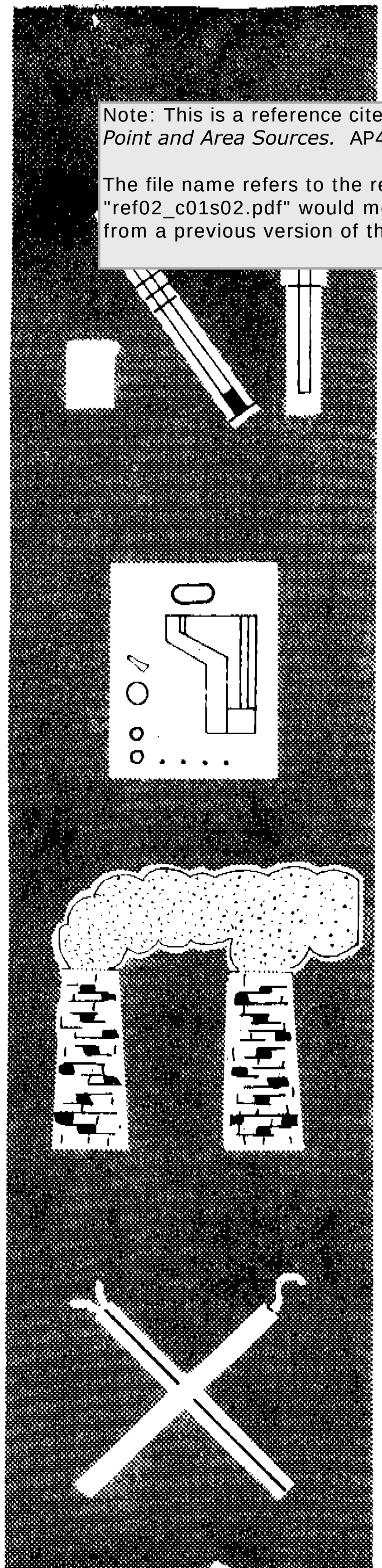
Project No. 76-NMM-4

8.19.2



AIR POLLUTION EMISSION TEST

Eastern Magnesia Talc Company

Johnson, Vermont

NO PROCESS RATES

3/15/93

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office of Air and Waste Management

Office of Air Quality Planning and Standards

Emission Measurement Branch

Research Triangle Park, North Carolina

EMISSION STUDY

at a

TALC CRUSHING AND GRINDING FACILITY

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Prepared for the

U.S. Environmental Protection Agency
Emission Measurement Branch
Research Triangle Park, North Carolina 27711

Prepared by

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25711 Southfield Road
Southfield, Michigan 48075

Project NMM-4

Task 24

Contract No. 68-02-1408

TABLE OF CONTENTS

TABLES

APPENDICES

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) retained Clayton Environmental Consultants, Inc. to conduct a series of emission tests at the Eastern Magnesia Talc Company located in Johnson, Vermont. The purpose of this study was to provide the EPA with data for the establishment of source performance standards for the non-metallic mineral-processing industry. This study was commissioned as Project NMM-4 of Task 24, Contract No. 68-02-1408.

The Eastern Magnesia Talc Company facility combines the unit operations of talc crushing, milling, and solids classification in the production of talc powder. Large pieces of talc-bearing rock are trucked from a nearby quarry to a storage hopper at the plant for subsequent crushing. The primary and secondary crushers reduce the size of the rock to that suitable for charging to the pebble mill, roller mill, and vertical mill, all of which produce talc-bearing dust that is later purified and washed in flotation-type cells. After drying and size classification, the product talc is stored in silos in preparation for bagging and shipment to the consumer.

Those unit operations that characteristically could produce fugitive dust emissions, such as crushing, milling, and grinding, at the Eastern Magnesia Talc Company are equipped with local exhaust dust collection systems. Ductwork carries the emissions picked up at each operation to a baghouse dust collector.

