92 1

PROCESS DATA CBI

(11)

Emission Test Report
Review Checklist

Reviewer: R. MARINSHAW
Review Date: 5/5/92

A. Background Information

1. Facility name: FMC

   Location: POCATELLO, IDAHO

2. Source category: PHOSPHATE ROCK PROCESSING

3. Test date: AUGUST 22-27, 1988

4. Test sponsor: EPA : EMB/ISB

5. Testing contractor: RADIAN

6. Purpose of test: OBTAIN RADIONUCLIDE EMISSION DATA FOR PHOSPHATE ROCK RADIONUCLIDE NESHAP

7. Pollutants measured

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

   Others (list): PARTICLE SIZE DISTRIBUTION, POLONIUM-210, LEAD-210

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	

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.)

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

Basis for data: _____
(Indicate page/table Nos. in test report)

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

Process ID	Capacity	Units	Test run	Process rate	Units
			1		
			2		
			3		
			4		
			1		
			2		
			3		
			4		
			1		
			2		
			3		
			4		
			1		
			2		
			3		
			4		

Basis for data: _____

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.

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:						
Type of APCD:						
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
			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
			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
			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.

3. Describe any deviations identified above.

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
	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:					
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
	Pollutant concentration:					

2. Tabulate pollutant mass flux rates

Test ID	Pollutant	Units	Mass flux rates			
			Run 1	Run 2	Run 3	Run 4

3. Present example emission factor calculations below.

4. Tabulate emission factors

Process	Pollutant	Units	Average emission factor	
			Uncontrolled	Controlled

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

DCN 89-222-124-26-02
Radian No. 222-124-26

EMISSION TEST REPORT
FMC ELEMENTAL PHOSPHORUS PLANT
POCATELLO, IDAHO

VOLUME II: APPENDICES A-M

EPA Contract No. 68-02-4338
Work Assignment No. 20

Prepared for:

Robert T. Harrison, Task Manager
Emissions Measurement Branch
Technical Support Division
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

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Radian Corporation
Post Office Box 13000
Research Triangle Park, North Carolina 27709

January 1989

JES/055

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APPENDIX A - EPA METHOD 111 PROTOCOL

(c) "Electric furnace" means a unit in which the phosphate rock is heated with silica and coke to reduce the phosphate to elemental phosphorus.

(d) "Curie" is a unit of radioactivity equal to 37 billion nuclear transformations (decays) per second.

§ 61.152 Standard.

Emissions of polonium-210 to air from sources subject to this subpart shall not exceed 1 curie in a calendar year.

§ 61.153 Emission tests.

(a) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator required to comply with § 61.152 shall test emissions from his source within the following time limits:

(1) Within 90 days of the effective date of this rule in the case of an existing source or a new source that has an initial startup date preceding the effective date of this rule; or

(2) Within 90 days of startup in the case of a new source that did not have an initial startup date preceding the effective date of this rule.

(b) The Administrator shall be notified at least 30 days prior to an emission test so that EPA may, at its option, observe the test.

(c) Each emission test shall consist of three runs. The phosphate rock processing rate during each test shall be recorded. The average of all three runs shall apply in computing the emission rate. For determining compliance with the emission standard of § 61.152, the annual polonium-210 emissions shall be determined by multiplying the polonium-210 emission rate in curies per metric ton of phosphate rock processed by the annual phosphate rock processing rate in metric tons. In determining the annual phosphate rock processing rate, the values used for operating hours and operating capacity shall be values that will maximize the expected production rate. If the owner or operator of a source subject to this subpart changes his operation in a way that could change his emissions of polonium-210, he may determine his compliance with the requirements of this subpart on the basis of calculations using data from previous emission tests.

(d) All samples shall be analyzed, and polonium-210 emissions shall be determined within 30 days after the source test. All determinations shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(e) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Administrator for a minimum of 2 years.

§ 61.154 Test methods and procedures.

(a) Each owner or operator of a source required to test emissions under § 61.153, unless an eqivalent or alternate method has been approved by the Administrator, shall use the following test methods:

1. Test Method 1 of Appendix A to Part 60 shall be used to determine sample and velocity traverses;

2. Test Method 2 of Appendix A to Part 60 shall be used to determine velocity and volumetric flow rate;

3. Test Method 5 of Appendix A to Part 60 shall be used to collect particulate matter containing the polonium-210;

4. Test Method 111 of Appendix B to this part shall be used to determine the polonium-210 emissions.

§ 61.155 Monitoring of operations.

(a) The owner or operator of any source subject to this subpart using a wet scrubbing emission control device shall install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ± 250 pascals (± 1 inch of water). Records of these measurements shall be maintained at the source and made available for inspection by the Administrator for a minimum of two years.

(b) For the purpose of conducting an emission test under § 61.153, the owner or operator of any source subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device for measuring the phosphate rock feed to any affected nodulizing kiln. The measuring device used must be accurate to within ± 5 percent of the mass rate over its operating range.

Appendix B—[Amended]

6. By adding the following test method of Appendix B:

Method 111—Determination of Polonium-210 Emissions From Stationary Sources

Performance of this method should not be attempted by persons unfamiliar with the use of equipment for measuring radioactive disintegration rates.

1.0 Applicability and Principle

1.1 *Applicability.* This method is applicable to the determination of polonium-210 emissions in particulate samples collected in stack gases.

1.2 *Principle.* A particulate sample is collected from stack gases as described in Method 5 of Appendix A to 40 CFR Part 60. The polonium-210 in the sample is put in solution, deposited on a metal disc and the radioactive disintegration rate measured. Polonium in acid solution spontaneously deposits on surfaces of metals which are more electropositive than polonium. This principle is routinely used in the radiochemical analyses of polonium-210 (reference 1).

2.0 Apparatus

2.1 Alpha-counter photomultiplier tube, (5 cm), with associated electronics to record pulses.

2.2 Constant temperature bath at 85°C.

2.3 Polished nickel discs, 3.8 cm diameter, 0.6 mm thick.

2.4 Silver activated zinc sulfide screen.

2.5 Beakers, 400 ml, 150 ml.

2.6 Hot plate, electric.

2.7 Fume hood.

2.8 Teflon beakers, 150 ml.

Teflon is a registered trademark of DuPont Co.

3.0 Reagents

3.1 *Analysis.*

3.1.1 Ascorbic acid, reagent grade.

3.1.2 Distilled water.

3.1.3 Hydrochloric acid 12*M*, concentrated reagent grade.

3.1.4 Hydrofluoric acid 28*M*, reagent grade.

3.1.5 Nitric acid 16*M*, concentrated reagent grade.

3.1.6 Perchloric acid 12*M*, 72 percent reagent grade.

3.1.7 Sodium hydroxide 18*M*. Dissolve 720 g of sodium hydroxide pellets in distilled water and dilute to 1 liter.

3.1.8 Trichloroethylene.

3.2 *Standard solution.* Prepare calibrated solution of polonium-210 from supplier of this radionuclide. Known aliquots are to be used to establish efficiency of deposition.

4.0 Procedure

4.1 *Sample Preparation.*

4.1.1 Place filter collected by EPA Method 5 Part 60 in Teflon beaker, add 30 ml hydrofluoric acid and evaporate to dryness on hot plate in hood.

4.1.2 Repeat step 4.1.1 until glass fiber filter has been digested.

4.1.3 Add 100 ml 16*M* nitric acid to residue in Teflon beaker and evaporate to dryness. Do not overheat.

4.1.4 Add 50 ml 16*M* nitric acid to residue from step 4.1.3 and heat to 80°C.

4.1.5 Decant acid solution into glass beaker and add 10 ml 12*M* perchloric acid.

4.1.6 Heat acid mixture to perchloric acid fumes.

4.1.7 Adjust volume to 60 ml with distilled water and neutralize with 18*M* sodium hydroxide.

4.1.8 Dilute to 100 ml with distilled water and adjust solution to 0.5*M* in HCl by adding 4 ml 12*M* hydrochloric acid.

4.2 *Sample Analysis.* Analyze the solution for polonium-210 using any published method which involves the spontaneous electrodeposition of polonium-210, including the method described below:

4.2.1 Add 200 ml of ascorbic acid and heat solution to 85°C in constant temperature bath.

4.2.2 Melt a thin coating of polyethylene on the unpolished side of disc to prevent deposition. Adhesion of the polyethylene to the disc is enhanced by sanding the nickel surface with garnet paper.

4.2.3 Clean polished side with trichloroethylene, hydrochloric acid, and distilled water.

4.2.4 Suspended nickel disc in the solution using glass or plastic hook.

4.2.5 Maintain disc in solution for 3 hours while stirring the solution.

4.2.6 Remove nickel disc, rinse with distilled water and dry at room temperature.

4.3 Measurement of Polonium-210.

4.3.1 Position deposition side of nickel disc adjacent to zinc sulfide screen on photomultiplier tube and count pulses.

4.3.2 Establish background count rate by measuring counts over clean nickel discs.

4.3.3 Determine procedure efficiency by adding calibrated aliquots of polonium-210 to acid solution with clean filter and following procedure through radioassay step.

4.3.4 Determine counter efficiency by carefully evaporating known aliquots of polonium-210 on nickel disc and measuring count rate, comparing count rate to known disintegration rate as fraction.

5.0 Calculations

5.1 Calculate the curies of polonium-210 in the sample using the following equation:

$$A = \frac{C_T - C_B}{2.22 \times 10^{-12} (E_C)(E_P)(T)(D)}$$

A = Curies of polonium-210 in sample.
C_T = total sample counts for counting period.
C_B = background counts for counting period.
E_P = procedure efficiency.
E_C = counting efficiency.
T = counting time in minutes.
D = decay correction.

5.1.1 Decay Correction

$$\text{Decay correction (D)} = e^{-\frac{0.693(T)}{t_{1/2}}}$$

T = time in days from midpoint of collection time to the counting time.
$t_{1/2}$ = radiological half life of polonium-210, 138.4 days.

5.2 Procedure for Calculating Emissions.

Calculate the polonium-210 emission per metric ton of rock processed using the following equation:

$$E = \frac{AQ_s}{V_t M}$$

E = Curies of polonium-210 per metric ton of rock processed.
A = Curies of polonium-210 in sample from 5.1.
Q_s = Volumetric flow rate of effluent stream in m^3/h.
V_t = Total volume of air sampled in m^3.
M = Rock processing rate during sampling in metric tons/hr.

6.0 References

1. Blanchard, Richard L., Rapid Determination of Lead-210 and Polonium-210 in Environmental Samples by Deposition on Nickel, Anal. Chem., *38*, 189 (1966).

[FR Doc. [illegible] Filed 4-[illegible] [illegible] am]
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APPENDIX B - EERF RADIOCHEMICAL ANALYSIS PROCEDURES

"Radiochemical Determination of Lead-210 and Polonium-210
in Dry Inorganic and Biological Samples"
EPA 520/5-84-006, EERF Radiochemistry Procedures Manual
Modified for Phosphate Samples

1.0 Principle

Polonium-209 and bismuth-207 tracers are added to a sample in a teflon beaker, the sample is then solubilized by wet ashing. The radioelements are coprecipitated with ammonium hydroxide. The hydroxide is redissolved in an acid solution and the polonium and bismuth are deposited on a metal disc. Polonium and bismuth in acid solution spontaneously deposit on surfaces of metals that are more electropositive. This method is applicable to the determination of polonium-210 and lead-210 in particulate and liquid samples.

2.0 Apparatus

2.1 Alpha spectrometry system consisting of a multichannel analyzer, biasing electronics, silicon surface barrier detector, vacuum pump and chamber.
2.2 Constant temperature bath at 80°C.
2.3 Polished nickel discs, 2.2 cm diameter with a small hole near the edge.
2.4 Glass beakers, 400 ml, 150 ml.
2.5 Hot plate, electric.
2.6 Fume hood.
2.7 Teflon beakers, 150 ml.
2.8 Magnetic stirrer.
2.9 Stirring bar.
2.10 Plastic or glass hooks to suspend plating discs.
2.11 Internal proportional counter for measuring alpha particles.
2.12 Internal proportional counter for measuring beta particles.
2.13 Gamma detectors.

2.14 Nucleopore filter membranes, 25 mm diameter, 0.2 micrometer pore size or equivalent.

2.15 Planchets, stainless steel, 32 mm diameter with 1.5 mm lip.

2.16 Transparent plastic tape, 2.5 cm wide with adhesive on both sides.

2.17 Epoxy spray enamel.

2.18 Suction filter apparatus for 25 mm diameter filter.

2.19 Wash bottles, 250 ml capacity.

2.20 Plastic graduated cylinder, 25 ml capacity.

2.21 250 ml glass centrifuge bottles.

2.22 Volumetric flasks.

3.0 Reagents

3.1 Ascorbic acid, Reagent grade.

3.2 Ammonium hydroxide (NH_4OH) 15 M, Reagent grade.

3.3 Distilled water.

3.4 Ethanol (C_2H_5OH), 95 percent, Reagent grade.

3.5 Hydrochloric acid (HCl), 12 M, Reagent grade.

3.6 Hydrochloric acid - 3 M, dilute 250 ml of the 12 M Reagent grade HCl to 1 liter with distilled water.

3.7 Hydrochloric acid, 1 M, dilute 83 ml of the 12 M Reagent grade HCl to 1 liter with distilled water.

3.8 Hydrofluoric acid (HF), 29 M, Reagent grade.

3.9 Lanthanum carrier, 10 mg La^{+3}/ml. Dissolve 7.8 g high purity $La(NO_3)_3 \cdot 6\ H_2O$ in 250 ml of distilled water.

3.10 Lanthanum carrier, 0.1 mg La^{+3}/ml. Dissolve 0.078 gram Reagent grade lanthanum nitrate, $La(NO_3)_3 \cdot 6\ H_2O$ in 250 ml of 1 M HCl.

3.11 Nitric acid (HNO_3), 16 M, Reagent grade.

3.12 Perchloric acid ($HClO_4$), 12 M, Reagent grade.

3.13 Polonium-209 solution.

3.14 Bismuth-207 solution.

3.15 Sandpaper.

3.16 Degreaser.

4.0 Procedure

4.1 Sample preparation.

4.1.1 Place sample in Teflon beaker. Add a measured aliquot of Bi-207 and Po-209 tracers. For filter samples, add 30 ml of 29 M hydrofluoric acid. For liquid samples, add nitric acid. Evaporate to near dryness on hot plate in a properly operating fume hood. Caution: Do not allow residue to go to dryness and overheat. This will result in a loss of polonium.

4.1.2 Repeat the procedure described in Section 4.1.1 until the glass fiber filter is dissolved.

4.1.3 Add 100 ml of 16 M nitric acid to residue in Teflon beaker and evaporate to near dryness. Caution: Do not allow residue to go to dryness and overheat.

4.1.4 Add 50 ml of 16 M nitric acid to residue. Add 10 ml of 12 M perchloric acid. Heat mixture until dense perchloric acid fumes are evolved.

4.1.5 Add 10 ml 12 M HCl and evaporate to near dryness. Repeat the HCl addition several times.

4.1.6 Dilute the sample with 3 M HCl in a volumetric flask.

4.2 Sample Screening.

The samples are checked for radioactivity levels to avoid contamination of the alpha spectrometry system. Use the following screening method:

4.2.1 Add 20 ml of 1 M HCl to a 150 ml beaker.

4.2.2 Add 1 ml of the lanthanum carrier solution, 0.1 mg lanthanum per ml.

4.2.3 Add a 1 ml aliquot of solution from Section 4.1.6 to the beaker.

4.2.4 Add 3 ml of 15 M ammonium hydroxide.

4.2.5 Allow the solution from Section 4.2.4 to stand for a minimum of 30 minutes.

4.2.6 Filter the solution through a filter membrane using suction.

4.2.7 Wash the membrane with 10 ml of distilled water and 5 ml of ethanol.

4.2.8 Air dry the membrane and mount, filtration side up, on a planchet lined with double-side plastic tape. After 24 hours count the membrane for 5 minutes using an internal proportional alpha counter.

4.2.9 Determine the aliquot volume of solution from Section 4.1.6 to be analyzed for polonium-210 and lead-210. The aliquot used should contain approximately 50 picocuries.

$$P = \frac{C_S - C_B}{2.22 \; E_I \; A_L \; T}$$

where:

P= activity per milliliter of the original solution in pCi.

C_S= total counts of screening sample.

C_B= total counts of instrument background.

E_I= counting efficiency, counts per minute per disintegration per minute.

2.22= disintegrations per minute per picocurie.

A_L= aliquot used in Section 4.2.3 in ml if different from 1 ml.

T= counting time in minutes for sample and background (which must be equal).

4.3 Preparation of Nickel Discs for Spontaneous Deposition

4.3.1 Clean both sides of disc with a mild abrasive cleanser. Sand disc to prepare for painting.

4.3.2 Clean both sides of disc with degreaser.

4.3.3 Place disc on absorbent paper and spray one side with epoxy spray enamel.

4.3.4 Allow paint to dry for 24 hours before using disc for deposition.

4.4 Sample Analysis

4.4.1 Add the aliquot of solution from Section 4.1.6 to be analyzed as determined in Section 4.2.9 to a 250 ml centrifuge bottle. Note, aliquot volume may require a larger container.

4.4.2 If a small aliquot of the original volume was taken for analysis, additional Po-209 and Bi-207 tracers must be added at this time to determine plating yield.

4.4.3 If necessary, bring the volume to 100 ml with 3 M HCl. If the aliquot volume exceeds 100 ml, use total aliquot.

4.4.4 Add 1 ml of lanthanum carrier, 10 mg lanthanum per ml.

4.4.5 Make sample basic to pH 9 by the addition of 15 M NH_4OH with stirring. Check the pH of the solution with indicator paper.

4.4.6 Allow sample to stand for a minimum of 30 minutes.

4.4.7 Centrifuge the sample for 30 minutes at 2000 rpm. Discard supernate.

4.4.8 Add 100 ml distilled water to the centrifuge bottle. Break up the precipitate with a stirring rod.

4.4.9 Centrifuge the sample for 10 minutes at 2000 rpm. Discard supernate.

4.4.10 Dissolve precipitate in 3 ml 12 M HCl.

4.4.11 Add 200 mg of ascorbic acid, with stirring.

4.4.12 Add 100 ml distilled water and heat solution to 80°C in a constant temperature bath. Stirring of the solution must be maintained while the solution is in the constant temperature bath for plating.

4.4.13 Suspend a nickel disc in the heated solution using a glass or plastic rod with a hook inserted through the hole in the disc. The disc should be totally immersed in the solution at all times.

4.4.14 Maintain the disc in solution for 4 hours while stirring. Wash down the sides of the centrifuge bottle with distilled water after 2 hours.

4.4.15 Remove the nickel disc, rinse with distilled water and allow to air dry at room temperature.

4.4.16 Mount the nickel disc with deposition side (unpainted side) up on planchet with double stick tape for radioassay.

4.5 Measurement of Polonium-210

4.5.1 Place the planchet with disc in the beta proportional counter. Cover the planchet with an absorber to eliminate counting the alpha particles. Beta count for 1000 minutes. Bismuth-210 has a 5 day half life; therefore, the beta count should be the first count.

4.5.2 Count the disc in the alpha spectrometry system for 1000 minutes.

4.5.3 Count the disc on the gamma detector for 1000 minutes.

Polonium Calculation

Calculate the chemical yield of Po.

$$Y_{Po} = \frac{T_{Po} \cdot L_s}{S_{Po} \cdot L_T}$$

T_{Po} = Net counts of Po-209 tracer

L_s = Length of Po-209 standard count

S_{Po} = Net counts of Po-209 standard

L_T = Length of Po-209 tracer count

Calculate the activity of Po-210 at time of counting.

$$ACT_{Po(1)} = \frac{C}{(2.22)\ (Y_{Po})\ (L_c)\ (E_A)\ (A)}$$

C = Net counts in Po-210 energy region

Y_{Po} = Calculated Po yield

L_c = Length of count

E_A = Alpha spec efficiency

A = Sample size for analysis

Subtract the Po-210 contributed from the decay of plated Bi-210 between time of plating and counting.

$$ACT_{Po(2)} = ACT_{Po(1)} - ACT_{Bi(1)} \quad \frac{\lambda_{Po}}{\lambda_{Po} - \lambda_{Bi}} \cdot \left(e^{-\lambda_{Bi} t} - e^{-\lambda_{Po} t}\right)$$

t = Time in minutes between mid-plating and mid-alpha spec count (minutes)

$ACT_{Bi(1)}$ = Calculated activity of Bi-210 at ~~counting~~ analysis

Decay the Po-210 to time of analysis.

$$ACT_{Po(3)} = \frac{ACT_{Po(2)}}{e^{-\lambda_{Po} t}}$$

This program added later λ in days T in days

Decay the Po-210 results to collection date.

$$ACT_{Po(4)} = ACT_{Po(3)} \cdot e^{\lambda_{Po} T} - \left(ACT_{Pb} \cdot \frac{\lambda_{Po}}{\lambda_{Po} - \lambda_{Pb}} \times e^{\lambda_{Po} T} - e^{\lambda_{Pb} T} \right)$$

T = Time between collection and analysis. (days)

ACT_{Pb} = activity of Pb at analysis

λ = radiological decay constant per unit time,

Lead Calculation

Calculate the chemical yield of bismuth.

$$Y_{Bi} = \frac{T_{Bi} \cdot L_s}{S_{Bi} \cdot L_T}$$

T_{Bi} = Net gamma counts of Bi-207 tracer

L_s = Length of Bi-207 standard count

S_{Bi} = Net gamma counts of Bi-207 standard

L_T = Length of Bi-207 tracer count

Calculate the activity of Bi-210 at time of analysis.

$$ACT_{Bi(1)} = \frac{\frac{B}{L_B} - \left(B_c \cdot Y_{Bi}\right)}{(Y_{Bi})\ (E_B)\ (2.22)\ (A)\ (e^{-\lambda_{Bi} t})}$$

B = Net beta counts for Bi

L_B = Length of beta count

B_c = Beta contribution from Bi-207 tracer (cpm)

E_B = Beta counting efficiency

t = Time between mid plating and mid beta count (minutes)

A = Sample size for analysis

At time of analysis, the Pb-210 is in equilibrium with the Bi-210.

Decay the Pb-210 results to collection date.

$$ACT_{Pb(2)} = ACT_{Pb(1)} \cdot e^{\lambda_{Pb} T}$$

T = Time between collection and analysis

APPENDIX C - METHOD 111 SAMPLING PARAMETER SUMMARIES

C.1 - Test Run No. 1, 8/24/88
C.2 - Test Run No. 2, 8/24/88
C.3 - Test Run No. 3, 8/25/88
C.4 - Test Run No. 4, 8/25/88
C.5 - Test Runs No. 5, 6, and 7, Outlets A and B, only

APPENDIX C.1 - Test Run No. 1, 8/24/88

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: INLET	
RUN NUMBER: 1.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	98.00
Corrected Barometric Pressure (in. Hg)	25.65
Absolute Stack Pressure,Ps(in. Hg)	25.43
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	465.94
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	43.04
Average Meter Pressure (in.H2O)	0.55
Average Meter Temperature (F)	101.94
Moisture Collected (g)	87.70
Carbon Dioxide Concentration (%V)	7.50
Oxygen Concentration (%V)	16.05
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Particulate Catch	0.8658
Average Sampling Rate (dscfm)	0.35
Standard Metered Volume,Vm(std) (dscf)	34.71
Standard Metered Volume,Vm(std) (dscm)	0.983
Standard Volume Water Vapor,Vw (scf)	4.14
Standard Volume Water Vapor,Vw (scm)	0.117
Stack Moisture (%V)	10.64
Mole Fraction Dry Stack Gas	0.894
Dry Molecular Weight	29.84
Wet Molecular Weight	28.58
Stack Gas Velocity,Vs (fpm)	2258.81
Stack Gas Velocity,Vs (mpm)	688.49
Volumetric Flow Rate (acfm)	323010.17
Volumetric Flow Rate (acmm)	9147.648
Volumetric Flow Rate (dscfm)	139788.14
Volumetric Flow Rate (dscmm)	3958.800
Percent Isokinetic	119.23
Percent Excess Air	386.93
Fuel Factor,Fo	0.647
Ultimate CO2	32.32
Concentration of Particulate (grains/acf)	4.22E-07
Concentration of Particulate (g/acm)	9.66E-07
Concentration of Particulate (grains/dscf)	0.38493
Concentration of Particulate (g/dscm)	0.88078

FACILITY : FMC - POCATELLO

DATE:	8/24/88
LOCATION:	OUTLET A
RUN NUMBER:	1.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.61
Absolute Stack Pressure,Ps(in. Hg)	25.59
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	131.50
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	42.54
Average Meter Pressure (in.H2O)	1.40
Average Meter Temperature (F)	87.30
Moisture Collected (g)	156.20
Carbon Dioxide Concentration (%V)	7.30
Oxygen Concentration (%V)	16.25
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.0900
Average Sampling Rate (dscfm)	0.58
Standard Metered Volume,Vm(std) (dscf)	35.06
Standard Metered Volume,Vm(std) (dscm)	0.993
Standard Volume Water Vapor,Vw (scf)	7.36
Standard Volume Water Vapor,Vw (scm)	0.209
Stack Moisture (%V)	17.36
Mole Fraction Dry Stack Gas	0.826
Dry Molecular Weight	29.82
Wet Molecular Weight	27.77
Stack Gas Velocity,Vs (fpm)	2753.01
Stack Gas Velocity,Vs (mpm)	839.12
Volumetric Flow Rate (acfm)	87873.61
Volumetric Flow Rate (acmm)	2488.581
Volumetric Flow Rate (dscfm)	55400.69
Volumetric Flow Rate (dscmm)	1568.947
Percent Isokinetic	97.93
Percent Excess Air	411.59
Fuel Factor,Fo	0.637
Ultimate CO2	32.81
Concentration of Particulate (grains/acf)	2.63E-07
Concentration of Particulate (g/acm)	6.03E-07
Concentration of Particulate (grains/dscf)	0.03961
Concentration of Particulate (g/dscm)	0.09063

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: OUTLET B	
RUN NUMBER: 1.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.61
Absolute Stack Pressure,Ps(in. Hg)	25.59
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	140.50
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	50.26
Average Meter Pressure (in.H2O)	2.17
Average Meter Temperature (F)	102.37
Moisture Collected (g)	199.20
Carbon Dioxide Concentration (%V)	7.60
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.30
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1026
Average Sampling Rate (dscfm)	0.68
Standard Metered Volume,Vm(std) (dscf)	40.78
Standard Metered Volume,Vm(std) (dscm)	1.155
Standard Volume Water Vapor,Vw (scf)	9.39
Standard Volume Water Vapor,Vw (scm)	0.266
Stack Moisture (%V)	18.72
Mole Fraction Dry Stack Gas	0.813
Dry Molecular Weight	29.86
Wet Molecular Weight	27.64
Stack Gas Velocity,Vs (fps)	3491.45
Stack Gas Velocity,Vs (mps)	1064.19
Volumetric Flow Rate (acfm)	111443.77
Volumetric Flow Rate (acmm)	3156.088
Volumetric Flow Rate (dscfm)	68067.35
Volumetric Flow Rate (dscmm)	1927.667
Percent Isokinetic	92.71
Percent Excess Air	396.70
Fuel Factor,Fo	0.632
Ultimate CO2	33.09
Concentration of Particulate (grains/acf)	2.37E-07
Concentration of Particulate (g/acm)	5.42E-07
Concentration of Particulate (grains/dscf)	0.03883
Concentration of Particulate (g/dscm)	0.08884

APPENDIX C.2 - Test Run No. 2, 8/24/88

FACILITY : FMC - POCATELLO

DATE:	8/24/88
LOCATION:	INLET
RUN NUMBER:	2.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	98.00
Corrected Barometric Pressure (in. Hg)	25.37
Absolute Stack Pressure,Ps(in. Hg)	25.35
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	466.29
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	45.02
Average Meter Pressure (in.H2O)	0.62
Average Meter Temperature (F)	109.26
Moisture Collected (g)	71.80
Carbon Dioxide Concentration (%V)	7.10
Oxygen Concentration (%V)	16.35
Nitrogen Concentration (%V)	76.55
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Particulate Catch	1.1539
Average Sampling Rate (dscfm)	0.36
Standard Metered Volume,Vm(std) (dscf)	35.73
Standard Metered Volume,Vm(std) (dscm)	1.012
Standard Volume Water Vapor,Vw (scf)	3.39
Standard Volume Water Vapor,Vw (scm)	0.096
Stack Moisture (%V)	8.65
Mole Fraction Dry Stack Gas	0.913
Dry Molecular Weight	29.79
Wet Molecular Weight	28.77
Stack Gas Velocity,Vs (fpm)	2291.41
Stack Gas Velocity,Vs (mpm)	698.42
Volumetric Flow Rate (acfm)	327672.06
Volumetric Flow Rate (acmm)	9279.673
Volumetric Flow Rate (dscfm)	144455.63
Volumetric Flow Rate (dscmm)	4090.984
Percent Isokinetic	118.78
Percent Excess Air	421.99
Fuel Factor,Fo	0.641
Ultimate CO2	32.61
Concentration of Particulate (grains/acf)	5.55E-07
Concentration of Particulate (g/acm)	1.27E-06
Concentration of Particulate (grains/dscf)	0.49834
Concentration of Particulate (g/dscm)	1.14029

FACILITY : FMC - POCATELLO

DATE:	8/24/88
LOCATION:	OUTLET A
RUN NUMBER:	2.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.60
Absolute Stack Pressure,Ps(in. Hg)	25.58
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	133.08
Stack Area (sq.in.)	4596.33
Metered Volume,Vm (cu.ft.)	43.39
Average Meter Pressure (in.H2O)	1.47
Average Meter Temperature (F)	102.28
Moisture Collected (g)	148.40
Carbon Dioxide Concentration (%V)	6.60
Oxygen Concentration (%V)	16.70
Nitrogen Concentration (%V)	76.70
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch -	0.1013
Average Sampling Rate (dscfm)	0.58
Standard Metered Volume,Vm(std) (dscf)	34.81
Standard Metered Volume,Vm(std) (dscm)	0.986
Standard Volume Water Vapor,Vw (scf)	7.00
Standard Volume Water Vapor,Vw (scm)	0.198
Stack Moisture (%V)	16.74
Mole Fraction Dry Stack Gas	0.833
Dry Molecular Weight	29.72
Wet Molecular Weight	27.76
Stack Gas Velocity,Vs (fpm)	2820.85
Stack Gas Velocity,Vs (mpm)	859.80
Volumetric Flow Rate (acfm)	90038.91
Volumetric Flow Rate (acmm)	2549.902
Volumetric Flow Rate (dscfm)	57018.56
Volumetric Flow Rate (dscmm)	1614.766
Percent Isokinetic	94.46
Percent Excess Air	468.56
Fuel Factor,Fo	0.636
Ultimate CO2	32.84
Concentration of Particulate (grains/acf)	2.89E-07
Concentration of Particulate (g/acm)	6.62E-07
Concentration of Particulate (grains/dscf)	0.04491
Concentration of Particulate (g/dscm)	0.10276

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: OUTLET B	
RUN NUMBER: 2.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.61
Absolute Stack Pressure,Ps(in. Hg)	25.59
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	136.17
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	52.01
Average Meter Pressure (in.H2O)	2.18
Average Meter Temperature (F)	103.50
Moisture Collected (g)	187.30
Carbon Dioxide Concentration (%V)	5.95
Oxygen Concentration (%V)	17.15
Nitrogen Concentration (%V)	76.90
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0:1272
Average Sampling Rate (dscfm)	0.70
Standard Metered Volume,Vm(std) (dscf)	42.12
Standard Metered Volume,Vm(std) (dscm)	1.193
Standard Volume Water Vapor,Vw (scf)	8.83
Standard Volume Water Vapor,Vw (scm)	0.250
Stack Moisture (%V)	17.33
Mole Fraction Dry Stack Gas	0.827
Dry Molecular Weight	29.64
Wet Molecular Weight	27.62
Stack Gas Velocity,Vs (fpm)	3486.69
Stack Gas Velocity,Vs (mpm)	1062.74
Volumetric Flow Rate (acfm)	111292.03
Volumetric Flow Rate (acmm)	3151.790
Volumetric Flow Rate (dscfm)	69638.80
Volumetric Flow Rate (dscmm)	1972.171
Percent Isokinetic	93.59
Percent Excess Air	541.53
Fuel Factor,Fo	0.630
Ultimate CO2	33.16
Concentration of Particulate (grains/acf)	2.94E-07
Concentration of Particulate (g/acm)	6.73E-07
Concentration of Particulate (grains/dscf)	0.04660
Concentration of Particulate (g/dscm)	0.10663

APPENDIX C.3 - Test Run No. 3, 8/25/88

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: INLET	
RUN NUMBER: 3.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	98.00
Corrected Barometric Pressure (in. Hg)	25.48
Absolute Stack Pressure,Ps(in. Hg)	25.26
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	474.88
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	36.78
Average Meter Pressure (in.H2O)	0.38
Average Meter Temperature (F)	103.37
Moisture Collected (g)	82.00
Carbon Dioxide Concentration (%V)	7.50
Oxygen Concentration (%V)	16.50
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Particulate Catch	0.8658
Average Sampling Rate (dscfm)	0.30
Standard Metered Volume,Vm(std) (dscf)	29.37
Standard Metered Volume,Vm(std) (dscm)	0.832
Standard Volume Water Vapor,Vw (scf)	3.87
Standard Volume Water Vapor,Vw (scm)	0.109
Stack Moisture (%V)	11.63
Mole Fraction Dry Stack Gas	0.884
Dry Molecular Weight	29.99
Wet Molecular Weight	28.59
Stack Gas Velocity,Vs (fps)	2247.60
Stack Gas Velocity,Vs (mps)	685.07
Volumetric Flow Rate (acfm)	321407.40
Volumetric Flow Rate (acmm)	9102.257
Volumetric Flow Rate (dscfm)	135330.38
Volumetric Flow Rate (dscmm)	3832.556
Percent Isokinetic	104.21
Percent Excess Air	446.18
Fuel Factor,Fo	0.587
Ultimate CO2	35.63
Concentration of Particulate (grains/acf)	4.24E-07
Concentration of Particulate (g/acm)	9.71E-07
Concentration of Particulate (grains/dscf)	0.45492
Concentration of Particulate (g/dscm)	1.04093

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: OUTLET A	
RUN NUMBER: 3.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.36
Absolute Stack Pressure,Ps(in. Hg)	25.54
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	136.67
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	50.47
Average Meter Pressure (in.H2O)	2.12
Average Meter Temperature (F)	102.09
Moisture Collected (g)	209.50
Carbon Dioxide Concentration (%V)	7.05
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.85
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.1152
Average Sampling Rate (dscfm)	0.68
Standard Metered Volume,Vm(std) (dscf)	40.51
Standard Metered Volume,Vm(std) (dscm)	1.147
Standard Volume Water Vapor,Vw (scf)	9.88
Standard Volume Water Vapor,Vw (scm)	0.280
Stack Moisture (%V)	19.60
Mole Fraction Dry Stack Gas	0.804
Dry Molecular Weight	29.77
Wet Molecular Weight	27.46
Stack Gas Velocity,Vs (fpm)	3434.43
Stack Gas Velocity,Vs (mpm)	1046.81
Volumetric Flow Rate (acfm)	109623.85
Volumetric Flow Rate (acmm)	3104.547
Volumetric Flow Rate (dscfm)	66524.03
Volumetric Flow Rate (dscmm)	1883.960
Percent Isokinetic	94.23
Percent Excess Air	382.99
Fuel Factor,Fo	0.681
Ultimate CO2	30.70
Concentration of Particulate (grains/acf)	2.70E-07
Concentration of Particulate (g/acm)	6.18E-07
Concentration of Particulate (grains/dscf)	0.04388
Concentration of Particulate (g/dscm)	0.10041

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: OUTLET B	
RUN NUMBER: 3.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.53
Absolute Stack Pressure,Ps(in. Hg)	25.51
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	140.50
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	51.85
Average Meter Pressure (in.H2O)	2.13
Average Meter Temperature (F)	106.97
Moisture Collected (g)	222.30
Carbon Dioxide Concentration (%V)	8.45
Oxygen Concentration (%V)	15.50
Nitrogen Concentration (%V)	76.05
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1037
Average Sampling Rate (dscfm)	0.69
Standard Metered Volume,Vm(std) (dscf)	41.59
Standard Metered Volume,Vm(std) (dscm)	1.178
Standard Volume Water Vapor,Vw (scf)	10.48
Standard Volume Water Vapor,Vw (scm)	0.297
Stack Moisture (%V)	20.13
Mole Fraction Dry Stack Gas	0.799
Dry Molecular Weight	29.97
Wet Molecular Weight	27.56
Stack Gas Velocity,Vs (fpm)	3420.63
Stack Gas Velocity,Vs (mpm)	1042.61
Volumetric Flow Rate (acfm)	109183.42
Volumetric Flow Rate (acmm)	3092.074
Volumetric Flow Rate (dscfm)	65328.05
Volumetric Flow Rate (dscmm)	1850.091
Percent Isokinetic	99.31
Percent Excess Air	337.51
Fuel Factor,Fo	0.639
Ultimate CO2	32.70
Concentration of Particulate (grains/acf)	2.44E-07
Concentration of Particulate (g/acm)	5.59E-07
Concentration of Particulate (grains/dscf)	0.03848
Concentration of Particulate (g/dscm)	0.08804

APPENDIX C.4 - Test Run No. 4, 8/25/88

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: INLET	
RUN NUMBER: 4.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	98.00
Corrected Barometric Pressure (in. Hg)	25.38
Absolute Stack Pressure,Ps(in. Hg)	25.16
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	445.96
Stack Area (sq.in.)	20392.00
Metered Volume,Vm (cu.ft.)	34.02
Average Meter Pressure (in.H2O)	0.33
Average Meter Temperature (F)	106.17
Moisture Collected (g)	66.62
Carbon Dioxide Concentration (%V)	7.50
Oxygen Concentration (%V)	16.05
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Particulate Catch	0.8638
Average Sampling Rate (dscfm)	0.27
Standard Metered Volume,Vm(std) (dscf)	26.93
Standard Metered Volume,Vm(std) (dscm)	0.763
Standard Volume Water Vapor,Vw (scf)	3.14
Standard Volume Water Vapor,Vw (scm)	0.089
Stack Moisture (%V)	10.45
Mole Fraction Dry Stack Gas	0.896
Dry Molecular Weight	29.84
Wet Molecular Weight	28.60
Stack Gas Velocity,Vs (fps)	2076.65
Stack Gas Velocity,Vs (mps)	632.96
Volumetric Flow Rate (acfm)	296960.62
Volumetric Flow Rate (acmm)	8409.925
Volumetric Flow Rate (dscfm)	130245.75
Volumetric Flow Rate (dscmm)	3688.560
Percent Isokinetic	99.28
Percent Excess Air	386.93
Fuel Factor,Fo	0.647
Ultimate CO2	32.32
Concentration of Particulate (grains/acf)	4.59E-07
Concentration of Particulate (g/acm)	1.05E-06
Concentration of Particulate (grains/dscf)	0.49616
Concentration of Particulate (g/dscm)	1.13530

FACILITY : FMC - POCATELLO

DATE: 8-25-89	
LOCATION: OUTLET A	
RUN NUMBER: 4.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	133.50
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	50.63
Average Meter Pressure (in.H2O)	2.07
Average Meter Temperature (F)	100.63
Moisture Collected (g)	187.80
Carbon Dioxide Concentration (%V)	6.35
Oxygen Concentration (%V)	17.10
Nitrogen Concentration (%V)	76.55
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.1053
Average Sampling Rate (dscfm)	0.68
Standard Metered Volume,Vm(std) (dscf)	40.50
Standard Metered Volume,Vm(std) (dscm)	1.147
Standard Volume Water Vapor,Vw (scf)	8.85
Standard Volume Water Vapor,Vw (scm)	0.251
Stack Moisture (%V)	17.94
Mole Fraction Dry Stack Gas	0.821
Dry Molecular Weight	29.70
Wet Molecular Weight	27.60
Stack Gas Velocity,Vs (fps)	3373.60
Stack Gas Velocity,Vs (mps)	1028.27
Volumetric Flow Rate (acfm)	107682.03
Volumetric Flow Rate (acmm)	3049.555
Volumetric Flow Rate (dscfm)	66660.72
Volumetric Flow Rate (dscmm)	1887.832
Percent Isokinetic	94.02
Percent Excess Air	547.29
Fuel Factor,Fo	0.598
Ultimate CO2	34.93
Concentration of Particulate (grains/acf)	2.52E-07
Concentration of Particulate (g/acm)	5.75E-07
Concentration of Particulate (grains/dscf)	0.04012
Concentration of Particulate (g/dscm)	0.09180

FACILITY : FMC - POCATELLO

DATE:	8/25/88
LOCATION:	OUTLET B
RUN NUMBER:	4.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	138.00
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	52.66
Average Meter Pressure (in.H2O)	2.15
Average Meter Temperature (F)	106.05
Moisture Collected (g)	198.30
Carbon Dioxide Concentration (%V)	7.30
Oxygen Concentration (%V)	16.80
Nitrogen Concentration (%V)	75.90
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1058
Average Sampling Rate (dscfm)	0.70
Standard Metered Volume,Vm(std) (dscf)	42.12
Standard Metered Volume,Vm(std) (dscm)	1.193
Standard Volume Water Vapor,Vw (scf)	9.35
Standard Volume Water Vapor,Vw (scm)	0.265
Stack Moisture (%V)	18.16
Mole Fraction Dry Stack Gas	0.818
Dry Molecular Weight	29.84
Wet Molecular Weight	27.69
Stack Gas Velocity,Vs (fpm)	3430.19
Stack Gas Velocity,Vs (mpm)	1045.52
Volumetric Flow Rate (acfm)	109488.34
Volumetric Flow Rate (acmm)	3100.710
Volumetric Flow Rate (dscfm)	67084.61
Volumetric Flow Rate (dscmm)	1899.836
Percent Isokinetic	97.94
Percent Excess Air	516.48
Fuel Factor,Fo	0.562
Ultimate CO2	37.21
Concentration of Particulate (grains/acf)	2.49E-07
Concentration of Particulate (g/acm)	5.69E-07
Concentration of Particulate (grains/dscf)	0.03876
Concentration of Particulate (g/dscm)	0.08869

APPENDIX C.5 - Test Runs No. 5, 6, and 7, Outlets A and B, only

FACILITY : FMC - POCATELLO

DATE:	8-26-88
LOCATION:	OUTLET A
RUN NUMBER:	5.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	134.33
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	59.59
Average Meter Pressure (in.H2O)	3.03
Average Meter Temperature (F)	75.46
Moisture Collected (g)	237.80
Carbon Dioxide Concentration (%V)	6.65
Oxygen Concentration (%V)	16.70
Nitrogen Concentration (%V)	76.65
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.1135
Average Sampling Rate (dscfm)	0.83
Standard Metered Volume,Vm(std) (dscf)	50.05
Standard Metered Volume,Vm(std) (dscm)	1.417
Standard Volume Water Vapor,Vw (scf)	11.21
Standard Volume Water Vapor,Vw (scm)	0.318
Stack Moisture (%V)	18.30
Mole Fraction Dry Stack Gas	0.817
Dry Molecular Weight	29.73
Wet Molecular Weight	27.58
Stack Gas Velocity,Vs (fpm)	4118.00
Stack Gas Velocity,Vs (mpm)	1255.16
Volumetric Flow Rate (acfm)	131442.58
Volumetric Flow Rate (acmm)	3722.454
Volumetric Flow Rate (dscfm)	80895.81
Volumetric Flow Rate (dscmm)	2290.969
Percent Isokinetic	95.74
Percent Excess Air	470.30
Fuel Factor,Fo	0.632
Ultimate CO2	33.09
Concentration of Particulate (grains/acf)	2.22E-07
Concentration of Particulate (g/acm)	5.08E-07
Concentration of Particulate (grains/dscf)	0.03499
Concentration of Particulate (g/dscm)	0.08007

FACILITY : FMC - POCATELLO

DATE:	8/26/88
LOCATION:	OUTLET B
RUN NUMBER:	5.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.53
Absolute Stack Pressure,Ps(in. Hg)	25.51
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	137.75
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	59.03
Average Meter Pressure (in.H2O)	2.95
Average Meter Temperature (F)	84.74
Moisture Collected (g)	239.90
Carbon Dioxide Concentration (%V)	6.90
Oxygen Concentration (%V)	16.20
Nitrogen Concentration (%V)	76.90
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1031
Average Sampling Rate (dscfm)	0.82
Standard Metered Volume,Vm(std) (dscf)	49.40
Standard Metered Volume,Vm(std) (dscm)	1.399
Standard Volume Water Vapor,Vw (scf)	11.31
Standard Volume Water Vapor,Vw (scm)	0.320
Stack Moisture (%V)	18.63
Mole Fraction Dry Stack Gas	0.814
Dry Molecular Weight	29.75
Wet Molecular Weight	27.56
Stack Gas Velocity,Vs (fpm)	4007.01
Stack Gas Velocity,Vs (mpm)	1221.34
Volumetric Flow Rate (acfm)	127899.91
Volumetric Flow Rate (acmm)	3622.125
Volumetric Flow Rate (dscfm)	78319.65
Volumetric Flow Rate (dscmm)	2218.012
Percent Isokinetic	98.39
Percent Excess Air	393.49
Fuel Factor,Fo	0.681
Ultimate CO2	30.68
Concentration of Particulate (grains/acf)	2.07E-07
Concentration of Particulate (g/acm)	4.74E-07
Concentration of Particulate (grains/dscf)	0.03220
Concentration of Particulate (g/dscm)	0.07369

FACILITY : FMC - POCATELLO

DATE: 8-26-88	
LOCATION: OUTLET A	
RUN NUMBER: 6.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	136.25
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	60.36
Average Meter Pressure (in.H2O)	2.88
Average Meter Temperature (F)	87.29
Moisture Collected (g)	256.20
Carbon Dioxide Concentration (%V)	6.20
Oxygen Concentration (%V)	16.90
Nitrogen Concentration (%V)	76.90
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.1331
Average Sampling Rate (dscfm)	0.83
Standard Metered Volume,Vm(std) (dscf)	49.58
Standard Metered Volume,Vm(std) (dscm)	1.404
Standard Volume Water Vapor,Vw (scf)	12.08
Standard Volume Water Vapor,Vw (scm)	0.342
Stack Moisture (%V)	19.59
Mole Fraction Dry Stack Gas	0.804
Dry Molecular Weight	29.67
Wet Molecular Weight	27.38
Stack Gas Velocity,Vs (fps)	4047.23
Stack Gas Velocity,Vs (mps)	1233.60
Volumetric Flow Rate (acfm)	129183.82
Volumetric Flow Rate (acmm)	3658.486
Volumetric Flow Rate (dscfm)	77999.66
Volumetric Flow Rate (dscmm)	2208.950
Percent Isokinetic	98.36
Percent Excess Air	494.59
Fuel Factor,Fo	0.645
Ultimate CO2	32.39
Concentration of Particulate (grains/acf)	2.65E-07
Concentration of Particulate (g/acm)	6.06E-07
Concentration of Particulate (grains/dscf)	0.04143
Concentration of Particulate (g/dscm)	0.09480

FACILITY : FMC - POCATELLO

DATE: 8/26/88	
LOCATION: OUTLET B	
RUN NUMBER: 6.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	140.50
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	60.23
Average Meter Pressure (in.H2O)	3.00
Average Meter Temperature (F)	92.88
Moisture Collected (g)	245.18
Carbon Dioxide Concentration (%V)	6.25
Oxygen Concentration (%V)	17.05
Nitrogen Concentration (%V)	76.70
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1093
Average Sampling Rate (dscfm)	0.82
Standard Metered Volume,Vm(std) (dscf)	49.44
Standard Metered Volume,Vm(std) (dscm)	1.400
Standard Volume Water Vapor,Vw (scf)	11.56
Standard Volume Water Vapor,Vw (scm)	0.327
Stack Moisture (%V)	18.95
Mole Fraction Dry Stack Gas	0.810
Dry Molecular Weight	29.68
Wet Molecular Weight	27.47
Stack Gas Velocity,Vs (fpm)	4074.15
Stack Gas Velocity,Vs (mpm)	1241.80
Volumetric Flow Rate (acfm)	130042.93
Volumetric Flow Rate (acmm)	3682.816
Volumetric Flow Rate (dscfm)	78583.64
Volumetric Flow Rate (dscmm)	2225.489
Percent Isokinetic	98.13
Percent Excess Air	530.47
Fuel Factor,Fo	0.616
Ultimate CO2	33.93
Concentration of Particulate (grains/acf)	2.16E-07
Concentration of Particulate (g/acm)	4.95E-07
Concentration of Particulate (grains/dscf)	0.03412
Concentration of Particulate (g/dscm)	0.07806

FACILITY : FMC - POCATELLO

DATE:	8-26-88
LOCATION:	OUTLET A
RUN NUMBER:	7.00

SAMPLING PARAMETER	PARTICULATE/RADIONUCLIDES
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	135.92
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	62.11
Average Meter Pressure (in.H2O)	3.07
Average Meter Temperature (F)	90.46
Moisture Collected (g)	259.40
Carbon Dioxide Concentration (%V)	6.20
Oxygen Concentration (%V)	16.90
Nitrogen Concentration (%V)	76.90
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Particulate Catch	0.1140
Average Sampling Rate (dscfm)	0.85
Standard Metered Volume,Vm(std) (dscf)	50.75
Standard Metered Volume,Vm(std) (dscm)	1.437
Standard Volume Water Vapor,Vw (scf)	12.23
Standard Volume Water Vapor,Vw (scm)	0.346
Stack Moisture (%V)	19.42
Mole Fraction Dry Stack Gas	0.806
Dry Molecular Weight	29.67
Wet Molecular Weight	27.40
Stack Gas Velocity,Vs (fpm)	4195.86
Stack Gas Velocity,Vs (mpm)	1278.90
Volumetric Flow Rate (acfm)	133927.89
Volumetric Flow Rate (acmm)	3792.838
Volumetric Flow Rate (dscfm)	81082.00
Volumetric Flow Rate (dscmm)	2296.242
Percent Isokinetic	96.85
Percent Excess Air	494.59
Fuel Factor,Fo	0.645
Ultimate CO2	32.39
Concentration of Particulate (grains/acf)	2.19E-07
Concentration of Particulate (g/acm)	5.01E-07
Concentration of Particulate (grains/dscf)	0.03467
Concentration of Particulate (g/dscm)	0.07932

FACILITY : FMC - POCATELLO

DATE: 8/26/88	
LOCATION: OUTLET B	
RUN NUMBER: 7.00	
SAMPLING PARAMETER PARTICULATE/RADIONUCLIDES	
Total Sampling Time (min.)	60.00
Corrected Barometric Pressure (in. Hg)	25.41
Absolute Stack Pressure,Ps(in. Hg)	25.39
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	141.17
Stack Area (sq.in.)	4596.35
Metered Volume,Vm (cu.ft.)	60.59
Average Meter Pressure (in.H2O)	2.95
Average Meter Temperature (F)	97.93
Moisture Collected (g)	253.70
Carbon Dioxide Concentration (%V)	6.25
Oxygen Concentration (%V)	17.05
Nitrogen Concentration (%V)	76.70
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Particulate Catch	0.1160
Average Sampling Rate (dscfm)	0.82
Standard Metered Volume,Vm(std) (dscf)	49.28
Standard Metered Volume,Vm(std) (dscm)	1.396
Standard Volume Water Vapor,Vw (scf)	11.96
Standard Volume Water Vapor,Vw (scm)	0.339
Stack Moisture (%V)	19.53
Mole Fraction Dry Stack Gas	0.805
Dry Molecular Weight	29.68
Wet Molecular Weight	27.40
Stack Gas Velocity,Vs (fpm)	4090.85
Stack Gas Velocity,Vs (mpm)	1246.89
Volumetric Flow Rate (acfm)	130576.15
Volumetric Flow Rate (acmm)	3697.916
Volumetric Flow Rate (dscfm)	78254.27
Volumetric Flow Rate (dscmm)	2216.161
Percent Isokinetic	98.23
Percent Excess Air	530.47
Fuel Factor,Fo	0.616
Ultimate CO2	33.93
Concentration of Particulate (grains/acf)	2.28E-07
Concentration of Particulate (g/acm)	5.23E-07
Concentration of Particulate (grains/dscf)	0.03632
Concentration of Particulate (g/dscm)	0.08311

APPENDIX D - MM 111 FIELD DATA SHEETS

D.1 - Test Run No. 1
D.2 - Test Run No. 2
D.3 - Test Run No. 3
D.4 - Test Run No. 4
D.5 - Test Runs No. 5, 6, and 7, Outlets A and B, only

APPENDIX D.1 - Test Run No. 1

9-14-88

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE M111
RUN NUMBER 1.00
OPERATOR .....MWH/JTW
AMBIENT TEMPERATURE 85.00
BAROMETRIC PRESSURE 25.67
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER W-26
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE 10.5FT,GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. ..... ~~0.250~~ 0.236
ASSUMED MOISTURE, % 5.60
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA HN 1.91
K FACTOR 2.70
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING 250.00
REFERENCE DEL P 0.25
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	9:50	745.645											
A-1	2.00		746.900	0.14	350	0.37	0.37		322		81.00	79.00	65.00	2.00
A-2	4.00		747.800	0.13	334	0.35	0.35		292		82.00	79.00	65.00	2.00
A-3	6.00		748.500	0.13	385	0.35	0.35		285		81.00	78.00	65.00	2.00
A-4	8.00		749.400	0.19	403	0.51	0.51		285		81.00	78.00	65.00	2.00
A-5	10.00		750.300	0.26	470	0.70	0.70		272		82.00	78.00	61.00	2.00
A-6	12.00		751.000	0.20	550	0.54	0.54		276		82.00	78.00	61.00	2.00
A-7	14.00	10:04	751.967	0.25	585	0.67	0.67		260		85.00	80.00	61.00	2.00
STOP	14.00		751.967											
B-1	16.00	10:08	752.900	0.16	340	0.43	0.43		290		86.00	81.00	65.00	2.00
B-2	18.00		953.600	0.12	360	0.32	0.32		291		86.00	81.00	65.00	2.00
B-3	20.00		754.400	0.12	390	0.32	0.32		290		88.00	82.00	64.00	2.00
B-4	22.00		755.400	0.19	433	0.51	0.51		293		89.00	82.00	64.00	2.00
B-5	24.00		756.200	0.20	535	0.54	0.54		285		91.00	83.00	61.00	2.00
B-6	26.00		757.200	0.27	595	0.73	0.73		283		92.00	84.00	61.00	2.00
B-7	28.00	10:20	758.170	0.30	621	0.81	0.81		282		93.00	84.00	61.00	2.00
STOP	28.00		758.170											
C-1	30.00	10:24	759.200	0.16	410	0.43	0.43		311		92.00	85.00	69.00	2.00
C-2	32.00		759.700	0.13	430	0.35	0.35		293		95.00	87.00	67.00	2.00
C-3	34.00		761.100	0.12	430	0.32	0.32		283		96.00	88.00	68.00	2.00
C-4	36.00		761.500	0.18	480	0.49	0.49		275		97.00	89.00	67.00	2.00
C-5	38.00		762.400	0.20	521	0.54	0.54		273		97.00	90.00	66.00	2.00
C-6	40.00		763.200	0.24	551	0.65	0.65		269		98.00	91.00	67.00	2.00
C-7	42.00	10:36	764.107	0.26	570	0.70	0.70		264		100.00	91.00	66.00	2.00
STOP	42.00		764.107											
D-1	44.00	10:44	765.200	0.14	363	0.37	0.37		285		98.00	93.00	72.00	2.00

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Filter Probe Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
D-2	46.00		765.650	0.12	365	0.32	0.32	272		99.00	94.00	70.00	2.00
D-3	48.00		766.300	0.12	395	0.32	0.32	269		100.00	94.00	70.00	2.00
D-4	50.00		767.400	0.14	441	0.37	0.37	267		101.00	95.00	68.00	2.00
D-5	52.00		768.200	0.18	500	0.49	0.49	264		102.00	96.00	68.00	2.00
D-6	54.00		769.700	0.24	552	0.65	0.65	260		103.00	96.00	65.00	2.00
D-7	56.00	10:56	770.118	0.26	570	0.70	0.70	256		105.00	97.00	63.00	2.00
STOP	56.00		770.118										
E-1	58.00	11:00	771.000	0.13	403	0.35	0.35	269		103.00	97.00	70.00	2.00
E-2	60.00		771.600	0.11	400	0.30	0.30	265		104.00	98.00	70.00	2.00
E-3	62.00		772.700	0.14	425	0.37	0.37	263		104.00	98.00	70.00	2.00
E-4	64.00		773.400	0.17	461	0.46	0.46	261		106.00	99.00	68.00	2.00
E-5	66.00		774.100	0.17	521	0.46	0.46	257		106.00	99.00	67.00	2.00
E-6	68.00		775.000	0.20	540	0.54	0.54	259		107.00	100.00	67.00	2.00
E-7	70.00	11:12	775.916	0.24	565	0.65	0.65	257		108.00	100.00	66.00	2.00
STOP	70.00		775.916										
F-1	72.00	11:18	777.800	1.80	380	0.49	0.49	278		104.00	100.00	60.00	2.00
F-2	74.00		778.000	0.14	404	0.37	0.37	270		106.00	101.00	60.00	2.00
F-3	76.00		778.600	0.23	420	0.62	0.62	262		106.00	101.00	58.00	2.00
F-4	78.00		779.200	0.26	450	0.70	0.70	261		106.00	101.00	58.00	2.00
F-5	80.00		779.800	0.28	497	0.76	0.76	261		107.00	102.00	57.00	2.00
F-6	82.00		780.400	0.25	520	0.67	0.67	261		108.00	102.00	56.00	2.00
F-7	84.00	11:30	781.476	0.30	540	0.81	0.81	257		109.00	103.00	53.00	2.00
STOP	84.00		781.476										
G-1	86.00	11:34	782.800	0.24	442	0.65	0.65	264.00		120.00	103.00	55.00	2.00
G-2	88.00		783.700	0.26	411	0.70	0.70	257.00		120.00	103.00	54.00	2.00
G-3	90.00		784.800	0.26	441	0.70	0.70	256.00		120.00	103.00	55.00	2.00
G-4	92.00		785.400	0.26	480	0.70	0.70	254.00		119.00	103.00	54.00	2.00
G-5	94.00		786.400	0.36	514	0.97	0.97	252.00		120.00	103.00	55.00	2.00
G-6	96.00		787.700	0.31	543	0.84	0.84	252.00		121.00	104.00	54.00	2.00
G-7	98.00	11:46	788.689	0.36	545	0.97	0.97	240.00		114.00	104.00	55.00	2.00
END													

42

FIELD DATA

PLANT FMC - Pocatello
DATE 8/24/88
SAMPLING LOCATION INLET
SAMPLE TYPE MM111
RUN NUMBER 1
OPERATOR MWH / JTW
AMBIENT TEMPERATURE 85°
BAROMETRIC PRESSURE 25.67
STATIC PRESSURE, (P_s) -3.0" H_2O
FILTER NUMBER (s) G1-26

PROBE LENGTH AND TYPE 15' Pyrex
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 5.6
SAMPLE BOX NUMBER —
METER BOX NUMBER RAC # 5 Y=0.9996
METER ΔH@ 1.91
K@ FACTOR ~~[illegible]~~ 2.7
PROBE HEATER SETTING None
HEATER BOX SETTING 250
REFERENCE Δp

7.3
5.6
.3 / min

INITIAL leak check .01 CFM @10" SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 MINUTES

2.7

.46 CFM @ .25 ΔP

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	9:50 ~~[illegible]~~	745.645 ~~372.751~~									
A-1	2	9:52	746.9	.14	.37	.37	350°	81	79	2.0	322	65
2	4	9:54	747.8	.13	.35	.35	334	82	79	2.0	292	65
3	6	9:56	748.5	.13	.35	.35	385	81	78	2.0	285	65
4	8	9:58	749.4	.19	.51	.51	403	81	78	2.0	285	65
5	10	10:00	750.3	.26	.70	.70	470	82	78	2.0	272	61
6	12	10:02	751.0	.20	.54	.54	550	82	78	2.0	276	61
7	14	10:04	751.967	.25	.67	.67	585	85	80	2.0	260	61
	14	10:06	751.967									
B-1	16	10:08	752.9	.16	.43	.43	340	86	81	2.0	290	65
2	18	10:10	753.6	.12	.32	.32	360	86	81	2.0	291	65
3	20	10:12	754.4	.12	.32	.32	390	88	82	2.0	290	64
4	22	10:14	755.4	.19	.51	.51	433	89	82	2.0	293	64
5	24	10:16	756.2	.20	.54	.54	535	91	83	2.0	285	61
6	26	10:18	757.2	.27	.73	.73	595	92	84	2.0	283	61
7	28	10:20	758.17	.30	.81	.81	621	93	84	2.0	282	61
	28	10:22	758.17									
C-1	30	10:24	759.2	.16	.43	.43	410	92	85	2.0	311	69
2	32	10:26	759.7	.13	.35	.35	430	95	87	2.0	293	67
3	34	10:28	761.1	.12	.32	.32	430	96	88	2.0	283	68
4	36	10:30	761.5	.18	.49	.49	480	97	89	2.0	275	67
5	38	10:32	762.4	.20	.54	.54	521	97	90	2.0	273	66
6	40	10:34	763.2	.24	.65	.65	551	98	91	2.0	269	67
7	42	10:36	764.107	.26	.70	.70	570	100	91	2.0	264	66

COMMENTS:

EPA (Dur) 235
4/72

.669 32.11 F/S. (377)

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	42	10:42	764.107									
D - 1	44	10:44	765.2	.14	.37	.37	363	98	93	2.0	285	72
2	46	10:46	765.65	.12	.32	.32	365	99	94	2.0	272	70
3	48	10:48	766.3	.12	.32	.32	395	100	94	2.0	269	70
4	50	10:50	767.4	.14	.37	.37	441	101	95	2.0	267	68
5	52	10:52	768.2	.18	.49	.49	500	102	96	2.0	264	68
6	54	10:54	769.7	.24	.65	.65	552	103	96	2.0	260	65
7	56	10:56	770.118	.26	.70	.70	570	105	97	2.0	256	63
	56	10:58	770.118									
E - 1	58	11:00	771.0	.13	.35	.35	403	103	97	2.0	269	70
2	60	11:02	771.6	.11	.30	.30	400	104	98	2.0	265	70
3	62	11:04	772.7	.14	.37	.37	425	104	98	2.0	263	70
4	64	11:06	773.4	.17	.46	.46	461	106	99	2.0	261	68
5	66	11:08	774.1	.17	.46	.46	521	106	99	2.0	257	67
6	68	11:10	~~774.3~~ 775	.20	.54	.54	540	107	100	2.0	259	67
7	70	11:12	776.916	.24	.65	.65	565	108	100	2.0	257	66
	70	11:16	776.916									
F - 1	72	11:18	777.8	.18	.49	.49	380	104	100	2.0	278	60
2	74	11:20	778.0	.14	.37	.37	404	100	101	2.0	270	60
3	76	11:22	778.6	.23	.62	.62	420	106	101	2.0	262	58
4	78	11:24	779.2	.26	.70	.70	450	106	101	2.0	261	58
5	80	11:26	779.8	.28	.76	.76	497	107	102	2.0	261	57
6	82	11:28	780.4	.25	.67	.67	520	108	102	2.0	261	56
7	84	11:30	781.476	.30	.81	.81	540	109	103	2.0	257	53
	84	11:32	781.476									
G - 1	86	11:34	782.8	.24	.65	.65	492	120	103	2.0	264	55
2	88	11:36	783.7	.26	.70	.70	411	120	103	2.0	257	54
3	90	11:38	784.8	.26	.70	.70	441	120	103	2.0	256	55
4	92	11:40	785.4	.26	.70	.70	480	119	103	2.0	254	54
5	94	11:42	786.4	.36	.97	.97	514	120	103	2.0	252	55
6	96	11:44	787.7	.31	.84	.84	543	121	104	2.0	252	54
7	98	11:46	788.689	.36	.97	.97	545	114	104	2.0	240	55
			FINAL	LEAK	.01	CF						

.424

.44574

EPA (Dur) 236
4 72

9-15-88

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 1.00
OPERATOR .....FLG/GDK
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER W-25
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....12', STEEL
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.25
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.002 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

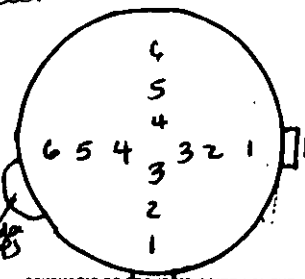
Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Orifice Pressure Differential (del H, in. H2O) Actual	Temperature: deg. F Probe	Temperature: deg. F Filter Skin	Temperature: deg. F Adsorbent Trap	Temperature: deg. F Dry Gas Meter Inlet (Tm in)	Temperature: deg. F Dry Gas Meter Outlet (Tm out)	Temperature: deg. F Impinger Exit	Pump Vacuum in. Hg
	0.00	9:40	990.492											
A-1	5.00		994.000	0.36	131	1.02	1.02		270		73.00	79.00	64.00	1.50
A-2	10.00		997.500	0.50	131	1.42	1.42		250		75.00	75.00	60.00	2.00
A-3	15.00		1001.100	0.53	133	1.50	1.50		245		80.00	75.00	64.00	2.00
A-4	20.00		1004.600	0.52	128	1.47	1.47		244		83.00	75.00	66.00	2.00
A-5	25.00		1007.800	0.39	128	1.10	1.10		245		87.00	77.00	67.00	2.00
A-6	30.00	10:10	1010.840	0.37	127	1.00	1.00		249		87.00	78.00	68.00	2.00
STOP		11:01	1010.984											
B-1	35.00	11:06	1014.575	0.52	132	1.50	1.50		270		80.00	82.00	64.00	2.00
B-2	40.00		1018.600	0.63	132	1.80	1.80		262		86.00	81.00	65.00	2.00
B-3	45.00		1022.500	0.62	133	1.80	1.80		255		92.00	82.00	67.00	2.00
B-4	50.00		1026.190	0.52	136	1.50	1.50		247		94.00	83.00	68.00	2.00
B-5	55.00		1030.000	0.50	136	1.40	1.40		248		96.00	83.00	68.00	2.00
B-6	60.00	11:31	1033.174	0.47	131	1.30	1.30		248		99.00	87.00	68.00	2.00
END														

INTIAL LEAK ✓: 0.01 cfm @ 5 in. Hg

Outlet A

PLANT FLC
DATE 8-24-88
SAMPLING LOCATION OUTLET 1-C
SAMPLE TYPE MIII
RUN NUMBER 1
OPERATOR FLG + GDK
AMBIENT TEMPERATURE 72 °F
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE, (P_s) Equip (PDS)
FILTER NUMBER(s) W-28

0 1605 990.492
2 1607 991.970



SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

PROBE LENGTH AND TYPE Glass lined SS, ~10 ft
NOZZLE I.D. 3 0.251
ASSUMED MOISTURE, % 8.2 %
SAMPLE BOX NUMBER
METER BOX NUMBER RAC # 12
METER ΔH@ 1.79
K-FACTOR 2.84 x ΔP
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 0.9943

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (ft³)	VELOCITY HEAD (Δp), in. H₂O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H₂O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H₂O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET (T_m), °F	DRY GAS METER TEMPERATURE OUTLET (T_m), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F #2	IMPINGER TEMPERATURE, °F #4
	2	942	992.063 *	0.36								
A-1	5	945	994.0	[illegible]	1.02	1.02	131	73	79	1.5	270	64
A-2	10	950	997.5	0.50	1.42	1.42	131	76	75	2.0	250	60
A-3	15	955	001.1	0.53	1.5	1.5	133	80	75	2.0	245	64
A-4	20	1000	004.6	0.52	1.47	1.47	128	83	75	2.0	244	66
A-5	25	1005	07.8	0.39	1.1	1.1	128	87	77	2.0	245	67
A-6	30	1010	10.840	0.37	1.0	1.0	127	87	78	2.0	249	68
	LEAK ✓ BEFORE PORT Δ = 0.01 cfm @ 5 in. Hg							I^T% at ½ = 97.4%				
	LEAK ✓ AFTER PORT A = 0.01 cfm @ 5 in. Hg											
1	—	1101	10.984									
B-1	35	1106	14.675	0.52	1.5	1.5	132	80	82	2.0	270	64
B-2	40	1111	18.6	0.63	1.8	1.8	132	86	81	2.0	262	65
B-3	45	1116	22.5	0.62	1.8	1.8	130	92	82	2.0	255	67
B-4	50	1121	26.19	0.62	1.5	1.5	136	94	83	2.0	247	68
B-5	55	1126	30.	0.50	1.4	1.4	136	96	83	2.0	240	68
B-6	60	1131	033.174	0.47	1.3	1.3	131	99	87	2.0	248	68
				$\bar{x}$ = 0.494								
	FINAL LEAK ✓ = 0.002 cfm @ 5 in.											

COMMENTS

* NOTE THAT 2 MINUTES (cf) SAMPLE WAS PULLED ON 8-23-88 PRIOR TO STOPPING (DUE TO PROBLEMS AT INLET).
TOTAL VOLUME SAMPLED SHOULD INCLUDE THE 8-23 VOLUME AND TIME FOR CALCULATION PURPOSES

V_{m1} = 18.770
V_{m2} = 22.19
V_{m} = 1.967

EPA Form 2B 4-77

Source Sampling Field Data

RADIAN

$$K = (597.446) \times (D_N)^4 \times \Delta H_e \times (1 - B_{ws})^2 \times \frac{M_d}{M_s} \times \frac{P_s}{P_m} \times \frac{T_m}{T_s}$$

$D_N = (0.251)^4$

$(D_N)^4 = 0.003969$

$\Delta H_e = 1.79$

$B_{ws} = 18.2\%$

$(1 - B_{ws})^2 = 0.66912$

$M_d = 30$

$M_s = [30 \times (1 - .182)] + [18 \times .182] = 27.816$

$P_s = 25.63 - \frac{0.3}{13.6} = 25.61$ in. Hg

$P_m = 25.63$

$T_m = 90° + 460 = 550$

$T_s = 133° + 460 = 593$

$$K = 1.7099 \times \frac{T_m}{T_s} \times \Delta H_e$$

$$K = 3.061 \times \frac{550}{593} = 2.84 \checkmark$$

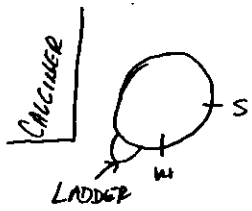
SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/89
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE .....Mill
RUN NUMBER 1.00
OPERATOR .....PMB/RDO
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER M-25
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
IAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....12', STEEL
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 28.04
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.79
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.25
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperatures deg. F: Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	11:00	712.925											
M-1	5.00		717.400	0.84	133	2.34	2.34				83.00	89.00		
M-2	10.00		721.770	0.96	134	2.68	2.68				85.00	95.00		
M-3	15.00		726.550	0.94	134	2.62	2.62				86.00	100.00		
M-4	20.00		730.700	0.67	137	1.87	1.87				87.00	101.00		
M-5	25.00		734.580	0.66	140	1.84	1.84				89.00	104.00		
M-6	30.00	11:30	738.669	0.69	139	1.93	1.93				91.00	106.00		
STOP	30.00	11:45	738.669											
T-1	35.00		742.500	0.70	158	1.95	1.95				92.00	96.00		
T-2	40.00		746.650	0.78	157	2.18	2.18				93.00	101.00		
T-3	45.00		650.700	0.78	147	2.18	2.18				95.00	108.00		
T-4	50.00		754.900	0.81	137	2.26	2.26				96.00	112.00		
T-5	55.00		759.100	0.81	135	2.26	2.26				99.00	115.00		
T-6	60.00	12:15	763.184	0.68	135	1.90	1.90				100.00	115.00		
END														



LEAK$_I$ < .01 FT³/MIN 8" Hg VAC

LEAK$_F$ < .01 FT³/MIN 9" Hg VAC

OTB

PLANT FMC POCATELLO
DATE 8-24-88
SAMPLING LOCATION OUTLET 1-2
SAMPLE TYPE M 111
RUN NUMBER # 7
OPERATOR PHB/RDO

RAC #7
ΔH@ = 1.77
Y = 1.0035
K = 2.79

NOZZLE = .250

1 of 1

TRAVERSE POINT NUMBER	CLOCK TIME (24 hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRYGAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRYGAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	5 / 1100	712.925									
W 1	1105	717.40	.88	2.34	2.34	133	83	88	1	308	55
2	1110	721.77	.96	2.68	2.68	134	85	95	1	344	49
3	1115	726.55	.94	2.62	2.62	134	86	100	1	348	53
4	1120	730.70	.67	1.87	1.87	137	87	101	1	360	56
5	1125	734.58	.66	1.84	1.84	140	89	104	1	376	57
6	1130	738.669	.69	1.93	1.93	139	91	106	1	385	57
	1145	738.669	~~.70~~	~~1.95~~	~~1.95~~	~~158~~	~~92~~	~~96~~	~~1~~	~~355~~	~~56~~
S 1	1150	742.50	.70	1.95	1.95	158	92	96	1	355	56
2	1155	746.65	.78	2.18	2.18	157	93	101	1	370	55
3	1200	750.70	.78	2.18	2.18	147	95	108	1	380	59
4	1205	754.90	.81	2.26	2.26	137	96	112	2	388	60
5	1210	759.10	.81	2.26	2.26	135	99	115	2	390	63
6	1215	763.184	.68	1.90	1.90	135	100	115	8	390	65
								O/R	95%		
		V_{m_1} = 25.744									
		V_{m_2} = 24.515									
		V_m = 50.259									

COMMENTS

P_m 25.63

C_p .84

D_n .250

B_w .19%

$\Delta H@$ 1.77

P_s 25.59

T_s 598°

T_m 570°

M_d 30.4

M_s 28.04

$$K = (846.72)(.0039)(1.77)(.7056)(.656)(1.0842)(.9984)(.9532)$$

$$K = 2.79$$

PLANT FMC - POCATELLO
DATE 8-22-88
SAMPLING LOCATION OUTLET 1-2
SAMPLE TYPE MIN
RUN NUMBER
OPERATOR
AMBIENT TEMPERATURE 95
BAROMETRIC PRESSURE 25.86
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

ABORTED
RB

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER RAC #7
METER ΔH@ 1.77
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y

LEAK RATE I <.01

RADIAN

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY _____ 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			
		686.635									
W 1											
2											
3											
4											
5											
6											
S 1											
2											
3											
4											
5											
6											

COMMENTS

EPA (Rev) 236
4-77

Source Sampling Field Data

APPENDIX D.2 - Test Run No. 2

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE M111
RUN NUMBER 2.00
OPERATOR .....MMM/JTM
AMBIENT TEMPERATURE 90.00
BAROMETRIC PRESSURE 25.59
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER W-29
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. ..... ~~0.350~~ 0.236
ASSUMED MOISTURE, % 5.60
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.91
K FACTOR ..... 2.70.
PROBE HEATER SETTING 250.00
HEATER BOX SETTING 250.00
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.020 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

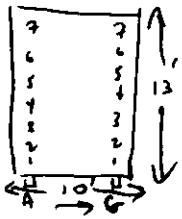
Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Stio	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	16:26	793.176											
A-1	2.00		793.760	0.14	350	0.36	0.36				103.00	102.00		
A-2	4.00		794.600	0.13	360	0.37	0.37				102.00	102.00		
A-3	6.00		795.300	0.13	420	0.37	0.37				102.00	101.00		
A-4	8.00		796.100	0.18	425	0.49	0.49				101.00	102.00		
A-5	10.00		797.000	0.24	495	0.65	0.65				102.00	102.00		
A-6	12.00		798.000	0.23	570	0.62	0.62				103.00	102.00		
A-7	14.00	16:40	799.051	0.29	594	0.78	0.78				104.00	102.00		
STOP	14.00		799.051											
B-1	16.00	16:44	800.100	0.20	345	0.54	0.54				104.00	102.00		
B-2	18.00		800.900	0.13	340	0.37	0.37				105.00	102.00		
B-3	20.00		801.500	0.13	373	0.37	0.37				105.00	102.00		
B-4	22.00		802.300	0.18	425	0.49	0.49				105.00	103.00		
B-5	24.00		803.400	0.24	493	0.65	0.65				106.00	103.00		
B-6	26.00		804.800	0.28	560	0.75	0.75				107.00	103.00		
B-7	28.00	16:56	805.422	0.30	561	0.81	0.81				108.00	104.00		
STOP	28.00		805.422											
C-1	30.00	17:00	806.300	0.16	380	0.43	0.43				107.00	104.00		
C-2	32.00		807.000	0.16	372	0.43	0.43				107.00	104.00		
C-3	34.00		807.700	0.14	393	0.38	0.38				107.00	105.00		
C-4	36.00		808.500	0.17	446	0.46	0.46				108.00	105.00		
C-5	38.00		809.400	0.22	479	0.59	0.59				109.00	105.00		
C-6	40.00		810.600	0.30	561	0.81	0.81				109.00	105.00		
C-7	42.00	17:12	811.00	0.30	565	0.81	0.81				110.00	105.00		
STOP	42.00		811.555											
D-1	44.00	17:16	812.300	0.18	355	0.49	0.49				109.00	106.00		

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperatures deg. F: Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
D-2	46.00		813.200	0.13	372	0.37	0.37				110.00	106.00		
D-3	48.00		814.300	0.14	403	0.39	0.39				110.00	106.00		
D-4	50.00		815.000	0.16	441	0.43	0.43				110.00	107.00		
D-5	52.00		816.000	0.20	524	0.54	0.54				110.00	107.00		
D-6	54.00		816.400	0.24	571	0.65	0.65				111.00	107.00		
D-7	56.00	17:28	817.534	0.28	536	0.75	0.75				112.00	108.00		
STOP	56.00		817.534											
E-1	58.00	17:32	818.300	0.18	421	0.49	0.49				111.00	107.00		
E-2	60.00		819.400	0.16	441	0.43	0.43				112.00	108.00		
E-3	62.00		820.200	0.20	456	0.54	0.54				112.00	108.00		
E-4	64.00		821.000	0.22	500	0.60	0.60				112.00	109.00		
E-5	66.00		822.100	0.20	511	0.54	0.54				112.00	109.00		
E-6	68.00		823.200	0.20	548	0.54	0.54				112.00	109.00		
E-7	70.00	17:44	823.871	0.34	549	0.92	0.92				113.00	109.00		
STOP	70.00		823.871											
F-1	72.00	17:48	824.900	0.22	374	0.59	0.59				112.00	108.00		
F-2	74.00		826.000	0.20	407	0.54	0.54				111.00	108.00		
F-3	76.00		827.000	0.25	421	0.68	0.68				111.00	108.00		
F-4	78.00		827.700	0.28	463	0.75	0.75				112.00	108.00		
F-5	80.00		828.800	0.26	492	0.70	0.70				112.00	108.00		
F-6	82.00		830.400	0.26	431	0.70	0.70				112.00	108.00		
F-7	84.00	18:00	830.820	0.32	547	0.87	0.87				113.00	108.00		
STOP	84.00		830.820											
G-1	86.00	18:04	832.000	0.26	404	0.70	0.70				111.00	107.00		
G-2	88.00		833.200	0.26	464	0.70	0.70				112.00	108.00		
G-3	90.00		834.400	0.29	474	0.78	0.78				112.00	108.00		
G-4	92.00		835.500	0.32	504	0.87	0.87				113.00	108.00		
G-5	94.00		836.800	0.41	556	1.10	1.10				114.00	109.00		
G-6	96.00		837.900	0.39	586	1.05	1.05				116.00	109.00		
G-7	98.00	18:16	838.751	0.39	590	1.05	1.05				118.00	109.00		
END														

FIELD DATA

PLANT FMC - Pocatello
DATE 8/24
SAMPLING LOCATION INLET
SAMPLE TYPE MM111
RUN NUMBER 882
OPERATOR MWH / JTW
AMBIENT TEMPERATURE 90°
BAROMETRIC PRESSURE 25.59
STATIC PRESSURE, (P_s) -3.0" H_2O
FILTER NUMBER (s) W-29



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 15' GLASS
NOZZLE I.D. .250
ASSUMED MOISTURE, % 5.6
SAMPLE BOX NUMBER
METER BOX NUMBER RAC # 5 0.9996 - 8
METER $\Delta H_@$ 1.91
K ϕ FACTOR 2.8
PROBE HEATER SETTING 250
HEATER BOX SETTING 250
REFERENCE Δp
13' x 10' = 130 FT^2

INITIAL Leak check .01 CFM. READ AND RECORD ALL DATA EVERY 2 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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1626	793.176									
A-1	2	28	793.76	.14	.36	.36	350	103	102	2.0	335	78
2	4	30	794.6	.13	.38	.37	360	102	102	2.0	305	85
3	6	32	795.3	.13	.37	.37	420	102	101	2.0	290	84
4	8	34	796.1	.18	.49	.49	425	101	102	2.0	290	82
5	10	36	797.0	.24	.65	.65	495	102	102	2.0	289	82
6	12	38	798.0	.23	.62	.62	570	103	102	2.0	286	80
7	14	40	799.051	.29	.78	.78	594	104	102	2.0	277	81
	14	16:42	799.051									
B-1	16	16:44	800.1	.20	.54	.54	345	104	102	2.0	300	86
2	18	16:46	800.9	.13	.37	.37	340	105	102	2.0	288	84
3	20	16:48	801.5	.13	.37	.37	373	105	102	2.0	280	82
4	22	16:50	802.3	.18	.49	.49	425	105	103	2.0	280	82
5	24	16:52	803.4	.24	.65	.65	493	106	103	2.0	282	83
6	26	16:54	804.8	.28	.75	.75	560	107	103	2.5	281	84
7	28	16:56	805.422	.30	.81	.81	561	108	104	3.0	277	82
	28	16:58	805.422									
C-1	30	17:00	806.3	.16	.43	.43	380	107	104	2.0	296	90
2	32	17:02	807.0	.16	.43	.43	372	107	104	2.0	272	89
3	34	17:04	807.7	.14	.38	.38	393	107	105	2.0	265	88
4	36	17:06	808.5	.17	.46	.46	446	108	105	2.0	260	88
5	38	17:08	809.4	.22	.59	.59	479	109	105	2.0	253	86
6	40	17:10	810.6	.30	.81	.81	561	109	105	2.0	247	79
7	42	17:12		.30	.81	.81	565	110	105	2.0	245	74

COMMENTS:

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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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	42	17:14	811.555									
D-1	44	17:16	812.3	.18	.49	.49	355	109	106	2.0	256	79
2	46	17:18	813.2	.13	.37	.37	372	110	106	2.0	251	80
3	48	17:20	814.3	.14	.39	.39	403	110	106	2.0	249	79
4	50	17:22	815.0	.16	.43	.43	441	110	107	2.0	252	78
5	52	17:24	816.0	.20	.54	.54	524	110	107	2.0	259	77
6	54	17:26	816.4	.24	.65	.65	571	111	107	2.0	261	79
7	56	17:28	~~[illegible]~~ 817.534	.28	.75	.75	536	112	108	3.0	260	77
	56	17:30	817.534									
E-1	58	17:32	818.30	.18	.49	.49	421	111	107	2.0	277	85
2	60	17:34	819.4	.16	.43	.43	441	112	108	2.0	267	79
3	62	17:36	820.2	.20	.54	.54	456	112	108	2.0	265	80
4	64	17:38	821.0	.22	.60	.60	500	112	109	2.0	264	78
5	66	17:40	822.1	.20	.54	.54	511	112	109	2.0	264	78
6	68	17:42	823.2	.20	.54	.54	548	112	109	2.0	264	79
7	70	17:44	823.871	.34	.92	.92	549	113	109	2.0	264	78
	70	17:46	823.871									
F-1	72	17:48	824.9	.22	.59	.59	374	112	108	2.0	279	83
2	74	17:50	826.6	.20	.54	.54	407	111	108	2.0	268	80
3	76	17:52	827.0	.25	.68	.68	421	111	108	2.0	267	81
4	78	17:54	827.7	.28	.75	.75	463	112	108	2.0	264	77
5	80	17:56	828.8	.26	.70	.70	492	112	108	2.0	263	77
6	82	17:58	830.4	.26	.70	.70	531	112	108	2.0	263	78
7	84	18:00	830.820	.32	.87	.87	547	113	108	3.0	263	76
	84	18:02	830.820									
G-1	86	18:04	832.0	.26	.70	.70	404	111	107	2.5	279	84
2	88	18:06	833.2	.26	.70	.70	464	112	108	2.5	270	75
3	90	18:08	834.4	.29	.78	.78	474	112	108	2.5	267	73
4	92	18:10	835.5	.32	.87	.87	504	113	108	2.5	266	73
5	94	18:12	836.8	.41	1.1	1.1	556	114	109	3.5	265	74
6	96	18:14	837.9	.39	1.05	1.05	586	116	109	3.5	265	70
7	98	18:16	838.751	.39	1.05	1.05	590	118	109	3.5	265	71

FINAL LEAK RATE 0.02

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SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 2.00
OPERATOR .....FLS/GDK
AMBIENT TEMPERATURE 95.00
BAROMETRIC PRESSURE 25.62
STATIC PRESSURE (Ps) -0.25
FILTER NUMBER W-30
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.016
IAG TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 2.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.25
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.008 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	16:21	76.162											
A-1	5.00		79.800	0.50	136	1.40	1.40				97.00	96.00		1.50
A-2	10.00		83.700	0.63	130	1.80	1.80				98.00	97.00		2.00
A-3	15.00		87.400	0.55	129	1.60	1.60				102.00	98.00		2.00
A-4	20.00		91.100	0.52	130	1.50	1.50				105.00	98.00		2.00
A-5	25.00		94.500	0.48	132	1.40	1.40				106.00	99.00		2.00
A-6	30.00	16:51	97.855	0.46	135	1.30	1.30				105.00	100.00		2.00
STOP	30.00	17:03	97.964											
B-1	35.00	17:08	101.000	0.35	134	0.99	0.99				100.00	98.00		2.00
B-2	40.00		104.500	0.50	134	1.40	1.40				100.00	100.00		2.00
B-3	45.00		108.200	0.55	135	1.60	1.60				103.00	100.00		2.00
B-4	50.00		111.700	0.50	136	1.40	1.40				105.00	101.00		2.00
B-5	55.00		115.600	0.55	135	1.60	1.60				105.00	101.00		2.00
B-6	60.00	17:33	119.662	0.60	131	1.70	1.70				107.00	101.00		2.00
END														

MODIFIED METHOD 5 DATA

PLANT FMC - Pocatello
DATE 8/24/88
SAMPLING LOCATION 1-1 outlet A
SAMPLE TYPE mm111
RUN NUMBER 2
OPERATOR Meg-GDR
AMBIENT TEMPERATURE 95
BAROMETRIC PRESSURE 25.62
STATIC PRESSURE (P_s) -.25
FILTER NUMBER (s) W30
MINIMUM SAMPLE VOLUME 40 cf
INITIAL LEAK CHECK .016 @ 5"

PROBE LENGTH AND TYPE 11' glass
NOZZLE I.D. .251
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER 2
METER BOX NUMBER 12
METER Δ HP 1.79
K FACTOR 2.84
PROBE HEATER SETTING 60%
HEATER BOX SETTING 60%
REFERENCE Δp NA
DRY/GAS METER FACTOR (Y) .9943
FINAL LEAK CHECK .008 @ 5"

SCHEMATIC OF TRAVERSE POINT LAYOUT
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	Stack T in °F	Orifice Pressure Differential (ΔH, in. H_2O) Desired	Actual	Temperature @ °C (Circle One) Probe	Filter Skin	Filter Out	Recirc. Water	Absorbent Trap	Dry Gas Meter Inlet (T_m in)	Dry Gas Meter Outlet (T_m out)	Impinger Exit	Pump Vacuum in. Hg
		1621	76.162													
B 1	5	26	79.8	.5	136		1.4		246				97	96	71	1
2	10	31	83.7	.63	130		1.8		236				98	97	68	1
3	15	36	87.4	.55	129		1.6		249				102	98	67	1
4	20	41	91.1	.52	130		1.5		261				105	98	69	1
5	25	46	94.5	.48	132		1.4		266				106	99	68	1
6	30	1651	97.855	.46	135		1.3		260				105	100	69	1
				end of port				leak ✓			.006 @ 5"					
		1703	97.964	changed parts				leak ✓			.005 @ 5"					
A 1	35	08	101.0	.35	134		.99		233				100	98	70	1
2	40	13	104.5	.5	134		1.4		239				100	100	60	1
3	45	18	108.2	.55	135		1.6		241				103	100	59	1
4	50	23	111.7	.5	136		1.4		245				105	101	60	1
5	55	28	115.6	.55	135		1.6		248				105	101	60	1
6	60	1733	119.662	.6	131		1.7		259				107	101	64	1

COMMENTS

V_{m1} = 21.693
V_{m2} = 21.698
V_M = 43.391

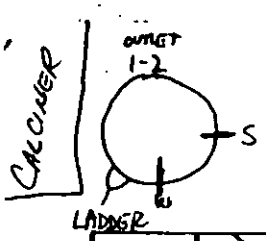
SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/89
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE M111
RUN NUMBER 2.00
OPERATOR .....PWB/RDO
AMBIENT TEMPERATURE 90.00
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE (Ps) -0.25
FILTER NUMBER W-31
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 28.04
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.79
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	16:20	815.228											
T-1	5.00		819.120	0.74	139	2.10	2.10				98.00	100.00		
T-2	10.00		823.580	0.82	139	2.30	2.30				98.00	104.00		
T-3	15.00		828.100	0.83	134	2.30	2.30				98.00	104.00		
T-4	20.00		832.680	0.89	135	2.50	2.50				99.00	110.00		
T-5	25.00		837.250	0.83	137	2.30	2.30				100.00	111.00		
T-6	30.00	16:50	841.569	0.72	137	2.00	2.00				100.00	111.00		
STOP	30.00	17:00	841.569											
N-1	35.00	17:05	845.800	0.80	134	2.25	2.25				99.00	103.00		
N-2	40.00		850.500	0.91	133	2.55	2.55				100.00	105.00		
N-3	45.00		855.250	0.91	133	2.55	2.55				100.00	108.00		
N-4	50.00		859.340	0.62	137	1.75	1.75				101.00	109.00		
N-5	55.00		863.260	0.62	138	1.75	1.75				101.00	112.00		
N-6	60.00	17:30	867.241	0.67	138	1.85	1.85				101.00	112.00		
END														



$LEAK_I$ <.01 CFM 9" Hg VAC

$LEAK_F$ <.01 CFM 10" Hg VAC

FILTER # W31

PLANT FMC – POCATELLO
DATE 8-24-88
SAMPLING LOCATION OUTLET 1-2
SAMPLE TYPE M111
RUN NUMBER 2
OPERATOR RKB/RDO

ΔH@ = 1.77
Y = 1.0035
K = 2.79

RAC #7

1 of 1

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	5	1620	815.228									
S 1		1625	819.12	.74	2.06	2.1	139	98	100	4	290	54
2		1630	823.58	.82	2.29	2.30	139	98	104	6	330	54
3		1635	828.10	.83	2.32	2.30	134	98	104	5	320	55
4		1640	832.68	.89	2.48	2.50	135	99	110	6	324	55
5		1645	837.25	.83	2.32	2.30	137	100	111	6	329	57
6		1650	841.569	.72	2.00	2.00	137	100	111	4	330	58
		1700	841.565	.80	2.23	2.25				5	337	53
W 1		1705	845.8	.80	2.23	2.25	134	99	103	5	337	54
2		1710	850.5	.91	2.54	2.55	133	100	105	6	333	54
3		1715	855.25	.91	2.54	2.55	133	100	108	6	335	56
4		1720	859.34	.62	1.73	1.75	137	101	109	6	330	56
5		1725	863.26	.62	1.73	1.75	138	101	112	4	350	57
6		1730	867.241	.67	1.87	1.85	138	101	112	4	347	57
			V_{m1} = ~~26.449~~	26.341								
			V_{m2} = ~~25.672~~	25.672								
			V_m = ~~52.121~~	52.013								

COMMENTS.

$P_m = 25.63$

$C_p = .84$

$D_n = .250$

$B_{kl} = .19$

$\Delta H@ = 1.77$

$P_s = 25.59$

$T_s = 598°$

$T_m = 570°$

$M_d = 30.4$

$M_s = 28.04$

$$K = (846.72)(D_n^4)(\Delta H@)(C_p^2)(1-B_{kl})^2\left[\frac{M_d}{M_s}\right]\left[\frac{P_s}{P_m}\right]\left[\frac{T_m}{T_s}\right]$$

$$K = (846.72)(.0039)(1.77)(.7056)(.656)(1.0842)(.9584)(.5532)$$

$$K = 2.79$$

APPENDIX D.3 - Test Run No. 3

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE M111
RUN NUMBER 3.00
OPERATOR .....MWW/JTW
AMBIENT TEMPERATURE 75.00
BAROMETRIC PRESSURE 25.50
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER W-35
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE 10.5FT,GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.239
ASSUMED MOISTURE, % 9.00
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.91
K FACTOR 1.70
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING 250.00
REFERENCE DEL P 250.00
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 3" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	11:30	842.006											
A-1	2.00		842.600	0.15	360	0.30	0.30				87.00	86.00		2.00
A-2	4.00		843.300	0.11	353	0.21	0.21				88.00	86.00		2.00
A-3	6.00		843.800	0.11	392	0.21	0.21				89.00	87.00		2.00
A-4	8.00		844.600	0.20	443	0.40	0.40				90.00	88.00		2.00
A-5	10.00		845.350	0.21	525	0.40	0.40				91.00	88.00		2.00
A-6	12.00		846.100	0.20	580	0.37	0.37				91.00	88.00		2.00
A-7	14.00	11:44	846.935	0.26	578	0.47	0.47				93.00	88.00		2.00
STOP	14.00		846.935											
B-1	16.00	11:48	847.560	0.16	382	0.29	0.29				94.00	91.00		2.00
B-2	18.00		848.170	0.11	390	0.20	0.20				96.00	92.00		2.00
B-3	20.00		848.730	0.11	410	0.20	0.20				97.00	92.00		2.00
B-4	22.00		849.400	0.17	471	0.30	0.30				98.00	92.00		2.00
B-5	24.00		850.150	0.21	527	0.36	0.36				100.00	94.00		2.00
B-6	26.00		850.900	0.24	603	0.41	0.41				101.00	94.00		2.00
B-7	28.00	12:00	851.807	0.34	616	0.58	0.58				102.00	96.00		2.00
STOP	28.00		851.807											
C-1	30.00	12:04	852.430	0.14	391	0.29	0.29				101.00	96.00		2.00
C-2	32.00		853.010	0.11	385	0.19	0.19				102.00	97.00		2.00
C-3	34.00		853.560	0.12	425	0.20	0.20				103.00	98.00		2.00
C-4	36.00		854.240	0.17	456	0.29	0.29				104.00	99.00		2.00
C-5	38.00		854.950	0.21	521	0.36	0.36				105.00	99.00		2.00
C-6	40.00		855.800	0.25	576	0.43	0.43				107.00	101.00		2.00
C-7	42.00	12:16	856.675	0.32	561	0.54	0.54				108.00	101.00		2.00
STOP	42.00		856.675											
D-1	44.00	12:20	857.350	0.15	385	0.25	0.25				107.00	102.00		2.00

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Orifice Pressure Differential (del H, in. H2O) Actual	Temperature: deg. F Probe	Temperature: deg. F Filter Skin	Temperature: deg. F Adsorbent Trap	Temperature: deg. F Dry Gas Meter Inlet (Tm in)	Temperature: deg. F Dry Gas Meter Outlet (Tm out)	Temperature: deg. F Impinger Exit	Pump Vacuum in. Hg
D-2	46.00		857.910	0.11	413	0.19	0.19				107.00	102.00		2.00
D-3	48.00		858.500	0.13	429	0.22	0.22				108.00	103.00		2.00
D-4	50.00		859.100	0.15	481	0.25	0.25				106.00	103.00		2.00
D-5	52.00		859.850	0.17	521	0.29	0.29				107.00	103.00		2.00
D-6	54.00		860.700	0.24	572	0.41	0.41				108.00	104.00		2.00
D-7	56.00	12:32	861.540	0.32	571	0.54	0.54				108.00	103.00		2.00
STOP	56.00		861.540											
E-1	58.00	12:36	862.100	0.16	380	0.27	0.27				107.00	102.00		2.00
E-2	60.00		862.730	0.14	416	0.24	0.24				106.00	103.00		2.00
E-3	62.00		863.400	0.16	435	0.27	0.27				105.00	103.00		2.00
E-4	64.00		864.200	0.21	467	0.35	0.35				106.00	103.00		2.00
E-5	66.00		864.950	0.20	524	0.33	0.33				106.00	103.00		2.00
E-6	68.00		865.600	0.21	542	0.35	0.35				106.00	103.00		2.00
E-7	70.00	12:48	866.464	0.30	548	0.50	0.50				106.00	103.00		2.00
STOP	70.00		866.464											
F-1	72.00	12:52	867.100	0.20	406	0.34	0.34				105.00	103.00		2.00
F-2	74.00		868.500	0.20	406	0.34	0.34				105.00	102.00		2.00
F-3	76.00		869.000	0.20	430	0.34	0.34				106.00	102.00		2.00
F-4	78.00		869.700	0.32	469	0.54	0.54				106.00	102.00		2.00
F-5	80.00		870.100	0.26	525	0.44	0.44				107.00	102.00		2.00
F-6	82.00		871.600	0.26	555	0.44	0.44				107.00	102.00		2.00
F-7	84.00	13:04	872.295	0.35	552	0.59	0.59				108.00	102.00		2.00
STOP	84.00		872.295											
G-1	86.00	13:08	873.100	0.27	429	0.46	0.46				106.00	102.00		2.00
G-2	88.00		874.300	0.27	421	0.46	0.46				106.00	102.00		2.00
G-3	90.00		875.100	0.32	458	0.54	0.54				106.00	103.00		2.00
G-4	92.00		875.800	0.33	487	0.57	0.57				107.00	103.00		2.00
G-5	94.00		876.800	0.36	516	0.61	0.61				108.00	103.00		2.00
G-6	96.00		877.700	0.36	503	0.61	0.61				108.00	103.00		2.00
G-7	98.00	13:20	878.782	0.39	483	0.65	0.65				108.00	103.00		2.00
END														

78.56 × √ΔP = Vs
.767 × √ΔP = CFM.

FIELD DATA

PLANT FMC - Pocatello
DATE 8/25/88
SAMPLING LOCATION INLET
SAMPLE TYPE MM111
RUN NUMBER 3
OPERATOR MWH / JTW
AMBIENT TEMPERATURE 75°
BAROMETRIC PRESSURE 25.5
STATIC PRESSURE, (P_s) -3.0
FILTER NUMBER (s) W-35

PROBE LENGTH AND TYPE 15' GLASS
NOZZLE I.D. .239
ASSUMED MOISTURE, % 4
SAMPLE BOX NUMBER —
METER BOX NUMBER RAC #5 .9990
METER ΔH@ 1.91
β FACTOR ~~2.0~~ ~~1.9~~ 1.7
PROBE HEATER SETTING 250
HEATER BOX SETTING 250
REFERENCE Δp

SCHEMATIC OF TRAVERSE POINT LAYOUT

Initial .01 @ 7" Hg

READ AND RECORD ALL DATA EVERY 2 MINUTES

.22 / .355 CFM.

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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	
	0	11:30	842.006										
A-1	2	11:32	842.60	.15	.3	.3	360	87	86	0	300	84	.297
2	4	11:34	843.30	.11	.21	.21	353	88	86	0	293	79	
3	6	11:36	843.80	.11	.21	.21	392	89	87	0	281	79	
4	8	11:38	844.60	.20	.40	.40	443	90	88	0	280	76	.686
5	10	11:40	845.35	.21	.40	.40	525	91	88	0	273	74	.703
6	12	11:42	846.10	.20	.37	.37	580	91	88	0	268	74	
7	14	11:44	846.935	.26	.47	.47	578	93	88	0	269	74	.782
	14	11:46	846.935										
B-1	16	11:48	847.56	.16	.29	.29	382	94	91	0	274	79	.614
2	18	11:50	848.17	.11	.20	.20	390	96	92	0	269	78	.509
3	20	11:52	848.73	.11	.20	.20	410	97	92	0	271	79	
4	22	11:54	849.40	.17	.30	.30	471	98	92	0	269	79	.637
5	24	11:56	850.15	.21	.36	.36	527	100	94	0	265	76	.703
6	26	11:58	850.90	.24	.41	.41	603	101	94	0	269	69	
7	28	12:00	851.807	.34	.58	.58	616	102	96	0	267	67	.895
	28	12:02	851.807										
C-1	30	12:04	852.43	.14	.24	.24	391	101	96	0	273	71	
2	32	12:06	853.01	.11	.19	.19	385	102	97	0	268	69	
3	34	12:08	853.56	.12	.20	.20	425	103	98	0	268	70	
4	36	12:10	854.24	.17	.29	.29	456	104	99	0	269	69	
5	38	12:12	854.95	.21	.36	.36	521	105	99	0	269	68	
6	40	12:14	855.8	.25	.425	.42	576	107	101	0	270	66	
7	42	12:16	856.675	.32	.54	.54	561	108	101	0	265	65	

COMMENTS:

EPA (Dur) 235
4/72

.634 .343

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	42	12:16	856.675									
D-1	44	12:20	857.35	.15	.25	.25	355	107	102	0	271	70
2	46	22	857.91	.11	.19	.19	413	107	102	0	269	70
3	48	24	858.5	.13	.22	.22	429	108	103	0	269	70
4	50	26	859.1	.15	.25	.25	471	106	103	0	269	70
5	52	28	859.85	.17	.29	.29	521	107	103	0	264	70
6	54	30	860.7	.24	.41	.41	572	108	104	0	265	68
7	56	32	861.540	.32	.54	.54	571	108	103	0	264	66
	56	12:34	861.540									
E-1	58	12:36	862.1	.16	.27	.27	380	107	102	0	267	73
2	60	12:38	862.73	.14	.24	.24	416	106	103	0	265	73
3	62	12:40	863.40	.16	.27	.27	435	105	103	0	263	74
4	64	12:42	864.20	.21	.35	.35	467	106	103	0	264	74
5	66	12:44	864.95	.20	.33	.33	524	106	103	0	264	72
6	68	12:46	865.6	.21	.35	.35	542	106	103	0	264	72
7	70	12:48	866.464	.30	.50	.50	548	106	103	0	261	72
	70	12:50	866.464									
F-1	72	12:52	867.1	.20	.34	.34	406	105	103	0	267	78
2	74	12:54	868.5	.20	.34	.34	406	105	102	0	274	76
3	76	12:56	869.0	.20	.34	.34	430	106	102	0	268	75
4	78	12:58	869.7	.32	.54	.54	469	106	102	0	261	74
5	80	13:00	870.1	.26	.44	.44	525	107	102	0	260	72
6	82	13:02	871.6	.26	.44	.44	555	107	102	0	262	73
7	84	13:04	872.295	.35	.54	.54	552	108	102	0	261	74
	84	13:06	872.295									
G-1	86	13:08	873.1	.27	.46	.46	429	106	102	0	268	78
2	88	13:10	874.3	.27	.46	.46	421	106	102	0	261	76
3	90	13:12	875.1	.32	.54	.54	458	106	103	0	261	75
4	92	13:14	875.8	.35	.57	.57	487	107	103	0	261	73
5	94	13:16	876.8	.36	.61	.61	516	108	103	0	257	73
6	96	13:18	877.7	.36	.61	.61	503	108	103	0	259	71
7	98	13:20	878.782	.39	.65	.65	487	108	103	0	260	71

FINAL LEAK CHK = 0.01 CFM @ 3" Hg

AVG $\sqrt{\Delta P}$ = .45

AVG .21

EPA (Dur) 236
4 72

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE .....Mill
RUN NUMBER 3.00
OPERATOR .....FLG/GDK
AMBIENT TEMPERATURE 83.00
BAROMETRIC PRESSURE 25.58
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER W-32
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.013
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE 10.5FT,GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 250.00
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.001 @ 8" Hg

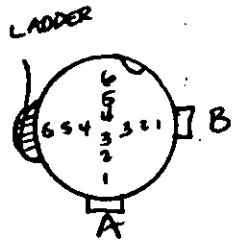
SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	11:22	119.932											
A-1	5.00		123.900	0.71	134	2.00	2.00				83.00	83.00		
A-2	10.00		138.400	0.94	134	2.70	2.70				92.00	84.00		
A-3	15.00		133.700	0.85	134	2.40	2.40				96.00	85.00		
A-4	20.00		137.000	0.75	135	2.10	2.10				98.00	86.00		
A-5	25.00		141.000	0.69	139	2.00	2.00				100.00	88.00		
A-6	30.00	11:52	145.369	0.64	140	1.80	1.80				103.00	90.00		
STOP		12:02	145.514											
B-1	35.00	12:07	149.000	0.55	139	1.56	1.56				100.00	94.00		
B-2	40.00		153.200	0.72	137	2.00	2.00				107.00	96.00		
B-3	45.00		157.300	0.72	139	2.00	2.00				111.00	98.00		
B-4	50.00		161.600	0.74	139	2.10	2.10				110.00	99.00		
B-5	55.00		165.900	0.80	136	2.30	2.30				110.00	100.00		
B-6	60.00	12:32	170.545	0.90	134	2.50	2.50				110.00	101.00		
END														

RUN 3

INITIAL LK ✓: 0.013 cfm @ 5 in. Hg

PLANT FMC-POCATELLO
DATE 8-26-88
SAMPLING LOCATION OUTLET 1-4 (OTA)
SAMPLE TYPE MIT
RUN NUMBER 3
OPERATOR FLG+GDR
AMBIENT TEMPERATURE 83°F
BAROMETRIC PRESSURE 25.56
STATIC PRESSURE, P_g -0.3 in. H_2O
FILTER NUMBER 32 W-32



SCHEMATIC OF TRAVERSE POINT LAYOUT

PROBE LENGTH AND TYPE 11' GLASS
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER
METER BOX NUMBER RAC #12
METER $\Delta H_@$ 1.79
K FACTOR 2.84
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 0.9943

READ AND RECORD ALL DATA EVERY 5 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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F #2	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, #1 °F	IMPINGER TEMPERATURE, #4 °F
	0	1122	119.932									
B-1	5	1127	123.9	0.71	2.0	2.0	134	83	83	2	225	62
B-2	10	1132	128.4	0.94	2.7	2.7	134	92	84	3	259	56
B-3	15	1137	133.7	0.85	2.4	2.4	134	96	85	3	252	62
B-4	20	1142	137	0.75	2.1	2.1	135	98	86	3	249	66
B-5	25	1147	140.0	0.69	2.0	2.0	139	100	88	3	249	72
B-6	30	1152	146.369	0.64	1.8	1.8	140	103	90	3	250	72
		LEAK ✓	BEFORE PORT Δ = 0.01 cfm @ 9 in. Hg									
		LEAK ✓	AFTER PORT Δ = 0.01 cfm @ 5 in. Hg									
A-1		1202	145.514									
A-1	35	1207	149.	0.55	1.56	1.56	139	100	94	3	252	64
A-2	40	1212	153.2	0.72	2.0	2.0	137	107	96	3	252	57
A-3	45	1217	157.3	0.72	2.0	2.0	139	111	98	3	259	62
A-4	50	1222	161.6	0.74	2.1	2.1	139	110	99	3	261	61
A-5	55	1227	165.9	0.80	2.3	2.3	136	110	100	3	262	61
A-6	60	1232	170.545	0.9	2.5	2.5	134	110	101	3	262	63
FINAL LEAK ✓: 0.001 cfm @ 8 in. Hg												

COMMENTS: FILTER HOLDER BROKEN PRE-TEST, CHANGED - NEW FILTER # W-32 SAME FILTER

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8-72

Source Sampling Field Data

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE M111
RUN NUMBER 3.00
OPERATOR .....PWB/RDO
AMBIENT TEMPERATURE 92.00
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER W-33
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE 10.5FT,GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.87
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 250.00
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 9" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Orifice Pressure Differential (del H, in. H2O) Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	11:25	912.259											
W-1	5.00		916.600	0.75	142	2.15	2.15				87.00	89.00		
W-2	10.00		921.250	0.90	136	2.58	2.58				88.00	94.00		
W-3	15.00		925.900	0.88	137	2.53	2.53				88.00	98.00		
W-4	20.00		930.100	0.64	140	1.84	1.84				89.00	101.00		
W-5	25.00		933.900	0.59	142	1.69	1.69				90.00	102.00		
W-6	30.00	11:55	937.806	0.65	142	1.87	1.87				92.00	104.00		
STOP	30.00	12:03	937.806											
T-1	35.00	12:08	941.800	0.67	140	1.92	1.92				96.00	110.00		
T-2	40.00		946.600	0.80	141	2.30	2.30				97.00	111.00		
T-3	45.00		950.600	0.85	142	2.44	2.44				100.00	117.00		
T-4	50.00		955.500	0.80	142	2.30	2.30				101.00	118.00		
T-5	55.00		959.900	0.74	142	2.12	2.12				102.00	119.00		
T-6	60.00	12:33	964.105	0.63	140	1.81	1.81				104.00	121.00		
END														

CALCINER

PLANT FMC - POCATELLO
DATE 8-25-88
SAMPLING LOCATION OUTLET 1-2 (OTB)
SAMPLE TYPE M111
RUN NUMBER 3
OPERATOR RWB/BDO
AMBIENT TEMPERATURE 92
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE, P_s, in. H_2O
FILTER NUMBER(s) W-33

LEAK$_I$ <.01CFM @ 8" Hg VAC
LEAK$_F$ <.01 CFM @ 5" Hg

PROBE LENGTH AND TYPE 11' GLASS
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 18
SAMPLE BOX NUMBER
METER BOX NUMBER RAC #9
METER $\Delta H_@$ .99
K6 FACTOR ~~0.944~~ 2.87
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 1.0035

RADIAN

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY _____ 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 (Δ$H_@$), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (Δ$H_@$), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	S 1125	912.259									
W 1	1130	916.6	.75	2.15	2.15	142	87	95	4	330	60
2	1135	921.25	.90	2.58	2.60	136	88	94	5	328	62
3	1140	925.9	.88	2.53	2.55	137	88	98	5	335	66
4	1145	930.1	.64	1.84	1.85	140	89	101	3	337	71
5	1150	933.9	.59	1.69	1.70	142	90	102	3	346	73
6	1155	937.806	.65	1.87	1.87	142	92	104	3	345	68
	1203	937.806									
S 1	1208	~~937.806~~ 941.8	.67	1.92	1.92	140	96	110	4	356	59
2	1213	946.6	.80	2.30	2.30	141	97	111	4	351	59
3	1218	950.6	.85	2.44	2.45	142	100	117	4	348	61
4	1223	955.5	.80	2.30	2.30	142	101	118	3	349	62
5	1228	959.9	.74	2.12	2.10	142	102	119	4	351	62
6	1233	964.105	.63	1.81	1.80	140	104	121	3	348	65

COMMENTS

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4-77

Source Sampling Field Data

P_n 25.55

η_p .84

D_n .250

3_{wl} .18

1_{He} 1.77

P_s 25.59

$\bar{T}_s$ 558°

T_n 570°

U_d 30.4

U_s 28.04

$$K = (8467)(.0039)(1.77)(.7056)(.672)(1.0842)(.1.0016)(.5532)$$

$$K = 2.87$$

APPENDIX D.4 - Test Run No. 4

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE M111
RUN NUMBER 4.00
OPERATOR .....MMH/JTN
AMBIENT TEMPERATURE 95.00
BAROMETRIC PRESSURE 25.40
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER N-34
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.001
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....15', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.239
ASSUMED MOISTURE, % 89.00
SAMPLE BOX NUMBER .....
METER BOX NUMBER RAC-5
METER DELTA H@ 1.91
K FACTOR 2.70
PROBE HEATER SETTING .....
HEATER BOX SETTING .....
REFERENCE DEL P .....
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.020 @ 4" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	17:30	882.617											
A-1	2.00		883.300	0.16	352	0.27	0.27				99.00			2.00
A-2	4.00		883.900	0.11	352	0.18	0.18				100.00			2.00
A-3	6.00		884.400	0.11	381	0.18	0.18				100.00			2.00
A-4	8.00		885.100	0.17	420	0.29	0.29				104.00			2.00
A-5	10.00		885.900	0.20	442	0.34	0.34				101.00			2.00
A-6	12.00		886.600	0.18	498	0.31	0.31				102.00			2.00
A-7	14.00	17:44	887.221	0.18	529	0.31	0.31				102.00			2.00
STOP	14.00		887.221											
B-1	16.00	17:48	887.800	0.16	343	0.27	0.27				103.00			2.00
B-2	18.00		888.450	0.13	345	0.22	0.22				104.00			2.00
B-3	20.00		889.000	0.11	378	0.18	0.18				105.00			2.00
B-4	22.00		889.600	0.16	415	0.27	0.27				106.00			2.00
B-5	24.00		890.300	0.19	488	0.32	0.32				108.00			2.00
B-6	26.00		891.100	0.21	529	0.36	0.36				108.00			2.00
B-7	28.00	18:00	892.073	0.32	550	0.54	0.54				108.00			2.00
STOP	28.00		892.073											
C-1	30.00	18:04	892.500	0.08	346	0.14	0.14				107.00			2.00
C-2	32.00		893.000	0.06	352	0.10	0.10				108.00			2.00
C-3	34.00		893.400	0.06	371	0.10	0.10				109.00			2.00
C-4	36.00		893.800	0.11	421	0.18	0.18				106.00			2.00
C-5	38.00		894.500	0.16	478	0.27	0.27				107.00			2.00
C-6	40.00		895.160	0.21	502	0.36	0.36				107.00			2.00
C-7	42.00	18:16	895.934	0.24	508	0.41	0.41				108.00			2.00
STOP	42.00		895.934											
D-1	44.00	18:20	896.300	0.08	354	0.14	0.14				106.00			2.00

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
D-2	46.00		896.800	0.08	386	0.14	0.14				106.00			2.00
D-3	48.00		897.300	0.08	394	0.14	0.14				107.00			2.00
D-4	50.00		897.900	0.10	455	0.17	0.17				107.00			2.00
D-5	52.00		898.400	0.12	505	0.21	0.21				107.00			2.00
D-6	54.00		899.000	0.19	553	0.32	0.32				108.00			2.00
D-7	56.00	18:32	899.806	0.25	542	0.42	0.42				108.00			2.00
STOP	56.00		899.806											
E-1	58.00	18:40	900.400	0.14	382	0.24	0.24				104.00			2.00
E-2	60.00		901.000	0.11	398	0.18	0.18				105.00			2.00
E-3	62.00		901.600	0.13	402	0.22	0.22				105.00			2.00
E-4	64.00		902.200	0.14	445	0.24	0.24				104.00			2.00
E-5	66.00		902.800	0.14	490	0.24	0.24				105.00			2.00
E-6	68.00		903.500	0.20	541	0.34	0.34				105.00			2.00
E-7	70.00	18:52	904.751	0.24	539	0.39	0.39				105.00			2.00
STOP	70.00		904.751											
F-1	72.00	18:58	905.400	0.23	399	0.39	0.39				104.00			2.00
F-2	74.00		905.800	0.21	412	0.36	0.36				104.00			2.00
F-3	76.00		906.700	0.28	436	0.48	0.48				105.00			2.00
F-4	78.00		907.500	0.28	460	0.48	0.48				105.00			2.00
F-5	80.00		908.400	0.30	491	0.51	0.51				106.00			2.00
F-6	82.00		909.300	0.32	521	0.55	0.55				106.00			2.00
F-7	84.00	19:10	910.241	0.32	512	0.55	0.55				107.00			2.00
STOP	84.00		910.241											
G-1	86.00	19:14	911.200	0.22	385	0.37	0.37				106.00			2.00
G-2	88.00		912.000	0.27	400	0.46	0.46				106.00			2.00
G-3	90.00		913.000	0.30	412	0.51	0.51				106.00			2.00
G-4	92.00		913.650	0.36	479	0.61	0.61				106.00			2.00
G-5	94.00		914.700	0.40	508	0.68	0.68				107.00			2.00
G-6	96.00		915.700	0.38	516	0.65	0.65				107.00			2.00
G-7	98.00	19:26	916.641	0.38	535	0.65	0.65				108.00			2.00
END														

$\sqrt{\Delta P}$ $\sqrt{\frac{T_s}{25.4 \cdot 29}}$

FIELD DATA

PLANT FMC - Pocatello
DATE 8/25/88
SAMPLING LOCATION INLET
SAMPLE TYPE MM 111
RUN NUMBER 4
OPERATOR MWH JTW
AMBIENT TEMPERATURE ~~80~~ 95
BAROMETRIC PRESSURE 25.4
STATIC PRESSURE, (P_s) -3.0" H_2O
FILTER NUMBER (s) U-34

PROBE LENGTH AND TYPE 15' GLASS
NOZZLE I.D. .239
ASSUMED MOISTURE, % 29
SAMPLE BOX NUMBER
METER BOX NUMBER RAC #5 0.9996
METER $\Delta H_@$ 1.91
K-FACTOR 1.7
PROBE HEATER SETTING 250
HEATER BOX SETTING 250
REFERENCE Δp

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 MINUTES

initial leak .001 CFM @ 6"

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0930	882.617									
A-1	2	17:32	883.30	.16	.27	.27	352	99	99	0	238	80
2	4	17:34	883.90	.11	.18	.18	352	100	100	0	243	79
3	6	17:36	884.40	.11	.18	.18	381	100	100	0	243	79
4	8	17:38	885.1	.17	.29	.29	420	104	100	0	243	80
5	10	17:40	885.9	.20	.34	.34	442	101	100	0	248	81
6	12	17:42	886.6	.18	.31	.31	498	102	100	0	254	80
7	14	17:44	887.221	.18	.31	.31	524	102	100	0	258	80
	14	17:46	887.221									
B-1	16	17:48	887.80	.16	.27	.27	343	103	101	0	263	85
2	18	17:50	888.45	.13	.22	.22	345	104	102	0	264	80
3	20	52	889.0	.11	.18	.18	378	105	103	0	267	80
4	22	54	889.6	.16	.27	.27	415	106	103	0	263	78
5	24	56	890.3	.19	.32	.32	488	108	105	0	269	75
6	26	58	891.1	.21	.36	.36	529	108	104	0	268	74
7	28	18:00	892.073	.32	.54	.54	550	108	105	0	246	72
	28	18:02	892.073									
C 1	30	18:04	892.5	.08	.14	.14	346	107	102	0	263	79
2	32	06	893.0	.06	.10	.10	352	108	104	0	266	75
3	34	08	893.4	.06	.10	.10	371	109	105	0	270	77
4	36	10	893.8	.11	.18	.18	421	106	106	0	268	71
5	38	12	894.5	.16	.27	.27	478	107	105	0	262	69
6	40	14	895.16	.21	.36	.36	502	107	105	0	255	67
7	42	16	895.934	.24	.41	.41	508	108	106	0	271	67

COMMENTS:

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4/72

.377 .542 .142 29 F/S.