Source sampling for the determination of dust loading and gas flowrate was performed on five different inlets to the baghouse and the baghouse outlet stack by Clayton Environmental Consultants personnel. Inlet No. 1 comes from the Primary and Secondary Crushers, Pebble Mill, and Roller Mill. Inlet No. 2 comes from the No. 4 Vertical Mill. Inlet No. 3 comes from the two silos and the bagging and air classification operations. Inlet No. 1-A comes from the silo storage prior to the No. 3 Vertical Mill, while Inlet No. 1-B comes from the silo storage prior to the No. 4 Vertical Mill. Particle sizing samples were obtained at Inlets No. 1, 2, and 3. Opacity readings of the baghouse outlet stack emissions and opacity readings of the fugitive dust generated at several locations within the plant were obtained by certified opacity readers from Clayton Environmental Consultants. Environmental Protection Agency personnel observed the source testing activities and monitored process operations.

This study was conducted during the week of October 17, 1976. Appendix A lists the project participants.

II. SUMMARY AND DISCUSSION OF RESULTS

Particulate Sampling Results

Tables I and II summarize the results of the particulate sampling at the baghouse inlets and outlet in English and metric units, respectively.

Filterable particulate emissions at the baghouse outlet stack averaged 10.4 pounds per hour and ranged from 8.2 to 11.8 pounds per hour. Total particulate emissions at the baghouse outlet stack averaged 11.6 pounds per hour and ranged from 11.2 to 12.2 pounds per hour.

Single emission measurements in each of the various inlet ducts indicated filterable particulate emissions ranging from 31.7 to 852 pounds per hour. These inlet measurements were not made simultaneously. Consequently, if these levels are representative of the inlet loadings present during outlet emission measurements, then the baghouse appears to abate emissions efficiently.

The baghouse inlet and outlet stack gas flowrates compare favorably, with the average outlet flowrate being approximately 7.5 percent greater than the sum of the measured inlet flowrates. Since the inlet ducts and the baghouse are under a negative static pressure, this air in-leakage is not unexpected. As Table I shows, the average measured outlet flowrate is 20,000 DSCFM while the sum of the measured inlet flowrates is approximately 18,600 DSCFM.

TABLE I

SUMMARY OF PARTICULATE EMISSIONS (ENGLISH UNITS)

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Sampling Location	Test No.	1976 Date	Stack Gas Conditions			Particulate Concentration				Particulate Emission Rate (lbs/hr)	
			Temp (°F)	Flowrate		Filterable		Total			
				ACFM	DSCFM	gr/ACF	gr/DSCF	gr/ACF	gr/DSCF	Filterable	Total
Baghouse Outlet	1	10/20	80	21,100	20,200	0.045	0.047	0.062	0.065	8.17	11.2
	2	10/20	83	21,300	20,200	0.065	0.068	0.067	0.071	11.8	12.2
	3	10/21	82	21,300	19,500	0.061	0.067	0.062	0.068	11.2	11.3
	Average		82	21,200	20,000	0.057	0.061	0.064	0.068	10.4	11.6
Baghouse Inlet No. 1	2	10/20	60	11,500	11,300	8.64	8.80	8.64	8.80	852	852
Baghouse Inlet No. 2	1	10/20	160	3,570	2,940	1.04	1.26	1.04	1.26	31.7	31.7
Baghouse Inlet No. 3	3	10/21	45	3,520	3,410	2.99	3.08	2.99	3.08	90.1	90.1
Baghouse Inlet No. 1A	4	10/21	48	396	393	63.7	64.6	-	-	218	-
Baghouse Inlet No. 1B	5	10/21	52	614	603	8.76	9.06	-	-	46.8	-

TABLE II

SUMMARY OF PARTICULATE EMISSIONS (METRIC UNITS)