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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	42	18:18	895.934									
D-1	44	20	896.3	.08	.14	.14	354	106	105	0	289	80
2	46	22	896.80	.08	.14	.14	386	106	105	0	280	75
3	48	24	897.30	.08	.14	.14	394	107	105	0	290	75
4	50	26	897.80	.10	.17	.17	455	107	106	0	288	76
5	52	28	898.4	.12	.21	.21	505	107	106	0	284	74
6	54	30	899.0	.19	.32	.32	553	108	106	0	281	73
7	56	32	899.806	.25	.42	.42	542	108	106	0	275	73
	56	18:38	899.806									
E-1	58	40	900.4	.14	.24	.24	382	104	103	0	287	82
2	60	42	901.0	.11	.18	.18	398	105	104	0	280	76
3	62	44	901.6	.13	.22	.22	402	105	104	0	278	76
4	64	46	902.2	.14	.24	.24	445	104	104	0	276	75
5	66	48	902.8	.14	.24	.24	490	105	104	0	276	75
6	68	50	903.5	.20	.34	.34	541	105	104	0	275	74
7	70	52	904.751	.24	.39	.39	539	105	104	0	273	73
	70	56	904.751									
F-1	72	58	905.4	.23	.39	.39	399	104	102	0	283	74
2	74	19:00	905.8	.21	.36	.36	412	104	103	0	280	72
3	76	1902	906.7	.28	.48	.46	436	105	103	0	278	70
4	78	19:04	907.5	.28	.48	.48	460	105	103	0	277	71
5	80	19:06	908.4	.30	.51	.51	491	106	102	0	274	71
6	82	19:08	909.3	.32	.55	.55	521	106	102	0	276	71
7	84	19:10	910.241	.32	.55	.55	512	107	102	0	269	71
	84	19:12	910.241									
G-1	86	19:14	911.2	.22	.37	.37	385	106	102	0	279	76
2	88	19:16	912.0	.27	.46	.46	400	106	102	0	268	71
3	90	19:18	913.0	.30	.51	.51	412	106	102	0	262	69
4	92	19:20	913.65	.36	.61	.61	479	106	102	0	258	68
5	94	19:22	914.7	.40	.68	.68	508	107	102	0	251	68
6	96	19:24	915.7	.38	.65	.65	516	107	102	0	250	69
7	98	19:26	916.641	.38	.65	.65	535	108	102	0	251	71

FINAL LEAK CHK = .02 CFM @ 4" Hg.

1691

EPA (Dur) 236
4 72

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8-25-88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 4.00
OPERATOR .....BDR
AMBIENT TEMPERATURE 90.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER W-10
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING 250.00
HEATER BOX SETTING 250.00
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.008 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	17:22	219.178											
B1	5.00		223.200	0.64	133	1.80	1.80				98.00	96.00		
B2	10.00		227.900	0.93	130	2.60	2.60				101.00	98.00		
B3	15.00		232.700	0.87	130	2.50	2.50				105.00	98.00		
B4	20.00		236.900	0.74	133	2.10	2.10				106.00	99.00		
B5	25.00		241.000	0.70	136	2.00	2.00				106.00	99.00		
B6	30.00	17:52	245.152	0.67	137	1.90	1.90				105.00	100.00		
STOP	30.00	18:04	245.271											
A1	35.00	18:09	248.900	0.49	134	1.40	1.40				98.00	97.00		
A2	40.00		252.900	0.67	134	1.90	1.90				99.00	98.00		
A3	45.00		257.100	0.70	136	2.00	2.00				103.00	98.00		
A4	50.00		261.400	0.78	136	2.20	2.20				104.00	99.00		
A5	55.00		265.700	0.77	131	2.20	2.20				105.00	99.00		
A6	60.00	18:34	269.928	0.78	132	2.20	2.20				105.00	99.00		
END														

INITIAL LEAK V: 0.01 CFM @ 5 in.

FIELD DATA

PLANT FMC
DATE 8-25-88
SAMPLING LOCATION OUTLET 1-1 (OTA)
SAMPLE TYPE M MILL
RUN NUMBER 4
OPERATOR JG - GDR
AMBIENT TEMPERATURE 90°
BAROMETRIC PRESSURE 25.45
STATIC PRESSURE, (P_s) -.3
FILTER NUMBER (s)

PROBE LENGTH AND TYPE 11' glass
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER 3
METER BOX NUMBER RAC #12
METER $\Delta H_@$ 1.79
K FACTOR 2.84
PROBE HEATER SETTING 60%
HEATER BOX SETTING 60%
REFERENCE Δp NA

SCHEMATIC OF TRAVERSE POINT LAYOUT

Y = .9943

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\ in}$), °F	OUTLET ($T_{m\ out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1722	219.178									
B 1	5	1727	223.2	.64		1.8	133	98	96	1	251	68
2	10	1732	227.9	.93		2.6	130	101	98	2	258	65
3	15	1737	232.7	.87		2.5	130	105	98	2	253	66
4	20	1742	236.9	.74		2.1	133	106	99	2	256	67
5	25	1747	241.0	.7		2.0	136	106	99	2	258	68
6	30	1752	245.152	.67		1.9	137	105	100	2	258	66
					end of port B			leak	✓	.012 @ 7"		
		1804	45.271		changed ports			leak	✓	.008 @ 5"		
A 1	35	1809	48.9	.49		1.4	134	98	97	2	265	63
2	40	1814	52.9	.67		1.9	134	98	98	2	260	64
3	45	1819	57.1	.7		2.0	136	103	98	2	248	58
4	50	1824	61.4	.78		2.2	136	104	99	2	246	56
5	55	1829	65.7	.77		2.2	131	105	99	2	246	60
6	60	1834	69.928	.78		2.2	132	105	99	2	248	62

COMMENTS:

final leak ✓ .008 @ 5"

EPA (Dur) 235
4/72

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			

EPA (Dur) 236
4/72

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE M111
RUN NUMBER 4.00
OPERATOR .....PWB/RDD
AMBIENT TEMPERATURE 92.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER N-33
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
IAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.250
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.88
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 10" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

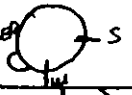
Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	17:20	11.653											
N-1	5.00		15.600	0.75	140	2.15	2.15				97.00	99.00		
N-2	10.00		20.200	0.86	137	2.50	2.50				98.00	101.00		
N-3	15.00		25.050	0.90	135	2.60	2.60				98.00	107.00		
N-4	20.00		29.350	0.64	133	1.85	1.85				100.00	111.00		
N-5	25.00		33.400	0.64	137	1.85	1.85				101.00	113.00		
N-6	30.00	17:50	37.694	0.69	138	2.00	2.00				101.00	113.00		
STOP	30.00	17:55	37.694											
T-1	35.00	18:00	41.800	0.71	141	2.05	2.05				101.00	108.00		
T-2	40.00		46.300	0.77	139	2.20	2.20				101.00	109.00		
T-3	45.00		50.800	0.77	139	2.20	2.20				101.00	111.00		
T-4	50.00		55.400	0.81	142	2.35	2.35				101.00	111.00		
T-5	55.00		59.900	0.77	138	2.20	2.20				101.00	111.00		
T-6	60.00	18:25	64.319	0.66	137	1.90	1.90				102.00	113.00		
END														

CALCULATED

LEAK$_I$ <.01 CFM -9" Hg

LEAK$_F$ <.01 CFM -10" Hg

LADDER



PLANT FMC - Pocatello
DATE 8-25-88
SAMPLING LOCATION OUTLET 1-2 OTB
SAMPLE TYPE M 11
RUN NUMBER OTB-4
OPERATOR DWR/DO

K = 2.88
Y = 1.0035
ΔH@ = 1.77

RAC #7

1 of 1

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	5 / 1720	11.655									
W 1	1725	15.6	.75	2.10	2.15	140	97	99	4	390	59
2	1730	20.2	.86	2.48	2.50	137	98	101	4	480	60
3	1735	25.05	.90	2.59	2.60	135	98	107	6	414	61
4	1740	29.35	.64	1.84	1.85	133	100	111	4	420	61
5	1745	33.44	.64	1.84	1.85	137	101	113	4	431	62
6	1750	37.694	.69	1.99	2.00	138	101	113	4	432	64
S 1	1755	37.694	.71	2.04	2.05	141	101	109	4	393	58
2	1800	41.8	.77	2.22	2.20	139	101	109	4	402	59
3	1805	46.3	.77	2.22	2.20	139	101	111	5	410	61
4	1810	50.8	.81	2.33	2.35	142	101	111	6	410	63
5	1815	55.4	.77	2.22	2.20	138	101	111	5	425	63
6	1820	59.9	.66	1.90	1.90	137	102	113	5	427	65
	1825	64.319									

COMMENTS

P_m 25.43

C_p .84

D_n .250

β_w .18

ΔH_e 1.77

P_s 25.59

T_s 558°

T_m 570°

M_d 30.4

M_s 28.04

$$K = (846.72)(D_n^4)(\Delta H_e)(C_p^2)(1-\beta_w)^2\left[\frac{M_d}{M_s}\right]\left[\frac{P_s}{P_m}\right]\left[\frac{T_m}{T_s}\right]$$

$$K = (846.72)(.0039)(1.77)(.7056)(.6724)(1.0892)(1.0063)(.9532)$$

$$K = 2.88$$

APPENDIX D.5 - Test Runs No. 5, 6, and 7, Outlets A and B, only

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8-26-88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 5.00
OPERATOR .....BDR/FLB
AMBIENT TEMPERATURE 70.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER W-38
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.011
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11", GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 5.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING .....
HEATER BOX SETTING .....
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.008 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	8:30	270.848											
A-1	5.00		274.900	0.75	134	2.10	2.10				70.00	70.00		
A-2	10.00		279.900	1.10	134	3.10	3.10				75.00	71.00		
A-3	15.00	8:45	284.862	1.20	133	3.40	3.40				80.00	72.00		
STOP	15.00	9:42	284.862											
A-4	20.00	9:47	289.700	0.99	138	2.80	2.80				71.00	70.00		
A-5	25.00		294.700	1.10	138	3.10	3.10				75.00	71.00		
A-6	30.00	9:57	299.959	1.20	134	3.40	3.40				78.00	72.00		
STOP	30.00	10:09	300.071											
B-1	35.00	10:14	305.200	1.10	133	3.10	3.10				74.00	73.00		
B-2	40.00		310.800	1.30	133	3.60	3.60				79.00	74.00		
B-3	45.00		316.000	1.20	133	3.40	3.40				83.00	74.00		
B-4	50.00		321.100	1.10	133	3.10	3.10				84.00	75.00		
B-5	55.00		325.900	1.00	132	2.70	2.70				84.00	76.00		
B-6	60.00	10:39	330.554	0.94	133	2.50	2.50				84.00	76.00		
END														

INITIAL LEAK-V: 0.011 cfm @ 5 in.
K=2.84 @ 100° tm
2.7 @ 80° tm

PLANT FMC
DATE 5-26-88
SAMPLING LOCATION OUTLET 1-1 (OTA)
SAMPLE TYPE M111
RUN NUMBER 5
OPERATOR GDR + FLM
AMBIENT TEMPERATURE 70°F
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE, in. H2O -0.3
FILTER NUMBER 1038

PROBE LENGTH AND TYPE 11' GLASS
NOZZLE I.D. 0.251 IN
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER 7
METER BOX NUMBER RAC #12
METER ΔH@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING 60%
HEATED BOX SETTING 60%
REFERENCE Δp NA
METER Y 0.9943

SCHEMATIC OF TRAVERSE POINT LAYOUT

RADIAN

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24-hr CLOCK)	GAS METER READING (ft³)	VELOCITY HEAD (in. H2O)	ORIFICE PRESSURE DIFFERENTIAL (in. H2O) DESIRED	ACTUAL	STACK TEMPERATURE (°F)	DRY GAS METER TEMPERATURE INLET (°F)	OUTLET (°F)	PUMP VACUUM (in. Hg)	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	0830	270.848									
A 1	5	0835	274.9	.75		2.1	134	70	70	1	262	55
2	10	0840	279.9	.71		3.1	134	75	71	2	256	49
3	15	0845	284.862	1.2		3.4	135	80	72	2	255	52
4				stopped	the	plant	upset					
		0942	289.862	restart								
A 4	20	0947	289.7	.99		2.8	138	71	70	2	250	64
5	25	0952	294.7	1.1		3.1	138	75	71	2	246	54
6	30	0957	299.959	1.2		3.4	134	78	72	2	253	58
				end	of	part	A	leak ✓		.020 @ 4"		
		1009	0.071	changed		parts	B &	leak	✓	.010 @ 3"		
B 1	35	1014	5.2	1.1		3.1	133	74	73	2	238	56
2	40	1019	10.8	1.3		3.6	133	79	74	2	245	50
3	45	1024	16.0	1.2		3.4	135	83	74	2	252	53
4	50	1029	21.1	1.1		3.1	133	84	73	2	251	56
5	55	1034	25.9	1.0		2.7	132	84	76	2	253	58
6	60	1039	30.554	.94		2.5	133	84	76	2	251	58

COMMENTS

Final leak ✓ .008 @ 5"

EPA Meth 2Da
4/77

Source Sampling Field Data

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/26/88
SAMPLING LOCATION ..OUTLET 9
SAMPLE TYPE M111
RUN NUMBER 5.00
OPERATOR .....PMB/RDG
AMBIENT TEMPERATURE 75.00
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER M-39
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER .....
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.88
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 10" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Orifice Pressure Differential (del H, in. H2O) Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	9:43	112.170								70.00	74.00		
M-1	5.00		117.000	1.10	139	3.20	3.20				70.00	80.00		
M-2	10.00		122.250	1.25	139	3.60	3.60				72.00	86.00		
M-3	15.00		127.440	1.15	136	3.30	3.30				73.00	88.00		
M-4	20.00		132.150	0.85	133	2.45	2.45				74.00	89.00		
M-5	25.00		136.700	0.83	138	2.40	2.40				75.00	90.00		
M-6	30.00	10:13	141.265	0.85	139	2.45	2.45							
STOP	30.00	10:18	141.265								74.00	89.00		
T-1	35.00	10:23	146.600	0.96	138	2.75	2.75				76.00	88.00		
T-2	40.00		150.950	1.10	137	3.20	3.20				76.00	91.00		
T-3	45.00		156.150	1.15	135	3.30	3.30				77.00	94.00		
T-4	50.00		161.470	1.15	137	3.30	3.30				78.00	96.00		
T-5	55.00		166.430	1.00	141	2.90	2.90				79.00	97.00		
T-6	60.00	10:48	171.201	0.88	141	2.55	2.55							
END														

Y = 1.0035

FILTER W39

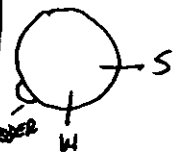
FIELD DATA

PLANT FMC Pocatello
DATE 8-26-88
SAMPLING LOCATION OUTLET 1-2 ORB
SAMPLE TYPE M 111
RUN NUMBER 5
OPERATOR ROB/RDO
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE
STATIC PRESSURE, (P_s)
FILTER NUMBER (s)

Leak$_I$ <.01 CFM | -9" Hg
Leak$_F$ <.01 CFM | -10" Hg

PROBE LENGTH AND TYPE
NOZZLE I.D. .250
ASSUMED MOISTURE, % 18
SAMPLE BOX NUMBER
METER BOX NUMBER PAC #7
METER $\Delta H_@$ 1.27
K FACTOR 2.88
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp

CALCULATOR



SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		5 0943	112.170									
W	1	0948	117.0	1.10	3.17	3.20	139	70	74	10	347	52
	2	0953	122.25	1.25	3.60	3.60	139	70	80	12	353	53
	3	0958	127.44	1.15	3.31	3.30	136	72	86	10	367	58
	4	1003	132.15	.85	2.45	2.45	133	73	88	7	358	60
	5	1008	136.7	.83	2.39	2.40	138	74	89	7	353	60
	6	1013	141.245	.85	2.45	2.45	139	75	90	7	359	61
S	1	1018	141.245	.96	2.76	2.75	138	74	89	8	335	58
S	2	1023	146.6	1.10	3.17	3.20	137	76	89	10	312	59
	3	1028	150.95	1.15	3.31	3.30	135	76	91	10	336	62
	4	1033	156.15	1.15	3.31	3.30	137	77	94	10	343	65
	5	1038	161.47	1.00	2.88	2.90	141	78	96	10	341	68
	6	1043	166.43	.88	2.53	2.55	141	79	97	8	361	65
		1048	171.281									

COMMENTS:

EPA (Dur) 235
4/72

P_m 25.43

C_p .84

D_n .250

B_{wl} .18

$\Delta H@$ 1.77

P_s 25.59

T_s 598°

T_m 570°

M_d 30.4

M_s 28.04

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			

$K = (84.72)(.0039)(1.77)(.7056)(.6794)(1.0842)(1.0063)(.9532)$

$K = 2.88$

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SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8-26-88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 6.00
OPERATOR .....GDR/FLS
AMBIENT TEMPERATURE 80.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER N-40
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.015
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11", GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER .....
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 2.84
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.018 @ 12" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Pv), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	12:38	331.023											
A-1	5.00		335.000	0.62	133	1.80	1.80				80.00	82.00		
A-2	10.00		339.200	0.85	134	2.40	2.40				82.00	79.00		
A-3	15.00		344.350	1.10	136	3.00	3.00				88.00	80.00		
A-4	20.00		348.000	1.10	132	3.00	3.00				91.00	81.00		
A-5	25.00		354.800	1.10	138	3.00	3.00				93.00	82.00		
A-6	30.00	13:08	359.744	1.00	140	2.80	2.80				94.00	82.00		
STOP	30.00	13:18	360.075											
B-1	35.00	13:23	365.500	1.30	138	3.60	3.60				86.00	82.00		
B-2	40.00		371.200	1.30	134	3.60	3.60				93.00	94.00		
B-3	45.00		376.800	1.30	134	3.60	3.60				96.00	85.00		
B-4	50.00		381.900	1.00	136	2.80	2.80				97.00	84.00		
B-5	55.00		386.800	0.90	140	2.50	2.50				97.00	86.00		
B-6	60.00	13:48	391.714	0.90	140	2.50	2.50				95.00	86.00		
END														

RUN #6

INITIAL LEAK V = 0.015 cfm @ 8 in.

PLANT FMC
DATE 9-26-88
SAMPLING LOCATION OUTLET 1-1 SOTA
SAMPLE TYPE HM
RUN NUMBER 6
OPERATOR GORTFLG
AMBIENT TEMPERATURE 80
BAROMETRIC PRESSURE 28.43
STATIC PRESSURE, P_s -0.3 in. H_2O
FILTER NUMBER(s) W-40

PROBE LENGTH AND TYPE 11' GLASS
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER
METER BOX NUMBER RAC 12
METER $\Delta H_@$ 1.74
K FACTOR 2.84
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 0.9943

K=2.78 @ Tm=80

SCHEMATIC OF TRAVERSE POINT LAYOUT

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) DESIRED	ACTUAL	STACK TEMPERATURE (T_s, °F)	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$, °F)	OUTLET ($T_{m_{out}}$, °F)	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1238	331.023									
A-1	5	1243	335.	0.62	1.8	1.8	133	80	82	2	268	66
A-2	10	1248	339.2	0.85	2.4	2.4	134	82	79	2	270	65
A-3	15	1253	344.85	1.1	3.0	3.0	136	88	80	4	275	67
A-4	20	1258	348	1.1	3.0	3.0	132	91	81	4	268	68
A-5	25	1303	354.8	1.1	3.0	3.0	138	93	82	4	269	72
A-6	30	1308	359.744	1.0	2.8	2.8	140	94	82	4	270	74
		LEAK CHECK BEFORE		PORT Δ =	0.02 cfm @ 8 in. Hg							
		LEAK CHECK AFTER		PORT Δ =	0.012 cfm @ 10 in. Hg							
		1318	360.075									
B-1	35	1323	365.5	1.3	3.6	3.6	138	86	82	5	251	60
B-2	40	1328	371.2	1.3	3.6	3.6	134	93	94	5	240	59
B-3	45	1333	376.8	1.3	3.6	3.6	134	96	88	5	243	61
B-4	50	1338	381.9	1.0	2.8	2.8	136	97	84	4	250	65
B-5	55	1343	386.8	0.9	2.5	2.5	140	97	86	4	255	67
B-6	60	1348	391.714	0.9	2.5	2.5	140	95	86	4	261	70
		FINAL LEAK V =		0.018 cfm @ 12 in. Hg								

COMMENTS

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Source Sampling Field Data

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/26/88
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE M111
RUN NUMBER 6.00
OPERATOR .....PWB/RDO
AMBIENT TEMPERATURE 80.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER M-41
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER .....
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.88
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 10" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	12:35	172.650											
T-1	5.00		177.250	0.99	141	2.85	2.85				78.00	81.00		
T-2	10.00		182.400	1.15	142	3.30	3.30				79.00	86.00		
T-3	15.00		187.600	1.15	144	3.30	3.30				79.00	86.00		
T-4	20.00		192.900	1.15	142	3.30	3.30				81.00	94.00		
T-5	25.00		197.880	0.97	136	2.80	2.80				83.00	97.00		
T-6	30.00	13:05	202.614	0.87	136	2.50	2.50				84.00	99.00		
STOP	30.00	13:10	202.614											
M-1	35.00	13:15	207.800	1.15	141	3.30	3.30				85.00	93.00		
M-2	40.00		213.300	1.30	142	3.74	3.74				86.00	98.00		
M-3	45.00		218.650	1.20	143	3.45	3.45				87.00	101.00		
M-4	50.00		223.550	0.90	138	2.60	2.60				88.00	102.00		
M-5	55.00		228.230	0.85	139	2.45	2.45				88.00	102.00		
M-6	60.00	13:40	232.878	0.85	142	2.45	2.45				87.00	102.00		
END														

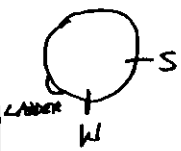
The "B" Team

Leak I <.01 cfm | -10" Hg

Leak F <.01 cfm | -10" Hg

Filter WH!

CALCINER



PLANT FMC-Pocatello
DATE 8-24-88
SAMPLING LOCATION Outlet 1-2 A/B
SAMPLE TYPE B/III
RUN NUMBER 16
OPERATOR EWR/RDO
AMBIENT TEMPERATURE
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE, (P_s)
FILTER NUMBER(s)

PROBE LENGTH AND TYPE
NOZZLE I.D. .250
ASSUMED MOISTURE, % 18
SAMPLE BOX NUMBER
METER BOX NUMBER EAC 197
METER ΔH@ 1.97
K FACTOR 2.88
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 1.0035

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (ft³)	VELOCITY HEAD (in. H₂O)	ORIFICE PRESSURE DIFFERENTIAL (in. H₂O) DESIRED	ORIFICE PRESSURE DIFFERENTIAL (in. H₂O) ACTUAL	STACK TEMPERATURE (°F)	DRY GAS METER TEMPERATURE INLET (°F)	DRY GAS METER TEMPERATURE OUTLET (°F)	PUMP VACUUM in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
			172.65									
S 1		1235	172.65	.95	2.85	2.85	141	78	81	4	316	59
2		1240	177.25	1.15	3.31	3.3	142	79	86	5	345	60
3		1245	182.4	1.15	3.31	3.3	144	79	86	6	346	60
4		1250	187.6	1.15	3.31	3.3	142	81	94	6	345	61
5		1255	192.9	.97	2.79	2.8	136	83	97	5	370	61
6		1300	197.80	.87	2.51	2.5	136	84	99	4	372	63
		1305	202.614									
W 1		1310	202.614	1.15	3.31	3.3	141	85	95	6	381	60
2		1315	207.8	1.30	3.74	3.74	142	86	98	6	372	61
3		1320	213.3	1.20	3.46	3.45	143	87	101	6	363	62
4		1325	218.66	.90	2.59	2.60	138	88	102	4	363	63
5		1330	223.55	.85	2.45	2.45	139	88	102	4	362	64
6		1335	228.23	.85	2.45	2.45	142	89	102	4	364	64
		1340	232.878									

COMMENTS

EPA Meth 2B
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Source Sampling Field Data

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8-26-88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE M111
RUN NUMBER 7.00
OPERATOR .....GDR/FLB
AMBIENT TEMPERATURE 85.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER W-42
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.012
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11", GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.251
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 7.00
METER BOX NUMBER RAC-12
METER DELTA HB 1.79
K FACTOR 2.80
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.012 @ 6" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	15:50	91.984											
A-1	5.00		96.100	0.75	134	2.15	2.15				86.00	87.00		
A-2	10.00		101.400	1.20	134	3.30	3.30				88.00	86.00		
A-3	15.00		106.800	1.20	134	3.30	3.30				91.00	86.00		
A-4	20.00		112.000	1.10	134	3.00	3.00				94.00	87.00		
A-5	25.00		117.000	1.10	138	3.00	3.00				95.00	87.00		
A-6	30.00	16:20	122.429	1.20	141	3.30	3.30				95.00	88.00		
STOP	30.00	16:29	22.566											
B-1	35.00	16:34	28.000	1.20	137	3.30	3.30				89.00	88.00		
B-2	40.00		33.600	1.30	134	3.60	3.60				94.00	88.00		
B-3	45.00		39.200	1.30	133	3.60	3.60				96.00	89.00		
B-4	50.00		44.400	1.10	139	3.00	3.00				97.00	89.00		
B-5	55.00		49.300	0.93	139	2.60	2.60				97.00	89.00		
B-6	60.00	16:59	54.229	0.98	134	2.70	2.70				96.00	89.00		
END														

FIELD DATA

PLANT FMC
DATE 8/26/88
SAMPLING LOCATION 1-1 DTA
SAMPLE TYPE manual
RUN NUMBER 2
OPERATOR Hg - RDR
AMBIENT TEMPERATURE 85
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE, (P_s) -.13
FILTER NUMBER (s) 672

PROBE LENGTH AND TYPE 11' glass
NOZZLE I.D. .251
ASSUMED MOISTURE, % 18.2
SAMPLE BOX NUMBER 4
METER BOX NUMBER 12
METER $\Delta H_@$ 1.79
K FACTOR 2.8
PROBE HEATER SETTING 602
HEATER BOX SETTING 602
REFERENCE Δp NA

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

Y = .9943

initial leak ✓ .012 @ 6"

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 DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	0	1550	91.984									
A 1	5	55	96.1	0.78	2.15	2.15	134	86	87	1	234	71
2	10	1600	101.4	1.2	3.3	3.3	134	88	86	1	235	70
3	15	05	106.8	1.2	3.3	3.3	134	91	86	1	247	71
4	20	10	112.0	1.1	3.0	3.0	134	94	87	1	252	70
5	25	15	117.0	1.1	3.0	3.0	138	95	87	1	248	68
6	30	1620	122.429	1.2	3.3	3.3	141	95	88	1	251	68
				end of	port	A		leak	✓	.008 @ 6"		
		1629	22.566	change	d	ports		leak	✓	.006 @ 6"		
B 1	35	34	28.10	1.2	3.3	3.3	137	89	88	2	235	61
2	40	39	33.6	1.3	3.6	3.6	134	94	88	2	240	58
3	45	44	39.2	1.3	3.6	3.6	133	96	89	2	248	58
4	50	49	44.4	1.1	3.0	3.0	139	97	89	2	250	61
5	55	54	49.3	.93	2.6	2.6	139	97	89	2	260	64
6	60	1659	54.229	.98	2.7	2.7	134	96	89	2	258	65

COMMENTS:

final leak ✓ .012 @ 6"

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SAMPLING DATA

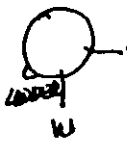
PLANT .....FMC - POCATELLO
DATE 8/26/88
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE M111
RUN NUMBER 7.00
OPERATOR .....PWB/RDO
AMBIENT TEMPERATURE 90.00
BAROMETRIC PRESSURE 25.43
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER N-43
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....11', GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER 7.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 2.81
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 9" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	15:50	233.171											
N-1	5.00		238.340	1.15	143	3.25	3.25				85.00	81.00		
N-2	10.00		243.700	1.30	136	3.65	3.65				86.00	87.00		
N-3	15.00		249.100	1.30	138	3.65	3.65				86.00	94.00		
N-4	20.00		254.000	0.90	144	2.55	2.55				88.00	98.00		
N-5	25.00		258.670	0.85	144	2.40	2.40				88.00	102.00		
N-6	30.00	16:20	263.358	0.84	143	2.35	2.35				89.00	104.00		
STOP	30.00	16:24	263.358											
T-1	35.00	16:29	268.200	1.00	136	2.80	2.80				90.00	98.00		
T-2	40.00		273.300	1.10	139	3.10	3.10				90.00	103.00		
T-3	45.00		278.500	1.10	143	3.10	3.10				91.00	105.00		
T-4	50.00		283.820	1.15	143	3.25	3.25				91.00	108.00		
T-5	55.00		289.100	1.00	143	2.80	2.80				92.00	109.00		
T-6	60.00	16:34	293.762	0.90	142	2.55	2.55				92.00	108.00		
END														

CALCULATED



PLANT FMC - POCATELLO
DATE 8-26-88
SAMPLING LOCATION OUTLET 1-2 OTB
SAMPLE TYPE M III
RUN NUMBER 5
OPERATOR [illegible]
AMBIENT TEMPERATURE 90
BAROMETRIC PRESSURE 26.43
STATIC PRESSURE, (P_s)
FILTER NUMBER

LEAK_I <.01 CFM | -10" Hg
LEAK_F <.01 CFM | -9" Hg

PROBE LENGTH AND TYPE
NOZZLE I.D. .250
ASSUMED MOISTURE, % 18
SAMPLE BOX NUMBER
METER BOX NUMBER RAC 07
METER ΔH@ 1.77
K FACTOR 3.81
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y 1.0035

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 5 MINUTES

TRAVERSE POINT NUMBER	CLOCK TIME (24 hr CLOCK) / SAMPLING TIME, min	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp), in. H₂O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H₂O DESIRED	ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET (T_m), °F	OUTLET (T_m), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
	5	233.171									
III 1	1550	233.171	1.15	3.23	3.20	143	86	87	10	340	66
2	1555	238.34	1.30	3.65	3.65	136	86	94	12	359	60
3	1600	243.7	1.30	3.65	3.65	138	86	98	12	380	65
4	1605	249.1	.90	2.53	2.55	144	88	102	8	374	72
5	1610	254.6	.85	2.39	2.40	140	88	104	8	377	74
6	1615	258.67	.84	2.36	2.35	143	89	104	7	379	72
	1620	263.358									
5 1	1624	263.358	1.0	2.81	2.80	136	90	98	7	331	65
2	1629	268.2	1.1	3.09	3.10	139	90	103	10	341	59
3	1634	273.3	1.1	3.09	3.10	143	91	105	10	356	60
4	1639	278.5	1.15	3.23	3.25	143	91	108	10	362	61
5	1644	283.82	1.0	2.81	2.80	143	92	109	8	368	63
6	1649	288.1	.90	2.53	2.55	142	92	108	7	370	65
	1654	293.762									

COMMENTS

EPA Meth 2G
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Source Sampling Field Data

RADIAN

APPENDIX E - PSD Sampling Parameter Summaries

E.1 - Test Run No. 1, 8/23/88
E.2 - Test Run No. 2, 8/24/88
E.3 - Test Run No. 3, 8/25/88

APPENDIX E.1 - Test Run No. 1, 8/23/88

FMC - POCATELLO, INLET RUN 1, 8/23/88
FILTER SET X

TIME	4.0000	TIME=MINUTES
VOLUME	1.7900	VOLUME=dcf MEASURED AT METER
Ts	872.7500	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	484.5278	T=IMPACTOR TEMPERATURE (K)
%M	0.1060	%M=STACK MOISTURE FRACTION (%/100)
MW	28.5800	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	23.8600	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4475	Qm=SAMPLING RATE AT METER (DCFM)
Pm	24.0800	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	546.5000	Tm=AVERAGE METER TEMPERATURE (R)
Qa	380.7477	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0003	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	0.0000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	1.3900	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	11.6952	0.03190	0.7696	0.2304	24.1818	5.613E-01
2	7.6386	0.00080	0.0193	0.2111	9.4517	4.801E-02
3	4.9841	0.00099	0.0239	0.1872	6.1702	5.928E-02
4	3.5195	0.00460	0.1110	0.0762	4.1883	3.380E-01
5	2.0835	0.00028	0.0068	0.0695	2.7080	1.365E-02
6	1.1831	0.00128	0.0309	0.0386	1.5700	5.782E-02
7	0.7246	0.00014	0.0034	0.0352	0.9259	7.300E-03
8	0.4576	0.00040	0.0097	0.0256	0.5758	2.225E-02
BCK-UP	< 0.4576	0.00106	0.0256	0.0000	0.0478	6.000E-03
	TOTAL	0.04145				

FACILITY : FMC - POCATELLO

DATE: 8/23/88	
LOCATION: INLET	
RUN NUMBER: 1.00	
SAMPLING PARAMETER	**PARTICLE SIZE DISTRIBUTION**
Total Sampling Time (min.)	4.00
Corrected Barometric Pressure (in. Hg)	24.08
Absolute Stack Pressure,Ps(in. Hg)	23.86
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	505.00
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	1.79
Average Meter Pressure (in.H2O)	0.53
Average Meter Temperature (F)	86.50
Moisture Collected (g)	87.70
Carbon Dioxide Concentration (%V)	7.50
Oxygen Concentration (%V)	16.05
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.35
Standard Metered Volume,Vm(std) (dscf)	1.39
Standard Metered Volume,Vm(std) (dscm)	0.039
Standard Volume Water Vapor,Vw (scf)	4.14
Standard Volume Water Vapor,Vw (scm)	0.117
Stack Moisture (%V)	10.64
Mole Fraction Dry Stack Gas	0.894
Dry Molecular Weight	29.84
Wet Molecular Weight	28.58
Stack Gas Velocity,Vs (fpm)	2510.59
Stack Gas Velocity,Vs (mpm)	765.23
Volumetric Flow Rate (acfm)	359014.57
Volumetric Flow Rate (acmm)	10167.292
Volumetric Flow Rate (dscfm)	139891.42
Volumetric Flow Rate (dscmm)	3961.725
Percent Isokinetic	104.43
Percent Excess Air	386.93
Fuel Factor,Fo	0.647
Ultimate CO2	32.32

FMC - POCATELLO, OUTLET A RUN 1, 8/23/88
FILTER SET L

TIME	90.0000	TIME=MINUTES
VOLUME	44.9700	VOLUME=dcf MEASURED AT METER
Ts	734.5000	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	407.7222	T=IMPACTOR TEMPERATURE (K)
%M	0.1453	%M=STACK MOISTURE FRACTION (%/100)
MW	28.1000	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3900	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4997	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.6100	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	549.6000	Tm=AVERAGE METER TEMPERATURE (R)
Qa	371.9244	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0002	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	1.6667	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	36.8300	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	11.1025	0.00060	0.0073	0.9927	23.5611	3.847E-04
2	7.2513	0.00037	0.0045	0.9883	8.9726	8.380E-04
3	4.7311	0.00113	0.0137	0.9746	5.8571	2.553E-03
4	3.3404	0.00015	0.0018	0.9728	3.9754	4.158E-04
5	1.9766	0.00191	0.0231	0.9496	2.5696	3.512E-03
6	1.1207	0.00264	0.0320	0.9176	1.4884	4.489E-03
7	0.6840	0.00340	0.0412	0.8765	0.8755	6.643E-03
8	0.4282	0.00744	0.0901	0.7864	0.5412	1.532E-02
BCK-UP	< 0.4282	0.06493	0.7864	0.0000	0.0463	1.408E-02
	TOTAL	0.08257				

FACILITY : FMC - POCATELLO

DATE: 8/23/88
LOCATION: OUTLET A
RUN NUMBER: 1.00

SAMPLING PARAMETER	PARTICLE SIZE DISTRIBUTION
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.61
Absolute Stack Pressure,Ps(in. Hg)	25.59
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	131.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	44.97
Average Meter Pressure (in.H2O)	0.62
Average Meter Temperature (F)	89.60
Moisture Collected (g)	156.20
Carbon Dioxide Concentration (%V)	7.30
Oxygen Concentration (%V)	16.25
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.41
Standard Metered Volume,Vm(std) (dscf)	36.83
Standard Metered Volume,Vm(std) (dscm)	1.043
Standard Volume Water Vapor,Vw (scf)	7.36
Standard Volume Water Vapor,Vw (scm)	0.209
Stack Moisture (%V)	14.53
Mole Fraction Dry Stack Gas	0.855
Dry Molecular Weight	29.82
Wet Molecular Weight	28.10
Stack Gas Velocity,Vs (fpm)	3313.86
Stack Gas Velocity,Vs (mpm)	1010.07
Volumetric Flow Rate (acfm)	105767.49
Volumetric Flow Rate (acmm)	2995.335
Volumetric Flow Rate (dscfm)	69022.52
Volumetric Flow Rate (dscmm)	1954.718
Percent Isokinetic	100.23
Percent Excess Air	411.59
Fuel Factor,Fo	0.637
Ultimate CO2	32.81

FMC - POCATELLO, OUTLET B RUN 1, 8/23/88
FILTER SET Y

TIME	90.0000	TIME=MINUTES
VOLUME	40.1700	VOLUME=dcf MEASURED AT METER
Ts	870.2857	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	483.1587	T=IMPACTOR TEMPERATURE (K)
%M	0.1872	%M=STACK MOISTURE FRACTION (%/100)
MW	27.6400	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3200	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4463	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.5400	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	557.9400	Tm=AVERAGE METER TEMPERATURE (R)
Qa	407.7586	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0003	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	0.0000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	32.6100	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	11.2892	0.00170	0.0227	0.9773	23.7584	1.245E-03
2	7.3735	0.00121	0.0162	0.9611	9.1236	3.095E-03
3	4.8113	0.00140	0.0187	0.9425	5.9562	3.573E-03
4	3.3976	0.00139	0.0186	0.9239	4.0431	4.354E-03
5	2.0117	0.00184	0.0246	0.8993	2.6144	3.826E-03
6	1.1429	0.00168	0.0224	0.8769	1.5163	3.238E-03
7	0.7010	0.00276	0.0368	0.8401	0.8951	6.152E-03
8	0.4441	0.00447	0.0597	0.7804	0.5580	1.067E-02
BCK-UP	< 0.4441	0.05845	0.7804	0.0000	0.0471	1.420E-02
	TOTAL	0.07490				

FACILITY : FMC - POCATELLO

DATE: 8/23/88	
LOCATION: OUTLET B	
RUN NUMBER: 1.00	
SAMPLING PARAMETER PARTICLE SIZE DISTRIBUTION	
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.54
Absolute Stack Pressure,Ps(in. Hg)	25.52
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	140.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	40.17
Average Meter Pressure (in.H2O)	0.47
Average Meter Temperature (F)	97.94
Moisture Collected (g)	199.20
Carbon Dioxide Concentration (%V)	7.60
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.30
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.36
Standard Metered Volume,Vm(std) (dscf)	32.61
Standard Metered Volume,Vm(std) (dscm)	0.923
Standard Volume Water Vapor,Vw (scf)	9.39
Standard Volume Water Vapor,Vw (scm)	0.266
Stack Moisture (%V)	18.72
Mole Fraction Dry Stack Gas	0.813
Dry Molecular Weight	29.86
Wet Molecular Weight	27.64
Stack Gas Velocity,Vs (fpm)	3300.35
Stack Gas Velocity,Vs (mpm)	1005.95
Volumetric Flow Rate (acfm)	105336.01
Volumetric Flow Rate (acmm)	2983.116
Volumetric Flow Rate (dscfm)	64213.59
Volumetric Flow Rate (dscmm)	1818.586
Percent Isokinetic	95.38
Percent Excess Air	396.70
Fuel Factor,Fo	0.632
Ultimate CO2	33.09

APPENDIX E.2 - Test Run No. 2, 8/24/88

FMC - POCATELLO, INLET RUN 2, 8/24/88
FILTER SET AB

TIME	4.0000	TIME=MINUTES
VOLUME	1.6500	VOLUME=dcf MEASURED AT METER
Ts	910.3000	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	505.3889	T=IMPACTOR TEMPERATURE (K)
%M	0.1872	%M=STACK MOISTURE FRACTION (%/100)
MW	27.6400	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3500	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4125	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.5700	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	559.1300	Tm=AVERAGE METER TEMPERATURE (R)
Qa	393.3333	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cmJ/sec)
u	0.0003	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	2.0000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	1.3300	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	11.6921	0.03240	0.8583	0.1417	24.1786	5.957E-01
2	7.6367	0.00103	0.0273	0.1144	9.4493	6.460E-02
3	4.9831	0.00094	0.0249	0.0895	6.1688	5.883E-02
4	3.5190	0.00069	0.0183	0.0713	4.1876	5.299E-02
5	2.0838	0.00052	0.0138	0.0575	2.7079	2.651E-02
6	1.1842	0.00038	0.0101	0.0474	1.5709	1.796E-02
7	0.7267	0.00011	0.0029	0.0445	0.9277	6.019E-03
8	0.4611	0.00019	0.0050	0.0395	0.5789	1.116E-02
BCK-UP	< 0.4611	0.00149	0.0395	0.0000	0.0480	8.799E-03
	TOTAL	0.03775				

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: INLET	
RUN NUMBER: 2.00	
SAMPLING PARAMETER	**PARTICLE SIZE DISTRIBUTION**
Total Sampling Time (min.)	4.00
Corrected Barometric Pressure (in. Hg)	25.57
Absolute Stack Pressure,Ps(in. Hg)	25.35
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	521.00
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	1.65
Average Meter Pressure (in.H2O)	0.55
Average Meter Temperature (F)	99.13
Moisture Collected (g)	199.20
Carbon Dioxide Concentration (%V)	7.60
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.30
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.33
Standard Metered Volume,Vm(std) (dscf)	1.33
Standard Metered Volume,Vm(std) (dscm)	0.038
Standard Volume Water Vapor,Vw (scf)	9.39
Standard Volume Water Vapor,Vw (scm)	0.266
Stack Moisture (%V)	18.72
Mole Fraction Dry Stack Gas	0.813
Dry Molecular Weight	29.86
Wet Molecular Weight	27.64
Stack Gas Velocity,Vs (fpm)	2279.79
Stack Gas Velocity,Vs (mpm)	694.88
Volumetric Flow Rate (acfm)	326010.30
Volumetric Flow Rate (acmm)	9232.612
Volumetric Flow Rate (dscfm)	120751.11
Volumetric Flow Rate (dscmm)	3419.672
Percent Isokinetic	115.81
Percent Excess Air	396.70
Fuel Factor,Fo	0.632
Ultimate CO2	33.09

FMC - POCATELLO, OUTLET A RUN 2, 8/24/88
FILTER SET AE

TIME	90.0000	TIME=MINUTES
VOLUME	37.3800	VOLUME=dcf MEASURED AT METER
Ts	726.0000	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	403.0000	T=IMPACTOR TEMPERATURE (K)
%M	0.1872	%M=STACK MOISTURE FRACTION (%/100)
MW	27.6400	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3800	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4153	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.6000	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	565.5800	Tm=AVERAGE METER TEMPERATURE (R)
Qa	312.2482	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0002	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	1.1667	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	29.8800	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	12.0663	0.00100	0.0183	0.9817	24.5624	8.365E-04
2	7.8806	0.00056	0.0102	0.9715	9.7514	1.563E-03
3	5.1415	0.00076	0.0139	0.9575	6.3654	2.116E-03
4	3.6300	0.00103	0.0188	0.9387	4.3202	3.519E-03
5	2.1476	0.00107	0.0196	0.9191	2.7921	2.424E-03
6	1.2169	0.00156	0.0285	0.8906	1.6166	3.266E-03
7	0.7414	0.00214	0.0392	0.8514	0.9498	5.136E-03
8	0.4622	0.00337	0.0617	0.7898	0.5854	8.482E-03
BCK-UP	< 0.4622	0.04316	0.7898	-0.0000	0.0481	1.134E-02
	TOTAL	0.05465				

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: OUTLET A	
RUN NUMBER: 2.00	
SAMPLING PARAMETER	**PARTICLE SIZE DISTRIBUTION**
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.60
Absolute Stack Pressure,Ps(in. Hg)	25.58
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	132.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	37.38
Average Meter Pressure (in.H2O)	0.45
Average Meter Temperature (F)	105.58
Moisture Collected (g)	199.20
Carbon Dioxide Concentration (%V)	7.60
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.30
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.33
Standard Metered Volume,Vm(std) (dscf)	29.88
Standard Metered Volume,Vm(std) (dscm)	0.846
Standard Volume Water Vapor,Vw (scf)	9.39
Standard Volume Water Vapor,Vw (scm)	0.266
Stack Moisture (%V)	18.72
Mole Fraction Dry Stack Gas	0.813
Dry Molecular Weight	29.86
Wet Molecular Weight	27.64
Stack Gas Velocity,Vs (fpm)	2856.19
Stack Gas Velocity,Vs (mpm)	870.57
Volumetric Flow Rate (acfm)	91160.14
Volumetric Flow Rate (acmm)	2581.655
Volumetric Flow Rate (dscfm)	56455.95
Volumetric Flow Rate (dscmm)	1598.832
Percent Isokinetic	99.42
Percent Excess Air	396.70
Fuel Factor,Fo	0.632
Ultimate CO2	33.09

FMC - POCATELLO, OUTLET B RUN 2, 8/24/88
FILTER SET FL

TIME	90.0000	TIME=MINUTES
VOLUME	44.0000	VOLUME=dcf MEASURED AT METER
Ts	849.5714	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	471.6508	T=IMPACTOR TEMPERATURE (K)
%M	0.1872	%M=STACK MOISTURE FRACTION (%/100)
MW	27.6400	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3900	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4889	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.6100	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	570.2700	Tm=AVERAGE METER TEMPERATURE (R)
Qa	426.5684	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0003	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	0.0000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	34.9200	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	10.9379	0.00100	0.0135	0.9865	23.3858	6.695E-04
2	7.1441	0.00070	0.0094	0.9771	8.8397	1.672E-03
3	4.6616	0.00092	0.0124	0.9647	5.7708	2.193E-03
4	3.2919	0.00088	0.0119	0.9528	3.9173	2.574E-03
5	1.9492	0.00164	0.0221	0.9307	2.5331	3.184E-03
6	1.1074	0.00221	0.0298	0.9008	1.4692	3.978E-03
7	0.6792	0.00252	0.0340	0.8668	0.8673	5.246E-03
8	0.4304	0.00598	0.0807	0.7862	0.5407	1.334E-02
BCK-UP	< 0.4304	0.05827	0.7862	0.0000	0.0464	1.331E-02
	TOTAL	0.07412				

FACILITY : FMC - POCATELLO

DATE: 8/24/88	
LOCATION: OUTLET B	
RUN NUMBER: 2.00	
SAMPLING PARAMETER	**PARTICLE SIZE DISTRIBUTION**
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.61
Absolute Stack Pressure,Ps(in. Hg)	25.59
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	158.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	44.00
Average Meter Pressure (in.H2O)	0.60
Average Meter Temperature (F)	110.27
Moisture Collected (g)	199.20
Carbon Dioxide Concentration (%V)	7.60
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.30
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.39
Standard Metered Volume,Vm(std) (dscf)	34.92
Standard Metered Volume,Vm(std) (dscm)	0.989
Standard Volume Water Vapor,Vw (scf)	9.39
Standard Volume Water Vapor,Vw (scm)	0.266
Stack Moisture (%V)	18.72
Mole Fraction Dry Stack Gas	0.813
Dry Molecular Weight	29.86
Wet Molecular Weight	27.64
Stack Gas Velocity,Vs (fpm)	3369.11
Stack Gas Velocity,Vs (mpm)	1026.90
Volumetric Flow Rate (acfm)	107530.74
Volumetric Flow Rate (acmm)	3045.271
Volumetric Flow Rate (dscfm)	63817.56
Volumetric Flow Rate (dscmm)	1807.313
Percent Isokinetic	102.77
Percent Excess Air	396.70
Fuel Factor,Fo	0.632
Ultimate CO2	33.09

APPENDIX E.3 - Test Run No. 3, 8/25/88

FMC - POCATELLO, INLET RUN 3, 8/25/88
FILTER SET P

TIME	4.0000	TIME=MINUTES
VOLUME	1.7500	VOLUME=dcf MEASURED AT METER
Ts	822.0000	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	456.3333	T=IMPACTOR TEMPERATURE (K)
%M	0.1163	%M=STACK MOISTURE FRACTION (%/100)
MW	28.5900	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3100	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4375	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.5300	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	557.0000	Tm=AVERAGE METER TEMPERATURE (R)
Qa	347.8119	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0002	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	0.0000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	1.4200	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	11.9645	0.04549	0.9103	0.0897	24.4586	7.960E-01
2	7.8143	0.00129	0.0258	0.0638	9.6693	7.578E-02
3	5.0985	0.00115	0.0230	0.0408	6.3120	6.739E-02
4	3.6000	0.00035	0.0070	0.0338	4.2843	2.517E-02
5	2.1306	0.00023	0.0046	0.0292	2.7695	1.097E-02
6	1.2086	0.00030	0.0060	0.0232	1.6047	1.324E-02
7	0.7385	0.00000	0.0000	0.0232	0.9447	0.000E+00
8	0.4636	0.00000	0.0000	0.0232	0.5851	0.000E+00
BCK-UP	< 0.4636	0.00116	0.0232	-0.0000	0.0481	6.408E-03
	TOTAL	0.04997				

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: INLET	
RUN NUMBER: 3.00	
SAMPLING PARAMETER	**PARTICLE SIZE DISTRIBUTION**
Total Sampling Time (min.)	4.00
Corrected Barometric Pressure (in. Hg)	25.53
Absolute Stack Pressure,Ps(in. Hg)	25.31
Stack Static Pressure (in. H2O)	-3.00
Average Stack Temperature (F)	521.00
Stack Area (sq.in.)	20592.00
Metered Volume,Vm (cu.ft.)	1.75
Average Meter Pressure (in.H2O)	0.50
Average Meter Temperature (F)	97.00
Moisture Collected (g)	82.00
Carbon Dioxide Concentration (%V)	7.50
Oxygen Concentration (%V)	16.50
Nitrogen Concentration (%V)	76.45
Dry Gas Meter Factor	0.99960
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.35
Standard Metered Volume,Vm(std) (dscf)	1.42
Standard Metered Volume,Vm(std) (dscm)	0.040
Standard Volume Water Vapor,Vw (scf)	3.87
Standard Volume Water Vapor,Vw (scm)	0.109
Stack Moisture (%V)	11.63
Mole Fraction Dry Stack Gas	0.884
Dry Molecular Weight	29.99
Wet Molecular Weight	28.59
Stack Gas Velocity,Vs (fpm)	2298.67
Stack Gas Velocity,Vs (mpm)	700.64
Volumetric Flow Rate (acfm)	328710.12
Volumetric Flow Rate (acmm)	9309.070
Volumetric Flow Rate (dscfm)	132163.01
Volumetric Flow Rate (dscmm)	3742.856
Percent Isokinetic	112.46
Percent Excess Air	446.18
Fuel Factor,Fo	0.587
Ultimate CO2	35.63

FMC - POCATELLO, OUTLET A RUN 3, 8/25/88
FILTER SET FP

TIME	90.0000	TIME=MINUTES
VOLUME	45.0000	VOLUME=dcf MEASURED AT METER
Ts	707.3300	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	392.6278	T=IMPACTOR TEMPERATURE (K)
%M	0.2152	%M=STACK MOISTURE FRACTION (%/100)
MW	27.2400	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.5100	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.5000	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.5300	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	560.4200	Tm=AVERAGE METER TEMPERATURE (R)
Qa	379.8007	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0002	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	1.7500	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	36.0300	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	10.8391	0.00062	0.0088	0.9912	23.2799	3.999E-04
2	7.0792	0.00054	0.0076	0.9836	8.7597	1.250E-03
3	4.6188	0.00072	0.0102	0.9734	5.7182	1.663E-03
4	3.2612	0.00069	0.0098	0.9637	3.8810	1.955E-03
5	1.9297	0.00138	0.0195	0.9441	2.5086	2.594E-03
6	1.0941	0.00187	0.0264	0.9177	1.4530	3.250E-03
7	0.6676	0.00349	0.0494	0.8683	0.8546	6.968E-03
8	0.4178	0.01252	0.1771	0.6913	0.5281	2.634E-02
BCK-UP	< 0.4178	0.04888	0.6913	-0.0000	0.0457	1.089E-02
	TOTAL	0.07071				

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: OUTLET A	
RUN NUMBER: 3.00	
SAMPLING PARAMETER PARTICLE SIZE DISTRIBUTION	
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.53
Absolute Stack Pressure,Ps(in. Hg)	25.51
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	139.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	45.00
Average Meter Pressure (in.H2O)	0.62
Average Meter Temperature (F)	100.42
Moisture Collected (g)	209.50
Carbon Dioxide Concentration (%V)	7.05
Oxygen Concentration (%V)	16.10
Nitrogen Concentration (%V)	76.85
Dry Gas Meter Factor	0.99430
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.40
Standard Metered Volume,Vm(std) (dscf)	36.03
Standard Metered Volume,Vm(std) (dscm)	1.020
Standard Volume Water Vapor,Vw (scf)	9.88
Standard Volume Water Vapor,Vw (scm)	0.280
Stack Moisture (%V)	21.52
Mole Fraction Dry Stack Gas	0.785
Dry Molecular Weight	29.77
Wet Molecular Weight	27.24
Stack Gas Velocity,Vs (fpm)	3393.91
Stack Gas Velocity,Vs (mpm)	1034.46
Volumetric Flow Rate (acfm)	108322.21
Volumetric Flow Rate (acmm)	3067.685
Volumetric Flow Rate (dscfm)	63842.13
Volumetric Flow Rate (dscmm)	1808.009
Percent Isokinetic	106.02
Percent Excess Air	382.99
Fuel Factor,Fo	0.681
Ultimate CO2	30.70

FMC - POCATELLO, OUTLET B RUN 3, 8/25/88
FILTER SET FK

TIME	90.0000	TIME=MINUTES
VOLUME	44.5200	VOLUME=dcf MEASURED AT METER
Ts	856.7000	Ts=IMPACTOR TEMPERATURE (R) (F+460)
T	475.6111	T=IMPACTOR TEMPERATURE (K)
%M	0.2047	%M=STACK MOISTURE FRACTION (%/100)
MW	27.4200	MW=STACK GAS MOLECULAR WEIGHT WET BASIS
Ps	25.3100	Ps=ABSOLUTE STACK GAS PRESSURE
Qm	0.4947	Qm=SAMPLING RATE AT METER (DCFM)
Pm	25.5300	Pm=PRESSURE AT THE METER (BAROMETRIC) (IN. HG)
Tm	554.9300	Tm=AVERAGE METER TEMPERATURE (R)
Qa	457.1165	Qa=ACTUAL VOL. FLOW RATE THROUGH IMPACTOR (cm3/sec)
u	0.0003	u=STACK GAS VISCOSITY (poise)
Lambda	0.0000	Lambda=GAS MEAN FREE PATH (cm)
Pvac	1.5000	Pvac=PRESSURE DROP ACROSS IMPACTOR (in. Hg)
Vm(std)	36.3300	Vm(std)=Standardized Metered Volume (dscf)

STAGE	Dp50 micron	Net Weight (grams)	Mass Fraction	Mass Fract. Less Than	Interval Geometric Midpoint	dM/dlog dP (gr/dscf)
1	10.5994	0.00066	0.0088	0.9912	23.0211	4.161E-04
2	6.9230	0.00027	0.0036	0.9876	8.5662	6.200E-04
3	4.5175	0.00052	0.0069	0.9807	5.5924	1.191E-03
4	3.1903	0.00091	0.0121	0.9686	3.7963	2.559E-03
5	1.8893	0.00130	0.0173	0.9513	2.4551	2.427E-03
6	1.0740	0.00196	0.0261	0.9253	1.4245	3.394E-03
7	0.6597	0.00519	0.0690	0.8563	0.8417	1.041E-02
8	0.4194	0.01309	0.1740	0.6822	0.5260	2.827E-02
BCK-UP	< 0.4194	0.05131	0.6822	-0.0000	0.0458	1.133E-02
	TOTAL	0.07521				

FACILITY : FMC - POCATELLO

DATE: 8/25/88	
LOCATION: OUTLET B	
RUN NUMBER: 3.00	
SAMPLING PARAMETER PARTICLE SIZE DISTRIBUTION	
Total Sampling Time (min.)	90.00
Corrected Barometric Pressure (in. Hg)	25.53
Absolute Stack Pressure,Ps(in. Hg)	25.51
Stack Static Pressure (in. H2O)	-0.30
Average Stack Temperature (F)	140.00
Stack Area (sq.in.)	4596.00
Metered Volume,Vm (cu.ft.)	44.52
Average Meter Pressure (in.H2O)	0.66
Average Meter Temperature (F)	94.93
Moisture Collected (g)	198.30
Carbon Dioxide Concentration (%V)	7.30
Oxygen Concentration (%V)	16.80
Nitrogen Concentration (%V)	75.90
Dry Gas Meter Factor	1.00350
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.40
Standard Metered Volume,Vm(std) (dscf)	36.33
Standard Metered Volume,Vm(std) (dscm)	1.029
Standard Volume Water Vapor,Vw (scf)	9.35
Standard Volume Water Vapor,Vw (scm)	0.265
Stack Moisture (%V)	20.47
Mole Fraction Dry Stack Gas	0.795
Dry Molecular Weight	29.84
Wet Molecular Weight	27.42
Stack Gas Velocity,Vs (fpm)	3455.52
Stack Gas Velocity,Vs (mpm)	1053.24
Volumetric Flow Rate (acfm)	110288.62
Volumetric Flow Rate (acmm)	3123.374
Volumetric Flow Rate (dscfm)	65761.47
Volumetric Flow Rate (dscmm)	1862.365
Percent Isokinetic	103.79
Percent Excess Air	516.48
Fuel Factor,Fo	0.562
Ultimate CO2	37.21

APPENDIX F - PSD FIELD DATA SHEETS

F.1 - Test Run No. 1
F.2 - Test Run No. 2
F.3 - Test Run No. 3
F.4 - Blank PSD Runs

APPENDIX F.1 - Test Run No. 1

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/23/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE .....PSD
RUN NUMBER 1.00
OPERATOR .....MMH/JTW
AMBIENT TEMPERATURE 85.00
BAROMETRIC PRESSURE 24.10
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.001
IAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.250
ASSUMED MOISTURE, % 5.60
SAMPLE BOX NUMBER .....
METER BOX NUMBER RAC-5
METER DELTA H@ 0.43
K FACTOR 2.24
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING 250.00
REFERENCE DEL P 0.24
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	12:15	730.012											
D-5	2.00		730.890	0.24	505	0.53	0.53		404		87.00	86.00		
D-5	4.00	12:19	731.802	0.24	505	0.53	0.53		425		87.00	86.00		
END														

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC / Pocatello

Sampling Location> Inlet Sample Ident.> FMC-PSD-IN-1

Type of Impactor> Anderson w/ PC. Impactor Substrate> X

802 (1-3) Date 08/23/98 (MMDDYY) Time Start 12:15 (HHMM) Time Finish 12:19 (HHMM)

Duct Dimensions 13' x 10' (ft) or Diameter . ft.

PTCF ____ DGMCF ____ Test Duration 4 min.

803 (1-3) Bar Press. 24.1 "Hg Static Press. -3.0 "H_2O

Nozzle Dia. 0.250 inches Condensed Water ____ gms

Intake leak rate .001 cfm Operator initials MWK / JRW

Flow .433 @ meter. 1/Imp = .8191 Vs = 40.04 AF/s

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impact Rotobox Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
804	D-S	12:17	730.012	.24	~~.505~~ .55	505	87	86	377	60°	
805	D-S	12:19	730.89	.24	.53	505	87	86	404	60°	
806	D-S	21	731.802	.24	.53	505	87	86	425	60°	
807									445	60°	
808											
809											
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											

• Dry air purge when sampling wet streams

Console ____

Weather ____

822 Remarks ____

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/23/88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE .....PSD
RUN NUMBER 1.00
OPERATOR .....FLG/GDK
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.186
ASSUMED MOISTURE, % 18.20
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-12
METER DELTA H@ .....
K FACTOR 0.86
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.72
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.002 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
---	0.00	11:33	927.47											
B-4	15.00		935.200	0.72	131	0.62	0.62		333		79.00	78.00		
B-4	30.00		942.550	0.72	131	0.62	0.62		350		87.00	82.00		
B-4	45.00		950.050	0.72	131	0.62	0.62		285		91.00	86.00		
B-2	60.00		957.500	0.72	131	0.62	0.62		234		92.00	88.00		
B-2	75.00		964.960	0.72	131	0.62	0.62		222		92.00	88.00		
B-2	90.00	13:05	972.435	0.72	131	0.62	0.62		223		93.00	89.00		
END														

IMPACTOR FIELD DATA RUN #1

801 (1-3) Plant Name> FMC - POCATELLO, IDAHO

Sampling Location> OUTLET 1-1 (OTA) Sample Ident.> FILTER SET L

Type of Impactor> Anderson Impactor Substrate> Glass Fiber

802 (1-3) Date 8-23-88 (MMDDYY) Time Start 1135 (HHMM) Time Finish _____ (HHMM)

Duct Dimensions _____ x _____ ft. or Diameter 76.5 in. Ø

PTCF _____ DGMCF 0.9943 Test Duration _____ min.

803 (1-3) Bar Press. 25.63 "Hg Static Press. _____ "H_2O

Nozzle Dia. 0.186 inches Condensed Water _____ gms

Intake leak rate _____ cfm Operator initials FLG & GDR

0.01 cfm @ 10 in. Hg INITIAL VARIAC SETTING: 40%

K = .861

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	IMPACTOR Not-Gas Temp. °F	SAMPLE TIME ~~Last Impinger Temp.~~ °C	L. Vac. in. Hg Gauge
		1135.	927.468								
804	B-4	1150	935.2	0.72	0.62	131	79	78	333	15	1.5
805	B-4	1205	942.55	0.72	0.62	131	87	82	350	30	1.5
806	B-4	1220	950.05	0.72	0.62	131	91	86	285	45	1.5
807	B-2	1235	957.50	0.72	0.62	131	92	88	234	60	1.5
808	B-2	1250	964.96	0.72	0.62	131	92	88	222	75	2.0
809	B-2	1305	972.435	0.72	0.62	131	93	89	223	90	2.0
810											
811								I =	106°		
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(4:2)	(11:4)	(10:7)	(25:4)	(30:4)	(39:4)	(46:4)	(53:4)	(60:4)	(67:4)	(74:4)

* Dry air purge when sampling wet streams

Console _____

Weather _____

822 Remarks _____

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/23/88
SAMPLING LOCATION ..OUTLET 8
SAMPLE TYPE .....PSD
RUN NUMBER 1.00
OPERATOR .....PWB/RDO
AMBIENT TEMPERATURE 92.00
BAROMETRIC PRESSURE 25.56
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.186
ASSUMED MOISTURE, % 21.57
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 0.68
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.69
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	11:40	643.38											
M-1	5.00		645.500	0.69	140	0.47	0.47		550		86.00	90.00		
M-2	20.00		651.300	0.69	140	0.47	0.47		519		90.00	97.00		
M-3	35.00		657.995	0.69	140	0.47	0.47		402		94.00	100.00		
M-4	50.00		664.350	0.69	140	0.47	0.47		360		96.00	100.00		
M-5	65.00		670.760	0.69	140	0.47	0.47		380		97.00	102.00		
M-6	80.00		677.275	0.69	140	0.47	0.47		331		96.00	100.00		
M-7	90.00	13:20	683.355	0.69	140	0.47	0.47		330		96.00	100.00		
END														

K FACTOR = .681

PSD

RADIAN

PLANT FMC Pocatello
DATE 8-23-88
SAMPLING LOCATION OUTLET 1-2 OTB
SAMPLE TYPE PSD
RUN NUMBER #1
OPERATOR 248 | 20
AMBIENT TEMPERATURE 92
BAROMETRIC PRESSURE 25.56
STATIC PRESSURE, in. H_2O
FILTER NUMBER(s)

PROBE LENGTH AND TYPE
NOZZLE I.D.
ASSUMED MOISTURE, % 24.57
SAMPLE BOX NUMBER
METER BOX NUMBER RAC #7
METER $\Delta H_@$ 1.77
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp
METER Y

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY _____ 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 DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
		1140	643.384								IMPACTOR	
W1		1145	645.5	.69	.47	.47	140	86	90	0	550	
		1200	651.3	.69	.47	.47	140	90	97	0	519	
		1215	657.995	.69	.47	.47	140	94	100	0	402	
		1230	664.35	.69	.47	.47	140	96	100	0	360	
		1245	670.76	.69	.47	.47	140	97	102	0	380	
		1300	677.275	.69	.47	.47	140	96	100	0	331	
	STOP	1315	683.566	.69	.47	.47	140	96	100	0	330	
	PURGE	1322	686.365									

COMMENTS:

EPA (Rev. 2/8)
4/77

Source Sampling Field Data

APPENDIX F.2 - Test Run No. 2

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE .....PSD
RUN NUMBER 2.00
OPERATOR .....MWH/JTW
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.59
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.020
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 28.04
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.77
K FACTOR 2.75
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.20
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	13:32	789.761											
D-5	2.00		790.340	0.20	521	0.55	0.55		456		98.00	98.00		
D-5	4.00	13:36	791.412	0.20	521	0.55	0.55		465		100.00	99.00		
END														

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC Run

Sampling Location> Scrubber Inlet Sample Ident.> Set #B

Type of Impactor> cascade Impactor Substrate> glass fiber

802 (1-3) Date 08/24/88 (MMDDYY) Time Start _____ (HHMM) Time Finish _____ (HHMM)

Duct Dimensions 13 x 10 ft. or Diameter N/A ft.

PTCF 0.84 DGMCF 0.9996 Test Duration 4 min.

803 (1-3) Bar Press. 25.69 "Hg Static Press. -3.0 "H_2O

Nozzle Dia. .250 inches Condensed Water _____ gms

Intake leak rate 0.02 cfm Operator initials MWH / JTW

@ 10" Hg. .380 ft/min 35.71 f/s

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor Nozzle Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
804		0:32	789.761						430		
805	D-5	2:34	790.54	0.20	0.55	521	98	98	456	60°	2.0
806	D-5	4:36	791.412	0.20	0.55	521	100	99	465	60	2.0
807											
808											
809											
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(4:0)	(11:4)	(18:7)	(25:5)	(32:5)	(39:5)	(46:5)	(53:5)	(60:5)	(67:5)	(74:5)

• Dry air purge when sampling wet streams

Console _____

Weather _____

822. Remarks _____

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE .....PSD
RUN NUMBER 2.00
OPERATOR .....GDR/FLB
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.62
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.002
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.186
ASSUMED MOISTURE, % .....
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.77
K FACTOR 0.86
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.53
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	12:38	34.363											
A-4	15.00		40.525	0.52	132	0.45	0.45		268		93.00	91.00		
A-4	30.00		46.720	0.52	132	0.45	0.45		360		101.00	97.00		
A-4	45.00		52.900	0.52	132	0.45	0.45		325		106.00	103.00		
A-3	60.00		59.080	0.53	132	0.45	0.45		232		113.00	104.00		
A-3	75.00		65.570	0.53	132	0.45	0.45		206		109.00	106.00		
A-3	90.00	14:08	71.741	0.53	132	0.45	0.45		205		106.00	105.00		
END														

IMPACTOR FIELD DATA

Run

801 (1-3) Plant Name> FMC

Sampling Location> OUTLET 1-1 Sample Ident.> Set AE

Type of Impactor> cascade Impactor Substrate> glass fiber

802 (1-3) Date 8-24-88 (MMDDYY) Time Start _____ (HHMM) Time Finish _____ (HHMM)

Duct Dimensions _____ x _____ ft. or Diameter _____ ft.

PTCF 84 DGMCF _____ Test Duration 90 min.

803 (1-3) Bar Press. 25.62 "Hg Static Press. _____ "H_2O

Nozzle Dia. .186 inches Condensed Water _____ gms

Intake leak rate _____ cfm Operator initials GDR + FLG

K factor 0.857 @ 100° T_m K=0.87

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor Temp. °F	Time Impactor Temp. °F	L. Vac. in. Hg Gauge
	0	1238	34.363								
804	A-4	1253	40.525	.52	0.45	132	93	91	268	15	1
805	A-4	1308	46.72	.52	0.45	132	101	97	360	30	1
806	A-4	1323	52.9	.52	0.45	132	106	103	325	45	1
807	A-3	1338	59.08	.53	0.46	132	113	104	232	60	1
808	A-3	1353	65.57	.53	0.45	132	109	106	206	75	1.5
809	A-3	1408	71.741	.53	0.45	132	106	105	205	90	1.5
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											

I ≈ 102%

* Dry air purge when sampling wet streams

Console INTAKE LEAK ✓ : 0.002 through Probe; 0.022 cfm @

Weather 4 in. through impactor

V_s = 47.18 ft/sec

822 Remarks POINTS A-4, Δp = .52

A-3, Δp = .53 — V_s = 47.64 ft/sec

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/24/88
SAMPLING LOCATION ..OUTLET B
SAMPLE TYPE .....PSD
RUN NUMBER 2.00
OPERATOR .....PB/RDO
AMBIENT TEMPERATURE 72.00
BAROMETRIC PRESSURE 25.63
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.010
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 30.00
NOZZLE I.D. 0.186
ASSUMED MOISTURE, % .....
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.77
K FACTOR 0.86
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 0.70
DRY/GAS METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 5" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Orifice Pressure Differential (del H, in. H2O) Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	13:21	768.261											
T-1	15.00		775.600	0.70	158	0.60	0.60		415		106.00	115.00		
T-1	30.00		783.100	0.70	158	0.60	0.60		430		108.00	117.00		
T-1	45.00		788.900	0.70	158	0.60	0.60		438		106.00	112.00		
T-1	60.00		797.600	0.70	158	0.60	0.60		385		108.00	114.00		
T-1	75.00		804.900	0.70	158	0.60	0.60		312		107.00	110.00		
T-1	90.00	14:51	812.264	0.70	158	0.60	0.60		347		108.00	114.00		
END														

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> OUTLET 1-2 Sample Ident.> filter Set FL

Type of Impactor> cascade Impactor Substrate> glass fiber

802 (1-3) Date 8-24-88 (MMDDYY) Time Start 1321 (HHMM) Time Finish 1451 (HHMM)

Duct Dimensions ____ x ____ ft. or Diameter ____ ft.

PTCF .84 DGMCF ____ Test Duration 90 min.

803 (1-3) Bar Press. 25.63 "Hg Static Press. ____ "H_2O

Nozzle Dia. .186 inches Condensed Water ____ gms

Intake leak rate .01 cfm Operator initials PLB/RDO

K = ~~.85~~ .86 (~~.858~~)

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	IMPACTOR Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
		1321	768.261	.70							
804	S 1	~~1325~~	~~764.021~~	~~.87~~	~~.75~~ .60	158	106	114	400		0
805		1336	775.60	~~.87~~	.60	158	106	115	415		0
806		1351	783.10	.70	.60	158	108	117	420		0
807		1406	788.90	.70	.60	158	106	112	438		0
808		1421	797.60	.70	.60	158	108	114	385		0
809		1436	804.90	.70	.60	158	107	110	312		0
810		1451	812.264	.70	.60	158	108	114	347		0
811		/									
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(6:2)	(11:4)	(18:7)	(25:5)	(30:5)	(39:3)	(46:3)	(53:3)	(60:3)	(67:3)	(74:3)

* Dry air purge when sampling wet streams

Console ____

Weather ____

822 Remarks ____

APPENDIX F.3 - Test Run No. 3

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..INLET
SAMPLE TYPE .....PSD
RUN NUMBER 3.00
OPERATOR .....MWH/JTW
AMBIENT TEMPERATURE 75.00
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.001
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE 10.5FT,GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZZLE I.D. 0.250
ASSUMED MOISTURE, % 9.00
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-5
METER DELTA H@ 1.91
K FACTOR 2.38
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING 250.00
REFERENCE DEL P 250.00
DRY/BAG METER FACTOR (Y) ... 0.99960
FINAL LEAK CHECK ..... 0.010 @ 3" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	14:33	878.821											
C-5	2.00		879.630	0.21	521	0.50	0.50		350		97.00	97.00		
C-5	4.00	14:37	880.572	0.21	521	0.50	0.50		374		97.00	97.00		
END														

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> Inlet Sample Ident.> Set P Run 3

Type of Impactor> Anderson / Precutter Impactor Substrate> Glass fiber

802 (1-3) Date 08/25/88 (MMDDYY) Time Start 1433 (HHMM) Time Finish 1437 (HHMM)

Duct Dimensions 13 x 10 ft. or Diameter ____ ft.

PTCF 0.84 DGMCF 0.9996 Test Duration 4 min.

803 (1-3) Bar Press. 25.55 "Hg Static Press. -3.0 "H_2O

Nozzle Dia. .250 inches Condensed Water ____ gms

Intake leak rate 0.001 cfm Operator initials MWH / JTW

	Pt.	Clock Time	Dry Gas Meter Reading ft^3	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor ~~Non-Box~~ Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
804		0 1433	878.821								
805	C-S	2 1435	879.63	.21	.50	521	97	97	350	60°	0
806	C-S	4 1437	880.572	.21	.50	521	97	97	374	60	0
807											
808											
809											
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											

• Dry air purge when sampling wet streams

Console ____

Weather ____

822 Remarks ____

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/89
SAMPLING LOCATION ..OUTLET A
SAMPLE TYPE .....PSD
RUN NUMBER 3.00
OPERATOR .....GDR/FLB
AMBIENT TEMPERATURE 83.00
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE (Ps) -0.30
FILTER NUMBER .....
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.013
XAD TRAP NUMBER .....

PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.186
ASSUMED MOISTURE, % .....
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-12
METER DELTA H@ 1.79
K FACTOR 0.86
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P 250.00
DRY/GAS METER FACTOR (Y) ... 0.99430
FINAL LEAK CHECK ..... 0.001 @ 8" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe Skin	Filter	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	13:51	171.129											
A-3	15.00		178.600	0.72	139	0.62	0.62		229		90.00	88.00		
A-3	30.00		186.100	0.72	139	0.62	0.62		262		95.00	90.00		
A-3	45.00		193.600	0.72	139	0.62	0.62		257		99.00	92.00		
A-2	60.00		201.000	0.72	139	0.62	0.62		243		101.00	91.00		
A-2	75.00		208.600	0.72	139	0.62	0.62		246		104.00	98.00		
A-2	90.00	15:21	216.130	0.72	139	0.62	0.62		247		109.00	101.00		
END														
											100.00	94.00		
											107.00	96.00		
											111.00	98.00		
											110.00	99.00		
											110.00	100.00		
											110.00	101.00		

RUN 3

IMPACTOR FIELD DATA

PORT A

	ΔP
POINT A-2	.72
A-3	.72

801 (1-3) Plant Name> FMC

Sampling Location> OUTLET 1-1, (OTA) Sample Ident.> Set FP Run 3

Type of Impactor> Anderson Mk III Impactor Substrate>

802 (1-3) Date 08-28-88 (MMDDYY) Time Start 1351 (HHMM) Time Finish 1421 (HHMM)

Duct Dimensions x ft. or Diameter 76.5 in ID ft.

K = .857

PTCF .84 DGMCF 0.9943 Test Duration 90 min.

803 (1-3) Bar Press. 25.55 "Hg Static Press. -0.3 in. "H_2O

K = .863 @ 100° Tm

Nozzle Dia. .186 inches Condensed Water gms

Intake leak rate cfm Operator initials GDR - [illegible]

0.008 cfm @ 8 in. through Probe 0.012 cfm @ 8 in through impactor

	Pt.	Clock Time (1351)	Dry Gas Meter Reading ft³ (171.129)	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor Temp. °F	Sample Time Impinger Temp. °F	L. Vac. In. Hg Gauge
804	A.3	1406	178.6	0.72	0.62	139	90	88	229	15	1
805	3	1421	186.1	0.72	0.62	139	95	90	262	30	1
806	3	1436	193.6	0.72	0.62	139	99	92	257	45	2
807	2	1451	201.0	0.72	0.62	139	101	91	243	60	2
808	2	1506	208.6	0.72	0.62	139	104	98	246	75	2
809	2	1521	216.13	0.72	0.62	139	109	101	247	90	2.5
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											

* Dry air purge when sampling wet streams

Console T_s @ point A-2 = 137, @ A-3 = 139°F

Weather

K = 0.863 @ T_m = 100°F & Stack = 139°F

Remarks

SAMPLING DATA

PLANT .....FMC - POCATELLO
DATE 8/25/88
SAMPLING LOCATION ..OUTLET 8
SAMPLE TYPE .....PSD
RUN NUMBER 3.00
OPERATOR .....PWD/RDO
AMBIENT TEMPERATURE 92.00
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE (Ps) -3.00
FILTER NUMBER M-33
MIN.SAMPLE VOLUME ..
INITIAL LEAK CHECK . 0.020
XAD TRAP NUMBER .....

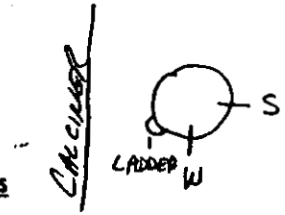
PROBE LENGTH AND TYPE .....GLASS
HEIGHT OF LOCATION(ft)..... 50.00
NOZILE I.D. 0.186
ASSUMED MOISTURE, % 18.00
SAMPLE BOX NUMBER 3.00
METER BOX NUMBER RAC-7
METER DELTA H@ 1.77
K FACTOR 0.88
PROBE HEATER SETTING .....N/A
HEATER BOX SETTING .....N/A
REFERENCE DEL P .....N/A
DRY/GAS METER FACTOR (Y) ... 1.00350
FINAL LEAK CHECK ..... 0.010 @ 10" Hg

SCHEMATIC OF TRAVERSE POINT LAYOUT

Traverse Point Number	Sampling Time Min.	Clock Time (24-hr Clock)	Gas Meter Reading (Vm), cu.ft	Velocity Head (del Ps), in. H2O	Stack Ts, in std. deg. F	Orifice Pressure Differential (del H, in. H2O) Desired	Actual	Temperature: deg. F Probe	Filter Skin	Adsorbent Trap	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit	Pump Vacuum in. Hg
	0.00	19:30	65.853											
M-1	15.00		73.200	0.75	140	0.66	0.66		434		94.00	98.00		
M-2	30.00		80.600	0.75	140	0.66	0.66		390		95.00	100.00		
M-3	45.00		88.000	0.75	140	0.66	0.66		377		95.00	100.00		
M-4	60.00		95.450	0.75	140	0.66	0.66		344		94.00	99.00		
M-5	75.00		102.800	0.75	140	0.66	0.66		360		94.00	100.00		
M-6	90.00	21:00	110.370	0.75	140	0.66	0.66		340		94.00	90.00		
END														
											101.00	108.00		
											101.00	109.00		
											101.00	111.00		
											101.00	111.00		
											101.00	111.00		
											102.00	113.00		

RADIAN
CORPORATION

Det & K Run 3



PARTICLE SIZING FIELD DATA
METHOD: ANDERSEN IMPACTOR

FILTER NUMBERS

PRE-IMPACTOR
STAGE 0
STAGE 1
STAGE 2
STAGE 3
STAGE 4
STAGE 5
STAGE 6
STAGE 7
FINAL FILTER

PLANT FMC - Pocatello
DATE 8-25-88
SAMPLING LOCATION Outlet 1-2
SAMPLE TYPE PSD
RUN NUMBER ~~3~~ 4
OPERATOR RWB
AMBIENT TEMPERATURE ~92°F
BAROMETRIC PRESSURE 25.55
STATIC PRESSURE, (P_s)
METER CORRECTION FACTOR 1.0035

PROBE LENGTH
NOZZLE I.D. .186
ASSUMED MOISTURE, % 18
IMPACTOR NUMBER
METER BOX NUMBER RAC #7
METER ΔH@ 1.77
K G FACTOR .876
REFERENCE ΔP

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 VACCUM, in. Hg	IMPACTOR TEMPERATURE °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m_{in}}$) °F	OUTLET ($T_{m_{out}}$) °F			
		1930	65.853	.75	.66	.66	140	94	95	0	307	
W 1		1945	73.2	.75	.66	.66	140	94	98	0	434	
		2000	80.6	.75	.66	.66	140	95	100	0	390	
		2015	88.0	.75	.66	.66	140	95	100	0	377	
		2030	95.45	.75	.66	.66	140	94	99	0	344	
		2045	102.8	.75	.66	.66	140	94	100	0	360	
		2100	110.370	.75	.66	.66	140	94	90	1	340	

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> OUTLET 1-2 OTB Sample Ident.> Set FO Run 3

Type of Impactor> _____ Impactor Substrate> _____

802 (1-3) Date 8-25-88 (MMDDYY) Time Start 1410 (HHMM) Time Finish 1540 (HHMM)

Duct Dimensions _____ x _____ ft. or Diameter _____ ft.

PTCF _____ DGMCF _____ Test Duration 90 min.

803 (1-3) Bar Press. _____ "Hg Static Press. _____ "H_2O

Nozzle Dia. .188 inches Condensed Water _____ gms

Intake leak rate <.02 CFM -10" Hg cfm Operator initials RWA/RPO

	Pt.	Clock Time	Dry Gas Meter Reading ft^3	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	IMPACTOR Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
804					.66						
805	W 1	1410	964.314	.75	[illegible]	140	97	97	360		1
806		1425	971.5	.75	.66	140	96	101	321		1
807		1440	978.9	.75	.66	140	100	108	420		1
808		1455	986.7	.75	.66	140	101	109	380		2
809		1510	994.4	.75	.66	140	103	113	390		2
810		1525	000.8	.75	.66	140	105	116	428		2
811		1540	009.268	.75	.66	140	107	118	418		
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(6:2)	(11:4)	(18:7)	(25:6)	(30:6)	(35:6)	(40:6)	(53:6)	(60:6)	(67:6)	(74:6)

$K = (846.72)(.0012)(.177)(.7056)(.6724)(1.0842)(1.0012)(.9532)$

$K = .88$

* Dry air purge when sampling wet streams

Console _____

Weather _____

822 Remarks Redo-Substrates-wet

APPENDIX F.4 - Blank PSD Runs

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> Inlet Sample Ident.> FN (Blank Run)

Type of Impactor> cascade Impactor Substrate> Glass Fiber

802 (1-3) Date 08/25/88 (MMDDYY) Time Start 0834 (HHMM) Time Finish 0838 (HHMM)

Duct Dimensions 13 x 10 ft. or Diameter — . ft.

PTCF 0.84 DGMCF 0.9896 Test Duration 4 min.

803 (1-3) Bar Press. 649 (25.55") "Hg Static Press. -3.0" H_2O "H_2O

Nozzle Dia. .250 inches Condensed Water ___ gms

Intake leak rate 0.015 cfm Operator initials MWH / JTW

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor Gas Temp. °F	Last Impinger Temp. °F	L. Vac. In. Hg Gauge
804		0 0834	839.898	.20	.50				~~255~~ mid		
805	C-S	2 0836	840.745	.20	.50	505	70	70	280	60	2.5
806	C-S	4 0838	841.567	.20	.50	505	71	70	320	60	2.5
807											
808											
809											
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(4:2)	(11:4)	(18:7)	(25:6)	(32:6)	(39:6)	(46:6)	(53:6)	(60:6)	(67:6)	(74:6)

* Dry air purge when sampling wet streams

Console ___

Weather Nice

822 Remarks Run (a) ΔH = .50 w/ nozzle out of flow

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> OTB (1-2) Sample Ident.> FM (Blank Run)

Type of Impactor> cascade Impactor Substrate> Glass Fiber

802 (1-3) Date 8-25-88 (MMDDYY) Time Start _____ (HHMM) Time Finish _____ (HHMM)

Duct Dimensions _____ x _____ ft. or Diameter _____ ft.

PTCF .84 DGMCF _____ Test Duration 90 min.

803 (1-3) Bar Press. _____ "Hg Static Press. _____ "H_2O

Nozzle Dia. .184 inches Condensed Water _____ gms

Intake leak rate <.01 cfm Operator initials _____

	Pt.	Clock Time	Dry Gas Meter Reading ft^3	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Impactor ~~Nozzle~~ Temp. °F	Last Impinger Temp. °F	L. Vac. in. Hg Gauge
804	South	0840	869.605		.60	138	76	79	330		1
805		0855	876.60		.60	138	79	88	418		2
806		0910	883.60		.60	138	84	96	457		2
807		0925	890.67		.60	138	87	98	448		2
808		0940	897.78		.60	138	92	105	415		2
809		0955	905.0		.60	138	93	107	370		2
810		1010	912.136		.60	138	94	107	351		2
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											
	(4:2)	(11:4)	(16:7)	(25:5)	(30:5)	(35:5)	(40:5)	(53:5)	(60:5)	(67:5)	(74:5)

* Dry air purge when sampling wet streams

Console _____

Weather _____

822 Remarks Blank run - perform w/ nozzle out of flow. Sample @ Δh .60

APPENDIX G - MOISTURE AND ORSAT ANALYSIS FIELD DATA

G.1 - Moisture Recovery
G.2 - Orsat

APPENDIX G.1 - Moisture Recovery

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Sample Identification Code: _____

Date 8/23/88

XAD Trap # _____

Sampling location Inlet

Sample type MM111

W-26

Run number 1

Sample box number _____

Clean-up person RFJ

Solvent rinses 0.1 N HNO_3

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0	KO	539.7	488.4	51.3
2	0.1 N HNO_3	150	MSG	623.2	618.4	4.8
3	0.1 N HNO_3	150	MSG	652.7	643.2	9.5
4	EMPTY	0	MSG	494.0	493.0	1
5	SILICA GEL	200	MSG	695.0	673.9	21.1
6						
7						

Total Weight Gain (grams) 87.7 g

% Moisture _____

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Sample Identification Code:

Date 8/23/88

XAD Trap #

Sampling location Outlet 1-1 OTA

W-25

Sample type MM111

Run number 1

Sample box number

Clean-up person RFJ

Solvent rinses 0.1 N HNO_3

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0	KO	563.0	460.7	102.3
2	0.1 N HNO_3	150	MGS	704.5	663.5	41.0
3	0.1 N HNO_3	150	GS	656.2	652.9	~~0.7~~ 3.3
4	—	0	MSG	445.5	446.1	-0.6
5	SILICA GEL	200	MSG	674.2	664.0	10.2
6						
7						

Total Weight Gain (grams) ~~157.4~~ pg

~~[illegible]~~ 1562 pg

Moisture % ____

FMCM5OT1

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Sample Identification Code:

Date 7/24/88

XAD Trap #

Sampling location (PTB) Outlet 1-2 OTB

Sample type MM111

Run number ~~2~~ 1 Q2

Sample box number

Clean-up person MH

Solvent rinses 0.1 HNO3

OTB W-28

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain	
1	EMPTY	0		611.7	488.6 ~~465.1~~ PB	~~146.6~~	123.1
2	0.1 HNO3	193		731.2	675.9 ~~657.~~ PB	~~74.1~~	55.3
3	0.1 HNO3	163		629.3	621.1 ~~612.1~~ PB	~~17.2~~	8.2
4	EMPTY	0		462.1	461.1 ~~490.4~~ PB	~~28.3~~	1
5	Silica Gel	215		751.5	740.4 ~~709.5~~	~~42.0~~ PB	11.1
6							
7							

Total Weight Gain (grams) ~~351.6~~ 199.2 PB

* change due to original set on wrong [illegible] ~~RJ~~ PB

~~9.382~~

50.251 + 9.382

Moisture (%) 18.5%

FMC M50B1.MF5

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/23/88

Sampling location Outlet 1-2

Sample type MM111

Run number 1

Sample box number

Clean-up person RFJ

Solvent rinses 0.1 N HNO_3

Sample Identification Code:

XAD Trap #

W-27

VOID Run Aborted due to capped probe

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1		0	KO		463.04	148.06
2	1' HNO_3	~200	MGS		614.6	116.6
3	0.1 HNO_3	~400	MGS		701.5	-73.1
4	—	0	MGS		463.9	-1.8
5	SILGAGEL	~200	MGS		698.6	52.9
6						
7						

Total Weight Gain (grams) _____

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant EMC

Date 8/24/88

Sampling location INLET

Sample type MM111

Run number 2

Sample box number

Clean-up person MH.

Solvent rinses 0.1N HNO3.

Sample Identification Code:

XAD Trap #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		540.2	490.0	50.2
2	0.1N HNO3	144.22		645.2	634.4	10.8
3	0.1N HNO3	145.30		620.0	619.7	0.3
4	EMPTY	0		487.0	486.6	0.4
5	SILICA GEL	195.90		695.2	685.1	10.1
6						
7						

Total Weight Gain (grams) 71.8

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/24/88

Sampling location Outlet 1-1

Sample type MM III

Run number 2

Sample box number

Clean-up person MH

Solvent rinses 0.1N HNO_3

Sample Identification Code:

XAD Trap #

OTA
W-30

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		576.5	481.4	95.1
2	0.1 HNO_3	198		680.6	645.4	35.2
3	0.1 HNO_3	143		635.1	627.4	7.7
4	—	0		478.7	477.8	0.9
5	Silica Gel	250		797.0	787.5	9.5
6						
7						

Total Weight Gain (grams) 148.4

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/24/83

Sampling location OUTLET 1-2

Sample type MM111

Run number ~~1~~ 2

Sample box number

Clean-up person MH

Solvent rinses 0.1N HNO3

Sample Identification Code: FMC-082488-MM111-OTB-2-II

XAD Trap #

W-31

OTB

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain	CoRR
1	EMPTY	0	K.O.	590.5	465.1 ~~488.6~~		125.4
2	0.1 HNO3	170.1		696.8	657.1 ~~675.4~~		39.7
3	0.1 HNO3	142.3		618.1	612.1 ~~621.1~~		6
4	—	0		493.0	490.4 ~~461.1~~		2.6
5	SILICA GEL	240		723.1	709.5 ~~710.4~~		13.6
6							
7							

Total Weight Gain (grams) ~~0~~ 187.2

18.6%

Moisture % ____

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/25/88

Sampling location INLET

Sample type MM111

Run number 3

Sample box number

Clean-up person HH.

Solvent rinses 0.1 N HNO3

Sample Identification Code:

XAD Trap #

W-35

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		557.96	495.6	62.3
2	0.1N HNO3	165		663.3	653.2	10.1
3	0.1N HNO3	166		635.2	634.5	.7
4	EMPTY	0		474.4	475.0	-.6
5	SILICA GEL	194		694.8	685.3	9.5
6						
7						

Total Weight Gain (grams) 82.0 g

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Sample Identification Code:

Date 1/25/88

XAD Trap #

Sampling location OUTLET 1-1 OTA

W-32

Sample type MM111

Run number 3

Sample box number

Clean-up person MH

Solvent rinses 0.1 N HNO3

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		602.4	487.4	115
2	0.1 N HNO3	170.6		713.6	646.6	67
3	0.1 N HNO3	162		648.9	638.2	10.7
4	EMPTY	0		462.7	461.3	1.4
5	SILICA GEL	233		735.7	720.3	15.4
6						
7						

Total Weight Gain (grams) 209.5

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant EMC

Date 3/25/88

Sampling location Outlet 1-2 OTB

Sample type MM111

Run number TB3

Sample box number

Clean-up person MH

Solvent rinses 0.1N HNO3

Sample Identification Code:

XAD Trap #

W-33

NOTE: ① Possible wall debris in filter (dark specs)

② Filter holder exit & (21924g) & inlet tube of 1st impinger stained discolored (red + wit) NOT 0.1 N HNO3 or acetone soluble.

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		580.27	459.8	120.47
2	0.1N HNO3			718.0	644.4	73.6
3	0.1N HNO3	175.8		687.9	676.0	11.9
4	—	0		477.2	473.8	3.4
5	Silica Gel	153		610.7	597.8	12.9
6						
7						

Total Weight Gain (grams) 222.3

Moisture (%)

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC Run #4

Date 08-25-88

Sampling location INLET

Sample type M111

Run number 4

Sample box number

Clean-up person BPJ/MHe

Solvent rinses 0.1 N HNO_3

Sample Identification Code: FMC-082588-IN-4

XAD Trap #

W-34

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0	MGS	662.7	492.7	170
2	0.1N HNO_3	~100ml	GS	486.9	587.41	
3	0.1N HNO_3	~100ml		526.7	575.54	
4	EMPTY	~~~~ 0	MGS	576.3	486.73	
5	SILICA GEL	~150g		607.7	651.3	
6						
7						

Total ~~2197.6~~ 2860.3 ~~2300.48~~ 2793.68 ~~103.38~~ ~~66.62~~ ~~273.38~~

Total Weight Gain (grams)

* Total Comp - order reversed on Impinger Recovery

66.62

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Sample Identification Code:

Date 8/25/88

XAD Trap #

Sampling location Outlet 1-1 OTA

Sample type HMM

Run number 4

Sample box number

Clean-up person MH

Solvent rinses 0.1 N HNO_3

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	Empty	0		610.7	481.8	128.9
2	0.1N HNO_3	159		673.7	633.7	40.0
3	0.1N HNO_3	125		613.0	607.2	5.8
4	Empty	0		479.1	477.1	2
5	Silica Gel	160		711.3	705.2	11.1
6						
7						
				3093.6	2905	188.8

Total Weight Gain (grams) 188.8

3 P. =
25.5 inHg

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location Outlet 1-2 OTB

Sample type MM111

Run number 4

Sample box number

Clean-up person NH

Solvent rinses 0.1N HNO3

Sample Identification Code:

XAD Trap #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	EMPTY	0		586.68	464.9	121.78
2	0.1N HNO3	162.		717.2	668.1	49.1
3	0.1N HNO3	160		627.3	621.3	6.0
4	EMPTY	0		494.4	489.6	4.8
5	SILICA GEL	172		684.0	667.4	16.6
6						
7						

Total Weight Gain (grams) 198.3

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location OTA-5

Sample type mmIII

Run number 5

Sample box number

Clean-up person fly

Solvent rinses

Sample Identification Code:

FILTER NO ~~XAD-Trap~~ # W-38

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	MT			648.3	483.6	164.7
2	.1N HNO_3	150		691.2	641.7	49.5
3	.1N HNO_3	150		643.7	635.5	8.2
4	MT			4820	479.6	2.4
5	silica gel	200g	MG 5	792.2	779.2	13.0
6						
7						

Total Weight Gain (grams) 237.8

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location ~~CTB~~ OTB - 5

Sample type mm 111

Run number 5

Sample box number

Clean-up person fig

Solvent rinses

Sample Identification Code:

~~XAD Trap~~ FILTER NO # W - 39

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	MT			636.7	466.9	169.8
2	.1N HNO_3			673.0	628.9	44.1
3	.1N HNO_3			597.9	594.2	3.7
4	MT			492.9	490.5	2.4
5	Silica Se	200g		746.9	727.0	19.9
6						
7						

Total Weight Gain (grams) 239.9

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location OTB-6

Sample type MM 111

Run number 6

Sample box number

Clean-up person Mwsl

Solvent rinses 0.1N HNO3

Sample Identification Code:

~~XAD Trap #~~ FILTER NO 41

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1				610.4	460.1	150.3
2				703.0	626.3	76.7
3				622.4	610.7	11.7
4				477.8	474.9	2.9
5				722.6	708.0	14.6
6						
7						

Total Weight Gain (grams) 256.2

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 5/26/88

Sampling location OTA-6

Sample type MM 111

Run number 6

Sample box number

Clean-up person Mott.

Solvent rinses HNO_3

Sample Identification Code:

~~XAD Trap #~~ FILTER NO 40

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	MT	—	Mod	605.8	488.72	117.08
2	0.1N HNO_3	100mL	Mod	711.2	628.0	83.2
3	0.1N HNO_3	100mL	G/S	620.8	600.9	19.9
4	MT	—	Mod	468.6	461.9	6.7
5	Silica Gel	200g	Mod	772.6	754.3	18.3
6						
7						

Total Weight Gain (grams) 245.18

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location OTB-7

Sample type MM-111

Run number 7

Sample box number

Clean-up person [illegible]

Solvent rinses DI N HNO_3

Sample Identification Code:

FILTER NO.

~~XAD Trap~~ #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	MT	—	M	636.6	466.8	169.8
2	0.1N H_2O_2	100ml	M	687.7	630.4 ~~[illegible]~~	57.3
3	0.1N H_2O_2	100ml	G/S	605.9	599.6	6.3
4	MT	—	M	495.6	491.4	4.2
5	S.G.	200g.	M	781.4	759.6	21.8
6						
7						

Total Weight Gain (grams) 259.4

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/26/88

Sampling location OTA-7

Sample type MM-111

Run number 7

Sample box number

Clean-up person Mwtl

Solvent rinses 0.1 N HNO3

Sample Identification Code:

~~XAD Trap~~ FILTER # #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	MT			661.9	482.3	179.6
2	0.1N HNO3	100		652.6	602.9	49.7
3	0.1N HNO3	100		589.8	582.0	7.8
4	MT			483.0	480.0	3.0
5	SG	200		794.5	780.9	13.6
6						
7						

Total Weight Gain (grams) 253.7

APPENDIX G.2 - Orsat

Check Gas ✓
Wet test run 1

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: EMC
DATE: ~~8/23~~ 8/24/88
SAMPLING TIME (24 hr CLOCK): 11:00
SAMPLING LOCATION: ~~[illegible]~~ IN-1
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: ORSAT
AMBIENT TEMPERATURE: 25 F
OPERATOR: R. O'Ln

COMMENTS:

GAS \ RUN	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	.8 8.4 8.4	7.6 ✓	.8 8.1 8.2	7.4 ✓	~~7.5~~		~~[illegible]~~ 7.50 ✓	44/100	3.30 ✓
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.8 24.2 24.3 23.5 ✓	15.9 ✓	23.9 24.2 24.4 ✓ 23.6	16.2 ✓	~~16.05~~		16.05 ✓	32/100	5.14 ✓
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.5 ✓		76.4 ✓			76.45 ✓	28/100	21.41 ✓
								TOTAL	29.84 ✓

EPA (Dur) 230
4/72

OTA Run #1

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: ~~8-23-88~~ 8/24/88
SAMPLING TIME (24 hr CLOCK): 11:00
SAMPLING LOCATION: OTA OUTLET 1-1 Run #1
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 75 F
OPERATOR: R. Olin

COMMENTS:

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	7.8 7.8	7.4	.6 7.8 7.8	7.2			7.30	44/100	3.21
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.6 24.0 24.0 23.6	16.2 ~~23.6~~	23.3 24.0 24.1 23.5	16.3			16.25	32/100	5.20
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.4		76.5			76.45	28/100	21.41
								TOTAL	29.82

EPA (Dur) 230
4/72

Checked GDA ✓

OTB run 1

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: ~~8-25-88~~ 8/24/88
SAMPLING TIME (24 hr CLOCK): 11.00
SAMPLING LOCATION: OUTLET 1-2 (B) run 1
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 75 F
OPERATOR: R. Olin

COMMENTS:

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	~~1.8~~ 8.4 8.4	7.6	~~1.0~~ 8.6 8.6	7.6			7.60	44/100	3.34
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	24.0 24.4 ~~24.6~~ 25.8	16.2	23.4 24.1 24.5 ~~24.6~~ 23.6	~~16.2~~ 16.0			16.2	32/100	5.18
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		~~83.4~~ 76.2		~~76.2~~ 76.4			76.3	28/100	21.38
								TOTAL	29.85

EPA (Dur) 230
4/72

checked out

DRY MOLECULAR WEIGHT DETERMINATION

Orsat done 8/25/88

PLANT FMC
DATE 8/24/88
SAMPLING TIME (24 hr CLOCK) 15:00
SAMPLING LOCATION OTA run 2
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 75 F
OPERATOR R. Olin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	-.4 6.8 6.8	6.4	-.1 6.8 6.9	6.8			6.6	44/100	2.90
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	22.1 23.1 23.4 23.5 231	16.7	23.4 23.6 235	16.7			16.7	32/100	5.34
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.9		76.5			76.7	28/100	21.48
								TOTAL	29.72

EPA (Dur) 230
4/72

Clean GUV

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/24/88
SAMPLING TIME (24 hr CLOCK): 15:00
SAMPLING LOCATION: OUTLET B - run 2
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 70
OPERATOR: R. Olin

COMMENTS: Orsat done 8/25/88.

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	~~7.5~~ ~~6.4~~	5.9	~~7.8~~ ~~7.0~~	6.0			5.95	44/100	2.62
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	~~22.5~~ ~~23.7~~ 23.2	~~16.8~~ 17.3	~~23.4~~ ~~23.8~~ 23	17			17.15 ~~16.9~~	32/100	5.49 ~~5.44~~
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		~~77.5~~ 76.8		77			76.9 ~~77.15~~	28/100	21.53 ~~21.60~~
								TOTAL	29.64 ~~29.63~~

EPA (Det) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/25/88
SAMPLING TIME (24 hr CLOCK): 1800
SAMPLING LOCATION: inlet IN-3
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 75 F
OPERATOR: R. Olin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	2.9 2.9	7.1	3.2 3.2	7.1			7.1	44/100	3.12
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.9 24.2 24.4 23.6	16.5	24.0 24.0 23.3	16.2			16.35	32/100	5.23
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.4		76.7			76.55	28/100	21.43
								TOTAL	29.78

EPA (Dur) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8-25-88
SAMPLING TIME (24 hr CLOCK): 11:40
SAMPLING LOCATION: OTA run 3 outlet 1-1
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 70 F
OPERATOR: R. Olin

COMMENTS:

GAS \ RUN	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	7.4 7.5 7.5	7.1	7.1 7.0 7.1	7.0			7.05	44/100	3.10
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.6 23.6 23.2	16.1	23.0 23.2 23.1	16.1			16.1	32/100	5.15
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.8		76.9			76.85	28/100	21.~~34~~ 52
								TOTAL	29.~~59~~ 77

EPA (Dec) 230
4/72

Checked GDK ✓

DRY MOLECULAR WEIGHT DETERMINATION

PLANT FMC
DATE 8-25-88
SAMPLING TIME (24 hr CLOCK) 11:40
SAMPLING LOCATION OT B (OUTLET 1-2) run 3
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 70 F
OPERATOR R. Olin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	-.1 8.6 8.6	8.5	-.3 8.6 8.7	8.4			8.45	44/100	3.72
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	24.0 24.2 24.1	15.6	23.8 24.0 24.1 23.8	15.4			15.5	32/100	4.96
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	21.29
N_2 (NET IS 100 MINUS ACTUAL CO READING)		75.9		76.2			76.05	28/100	
								TOTAL	29.97

EPA (Dual) 230
4/72

Checked [illegible]

DRY MOLECULAR WEIGHT DETERMINATION

PLANT FMC
DATE 8-25-88
SAMPLING TIME (24 hr CLOCK) 16:00
SAMPLING LOCATION OUTLET 1-1 OTA run 4
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 80 F
OPERATOR R. Olin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	.10 6.2 6.4	6.4	.4 6.6 6.7	6.3			6.35	44/100	2.79
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.4 23.5	17.1	23.4 23.6 23.8 23.4	17.1			17.1	32/100	5.47
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.5		76.6			76.55	28/100	21.43
								TOTAL	29.70 (64)

EPA (Det) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/25/88
SAMPLING TIME (24 hr CLOCK): 16:00
SAMPLING LOCATION: OUTLET 1-2 OTB - run 4
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 80 F
OPERATOR: R. Olin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	7.2	7.3	7.3	7.3			7.3	44/100	3.21
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	24.6 / 24.8 / 24.1	16.8	24.2 / 24.3 / 24.1	16.8			16.8	32/100	5.38
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		75.9		75.9			75.9	28/100	21.52
								TOTAL	29.84

EPA (Dual) 230
4/72

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/26/88
SAMPLING TIME (24 hr CLOCK): 9:00
SAMPLING LOCATION: OTA OUTLET 1-1 Run 5
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 70 F
OPERATOR: R. Olin

COMMENTS:

GAS \ RUN	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	7.0	6.6	7.8	6.7			6.65	44/100	2.93
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	22.8 23.7 23.8 23.4	16.8	24.3 24.8 25.03	16.6			16.7	32/100	5.34
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.6		76.7			76.65	28/100	21.46
								TOTAL	29.73

EPA (Dot) 230
4/72

ORSATS

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/26/88
SAMPLING TIME (24 hr CLOCK): 1000
SAMPLING LOCATION: OTB outlet run 5
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 25
OPERATOR: R Olin

COMMENTS: O_2 reagent changed

GAS \ RUN	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	4.4, 7.2, 7.2	6.8	7.4	7.0			6.9	44/100	3.04
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	22.1, 22.4, 23.3, 23.4, 23.0	16.2	22.2, 23.6, 23.2	16.2			16.2	32/100	5.18
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		77		76.8			76.9	28/100	21.53
								TOTAL	29.75

EPA (Dist) 230
4/72

Checked GDR ✓

DRY MOLECULAR WEIGHT DETERMINATION

PLANT: FMC
DATE: 8/20/88
SAMPLING TIME (24 hr CLOCK): 1500
SAMPLING LOCATION: outlet H2 OTB run 6
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS):
ANALYTICAL METHOD: Orsat
AMBIENT TEMPERATURE: 75F
OPERATOR: R. Otis

COMMENTS:

GAS \ RUN	1 ACTUAL READING	1 NET	2 ACTUAL READING	2 NET	3 ACTUAL READING	3 NET	AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
CO_2	~~6.4~~ 6.7 6.7	6.3	~~6.0~~ 6.2	6.2			6.25	44/100	2.75
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.7 23.7 23.3	17.0	23.0 23.3	17.1			17.05	32/100	5.46
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.7		76.7			76.7	28/100	21.48
								TOTAL	29.69

EPA (Det) 230
4/72

electrical GIDL ✓

DRY MOLECULAR WEIGHT DETERMINATION

PLANT FMC
DATE 8/26/28
SAMPLING TIME (24 hr CLOCK) 1600
SAMPLING LOCATION OTA OUTLET H1 RUN 7
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS)
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 75 F
OPERATOR R. Ozin

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d, lb/lb-mole
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	~~6.5~~ 6.8	6.3	~~6.3~~ 6.4	6.1			6.2	44/100	2.73
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	23.6 / 23.1	16.8 ~~17.5~~	23.4 / 23.1	17			16.9	32/100	5.41
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		76.9		76.9			76.9	28/100	21.53
								TOTAL	29.67

EPA (Dur) 230
4/72

APPENDIX H - MM 111 ANALYTICAL WEIGHTS

RADIAN CORPORATION

METHOD 5 ANALYSIS DATA SHEET

Client EMB Phos.
Plant FMC
Sample Type Filters

Run #
Date
Technician
Sheet of

Weights from Log (#13523 pg 30 #21087 pg 9)

Run #	Sample ID#	Sample Vol. ml	Blank Corr. ml	Tare Weight (g)	Final Weight (g)	Sample Weight (g)	Comments
OTA1	W25			.6281	.7042	.0761	
OTB1	W28			.6236	.7184	.0948	
IN1	W26			.6273	.7551	0.1278	
OTA2	W30			.6224	.7013	.0789	
OTB2	W31			.6264	.7244	.0980	
IN2	W29			.6243	1.3645	.7402	
OTA3	W32			.6227	~~.7188~~ .7210	.0983	
OTB3	W33			.6243	.7188	.0945	
IN3	W35			.6365	.8177	.1862	
OTA4	W36			.6257	.7225	.0968	
OTB4	W37			.6341	.7250	.0909	
IN4	W34			.6258	.8571	.2313	

RADIAN CORPORATION

METHOD 5 ANALYSIS DATA SHEET

Client: EMB-Phos.
Plant: FMC
Sample Type: 5'/2 Particulates

Run #
Date
Technician
Sheet ____ of ____

From Log

Run #	Sample ID#	Sample Vol. ml	Blank Corr. ml	Tare Weight (g)	Final Weight (g)	Sample Weight (g)	Comments
OTA1	101	200+ 200+ 150		106.7182	106.7324		
					106.7316		
					106.7321		
						.0139	
OTB1	102	200+ 200+ 200		106.6505	106.6585		
					106.6583		
						.0078	
IN1	103	200+ 200+ 150		109.9259	110.6639		
					110.6639		
						.7380	
OTA2	104	200+ 200+ 125		108.1949	108.2171		
					108.2173		
						.0224	
OTB2	105	200+ 200+ 175+75		108.4128	108.4424		
					108.4420		
						.0292	
IN2	106	200+ 200+ 200+ 50		106.6175	107.0316		
					107.0312		
						.4137	
OTA3	107	200+ 200+ 50		105.8124	105.8290		
					105.8293	.0169	
OTB3	108	200+ 200+ 125		106.9921	107.0018		
					107.0013		
						.0092	.002
IN3	109	200+ 200+ 150+75		108.7907	109.0018		
					109.6014		
						.8107	
						.0107	.02
OTA4	110	200+ 200+ 150		106.4147	106.4233		
					106.4232	.0085	
OTB4	111	200+ 200+ 125+ 80		110.9992	[illegible]		
					111.0141		
					.02	.0149	

.02

RADIAN CORPORATION

METHOD 5 ANALYSIS DATA SHEET

Client EMB Plus
Plant FMC
Sample Type f/2 dry downs

Run #
Date
Technician
Sheet ____ of ____

Run #	Sample ID#	Sample Vol. ml	Blank Corr. ml	Tare Weight (g)	Final Weight (g)	Sample Weight (g)	Comments
IN 4	112	200 +100 +50		107.2195	108.6782		
					108.6787	1.4592	
OTA5	113	250		105.1984	105.2196		
				105.1981	105.2196		
						.0215	
OTB5	114	325		105.1732	105.1835		
				105.1728	105.1832		
						.0104	
OTA6 B	115	350		111.1818	111.1904		
				111.1819	111.1904		
						.0085	
OTB6 A	116	~~450~~ 375		108.5327	108.5674		
				108.5323	108.5677		
						.0354	
OTA7	117	450 ~~250~~		108.6834	108.5673		
				108.6832	108.6991		
					108.6996		
						.0164	
OTB7	118	250		108.1062	108.1191		
				108.1060	108.1196		
						.0136	
Blank	119	200		107.4964	107.4961		
				107.4961	107.4961	0.00	
						0.0000	
OTA FB	120	250		109.2859			
OT Blank	121	~~140~~ 250					
IN Blank	122	~~140~~ 200					
IN FB	123	225					

RADIAN CORPORATION

METHOD 5 ANALYSIS DATA SHEET

Client EMB Phos
Plant FMC
Sample Type Filter Wts

Run #
Date
Technician
Sheet ___ of ___

wts from Log (#21087)

Run #	Sample ID#	Sample Vol. ml	Blank Corr. ml	Tare Weight (g)	Final Weight (g)	Sample Weight (g)	Comments
OTA5	W38			.6330	.7250	~~.0950~~	
						.0920	
OTB5	W39			.6270	.7197	~~.0927~~	
						.0927	
OTA6	W40			.6345	.7322		
						.0977	
OTB6	W41			.6317	.7325		
						.1008	
OTA7	W42			.6284	.7260		
						.0976	
OTB7	W43			.6294	.7318		
						.1024	

APPENDIX I - PSD ANALYTICAL WEIGHTS

Project No.
Book No. 21087 TITLE FMC PSD final Wts Run 1

From Page No.

	8/24 1045	8/25 1000	1430	1845	Net
FMC OTA-1 L-0	.55976	.56010	.56007		.00011
1	.70148	~~.70170~~ .70170	.70175	.70170	.00050
2	.66919	.66944	.66939	.66934	.00037
3	.68815	.68834	.68834		.00113
4	.68355	.68375	.68365	.68365	.00015
5	.68359	.68383	.68375	.68379	.00191
6	.68947	.68969	.68958	.68958	.00264
7	.70363	.70390	.70377 D²	.70365	.00340
8	.66838	.66834	.66844		.00144
9	.88452	.88448	.88527	.88456	.06493
FMC OTB-1 Y-0	.52209	.52241 D²	.52264	.52263	.00054
1	.69303	.69328	.69353	.69358	.00119
2	.67436	.67412	.67480 D²	.67477	.00131
3	.69494	.69484	~~.69529~~ .69529	.69533	.00140
4	.67369	.67385	.67388		.00139
5	.69892	.69903	.69914	.69915	.00184
6	.68343	.68323	.68345		.00168
7	.69873	.69836	.69871		.00276
8	.68579	.68551	.68583		.00447 ~~.00447~~ ~~.02521~~
9	.82650 D²	.82753	.82771	.82750	.05845
FMC 1-1-01 W-1 X-0	.55237 D²	.55219	.55240	.55215	.03067
1	.69744	.69720	.69739	.69739	.00025
2	.66406	.66393	.66406		.00080
3	.69940	.69925	.69931	.69930	.00099
4	.66937	.66916	.66926	.66939	.00046
5	.67297	.67292	.67291		.00028
6	.67330	.67299	.67298		.00138
7	.68976	.68957	.68953		.00053
8	.69870	.69847	.69854	.69859	.00004
9	.78423	.78409	.78408		.00102

O = cyclone 9 = Backup Filter

To Page No.

Witnessed & Understood by me. | Date | Invented by | Date | Recorded by

TITLE PSD fuel into Run 2

Project No.

Book No. 21087

From Page No.

	8/25 1130	1545	1930	(8/26) 0730	Net
FL Ø	.62472	.62456	.62457		.00018
1	.78102	.78110	.78092	.78091	.00084
2	.75553	.75555			.00076
3	.83738	.83735			.00092
OTB-2 4	.75623	.75611	.75618		.00088
5	.79365	.79340			.00164
6	.77366	.77367			.00221
7	.77926	.77910	.77907		.00252
8	.76594	.76563	.76562		.00598
9	.93912	.93851	.93851		.05827
AE Ø	.54647	.54622	.54629		.00034
1	.68100	.68104			.00064
2	.67037	.67043	.67034		.00056
3	.67468	.67468			.00076
OTA-2 4	.66291	.66289	.66290		.00103
5	.70484	.70464	.70465		.00107
6	.68079	.68066	.68067		.00156
7	.69322	.69308	.69307		.00214
8	.67885	.67848	.67848		.00337
9	.80040	.80009	~~.0800~~ .79992	.79990	.04316
AB Ø	.59695	.59637	.59641		.03133
1	.70564	.70516	.70507	.70505	.00110
2	.66706	.66674	.66679		.00103
3	.69537 .69530	~~.69530~~	.69576	.69514	.00094
tubt 4	.67009	.67012	.67005		.00069
02 5	.69245	.69230	.69224	.69234	.00052
6	.68842	.68838			.00038
7	.70002	.69964	.69960		.00011
8	.68040	.68008	.67999	.68012	.00019
9	.80736	.80719	.80716		.00149

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

Project No.

Book No. 21087 TITLE FMC PSD final wts. Run 3

From Page No.

				Net
/ (8/26) 0845		1400	1840	
FKØ	.61804	.61792	.61801	0.00016
1	.77501	.77497		0.00050
2	.76035	.76050	.76046	0.00027
3	.85374	.85384	.85380	0.00052 ~~0.07861~~ TMW
4	.76703	.76713	.76712	0.00091
5	.79017	.79027	.79032	0.00130
6	.77081	.77094	.77097	0.00196
7	.78416	.78409	.78406	0.00519
8	.76912	.76908		0.07309
9	.92868	.92861	.92863	0.05131
FPØ	.61164	.61147	.61160	0.00025
1	.78656	.78657		0.00037
2	.76026	.76029		0.00054
3	.84722	~~.847~~ .84692	.84697	~~0.07914~~ TMW 0.00072
4	.76872	.76852	.76852	.00069
5	.76659	.76648	.76653	0.00138
6	.75913	.75904	.75907	0.00187
7	.79442	.79438		0.00349
8	.77719	.77714		0.01252
9	.92723	.92717		0.04888
PØ	.55228	.55229		+0.04388
P1	.67094	.67090		+0.00161
P2	.63702	.63701		+0.00129
3	.66924	.66913	.66916	+0.00115
4	.64870	.64862	.64858	0.00035
5	.67333	.67331		0.00023
6	.63793	.63791		0.00030
7	.66634	.66619	.66617	-0.00001
8	.65152	.65143	.65139	-0.00005
9	.76331	.76334	~~.75~~	0.00116

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Witnessed & Understood by me	Date	Invented by	Date
		Recorded by	

TITLE FMC PSD Blank final wts. Project No. _____ Book No. 21087 17

From Page No. —

	8/26 0920	1100	1940
FM-1	.78150	.78155	.78739
2	1.39384	1.39372	1.39368
3	.83821	.83817	
Inlet 4	.76123	.76130	.76119
Blank 5	.78772	.78781	.78776
6	.78148	.78148	
7	.78228	.78194	.78194
8	.75929	.75915	.75912
9	.88946	.88943	
FM1	.77644	.77642	
2	.76232	.76208	.76213
3	.84433	.84913	.84928
Inlet 4	.76593	.76578	.76589
Blank 5	.78709	.78708	
6	.77118	.77119	
7	.78972	.78975	
8	.76192	.76206	.76197
9	.89460	.89484	~~.89480~~ .89414

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Witnessed & Understood by me,	Date	Invented by	Date
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TITLE PSD Tare Wts 8/23/88

Project No. FMC
Book No. 21087

From Page No.