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Sampling Location	Test No.	1976 Date	Stack Gas Conditions			Particulate Concentration				Particulate Emission Rate (lbs/hr)	
			Temp (°C)	Flowrate		Filterable		Total			
				Am^3/min	DSm^3/min	mg/Am^3	mg/DSm^3	mg/Am^3	mg/DSm^3	Filterable	Total
Baghouse Outlet	1	10/20	27	598	572	104	108	142	149	3.71	5.11
	2	10/20	28	603	572	149	157	154	162	5.39	5.56
	3	10/21	28	603	552	140	153	142	155	5.07	5.13
	Average		28	601	566	131	139	146	155	4.72	5.26
Baghouse Inlet No. 1	2	10/20	16	326	320	19,800	20,100	19,800	20,100	387	387
Baghouse Inlet No. 2	1	10/20	71	101	83	2,370	2,880	2,370	2,880	14.4	14.4
Baghouse Inlet No. 3	3	10/21	7	100	97	6,840	7,050	6,840	7,050	40.9	40.9
Baghouse Inlet No. 1A	4	10/21	9	11	11	146,000	148,000	-	-	98.7	-
Baghouse Inlet No. 1B	5	10/21	11	17	17	20,000	20,700	-	-	21.2	-

Of the five particulate emission tests conducted on the inlet ducts, the tests at locations 1-A and 1-B (Tests No. 4 and 5, respectively) were abbreviated due to plugging of the filters. Appendix B contains the field data sheets for all source tests conducted.

Visible Emissions Observations

Opacity measurements were taken during the study by two certified visible-emission readers from Clayton Environmental Consultants. Measurements were taken at several locations in the plant on October 19, 20, and 21, and at the baghouse outlet stack on October 20 and 21 in conjunction with the source testing activities.

Each observer took a reading every 15 seconds during the observation periods. Readings were summed and averaged for each 6-minute period and plotted versus time. The series of 6-minute averages and the corresponding plots are presented for each in-plant site in chronological order in Tables III-1 through III-9.

Tables III-3, III-5, and III-9 provide summaries of in-plant visible emissions data at the bagging operation. Tables III-4 and III-8 provide summaries of in-plant visible emissions data at the secondary crushing operation. Tables III-1, III-2, III-6, and III-7 provide summaries of in-plant visible emissions data at the Pebble Mill, Roller Mill, Primary Crusher, and Vertical Mill, respectively. Tables III-10 through III-12 provide summaries of visible emissions data at the baghouse outlet stack. These stack opacity measurements were taken simultaneously

TABLE III-1
SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/19/76
Type of Discharge: Process
Height of Point of Discharge: In room
Wind Direction: N/A
Color of Plume: White
Observer No.: 2
Type of Plant: Talc Manufacturing
Location of Discharge: Pebble Mill 2
Description of Sky: N/A
Wind Velocity: N/A
Detached Plume: N/A
Duration of Observation: 1.5 hrs.
Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: W
Height of Observation Point: Floor
Description of Background: Clear room air; well lit; wooden wall background

SUMMARY OF AVERAGE OPACITY									
Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	09:59	10:05	N	N	21				
2	10:05	10:11	0	0	22				
3	10:11	10:17	0	0	23				
4	10:17	10:23	0	0	24				
5	10:23	10:29	0	0	25				
6	10:29	10:35	N	N	26				
7	10:35	10:41	0	0	27				
8	10:41	10:47	N	N	28				
9	10:47	10:53	N	N	29				
10	10:53	10:59	0	0	30				
11	10:59	11:05	15	0.6	31				
12	11:05	11:11	55	2.3	32				
13	11:11	11:17	0	0	33				
14	11:17	11:23	0	0	34				
15	11:23	11:29	50	2.1	35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

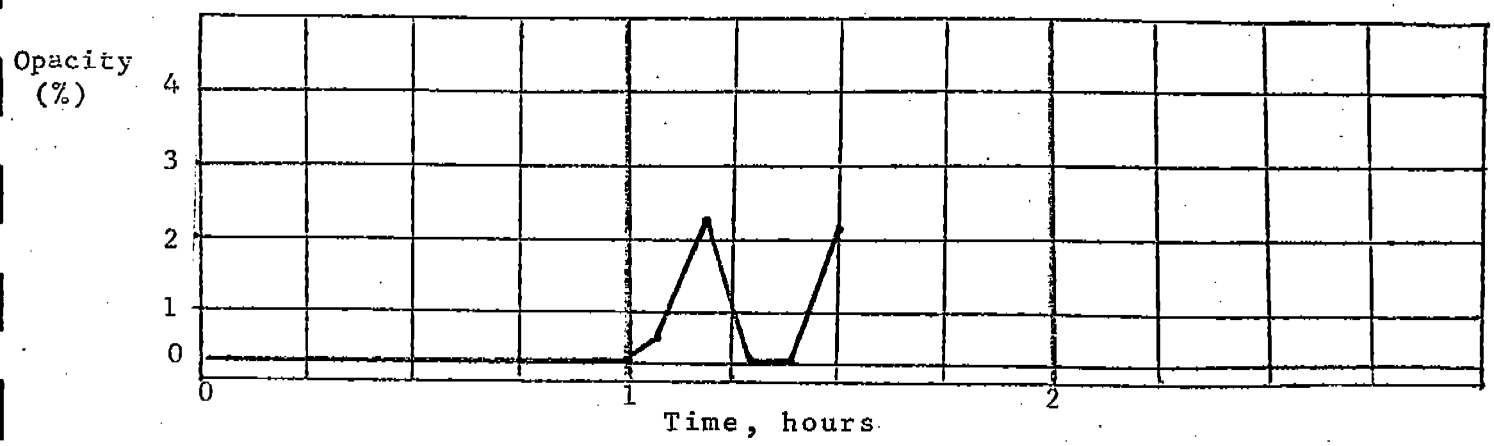


TABLE III-2

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/19/76
Type of Discharge: Process
Height of Point of Discharge: In room
Wind Direction: N/A
Color of Plume: White
Observer No.: 2
Type of Plant: Talc Manufacturing
Location of Discharge: Roller Mill
Description of Sky: N/A
Wind Velocity: N/A
Detached Plume: N/A
Duration of Observation: 1.5 hrs.
Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: N
Height of Observation Point: Floor
Description of Background: Clear room air; well lit; other equipment in room

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	13:20	13:26	215	9.0	21				
2	13:26	13:32	385	16.0	22				
3	13:32	13:38	350	15.0	23				
4	13:38	13:44	300	12.5	24				
5	13:44	13:50	385	16.0	25				
6	13:50	13:56	325	13.5	26				
7	13:56	14:02	355	14.8	27				
8	14:02	14:08	325	13.5	28				
9	14:08	14:14	250	10.4	29				
10	14:14	14:20	255	10.6	30				
11	14:20	14:26	160	6.7	31				
12	14:26	14:32	130	5.4	32				
13	14:32	14:38	155	6.5	33				
14	14:38	14:44	120	5.0	34				
15	14:44	14:50	135	5.6	35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