#	1300	1530	1700	
FL0	.62437	.62439		
FL1	.78007	.78007		
FL2	.75480	.75485		
FL3	.83642	.83643		
FL4	.75529	.75530		
FL5	.79191	.79196		
FL6	.77135	.77144	.77146	
FL7	.77651	.77666	~~.77600~~ .77655	
FL8	.75980	.75974	.75964	
FL9	.88023	.88030	.88024	
	8/23	8/24		
	1700	0745	1645	
FM1	.77613	.77619	.77621	
2	.76210	.76210	.76212	
3	.84923	.84932	.84924	
4	.76575	.76578	.76580	
5	.78698	.78707	.78703	
6	.77102	.77101	.77100	
7	.78964	.78964	.78960	
8	.76203	.76202	.76203	
9	.89393	.89399	.89399	
FM0	.62827	.62827	.62824	1920 ~~1855~~
FN0	.60895	.60902	.60890	
1	.78739	.78746	.78734	
2	1.39381	1.39376	1.39371	
3	.83838	.83842	.83823	.83828
4	.76153	.76158	.76144	.76149
5	.78799	.78814	.78803	
6	.78162	.78175	.78173	
7	.78211	.78221	.78223	
8	.75931	.75944	.75945	
9	.88944	.88957	.88942	

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Witnessed & Understood by me, | Date | Invented by | Date

Project No._____
Book No. 21087 TITLE PSD Tare Wts

From Page No.__

#	8/23 1732	8/24 0730	1715	1855
F0 Ø	.61444	.61432	.61441	
F0 1	.79170	.79152	.79162	.79164
2	.76771	.76750	.76769	
3	~~.84408~~ D2 .84393	.84325	.84334	.84335
4	.75414	.75386	.75409	
5	.77654	.77634	.77649	.77637
6	.75944	.75911	.75936	.75915
7	.78549	.78522	.78541	.78527
8	.76911	.76914	.76913	
9	.89104	.89093	.89102	

	8/24 0830	1600	8/25 0745
FP 0	.61137	.61128	.61135
1	.78631	.78621	.78620
2	.75985	.75970	.75975
3	.84624	.84620	.84625
4	.76781	.76764	.76783
5	.76513	.76502	.76515
6	.75719	.75706	.75720
7	.79094	.79084	.79089
8	.76445	.76460	.76462
9	.87882	.87892	.87889

	1315	1745
FK 0	.61794	.61785
1	.77459	.77447
2	~~.76040~~ D2 .76020	.76019
3	.85338	D3 ~~.85334~~ .85328
4	.76634	.76621
5	.78902	.78902
6	.76906	.76901
7	.77897	.77887
8	.75609	.75599
9	.87737	D3 ~~.87734~~ .87732

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TITLE FMC PSD tare wts

Project No.

Book No. 21087

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8/25 1345

FU-Ø	.62344
1	.76905
2	.77143
3	.82576
4	.76770
5	.78275
6	.76864
7	.79001
8	.77087
9	.87804

FVØ	.62353	Field blank
1	.79031	
2	.76347	
3	.79352	
4	.76410	
5	.79110	
6	.76395	
7	.77478	
8	.75813	
9	.87560	

To

Witnessed & Understood by me. | Date | Invented by | Date

TITLE _____ Project No. _____ Book No. _____

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From Page No. ___

Set and Number	8/5/88 wt #1	8/6/88 wt #2	8/8/88 wt #3	TARE Value
P zero	.50846 ✓	.50832	.50841 ✓	.50841
P1	.66949	.66929 ✓	.66934 ✓	.66924
P2	.63586	.63572 ✓	.63573 ✓	.63572
P3	.66813	.66801 ✓	.66801 ✓	.66801
P4	.64823 ✓	.64816	.64825 ✓	.64823
P5	.67313 ✓	.67299	.67308 ✓	.67308
P6	~~.63914~~ (WB)	.63761 ✓	.63762 ✓	.63761
P7	.66621 ✓	.66619 ✓	.66618 ✓	.66618
P8	.65150	.65145 ✓	.65144 ✓	.65144
P9	.76222	.76219 ✓	.76218 ✓	.76218
Q zero	.50502 ✓	.50504 ✓	—	.50502
Q 1	.67849 ✓	.67850 ✓	—	.67849
Q 2	.64708 ✓	.64708 ✓	—	.64708
Q 3	.65071	.65051 ✓	.65049 ✓	.65049
Q 4	.65153 ✓	.65155 ✓	—	.65153
Q 5	.68476 ✓	.68477 ✓	—	.68476
Q 6	.66050 ✓	.66063	.66045 ✓	.66045
Q 7	.67711 ✓	.67728	.67707 ✓	.67707
Q 8	.65295 ✓	.65293 ✓	—	.65293
Q 9	.75079 ✓	.75094	.75083 ✓	.75079
R zero	.49773 ✓	.49777 ✓	—	.49773
R1	.65321 ✓	.69324 ✓	—	.65321
R2	.65017 ✓	.65012 ✓	—	.65012
R3	.66083 ✓	.66107	.66063	.66079 ✓ .66079
R4	.65531	.65523 ✓	~~[illegible]~~ (WB)	.65522 ✓ .65522
R5	.67887	.67894 ✓	.67893 ✓	.67893
R6	.65004 ✓	.65005 ✓	—	.65004
R7	.67287 ✓	.67284 ✓	—	.67284
R8	.66135 ✓	.66133 ✓	—	.66133
R9	.75281 ✓	.75277 ✓	—	.75277

Set P done

Set Q done

Set R done

Witnessed & Understood by me | Date | Inventor

PSD filter 8/88

Project No.

Book No.

Set and number	8/5/88 wt #1	8/6/88 wt #2	8/8/88 wt #3	8/9/88 wt 4	Tare Value
V zero	.52186 ✓	.521173 (?)	.52181 ✓	Set V done	.52181
V 1	.68926 ✓	.68902	.68928 ✓		.68926
V 2	.65950 ✓	.65919	.65951 ✓		.65950
V 3	.67261 ✓	.67217	.67256 ✓		.67256
V 4	.64859	.64809	.64825 ✓	.64825 ✓	.64825
V 5	.67413 ✓	.67388	.67412 ✓		.67412
V 6	.67114 ✓	.67081	.67110 ✓		.67110
V 7	.67[illegible]	.67124 ✓	.67138	.67128 ✓	.67124
V 8	.65674	.65642 ✓	.65647 ✓		.65642
V 9	.74733	.74698 ✓	.74699 ✓		.74698
W zero	.50354 ✓	.50337	.50358 ✓		.50358
W 1	.67817	.67787	.67797 ✓	.67797 ✓	.67797
W 2	.65511	.65483 ✓	.65496	.65481 ✓	.65481
W 3	.67866	.67823	.67840 ✓	.67840 ✓	.67840
W 4	.64252	.64286	.64218 ✓	.64222 ✓	.64218
W 5	.66200 ✓	.66189	.66205 ✓	Set W done	.66200
W 6	.65019 ✓	.64985	.65014 ✓		.65014
W 7	.68137	.68107 ✓	.68118	.68109 ✓	.68107
W 8	.65693	.65654 ✓	.65659 ✓		.65654
W 9	.74991	.74964	.74944 ✓	.74943 ✓	.74943

	8/8/88 wt #1	8/9/88 wt #2 (Afn)	8/9/88 wt 3 ← (Pa)	8/10/88 wt 4	Tare Value
X zero	.52170	.52148 ✓	.52152 ✓	—	.52148
X 1	.69614 ✓	.69602	(B.d) ~~.69623~~ (Bad)	.69619 ✓	.69614
X 2	.66343	.66316	.66329 ✓	.66326 ✓	.66326
X 3	.69831 ✓	.69834 ✓	—	—	.69831
X 4	.66893 ✓	.66881	.66895 ✓	—	.66893
X 5	.67268 ✓	.67248	.67263 ✓	—	.67263
X 6	.67272 ✓	.67263	.67270 ✓	—	.67270
X 7	.68960	.68939 ✓	.68950	.68939 ✓	.68939
X 8	.69858 ✓	.69841	.69859 ✓	—	.69855
X 9	.78303 ✓	.78302 ✓	—		.78302

Set X done

To Page No.

Invented by

Date

Project No. _____
Book No. _____ TITLE _____

From Page No. ___

Set and Number	8/6/88 wt #1	8/6/88 wt #2	8/8/88 wt #3	8/9/88 wt 4	True Value
L-zero	.55983	.55996 ✓	.55998 ✓		.55996
L 1	.70120 ✓	.70145	.70125 ✓		.70126
L 2	.66904	.66902 ✓	.66897 ✓		.66897
L 3	.68731	.68721 ✓	.68721 ✓		.68721
L 4	.68267	.68250 ✓	.68232	.68253 ✓	.68250
L 5	.68199	.68206 ✓	.68208 ✓		.68206
L 6	.68694 ✓	.68709	.68686	.68694 ✓	.68694
L 7	.70025 ✓	.70030 ✓	.70011		.70025
L 8	.66098	.66102 ✓	.66097 ✓	Set L done	.66098
L 9	.81969	.81966 ✓	.81963 ✓		.81969
M zero	.54518	.54504 ✓	.54502 ✓		.54518
M 1	.66777 ✓	.66766	.66750	.66778 ✓	.66777
M 2	.70157 ✓	.70145	.70137	.70153 ✓	.70157
M 3	.65321 ✓	.65323 ✓	.65302		.65321
M 4	.63065 ✓	.63073	.63067 ✓		.63065
M 5	.71520 ✓	.71533	.71507	.71527 ✓	.71527
M 6	.64110 ✓	.64122	.64113 ✓	Set M done	.64110
M 7	.70040	.70047	.70023 ✓	.70020 ✓	.70020
M 8	.65060 ✓	.65063 ✓	.65044		.65060
M 9	.77587	.77576	.77560 ✓	.77565 ✓	.77560
N zero	.48810	.48801	.48795 ✓	.48797 ✓	.48795
N 1	.63790	.63780 ✓	.63779 ✓		.63779
N 2	.65635	.65621 ✓	.65622 ✓		.65622
N 3	.66936	.66878	.66911 ✓	.66915 ✓	.66911
N 4	.65040	.65012 ✓	.65007 ✓		.65007
N 5	.67445 ✓	.67441 ✓	.67414		.67441
N 6	.65648	.65642 ✓	.65637 ✓	Set N done	.65637
N 7	.66572 ✓	.66573 ✓	.66568		.66572
N 8	.65398 ✓	.65400 ✓	.65389		.65399
N 9	.77158	.77146 ✓	.77149 ✓		.77146

Note to avoid confusion there is no set w/ the letter "O" as in OOPS!

Witnessed & Understood by me.	Date	Invented by

Project No._____ Book No._____ TITLE PSD filters 8/88

From Page No.__

Set and Number	8/5/88 wt 1	8/6/88 wt 2	8/8/88 wt # 3	8/9/88 wt 4	TAPE Value
S zero	.50396	.50428	.50386 ✓	.50386 ✓	.50386
S 1	.66972	.66984	.66953 ✓	.66937 ✓	.66953
S 2	.63556	.63563	.63518 ✓	.63513 ✓	.63513
S 3	.67367 ✓	.67402	.67369 ✓		.67367
S 4	.66608 ✓	.66628	.66603 ✓	Set S done	.66603
S 5	.68486 ✓	.68505	.68486 ✓		.68486
S 6	.65506 ✓	.65520	.65506 ✓		.65506
S 7	.66357	.66372	.66344 ✓	.66348 ✓	.66344
S 8	.64646	.64652	.64638 ✓	.64636 ✓	.64636
S 9	.76838 ✓	.76843 ✓	.76838 ✓		.76838
T zero	.51515 ✓	.51523	.51497	.51510 ✓	.51510
T 1	.66633	.66621 ✓	.66618 ✓		.66618
T 2	.66811	.66787 ✓	.66781	.66787 ✓	.66787
T 3	.65830	.65800 ✓	.65800 ✓		.65800
T 4	.64268	.64228 ✓	.64229 ✓	Set T done	.64228
T 5	.69037 ✓	.69041 ✓	—		.69037
T 6	.65286 ✓	.65282 ✓	—		.65282
T 7	.66378 ✓	.66385	.66365	.66378 ✓	.66378
T 8	.65958 ✓	.65953 ✓	—		.65953
T 9	.75409	.75395 ✓	.75393 ✓		.75393
U zero	.49301 ✓	.49303 ✓	—		.49301
U-1	.64487 ✓	.64483 ✓	—		.64483
U 2	.64481 ✓	.64477 ✓	—		.64477
U 3	.65507 ✓	.65508 ✓	—	Set U done	.65507
U 4	.66478 ✓	.66473 ✓	—		.66473
U 5	.69848	.69857 ✓	~~.69876~~ .69862 ✓		.69857
U 6	.67504 ✓	.67500 ✓	—		.67500
U 7	.67867	.67853 ✓	.67857 ✓		.67853
U 8	.62579	.62563 ✓	.62567 ✓		.62563
U 9	.75211	.75194 ✓	.75198 ✓		.75194

Witnessed & Understood by me. | Date | Invented by

TITLE Set W weights

Project No.

Book No.

From Page No. 30

	(1800)	(2230)
W31	.6263	.6264
W32	.6225	.6227
W33	.6242	.6243
W34	.6257	.6258
W35	.6315	.6315
W36	.6254	.6257
W37	.6340	.6341
W38	.6327	.6330
W39	.6267	.6270
W40	.6342	.6345
W41	.6314	.6317
W42	.6282	.6284
W43	.6293	.6294
W44	.6233	.6236
W45	.6322	.6324
W46	.6345	.6344
W47	.6342	.6342
W48	.6359	.6360
W49	.6316	.6317
W50	.6197	.6195
W51	.6203	.6199
W52	.6175	.6172
W53	.6199	.6197
W54	.6229	.6227
W55	.6250	.6249
W56	.6219	.6217
W57	.6240	.6239
W58	.6222	.6220
W59	.6206	.6204
W60	.6345	.6345
W61	.6229	.6226
W62	.6262	.6260
W63	.6338	.6336
W64	.6348	.6346
W65	.6377	.6374
W66	.6326	.6324
* W67	.6179	.6176

To Page

Witnessed & Understood by me. | Date | Invented by | Date

Recorded by

Project No._____
Book No._____ TITLE: Filter Weights set "W"

From Page No. NA

Glass Fiber Whatman 934AH
Baked to 400°F before dessicating

8/8/88 1800 Hours
wet bulb ~~[illegible]~~ 77°F dry bulb = 68°F
Calibration: 1g = .9990 g
500 mg = .4999 g
200 mg = .1998 g

Filter #	Tare 1800	TARE 2230
W1	.6164	.6165 ✓
W2	.6193	.6193 ✓
W3	.6165	.6166 ✓ ~~[illegible]~~
W4	.6185	.6187 ✓
W5	.6277	.6279 ✓
W6	.6258	.6257
W7	.6193	.6190
W8	.6138	.6137
W9	.6193	.6190
W10	.6206	.6201
W11	.6179	.6177
W12	.6280	.6276
W13	.6345	.6341
W14	.6306	.6304
W15	.6295	.6291 ~~.6290~~ .6292
W16	.6316	.6312
W17	.6361	.6358
W18	.6276	.6274
W19	.6303	.6299
W20	.6338	.6338
W21	.6246	.6247
W22	.6235	.6236
W23	.6248	.6249
W24	.6264	.6266
W25	.6279	.6281
W26	.6271	.6273
W27	.6232	.6232
W28	.6236	.6236
W29	.6241	.6243
W30	.6225	.6224

Witnessed & Understood by me, | Date | Invented by

Recorded by: [signature]

Project No. _____ Book No. _____ TITLE PSW pellets 0/08

From Page No. 8/8/88

Set & Number	8/8/88 wt#1	8/9/88 (AM) wt#2	8/9/88 (PM) wt 3	wt 4 8/10/88	Tare Val
y zero	.52210 ✓	.52209 ✓	—	—	.52201
y 1	.69289	.69244 ✓	.69239	.69239 ✓	.69235
y 2	.67356 ✓	.67361 ✓	—	—	.67356
y 3	.69398 ✓	.69393 ✓	—	—	.69393
y 4	.67249 ✓	.67250 ✓	—	—	.67241
y 5	.69731 ✓	.69733 ✓	—	—	.6973
y 6	.68177 ✓	.68179 ✓	—	—	.68171
y 7	.69612	.69595 ✓	.69600 ✓	—	.6959
y 8	.68155	.68136 ✓	.68140 ✓	—	.681
y 9	.76907 ✓	.76905 ✓	—	—	.7690
z zero	.55740 ✓	.55744 ✓	—		.55.
z 1	.69088 ✓	.69085 ✓	—		.69.
z 2	.69467 ✓	.69466 ✓	—		.694..
z 3	.69303 ✓	.69300 ✓	—		.69300
z 4	.67014 ✓	.66997	.67015 ✓		.67014
z 5	.69736 ✓	.69716	.69731 ✓		.69731
z 6	.66566 ✓	.66564 ✓	—		.66564
z 7	.68564 ✓	.68564 ✓	—		.68564
z 8	.66060 ✓	.66042	.66056 ✓		.66056
z 9	.76845 ✓	.76844 ✓	—		.76844
AA zero	.54883	.54874 ✓	.58473 ✓	.54873	~~.58495~~
AA 1	.68495 ✓	.68499 ✓	—		.68495
AA 2	.68049 ✓	.68047 ✓	—		.68047
AA 3	.69526 ✓	.69510	.69524 ✓		.69524
AA 4	.66774 ✓	.66781 ✓	.66779 ✓		.66774
AA 5	.70018 ✓	.70018 ✓	—		.70018
AA 6	.66206 ✓	.66214 ✓	.66210 ✓		.66206
AA 7	.70627 ✓	.70632 ✓	—		.70627
AA 8	.66056	.66064 ✓	.66067 ✓		.66064
AA 9	.79458 ✓	.79455 ✓	—		.79455

Set y done

Set z done

Set AA done

Start with set 28 and end on 8/9/88

Witnessed & Understood by me. | Date | Invented by

PSD filters 8/88

Project No._____
Book No._____

Number	8/9/88 wt #1 AM	pm 8/9/88 wt #2	8/10/88 wt 3	8/11/88 wt 4	Tare value
B zero	.56524	.56535	.56508	.56509	.56508
B1	.70427	.70417	.70400	.70395	.70395
B2	.66576	.66591	.66579	—	.66576
B3	.69420	.69439	.69425	—	.69420
B4	.66936	.66941	—	—	.66936
B5	.69199	.69187	.69182	—	.69182
B6	.68802	.68800	—	—	.68800
B7	.69965	.69953	.69949	—	.69949
B8	.68009	.67997	.67993	—	.67993
B9	.80567	.80570	—	—	.80567
C zero	.54487	.54498	.54482		.54482
C1	.69424	.69429	—		.69424
C2	.67460	.67484	.67458		.67458
C3	.69068	.69086	.69073		.69068
C4	.68282	.68295	.68282		.68282
C5	.67953	.67951	—		.67951
C6	.67881	.67880	—		.67880
C7	.69452	.69467	.69454		.69452
C8	.69152	.69153	—		.69152
C9	.77439	.77430	.77425		.77425
D zero	.54065	.54069	—		.54065
D1	.67699	.67704	—		.67699
D2	.67345	.67349	—		.67345
D3	.68700	.68705	—		.68700
D4	.67746	.67750	—		.67746
D5	.69962	.69964	—		.69962
D6	.69865	.69870	—		.69865
D7	.70001	.70012	.70000		.70000
D8	.68867	.68863	—		.68863
D9	.80035	.80056	.80051		.80051

Set AC Done

Set AD Done

To Page No._____

Witnessed by | Date | Invented by | Date

Project No._____ PSD pellets 8/88

40 Book No._____ TITLE: _____

From Page No.__

Set Number	8/9/88 wt #1 (PM)	8/9/88 wt 2 (PM)	8/10/88 wt #3		Fare value
AE zero	.54594 ✓	.54590 ✓	—		.54590
AE 1	.68040 ✓	.68043 ✓	—		.68040
AE 2	.66978 ✓	.66978 ✓	—		.66978
AE 3	.67395 ✓	.67392 ✓	—	Set AE done	.67392
AE 4	.66201	.66187 ✓	.66191 ✓		.66187
AE 5	.70359 ✓	.70358 ✓	—		.70358
AE 6	.67911 ✓	.67911 ✓	—		.67911
AE 7	.69098 ✓	.69086	.69093 ✓		.69093
AE 8	.67524	.67515 ✓	.67511 ✓		.67511
AE 9	.75674 ✓	.75676 ✓	—		.75674
AF zero	.52664 ✓	.52672	.52660 ✓		.52660
AF 1	.69123 ✓	.69140	.69128 ✓		.69123
AF 2	.69202 ✓	.69207 ✓	—		.69202
AF 3	.68840 ✓	.68844 ✓	—	Set AF done	.68840
AF 4	.66152 ✓	.66157 ✓	—		.66152
AF 5	.68979	.68968 ✓	.68963 ✓		.68963
AF 6	.67218 ✓	.67221 ✓	—		.67218
AF 7	.69680 ✓	.69693	.69675 ✓		.69675
AF 8	.68125 ✓	.68134	.68125 ✓		.68125
AF 9	.77947	.77965 ✓	.77961 ✓		.77961
AG zero	.54571 ✓	.54597	.54569 ✓		.54569
AG 1	.68252 ✓	.68266	.68253 ✓		.68253
AG 2	.67038 ✓	.67051	.67034 ✓		.67034
AG 3	.67710 ✓	.67715 ✓	—		.67710
AG 4	.68611 ✓	.68620	.68609 ✓	Set AG done	.68609
AG 5	.69667 ✓	.69686	.69669 ✓		.69669
AG 6	.69009 ✓	.69012 ✓	—		.69009
AG 7	.70212 ✓	.70220	.70210		.70210
AG 8	.68994 ✓	.68999 ✓	—		.68994
AG 9	.76527 ✓	.76550	.76532 ✓		.76527

Witnessed & Understood by me | Date | Invented by

TITLE				Project No.	
				Book No.	
From Page No. — Set Number	8/9/88 wt #1 (Pre)	8/9/88 wt 2 (Pr)	8/10/88 wt 3		Tare Value
AH zero	.52906 ✓	.52901 ✓	—		.52
AH 1	.67842 ✓	.67842 ✓	—		.678
AH 2	.66533 ✓	.66529 ✓	—		.665
AH 3	.66835	.68820 ✓	.68815 ✓		.688
AH 4	.67099	.67084 ✓	.67082 ✓		.670
AH 5	.68928 ✓	.68926 ✓	—		.689
AH 6	.65649 ✓	.65644 ✓	—	.69010	.65
AH 7	.69932 ✓	.69934 ✓	—		.699
AH 8	.66608 ✓	.66609 ✓	—		.66
AH 9	.79002 ✓	.79006 ✓	—	.76551	.79

Set AH done

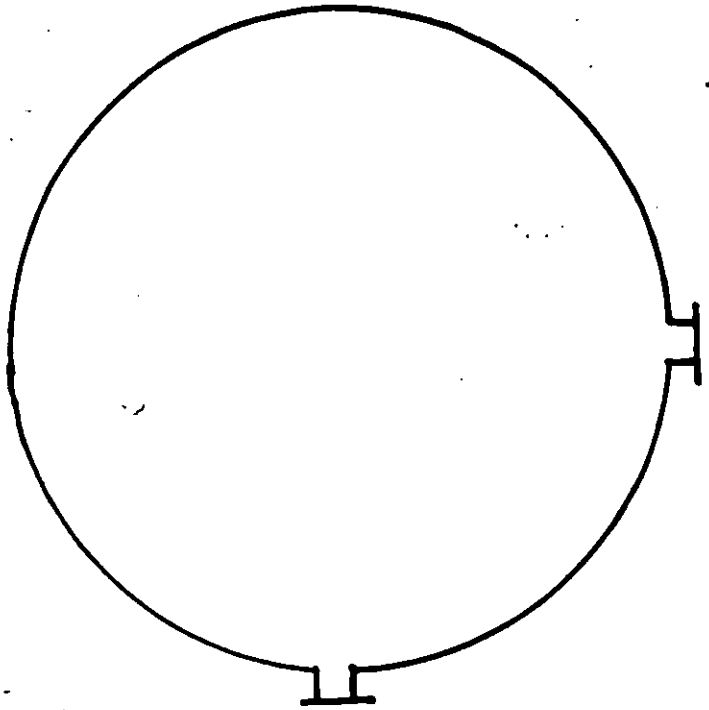
Notes on weighing of filters — most all weights determined using new (purchased 8/88) Fisher 5 place 30g/200g balance in Balance Room. From wt set X and the 5th and some of the 3rd are determined by mettler H20T in Balance Room. Note good agreement between 2 balances.

Operators notes for Fisher/Ainsworth 5 place — allow 24 Hours to warm up. Some zero drift still valid up to 12 HRS after plugging into power.

be very careful in taking balance — go slowly. Each weighing takes ~1 minute. Wait until "g" shows up on left part of display before can consider a given value.

Witnessed & Understood by me.	Date	Performed by [signature]	Date
		Recorded by 8/10/88	

APPENDIX J - PRELIMINARY SAMPLING POINT LOCATION AND TRAVERSE DATA



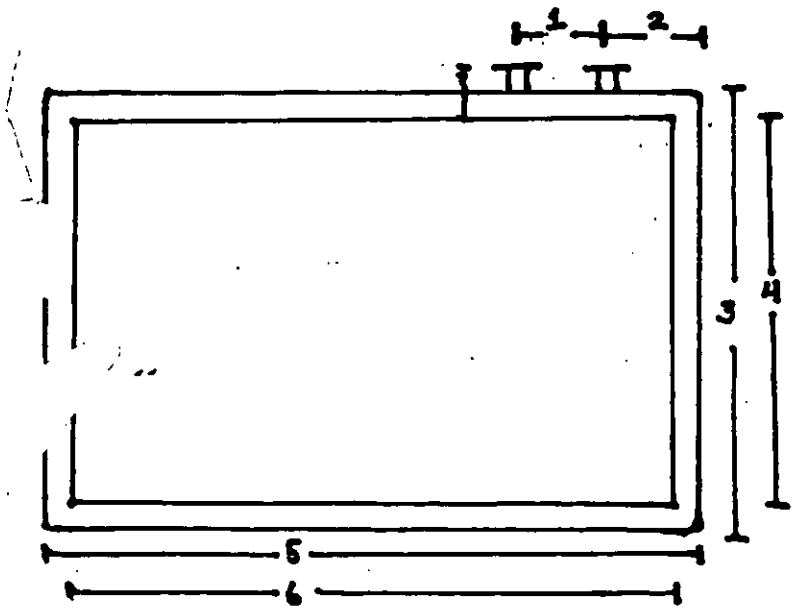
diameter =
port depth =

PLANT FMC
LOCATION INLET
DATE 8/22/88

NEAREST OBSTRUCTION

UPSTREAM – 25'

DOWNSTREAM – 12'



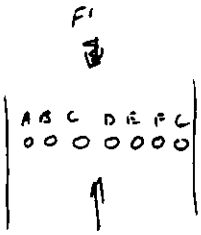
1 17"
2 ~~X~~ 17"
3 11' 4"
4 10'
5 14' 4"
6 13'
7 12"

RADIAN
CORPORATION

.250
= .535CF/M
actual.
@ 475°

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT ~~[illegible]~~ FMC - POCATELLO
DATE 8/22/88
SAMPLING LOCATION INLET
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE. (DISTANCE A) 14'
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE. (DISTANCE B) 1'
STACK I.D.. (DISTANCE A - DISTANCE B) 13' x 11'
NEAREST UPSTREAM DISTURBANCE ~~[illegible]~~ 20-25'
NEAREST DOWNSTREAM DISTURBANCE ~~[illegible]~~ 12'
CALCULATOR MWH / MH



see over

STATIC - 3.5" H_2O

SCHEMATIC OF SAMPLING LOCATION

BAROMETRIC -

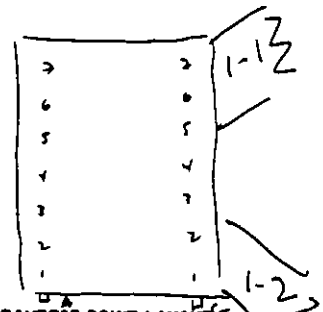
PT	TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF NIPPLE (SUM OF COLUMNS 4 & 5)
	ΔP	TEMP	ΔP	TEMP	ΔP	TEMP
G1	0.25	390	D-1 0.17	385	B-1 0.19	385
2	0.25	385	2 0.16	410	2 0.15	370
3	0.32	410	3 0.16	430	3 0.13	400
4	0.33	445	4 0.18	472	4 0.19	500
5	0.33	475	5 0.22	506	5 0.24	545
6	0.37	460	6 0.27	565	6 0.25	574
7	0.42	480	7 0.32	545	7 0.32	621
F1	0.22	370	C-1 0.19	415	A-1 0.20	360
2	0.19	385	2 0.16	425	2 0.18	380
3	0.27	400	3 0.16	465	3 0.14	405
4	0.28	430	4 0.19	506	4 0.20	460
5	0.27	470	5 0.25	530	5 0.24	528
6	0.29	511	6 0.28	575	6 0.21	575
7	0.34	507	7 0.34	575	7 0.27	605
E1	0.21	375				
2	0.17	365				
3	0.19	405				
4	0.21	440				
5	0.22	470				
6	0.27	533				
7	0.32	485				

EPA (Dun 232
4/72

40.83 AFS

PRELIMINARY VELOCITY TRAVERSE

PLANT ~~Monsanto / Soda Springs~~ FMC / POCATELLO.
DATE 8/23/88
LOCATION INLET.
STACK I.D. 13' x 10'
BAROMETRIC PRESSURE, in. Hg 24.1"
STACK GAUGE PRESSURE, in. H_2O -3.0" H_2O
OPERATORS MWH / JTW / JTW.



SCHEMATIC OF TRAVERSE POINT LAYOUT

V_s = 34.94 AFS (.817 ACFM) × $\frac{560}{917}$ × .94 = 0.47 CFM @ meter
457.22

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F	
C - 1	0.30	421	
2	0.33	445	
3	0.36	450	
4	0.36	510	
5	0.41	544	
6	0.33	550	
7	0.30	538	
F - 1	0.22	375	4.05
2	0.23	401	
3	0.29	418	
4	0.30	435	
5	0.29	465	
6	0.30	516	
7	0.36	540	8.1
E - 1	0.23	412	
2	0.19	400	
3	0.22	410	
4	0.23	440	
5	0.24	466	
6	0.26	510	
7	0.31	525	
D - 1	0.18	380	
2	0.18	390	
3	0.18	400	11.53.
AVERAGE			

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F	
4	0.20	440	
5	0.24	505	
6	0.28	561	
7	0.31	568	14.8
C - 1	0.20	365	
2	0.16	360	
3	0.18	400	
4	0.22	430	
5	0.26	481	
6	0.27	580	
7	0.33	604	16.2
B - 1	0.21	360	
2	0.16	350	
3	0.16	380	
4	0.22	420	
5	0.24	490	
6	0.28	570	
7	0.35	620	21.59
A - 1	.19	350	
2	.16	~~335~~	
3	16	380	
4	.22	400	
5	.27	430	
6	.15	525	
AVERAGE 7	.26	559	

EPA (Dur) 233
4/72

avg $\sqrt{\Delta P}$ = ~~.50~~ .502
ΔP_{AVG} = .25

OUTLET 1-1
Traverse Point Locations

PT	A FRACTION OF STACK	B STACK ID	PROBE A×B	NIPPLE	PT
1	0.044	76.5	3.37	3.5	8.87*
2	0.146	76.5	11.17	3.5	14.67
3	0.296	76.5	22.64	3.5	26.14
4	0.704	76.5	53.86	3.5	57.36
5	0.854	76.5	65.33	3.5	68.83
6	0.956	76.5	73.13	3.5	74.63*

* These points have been moved in from the stack wall 2 in. to prevent condensed material from accidently being collected (due to bumping wall).

Preliminary Velocity
@ 1730

8-22-88
Fine
OUTLET

Velocity temp - profile 1-1

outlet

	ΔP	Ts
B 1-	.9	129
2-	1.2	128
3-	1.1	130
4-	.85	130
5-	.8	130
6-	.63	131

Static = -.25

Ave Gs & Glen Rs
~~stack~~

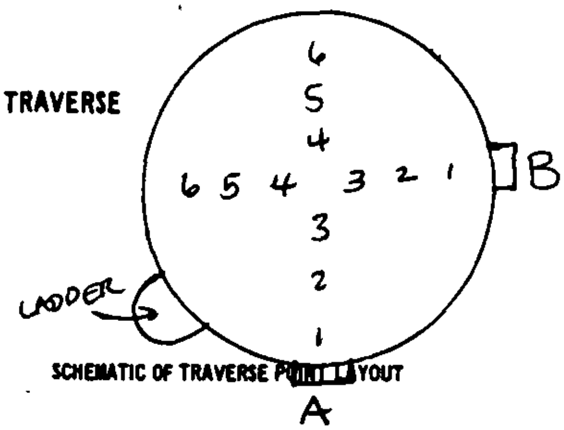
$\bar{X}_B = 0.91$

	ΔP	Ts
A-1-	.6	130
-2-	.9	132
3-	.92	132
4-	.87	134
5-	.9	134
6-	.63	135

$X_A = 0.80$

PRELIMINARY VELOCITY TRAVERSE

PLANT FMC OUTLET 1-1
DATE 8-23-88
LOCATION OUTLET 1-1
STACK I.D. 76.5 in.
BAROMETRIC PRESSURE, in. Hg 25.
STACK GAUGE PRESSURE, in. H_2O
OPERATORS GDR & FLG
@ 915 am



SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
A-1	0.53	131
-2	0.74	133
-3	0.73	135
-4	0.73	136
-5	0.71	136
-6	0.78	137
AVG	0.70	136
B-1	0.72 *	131
B-2	0.86	131
B-3	0.82	132
B-4	0.72 *	131
B-5	0.70	132
B-6	0.66	132
AVG$_B$ =	0.74	132
AVERAGE		

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

EPA (Dur) 233
4/72

SATURATION @ 130°F = 17.4 137 = 21.6
133 · 18.9

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/22/88

Sampling location Outlet 1-1

Sample type PSD Preliminary

Run number PRE

Sample box number

Clean-up person RFJ

Solvent rinses NA

Sample Identification Code:

XAD Trap #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	1N HNO_3	~100ml	Bottle w/stopper	749.6	679.9	69.7
2	—	250g	Bottle w/o stopper	511.15	493.9	17.8
3						
4						
5						
6						
7						

Total Weight Gain (grams) 87.45g

% Moisture

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

ANT FMC - Pocatello
DATE 8-22-88
SAMPLING LOCATION OUTLET 1-2
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 80"
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 3.5"
STACK I.D., (DISTANCE A - DISTANCE B) 76.5"
NEAREST UPSTREAM DISTURBANCE
NEAREST DOWNSTREAM DISTURBANCE
CALCULATOR

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	0.044	76.5"	3.36	3.5"	6.86
2	0.146		11.17		14.67
3	0.296		22.64		26.14
4	0.704		53.86		57.36
5	0.854		65.33		68.83
6	0.956		73.13		76.63

EPA (Dur) 232
4/72

PRELIMINARY VELOCITY TRAVERSE

PLANT FMC - POCATELLO
DATE 8-22-88
LOCATION OUTLET 1-2 (1844-1845)
STACK I.D. 76.5
BAROMETRIC PRESSURE, in. Hg
STACK GAUGE PRESSURE, in. H_2O
OPERATORS

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (Δp_s), in. H_2O	STACK TEMPERATURE (T_s), °F
1	.235	137.1
2	.305	137.2
3	.310	137.0
4	.250	137.8
5	.310	138.0
6	.610	138.2
AVERAGE		

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

EPA (Dur) 233
4/72

FMC
8-22-88

RADIAN
CORPORATION

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT _____
DATE _____
SAMPLING LOCATION OUTLET 1-2
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 80"
INSIDE OF REAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 3.5
STACK I.D., (DISTANCE A - DISTANCE B) 76.5
NEAREST UPSTREAM DISTURBANCE _____
NEAREST DOWNSTREAM DISTURBANCE _____
CALCULATOR _____

SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	Δp ~~FRACTION OF STACK I.D.~~	Temp °F ~~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)
~~A-1~~	~~0.29~~	~~163~~			
~~A 1~~	~~.17~~				
~~2~~	~~.35~~				
~~3~~	~~.89~~				
~~4~~	~~.96~~				
~~5~~	~~.96~~				
~~6~~	~~.85~~				
~~A 1~~	~~[illegible]~~	~~163~~			
~~2~~					
~~3~~					
~~4~~					
~~5~~					
~~6~~	~~1.1~~	~~163~~			
1	0.044	~~80~~ 76.5	~~3.52~~ 3.36	3.5	6.86
2	0.146	~~80~~ 76.5	~~11.68~~ 11.17	3.5	14.67
3	0.296	~~80~~ 76.5	~~23.68~~ 22.64	3.5	26.14
4	0.704	~~80~~ 76.5	~~56.32~~ 53.86	3.5	57.36
5	0.854	~~80~~ 76.5	~~68.32~~ 65.33	3.5	68.83
6	0.956	~~80~~ 76.5	~~76.48~~ 73.13	3.5	76.63

EPA (Dwt) 232
4/72

PSD

POINT B-4, $\Delta p = 0.85$, $T_s = 130°F$
$K = 0.62$ @ $\frac{90°F = t_m}{130°F = T_s}$
METERBOX = RAC #12, $\Delta H@ 1.84$
$Y = 0.9943$

OUTLET 1-1
FMC
PRELIMINARY PSD
RUN 08-22-88
$D_N = 0.186$
GDRiks & FLG

0 1840 890.445 ft³

CUM. TIME	CLOCK TIME	DGM VOL ft³	Δp	ΔH	DGM °F IN	DGM °F OUT	IMPACTOR TEMP °F	VAC in Hg
10	1850	895.10	0.85	0.53	91	91	333	1
20	1900	99.84	0.85	0.53	97	94	306	1
30	1910	904.57	0.85	0.54	100	95	274	1
40	1920	09.2	0.85	0.54	100	98	225	1
50	1930	14.0	0.85	0.54	99	97	192*	1.5
60	1940	918.645	0.85	0.54	100	97	167	1.5

$\boxed{28.2\ ft^3}$ $\bar{X} = \boxed{96.6°F}$

* Temperature dropping fast, increased vacuum to 100%, impactor temp continuing to fall. ~1915

$$V_s = .84 \times 85.49 \times \sqrt{(\Delta p)_{avg}} \times \sqrt{\frac{T_s}{M_s \times P_s}}$$

$$= .84 \times 85.49 \times \underset{0.922}{\sqrt{(\Delta p)_{avg}}} \times \sqrt{\frac{590}{25.5 \times 24.18}}$$

$$\text{" "} \times 0.922 \times .9782$$

$V_s = 64.767$ ft/sec

K-FACTOR WORKSHEET

Date: 8-23-88 Operator: GDR

Sampling Train: PSD Checked by: _____

Site: FMC OUTLET 1-1 Used for Runs: Run 1

1. C_p (for S-type pitots) = 0.84

2. D_n (nozzle diameter inches) = 0.186

3. B_w (moisture in gas stream, percent) = ~~15.4%~~ ASSUME 18.2%

4. P_m (barometric pressure at meter, in Hg) = 25.6

5. $\Delta H@$ (Pressure differential of orifice in meterbox, in H_2O) = 1.79

6. P_s (stack pressure, in Hg) = Pb $\pm \frac{\text{stack static pressure } (H_2O)}{13.6}$ = -0. = 25.5

7. T_s (average stack temperature, ^oR) = 460 + ^oF = 590 °R

8. T_m (average meter temperature, ^oR) = 550°F = ambient + 20°F + 460°F

9. M_d (molecular weight of stack gas, dry, lb/lb mole)

= (0.44 x % CO_2) + (0.32 x % O_2) + [0.28 + % N_2]

= (0.44 x ____) + (0.32 x ____) + (0.28 + ____) = 30.4

10. M_s (molecular weight of stack gas with water vapor, lb/mole)

= [M_d x (1-B_w)] + [18 x B_w]

= [30.4 x (1 - ~~.154~~ .182)] + [18 x ~~.154~~ .182] = ~~28.5~~ 28.14

Figure 4-13. K-factor calculation form.

$$K = (846.72)(D_n^{\,4})(\Delta H@)(C_p^{\,2})(1-B_w)^2 \left[\frac{M_d}{M_s}\right]\left[\frac{P_s}{P_m}\right]\left[\frac{T_m}{T_s}\right]$$

$$K = (846.72)\ (.186)^4(1.79)(0.84)^2(0.818)^2(1.04)(0.996)\left(\frac{550}{592}\right)$$

715.999 × (.186)⁴

K = 0.857 ✓

OR K = 0.479 × ΔH@

$$\Delta H = K\Delta P$$

Correlation Chart

ΔH	ΔP
0.62	0.72

Figure 4-13. K-factor calculation form.

IMPACTOR FIELD DATA

801 (1-3) Plant Name> FMC

Sampling Location> INLET - PRELIM Sample Ident.>

Type of Impactor> ANDERSON Impactor Substrate>

802 (1-3) Date 8-22-88 (MMDDYY) Time Start (HHMM) Time Finish (HHMM)

Duct Dimensions x ft. or Diameter ft.

PTCF DGMCF 0.9996 Test Duration 2 min min.

803 (1-3) Bar Press. "Hg Static Press. "H_2O

Nozzle Dia. 0.250 inches Condensed Water gms

Intake leak rate <0.01 cfm @ 5 in. Hg Operator initials

Va = .764

	Pt.	Clock Time	Dry Gas Meter Reading ft³	ΔP in. H_2O	ΔH in. H_2O	Stack Temp. °F	Dry Gas Meter Temperature Inlet °F	Dry Gas Meter Temperature Outlet °F	Hot Box Temp. °F	Last Impinger Temp. °F	I. Vac. in. Hg Gauge
		0	716.142								
804	E-4	0	716.142	—	0.60						
805	E-4	2 min	717.031	0.24	0.50	440	90	91	~444	—	1.2
806		PURGED W/ AMBIENT ~2 min-DRY									
807	E-4	0/2048	717.637	—	20	—	94	98	—	—	6.4
808	E-4	15/2103	729.813				96	105	—		1.
809											
810											
811											
812											
813											
814											
815											
816											
817											
818											
819											
820											
821											

• Dry air purge when sampling wet streams

Console

Weather

822 Remarks AD - nozzle 0.187

RADIAN CORPORATION

MOISTURE RECOVERY FORM FOR METHODS 4, 5, 6

Plant FMC

Date 8/22/88

Sampling location Inlet

Sample type PRELIMINARY

Run number PRE

Sample box number

Clean-up person JONGEW

Solvent rinses

Sample Identification Code:

XAD Trap #

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight (grams) Final	Initial	Weight Gain
1	1N NaOH	100	Bottle 950	717.8	710.1	7.7
2	Silica Gel	250	Bottle 500 w/o stopper	541.2	533.1	8.1
3						
4						
5						
6						
7						

Total Weight Gain (grams) 15.8 g

% Moisture:

APPENDIX K - SAMPLE CUSTODY LOG

TITLE SAMPLE LOG - FMC

Project No. 21088
Book No.

From Page No.

FIELD #	SAMPLE CODE	(g.) SAMPLE WEIGHT	ANALYSIS/DISPOSITION	COMMENTS
FMC-1	FMC-082488-MMIII-IN-1-PRA	(0.7380)	PM & pC: (α radiation) ④0053	F 1/2 Acetone Test Run Vol
FMC-2	FMC-082488-MMIII-IN-1-PRN	2349	PM & pC: ④0216	F 1/2 Nitric " " "
FMC-3	FMC-082488-MMIII-IN-1-F	0.1278	" " ④0050	Filter W-26 " " "
FMC-4	FMC-082488-MMIII-IN-1-IR	800.3	" " ④0216	B 1/2 Nitric " " "
FMC-5	FMC-082488-MMIII-OTA-1-PRA	(0.0139)	" " ④0053	F 1/2 Acetone " " "
FMC-6	FMC-082488-MMIII-OTA-1-PRN	251.9	" " ④0216	F 1/2 Nitric " " "
FMC-7	FMC-082488-MMIII-OTA-1-F	0.0761	" " ④0050	Filter W-25 " " "
FMC-8	FMC-082488-MMIII-OTA-1-IR	795.7	" " ④0216	B 1/2 Nitric " " "
FMC-9	FMC-082488-MMIII-OTB-1-PRA	(0.0078)	" " ④0053	F 1/2 Acetone " " "
FMC-10	FMC-082488-MMIII-OTB-1-PRN	188.6	" " ④0216	F 1/2 Nitric " " "
FMC-11	FMC-082488-MMIII-OTB-1-F	0.0948	" " ④0050	FILTER W-28 " " "
FMC-12	FMC-082488-MMIII-OTB-1-IR	448.2	" " ④0216	B 1/2 Nitric " " "
FMC-13	FMC-082488-MMIII-IN-2-PRA	(0.4137)	" " ④0053	F 1/2 Acetone
FMC-14	FMC-082488-MMIII-IN-2-PRN	284.0	" " ④0216	F 1/2 Nitric
FMC-15	FMC-082488-MMIII-IN-2-F	.7402	" " ④0050	FILTER W-29
FMC-16	FMC-082488-MMIII-IN-2-IR	777.2	" " ④0216	B 1/2 Nitric
FMC-17	FMC-082488-MMIII-OTA-2-PRA	(0.0224)	" " ④0054	F 1/2 Acetone
FMC-18	FMC-082488-MMIII-OTA-2-PRN	153.7	" " ④0218	F 1/2 Nitric
FMC-19	FMC-082488-MMIII-OTA-2-F	0.0789	" " 0050	FILTER W-30
FMC-20	FMC-082488-MMIII-OTA-2-IR	616.2	" " ④0216	B 1/2 Nitric
FMC-21	FMC-082488-MMIII-OTB-2-PRA	(0.0292)	" " ④0054	F 1/2 Acetone
FMC-22	FMC-082488-MMIII-OTB-2-PRN	172.8	" " ④0218	F 1/2 Nitric
FMC-23	FMC-082488-MMIII-OTB-2-F	0.0980	" " ④0050	FILTER W-31
FMC-24	FMC-082488-MMIII-OTB-2-IR	869.1	" " ④0218	B 1/2 Nitric
FMC-25	FMC-082388-MMIII-PROBE BLANK	250.2	" " ④0223	PROBE BLANK - BETWEEN PLANTS / NITRIC
FMC-26	FMC-082588-MMIII-IN-3-PRA	(0.8107)	" " ④0054	F 1/2 Acetone
FMC-27	FMC-082588-MMIII-IN-3-PRN	213.8	" " ④0218	F 1/2 Nitric
FMC-28	FMC-082588-MMIII-IN-3-F	0.1862	" " ④0050	FILTER W-35 ~10-20mg PM SPIKED
FMC-29	FMC-082588-MMIII-IN-3-IR	713.2	" " ④0218	B 1/2 Nitric
FMC-30	FMC-082588-MMIII-OTA-3-PRA	(0.0169)	" " ④0054	F 1/2 Acetone
FMC-31	FMC-082588-MMIII-OTA-3-PRN	224.8	" " ④0218	F 1/2 Nitric
FMC-32	FMC-082588-MMIII-OTA-3-F	0.0983	" " ④0050	FILTER W-32

* The following code is used for MMIII samples on the custody labels:
Container 1 = PRA #2 - PRN, #3 - F, #4 - IR : "( )" denote acetone rinse residue weighed to constant weight.

Filter Set AD

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FMC-33	FMC-082588-MM111-OTB-3-PRN	(0.0096)	PM ; pCi (α radiation) ⑤ 0058	F 1/2 Acetone
FMC-34	FMC-082588-MM111-OTB-3-PRN	340.5	" " ⑤ 0218	F 1/2 Nitric
FMC-35	FMC-082588-MM111-OTB-3-F	0.0945	" " ④ 0050	FILTER W-33
FMC-36	FMC-082588-MM111-OTB-3-IR	918.9	" " ⑤ 0219	B 1/2 Nitric
FMC-37	FMC-082588-MM111-IN-4-PRA	(1.4592)	" " ⑤ 0053	F 1/2 Acetone
FMC-38	FMC-082588-MM111-IN-4-PRN	280.9	" " ⑤ 0219	F 1/2 Nitric
FMC-39	FMC-082588-MM111-IN-4-F	0.2313	" " ④ 0050	FILTER #
FMC-40	FMC-082588-MM111-IN-4-IR	478.9	" " ⑤ 0219	B 1/2 Nitric
FMC-41	FMC-082588-MM111-OTA-4-PRA	(0.0085)	" " ⑤ 0053	F 1/2 Acetone
FMC-42	FMC-082588-MM111-OTA-4-PRN	181.2	" " ⑤ 0219	F 1/2 Nitric
FMC-43	FMC-082588-MM111-OTA-4-F	0.0968	" " ⑤ 0051	FILTER # W-36
FMC-44	FMC-082588-MM111-OTA-4-IR	727.2	" " ⑤ 0222	B 1/2 Nitric
FMC-45	FMC-082588-MM111-OTB-4-PRA	(0.0149)	" " ⑤ 0054	F 1/2 Acetone
FMC-46	FMC-082588-MM111-OTB-4-PRN	294.4	" " ⑤ 0219	F 1/2 Nitric
FMC-47	FMC-082588-MM111-OTB-4-F	0.0909	" " ⑤ 0051	FILTER # W-37
FMC-48	FMC-082588-MM111-OTB-4-IR	874.1	" " ⑤ 0222	B 1/2 Nitric
FMC-49	FMC-082688-MM111-OTA-5-PRA	3	" " ⑤ 0049	F 1/2 Acetone
FMC-50	FMC-082688-MM111-OTA-5-PRN	234.7	" " ⑤ 0219	F 1/2 Nitric
FMC-51	FMC-082688-MM111-OTA-5-F	0.0920	" " ⑤ 0051	FILTER # W-38
FMC-52	FMC-082688-MM111-OTA-5-IR	860.0	" " ⑤ 0222	B 1/2 Nitric
FMC-53	FMC-082688-MM111-OTB-5-PRA		" " ⑤ 0049	F 1/2 Acetone
FMC-54	FMC-082688-MM111-OTB-5-PRN	207.5	" " ⑤ 0222	F 1/2 Nitric
FMC-55	FMC-082688-MM111-OTB-5-F	0.0927	" " ⑤ 0051	FILTER # W-39
FMC-56	FMC-082688-MM111-OTB-5-IR	723.6	" " ⑤ 0222	B 1/2 Nitric
FMC-57	FMC-082688-MM111-OTA-6-PRA		" " ⑤ 0049	F 1/2 Acetone
FMC-58	FMC-082688-MM111-OTA-6-PRN	129.1	" " ⑤ 0222	F 1/2 Nitric
FMC-59	FMC-082688-MM111-OTA-6-F	0.0977	" " ⑤ 0051	FILTER # W-40
FMC-60	FMC-082688-MM111-OTA-6-IR	787.8	" " ⑤ 0223	B 1/2 Nitric
FMC-61	FMC-082688-MM111-OTB-6-PRA		" " ⑤ 0049	F 1/2 Acetone
FMC-62	FMC-082688-MM111-OTB-6-PRN	202.8	" " ⑤ 0222	F 1/2 Nitric
FMC-63	FMC-082688-MM111-OTB-6-F	0.1008	" " ⑤ 0051	FILTER # W-41
FMC-64	FMC-082688-MM111-OTB-6-IR	778.2	" " ⑤ 0222	B 1/2 Nitric

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FMC-65	FMC-082688-MM1111-OTA-7-PRA		PM	pCi	(α radiation) 0049	F 1/2 Acetone
FMC-66	FMC-082688-MM1111-OTA-7-PRN	192.4	"	"	0222	F 1/2 Nitric
FMC-67	FMC-082688-MM111-OTA-7-F	0.0976	"	"	0051	FILTER # W-42
FMC-68	FMC-082688-MM111-OTA-7-IR	779.0	"	"	0219	B 1/2 Nitric
FMC-69	FMC-082688-MM111-OTB7PRA		"	"	0049	F 1/2 Acetone
FMC-70	FMC-082688-MM111-OTB7PRN	239.1	"	"	0219	F 1/2 Nitric
FMC-71	FMC-082688-MM111-OTB7F	0.1024	"	"	0051	FILTER # W-43
FMC-72	FMC-082688-MM111-OTB7IR	853.4	"	"	0219	B 1/2 Nitric
FMC-73	FMC-082688-MM11-OTA-3-IR	949.1	"	"	0223	B 1/2 Nitric
FMC-74	FMC-082688-MM111-IN-FB-PRA	181.68	"	"	0054	F 1/2 FIELD BLANK IN Acetone
FMC-75	FMC-082688-MM111-IN-FB-PRN	161.19	"	"	0223	F 1/2 FIELD BLANK IN Nitric
FMC-76A	FMC-082688-MM111-IN-FB-F		"	"		FIELD BLANK FILTER IN W-44
FMC-77	FMC-082688-MM111-IN-FB-IR	513.69	"	"	0223	B 1/2 ~~FIELD~~ Nitric
FMC-78	FMC-082688-MM111-OTB-FB-PRA	168.89	"	"	0053	
FMC-79	FMC-082688-MM111-OTB-FB-PRN	183.81	"	"	0218	
FMC-80A	FMC-082688-MM111-OTB-FB-F		"	"		W-45
FMC-81	FMC-082688-MM111-OTB-FB-IR	481.41	"	"	0218	
FMC-82	FMC-082488-MM111-FS-1	952.0	"	"	0223	
FMC-83	FMC-082488-MM111-FS-2	753.6		"	0223	
FMC-84	FMC-082488-MM111-FS-3	1078.4		"	0223	
FMC-85	FMC-082688-MM111-FS-4	531.6		"	0223	
FMC-86	FMC-082488-PSD-IN-1-ST1		"	"	0052	STAGE 0, 1 & PRESEP SET X
FMC-87	FMC-082488-PSD-IN-1-ST2-5		"	"		STAGE 2, 3, 4 & 5 SET X
FMC-88	FMC-082488-PSD-IN-1-ST6		"	"		STAGE 6 F. SET X
FMC-89	FMC-082488-PSD-IN-1-ST7		"	"		STAGE 7 F. SET X
FMC-90	FMC-082488-PSD-IN-1-ST8		"	"		STAGE 8 F. SET X
FMC-91	FMC-082488-PSD-IN-1-ST9		"	"		BACKUP FILTER F. SET X
FMC-92	FMC-082488-PSD-OTA-1-ST1		"	"	0052	STAGE 0, 1 & PRESEP; F. SET L
FMC-93	FMC-082488-PSD-OTA-1-ST2-5		"	"		STAGE 2, 3, 4 & 5, SET L
FMC-94	FMC-082488-PSD-OTA-1-ST6		"	"		STAGE 6 SET L
FMC-95	FMC-082488-PSD-OTA-1-ST7		"	"		STAGE 7 SET L
FMC-96	FMC-082488-PSD-OTA-1-ST8		"	"		STAGE 8 SET L
FMC-97	FMC-082488-PSD-OTA-1-ST9		"	"		BACKUP FILTER SET L

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FMC-98	FMC-082488-PSD-OTB-1-ST1		PM + pCi (α radiation)	PRESEP, STG 0, ST1 SET Y
FMC-99	FMC-082488-PSD-OTB-1-ST2-5		" " ⑨0052	STAGE 2,3,4 + 5 " Y
FMC-100	FMC-082488-PSD-OTB-1-ST6		" "	STAGE 6 " "
FMC-101	FMC-082488-PSD-OTB-1-ST7		" "	STAGE 7 " "
FMC-102	FMC-082488-PSD-OTB-1-ST8		" "	STAGE 8 " "
FMC-103	FMC-082488-PSD-OTB-1-ST9		" "	~~ST9~~ BACKUP FILTER " "
FMC-104	FMC-082488-PSD-IN-2-ST1		" " ⑨0052	PRESEP, STG0, ST1 F.SET AB
FMC-105	FMC-082488-PSD-IN-2-ST2-5		" "	ST 2,3,4 + 5 SET AB
FMC-106	FMC-082488-PSD-IN-2-ST6		" "	STG 6 " AB
FMC-107	FMC-082488-PSD-IN-2-ST7		" "	STG 7 AB
FMC-108	FMC-082488-PSD-IN-2-ST8		" "	STG 8 AB
FMC-109	FMC-082488-PSD-IN-2-ST9		" "	~~STG~~ BACKUP FILTER AB
FMC-110	FMC-082488-PSD-OTA-2-ST1		" " ⑨0052	PRES. STG0, 1 F.SET AE
FMC-111	FMC-082488-PSD-OTA-2-ST2-5		" "	ST 2,3,4 + 5 " "
FMC-112	FMC-082488-PSD-OTA-2-ST6		" "	STG 6 " "
FMC-113	FMC-082488-PSD-OTA-2-ST7		" "	ST7 "
FMC-114	FMC-082488-PSD-OTA-2-ST8		" "	ST8 " "
FMC-115	FMC-082488-PSD-OTA-2-ST9		" "	BACKUP FILTER " "
FMC-116	FMC-082488-PSD-OTB-2-ST1		" " ⑨0052	PRES. STG.0, 1 F.SET FL
FMC-117	FMC-082488-PSD-OTB-2-ST2-5		" "	STG 2,3,4 + 5 " "
FMC-118	FMC-082488-PSD-OTB-2-ST6		" "	STG 6 " "
FMC-119	FMC-082488-PSD-OTB-2-ST7		" "	STG 7 " "
FMC-120	FMC-082488-PSD-OTB-2-ST8		" "	STG 8 " "
FMC-121	FMC-082488-PSD-OTB-2-ST9		" "	BACKUP FILTER " "
FMC-122	FMC-082588-PSD-IN-3-ST1		" " SUBSTANTIAL AMT OF PM LOST ⑨0053	PRESEP, STG0 + 1 F.SET FP
FMC-123	FMC-082588-PSD-IN-3-ST2-5		" "	STG 2,3,4 + 5 " "
FMC-124	FMC-082588-PSD-IN-3-ST6		" "	STG 6 " "
FMC-125	FMC-082588-PSD-IN-3-ST7		" "	STG 7 " "
FMC-126	FMC-082588-PSD-IN-3-ST8		" "	STG 8 " "
FMC-127	FMC-082588-PSD-IN-3-ST9		" "	~~STG 9~~ BACKUP FILTER " "
FMC-128	FMC-082588-PSD-OTA-3-ST1		" " ⑨0052	PRES. STG0 + 1 F.SET FP
FMC-129	FMC-082588-PSD-OTA-3-ST2-5		" "	STG 2,3,4 + 5 "

* The following code is used for PSD samples on custody labels: Container 1 = ST1; Container 2 = ST2-5, 3 = ST6, 4 = ST7, 5 = ST8, 6 = BACKUP FILTER

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FIELD #	SAMPLE CODE	SAMPLE WT.	ANALYSIS/DISPOSITION	COMMENTS
FMC-130	FMC-082588-PSD-OTA-3-ST6		PM & pCi (α radiation)	~~OTA~~, STG 6 FILTER SET FP
FMC-131	FMC-082588-PSD-OTA-3-ST7		" " ④0052	STG 7 " "
FMC-132	FMC-082588-PSD-OTA-3-ST8		" "	STG 8 " "
FMC-133	FMC-082588-PSD-OTA-3-ST9		" "	~~STG~~ BACKUP FILTER " "
FMC-134	FMC-082588-PSD-OTB-3-ST1		" " ④0052	PRESEP, STG 0, & 1 FILTER SET FK
FMC-135	FMC-082588-PSD-OTB-3-ST2-5		" "	STG 2,3,4 & 5 " " FK
FMC-136	FMC-082588-PSD-OTB-3-ST6		" "	STG. 6 " " "
FMC-137	FMC-082588-PSD-OTB-3-ST7		" "	STG. 7 " " "
FMC-138	FMC-082588-PSD-OTB-3-ST8		" "	STG. 8 " " "
FMC-139	FMC-082588-PSD-OTB-3-ST9		" "	BACKUP FILTER " " "
FMC-140	FMC-082788-MMIII-RB-F		*ARCHIVE ④0052	FILTER (REAGENT) BLANK W-0.46 (NOT RUN)
FMC-141	FMC-082688-PSD-~~R~~FB-ST1		PM & pCi (α radiation) ④0052	F. BLANK STG 0 & 1 " FILTER SET FV
FMC-142	FMC-082688-PSD-~~R~~FB-ST2-5		" "	F. BLANK STG. 2,3,4 & 5 "
FMC-143	FMC-082688-PSD-~~R~~FB-ST6		" "	" " STG 6 "
FMC-144	FMC-082688-PSD-~~R~~FB-ST7		" "	" " STG 7 "
FMC-145	FMC-082688-PSD-~~R~~FB-ST8		" "	" " STG 8 "
FMC-146	FMC-082688-PSD-~~R~~FB-ST9		" "	" " STG 9 BACKUP "
FMC-147	FMC-082688-PSD-IN-BLANK RUN		ARCHIVE - CHECK FOR WEIGHT INTERACTION	STAGE 0-9; FILTER SET FN
FMC-148	FMC-082688-PSD-OTB-BLANK RUN		ARCHIVE -	STAGE 0-9; " " FM
~~FMC-149~~	~~RB~~			
~~FMC-150~~	~~RB~~			

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APPENDIX L - RADIONUCLIDE ANALYTICAL DATA

L.1 - MM 111 Radionuclide Data
L.2 - PSD Radionuclide Data
L.3 - Feedstock Radionuclide Data
L.4 - Summary of Analytical Data

APPENDIX L.1 - MM 111 Radionuclide Data

```
Sample ID                  PS  88.0585B
Sample type                MISC
Collection date, time       8/24/88    0:00
Receipt date                8/29/88
Completion date             0/ 0/00
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC1,2,3: FRONT HALF
Comments                   FMC082488-MM111-IN-1-PRA, FMC082488-MM111-IN-1-PRN, FMC082488-MM111-IN-1-F, PROBE RINSE AND FILTER
Report to                  GERR/ LUSTER

 Type of analysis          ********** PO        **********
  Verified by             GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted       9/13/88  13:40
  Length of count         1000 min
  Preparer                ASVL
  Counting system         AS19
  Sample size               0.010000 SAMP
  Comments                RECALCULATION, 10 ML OF 1000
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.0228E+03       9.23 %  PCI/SAMP   9/10/88 ANALYSIS
    PO-210     5.4604E+03       9.23 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.3635E+01       8.99 %  PER CENT   9/10/88

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted       9/10/88  13:50
  Length of count         1000 min
  Preparer                ASVL
  Counting system         TE10
  Sample size               0.010000 SAMP
  Comments                10ML OF 1000
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     1.1412E+02      37.09 %  PCI/SAMP   9/10/88 ANALYSIS
    PB-210     1.1430E+02      37.09 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.9978E+01       7.57 %  PER CENT   9/10/88
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Sample ID	PS 88,05859
Sample type	MISC
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC4: BACK HALF
Comments	FMC082488-MM111-IN-1-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/16/88 14:55
Length of count	1000 min
Preparer	ERVL
Counting system	TN1D
Sample size	0.150000 SAMP
Comments	15ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.3488E+00	121.68 %	PCI/SAMP	9/16/88	ANALYSIS
PB-210	2.3537E+00	121.69 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.8112E+01	7.13 %	PER CENT	9/16/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:30
Length of count	1000 min
Preparer	ERVL
Counting system	AS18
Sample size	0.150000 SAMP
Comments	15ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.8476E+02	8.23 %	PCI/SAMP	9/16/88	ANALYSIS
PO-210	3.1935E+02	8.23 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	5.7188E+01	7.82 %	PER CENT	9/16/88	

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Sample ID                PS  88.05860
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC5,6,7: FRONT HALF
Comments                 FMC082488-MM111-OTA-1-PRA, FMC082488-MM111-OTA-1-PRN, FMC082488-MM111-OTA-1-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/14/88  14:28
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS19
  Sample size              0.010000 SAMP
  Comments               RECALCULATION, 10 ML OF 1000
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     4.2876E+03       9.35 %  PCI/SAMP   9/12/88 ANALYSIS
    PO-210     4.7164E+03       9.35 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.9368E+01       9.08 %  PER CENT   9/12/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/12/88  14:10
  Length of count        1000 min
  Preparer               ASVL
  Counting system        TN2A
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     7.0080E+00     617.91 %  PCI/SAMP   9/12/88 ANALYSIS
    PB-210     7.0200E+00     617.92 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5663E+01       8.40 %  PER CENT   9/12/88
```

```
Sample ID                PS  88.05860X
Sample type              MISC
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC5,6,7: FRONT HALF
Comments                 FMC082488-MM111-OTA-1-PRA, FMC082488-MM111-OTA-1-PRN, FMC082488-MM111-OTA-1-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/12/88  14:10
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2B
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     4.2129E+01      86.02 %  PCI/SAMP   9/12/88 ANALYSIS
    PB-210     4.2202E+01      86.02 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5682E+01       8.00 %  PER CENT   9/12/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/14/88  14:28
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS20
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.7735E+03       9.57 %  PCI/SAMP   9/12/88 ANALYSIS
    PO-210     5.2474E+03       9.57 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.3747E+01       9.32 %  PER CENT   9/12/88
```

Sample ID	PS 88.05861
Sample type	MISC
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC8: BACK HALF
Comments	FMC082488-MM111-OTA-1-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/15/88 14:30
Length of count 1000 min
Preparer ERVL
Counting system TN3B
Sample size 0.500000 SAMP
Comments 50ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.1922E+00	34.03 %	PCI/SAMP	9/15/88	ANALYSIS
PB-210	3.1986E+00	34.03 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.6046E+01	6.71 %	PER CENT	9/15/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/18/88 11:47
Length of count 1000 min
Preparer ERVL
Counting system AS17
Sample size 0.500000 SAMP
Comments 50ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.3971E+01	5.24 %	PCI/SAMP	9/15/88	ANALYSIS
PO-210	2.6399E+01	5.24 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	8.2757E+01	4.42 %	PER CENT	9/15/88	

```
Sample ID                PS  89,05862
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC9,10,11: FRONT HALF
Comments                 FMC082488-MM111-OTB-1-PRA, FMC082488-MM111-OTB-1-PRN, FMC082488-MM111-OTB-1-F, PPROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/14/88) and GL ( 9/14/88)
  Date, time counted     9/ 8/88  14:42
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS19
  Sample size             0.006000 SAMP
  Comments              RECALCULATION, 6 ML OF 1000
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     7.0640E+03      9.06 %  PCI/SAMP   9/ 6/88 ANALYSIS
    PO-210     7.5366E+03      9.06 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      9.1263E+01      8.81 %  PER CENT   9/ 6/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/14/88) and GL ( 9/14/88)
  Date, time counted     9/ 7/88  14:35
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN3B
  Sample size             0.006000 SAMP
  Comments              6 ML OF 1000
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     6.1977E+01    116.71 %  PCI/SAMP   9/ 6/88 ANALYSIS
    PB-210     6.2050E+01    116.71 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.5322E+01      8.26 %  PER CENT   9/ 6/88
```

```
Sample ID                PS  88.05863
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC12: BACK HALF
Comments                 FMC082488-MM111-OTB-1-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:30
  Length of count       1000 min
  Preparer              ERVL
  Counting system       TN3D
  Sample size             0.500000 SAMP
  Comments              50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.8224E+00      43.20 %  PCI/SAMP   9/15/88 ANALYSIS
    PB-210     2.8280E+00      43.20 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.0439E+01       8.15 %  PER CENT   9/15/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/18/88  11:47
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS18
  Sample size             0.500000 SAMP
  Comments              50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     3.6562E+01       7.62 %  PCI/SAMP   9/15/88 ANALYSIS
    PO-210     4.0504E+01       7.62 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.6147E+01       6.69 %  PER CENT   9/15/88
```

Sample ID	PS 88.05865
Sample type	MISC
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC13,14,15: FRONT HALF
Comments	FMC082488-MM111-IN-2-PRA, FMC082488-MM111-IN-2-PRN, FMC082488-MM111-IN-2-F, PROBE RINSE AND FILTER
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/20/88) and GL (9/20/88)
Date, time counted	9/12/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN2C
Sample size	0.010000 SAMP
Comments	10ML OF 1000ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	7.8726E+01	53.90 %	PCI/SAMP	9/12/88	ANALYSIS
PB-210	7.8861E+01	53.90 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.1671E+01	8.61 %	PER CENT	9/12/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/20/88) and GL (9/20/88)
Date, time counted	9/14/88 14:28
Length of count	1000 min
Preparer	ASVL
Counting system	AS21
Sample size	0.010000 SAMP
Comments	10ML OF 1000ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.4733E+03	9.62 %	PCI/SAMP	9/12/88	ANALYSIS
PO-210	6.0136E+03	9.62 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.2696E+01	9.40 %	PER CENT	9/12/88	

```
Sample ID                PS  88.05866
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC16: BACK HALF
Comments                 FMC082488-MM111-IN-2-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/14/88  14:28
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS22
  Sample size             0.250000 SAMP
  Comments              RECALCULATION, 25 OF 100 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     1.8219E+02     11.66 %  PCI/SAMP   9/12/88 ANALYSIS
    PO-210     2.0020E+02     11.66 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      4.0018E+01     11.27 %  PER CENT   9/12/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/12/88  14:10
  Length of count       1000 min
  Preparer              ERVL
  Counting system       TN2D
  Sample size             0.250000 SAMP
  Comments              25ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.3679E+00     86.61 %  PCI/SAMP   9/12/88 ANALYSIS
    PB-210     2.3720E+00     86.61 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.4591E+01      9.96 %  PER CENT   9/12/88
```

Sample ID	PS 88.05867
Sample type	MISC
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC17,18,19: FRONT HALF
Comments	FMC082488-MM111-OTA-2-PRA, FMC082488-MM111-OTA-2-PRN, FMC082488-MM111-OTA-2-F, PROBE RINSE AND FILTER
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/14/88) and GL (9/14/88)
Date, time counted 9/ 7/88 14:35
Length of count 1000 min
Preparer ASVL
Counting system TN3D
Sample size 0.009000 SAMP
Comments 9 ML OF 1000

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.1212E+02	65.34 %	PCI/SAMP	9/ 6/88	ANALYSIS
PB-210	1.1225E+02	65.34 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	5.6432E+01	10.20 %	PER CENT	9/ 6/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/14/88) and GL (9/14/88)
Date, time counted 9/ 8/88 14:42
Length of count 1000 min
Preparer ASVL
Counting system AS20
Sample size 0.009000 SAMP
Comments 9 ML OF 1000

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	4.4608E+03	9.69 %	PCI/SAMP	9/ 6/88	ANALYSIS
PO-210	4.7543E+03	9.69 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.2432E+01	9.38 %	PER CENT	9/ 6/88	

```
Sample ID                PS  88.05868
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC20: BACK HALF
Comments                 FMC082488-MM111-OTA-2-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:30
  Length of count       1000 min
  Preparer              ERVL
  Counting system       TN2A
  Sample size             0.250000 SAMP
  Comments              25ML OF 100ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210    -1.4199E+00     121.68 %  PCI/SAMP   9/15/88 ANALYSIS
    PB-210    -1.4228E+00     121.68 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5904E+01       7.54 %  PER CENT   9/15/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/18/88  11:47
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS19
  Sample size             0.250000 SAMP
  Comments              25ML OF 100ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.4280E+01       8.34 %  PCI/SAMP   9/15/88 ANALYSIS
    PO-210     1.6115E+01       8.34 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.9103E+01       6.41 %  PER CENT   9/15/88
```

```
Sample ID                PS  88.05869
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC21,22,23: FRONT HALF
Comments                 FMC082488-MM111-OTB-2-PRA, FMC082488-MM111-OTB-2-PRN, FMC082488-MM111-OTB-2-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/14/88) and GL ( 9/14/88)
  Date, time counted     9/10/88  10:31
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS22
  Sample size             0.007000 SAMP
  Comments              RECALCULATION, 7 ML OF 1000
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     7.5136E+03      9.47 %  PCI/SAMP   9/ 8/88 ANALYSIS
    PO-210     8.0955E+03      9.47 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.0618E+01      9.24 %  PER CENT   9/ 8/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/14/88) and GL ( 9/14/88)
  Date, time counted     9/ 8/88  14:00
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TH1D
  Sample size             0.007000 SAMP
  Comments              7 ML OF 1000
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     7.8354E+01     77.19 %  PCI/SAMP   9/ 8/88 ANALYSIS
    PB-210     7.8461E+01     77.19 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.4711E+01      8.43 %  PER CENT   9/ 8/88
```

```
Sample ID                PS  88.05870
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC241 BACK HALF
Comments                 FMC082488-MM111-OTB-2-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/22/88  14:00
  Length of count        1000 min
  Preparer               ERVL
  Counting system        TN1A
  Sample size              0.190000 SAMP
  Comments               C.19ML OF100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.0450E+00    293.63 %  PCI/SAMP   9/22/88 ANALYSIS
    PB-210     1.0477E+00    293.63 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      4.4935E+01     10.20 %  PER CENT   9/22/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/25/88   9:47
  Length of count        1000 min
  Preparer               ERVL
  Counting system        AS17
  Sample size              0.190000 SAMP
  Comments               C.19ML OF100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     9.6330E+01     15.83 %  PCI/SAMP   9/22/88 ANALYSIS
    PO-210     1.1127E+02     15.83 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      1.2113E+01     14.67 %  PER CENT   9/22/88
```

```
Sample ID                PS  88.05870X
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC241 BACK HALF
Comments                 FMC082488-MM111-OTB-2-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/13/88  13:40
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS20
  Sample size             0.400000 SAMP
  Comments              RECALCULATION
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     9.4719E+01       8.66 %  PCI/SAMP   9/10/88 ANALYSIS
    PO-210     1.0311E+02       8.66 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.5556E+01       8.19 %  PER CENT   9/10/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/10/88  13:50
  Length of count       1000 min
  Preparer              ERVL
  Counting system       TN28
  Sample size             0.400000 SAMP
  Comments              40ML OF 100ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     5.6087E-01     326.21 %  PCI/SAMP   9/10/88 ANALYSIS
    PB-210     5.6173E-01     326.21 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.2634E+01       7.56 %  PER CENT   9/10/88
```

```
Sample ID                PS  88.05872
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC26,27,28: FRONT HALF
Comments                 FMC082588-MM111-IN-3-PRA, FMC082588-MM111-IN-3-PRN, FMC082588-MM111-IN-3-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  13:40
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS21
  Sample size             0.010000 SAMP
  Comments              RECALCULATION
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     3.8016E+03      9.36 %  PCI/SAMP   9/10/88 ANALYSIS
    PO-210     4.1130E+03      9.36 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      8.2497E+01      9.07 %  PER CENT   9/10/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/10/88  13:50
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2C
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     8.2157E+01     50.41 %  PCI/SAMP   9/10/88 ANALYSIS
    PB-210     8.2276E+01     50.41 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.9065E+01      8.22 %  PER CENT   9/10/88
```

Sample ID	PS 88.05873
Sample type	MISC
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC291 BACK HALF
Comments	FMC082588-MM111-IN-3-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/15/88 14:30
Length of count 1000 min
Preparer ERVL
Counting system TN28
Sample size 0.300000 SAMP
Comments 30ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	9.6783E-01	144.40 %	PCI/SAMP	9/15/88	ANALYSIS
PB-210	9.6967E-01	144.39 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.9072E+01	8.45 %	PER CENT	9/15/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/18/88 11:47
Length of count 1000 min
Preparer ERVL
Counting system AS20
Sample size 0.300000 SAMP
Comments 30ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.8096E+01	8.96 %	PCI/SAMP	9/15/88	ANALYSIS
PO-210	1.0890E+02	8.96 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.7638E+01	8.55 %	PER CENT	9/15/88	

```
Sample ID                PS  88.05874
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC30,31,32: FRONT HALF
Comments                 FMC082588-MM111-OTA-3-PRA, FMC082588-MM111-OTA-3-PRN, FMC082588-MM111-OTA-3-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  13:40
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS22
  Sample size             0.010000 SAMP
  Comments              RECALCULATION
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.0506E+03      8.84 %  PCI/SAMP   9/10/88 ANALYSIS
    PO-210     4.3838E+03      8.84 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      8.9872E+01      8.59 %  PER CENT   9/10/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/10/88  13:50
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2D
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     6.9705E+01     65.22 %  PCI/SAMP   9/10/88 ANALYSIS
    PB-210     6.9806E+01     65.22 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.2173E+01      8.59 %  PER CENT   9/10/88
```

```
Sample ID                PS  88.05875
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC73: BACK HALF
Comments                 FMC08258A-MM111-OTA-3-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/10/88  13:50
  Length of count        1000 min
  Preparer               ERVL
  Counting system        TN38
  Sample size              0.990000 SAMP
  Comments               99ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.8629E+00      36.97 %  PCI/SAMP   9/10/88 ANALYSIS
    PB-210     1.8656E+00      36.97 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.5784E+01       4.98 %  PER CENT   9/10/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  13:40
  Length of count        1000 min
  Preparer               ERVL
  Counting system        AS23
  Sample size              0.990000 SAMP
  Comments               99ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.1900E+01       7.36 %  PCI/SAMP   9/10/88 ANALYSIS
    PO-210     2.3577E+01       7.36 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      1.6988E+01       5.65 %  PER CENT   9/10/88
```

Sample ID	PS 88.05876
Sample type	MISC
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC33,34,35: FRONT HALF
Comments	FMC082588-MM111-OTB-3-PRA, FMC082588-MM111-OTB-3-PRN, FMC082588-MM111-OTB-3-F, PROBE RINSE AND FILTER
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/20/88) and GL (9/20/88)
Date, time counted	9/12/88 14:10
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3B
Sample size	0.010000 SAMP
Comments	10 ML OF 1000

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	6.4503E+02	16.83 %	PCI/SAMP	9/12/88	ANALYSIS
PB-210	6.4608E+02	16.83 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.1007E+01	9.80 %	PER CENT	9/12/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/20/88) and GL (9/20/88)
Date, time counted	9/15/88 14:54
Length of count	1000 min
Preparer	ZSVL
Counting system	AS17
Sample size	0.010000 SAMP
Comments	10 ML OF 1000

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.2858E+03	9.80 %	PCI/SAMP	9/12/88	ANALYSIS
PO-210	5.7250E+03	9.80 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.7191E+01	9.53 %	PER CENT	9/12/88	

```
Sample ID                  PS  88.05877
Sample type                MISC
Collection date, time       8/25/88   0:00
Receipt date                8/29/88
Completion date             0/ 0/00
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC361 BACK HALF
Comments                   FMC082588-MM111-OTB-3-IR, IMPINGER
Report to                  GERRY LUSTER

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted       9/15/88  14:30
  Length of count         1000 min
  Preparer                ERVL
  Counting system         T42C
  Sample size               0.500000 SAMP
  Comments                50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     5.5252E-01    167.03 %  PCI/SAMP   9/15/88 ANALYSIS
    PB-210     5.5357E-01    167.03 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.9870E+01      6.19 %  PER CENT   9/15/88

 Type of analysis          ********** PO-AUTO  **********
  Verified by             GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted       9/18/88  11:47
  Length of count         1000 min
  Preparer                ERVL
  Counting system         AS21
  Sample size               0.500000 SAMP
  Comments                50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.0436E+01      7.35 %  PCI/SAMP   9/15/88 ANALYSIS
    PO-210     4.4874E+01      7.35 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.9447E+01      6.61 %  PER CENT   9/15/88
```

```
Sample ID                PS  88.05879
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC37,38,39: FRONT HALF
Comments                 FMC082588-MM111-IN-4-PRA, FMC082588-MM111-IN-4-PRN, FMC082588-MM111-IN-4-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/30/88  13:25
  Length of count        1000 min
  Preparer               AS
  Counting system        TN2B
  Sample size              0.020000 SAMP
  Comments               20ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.1843E+02     17.09 %  PCI/SAMP   9/30/88 ANALYSIS
    PB-210     2.1915E+02     17.09 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      8.0186E+01      8.88 %  PER CENT   9/30/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted    10/ 3/88  14:21
  Length of count        1000 min
  Preparer               AS
  Counting system        AS20
  Sample size              0.020000 SAMP
  Comments               20ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.7963E+03      9.11 %  PCI/SAMP   9/30/88 ANALYSIS
    PO-210     3.3073E+03      9.11 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      8.1277E+01      8.90 %  PER CENT   9/30/88
```

Sample ID	PS 88.05669
Sample type	MISC
Collection date, time	8/18/88 0:00
Receipt date	8/23/88
Completion date	9/26/88
Flag date	10/22/88
Location	ID:SODA SPRINGS
Other ID's	MS59: BACK HALF
Comments	MSS081888-MM111-IN-4-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis ********** PO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ZSVL
Counting system	AS24
Sample size	0.150000 samp
Comments	RECALCULATION, 15 ML OF 100

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	6.5963E+02	7.67 %	PCI/samp	9/20/88	ANALYSIS
PO-210	7.7787E+02	7.67 %	PCI/samp	8/18/88	COLLECTION
YIELD	7.4336E+01	7.53 %	PER CENT	9/20/88	

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:25
Length of count	1000 min
Preparer	ZSVL
Counting system	SH3B
Sample size	0.150000 SAMP
Comments	15ML OF 100ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.8853E+00	107.74 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	3.8969E+00	107.74 %	PCI/SAMP	8/18/88	COLLECTION
YIELD	6.1771E+01	9.48 %	PER CENT	9/20/88	

```
Sample ID                PS  88.05880
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC40: BACK HALF
Comments                 FMC08258B-MM111-IN-4-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/30/88  13:25
  Length of count        1000 min
  Preparer               ERAS
  Counting system        TN1D
  Sample size              0.490000 SAMP
  Comments               49ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.6892E+00      45.35 %  PCI/SAMP   9/30/88 ANALYSIS
    PB-210     2.6980E+00      45.35 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      5.7175E+01       7.39 %  PER CENT   9/30/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     10/ 3/88  14:21
  Length of count        1000 min
  Preparer               ERAS
  Counting system        AS24
  Sample size              0.490000 SAMP
  Comments               49ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     6.2843E+01       7.95 %  PCI/SAMP   9/30/88 ANALYSIS
    PO-210     7.4767E+01       7.95 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      5.7752E+01       7.34 %  PER CENT   9/30/88
```

```
Sample ID                PS  88.05RROX
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC40: HACK HALF
Comments                 FMC082588-MM111-IN-4-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     9/30/88  13:25
  Length of count       1000 min
  Preparer              ERAS
  Counting system       SH3B
  Sample size             0.500000 SAMP
  Comments              50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.5762E+00     67.01 %  PCI/SAMP   9/30/88 ANALYSIS
    PB-210     1.5813E+00     67.01 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.1505E+01      6.14 %  PER CENT   9/30/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted    10/ 4/88  14:00
  Length of count       1000 min
  Preparer              ERAS
  Counting system       AS18
  Sample size             0.500000 SAMP
  Comments              50ML OF 100ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     6.5936E+01      7.54 %  PCI/SAMP   9/30/88 ANALYSIS
    PO-210     7.8694E+01      7.54 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      5.8170E+01      6.96 %  PER CENT   9/30/88
```

```
Sample ID                PS  88.05881
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date          10/ 3/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC41,42,43: FRONT HALF
Comments                 FMC082588-MM111-OTA-4-PRA, FMC082588-MM111-OTA-4-PRN, FMC082588-MM111-OTA-4-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 3/88) and GL (10/ 3/88)
  Date, time counted     9/26/88  14:55
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        TN2A
  Sample size              0.010000 SAMP
  Comments               RECAL.,10ML OF1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     4.7544E+01     151.62 %  PCI/SAMP   9/26/88 ANALYSIS
    PB-210     4.7682E+01     151.62 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      5.9156E+01      11.91 %  PER CENT   9/26/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 3/88) and GL (10/ 3/88)
  Date, time counted     9/28/88  13:53
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS17
  Sample size              0.010000 SAMP
  Comments               RECAL.,10ML OF1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     3.4158E+03       9.88 %  PCI/SAMP   9/26/88 ANALYSIS
    PO-210     4.0033E+03       9.88 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.7920E+01       9.50 %  PER CENT   9/26/88
```

Sample ID PS 88.05882
Sample type MISC
Collection date, time 8/25/88 0:00
Receipt date 8/29/88
Completion date 0/ 0/00
Flag date 10/28/88
Location ID:POCATELLO
Other ID's FMC44: BACK HALF
Comments FMC082588-MM111-OTA-4-IR, IMPINGER
Report to GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (10/ 6/88) and GL (10/ 6/88)
Date, time counted 9/27/88 14:55
Length of count 1000 min
Preparer ERVL
Counting system SH1A
Sample size 0.500000 SAMP
Comments 50 ML OF 100

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.3133E-01	452.30 %	PCI/SAMP	9/26/88	ANALYSIS
PB-210	2.3200E-01	452.28 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.3329E+01	5.38 %	PER CENT	9/26/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (10/ 6/88) and GL (10/ 6/88)
Date, time counted 9/28/88 13:53
Length of count 1000 min
Preparer ERVL
Counting system AS22
Sample size 0.500000 SAMP
Comments 50 ML OF 100

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.6568E+01	5.87 %	PCI/SAMP	9/26/88	ANALYSIS
PO-210	3.1162E+01	5.87 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	5.6329E+01	4.92 %	PER CENT	9/26/88	

PS 5887 loose sheet

```
Sample ID                PS  88.05883
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC45,46,47: FRONT HALF
Comments                 FMC082588-MM111-OTB-4-PRA, FMC082588-MM111-OTB-4-PRN, FMC082588-MM111-OTB-4-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 4/88) and GL (10/ 4/88)
  Date, time counted     9/27/88  14:55
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       TN1A
  Sample size             0.025000 SAMP
  Comments              25ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.9528E+01      67.28 %  PCI/SAMP   9/27/88 ANALYSIS
    PB-210     2.9617E+01      67.28 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.5437E+01       8.52 %  PER CENT   9/27/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 4/88) and GL (10/ 4/88)
  Date, time counted     9/29/88  14:54
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS21
  Sample size             0.025000 SAMP
  Comments              25ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     3.2293E+03       9.06 %  PCI/SAMP   9/27/88 ANALYSIS
    PO-210     3.8062E+03       9.06 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.9150E+01       8.92 %  PER CENT   9/27/88
```

Sample ID	PS 88.05884
Sample type	MISC
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC48: BACK HALF
Comments	FMC082588-MM111-OTB-4-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (10/ 4/88) and GL (10/ 4/88)
Date, time counted 9/27/88 14:55
Length of count 1000 min
Preparer ERVL
Counting system TN2B
Sample size 0.500000 SAMP
Comments 100ML OF200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	7.1190E+00	33.31 %	PCI/SAMP	9/27/88	ANALYSIS
PB-210	7.1403E+00	33.31 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	5.5693E+01	8.76 %	PER CENT	9/27/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (10/ 4/88) and GL (10/ 4/88)
Date, time counted 9/29/88 14:54
Length of count 1000 min
Preparer ERVL
Counting system AS18
Sample size 0.500000 SAMP
Comments 100ML OF200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	4.7703E+01	5.67 %	PCI/SAMP	9/27/88	ANALYSIS
PO-210	5.5020E+01	5.67 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	5.1631E+01	5.07 %	PER CENT	9/27/88	

```
Sample ID                PS  88,05886
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC49,50,51: FRONT HALF
Comments                 FMC082688-MM111-OTA-5-PRA, FMC082688-MM111-OTA-5-PRN, FMC082688-MM111-OTA-5-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/28/88  13:53
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS18
  Sample size             0.015000 SAMP
  Comments              RECAL.,15ML OF1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.9539E+03      8.69 %  PCI/SAMP   9/26/88 ANALYSIS
    PO-210     5.7781E+03      8.69 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      8.5435E+01      8.54 %  PER CENT   9/26/88

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/26/88  14:55
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2C
  Sample size             0.015000 SAMP
  Comments              15ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     6.2839E+01     39.56 %  PCI/SAMP   9/26/88 ANALYSIS
    PB-210     6.3015E+01     39.56 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.7450E+01      7.28 %  PER CENT   9/26/88
```

```
Sample ID                PS  88.05R87
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC52: BACK HALF
Comments                 FMC082688-MM111-OTA-5-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     9/27/88  14:55
  Length of count       1000 min
  Preparer              ERVL
  Counting system       SH1B
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -1.3915E-01   1027.16 %  PCI/SAMP   9/26/88 ANALYSIS
    PB-210   -1.3954E-01   1027.16 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     7.3868E+01      8.04 %  PER CENT   9/26/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     9/28/88  13:53
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS23
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    2.3172E+01      5.77 %  PCI/SAMP   9/26/88 ANALYSIS
    PO-210    2.7101E+01      5.77 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     6.7082E+01      4.78 %  PER CENT   9/26/88
```

```
Sample ID                PS  88.05888
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC53,54,55: FRONT HALF
Comments                 FMC082688-MM111-OTB-5-PRA, FMC082688-MM111-OTB-5-PRN, FMC082688-MM111-OTB-5-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/27/88  14:55
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH3B
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     7.9281E+01      66.21 %  PCI/SAMP   9/27/88 ANALYSIS
    PB-210     7.9510E+01      66.21 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.2723E+01       9.43 %  PER CENT   9/27/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/29/88  14:54
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS24
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     4.2290E+03       9.55 %  PCI/SAMP   9/27/88 ANALYSIS
    PO-210     4.9527E+03       9.55 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.5913E+01       9.28 %  PER CENT   9/27/88
```

```
Sample ID                PS  88.05889
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC56: BACK HALF
Comments                 FMC082688-MM111-OTB-5-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/27/88  14:55
  Length of count        1000 min
  Preparer               ERVL
  Counting system        TN2C
  Sample size              0.500000 SAMP
  Comments               100ML OF200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS    DATE
    PB-210    1.3050E+00     68.95 %  PCI/SAMP   9/27/88 ANALYSIS
    PB-210    1.3088E+00     68.95 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     6.2799E+01      5.64 %  PER CENT   9/27/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/29/88  14:54
  Length of count        1000 min
  Preparer               ERVL
  Counting system        AS19
  Sample size              0.500000 SAMP
  Comments               100ML OF200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS    DATE
    PO-210    4.0188E+01      8.22 %  PCI/SAMP   9/27/88 ANALYSIS
    PO-210    4.6969E+01      8.22 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     2.2329E+01      7.05 %  PER CENT   9/27/88
```

```
Sample ID                PS  88.05890
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC57,58,59: FRONT HALF
Comments                 FMC082688-MM111-OTA-6-PRA, FMC082688-MM111-OTA-6-PRN, FMC082688-MM111-OTA-6-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 5/88  13:30
  Length of count        1000 min
  Preparer               ASVL
  Counting system        TM2C
  Sample size              0.010000 SAMP
  Comments               C, 10 ML OF 1000
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS    DATE
    PB-210   -4.3290E+00   1081.47 %  PCI/SAMP  10/ 4/88 ANALYSIS
    PB-210   -4.3443E+00   1081.46 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     7.7306E+01      9.14 %  PER CENT  10/ 4/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 6/88  14:43
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS19
  Sample size              0.010000 SAMP
  Comments               C, 10 ML OF 1000
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS    DATE
    PO-210    4.9923E+03      9.56 %  PCI/SAMP  10/ 4/88 ANALYSIS
    PO-210    6.0738E+03      9.56 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     7.2530E+01      9.32 %  PER CENT  10/ 4/88
```

```
Sample ID                 PS  88.05890X
Sample type               MISC
Collection date, time      8/26/88   0:00
Receipt date               8/29/88
Completion date            0/ 0/00
Flag date                 10/28/88
Location                  ID:POCATELLO
Other ID's                FMC57,58,59: FRONT HALF
Comments                  FMC082688-MM111-OTA-6-PRA, FMC082688-MM111-OTA-6-PRN, FMC082688-MM111-OTA-6-F, PROBE RINSE AND FILTER
Report to                 GERRY LUSTER

 Type of analysis         ********** PB        **********
  Verified by            GL (10/ 0/88) and GL (10/ 8/88)
  Date, time counted      9/27/88  14:55
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH3A
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210    -1.3678E+01    340.85 %   PCI/SAMP   9/27/88 ANALYSIS
    PB-210    -1.3717E+01    340.87 %   PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.6604E+01      8.80 %   PER CENT   9/27/88

 Type of analysis         ********** PO-AUTO  **********
  Verified by            GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted      9/29/88  14:54
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS23
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.5669E+03      8.86 %   PCI/SAMP   9/27/88 ANALYSIS
    PO-210     6.5401E+03      8.86 %   PCI/SAMP   8/26/88 COLLECTION
    YIELD      9.2567E+01      8.68 %   PER CENT   9/27/88
```

```
Sample ID                PS  88.05891
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC601 BACK HALF
Comments                 FMC082688-MM111-OTA-6-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted      9/27/88  14:55
  Length of count        1000 min
  Preparer               ERVL
  Counting system        TN2D
  Sample size              0.500000 SAMP
  Comments               100ML OF200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     7.9047E-03  12805.04 %  PCI/SAMP   9/27/88 ANALYSIS
    PB-210     7.9276E-03  12804.63 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.2585E+01      6.71 %  PER CENT   9/27/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted      9/29/88  14:54
  Length of count        1000 min
  Preparer               ERVL
  Counting system        AS20
  Sample size              0.500000 SAMP
  Comments               100ML OF200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     2.2596E+01      5.90 %  PCI/SAMP   9/27/88 ANALYSIS
    PO-210     2.6535E+01      5.90 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.0451E+01      4.81 %  PER CENT   9/27/88
```

```
Sample ID                PS  88.05892
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC61,62,63: FRONT HALF
Comments                 FMC082688-MM111-OTB-6-PRA, FMC082688-MM111-OTB-6-PRN, FMC082688-MM111-OTB-6-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/28/88  14:00
  Length of count        1000 min
  Preparer               ASGL
  Counting system        TN2B
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210    -7.0180E-01   7193.93 %  PCI/SAMP   9/28/88 ANALYSIS
    PB-210    -7.0389E-01   7194.02 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.1865E+01      7.51 %  PER CENT   9/28/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     10/ 1/88  10:32
  Length of count        1000 min
  Preparer               ASGL
  Counting system        AS18
  Sample size              0.010000 SAMP
  Comments               10ML OF 1000ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     6.7013E+03      9.30 %  PCI/SAMP   9/28/88 ANALYSIS
    PO-210     7.9098E+03      9.30 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.0029E+01      9.12 %  PER CENT   9/28/88
```

Sample ID	PS 88.05893
Sample type	MISC
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC64: BACK HALF
Comments	FMC082688-MM111-OTB-6-IR, IMPINGER
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (10/ 6/88) and GL (10/ 6/88)
Date, time counted	9/28/88 14:00
Length of count	1000 min
Preparer	ASGL
Counting system	SH3A
Sample size	0.500000 SAMP
Comments	100 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-1.1484E+00	97.88 %	PCI/SAMP	9/28/88	ANALYSIS
PB-210	-1.1518E+00	97.87 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.9358E+01	6.89 %	PER CENT	9/28/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (10/ 6/88) and GL (10/ 6/88)
Date, time counted	10/ 1/88 10:32
Length of count	1000 min
Preparer	ASGL
Counting system	AS23
Sample size	0.500000 SAMP
Comments	100 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.3320E+01	7.69 %	PCI/SAMP	9/28/88	ANALYSIS
PO-210	2.7732E+01	7.69 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	3.2402E+01	6.13 %	PER CENT	9/28/88	

```
Sample ID                PS  88.05894
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC65,66,67: FRONT HALF
Comments                 FMC082688-MM111-OTA-7-PRA, FMC082688-MM111-OTA-7-PRN, FMC082688-MM111-OTA-7-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/30/88  13:25
  Length of count       1000 min
  Preparer              AS
  Counting system       TN2C
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     4.5175E+01      93.78 %  PCI/SAMP   9/30/88 ANALYSIS
    PB-210     4.5318E+01      93.78 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.5114E+01       8.77 %  PER CENT   9/30/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted    10/ 3/88  14:21
  Length of count       1000 min
  Preparer              AS
  Counting system       AS21
  Sample size             0.010000 SAMP
  Comments              10ML OF 1000ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.4621E+03       9.61 %  PCI/SAMP   9/30/88 ANALYSIS
    PO-210     5.3112E+03       9.61 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.4170E+01       9.34 %  PER CENT   9/30/88
```

```
Sample ID                PS  88.05R95
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC68: BACK HALF
Comments                 FMC082688-MM111-DTA-7-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted      9/30/88  13:25
  Length of count        1000 min
  Preparer               ERAS
  Counting system        SH3A
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210   -8.3185E-01     122.53 %  PCI/SAMP   9/30/88 ANALYSIS
    PB-210   -8.3448E-01     122.54 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     6.7792E+01       6.39 %  PER CENT   9/30/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 4/88  14:00
  Length of count        1000 min
  Preparer               ERAS
  Counting system        AS17
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210    2.0881E+01       5.85 %  PCI/SAMP   9/30/88 ANALYSIS
    PO-210    2.5056E+01       5.85 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     6.4556E+01       4.75 %  PER CENT   9/30/88
```

```
Sample ID                PS  88.05896
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC69,70,71: FRONT HALF
Comments                 FMC082688-MM111-OTB-7-PRA, FMC082688-MM111-OTB-7-PRN, FMC082688-MM111-OTB-7-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 3/88  14:15
  Length of count        1000 min
  Preparer               ASGL
  Counting system        SH1A
  Sample size              0.010000 SAMP
  Comments               10 ML OF 1000 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS    DATE
    PB-210   -2.6655E+01     169.72 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PB-210   -2.6747E+01     169.72 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     7.4984E+01       9.22 %  PER CENT  10/ 3/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 4/88  14:00
  Length of count        1000 min
  Preparer               ASGL
  Counting system        AS19
  Sample size              0.010000 SAMP
  Comments               10 ML OF 1000 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS    DATE
    PO-210    6.2023E+03       9.63 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PO-210    7.5126E+03       9.63 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     6.9660E+01       9.43 %  PER CENT  10/ 3/88
```

```
Sample ID                PS  88.05897
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC72: BACK HALF
Comments                 FMC082688-MM111-OTB-7-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 4/88  14:15
  Length of count        1000 min
  Preparer               ERAS
  Counting system        SH1A
  Sample size              0.500000 SAMP
  Comments               100 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS    DATE
    PB-210     1.1206E+00    153.81 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PB-210     1.1245E+00    153.80 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      5.5213E+01      8.78 %  PER CENT  10/ 3/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 5/88  14:33
  Length of count        1000 min
  Preparer               ERAS
  Counting system        AS18
  Sample size              0.500000 SAMP
  Comments               100 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS    DATE
    PO-210     2.6037E+01      5.66 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PO-210     3.1277E+01      5.66 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.3383E+01      4.75 %  PER CENT  10/ 3/88
```

```
Sample ID                PS  88.05898
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:PUCATELLO
Other ID's               FMC74,75,76A: FRONT HALF
Comments                 FMC082688-MM111-IN-FB-PRA, FMC082688-MM111-IN-FB-PRN, FMC082688-MM111-IN-FB-F, PROBE RINSE AND FILTER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 3/88  14:15
  Length of count        1000 min
  Preparer               ASGL
  Counting system        SH2B
  Sample size              0.500000 SAMP
  Comments               50 ML OF 100 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.6782E-01     514.23 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PB-210     2.6874E-01     514.21 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.4588E+01       8.55 %  PER CENT  10/ 3/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 4/88  14:00
  Length of count        1000 min
  Preparer               ASGL
  Counting system        AS21
  Sample size              0.500000 SAMP
  Comments               50 ML OF 100 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.4337E+01       9.81 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PO-210     6.5710E+01       9.81 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.7583E+01       9.41 %  PER CENT  10/ 3/88
```

```
Sample ID                PS  88.05899
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC77: BACK HALF
Comments                 FMC082688-MM111-IN-FB-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 3/88  14:15
  Length of count        1000 min
  Preparer               ERAS
  Counting system        SH3A
  Sample size              0.500000 SAMP
  Comments               100 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PB-210    -2.9227E-01     383.79 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PB-210    -2.9328E-01     383.80 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      5.8669E+01       6.60 %  PER CENT  10/ 3/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 6/88) and GL (10/ 6/88)
  Date, time counted     10/ 4/88  14:00
  Length of count        1000 min
  Preparer               ERAS
  Counting system        AS22
  Sample size              0.500000 SAMP
  Comments               100 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PO-210     6.6134E+00       8.01 %  PCI/SAMP  10/ 3/88 ANALYSIS
    PO-210     8.0661E+00       8.01 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      5.7569E+01       4.89 %  PER CENT  10/ 3/88
```

```
Sample ID                PS  88.05900
Sample type              MISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC78,79,80A; FRONT HALF
Comments                 FMC082688-MM111-OUT-FB-PRA, FMC082688-MM111-OUT-FB-PRN, FMC082688-MM111-OTB-FB-F, PROBE RINSE AND FILTE
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/16/88  14:55
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2A
  Sample size             0.490000 SAMP
  Comments              49 ML OF 100 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     3.9703E-01     830.16 %  PCI/SAMP   9/16/88 ANALYSIS
    PB-210     3.9779E-01     830.14 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      2.2816E+01      12.28 %  PER CENT   9/16/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/19/88  14:30
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS19
  Sample size             0.490000 SAMP
  Comments              49 ML OF 100 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.2799E+01       7.80 %  PCI/SAMP   9/16/88 ANALYSIS
    PO-210     5.8629E+01       7.80 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      2.3957E+01       6.92 %  PER CENT   9/16/88
```

Sample ID	PS 88.05900X
Sample type	MISC
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC78,79,80A: FRONT HALF
Comments	FMC082688-MM111-OUT-FB-PRA, FMC082688-MM111-OUT-FB-PRN, FMC082688-MM111-OTB-FB-F, PROBE RINSE AND FILTE
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/16/88 14:55
Length of count 1000 min
Preparer ASVL
Counting system TN28
Sample size 0.500000 SAMP
Comments 50 ML OF 100 ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	4.8323E-01	487.22 %	PCI/SAMP	9/16/88	ANALYSIS
PB-210	4.8415E-01	487.23 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	2.1704E+01	8.29 %	PER CENT	9/16/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/19/88 14:30
Length of count 1000 min
Preparer ASVL
Counting system AS20
Sample size 0.500000 SAMP
Comments 50 ML OF 100 ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.3359E+01	7.58 %	PCI/SAMP	9/16/88	ANALYSIS
PO-210	5.9243E+01	7.58 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	2.4096E+01	6.70 %	PER CENT	9/16/88	

```
Sample ID                PS  88.05901
Sample type              *ISC
Collection date, time     8/26/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMCR11 BACK HALF
Comments                 FMC082688-MM111-OUT-FB-IR, IMPINGER
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/21/88  14:10
  Length of count       1000 min
  Preparer              ERVL
  Counting system       TN1D
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY  2 SIG ERROR    UNITS     DATE
    PB-210     2.6023E+00     40.35 %  PCI/SAMP   9/21/88 ANALYSIS
    PB-210     2.6084E+00     40.35 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.2775E+01      6.71 %  PER CENT   9/21/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/24/88  11:00
  Length of count       1000 min
  Preparer              ERVL
  Counting system       AS18
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY  2 SIG ERROR    UNITS     DATE
    PO-210     3.5551E+00      8.75 %  PCI/SAMP   9/21/88 ANALYSIS
    PO-210     3.6876E+00      8.75 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.8600E+01      4.46 %  PER CENT   9/21/88
```

Sample ID	PS 88.05903
Sample type	MISC
Collection date, time	8/23/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC25
Comments	FMC082388-PROBE BLANK
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/17/88 14:10
Length of count	1000 min
Preparer	ERVL
Counting system	TN1D
Sample size	0.500000 SAMP
Comments	50 ML OF 100

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	7.4810E-01	90.31 %	PCI/SAMP	9/17/88	ANALYSIS
PB-210	7.4979E-01	90.31 %	PCI/SAMP	8/23/88	COLLECTION
YIELD	7.4188E+01	7.59 %	PER CENT	9/17/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:21
Length of count	1000 min
Preparer	ERVL
Counting system	AS18
Sample size	0.500000 SAMP
Comments	50 ML OF 100

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	8.7625E-01	17.31 %	PCI/SAMP	9/17/88	ANALYSIS
PO-210	8.9329E-01	17.31 %	PCI/SAMP	8/23/88	COLLECTION
YIELD	7.0331E+01	6.52 %	PER CENT	9/17/88	

```
Sample ID                 PS  88.05902
Sample type               MISC
Collection date, time      8/27/88   0:00
Receipt date               8/29/88
Completion date            9/26/88
Flag date                 10/28/88
Location                  ID:POCATELLO
Other ID's                FMC140
Comments                  FMC082788-MM111-RB-F
Report to                 GERRY LUSTER

 Type of analysis         ********** PB        **********
  Verified by            GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted      9/17/88  14:10
  Length of count        1000 min
  Preparer               ERVL
  Counting system        TN1A
  Sample size              0.500000 SAMP
  Comments               50 ML OF 100
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     8.2818E-01     150.04 %  PCI/SAMP   9/17/88 ANALYSIS
    PB-210     8.2976E-01     150.04 %  PCI/SAMP   8/27/88 COLLECTION
    YIELD      5.0632E+01      10.76 %  PER CENT   9/17/88

 Type of analysis         ********** PO-AUTO  **********
  Verified by            GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted      9/20/88  14:21
  Length of count        1000 min
  Preparer               ERVL
  Counting system        AS17
  Sample size              0.500000 SAMP
  Comments               50 ML OF 100
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.9479E-01      23.79 %  PCI/SAMP   9/17/88 ANALYSIS
    PO-210     5.6873E-01      23.79 %  PCI/SAMP   8/27/88 COLLECTION
    YIELD      5.3237E+01       7.13 %  PER CENT   9/17/88
```

APPENDIX L.2 - PSD Radionuclide Data

```
Sample ID                PS  88.05904
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC86: ANDERSEN
Comments                 FMC082488-PSD-IN-1-ST1
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/14/88  14:30
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        TN1A
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     8.7616E-01     97.75 %  PCI/SAMP   9/14/88 ANALYSIS
    PB-210     8.7782E-01     97.75 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.6395E+01      5.32 %  PER CENT   9/14/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/17/88  11:52
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS17
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     1.0846E+01      6.42 %  PCI/SAMP   9/14/88 ANALYSIS
    PO-210     1.1955E+01      6.42 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.1950E+01      4.60 %  PER CENT   9/14/88
```

```
Sample ID                PS  88.05905
Sample type              FILTER
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC87: ANDERSEN
Comments                 FMC082488-PSD-IN-1-ST2-5
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/14/88  14:30
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        TN1D
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     1.7709E+00      69.47 %   PCI/SAMP   9/14/88 ANALYSIS
    PB-210     1.7743E+00      69.46 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.4025E+01       7.35 %   PER CENT   9/14/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/17/88  11:52
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS1A
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.5954E+01       6.75 %   PCI/SAMP   9/14/88 ANALYSIS
    PO-210     1.7532E+01       6.75 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.0390E+01       5.11 %   PER CENT   9/14/88
```

```
Sample ID                PS  88.05906
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID;POCATELLO
Other ID's               FMC88: ANDERSEN
Comments                 FMC082488-PSD-IN-1-ST6
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/14/88  14:30
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       TN2A
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     7.7936E-01    127.24 %  PCI/SAMP   9/14/88 ANALYSIS
    PB-210     7.8084E-01    127.24 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.8650E+01      5.99 %  PER CENT   9/14/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/17/88  11:52
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS19
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     7.8927E+00      6.88 %  PCI/SAMP   9/14/88 ANALYSIS
    PO-210     8.6841E+00      6.88 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.7130E+01      4.56 %  PER CENT   9/14/88
```

```
Sample ID                PS  88.05907
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMCR9: ANDERSEN
Comments                 FMC0824R8-PSD-IN-1-ST7
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:30
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       TN2D
  Sample size             0.250000 SAMP
  Comments              50ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -1.4074E+00    124.31 %  PCI/SAMP   9/15/88 ANALYSIS
    PB-210   -1.4102E+00    124.32 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.2473E+01      8.26 %  PER CENT   9/15/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/18/88  11:47
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS22
  Sample size             0.250000 SAMP
  Comments              50ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    8.0420E+00      9.53 %  PCI/SAMP   9/15/88 ANALYSIS
    PO-210    9.1465E+00      9.53 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.6311E+01      6.35 %  PER CENT   9/15/88
```

```
Sample ID                PS  88.05908
Sample type              FILTER
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC90: ANDERSEN
Comments                 FMC082488-PSD-IN-1-STB
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:30
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       SH1A
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -1.7289E+00      57.95 %  PCI/SAMP   9/15/88 ANALYSIS
    PB-210   -1.7323E+00      57.95 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.1340E+01       6.22 %  PER CENT   9/15/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/18/88  11:47
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS23
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    8.9966E+00       6.50 %  PCI/SAMP   9/15/88 ANALYSIS
    PO-210    1.0250E+01       6.50 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     8.2631E+01       4.51 %  PER CENT   9/15/88
```

```
Sample ID                PS  88.05909
Sample type              FILTER
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC91: ANDERSEN
Comments                 PSD-IN-1-STAGE 9
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:30
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH1B
  Sample size              0.300000 SAMP
  Comments               60 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PB-210    -1.5169E+00     128.08 %   PCI/SAMP   9/15/88 ANALYSIS
    PB-210    -1.5199E+00     128.09 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.0230E+01       9.29 %   PER CENT   9/15/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/18/88  11:47
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS24
  Sample size              0.300000 SAMP
  Comments               60 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PO-210     1.0062E+02       6.40 %   PCI/SAMP   9/15/88 ANALYSIS
    PO-210     1.1256E+02       6.40 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.6832E+01       6.09 %   PER CENT   9/15/88
```

```
Sample ID                PS  88.05910
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC92: ANDERSEN
Comments                 FMC082488-PSD-OTA-1-ST1
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/13/88  14:20
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       SH1A
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.0297E+00      99.83 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210     1.0316E+00      99.83 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.7652E+01       5.96 %  PER CENT   9/13/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/15/88  14:54
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS18
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     9.4808E+01       7.49 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210     1.0472E+02       7.49 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.5369E+01       7.07 %  PER CENT   9/13/88
```

```
Sample ID                PS  88.05910X
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC92: ANDERSEN
Comments                 FMC082488-PSD-DTA-1-ST1
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  14:20
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       SH18
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -7.5686E-01     127.72 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210   -7.5823E-01     127.72 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.5221E+01       6.12 %  PER CENT   9/13/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/15/88  14:54
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS19
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    8.8832E+01       7.19 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210    9.8301E+01       7.19 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD     6.9490E+01       6.80 %  PER CENT   9/13/88
```

Run 1

Sample ID	PS 88.05911 ✓
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC93: ANDERSEN
Comments	FMC082488-PSD-OTA-1-ST2-5
Report to	GERRY LUSTER

Type of analysis ********** PO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/17/88 11:52
Length of count	1000 min
Preparer	ZSVL
Counting system	AS20
Sample size	0.250000 SAMP
Comments	RECALCULATION, 50 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.4771E+02	10.21 %	PCI/SAMP	9/14/88	ANALYSIS
PO-210	2.7497E+02	10.21 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.2261E+01	9.99 %	PER CENT	9/14/88	

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/14/88 14:30
Length of count	1000 min
Preparer	ZSVL
Counting system	TN2B
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.6650E+00	67.08 %	PCI/SAMP	9/14/88	ANALYSIS
PB-210	2.6701E+00	67.08 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.2903E+01	8.25 %	PER CENT	9/14/88	

```
Sample ID                PS  88.05912
Sample type              FILTER
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC94: ANDERSEN
Comments                 FMC082488-PSD-UTA-1-ST6
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  14:20
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH2A
  Sample size              0.125000 SAMP
  Comments               25 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PB-210     1.6714E+01      36.00 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210     1.6745E+01      36.00 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.4189E+01       7.80 %  PER CENT   9/13/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/15/88  14:54
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS20
  Sample size              0.125000 SAMP
  Comments               25 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PO-210     8.0327E+01       9.02 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210     8.7049E+01       9.02 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5849E+01       7.70 %  PER CENT   9/13/88
```

Sample type FILTER 5913
Collection date, time 8/24/88 0:00
Receipt date 8/29/88
Completion date 0/ 0/00 88.05913
Flag date 10/28/88
Location ID:POCATELLO
Other ID's FMC95: ANDERSEN
Comments FMC082488-PSD-OTA-1-ST7
Report to GERRY LUSTER

[illegible] indicated that the extra count on the first run was not correct

Type of analysis ********** PO **********
Verified by GL (9/20/88) and GL (9/20/88)
Date, time counted 9/13/88 13:40
Length of count 1000 min
Preparer ZSVL
Counting system AS24
Sample size 0.250000 SAMP
Comments RECALCULATION, RERUN INDICATED ERROR IN PB VALUE

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.1650E+02	9.89 %	PCI/SAMP	9/12/88	ANALYSIS
PO-210	1.1130E+02	9.89 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.7101E+01	9.42 %	PER CENT	9/12/88	

ORIGINAL ANALYSIS

Type of analysis ********** PB **********
Verified by GL (9/20/88) and GL (9/20/88)
Date, time counted 9/12/88 14:10
Length of count 1000 min
Preparer ZSVL
Counting system TN3D
Sample size 0.250000 SAMP
Comments RERUN INDICATED ERROR IN PB VALUE

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.6831E+02	9.62 %	PCI/SAMP	9/12/88	ANALYSIS
PB-210	1.6860E+02	9.62 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.9140E+01	8.79 %	PER CENT	9/12/88	

Type of analysis ********** PO-AUTO **********
Verified by (0/ 0/00) and (0/ 0/00)

Type of analysis ********** PB **********
Verified by GL (11/22/88) and GL (11/22/88)
Date, time counted 11/16/88 16:25
Length of count 1000 min
Preparer VL
Counting system SH3A
Sample size 0.250000 SAMP
Comments RERUN AT PAUL MAGNO'S REQUEST

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.0424E+00	69.93 %	PCI/SAMP	11/16/88	ANALYSIS
PB-210	3.0656E+00	69.93 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.8239E+01	9.79 %	PER CENT	11/16/88	

Second analysis, these results were used.