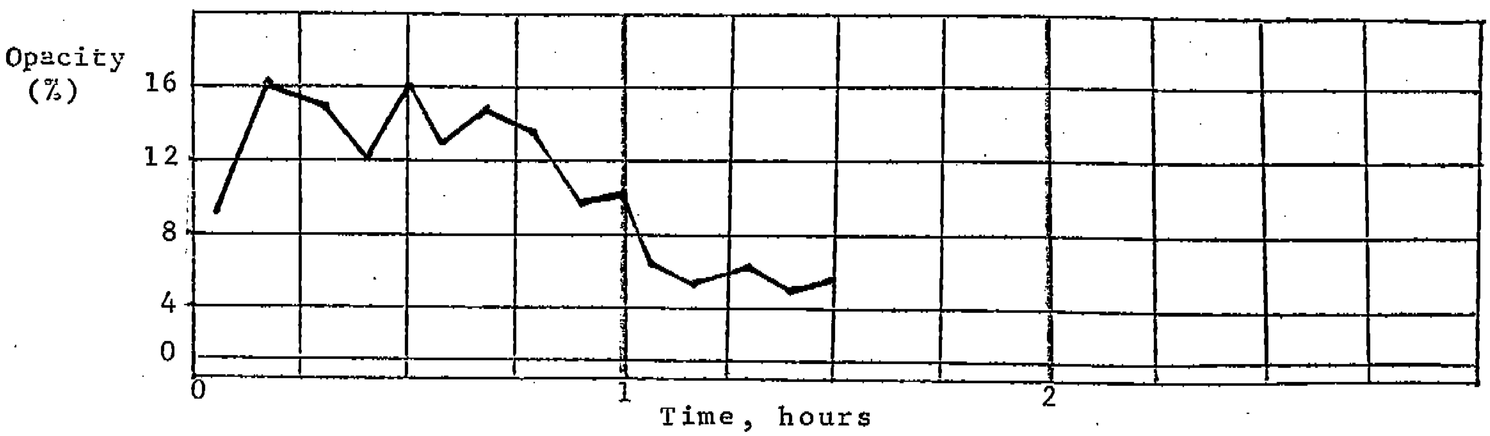


TABLE III-3

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/19/76
Type of Plant: Talc Manufacturing
Type of Discharge: Process
Location of Discharge: Bagger
Height of Point of Discharge: In room
Description of Sky: N/A
Wind Direction: N/A
Wind Velocity: N/A
Color of Plume: White
Detached Plume: N/A
Observer No.: 2
Duration of Observation: approx. 1 hr.
Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: W
Height of Observation Point: Floor
Description of Background: Clear room air; well lit; light wall background

SUMMARY OF AVERAGE OPACITY									
Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	15:03	15:09	N	N	21				
2	15:09	15:15	N	N	22				
3	15:15	15:21	5	0.2	23				
4	15:21	15:27	N	N	24				
5	15:27	15:33	0	0	25				
6	15:36	15:42	0	0	26				
7	15:42	15:48	0	0	27				
8	15:48	15:55	215	7.7	28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

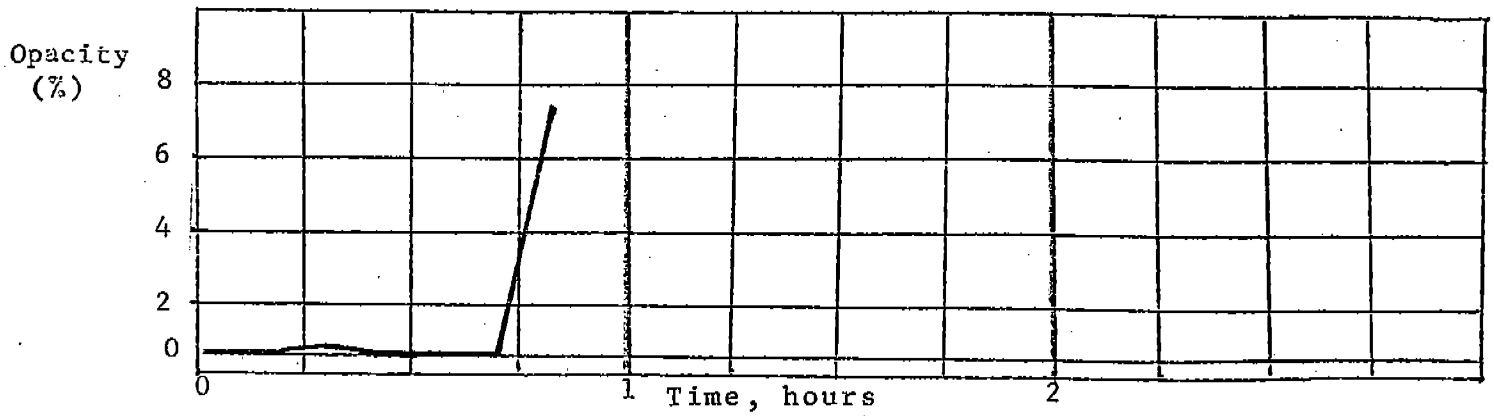


TABLE III-4

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20/76
Type of Discharge: Process
Height of Point of Discharge: In room
Wind Direction: N/A
Color of Plume: White
Observer No.: 2
Type of Plant: Talc Manufacturing
Location of Discharge: Secondary crusher
Description of Sky: N/A
Wind Velocity: N/A
Detached Plume: N/A
Duration of Observation: 1.5 hrs.
Distance from Observer to Discharge Point: approx. 5'
Direction of Observer from Discharge Point: S
Height of Observation Point: Floor
Description of Background: Clear room air; semi-well lit; wooden background