Type of analysis ********** PO-AUTO **********
Verified by GL (11/22/88) and GL (11/22/88)
Date, time counted 11/17/88 14:18
Length of count 1000 min
Preparer VL
Counting system AS17
Sample size 0.250000 SAMP
Comments RERUN AT PAUL MAGNO'S REQUEST

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.9777E+01	9.91 %	PCI/SAMP	11/16/88	ANALYSIS
PO-210	1.5056E+02	9.91 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.4127E+01	9.44 %	PER CENT	11/16/88	

```
Sample ID                PS  88.05914
Sample type              FILTER
Collection date, time     8/24/88    0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC961 ANDERSEN
Comments                 FMC082488-PSD-UTA-1-ST8
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/14/88  14:30
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH1A
  Sample size              0.125000 SAMP
  Comments               25 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PB-210   -7.4897E+00      69.29 %   PCI/SAMP   9/13/88 ANALYSIS
    PB-210   -7.5032E+00      69.29 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.0187E+01       9.42 %   PER CENT   9/13/88

Type of analysis         ********** PO-AUTO  **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/15/88  14:54
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS21
  Sample size              0.125000 SAMP
  Comments               25 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR     UNITS     DATE
    PO-210    2.3146E+02       5.80 %   PCI/SAMP   9/13/88 ANALYSIS
    PO-210    2.5672E+02       5.80 %   PCI/SAMP   8/24/88 COLLECTION
    YIELD     7.0585E+01       5.44 %   PER CENT   9/13/88
```

```
Sample ID                PS  88.05915
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC97: ANDERSEN
Comments                 FMC082488-PSD-OTA-1-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/15/88  14:54
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS22
  Sample size              0.025000 SAMP
  Comments               RECALCULATION, 5 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.8089E+03       8.46 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210     1.9987E+03       8.46 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      9.4951E+01       8.23 %  PER CENT   9/13/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  14:20
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH3A
  Sample size              0.025000 SAMP
  Comments               5 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     1.3333E+01     114.26 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210     1.3357E+01     114.25 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.1601E+01       7.04 %  PER CENT   9/13/88
```

Sample ID	PS 88.05916
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC98: ANDERSEN
Comments	FMC082488-PSD-OTR-1-ST1
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 5/88 13:30
Length of count	1000 min
Preparer	ASVL
Counting system	TN2D
Sample size	0.300000 SAMP
Comments	B, 60 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-8.2758E-01	225.96 %	PCI/SAMP	10/ 4/88	ANALYSIS
PB-210	-8.3066E-01	225.95 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.8370E+01	8.05 %	PER CENT	10/ 4/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 6/88 14:43
Length of count	1000 min
Preparer	ASVL
Counting system	AS20
Sample size	0.300000 SAMP
Comments	B, 60 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.1329E+01	6.67 %	PCI/SAMP	10/ 4/88	ANALYSIS
PO-210	6.3259E+01	6.67 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.5928E+01	6.05 %	PER CENT	10/ 4/88	

```
Sample ID                PS  88.05917
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC991 ANDERSEN
Comments                 FMC082488-PSD-OTB-1-ST2-5
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted      9/22/88  14:00
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        TN1D
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.5723E+00      47.69 %  PCI/SAMP   9/22/88 ANALYSIS
    PB-210     2.5791E+00      47.69 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.3314E+01       7.38 %  PER CENT   9/22/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted      9/25/88   9:47
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS1B
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.7234E+02       7.34 %  PCI/SAMP   9/22/88 ANALYSIS
    PO-210     1.9897E+02       7.34 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      5.4609E+01       7.10 %  PER CENT   9/22/88
```

Sample ID	PS 88.05918
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/28/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC100: ANDERSEN
Comments	FMC082488-PSD-OTB-1-ST6
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/28/88) and GL (9/28/88)
Date, time counted	9/22/88 14:00
Length of count	1000 min
Preparer	ZSVL
Counting system	SH3A
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.1384E-01	369.77 %	PCI/SAMP	9/22/88	ANALYSIS
PB-210	3.1466E-01	369.80 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	5.7222E+01	6.59 %	PER CENT	9/22/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/28/88) and GL (9/28/88)
Date, time counted	9/25/88 9:47
Length of count	1000 min
Preparer	ZSVL
Counting system	AS19
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	3.8226E+01	5.52 %	PCI/SAMP	9/22/88	ANALYSIS
PO-210	4.4172E+01	5.52 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.1983E+01	4.87 %	PER CENT	9/22/88	

```
Sample ID                PS  88.05919
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC101: ANDERSEN
Comments                 FMC082488-PSD-OTR-1-ST7
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/22/88  14:00
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH3B
  Sample size              0.250000 SAMP
  Comments               50ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.5854E+00      74.15 %  PCI/SAMP   9/22/88 ANALYSIS
    PB-210     2.5922E+00      74.15 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.2581E+01       8.63 %  PER CENT   9/22/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/25/88   9:47
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS20
  Sample size              0.250000 SAMP
  Comments               50ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     7.9529E+01       6.78 %  PCI/SAMP   9/22/88 ANALYSIS
    PO-210     9.1597E+01       6.78 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5457E+01       6.37 %  PER CENT   9/22/88
```

Sample ID	PS 88.05920
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC102: ANDERSEN
Comments	FMC082488-PSD-OTB-1-ST8
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 4/88 14:30
Length of count	1000 min
Preparer	VL
Counting system	TN1A
Sample size	0.125000 SAMP
Comments	C, 25 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	4.0255E+00	97.26 %	PCI/SAMP	10/ 4/88	ANALYSIS
PB-210	4.0404E+00	97.27 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.1642E+01	7.43 %	PER CENT	10/ 4/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 5/88 14:33
Length of count	1000 min
Preparer	VL
Counting system	AS20
Sample size	0.125000 SAMP
Comments	C, 25 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.6885E+02	6.05 %	PCI/SAMP	10/ 4/88	ANALYSIS
PO-210	2.0654E+02	6.05 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.1724E+01	5.52 %	PER CENT	10/ 4/88	

Sample ID	PS 88.05920X
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC102: ANDERSEN
Comments	FMC082488-PSD-DTB-1-ST8
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted 10/ 4/88 14:30
Length of count 1000 min
Preparer ZSVL
Counting system TN1D
Sample size 0.125000 SAMP
Comments D, 25 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	8.7848E+00	42.41 %	PCI/SAMP	10/ 4/88	ANALYSIS
PB-210	8.8175E+00	42.41 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.2748E+01	7.04 %	PER CENT	10/ 4/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted 10/ 5/88 14:33
Length of count 1000 min
Preparer ZSVL
Counting system A521
Sample size 0.125000 SAMP
Comments D, 25 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.6206E+02	5.73 %	PCI/SAMP	10/ 4/88	ANALYSIS
PO-210	1.9712E+02	5.73 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.9146E+01	5.27 %	PER CENT	10/ 4/88	

```
Sample ID                PS  88.05921
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC103: ANDERSEN
Comments                 FMC082488-PSD-OTB-1-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 4/88  14:30
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        SH3A
  Sample size              0.025000 SAMP
  Comments               8, 5 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     3.8796E+00    463.01 %  PCI/SAMP  10/ 4/88 ANALYSIS
    PB-210     3.8940E+00    463.02 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.8622E+01      8.15 %  PER CENT  10/ 4/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 8/88) and GL (10/ 8/88)
  Date, time counted     10/ 5/88  14:33
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS22
  Sample size              0.025000 SAMP
  Comments               8, 5 ML OF 200
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.1084E+03      8.98 %  PCI/SAMP  10/ 4/88 ANALYSIS
    PO-210     2.5898E+03      8.98 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5645E+01      8.75 %  PER CENT  10/ 4/88
```

Sample ID	PS 88.05922
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC104: ANDERSEN
Comments	FMC082488-PSD-IN-2-ST1
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN1A
Sample size	0.500000 SAMP
Comments	100ML OF200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.4351E+00	63.85 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	1.4385E+00	63.85 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.7989E+01	5.76 %	PER CENT	9/19/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ASVL
Counting system	AS21
Sample size	0.500000 SAMP
Comments	100ML OF200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.1033E+00	6.86 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	1.0173E+01	6.86 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.1618E+01	4.69 %	PER CENT	9/19/88	

```
Sample ID                  PS  88.05923
Sample type                FILTER
Collection date, time       8/24/88   0:00
Receipt date                8/29/88
Completion date             9/26/88
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC105: ANDERSEN
Comments                   FMC082488-PSD-IN-2-ST2-5
Report to                  GERRY LUSTER

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/19/88  14:10
  Length of count         1000 min
  Preparer                ASVL
  Counting system         TN1D
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     3.5715E+00      27.47 %  PCI/SAMP   9/19/88 ANALYSIS
    PB-210     3.5799E+00      27.47 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.2661E+01       5.64 %  PER CENT   9/19/88

 Type of analysis          ********** PO-AUTO  **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/21/88  14:38
  Length of count         1000 min
  Preparer                ASVL
  Counting system         A522
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     1.6397E+01       6.11 %  PCI/SAMP   9/19/88 ANALYSIS
    PO-210     1.8186E+01       6.11 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.3523E+01       4.74 %  PER CENT   9/19/88
```

Sample ID	PS 88.05924
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC106: ANDERSEN
Comments	FMC082488-PSD-IN-2-ST6
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN2A
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	7.1039E-01	166.22 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	7.1206E-01	166.22 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.2027E+01	7.03 %	PER CENT	9/19/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ASVL
Counting system	AS17
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	7.0187E+00	7.36 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	7.8988E+00	7.36 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.8642E+01	4.66 %	PER CENT	9/19/88	

Sample ID	PS 88,05925
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC107: ANDERSEN
Comments	FMC082488-PSD-IN-2-ST7
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:25
Length of count	1000 min
Preparer	ASVL
Counting system	TN1A
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.2163E+00	337.63 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	1.2193E+00	337.62 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.3708E+01	9.28 %	PER CENT	9/20/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/22/88 13:54
Length of count	1000 min
Preparer	ASVL
Counting system	AS19
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.7642E+00	10.29 %	PCI/SAMP	9/20/88	ANALYSIS
PO-210	1.1006E+01	10.29 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	8.3091E+01	5.16 %	PER CENT	9/20/88	

Sample ID	PS 88.05926
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC108: ANDERSEN
Comments	FMC082488-PSD-IN-2-ST8
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN2B
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.9729E+00	64.58 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	1.9775E+00	64.58 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.9755E+01	8.44 %	PER CENT	9/19/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ASVL
Counting system	AS18
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.2474E+01	8.44 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	1.3939E+01	8.44 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.9160E+01	6.30 %	PER CENT	9/19/88	

```
Sample ID                  PS  88.05927
Sample type                FILTER
Collection date, time       8/24/88   0:00
Receipt date                8/29/88
Completion date             9/26/88
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC109
Comments                   FMC082488-PSD-IN-2-ST9
Report to                  GERRY LUSTER

 Type of analysis          ********** PO        **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/21/88  14:38
  Length of count         1000 min
  Preparer                ASVL
  Counting system         AS19
  Sample size               0.250000 SAMP
  Comments                RECALCULATION, 50 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.2557E+02       9.51 %  PCI/SAMP   9/19/88 ANALYSIS
    PO-210     1.4264E+02       9.51 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.2638E+01       9.16 %  PER CENT   9/19/88

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/19/88  14:10
  Length of count         1000 min
  Preparer                ASVL
  Counting system         TN2C
  Sample size               0.250000 SAMP
  Comments                50ML OF200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     3.2758E+00      48.81 %  PCI/SAMP   9/19/88 ANALYSIS
    PB-210     3.2835E+00      48.81 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.1219E+01       8.30 %  PER CENT   9/19/88
```

```
Sample ID                PS  88.05928
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC110: ANDERSEN
Comments                 FMC082488-PSD-OTA-2-ST1
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/14/88   1:04
  Length of count        1000 min
  Preparer               ASVL
  Counting system        TN2C
  Sample size              0.300000 SAMP
  Comments               60ML OF200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     9.2306E-01    118.67 %  PCI/SAMP   9/14/88 ANALYSIS
    PB-210     9.2482E-01    118.67 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.0853E+01      7.74 %  PER CENT   9/14/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/17/88  11:52
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS21
  Sample size              0.300000 SAMP
  Comments               60ML OF200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     8.6505E+01      9.13 %  PCI/SAMP   9/14/88 ANALYSIS
    PO-210     9.6028E+01      9.13 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5547E+01      8.65 %  PER CENT   9/14/88
```

Sample ID	PS 88.05929
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC111: ANDERSEN
Comments	FMC082488-PSD-UTA-2-ST2-5
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/21/88) and GL (9/21/88)
Date, time counted	9/14/88 14:30
Length of count	1000 min
Preparer	ASVL
Counting system	TN2D
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.3105E+00	114.38 %	PCI/SAMP	9/14/88	ANALYSIS
PB-210	3.3168E+00	114.38 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.1855E+01	7.88 %	PER CENT	9/14/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/21/88) and GL (9/21/88)
Date, time counted	9/17/88 11:52
Length of count	1000 min
Preparer	ASVL
Counting system	AS22
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.9505E+02	8.18 %	PCI/SAMP	9/14/88	ANALYSIS
PO-210	3.2751E+02	8.18 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.7053E+01	7.76 %	PER CENT	9/14/88	

```
Sample ID                PS  88.05930
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC112: ANDERSEN
Comments                 FMC082488-PSD-OTA-2-ST6
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/15/88  14:54
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS23
  Sample size              0.300000 SAMP
  Comments               RECALCULATION, 60 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     5.5953E+01       6.34 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210     6.1783E+01       6.34 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.1074E+01       5.85 %  PER CENT   9/13/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  14:20
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH3B
  Sample size              0.300000 SAMP
  Comments               60 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     7.9824E-01     175.52 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210     7.9966E-01     175.52 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.8362E+01       8.48 %  PER CENT   9/13/88
```

```
Sample ID                PS  88.05930X
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC112: ANDERSEN
Comments                 FMC082488-PSD-OTA-2-ST6
Report to                GERRY LUSTER

Type of analysis         ********** PO        **********
 Verified by            GL ( 9/20/88) and GL ( 9/20/88)
 Date, time counted       9/15/88  14:54
 Length of count         1000 min
 Preparer                ASVL
 Counting system         AS24
 Sample size               0.300000 SAMP
 Comments                RECALCULATION, 60 ML OF 200
   NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
   PO-210     4.8524E+01       6.92 %  PCI/SAMP   9/13/88 ANALYSIS
   PO-210     5.3570E+01       6.92 %  PCI/SAMP   8/24/88 COLLECTION
   YIELD      6.1339E+01       6.25 %  PER CENT   9/13/88

Type of analysis         ********** PB        **********
 Verified by            GL ( 9/20/88) and GL ( 9/20/88)
 Date, time counted       9/13/88  14:20
 Length of count         1000 min
 Preparer                ASVL
 Counting system         TN3B
 Sample size               0.300000 SAMP
 Comments                60 ML OF 200 ML
   NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
   PB-210     7.8394E-01     203.94 %  PCI/SAMP   9/13/88 ANALYSIS
   PB-210     7.8536E-01     203.94 %  PCI/SAMP   8/24/88 COLLECTION
   YIELD      6.0050E+01       8.37 %  PER CENT   9/13/88
```

```
Sample ID                PS  88.05931
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC113: ANDERSEN
Comments                 FMC082488-PSD-UTA-2-ST7
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/14/88  14:30
  Length of count       1000 min
  Preparer              ASVL
  Counting system       SH3A
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     9.7627E-01     109.20 %  PCI/SAMP   9/14/88 ANALYSIS
    PB-210     9.7812E-01     109.20 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.5824E+01       6.01 %  PER CENT   9/14/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/17/88  11:52
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS23
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     8.0169E+01       7.38 %  PCI/SAMP   9/14/88 ANALYSIS
    PO-210     8.8980E+01       7.38 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      6.4535E+01       6.93 %  PER CENT   9/14/88
```

```
Sample ID                PS  88.05932
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC114: ANDERSEN
Comments                 FMC082488-PSD-OTA-2-ST8
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/14/88  14:28
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS24
  Sample size             0.500000 SAMP
  Comments              RECALCULATION, 100 ML OF 200 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1.1070E+02       6.66 %  PCI/SAMP   9/13/88 ANALYSIS
    PO-210     1.2216E+02       6.66 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.8937E+01       6.41 %  PER CENT   9/13/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/20/88) and GL ( 9/20/88)
  Date, time counted     9/13/88  14:20
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN3B
  Sample size             0.500000 SAMP
  Comments              100 ML OF 200
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.2931E+00      55.47 %  PCI/SAMP   9/13/88 ANALYSIS
    PB-210     2.2973E+00      55.47 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.5240E+01       7.99 %  PER CENT   9/13/88
```

```
Sample ID                PS  88,05933
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/26/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC115: ANDERSEN
Comments                 FMC082488-PSD-OTA-2-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PO        **********
  Verified by           GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted     9/17/88  11:52
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS24
  Sample size             0,025000 SAMP
  Comments              RECALCULATION,5ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     1,7486E+03       9,01 %  PCI/SAMP   9/14/88 ANALYSIS
    PO-210     1,9421E+03       9,01 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8,4497E+01       8,76 %  PER CENT   9/14/88

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted     9/14/88  14:30
  Length of count       1000 min
  Preparer              ASVL
  Counting system       SH3B
  Sample size             0,025000 SAMP
  Comments              5ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     9,7696E+00     173,16 %  PCI/SAMP   9/14/88 ANALYSIS
    PB-210     9,7882E+00     173,16 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8,1804E+01       8,06 %  PER CENT   9/14/88
```

Sample ID	PS 88,05934
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/28/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC116: ANDERSEN
Comments	FMC082488-PSD-OTB-2-ST1
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/28/88) and GL (9/28/88)
Date, time counted 9/22/88 14:00
Length of count 1000 min
Preparer ASVL
Counting system SH1B
Sample size 0.250000 SAMP
Comments 50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-1.7262E+00	97.38 %	PCI/SAMP	9/22/88	ANALYSIS
PB-210	-1.7308E+00	97.38 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.0294E+01	7.71 %	PER CENT	9/22/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/28/88) and GL (9/28/88)
Date, time counted 9/25/88 9:47
Length of count 1000 min
Preparer ASVL
Counting system AS24
Sample size 0.250000 SAMP
Comments 50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	8.7368E+01	9.61 %	PCI/SAMP	9/22/88	ANALYSIS
PO-210	1.0134E+02	9.61 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	8.5829E+01	9.15 %	PER CENT	9/22/88	

Sample ID	PS 88.05935
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/30/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC117: ANDERSEN
Comments	FMC082488-PSD-DTB-2-ST2-5
Report to	GERRY LUSTER

Type of analysis	********** PO **********
Verified by	GL (9/30/88) and GL (9/30/88)
Date, time counted	9/26/88 14:13
Length of count	1000 min
Preparer	ASVL
Counting system	AS23
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.8835E+02	9.18 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	3.3522E+02	9.18 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	8.5701E+01	9.03 %	PER CENT	9/23/88	

Type of analysis	********** PB **********
Verified by	GL (9/30/88) and GL (9/30/88)
Date, time counted	9/23/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN1A
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.2468E-01	689.83 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	2.2529E-01	689.82 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.8234E+01	7.47 %	PER CENT	9/23/88	

Sample ID	PS 88.05936
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	9/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC118: ANDERSEN
Comments	FMC082488-PSD-OTB-2-ST6
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/29/88) and GL (9/29/88)
Date, time counted	9/24/88 11:35
Length of count	1000 min
Preparer	ASVL
Counting system	TN2A
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	6.2060E-01	265.94 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	6.2228E-01	265.94 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.3566E+01	7.88 %	PER CENT	9/23/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/29/88) and GL (9/29/88)
Date, time counted	9/27/88 14:27
Length of count	1000 min
Preparer	ASVL
Counting system	AS17
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.0385E+02	9.05 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	1.2065E+02	9.05 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.3792E+01	8.63 %	PER CENT	9/23/88	

Sample ID	PS 88.05937
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC119: ANDERSEN
Comments	FMC082488-PSD-OTB-2-ST7
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/24/88 11:35
Length of count 1000 min
Preparer ASVL
Counting system TN2B
Sample size 0.125000 SAMP
Comments 25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.7841E+01	26.45 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	2.7917E+01	26.45 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.4755E+01	6.97 %	PER CENT	9/23/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/27/88 14:27
Length of count 1000 min
Preparer ASVL
Counting system AS1B
Sample size 0.125000 SAMP
Comments 25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.8962E+02	8.26 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	2.1593E+02	8.26 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	6.9246E+01	7.62 %	PER CENT	9/23/88	

Sample ID	PS 88.05938
Sample type	FILTER
Collection date, time	8/24/88 0:00
Receipt date	8/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC120: ANDERSEN
Comments	FMC082488-PSD-OTB-2-ST8
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/29/88) and GL (9/29/88)
Date, time counted	9/24/88 11:35
Length of count	1000 min
Preparer	ASVL
Counting system	TN2C
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.0629E+01	36.46 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	1.0658E+01	36.46 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	7.7125E+01	7.02 %	PER CENT	9/23/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/29/88) and GL (9/29/88)
Date, time counted	9/27/88 14:27
Length of count	1000 min
Preparer	ASVL
Counting system	AS19
Sample size	0.125000 SAMP
Comments	25ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	4.0807E+02	7.66 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	4.7272E+02	7.66 %	PCI/SAMP	8/24/88	COLLECTION
YIELD	8.5872E+01	7.40 %	PER CENT	9/23/88	

```
Sample ID                PS  88.05939
Sample type              FILTER
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC121: ANDERSEN
Comments                 FMC082488-PSD-OTB-2-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/24/88  11:35
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2D
  Sample size             0.010000 SAMP
  Comments              2ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     1.0545E+02      53.11 %  PCI/SAMP   9/23/88 ANALYSIS
    PB-210     1.0574E+02      53.11 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      7.2256E+01       9.44 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/27/88  14:27
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS20
  Sample size             0.010000 SAMP
  Comments              2ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     3.6463E+03       9.34 %  PCI/SAMP   9/23/88 ANALYSIS
    PO-210     4.2222E+03       9.34 %  PCI/SAMP   8/24/88 COLLECTION
    YIELD      8.2489E+01       9.03 %  PER CENT   9/23/88
```

Sample ID	PS 88.05940
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/30/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC122: ANDERSEN
Comments	FMC082588-PSD-IN-3-ST1
Report to	GERRY LUSTER

Type of analysis ********** PO **********

Verified by	GL (9/30/88) and GL (9/30/88)
Date, time counted	9/24/88 11:00
Length of count	1000 min
Preparer	ASVL
Counting system	AS20
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	3.3508E+01	6.81 %	PCI/SAMP	9/21/88	ANALYSIS
PO-210	3.7964E+01	6.81 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.0862E+01	5.92 %	PER CENT	9/21/88	

Type of analysis ********** PB **********

Verified by	GL (9/28/88) and GL (9/28/88)
Date, time counted	9/21/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN2B
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.8311E+00	41.62 %	PCI/SAMP	9/21/88	ANALYSIS
PB-210	2.8380E+00	41.62 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.3357E+01	7.51 %	PER CENT	9/21/88	

Sample ID	PS 88.05940X
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/30/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC122: ANDERSEN
Comments	FMC082588-PSD-IN-3-ST1
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/30/88) and GL (9/30/88)
Date, time counted 9/21/88 14:10
Length of count 1000 min
Preparer ASVL
Counting system TN2C
Sample size 0.300000 SAMP
Comments 60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	3.1098E+00	44.47 %	PCI/SAMP	9/21/88	ANALYSIS
PB-210	3.1174E+00	44.47 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.6428E+01	7.87 %	PER CENT	9/21/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/30/88) and GL (9/30/88)
Date, time counted 9/24/88 11:00
Length of count 1000 min
Preparer ASVL
Counting system AS21
Sample size 0.300000 SAMP
Comments 60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.8407E+01	6.56 %	PCI/SAMP	9/21/88	ANALYSIS
PO-210	3.2082E+01	6.56 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	9.0084E+01	5.69 %	PER CENT	9/21/88	

Sample ID	PS 88.05941
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC123: ANDERSEN
Comments	FMC082588-PSD-IN-3-ST2-5
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	TN2D
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.3327E+00	140.99 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	1.3357E+00	141.00 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.2430E+01	9.15 %	PER CENT	9/19/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ASVL
Counting system	AS20
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.7271E+01	7.55 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	6.4757E+01	7.55 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	5.8282E+01	6.88 %	PER CENT	9/19/88	

Sample ID	P8 88,05942
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC124: ANDERSEN
Comments	FMC082588-PSD-IN-3-ST6
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:25
Length of count	1000 min
Preparer	ASVL
Counting system	TN1D
Sample size	0,500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	8,7601E-01	97,98 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	8,7807E-01	97,98 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6,3887E+01	5,61 %	PER CENT	9/20/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/22/88 13:54
Length of count	1000 min
Preparer	ASVL
Counting system	AS20
Sample size	0,500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1,1362E+01	6,47 %	PCI/SAMP	9/20/88	ANALYSIS
PO-210	1,2825E+01	6,47 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6,8759E+01	4,63 %	PER CENT	9/20/88	

```
Sample ID                PS  88.05943
Sample type              FILTER
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC125: ANDERSEN
Comments                 FMC082588-PSD-IN-3-ST7
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/21/88  14:10
  Length of count       1000 min
  Preparer              ASVL
  Counting system       TN2D
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.6770E+00     63.94 %  PCI/SAMP   9/21/88 ANALYSIS
    PB-210     1.6811E+00     63.95 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.0866E+01      6.85 %  PER CENT   9/21/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/24/88  11:00
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS22
  Sample size             0.500000 SAMP
  Comments              100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     9.7267E+00      6.13 %  PCI/SAMP   9/21/88 ANALYSIS
    PO-210     1.0896E+01      6.13 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      8.5847E+01      4.35 %  PER CENT   9/21/88
```

Sample ID	PS 88.05944
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC126: ANDERSEN
Comments	FMC082588-PSD-IN-3-ST8
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/28/88) and GL (9/28/88)
Date, time counted	9/21/88 14:10
Length of count	1000 min
Preparer	ASVL
Counting system	SH3A
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	4.5197E-01	218.91 %	PCI/SAMP	9/21/88	ANALYSIS
PB-210	4.5308E-01	218.91 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.7132E+01	5.79 %	PER CENT	9/21/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/28/88) and GL (9/28/88)
Date, time counted	9/24/88 11:00
Length of count	1000 min
Preparer	ASVL
Counting system	AS23
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.1638E+01	6.15 %	PCI/SAMP	9/21/88	ANALYSIS
PO-210	1.3262E+01	6.15 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	8.1045E+01	4.53 %	PER CENT	9/21/88	

```
Sample ID                PS  88.05945
Sample type              FILTER
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC127: ANDERSEN
Comments                 FMC0825A8-PSD-IN-3-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/21/88  14:10
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH3B
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     3.1012E+00     47.38 %  PCI/SAMP   9/21/88 ANALYSIS
    PB-210     3.1088E+00     47.38 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.1317E+01      8.50 %  PER CENT   9/21/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/24/88  11:00
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS24
  Sample size              0.500000 SAMP
  Comments               100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     1.2878E+02      7.16 %  PCI/SAMP   9/21/88 ANALYSIS
    PO-210     1.4704E+02      7.16 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.8409E+01      6.90 %  PER CENT   9/21/88
```

Sample ID	PS 88.05946
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC128: ANDERSEN
Comments	FMC082588-PSD-OTA-3-ST1
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3B
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.9807E+00	51.69 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	1.9852E+00	51.69 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.5340E+01	6.73 %	PER CENT	9/19/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/21/88 14:38
Length of count	1000 min
Preparer	ZSVL
Counting system	AS23
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.9335E+01	5.43 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	2.1658E+01	5.43 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	8.6787E+01	4.45 %	PER CENT	9/19/88	

Sample ID	PS 88.05947
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC129: ANDERSEN
Comments	FMC082588-PSD-OTA-3-ST2-5
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:10
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3D
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.2991E+00	71.35 %	PCI/SAMP	9/19/88	ANALYSIS
PB-210	2.3043E+00	71.34 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.0881E+01	8.05 %	PER CENT	9/19/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/22/88 13:54
Length of count	1000 min
Preparer	ZSVL
Counting system	AS17
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.9599E+01	7.20 %	PCI/SAMP	9/19/88	ANALYSIS
PO-210	1.1262E+02	7.21 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.0874E+01	6.83 %	PER CENT	9/19/88	

```
Sample ID                PS  88.05948
Sample type              FILTER
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           0/ 0/00
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC130: ANDERSEN
Comments                 FMC082588-PSD-OTA-3-ST6
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/16/88  14:55
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       TN2C
  Sample size             0.300000 SAMP
  Comments              60ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.1323E+00      68.42 %  PCI/SAMP   9/16/88 ANALYSIS
    PB-210     2.1365E+00      68.42 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.1654E+01       8.70 %  PER CENT   9/16/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/21/88) and GL ( 9/21/88)
  Date, time counted     9/19/88  14:30
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS21
  Sample size             0.300000 SAMP
  Comments              60ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     4.6407E+01       6.58 %  PCI/SAMP   9/16/88 ANALYSIS
    PO-210     5.1580E+01       6.58 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.5830E+01       5.96 %  PER CENT   9/16/88
```

Sample ID	PS 88.05949
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC131: ANDERSEN
Comments	FMC082588-PSD-OTA-3-ST7
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/16/88 14:55
Length of count 1000 min
Preparer ZSVL
Counting system TN2D
Sample size 0.500000 SAMP
Comments 100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	2.3656E+00	43.73 %	PCI/SAMP	9/16/88	ANALYSIS
PB-210	2.3703E+00	43.73 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.8390E+01	6.23 %	PER CENT	9/16/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/21/88) and GL (9/21/88)
Date, time counted 9/19/88 14:30
Length of count 1000 min
Preparer ZSVL
Counting system AS22
Sample size 0.500000 SAMP
Comments 100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.0925E+02	6.94 %	PCI/SAMP	9/16/88	ANALYSIS
PO-210	1.2174E+02	6.94 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.0306E+01	6.63 %	PER CENT	9/16/88	

Sample ID	PS 88.05950
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC132: ANDERSEN
Comments	FMC082588-PSD-OTA-3-STB
Report to	GERRY LUSTER

Type of analysis ********** PO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:30
Length of count	1000 min
Preparer	ZSVL
Counting system	AS23
Sample size	0.250000 SAMP
Comments	RECALCULATION 50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	3.2333E+02	9.58 %	PCI/SAMP	9/16/88	ANALYSIS
PO-210	3.6055E+02	9.58 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.3471E+01	9.43 %	PER CENT	9/16/88	

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/16/88 14:55
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3B
Sample size	0.250000 SAMP
Comments	RECALCULATION 50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	4.8665E+00	39.99 %	PCI/SAMP	9/16/88	ANALYSIS
PB-210	4.8762E+00	39.99 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.5125E+01	8.53 %	PER CENT	9/16/88	

Sample ID	PS 88.05950X
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC132: ANDERSEN
Comments	FMC082588-PSD-OTA-3-ST8
Report to	GERRY LUSTER

Type of analysis ********** PO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/19/88 14:30
Length of count	1000 min
Preparer	ZSVL
Counting system	AS24
Sample size	0.250000 SAMP
Comments	RECALCULATION, 50 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.9716E+02	9.54 %	PCI/SAMP	9/16/88	ANALYSIS
PO-210	3.3130E+02	9.54 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.8068E+01	9.39 %	PER CENT	9/16/88	

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/16/88 14:55
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3D
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	5.1069E+00	38.20 %	PCI/SAMP	9/16/88	ANALYSIS
PB-210	5.1170E+00	38.20 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.8061E+01	8.91 %	PER CENT	9/16/88	

Sample ID	PS 88.05951
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/28/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC133; ANDERSEN
Comments	FMC082588-PSD-OTA-3-ST9
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/28/88) and GL (9/28/88)
Date, time counted 9/17/88 14:10
Length of count 1000 min
Preparer ZSVL
Counting system TN2D
Sample size 0.025000 SAMP
Comments RECALCULATION,5ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.3640E+01	120.01 %	PCI/SAMP	9/17/88	ANALYSIS
PB-210	1.3669E+01	120.00 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.5843E+01	8.24 %	PER CENT	9/17/88	

Type of analysis ********** PO **********
Verified by GL (9/28/88) and GL (9/28/88)
Date, time counted 9/19/88 14:30
Length of count 1000 min
Preparer ZSVL
Counting system AS22
Sample size 0.025000 SAMP
Comments RECALCULATION,5ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	1.8860E+03	8.86 %	PCI/SAMP	9/17/88	ANALYSIS
PO-210	2.1153E+03	8.86 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	8.0102E+01	8.61 %	PER CENT	9/17/88	

Sample ID	PS 88.05952
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC129
Comments	FMC082588-PSD-OTB-3-ST1
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/24/88 11:35
Length of count 1000 min
Preparer ASVL
Counting system SH1A
Sample size 0.300000 SAMP
Comments 60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-1.2420E+00	154.03 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	-1.2453E+00	154.02 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.1779E+01	0.48 %	PER CENT	9/23/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/27/88 14:27
Length of count 1000 min
Preparer ASVL
Counting system AS21
Sample size 0.300000 SAMP
Comments 60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	6.6481E+01	6.32 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	7.7103E+01	6.32 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.9051E+01	5.89 %	PER CENT	9/23/88	

Sample ID	PS 88.05953
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	9/29/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC130: ANDERSEN
Comments	FMC082588-PSD-OTB-3-ST2-5
Report to	GERRY LUSTER

Type of analysis ********** PO **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/27/88 14:27
Length of count 1000 min
Preparer ZSVL
Counting system AS22
Sample size 0.500000 SAMP
Comments 100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.0796E+02	6.81 %	PCI/SAMP	9/23/88	ANALYSIS
PO-210	2.4073E+02	6.81 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.9782E+01	6.65 %	PER CENT	9/23/88	

Type of analysis ********** PB **********
Verified by GL (9/29/88) and GL (9/29/88)
Date, time counted 9/24/88 11:35
Length of count 1000 min
Preparer ZSVL
Counting system SH1B
Sample size 0.500000 SAMP
Comments 100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-9.4570E-01	128.22 %	PCI/SAMP	9/23/88	ANALYSIS
PB-210	-9.4818E-01	128.22 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	6.5233E+01	6.32 %	PER CENT	9/23/88	

```
Sample ID                  PS  88.05954
Sample type                FILTER
Collection date, time       8/25/88   0:00
Receipt date                8/29/88
Completion date             9/29/88
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC131: ANDERSEN
Comments                   FMC0825A8-PSD-OTB-3-ST6
Report to                  SAM WINDHAM

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted       9/24/88  11:35
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         SH2A
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     1.1024E-01   2068.12 %  PCI/SAMP   9/23/88 ANALYSIS
    PB-210     1.1053E-01   2068.13 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      6.2724E+01      6.10 %  PER CENT   9/23/88

 Type of analysis          ********** PO-AUTO  **********
  Verified by             GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted       9/27/88  14:27
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         AS23
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     7.7991E+01      7.09 %  PCI/SAMP   9/23/88 ANALYSIS
    PO-210     9.0206E+01      7.09 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD      7.3526E+01      6.66 %  PER CENT   9/23/88
```

```
Sample ID                PS  88.05955
Sample type              FILTER
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC132: ANDERSEN
Comments                 FMC082588-PSD-OTB-3-ST7
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/24/88  11:35
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       SH2B
  Sample size             0.250000 SAMP
  Comments              50ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210   -1.6853E+00     199.15 %  PCI/SAMP   9/23/88 ANALYSIS
    PB-210   -1.6898E+00     199.14 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD     6.2027E+01       9.17 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/27/88  14:27
  Length of count       1000 min
  Preparer              ZSVL
  Counting system       AS24
  Sample size             0.250000 SAMP
  Comments              50ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210    2.3250E+02      10.33 %  PCI/SAMP   9/23/88 ANALYSIS
    PO-210    2.6923E+02      10.33 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD     6.0917E+01      10.10 %  PER CENT   9/23/88
```

Sample ID	PS 88.05956
Sample type	FILTER
Collection date, time	8/25/88 0:00
Receipt date	8/29/88
Completion date	0/ 0/00
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC133: ANDERSEN
Comments	FMC082588-PSD-OTB-3-ST8
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 4/88 14:30
Length of count	1000 min
Preparer	ASVL
Counting system	SH3B
Sample size	0.100000 SAMP
Comments	B, 20 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	6.5335E+00	77.32 %	PCI/SAMP	10/ 4/88	ANALYSIS
PB-210	6.5572E+00	77.32 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.0247E+01	8.21 %	PER CENT	10/ 4/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (10/ 8/88) and GL (10/ 8/88)
Date, time counted	10/ 5/88 14:33
Length of count	1000 min
Preparer	ASVL
Counting system	AS23
Sample size	0.100000 SAMP
Comments	B, 20 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.9722E+02	8.10 %	PCI/SAMP	10/ 4/88	ANALYSIS
PO-210	7.2868E+02	8.10 %	PCI/SAMP	8/25/88	COLLECTION
YIELD	7.6584E+01	7.87 %	PER CENT	10/ 4/88	

```
Sample ID                PS  88.05957
Sample type              FILTER
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date          10/ 5/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC134: ANDERSEN
Comments                 FMC082588-PSD-OTB-3-ST9
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/27/88  14:55
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        TN2A
  Sample size              0.025000 SAMP
  Comments               5ML OF200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -3.4027E+00    517.91 %  PCI/SAMP   9/27/88 ANALYSIS
    PB-210   -3.4128E+00    517.93 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD     7.7398E+01      7.49 %  PER CENT   9/27/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL (10/ 5/88) and GL (10/ 5/88)
  Date, time counted     9/29/88  14:54
  Length of count        1000 min
  Preparer               ZSVL
  Counting system        AS17
  Sample size              0.025000 SAMP
  Comments               5ML OF200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    2.1736E+03      9.04 %  PCI/SAMP   9/27/88 ANALYSIS
    PO-210    2.5662E+03      9.04 %  PCI/SAMP   8/25/88 COLLECTION
    YIELD     7.9697E+01      8.82 %  PER CENT   9/27/88
```

```
Sample ID                  PS  88.05958
Sample type                FILTER
Collection date, time       8/26/88   0:00
Receipt date                8/29/88
Completion date             9/26/88
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC141: ANDERSEN
Comments                   FMC082688-PSD-FB-ST1
Report to                  GERRY LUSTER

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/20/88  14:25
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         SH1A
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210    -2.9493E-01     363.98 %  PCI/SAMP   9/20/88 ANALYSIS
    PB-210    -2.9560E-01     363.97 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      6.5436E+01       6.92 %  PER CENT   9/20/88

 Type of analysis          ********** PO-AUTO  **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/22/88  13:54
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         AS21
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     3.7542E-01      24.80 %  PCI/SAMP   9/20/88 ANALYSIS
    PO-210     4.6517E-01      24.80 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD      7.3898E+01       4.65 %  PER CENT   9/20/88
```

```
Sample ID                  PS  88.05959
Sample type                FILTER
Collection date, time       8/26/88   0:00
Receipt date                8/29/88
Completion date             9/26/88
Flag date                  10/28/88
Location                   ID:POCATELLO
Other ID's                 FMC142: ANDERSEN
Comments                   FMC082688-PSD-FB-ST2-5
Report to                  GERRY LUSTER

 Type of analysis          ********** PB        **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/20/88  14:25
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         SH1B
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210   -1.0830E+00    108.37 %  PCI/SAMP   9/20/88 ANALYSIS
    PB-210   -1.0854E+00    108.37 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     5.5406E+01      6.65 %  PER CENT   9/20/88

 Type of analysis          ********** PO-AUTO  **********
  Verified by             GL ( 9/26/88) and GL ( 9/26/88)
  Date, time counted       9/22/88  13:54
  Length of count         1000 min
  Preparer                ZSVL
  Counting system         AS22
  Sample size               0.500000 SAMP
  Comments                100ML OF 200ML
    NUCLIDE   ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210    1.1923E+00     15.90 %  PCI/SAMP   9/20/88 ANALYSIS
    PO-210    1.4969E+00     15.90 %  PCI/SAMP   8/26/88 COLLECTION
    YIELD     5.6743E+01      4.91 %  PER CENT   9/20/88
```

Sample ID	PS 88.05960
Sample type	FILTER
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC143: ANDERSEN
Comments	FMC082688-PSD-FB-ST6
Report to	GERRY LUSTER

Type of analysis ********** PB **********
Verified by GL (9/26/88) and GL (9/26/88)
Date, time counted 9/20/88 14:25
Length of count 1000 min
Preparer ZSVL
Counting system SH2A
Sample size 0.500000 SAMP
Comments 100 ML OF 200 ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-5.7751E-01	282.54 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	-5.7882E-01	282.54 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.5215E+01	6.03 %	PER CENT	9/20/88	

Type of analysis ********** PO-AUTO **********
Verified by GL (9/26/88) and GL (9/26/88)
Date, time counted 9/22/88 13:54
Length of count 1000 min
Preparer ZSVL
Counting system AS23
Sample size 0.500000 SAMP
Comments 100 ML OF 200 ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	5.1796E-01	20.39 %	PCI/SAMP	9/20/88	ANALYSIS
PO-210	6.6465E-01	20.39 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	8.1421E+01	4.53 %	PER CENT	9/20/88	

Sample ID	PS 88.05960X
Sample type	FILTER
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC143; ANDERSEN
Comments	FMC082688-PSD-FB-ST6
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:25
Length of count	1000 min
Preparer	ZSVL
Counting system	SH2B
Sample size	0.495000 SAMP
Comments	99 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	-3.2133E-01	423.49 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	-3.2206E-01	423.49 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.0744E+01	6.56 %	PER CENT	9/20/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/22/88 13:54
Length of count	1000 min
Preparer	ZSVL
Counting system	AS24
Sample size	0.495000 SAMP
Comments	99 ML OF 200

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	9.3733E-02	53.94 %	PCI/SAMP	9/20/88	ANALYSIS
PO-210	1.4933E-01	53.93 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.3757E+01	4.81 %	PER CENT	9/20/88	

Sample ID	PS 88.05961
Sample type	FILTER
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC144: ANDERSEN
Comments	FMC082688-PSD-FB-ST7
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:25
Length of count	1000 min
Preparer	ZSVL
Counting system	SH3A
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	9.5631E-01	130.43 %	PCI/SAMP	9/20/88	ANALYSIS
PB-210	9.5847E-01	130.43 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	5.9095E+01	7.24 %	PER CENT	9/20/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/22/88 13:54
Length of count	1000 min
Preparer	ZSVL
Counting system	AS18
Sample size	0.500000 SAMP
Comments	100ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	2.0215E-01	33.96 %	PCI/SAMP	9/20/88	ANALYSIS
PO-210	1.0108E-01	33.97 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	7.3631E+01	4.55 %	PER CENT	9/20/88	

Sample ID	PS 88.05962
Sample type	FILTER
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC145: ANDERSEN
Comments	FMC082688-PSD-FB-ST8
Report to	GERRY LUSTER

Type of analysis ********** PB **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/17/88 14:10
Length of count	1000 min
Preparer	zsvl
Counting system	TN3B
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.5722E-01	975.51 %	PCI/SAMP	9/17/88	ANALYSIS
PB-210	1.5754E-01	975.50 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	8.1469E+01	9.31 %	PER CENT	9/17/88	

Type of analysis ********** PO-AUTO **********

Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:21
Length of count	1000 min
Preparer	zsvl
Counting system	AS23
Sample size	0.250000 SAMP
Comments	50ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	7.5548E-01	24.55 %	PCI/SAMP	9/17/88	ANALYSIS
PO-210	8.2537E-01	24.55 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	7.8297E+01	6.47 %	PER CENT	9/17/88	

Sample ID	PS 88.05963
Sample type	FILTER
Collection date, time	8/26/88 0:00
Receipt date	8/29/88
Completion date	9/26/88
Flag date	10/28/88
Location	ID:POCATELLO
Other ID's	FMC146: ANDERSEN
Comments	FMC082688-PSD-FB-ST9
Report to	GERRY LUSTER

Type of analysis	********** PB **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/17/88 14:10
Length of count	1000 min
Preparer	ZSVL
Counting system	TN3D
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PB-210	1.3637E+00	134.07 %	PCI/SAMP	9/17/88	ANALYSIS
PB-210	1.3665E+00	134.06 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.7844E+01	10.64 %	PER CENT	9/17/88	

Type of analysis	********** PO-AUTO **********
Verified by	GL (9/26/88) and GL (9/26/88)
Date, time counted	9/20/88 14:21
Length of count	1000 min
Preparer	ZSVL
Counting system	AS24
Sample size	0.300000 SAMP
Comments	60ML OF 200ML

NUCLIDE	ACTIVITY	2 SIG ERROR	UNITS	DATE	
PO-210	3.5946E-01	34.58 %	PCI/SAMP	9/17/88	ANALYSIS
PO-210	2.4193E-01	34.58 %	PCI/SAMP	8/26/88	COLLECTION
YIELD	6.9818E+01	6.01 %	PER CENT	9/17/88	

APPENDIX L.3 - Feedstock Radionuclide Data

```
Sample ID                PS  88.05864
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC82
Comments                 FMC082488-FS-1, FEEDSTOCK
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/23/88  14:10
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH2A
  Sample size              0.100200 GDRY
  Comments               50 ML OF 500; 1.0019 GDRY IN 500 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PB-210     2.4092E+01      43.09 %  PCI/GDRY   9/23/88 ANALYSIS
    PB-210     2.4157E+01      43.10 %  PCI/GDRY   8/24/88 COLLECTION
    YIELD      7.7087E+01       6.86 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/26/88  14:13
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS19
  Sample size              0.100200 GDRY
  Comments               50 ML OF 500; 1.0019 GDRY IN 500 ML
    NUCLIDE    ACTIVITY    2 SIG ERROR    UNITS     DATE
    PO-210     2.4161E+01       8.15 %  PCI/GDRY   9/23/88 ANALYSIS
    PO-210     2.4167E+01       8.15 %  PCI/GDRY   8/24/88 COLLECTION
    YIELD      8.9176E+01       5.24 %  PER CENT   9/23/88
```

```
Sample ID                PS  88.05871
Sample type              MISC
Collection date, time     8/24/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC83
Comments                 FMC082488-FS-2, FEEDSTOCK
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/23/88  14:00
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH2B
  Sample size              0.252300 GDRY
  Comments               125 ML OF 500, 1.0095 GDRY IN 500 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.7871E+01      19.53 %  PCI/GDRY   9/23/88 ANALYSIS
    PB-210     2.7947E+01      19.53 %  PCI/GDRY   8/24/88 COLLECTION
    YIELD      6.1947E+01       9.17 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/26/88  14:13
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS20
  Sample size              0.252300 GDRY
  Comments               125 ML OF 500; 1.0095 GDRY IN 500 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.3695E+01       7.77 %  PCI/GDRY   9/23/88 ANALYSIS
    PO-210     2.3010E+01       7.77 %  PCI/GDRY   8/24/88 COLLECTION
    YIELD      7.4903E+01       6.38 %  PER CENT   9/23/88
```

```
Sample ID                PS  88.05878
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           9/29/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMCR4
Comments                 FMC082588-FS-3, FEEDSTOCK
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/23/88  14:10
  Length of count        1000 min
  Preparer               ASVL
  Counting system        SH3A
  Sample size              0.250800 GDRY
  Comments               125 ML OF 500 ML; 1.0035 GDRY IN 500 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.0608E+01     18.32 %  PCI/GDRY   9/23/88 ANALYSIS
    PB-210     2.0662E+01     18.32 %  PCI/GDRY   8/25/88 COLLECTION
    YIELD      7.5000E+01      9.53 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/29/88) and GL ( 9/29/88)
  Date, time counted     9/26/88  14:13
  Length of count        1000 min
  Preparer               ASVL
  Counting system        AS21
  Sample size              0.250800 GDRY
  Comments               125 ML OF 500 ML; 1.0035 GDRY IN 500 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.2980E+01      7.85 %  PCI/GDRY   9/23/88 ANALYSIS
    PO-210     2.3347E+01      7.85 %  PCI/GDRY   8/25/88 COLLECTION
    YIELD      7.7616E+01      6.49 %  PER CENT   9/23/88
```

```
Sample ID                PS  88.05885
Sample type              MISC
Collection date, time     8/25/88   0:00
Receipt date              8/29/88
Completion date           9/28/88
Flag date                10/28/88
Location                 ID:POCATELLO
Other ID's               FMC85: BACK HALF
Comments                 FMC082588-FS-4, FEEDSTOCK
Report to                GERRY LUSTER

 Type of analysis        ********** PB        **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/23/88  14:10
  Length of count       1000 min
  Preparer              ASVL
  Counting system       SH3B
  Sample size             0.250900 GDRY
  Comments              50 ML OF 200; 1.0037 GDRY IN 200 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PB-210     2.3173E+01      21.57 %  PCI/GDRY   9/23/88 ANALYSIS
    PB-210     2.3234E+01      21.57 %  PCI/GDRY   8/25/88 COLLECTION
    YIELD      6.4060E+01      11.85 %  PER CENT   9/23/88

 Type of analysis        ********** PO-AUTO  **********
  Verified by           GL ( 9/28/88) and GL ( 9/28/88)
  Date, time counted     9/26/88  14:13
  Length of count       1000 min
  Preparer              ASVL
  Counting system       AS22
  Sample size             0.250900 GDRY
  Comments              50 ML OF 200 ML; 1.0037 GDRY IN 200 ML
    NUCLIDE    ACTIVITY   2 SIG ERROR    UNITS     DATE
    PO-210     2.2647E+01       8.30 %  PCI/GDRY   9/23/88 ANALYSIS
    PO-210     2.2559E+01       8.30 %  PCI/GDRY   8/25/88 COLLECTION
    YIELD      6.2433E+01       6.74 %  PER CENT   9/23/88
```

APPENDIX L.4 - Summary of Analytical Data

TABLE L.4-1. COMPLETE LIST OF RADIAN SAMPLES RECEIVED BY EERF

9/14/88

EERF NUMBER	COLLECTION	RADIAN NO.	RADIAN DESCRIPTION
PS 88.05646	8/17/88	MS18,23,75	MSS081788-MM111-IN-2-PRA MSS081788-MM111-IN-2-PRN MSS081788-MM111-IN-2-F PROBE RINSE AND FILTER
PS 88.05647	8/17/88	MS17	MSS081788-MM111-IN-2-IR IMPINGER
PS 88.05648	8/17/88	MS20,24,71	MSS081788-MM111-OTA-2-PRA MSS081788-MM111-OTA-2-PRA MSS081788-MM111-OTA-2-F PROBE RINSE AND FILTER
PS 88.05649	8/17/88	MS28	MSS081788-MM111-OTA-2-IR IMPINGER
PS 88.05650	8/17/88	MS21,25,72	MSS081788-MM111-OTB-2-PRA MSS081788-MM111-OTB-2-PRN MSS081788-MM111-OTB-2-F PROBE RINSE AND FILTER
PS 88.05650X	8/17/88	MS21,25,72	MSS081788-MM111-OTB-2-PRA MSS081788-MM111-OTB-2-PRN MSS081788-MM111-OTB-2-F PROBE RINSE AND FILTER
PS 88.05651	8/17/88	MS29	MSS081788-MM111-OTB-2-IR IMPINGER
PS 88.05652	8/17/88	MS19,26,73	MSS081788-MM111-OTC-2-PRA MSS081788-MM111-OTC-2-PRN MSS081788-MM111-OTC-2-F PROBE RINSE AND FILTER
PS 88.05653	8/17/88	MS30	MSS081788-MM111-OTC-2-IR IMPINGER
PS 88.05654	8/19/88	MS99,82,84	MSS081988-MM111-OTD-5-PRA MSS081988-MM111-OTD-5-PRN MSS081988-MM111-OTD-5-F PROBE RINSE AND FILTER
PS 88.05655	8/19/88	MS83	MSS0819-MM111-OTD-5-IR IMPINGER
PS 88.05656	8/17/88	MS49	MSS081788-FS-2-C FEEDSTOCK
PS 88.05657	8/17/88	MS32,33,80	MSS081788-MM111-IN-3-PRA MSS081788-MM111-IN-3-PRN MSS081788-MM111-IN-3-F PROBE RINSE AND FILTER
PS 88.05658	8/17/88	MS34	MSS081788-MM111-IN-3-IR IMPINGER

PS	88.05659	8/17/88	MS39,43,76	MSS081788-MM111-OTA-3-PRA MSS081788-MM111-OTA-3-PRN MSS081788-MM111-OTA-3-F PROBE RINSE AND FILTER
PS	88.05660	8/17/88	MS46	MSS081788-MM111-OTA-3-IR IMPINGER
PS	88.05660X	8/17/88	MS46	MSS081788-MM111-OTA-3-IR IMPINGER
PS	88.05661	8/17/88	MS38,41,77	MSS081788-MM111-OTB-3-PRA MSS081788-MM111-OTB-3-PRN MSS081788-MM111-OTB-3-F PROBE RINSE AND FILTER
PS	88.05662	8/17/88	MS35	MSS081788-MM111-OTB-3-IR IMPINGER
PS	88.05663	8/17/88	MS36,42,78	MSS081788-MM111-OTC-3-PRA MSS081788-MM111-OTC-3-PRN MSS081788-MM111-OTC-3-F PROBE RINSE AND FILTER
PS	88.05664	8/17/88	MS45	MSS081788-MM111-OTC-3-IR IMPINGER
PS	88.05665	8/17/88	MS37,40,79	MSS081788-MM111-OTD-3-PRA MSS081788-MM111-OTD-3-PRN MSS081788-MM111-OTD-3-F PROBE RINSE AND FILTER
PS	88.05666	8/17/88	MS44	MSS081788-MM111-OTD-3-IR IMPINGER
PS	88.05667	8/17/88	MS50	MSS081788-FS-3-C FEEDSTOCK
PS	88.05668	8/18/88	MS55,57,98	MSS081888-MM111-IN-4-PRA MSS081888-MM111-IN-4-PRN MSS081888-MM111-IN-4-F PROBE RINSE AND FILTER
PS	88.05669	8/18/88	MS59	MSS081888-MM111-IN-4-IR IMPINGER
PS	88.05670	8/18/88	MS53,52,94	MSS081888-MM111-OTA-4-PRA MSS081888-MM111-OTA-4-PRN MSS081888-MM111-OTA-4-F PROBE RINSE AND FILTER
PS	88.05670X	8/18/88	MS53,52,94	MSS081888-MM111-OTA-4-PRA MSS081888-MM111-OTA-4-PRN MSS081888-MM111-OTA-4-F PROBE RINSE AND FILTER
PS	88.05671	8/18/88	MS60	MSS081888-MM111-OTA-4-IR IMPINGER

PS	88.05672	8/18/88	MS54,65,95	MSS081888-MM111-OTB-4-PRA MSS081888-MM111-OTB-4-PRN MSS081888-MM111-OTB-4-F PROBE RINSE AND FILTER
PS	88.05673	8/18/88	MS51	MSS081888-MM111-OTB-4-IR IMPINGER
PS	88.05674	8/18/88	MS58,56,96	MSS081888-MM111-OTC-4-PRA MSS081888-MM111-OTC-4-PRN MSS081888-MM111-OTC-4-F PROBE RINSE AND FILTER
PS	88.05675	8/18/88	MS62	MSS081888-MM111-OTC-4-IR IMPINGER
PS	88.05676	8/18/88	MS64,63,97	MSS081888-MM111-OTD-4-PRA MSS081888-MM111-OTD-4-PRN MSS081888-MM111-OTD-4-F PROBE RINSE AND FILTER
PS	88.05677	8/18/88	MS61	MSS081888-MM111-OTD-4-IR IMPINGER
PS	88.05678	8/18/88	MS81	MSS081888-FS-4-C FEEDSTOCK
PS	88.05800	8/19/88	MS85,87,92	MSS081988-MM111-IN-FB-PRA MSS081988-MM111-IN-FB-PRN MSS081988-MM111-IN-FB-F PROBE RINSE AND FILTER
PS	88.05800X	8/19/88	MS85,87,92	MSS081988-MM111-IN-FB-PRA MSS081988-MM111-IN-FB-PRN MSS081988-MM111-IN-FB-F PROBE RINSE AND FILTER
PS	88.05801	8/19/88	MS86	MSS081988-MM111-IN-FB-IR IMPINGER
PS	88.05802	8/19/88	MS88,89,91	MSS081988-MM111-OTA-FB-PRA MSS081988-MM111-OTA-FB-PRN MSS081988-MM111-OTA-FB-F PROBE RINSE AND FILTER
PS	88.05803	8/19/88	MS90	MSS081988-MM111-OTA-FB-IR IMPINGER
PS	88.05804	8/17/88	MS100	MSS081788-PSD-IN-1-ST1
PS	88.05805	8/17/88	MS101	MSS081788-PSD-IN-1-ST2 TO 5
PS	88.05806	8/17/88	MS102	MSS081788-PSD-IN-1-ST6
PS	88.05807	8/17/88	MS103	MSS081788-PSD-IN-1-ST7
PS	88.05808	8/17/88	MS104	MSS081788-PSD-IN-1-ST8
PS	88.05809	8/17/88	MS105	MSS081788-PSD-IN-1-ST9

PS	88.05810	8/17/88	MS106	MSS081788-PSD-OTC-1-ST1
PS	88.05810X	8/17/88	MS106	MSS081788-PSD-OTC-1-ST1
PS	88.05811	8/17/88	MS107	MSS081788-PSD-OTC-1-ST2 TO 5
PS	88.05812	8/17/88	MS108	MSS081788-PSD-OTC-1-ST6
PS	88.05813	8/17/88	MS109	MSS081788-PSD-OTC-1-ST7
PS	88.05814	8/17/88	MS110	MSS081788-PSD-OTC-1-ST8
PS	88.05815	8/17/88	MS111	MSS081788-PSD-OTC-1-ST9
PS	88.05816	8/18/88	MS112	MSS081888-PSD-IN-2-ST1
PS	88.05817	8/18/88	MS113	MSS081888-PSD-IN-2-ST2 TO 5
PS	88.05818	8/18/88	MS114	MSS081888-PSD-IN-2-ST6
PS	88.05819	8/18/88	MS115	MSS081888-PSD-IN-2-ST7
PS	88.05820	8/18/88	MS116	MSS081888-PSD-IN-2-ST8
PS	88.05820X	8/18/88	MS116	MSS081888-PSD-IN-2-ST8
PS	88.05821	8/18/88	MS117	MSS081888-PSD-IN-2-ST9
PS	88.05822	8/18/88	MS118	MSS081888-PSD-OTC-2-ST1
PS	88.05823	8/18/88	MS119	MSS081888-PSD-OTC-S-ST2 TO 5
PS	88.05824	8/18/88	MS120	MSS081888-PSD-OTC-S-ST6
PS	88.05825	8/18/88	MS121	MSS081888-PSD-OTC-2-ST7
PS	88.05826	8/18/88	MS122	MSS081888-PSD-OTC-2-ST8
PS	88.05827	8/18/88	MS123	MSS081888-PSD-OTC-2-ST9
PS	88.05828	8/19/88	MS124	MSS081988-PSD-IN-3-ST1
PS	88.05829	8/19/88	MS125	MSS081988-PSD-IN-3-ST2 TO 5
PS	88.05830	8/19/88	MS126	MSS081988-PSD-IN-3-ST6
PS	88.05830X	8/19/88	MS126	MSS081988-PSD-IN-3-ST6
PS	88.05831	8/19/88	MS127	MSS081988-PSD-IN-3-ST7
PS	88.05832	8/19/88	MS128	MSS081988-PSD-IN-3-ST8
PS	88.05833	8/19/88	MS129	MSS081988-PSD-IN-3-ST9
PS	88.05834	8/19/88	MS130	MSS081988-PSD-OTC-3-ST1
PS	88.05835	8/19/88	MS131	MSS081988-PSD-OTC-3-ST2 TO 5
PS	88.05836	8/19/88	MS132	MSS081988-PSD-OTC-3-ST6

PS	88.05837	8/19/88	MS133	MSS081988-PSD-OTC-3-ST7
PS	88.05838	8/19/88	MS134	MSS081988-PSD-OTC-3-ST8
PS	88.05839	8/19/88	MS135	MSS081988-PSD-OTC-3-ST9
PS	88.05858	8/24/88	FMC1,2,3	FMC082488-MM111-IN-1-PRA FMC082488-MM111-IN-1-PRN FMC082488-MM111-IN-1-F PROBE RINSE AND FILTER
PS	88.05859	8/24/88	FMC4	FMC082488-MM111-IN-1-IR IMPINGER
PS	88.05860	8/24/88	FMC5,6,7	FMC082488-MM111-OTA-1-PRA FMC082488-MM111-OTA-1-PRN FMC082488-MM111-OTA-1-F PROBE RINSE AND FILTER
PS	88.05860X	8/24/88	FMC5,6,7	FMC082488-MM111-OTA-1-PRA FMC082488-MM111-OTA-1-PRN FMC082488-MM111-OTA-1-F PROBE RINSE AND FILTER
PS	88.05861	8/24/88	FMC8	FMC082488-MM111-OTA-1-IR IMPINGER
PS	88.05862	8/24/88	FMC9,10,11	FMC082488-MM111-OTB-1-PRA FMC082488-MM111-OTB-1-PRN FMC082488-MM111-OTB-1-F PROBE RINSE AND FILTER
PS	88.05863	8/24/88	FMC12	FMC082488-MM111-OTB-1-IR IMPINGER
PS	88.05864	8/24/88	FMC82	FMC082488-FS-1 FEEDSTOCK
PS	88.05865	8/24/88	FMC13,14,15	FMC082488-MM111-IN-2-PRA FMC082488-MM111-IN-2-PRN FMC082488-MM111-IN-2-F PROBE RINSE AND FILTER
PS	88.05866	8/24/88	FMC16	FMC082488-MM111-IN-2-IR IMPINGER
PS	88.05867	8/24/88	FMC17,18,19	FMC082488-MM111-OTA-2-PRA FMC082488-MM111-OTA-2-PRN FMC082488-MM111-OTA-2-F PROBE RINSE AND FILTER
PS	88.05868	8/24/88	FMC20	FMC082488-MM111-OTA-2-IR IMPINGER
PS	88.05869	8/24/88	FMC21,22,23	FMC082488-MM111-OTB-2-PRA FMC082488-MM111-OTB-2-PRN FMC082488-MM111-OTB-2-F PROBE RINSE AND FILTER

PS	88.05870	8/24/88	FMC24	FMC082488-MM111-OTB-2-IR IMPINGER
PS	88.05870X	8/24/88	FMC24	FMC082488-MM111-OTB-2-IR IMPINGER
PS	88.05871	8/24/88	FMC83	FMC082488-FS-2 FEEDSTOCK
PS	88.05872	8/25/88	FMC26,27,28	FMC082588-MM111-IN-3-PRA FMC082588-MM111-IN-3-PRN FMC082588-MM111-IN-3-F PROBE RINSE AND FILTER
PS	88.05873	8/25/88	FMC29	FMC082588-MM111-IN-3-IR IMPINGER
PS	88.05874	8/25/88	FMC30,31,32	FMC082588-MM111-OTA-3-PRA FMC082588-MM111-OTA-3-PRN FMC082588-MM111-OTA-3-F PROBE RINSE AND FILTER
PS	88.05875	8/25/88	FMC73	FMC082588-MM111-OTA-3-IR IMPINGER
PS	88.05876	8/25/88	FMC33,34,35	FMC082588-MM111-OTB-3-PRA FMC082588-MM111-OTB-3-PRN FMC082588-MM111-OTB-3-F PROBE RINSE AND FILTER
PS	88.05877	8/25/88	FMC36	FMC082588-MM111-OTB-3-IR IMPINGER
PS	88.05878	8/25/88	FMC84	FMC082588-FS-3 FEEDSTOCK
PS	88.05879	8/25/88	FMC37,38,39	FMC082588-MM111-IN-4-PRA FMC082588-MM111-IN-4-PRN FMC082588-MM111-IN-4-F PROBE RINSE AND FILTER
PS	88.05880	8/25/88	FMC40	FMC082588-MM111-IN-4-IR IMPINGER
PS	88.05880X	8/25/88	FMC40	FMC082588-MM111-IN-4-IR IMPINGER
PS	88.05881	8/25/88	FMC41,42,43	FMC082588-MM111-OTA-4-PRA FMC082588-MM111-OTA-4-PRN FMC082588-MM111-OTA-4-F PROBE RINSE AND FILTER
PS	88.05882	8/25/88	FMC44	FMC082588-MM111-OTA-4-IR IMPINGER
PS	88.05883	8/25/88	FMC45,46,47	FMC082588-MM111-OTB-4-PRA FMC082588-MM111-OTB-4-PRN FMC082588-MM111-OTB-4-F

				PROBE RINSE AND FILTER
PS	88.05884	8/25/88	FMC48	FMC082588-MM111-OTB-4-IR IMPINGER
PS	88.05885	8/25/88	FMC85	FMC082588-FS-4 FEEDSTOCK
PS	88.05886	8/26/88	FMC49,50,51	FMC082688-MM111-OTA-5-PRA FMC082688-MM111-OTA-5-PRN FMC082688-MM111-OTA-5-F PROBE RINSE AND FILTER
PS	88.05887	8/26/88	FMC52	FMC082688-MM111-OTA-5-IR IMPINGER
PS	88.05888	8/26/88	FMC53,54,55	FMC082688-MM111-OTB-5-PRA FMC082688-MM111-OTB-5-PRN FMC082688-MM111-OTB-5-F PROBE RINSE AND FILTER
PS	88.05889	8/26/88	FMC56	FMC082688-MM111-OTB-5-IR IMPINGER
PS	88.05890	8/26/88	FMC57,58,59	FMC082688-MM111-OTA-6-PRA FMC082688-MM111-OTA-6-PRN FMC082688-MM111-OTA-6-F PROBE RINSE AND FILTER
PS	88.05890X	8/26/88	FMC57,58,59	FMC082688-MM111-OTA-6-PRA FMC082688-MM111-OTA-6-PRN FMC082688-MM111-OTA-6-F PROBE RINSE AND FILTER
PS	88.05891	8/26/88	FMC60	FMC082688-MM111-OTA-6-IR IMPINGER
PS	88.05892	8/26/88	FMC61,62,63	FMC082688-MM111-OTB-6-PRA FMC082688-MM111-OTB-6-PRN FMC082688-MM111-OTB-6-F PROBE RINSE AND FILTER
PS	88.05893	8/26/88	FMC64	FMC082688-MM111-OTB-6-IR IMPINGER
PS	88.05894	8/26/88	FMC65,66,67	FMC082688-MM111-OTA-7-PRA FMC082688-MM111-OTA-7-PRN FMC082688-MM111-OTA-7-F PROBE RINSE AND FILTER
PS	88.05895	8/26/88	FMC68	FMC082688-MM111-OTA-7-IR IMPINGER
PS	88.05896	8/26/88	FMC69,70,71	FMC082688-MM111-OTB-7-PRA FMC082688-MM111-OTB-7-PRN FMC082688-MM111-OTB-7-F PROBE RINSE AND FILTER
PS	88.05897	8/26/88	FMC72	FMC082688-MM111-OTB-7-IR IMPINGER

PS	88.05898	8/26/88	FMC74,75,76A	FMC082688-MM111-IN-FB-PRA FMC082688-MM111-IN-FB-PRN FMC082688-MM111-IN-FB-F PROBE RINSE AND FILTER
PS	88.05899	8/26/88	FMC77	FMC082688-MM111-IN-FB-IR IMPINGER
PS	88.05900	8/26/88	FMC78,79,80A	FMC082688-MM111-OUT-FB-PRA FMC082688-MM111-OUT-FB-PRN FMC082688-MM111-OTB-FB-F PROBE RINSE
PS	88.05900X	8/26/88	FMC78,79	FMC082688-MM111-OUT-FB-PRA FMC082688-MM111-OUT-FB-PRN PROBE RINSE
PS	88.05901	8/26/88	FMC81	FMC082688-MM111-OUT-FB-IR IMPINGER
PS	88.05902	8/27/88	FMC140	FMC082788-MM111-RB-F
PS	88.05903	8/23/88	FMC25	FMC082388-PROBE BLANK
PS	88.05904	8/24/88	FMC86	FMC082488-PSD-IN-1-ST1
PS	88.05905	8/24/88	FMC87	FMC082488-PSD-IN-1-ST2-5
PS	88.05906	8/24/88	FMC88	FMC082488-PSD-IN-1-ST6
PS	88.05907	8/24/88	FMC89	FMC082488-PSD-IN-1-ST7
PS	88.05908	8/24/88	FMC90	FMC082488-PSD-IN-1-ST8
PS	88.05909	8/24/88	FMC91	FMC082488-PSD-IN -1-ST9
PS	88.05910	8/24/88	FMC92	FMC082488-PSD-OTA-1-ST1
PS	88.05910X	8/24/88	FMC92	FMC082488-PSD-OTA-1-ST1
PS	88.05911	8/24/88	FMC93	FMC082488-PSD-OTA-1-ST2-5
PS	88.05912	8/24/88	FMC94	FMC082488-PSD-OTA-1-ST6
PS	88.05913	8/24/88	FMC95	FMC082488-PSD-OTA-1-ST7
PS	88.05914	8/24/88	FMC96	FMC082488-PSD-OTA-1-ST8
PS	88.05915	8/24/88	FMC97	FMC082488-PSD-OTA-1-ST9
PS	88.05916	8/24/88	FMC98	FMC082488-PSD-OTB-1-ST1
PS	88.05917	8/24/88	FMC99	FMC082488-PSD-OTB-1-ST2-5
PS	88.05918	8/24/88	FMC100	FMC082488-PSD-OTB-1-ST6
PS	88.05919	8/24/88	FMC101	FMC082488-PSD-OTB-1-ST7

PS	88.05920	8/24/88	FMC102	FMC082488-PSD-OTB-1-ST8
PS	88.05920X	8/24/88	FMC102	FMC082488-PSD-OTB-1-ST8
PS	88.05921	8/24/88	FMC103	FMC082488-PSD-OTB-1-ST9
PS	88.05922	8/24/88	FMC104	FMC082488-PSD-IN-2-ST1
PS	88.05923	8/24/88	FMC105	FMC082488-PSD-IN-2-ST2-5
PS	88.05924	8/24/88	FMC106	FMC082488-PSD-IN-2-ST6
PS	88.05925	8/24/88	FMC107	FMC082488-PSD-IN-2-ST7
PS	88.05926	8/24/88	FMC108	FMC082488-PSD-IN-2-ST8
PS	88.05927	8/24/88	FMC109	FMC082488-PSD-IN-2-ST9
PS	88.05928	8/24/88	FMC110	FMC082488-PSD-OTA-2-ST1
PS	88.05929	8/24/88	FMC111	FMC082488-PSD-OTA-2-ST2-5
PS	88.05930	8/24/88	FMC112	FMC082488-PSD-OTA-2-ST6
PS	88.05930X	8/24/88	FMC112	FMC082488-PSD-OTA-2-ST6
PS	88.05931	8/24/88	FMC113	FMC082488-PSD-OTA-2-ST7
PS	88.05932	8/24/88	FMC114	FMC082488-PSD-OTA-2-ST8
PS	88.05933	8/24/88	FMC115	FMC082488-PSD-OTA-2-ST9
PS	88.05934	8/24/88	FMC116	FMC082488-PSD-OTB-2-ST1
PS	88.05935	8/24/88	FMC117	FMC082488-PSD-OTB-2-ST2-5
PS	88.05936	8/24/88	FMC118	FMC082488-PSD-OTB-2-ST6
PS	88.05937	8/24/88	FMC119	FMC082488-PSD-OTB-2-ST7
PS	88.05938	8/24/88	FMC120	FMC082488-PSD-OTB-2-ST8
PS	88.05939	8/24/88	FMC121	FMC082488-PSD-OTB-2-ST9
PS	88.05940	8/25/88	FMC122	FMC082588-PSD-IN-3-ST1
PS	88.05940X	8/25/88	FMC122	FMC082588-PSD-IN-3-ST1
PS	88.05941	8/25/88	FMC123	FMC082588-PSD-IN-3-ST2-5
PS	88.05942	8/25/88	FMC124	FMC082588-PSD-IN-3-ST6
PS	88.05943	8/25/88	FMC125	FMC082588-PSD-IN-3-ST7
PS	88.05944	8/25/88	FMC126	FMC082588-PSD-IN-3-ST8
PS	88.05945	8/25/88	FMC127	FMC082588-PSD-IN-3-ST9
PS	88.05946	8/25/88	FMC128	FMC082588-PSD-OTA-3-ST1

PS	88.05947	8/25/88	FMC129	FMC082588-PSD-OTA-3-ST2-5
PS	88.05948	8/25/88	FMC130	FMC082588-PSD-OTA-3-ST6
PS	88.05949	8/25/88	FMC131	FMC082588-PSD-OTA-3-ST7
PS	88.05950	8/25/88	FMC132	FMC082588-PSD-OTA-3-ST8
PS	88.05950X	8/25/88	FMC132	FMC082588-PSD-OTA-3-ST8
PS	88.05951	8/25/88	FMC133	FMC082588-PSD-OTA-3-ST9
PS	88.05952	8/25/88	FMC129	FMC082588-PSD-OTB-3-ST1
PS	88.05953	8/25/88	FMC130	FMC082588-PSD-OTB-3-ST2-5
PS	88.05954	8/25/88	FMC131	FMC082588-PSD-OTB-3-ST6
PS	88.05955	8/25/88	FMC132	FMC082588-PSD-OTB-3-ST7
PS	88.05956	8/25/88	FMC133	FMC082588-PSD-OTB-3-ST8
PS	88.05957	8/25/88	FMC134	FMC082588-PSD-OTB-3-ST9
PS	88.05958	8/26/88	FMC141	FMC082688-PSD-FB-ST1
PS	88.05959	8/26/88	FMC142	FMC082688-PSD-FB-ST2-5
PS	88.05960	8/26/88	FMC143	FMC082688-PSD-FB-ST6
PS	88.05960X	8/26/88	FMC143	FMC082688-PSD-FB-ST6
PS	88.05961	8/26/88	FMC144	FMC082688-PSD-FB-ST7
PS	88.05962	8/26/88	FMC145	FMC082688-PSD-FB-ST8
PS	88.05963	8/26/88	FMC146	FMC082688-PSD-FB-ST9
PS	88.06080	8/18/88	MS48	MSS081888 HNO3 BLANK
PS	88.06080X	8/18/88	MS48	MSS081888 HNO3 BLANK
PS	88.06081	8/18/88	MS47	MSS081888 ACETONE REAGENT BLANK ARC~~HIVED SAMPLE~~
PS	88.06082	8/16/88	MS16	MSS081688-FS-1-C COMPOSITE ARCHIVED SAMPLE
PS	88.06083	8/16/88	MS13,14,70	MSS081688-MM111-IN-1-PRA MSS081688-MM111-IN-1-PRN MSS081688-MM111-IN-1-F PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06084	8/16/88	MS15	MSS0 81688-MM111-IN-1-IR IMPINGER

				ARCHIVED SAMPLE
PS	88.06085	8/16/88	MS10,11,66	MSS081688-MM111-OTA-1-PRA MSS081688-MM111-OTA-1-PRN MSS081688-MM111-OTA-1-F PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06086	8/16/88	MS12	MSS0 81688-MM111-OTA-1-IR IMPINGER ARCHIVED SAMPLE
PS	88.06087	8/16/88	MS7,8,67	MSS081688-MM111-OTB-1-PRA MSS081688-MM111-OTB-1-PRN MSS081688-MM111-OTB-1-F PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06088	8/16/88	MS9	MSS08 1688-MM111-OTB-1-IR IMPINGER ARCHIVED SAMPLE
PS	88.06089	8/16/88	MS4,5,68	MSS081688-MM111-OTC-1-PRA MSS081688-MM111-OTC-1-PRN MSS081688-MM111-OTC-1-F PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06090	8/16/88	MS6	MSS08 1688-MM111-OTC-1-IR IMPINGER ARCHIVED SAMPLE
PS	88.06090X	8/16/88	MS6	MSS08 1688-MM111-OTC-1-IR IMPINGER ARCHIVED SAMPLE
PS	88.06091	8/16/88	MS1,2,69	MSS081688-MM111-OTD-PRA, MSS081688-MM111-OTD-1-PRN MSS081688-MM111-OTD-F, PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06092	8/16/88	MS3	MSS08 1688-MM111-OTD-1-IR IMPINGER ARCHIVED SAMPLE
PS	88.06093	8/17/88	MS22,27,74	MSS081788-MM111-OTD-2-PRA MSS081788-MM111-OTD-2-PRN MSS081788-MM111-OTD-2-F PROBE RINSE AND FILTER ARCHIVED SAMPLE
PS	88.06094	8/17/88	MS31	MSS081788-MM111-OTD-2-IR IMPINGER ARCHIVED SAMPLE
PS	88.06095	8/19/88	M93	MSS081988-MM111-FS-5-C FEEDSTOCK

TABLE L.4.2. SUMMARY OF RADIONUCLIDE ANALYTICAL DATA, FMC, POCATELLO, IDAHO (August 1988)

EERF Sample Number[a]	Pico Curies per sample			
	Pb-210 Activity Collection	2σ (%)[b]	Po-210 Activity Collection	2σ (%)[b]
88.05858	5.4604E+03	9.23	1.1430E+02	37.09
88.05859	2.3531E+00	121.69	3.1935E+02	8.23
88.05860	7.0200E+00	617.92	4.7164E+03	9.35
88.05860x	4.2202E+01	86.02	5.2474E+03	9.57
88.05861	3.1986E+00	34.03	2.6399E+01	5.24
88.05862	6.2050E+01	116.71	7.5366E+03	9.06
88.05863	2.8280E+00	43.20	4.0504E+01	7.62
88.05864	2.4157E+01	43.10	2.4167E+01	8.15
88.05865	7.8861E+01	53.90	6.0136E+03	9.62
88.05866	2.3720E+00	86.61	2.0020E+02	11.66
88.05867	1.1225E+02	65.34	4.7543E+03	9.69
88.05868	-1.4228E+00	121.68	1.6115E+01	8.34
88.05869	7.8461E+01	77.19	8.0955E+03	9.47
88.05870	1.0477E+00	293.63	1.1127E+02	15.83
88.05870x	5.6173E-01	326.21	1.0311E+02	8.66
88.05871	2.7947E+01	19.53	2.3010E+01	7.77
88.05872	8.2276E+01	50.41	4.1130E+03	9.36
88.05873	9.6967E-01	144.39	1.0890E+02	8.96
88.05874	6.9806E+01	65.22	4.3838E+03	8.84
88.05875	1.8656E+00	36.97	2.3577E+01	7.36
88.05876	6.4608E+02	16.83	5.7250E+03	9.80
88.05877	5.5357E-01	167.03	4.4874E+01	7.35
88.05878	2.0662E+01	18.32	2.3347E+01	7.85
88.05879	2.1915E+02	17.09	3.3073E+03	9.11
88.05880	2.6980E+00	45.35	7.4767E+01	7.95
88.05880x	1.5813E+00	67.01	7.8694E+01	7.54

TABLE L.4.2. SUMMARY OF RADIONUCLIDE ANALYTICAL DATA, FMC, POCATELLO, IDAHO (August 1988) (continued)

EERF Sample Number[a]	Pico Curies per sample			
	Pb-210 Activity Collection	2σ (%)[b]	Po-210 Activity Collection	2σ (%)[b]
88.05881	4.7682E+01	151.62	4.0033E+03	9.88
88.05882	2.3200E-01	452.28	3.1162E+01	5.87
88.05883	2.9617E+01	67.28	3.8062E+03	9.06
88.05884	7.1403E+00	33.31	5.5020E+01	5.67
88.05885	2.3234E+01	21.57	2.2559E+01	8.30
88.05886	6.3015E+01	39.56	5.7781E+03	8.69
88.05887	-1.3954E-01	1027.15	2.7101E+01	5.77
88.05888	7.9510E+01	66.21	4.9527E+03	9.55
88.05889	1.3088E+00	68.95	4.6969E+01	8.22
88.05890	-4.3443E+00	1081.46	6.0738E+03	9.56
88.05890x	-1.3717E+01	340.87	6.5401E+03	8.86
88.05891	7.9276E-03	12804.63	2.6535E+01	5.90
88.05892	-7.0389E-01	7194.02	7.9098E+03	9.30
88.05893	-1.1518E+00	97.87	2.7732E+01	7.69
88.05894	4.5318E+01	93.78	5.3112E+03	9.61
88.05895	-8.3448E-01	122.54	2.5056E+01	5.85
88.05896	-2.6747E+01	169.72	7.5126E+03	9.63
88.05897	1.1245E+00	153.80	3.1277E+01	5.66
88.05898	2.6874E-01	514.21	6.5710E+01	9.81
88.05899	-2.9328E-01	383.80	8.0661E+00	8.01
88.05900	3.9779E-01	830.14	5.8629E+01	7.80
88.05900x	4.8415E-01	487.23	5.9243E+01	7.58
88.05901	2.6084E+00	40.35	3.6876E+00	8.75
88.05902	8.2976E-01	150.04	5.6873E-01	23.79
88.05903	7.4979E-01	90.31	8.9329E-01	17.31
88.05904	8.7782E-01	97.75	1.1955E+01	6.42

TABLE L.4.2. SUMMARY OF RADIONUCLIDE ANALYTICAL DATA, FMC, POCATELLO, IDAHO (August 1988) (continued)

EERF Sample Number[a]	Pico Curies per sample			
	Pb-210 Activity Collection	2σ (%)[b]	Po-210 Activity Collection	2σ (%)[b]
88.05905	1.7743E+00	69.46	1.7532E+01	6.75
88.05906	7.8084E-01	127.24	8.6841E+00	6.88
88.05907	-1.4102E+00	124.32	9.1465E+00	9.53
88.05908	-1.7323E+00	57.95	1.0250E+01	6.50
88.05909	-1.5199E+00	128.09	1.1256E+02	6.40
88.05910	1.0316E+00	99.83	1.0472E+02	7.49
88.05910x	-7.5823E-01	127.72	9.8301E+01	7.19
88.05911	2.6701E+00	67.08	2.7497E+02	10.21
88.05912	1.6745E+01	36.00	8.7049E+01	9.02
88.05913	1.6860E+02	9.62	1.1130E+02	9.89
88.05914	-7.5032E+00	69.29	2.5672E+02	5.80
88.05915	1.3357E+01	114.25	1.9987E+03	8.46
88.05916	-8.3066E-01	225.95	6.3259E+01	6.67
88.05917	2.5791E+00	47.69	1.9897E+02	7.34
88.05918	3.1466E-01	369.80	4.4172E+01	5.52
88.05919	2.5922E+00	74.15	9.1597E+01	6.78
88.05920	4.0404E+00	97.27	2.0654E+02	6.05
88.05920x	8.8175E+00	42.41	1.9712E+02	5.73
88.05921	3.8940E+00	463.02	2.5898E+03	8.98
88.05922	1.4385E+00	63.85	1.0173E+01	6.86
88.05923	3.5799E+00	27.47	1.8186E+01	6.11
88.05924	7.1206E-01	166.22	7.8988E+00	7.36
88.05925	1.2193E+00	337.62	1.1006E+01	10.29
88.05926	1.9775E+00	64.58	1.3939E+01	8.44
88.05927	1.4264E+02	9.51	3.2835E+00	48.81
88.05928	9.2482E-01	118.67	9.6028E+01	9.13

TABLE L.4.2. SUMMARY OF RADIONUCLIDE ANALYTICAL DATA, FMC, POCATELLO, IDAHO (August 1988) (continued)

EERF Sample Number[a]	Pico Curies per sample			
	Pb-210 Activity Collection	2σ (%)[b]	Po-210 Activity Collection	2σ (%)[b]
88.05929	3.3168E+00	114.38	3.2751E+02	8.18
88.05930	7.9968E-01	175.51	6.1783E+01	6.34
88.05930x	7.8536E-01	203.94	5.3570E+01	6.92
88.05931	9.7812E-01	109.20	8.8980E+01	7.38
88.05932	2.2973E+00	55.47	1.2216E+02	6.66
88.05933	9.7882E+00	173.16	1.9421E+03	9.01
88.05934	-1.7308E+00	97.38	1.0134E+02	9.61
88.05935	2.2529E-01	689.82	3.3522E+02	9.18
88.05936	6.2228E-01	265.94	1.2065E+02	9.05
88.05937	2.7917E+01	26.45	2.1593E+02	8.26
88.05938	1.0658E+01	36.46	4.7272E+02	7.66
88.05939	1.0574E+02	53.11	4.2222E+03	9.34
88.05940	2.8380E+00	41.62	3.7964E+01	6.81
88.05940x	3.1174E+00	44.47	3.2082E+01	6.56
88.05941	1.3357E+00	141.00	6.4757E+01	7.55
88.05942	8.7807E-01	97.98	1.2825E+01	6.47
88.05943	1.6811E+00	63.95	1.0896E+01	6.13
88.05944	4.5308E-01	218.91	1.3262E+01	6.15
88.05945	3.1088E+00	47.38	1.4704E+02	7.16
88.05946	1.9852E+00	51.69	2.1658E+01	5.43
88.05947	2.3043E+00	71.34	1.1262E+02	7.21
88.05948	2.1365E+00	68.42	5.1580E+01	6.58
88.05949	2.3703E+00	43.73	1.2174E+02	6.94
88.05950	4.8762E+00	39.99	3.6055E+02	9.58
88.05950x	5.1170E+00	38.20	3.3130E+02	9.54
88.05951	1.3669E+01	120.00	2.1153E+03	8.86

TABLE L.4.2. SUMMARY OF RADIONUCLIDE ANALYTICAL DATA, FMC, POCATELLO, IDAHO (August 1988) (continued)

EERF Sample Number[a]	Pico Curies per sample			
	Pb-210 Activity Collection	2σ (%)[b]	Po-210 Activity Collection	2σ (%)[b]
88.05952	-1.2453E+00	154.02	7.7103E+01	6.32
88.05953	-9.4818E-01	128.22	2.4073E+02	6.81
88.05954	1.1053E-01	2068.13	9.0206E+01	7.09
88.05955	-1.6898E+00	199.14	2.6923E+02	10.33
88.05956	6.5572E+00	77.32	7.2868E+02	8.10
88.05957	-3.4128E+00	517.93	2.5662E+03	9.04
88.05958	-2.9560E-01	363.97	4.6517E-01	24.80
88.05959	-1.0854E+00	108.37	1.4969E+00	15.90
88.05960	-5.7882E-01	282.54	6.6465E-01	20.39
88.05960x	-3.2206E-01	423.49	1.4933E-01	53.93
88.05961	9.5847E-01	130.43	1.0108E-01	33.97
88.05962	1.5754E-01	975.50	8.2537E-01	24.55
88.05963	1.3665E+00	134.06	2.4193E-01	34.58

[a]An "x" in the sample number indicates a duplicate analysis. Refer to Table L.1.1 to determine corresponding Radian sample number.

[b]A 2σ value near or over 100 indicates that the target radionuclide was not detected.

TABLE L.4.3. EERF INTERNAL - PERFORMANCE (QC) SAMPLES[a]

Sample No.	Po-210	Pb-210	Known (2 σ)
JMS-88.5157[b]			
A	481 ± 24	464 ± 40	435 ± 45
B-1	379 ± 24	397 ± 44	"
B-2	435 ± 33	493 ± 33	"
C-1	411 ± 31	463 ± 77	"
C-2	389 ± 31	442 ± 38	"
D	415 ± 37	409 ± 73	"
E	421 ± 24	501 ± 54	"
JMW-88.5352	14 ± 1	15 ± 2	12 ± 1
JMW-88.5353	13 ± 1	16 ± 2	12 ± 1
JMW-88.5354	13 ± 1	15 ± 2	12 ± 1
JMS-88.5840[b]			
A	445 ± 42	444 ± 53	435 ± 45
B	419 ± 40	442 ± 55	"
C	390 ± 53	438 ± 117	"
D	424 ± 41	352 ± 55	"
JMW-88.5355	108 ± 7	2 ± 1	105 ± 11
"	121 ± 9	122 ± 9	"
JMW-88.5841	10 ± 1	7 ± 2	7.4 ± 1
JMW-88.5842	19 ± 1	23 ± 2	19 ± 2
JMW-88.5971	117 ± 9	125 ± 12	105 ± 11
JMW-88.6025	0 ± 0	1 ± 1	0 ± 0
JMW-88.6026	468 ± 43	442 ± 51	433 ± 45
JMW-88.6027	566 ± 52	573 ± 51	524 ± 52
JMW-88.6028	286 ± 24	344 ± 41	262 ± 26

[a]Source: November 21, 1988, Memorandum from James B. Moore to Jon A. Broadway, Acting Chief, Monitoring and Analytical Services Branch, EPA, Eastern Environmental Radiation Facility (EERF).
[b]Replicate analysis of mill tailings.

APPENDIX M - CALIBRATION DATA

Date: 8/9/88 Operator Initials: [illegible]

Pitot Tube I.D. No.: P-1 Length: _____

Pitot tube assembly level? ✓ yes _____ no

Pitot tube openings damaged? _____ yes (explain below) ✓ no

Quick connects attached, leak free? _____ yes ✓ no

α_1 = 1.0 ° α_2 = 1.0 °

β_1 = 0.0 ° β_2 = 1.0 °

γ = 4.0 °, θ = 1.0 °, A = .572 cm (in.)

z = A sin γ = 0.040 cm (in.);

w = A sin θ = .010 cm (in.);

P_A = .288 cm (in.);

P_b = .289 cm (in.);

D_c = .250 cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes _____ no

β_1 and β_2 < 5° ✓ yes _____ no

z < 0.32 cm (1/8 in.) ✓ yes _____ no

w < 0.08 cm (1/32 in.) ✓ yes _____ no

P_A and P_b, 1.05 D_c < P < 1.50 D_c ✓ yes _____ no

D_c, 0.48 cm (3/16 in) ≤ D_c ≤ 0.95 cm (3/8 in) ✓ yes _____ no

Pitot Tube Acceptable? ✓ yes _____ no

Comments: New pitot - 8' effective EMB Phase

Pitot spection sheet.

Date: 8/8/88 Operator Initials: PE 2

Pitot Tube I.D. No.: P-2 Length: 8 effective

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

Quick connects attached, leak free? ____ yes ✓ no

α_1 = 2.0 ° α_2 = 3.0 °

β_1 = 1.0 ° β_2 = 1.0 °

γ = 2.0 °, θ = 1.0 °, A = (.550) cm (in.)

z = A sin γ = (.019) cm (in.);

w = A sin θ = (.010) cm (in.);

P_A = (.275) cm (in.);

P_b = (.275) cm (in.);

D_c = (.250) cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes ____ no

β_1 and β_2 < 5° ✓ yes ____ no

z < 0.32 cm (1/8 in.) ✓ yes ____ no

w < 0.08 cm (1/32 in.) ✓ yes ____ no

P_A and P_b, 1.05 D_c < P < 1.50 D_c ✓ yes ____ no

D_c, 0.48 cm (3/16 in) ≤ D_c ≤ 0.95 cm (3/8 in) ✓ yes ____ no

Pitot Tube Acceptable? ✓ yes ____ no

Comments: New Pitot EMB Phase

M-4

Pitot tube inspection sheet.

Date: 8/8/88 Operator Initials: DZ

Pitot Tube I.D. No.: P3 Length: 8' effective

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ____ no

Quick connects attached, leak free? ____ yes ✓ no

α_1 = 1.0 ° α_2 = 1.0 °

β_1 = 0.0 ° β_2 = 1.0 °

γ = 0.0 °, θ = 0.0 °, A = (.564) cm (in.)

z = A sin γ = 0 cm (in.);

w = A sin θ = 0 cm (in.);

P_A = (.284) cm (in.);

P_b = (.285) cm (in.);

D_c = (.250) cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes ____ no

β_1 and β_2 < 5° ✓ yes ____ no

z < 0.32 cm (1/8 in.) ✓ yes ____ no

w < 0.08 cm (1/32 in.) ✓ yes ____ no

P_A and P_b, 1.05 D_c < P < 1.50 D_c ✓ yes ____ no

D_c, 0.48 cm (3/16 in) ≤ D_c ≤ 0.95 cm (3/8 in) ✓ yes ____ no

Pitot Tube Acceptable? ✓ yes ____ no

Comments: EMB Phosphate - New Pitot

M-5

Pitot tube inspection sheet.

Date: 8/8/88 Operator Initials: D2

Pitot Tube I.D. No.: P4 Length: 8' effective

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

Quick connects attached, leak free? ✓ yes ____ no

α_1 = 0.0 ° α_2 = 2.0 °

β_1 = 1.0 ° β_2 = 1.0 °

γ = 3.0 °, θ = 2.0 °, A = (.562) cm (in.)

z = A sin γ = (.029) cm (in.);

w = A sin θ = (.020) cm (in.);

P_A = (.281) cm (in.);

P_b = (.281) cm (in.);

D_c = (.250) cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes ____ no

β_1 and β_2 < 5° ✓ yes ____ no

z < 0.32 cm (1/8 in.) ____ yes ____ no

w < 0.08 cm (1/32 in.) ____ yes ____ no

P_A and P_b, 1.05 D_c < P < 1.50 D_c ✓ yes ____ no

D_c, 0.48 cm (3/16 in) ≤ D_c ≤ 0.95 cm (3/8 in) ✓ yes ____ no

Pitot Tube Acceptable? ✓ yes ____ no

Comments: GMB Phase — New Pitot

M-6

Pitot tube inspection sheet.

Date: 8/8/88 Operator Initials: [illegible]

Pitot Tube I.D. No.: P-5 Length: 14' effective

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

Quick connects attached, leak free? ____ yes ✓ no

α_1 = 2.0 ° α_2 = 1.0 °

β_1 = 1.0 ° β_2 = 1.0 °

γ = 1.0 °, θ = 2.0 °, A = (.584) cm (in.)

z = A sin γ = (.010) cm (in.);

w = A sin θ = (.020) cm (in.);

P_A = (.292) cm (in.);

P_b = (.292) cm (in.);

D_c = (.250) cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes ____ no

β_1 and β_2 < 5° ✓ yes ____ no

z < 0.32 cm (1/8 in.) ✓ yes ____ no

w < 0.08 cm (1/32 in.) ✓ yes ____ no

P_A and P_b, 1.05 D_c < P < 1.50 D_c ✓ yes ____ no

D_c, 0.48 cm (3/16 in) ≤ D_c ≤ 0.95 cm (3/8 in) ✓ yes ____ no

Pitot Tube Acceptable? ✓ yes ____ no

Comments: EMB phone New Pitot

M-7

Pitot tube inspection sheet.

Date: 8/8/88 Operator Initials: D2

Pitot Tube I.D. No.: P6 Length: 14' effective

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

Quick connects attached, leak free? ____ yes ✓ no

α_1 = 1.0 ° α_2 = 30 °

β_1 = 0.0 ° β_2 = 1.0 °

γ = 1.0 °, θ = 1.0 °, A = (.584) cm (in.)

z = A sin γ = (.010) cm (in.);

w = A sin θ = (.010) cm (in.);

P_A = (.292) cm (in.);

P_b = (.292) cm (in.);

D_t = (.250) cm (in.)

Acceptance Criteria:

α_1 and α_2 < 10° ✓ yes ____ no

β_1 and β_2 < 5° ✓ yes ____ no

z < 0.32 cm (1/8 in.) ✓ yes ____ no

w < 0.08 cm (1/32 in.) ✓ yes ____ no

P_A and P_b, 1.05 D_t < P < 1.50 D_t ✓ yes ____ no

D_t, 0.48 cm (3/16 in) ≤ D_t ≤ 0.95 cm (3/8 in) ✓ yes ____ no

Pitot Tube Acceptable? ✓ yes ____ no

Comments: EMB place New pitot

M-8

Pitot tube inspection sheet.

8/15/85 7 Nozzle Cold Air Springs
Nozzle Calibration

Location	Nozzle #	D_1	D_2	D_3	D_4	$\overline{D_n}$
Outlet	2	.250	.250	.251	.250	.250
Outlet	3	.251	.250	.250	.251	.251
Outlet	5	.249	.250	.250	.251	.250
Outlet	7	.250	.250	.250	.248	.250
Inlet	6	.248	.249	.247	.248	.248

RADIAN CORPORATION

CALCULATION SHEET

SIGNATURE _____ DATE _____ CHECKED _____ DATE _____ CALC. NO. _____

PROJECT _____ JOB NO. _____

SUBJECT _____ SHEET _____ OF _____ SHEETS

Meter Box #	Pre γ	Post γ	Agree ± 5% & pre factor?
4	1.0044	0.9907	yes
5	0.9996	1.0030	yes
7	1.0035	0.9926	yes
8	1.0045	1.0440	yes
12	0.9943	1.0136	yes

4-81-3361

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Calibration Meter # DGM6037014 Y = .9956

Date 6/4/87

Barometric Pressure, Bp = 29.69

Meter Box # 4

Dry Gas Meter #

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³ 22.700	Temperature Calibration Meter In	Out	Dry Gas Meter In	Out	Time θ Min. .00	Y	ΔHD
0.5	-.02	final 59.443	final ~~16.200~~	initial 82	80	initial 95	87	15.79	.9921 ~~.9965~~	1.753
		initial 53.089	initial 16.200	std.		std.				
		total 6.354	total 6.500	final 83	81	final 103	89			
				ave. 82		ave. 94				
0.5	-.02	final 64.721	final 28.100	initial 83	81	initial 103	89	13.00	.9970	1.711
		initial 59.443	initial 22.700	std.		std.				
		total 5.278	total 5.400	final 83	81	final 104	89			
				ave. 82		ave. 96				
1.8	-.08	final 73.210	final 36.700	initial 83	81	initial 104	89	10.98	1.0088	1.685
		initial 64.721	initial 28.100	std. 84	82	std. 112	90			
		total 8.489	total 8.600	final 84	82	final 114	92			
				ave. 83		ave. 100				
1.8	-0.08	final 85.256	final 49.550	initial 84	82	initial 114	92	15.58	1.0074	1.684
		initial 73.210	initial 36.700	std. 84	82	std. 114	91			
		total 12.046	total 12.850	final 83	82	final 115	92			
				ave. 83		ave. 103				
3.0	-0.1	final 103.841	final 67.800	initial 83	82	initial 115	92	19.95	1.0155	1.919
		initial 85.256	initial 46.950	std. 83	81	std. 119	94			
		total 18.585	total 18.850	final 83	81	final 120	94			
				ave. 82		ave. 105				
3.0	-0.1	final 56.130	final 121.000	initial 83	81	initial 117	94	52.33	1.0240	1.919
		initial 3.841	initial 67.800	std. 83	81	std. 120	96			
		total 52.289	total 53.200	final 83	81	final 126	103			
				ave. 82		ave. 109				
		final	final	initial		initial				
		initial	initial	std.		std.				
		total	total	final		final			~~1.0075~~	1.780
				ave.		ave.				
								ave.	1.0075	1.780

Meter leak check front ____ back ____

Pitot leak check ____

Electrical check ____

Vacuum gauge check

5" Hg = ____

10" Hg = ____

15" Hg = ____

Calibrating technician _____

Thermocouple calibrations

DGM: std. test

ice ____ ____

ambient ____ ____

DGM: ice ____ ____

ambient ____ ____

EMB Phosphorous Pre-Cal

DRY GAS METER CALIBRATION DATA

(English Units) Present Post Test

Calibration Meter # 6837014 Y = .9956

Barometric Pressure, Pb = 29.57

Dry Gas Meter # 5

Date 5/6/88

Meter Box # 5

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y
.5	-.01	final 37.491	final 62.249	initial 80	78	initial 86	80	1341.7	
		initial 32.107	initial 56.807	mid.		mid.			
		total 5.384	total 5.442	final 78	77	final 91	84	13.7	.9964
				ave. 78.3		ave. 85.3			
1.0	-.03	final 48.818	final 67.667	initial 78	77	initial 91	84	9:40.8	
		initial 37.491	initial 62.249	mid.		mid.			
		total 5.327	total 5.418	final 78	77	final 96	86	9.68	.9980
				ave. 77.5		ave. 89.3			
3.0	-.08	final 48.781	final 73.709	initial 77	77	initial 96	86	6:30.6	
		initial 42.818	initial 67.667	mid.		mid.			
		total 5.963	total 6.042	final 78	77	final 104	88	6.51	1.0044
				ave. 77.5		ave. 93.5			
		final	final	initial		initial			
		initial	initial	mid.		mid.			
		total	total	final		final			
								ave	.9996

$$\frac{V_w\left(P_b + \frac{\Delta H_w}{13.6}\right)(t_d + 460)}{V_d\left(P_b + \frac{\Delta H_d}{13.6}\right)(T_w + 460)}$$

$$\frac{0.0317\ \Delta H}{P_b\ t_d + 460}\left[\frac{T_w + 460\ \theta}{V_w}\right]^2$$

ΔH		
.5	$\frac{5.384 \times 29.57 \times 545.3 \times .9956}{5.442 \times 29.61 \times 538.3} = .9964$	$\frac{.0317 \times .5}{29.57 \times 545.3}\left(\frac{538.3 \times 13.7}{5.384}\right)^2 = 1.844$
1.0	$\frac{5.327 \times 29.57 \times 549.3 \times .9956}{5.418 \times 29.64 \times 537.5} = .9980$	$\frac{.0317}{29.57 \times 545.3}\left(\frac{537.5 \times 9.68}{5.327}\right)^2 = 1.875$
3.0	$\frac{5.963 \times 29.57 \times 553.5 \times .9956}{6.042 \times 29.79 \times 537.5} = 1.0044$	$\frac{.0317 \times 3}{29.57 \times 553.5}\left(\frac{537.5 \times 6.51}{5.963}\right)^2 = 2.000$

Meter leak check front ✓ back ✓

Pitot leak check ✓

Electrical check ✓

Calibrating technician: [illegible]

EMB Phosphorus Pre-Cal

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Calibration Meter # 683014 Y = .9956

Barometric Pressure, Bp = 29.33

Date 4/6/88

Meter Box # 1

Dry Gas Meter # 1

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft^3	Gas Volume Dry Gas Meter Vd ft^3	Temperature Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time @ Min. .50	Y	ΔH@
.5	-.02	final 32.47	final 41.806	initial 77	78	initial 92	86			
		initial 27.47	initial 36.714	mid.		mid.				
		total 5	total 5.092	final 77	78	final 95	87	16.14		
				ave. 77.5		ave. 90				
1.5	-.04	final 37.468	final 46.886	initial 77	78	initial 95	87			
		initial 32.47	initial 41.886	mid.		mid.				
		total 4.998	total 5.08	final 77	78	final 102	88	7.28		
				ave. 77.5		ave. 93				
3.0	-.08	final 42.467	final 51.956	initial 77	78	initial 100	88			
		initial 37.468	initial 46.886	mid.		mid.				
		total 4.999	total 5.07	final 77	78	final 107	89	5.19		
				ave. 77.5		ave. 96				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
								ave	1.0035	

$$\frac{V_w}{V_d}\frac{\left(P_b - \frac{\Delta H}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(T_w + 460)}$$

$$\frac{0.0317\ \Delta H}{P_b}\frac{(t_w + 460\ @)}{t_d + 460}\left[\frac{t_w + 460\ @}{V_w}\right]^2$$

ΔH		
.5	$\frac{5 \times 29.33 \times 550 \times .9956}{5.092 \times 29.37 \times 537.5} = .9990$	$\frac{.5 \times .0317}{29.33 \times 550}\left(\frac{537.5 \times 16.14}{5}\right)^2 = 1.70$
1.5	$\frac{4.998 \times 29.33 \times 553 \times .9956}{5.08 \times 29.44 \times 537.5} = 1.0040$	$\frac{1.5 \times .0317}{29.33 \times 553}\left(\frac{537.5 \times 7.28}{4.998}\right)^2 = 1.80$
3.0	$\frac{4.999 \times 29.32 \times 556 \times .9956}{5.07 \times 29.55 \times 537.5} = 1.0075$	$\frac{3 \times .0317}{29.33 \times 556}\left(\frac{537.5 \times 5.19}{4.999}\right)^2 = 1.82$

Meter leak check front ✓ back ✓

Pitot leak check ____

Electrical check ____

EMB Phosphorous Pre-Cal

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Calibration Meter # 68-7614 Y = .9956

Date 12/17/87

Barometric Pressure, Bp = 30.02

Meter Box # 8

Dry Gas Meter # 8

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	ΔH@
.5	-.02	final 51.438	final 19.774	initial 76	76	initial 78	78	13:27.8		
		initial 46.281	initial 14.600	mid.		mid.				
		total 5.157	total 5.174	final 75	76	final 91	79		1.0021	1.90
				ave. 75.8		ave. 81.5				
1.0	-.04	final 56.436	final 24.83	initial 75	76	initial 91	79	9:27.9		
		initial 51.438	initial 19.774	mid.		mid.				
		total 4.998	total 5.056	final 75	76	final 100	81		1.0044	1.98
				ave. 75.5		ave. 87.8				
2.5	-.07	final 62.249	final 30.731	initial 75	76	initial 100	81	7:05.2		
		initial 56.436	initial 24.83	mid.		mid.				
		total 5.813	total 5.901	final 76	76	final 110	83		1.0071	2.03
				ave. 75.8		ave. 93.5				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
								ave	1.0045	1.97

$$\frac{V_w}{V_d}\frac{\left(P_b - \frac{\Delta H}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(T_w + 460)} \qquad \frac{0.0317\ \Delta H}{P_b\ \ t_d + 460}\left[\frac{T_w + 460\ \theta}{V_w}\right]^2$$

ΔH		
.5	$\frac{5.157 \times 30.02 \times 541.5 \times .9956}{5.174 \times 30.06 \times 535.8} = 1.0021$	$\frac{.0317 \times .5}{30.06 \times 541.5}\left(\frac{535.8 \times 13.46}{5.157}\right)^2 = 1.907$
1.0	$\frac{4.998 \times 30.02 \times 547.8 \times .9956}{5.056 \times 30.09 \times 535.5} = 1.0044$	$\frac{.0317}{30.02 \times 547.8}\left(\frac{535.5 \times 9.47}{4.998}\right)^2 = 1.985$
2.5	$\frac{5.813 \times 30.02 \times 553.5 \times .9956}{5.901 \times 30.2 \times 535.8} = 1.0071$	$\frac{.0317 \times 2.5}{30.02 \times 553.5}\left(\frac{535.8 \times 7.09}{5.813}\right)^2 = 2.037$

Meter leak check front ✓ back ✓

Pitot leak check ✓

Electrical check needs heater switch

Calibrating technician [illegible]

EMB Phosphorous Pre-Cal

DRY GAS METER CALIBRATION DATA

(English Units) Protocol Post Test

Calibration Meter # 6837814 Y = .9956

Barometric Pressure, Bp = 29.57

Dry Gas Meter # 12

Date 6/6/88

Meter Box # 12

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	ΔH
.5	-.01	final 55.949	final 50.141	initial 78	78	initial 86	81	12:57		
		initial 49.808	initial 44.923	mid.		mid.				
		total 5.141	total 5.218	final 81	80	final 91	83	12.95	.9905	1.
				ave. 79.3		ave. 85.3				
1.0	-.03	final 59.431	final 55.705	initial 80	80	initial 91	82	9:24.7		
		initial 53.949	initial 50.141	mid.		mid.				
		total 5.482	total 5.564	final 84	81	final 98	85	9.41	.9931	1.
				ave. 81.3		ave. 89.3				
3.0	-0.8	final 64.980	final 61.300	initial 83	81	initial 98	85	5:48.4		
		initial 59.431	initial 55.705	mid.		mid.				
		total 5.549	total 5.595	final 86	81	final 105	86	5.81	.9994	1.
				ave. 82.8		ave. 93.5				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
								ave	.9943	1.

$$\frac{V_w}{V_d}\frac{\left(P_b - \frac{\Delta H}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(T_w + 460)} \qquad \frac{0.0317\,\Delta H}{P_b\,(t_d + 460)}\left[\frac{t_w + 460\ \theta}{V_w}\right]^2$$

ΔH		
.5	$\frac{5.141 \times 29.57 \times 545.3 \times .9956}{5.218 \times 29.61 \times 539.3} = .9905$	$\frac{.0317 \times .5}{29.57 \times 545.3}\left(\frac{539.3 \times 12.95}{5.141}\right)^2 = 1.814$
1.0	$\frac{5.482 \times 29.57 \times 549.3 \times .9956}{5.564 \times 29.64 \times 541.3} = .9931$	$\frac{.0317}{29.57 \times 549.3}\left(\frac{541.3 \times 9.41}{5.482}\right)^2 = 1.685$
3.0	$\frac{5.549 \times 0.157 \times 553.5 \times .9956}{5.595 \times 29.79 \times 542.8} = .9994$	$\frac{.0317 \times 3}{29.57 \times 553.3}\left(\frac{542.8 \times 5.81}{5.549}\right)^2 = 1.677$

Meter leak check front ✓ back ✓

Pitot leak check ✓

Electrical check ✓

Calibrating technician: [illegible]

EMB Phosphate Post Cal

DRY GAS METER CALIBRATION DATA

(English Units) Protocol Post Test

Calibration Meter # 6837014 Y = .9956

Barometric Pressure, Pb = 29.87

Date 8/30/88

Meter Box # 4

Dry Gas Meter # 4

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	L
2.0	-.06	final 16.254	final 60.843	initial 71	71	initial 76	73			
		initial 7.597	initial 57.960	mid.		mid.				
		total 2.647	total 2.863	final 71	70	final 93	75			
				ave. 70.8		ave. 79.3				
2.0	-.06	final 21.413	final 66.155	initial 71	70	initial 93	75			
		initial 16.254	initial 60.843	mid.		mid.				
		total 5.159	total 5.312	final 71	70	final 100	79			
				ave. 70.5		ave. 86.8				
2.0	-.06	final 26.218	final 71.110	initial 71	70	initial 100	79			
		initial 21.413	initial 66.155	mid.		mid.				
		total 4.805	total 4.955	final 71	70	final 108	80			
				ave. 70.5		ave. 90.7				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				

ave

$$\frac{V_w}{V_d}\frac{\left(P_b + \frac{\Delta H}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(T_w + 460)} \qquad \frac{0.0317\ \Delta H}{P_b\ t_d + 460}\left[\frac{t_w + 460\ \theta}{V_w}\right]^2$$

ΔH		
2.0	$\frac{8.657 \times 29.87 \times 539.3 \times .9956}{2.263 \times 30.02 \times 530.8} = .9831$	
2.0	$\frac{5.159 \times 29.87 \times 596.2 \times .9956}{5.312 \times 30.02 \times 530.5} = .9917$	
2.0	$\frac{4.805 \times 29.87 \times 550.8 \times .9956}{4.955 \times 30.02 \times 530.5} = .9974$	
	Y = .9907	

Meter lock chain front ✓ back ✓

Pitot lock chain —

Electrical chain ✓

Calibrating technician [illegible]

A.P.91

0.9996

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Calibration Meter # 6937014 Y = .99956

Date 7 Sept 88

Barometric Pressure, Bp = 30.12

Meter Box # 5

Dry Gas Meter #

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	ΔH
2.0"	.06"	final 68.462	final 44.775	initial 74	72	initial 99	84	15.0	1.0032	1.9
		initial 57.191	initial 33.362	mid. 73	72	mid. 105	83			
		total 11.271	total 11.613	final 73	72	final 103	91			
9" VACUUM				ave.	72.67	ave.	93.33			
2.0"	.06"	final 78.620	final 56.630	initial 73	72	initial 103	91	15.0	1.0017	1
		initial 68.462	initial 44.575	mid. 73	72	mid. 111	94			
		total 11.205	total 11.205	final 73	72	final 113	97			
9" VACUUM				ave.	72.5	ave.	102.33			
2.0"	0.06"	final 87.149	final 64.237	initial 73	72	initial 113	97	10	1.0023	1
		initial 79.670	initial 56.680	mid. 72	72	mid. 114	98			
		total 7.479	total 7.557	final 72	72	final 114	99			
9" VACUUM				ave.	72.18	ave.	105.67			
2.0"	0.06"	final 98.358	final 76.349	initial 72	72	initial 112	99	15	1.0046	1
		initial 87.149	initial 64.337	mid. 72	72	mid. 115	100			
		total 11.234	total 11.812	final 72	72	final 115	101			
9" VACUUM					72	107	ΔHθ	Hwy	1.00295	

$$\frac{V_w}{V_d}\frac{\left(P_b - \frac{\Delta H}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(T_w + 460)}$$

$$\frac{0.0317\ \Delta H}{P_b\ \ t_d + 460}\left[\frac{T_w + 460\ \theta}{T_w}\right]^2$$

ΔH		
		ΔHθ = 1.926
		ΔHθ = 1.924
		ΔHθ = 1.907
		ΔHθ = 1.894

Meter leak check front 13" back ____

Pitot leak check ✓

Electrical check ____

Calibrating technician [illegible]

#835

1.77

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Date 8 Sept 85

Meter Box # 7

Calibration Meter # 6837014 Y = .9956

Barometric Pressure, Bp = 30.14

Dry Gas Meter #

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vw ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y
2.0	0.06"	final 17.858	final 13.818	initial 58	57	initial 77	60	15	.9923
		initial 6.378	initial 2.519	mid. 59	59	mid. 86	63		
		total 10.450	total 11.299	final 60	60	final 95	70		
11" vacuum				ave. 59.17		ave. 75.17			
2.0"	0.06"	final 29.912	final 25.430	initial 60	60	initial 95	70	15	.9922
		initial 17.858	initial 13.815	mid. 61	60	mid. 101	75		
		total 11.054	total 11.612	final 61	61	final 106	77		
11" vacuum				ave. 60.5		ave. 97.67			
2.0	0.06"	final 40.117	final 37.394	initial 62	61	initial 103	81	15	.9932
		initial 29.912	initial 25.430	mid. 62	62	mid. 112	87		
		total 11.205	total 11.964	final 63	62	final 115	90		
				ave. 62		ave. 108.83			
2.0	0.06"	final 51.358	final 49.494	initial 63	62	initial 115	90	15	.9921
		initial 40.112	initial 37.394	mid. 63	63	mid. 117	93		
		total 11.221	total 12.100	final 63	64	final 119	95		

63

$$\frac{V_w}{V_d}\frac{\left(P_b + \frac{\Delta H_m}{13.6}\right)}{\left(P_b + \frac{\Delta H}{13.6}\right)}\frac{(t_d + 460)}{(t_w + 460)}$$

.0413 ΔHθ

$$\frac{0.0317\ \Delta H}{P_b\ \ t_d + 460}\left[\frac{t_w + 460\ \theta}{V_w}\right]^2$$

0.9925

ΔH	
	ΔHθ = 1.995
	ΔHθ = 1.933
	ΔHθ = 1.834
	ΔHθ = 1.837

Meter leak check front 17" back ____

Pitot leak check ✓

Electrical check ____

Calibrating technician ____

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Calibration Meter # 6837014 Y = .9956

Date 9/10/88 Barometric Pressure, Pb = 751mm

Meter Box # 8 Dry Gas Meter # 8

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHm	Gas Volume Calibration Meter Vm ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	ΔH@
0.50	0.02	final 969.761	final 803.626	initial 77	76	initial 117	89	26.00	1.0350	1.714
		initial 959.272	initial 795.000	std. 78	77	std. 119	94			
		total 10.489	total 10.626	final 78	78	final 122	99			
				ave. 77.33		ave. 106.67				
1.0	0.04	final 988.565	final 822.604	initial 79	79	initial 128	103	24.00	1.0531	1.75
		initial 975.100	initial 809.000	std. 80	79	std. 131	106			
		total 13.465	total 13.604	final 80	80	final 132	109			
				ave. 79.5		ave. 118.17				
2.0	0.06	final 1012.115	final 846.094	initial 81	81	initial 138	112	18.00	1.0750	1.79
		initial 998.080	initial 832.000	std. 81	81	std. 139	114			
		total 14.035	total 14.094	final 82	81	final 140	115			
		14.115		ave. 81.17		ave. 126.33				
3.0	0.09	final 72.361	final 906.389	initial 76	75	initial 131	96	20.00	1.0637	1.74
		initial 52.972	initial 887.000	std. 77	76	std. 135	101			
		total 19.389	total 19.389	final 78	77	final 137	106			
				ave. 76.5		ave. 117.67				
		final	final	initial		initial				
		initial	initial	std.		std.				
		total	total	final		final				
				ave.		ave.				
		final	final	initial		initial				
		initial	initial	std.		std.				
		total	total	final		final				
				ave.		ave.				
		final	final	initial		initial				
		initial	initial	std.		std.				
		total	total	final		final				
				ave.		ave.				
								ave.	1.0568	

Meter leak check front ____ back ____

Pitot leak check ____

Electrical check ____

Vacuum gauge check

5" Hg = ____

10" Hg = ____

15" Hg = ____

Calibrating technician _____

Thermocouple calibrations

DGM: std. test

ice ____ ____

ambient ____ ____

DGM:

ice ____ ____

ambient ____ ____

for ΔH = 0.5 + 1.0

avg = 1.044

DRY GAS METER CALIBRATION DATA

(English Units) Pretest Post Test

Date 9/9/88

Meter Box # 12

Calibration Meter # 6837014 to 9956

Barometric Pressure, Pb = 742 mm

Dry Gas Meter # 12

Orifice Manometer Setting ΔH in. H_2O	Manometer Pressure Cal. Meter ΔHw	Gas Volume Calibration Meter Vc ft³	Gas Volume Dry Gas Meter Vd ft³	Temperature: Calibration Meter In	Calibration Meter Out	Dry Gas Meter In	Dry Gas Meter Out	Time θ Min. .00	Y	ΔH@
.50	0.02	final 831.003	final 472.257	initial 77	78	initial 99	83	18.00	1.0044	1.53
		initial 823.91	initial 465.000	mid. 77	78	mid. 105	86			
		total 7.093	total 7.257	final 77	78	final 109	91			
				ave. 77.5		ave. 95.5				
1.0	0.04	final 853.553	final 495.422	initial 76	77	initial 90	97	21.00	1.0080	1.7
		initial 841.463	initial 483.000	mid. 75	76	mid. 92	106			
		total 12.090	total 12.422	final 74	75	final 95	114			
				ave. 75.5		ave. 95.5				
2.0	0.06	final 868.232	final 510.583	initial 74	75	initial 94	118	17.00	1.0197	1.34
		initial 855.091	initial 497.000	mid. 75	75	mid. 96	122			
		total 13.141	total 13.583	final 76	76	final 100	127			
				ave. 75.7		ave. 109.50				
3.0	0.09	final 902.292	final 545.848	initial 76	76	initial 101	130	15.00	1.0223	1.8
		initial 888.000	initial 531.000	mid. 76	76	mid. 103	131			
		total 14.292	total 14.848	final 76	76	final 104	133			
				ave. 76		ave. 117				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
				ave.		ave.				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
				ave.		ave.				
		final	final	initial		initial				
		initial	initial	mid.		mid.				
		total	total	final		final				
				ave.		ave.				
								ave.	1.0136	

Meter leak check front ____ back ____

Pitot leak check ____

Electrical check ✓

Vacuum gauge check

5" Hg = 4.5

10" Hg = 9.5

15" Hg = 14.5

Calibrating technician WPG

10" Vacuum

Thermocouple calibrations

DGM: std. test

ice ____ ____

boiling ____ ____

DGM:

ice ____ ____

boiling ____ ____

enclosed. Transfer points are sometimes hooded and evacuated. Bucket elevators are usually enclosed and evacuated to a control device, and ground rock is generally conveyed in totally enclosed systems with well defined and easily controlled discharge points. Dry rock is normally stored in enclosed bins or silos which are vented to the atmosphere, with fabric filters frequently used to control emissions.

Table 8.18-2. PARTICLE SIZE DISTRIBUTION OF EMISSIONS FROM PHOSPHATE ROCK DRYERS AND CALCINERS[a]

Diameter (μm)	Percent Less Than Size	
	Dryers	Calciners
10.0	82	96
5.0	60	81
2.0	27	52
1.0	11	26
0.8	7	10
0.5	3	5

[a]Reference 1.

References for Section 8.18

1. Background Information: Proposed Standards for Phosphate Rock Plants (Draft), EPA-450/3-79-017, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1979.

2. "Sources of Air Pollution and Their Control", Air Pollution, Volume III, 2nd Ed., Arthur Stern, ed., New York, Academic Press, 1968, pp. 221-222.

3. Unpublished data from phosphate rock preparation plants in Florida, Midwest Research Institute, Kansas City, MO, June 1970.

4. Control Techniques for Fluoride Emissions, Internal document, Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC, pp. 4-34, 4-36 and 4-46.