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	08:12	08:18	0	0	21				
2	08:18	08:24	N	N	22				
3	08:24	08:30	N	N	23				
4	08:30	08:36	N	N	24				
5	08:36	08:42	N	N	25				
6	08:43	08:49	N	N	26				
7	08:49	08:55	N	N	27				
8	08:55	08:58	N	N.	28				
9	09:04	09:10	0	0	29				
10	09:10	09:16	10	0.4	30				
11	09:16	09:22	N	N	31				
12	09:22	09:28	0	0	32				
13	09:28	09:34	0	0	33				
14	09:34	09:37	N	N	34				
15	09:54	10:00	N	N	35				
16	10:00	10:06	N	N	36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

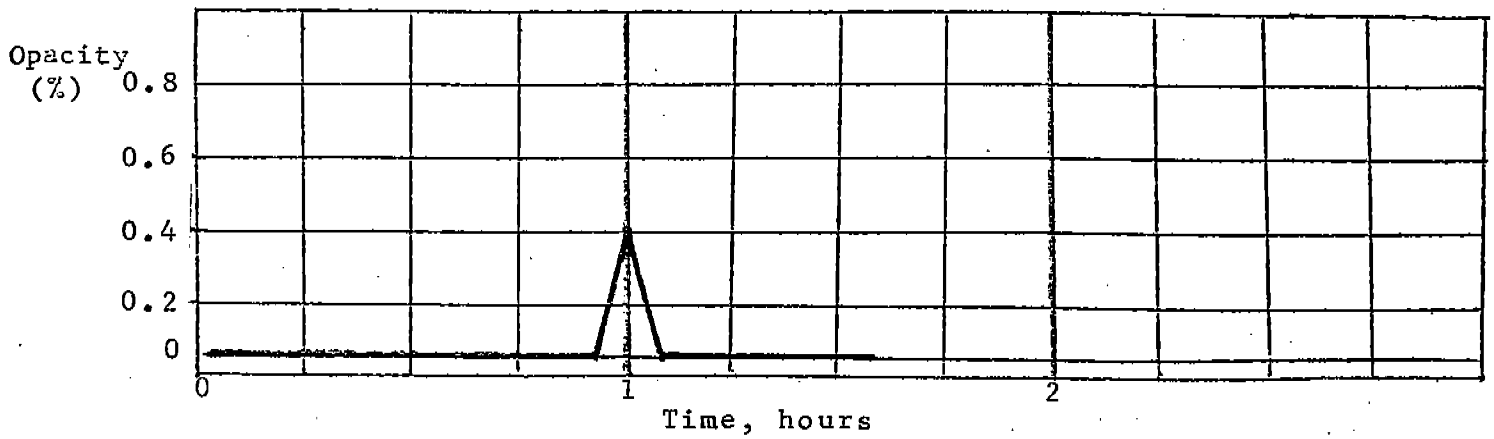


TABLE III-5

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20/76
Type of Discharge: Process
Height of Point of Discharge: In room
Wind Direction: N/A
Color of Plume: White
Observer No.: 2

Type of Plant: Talc Manufacturing
Location of Discharge: Bagger
Description of Sky: N/A
Wind Velocity: N/A
Detached Plume: N/A
Duration of Observation: approx. 45 min.

Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: W
Height of Observation Point: Floor
Description of Background: Clear room air; well lit; light wall background

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	10:15	10:21	45	1.9	21				
2	10:21	10:23	N	N	22				
3	11:03	11:07	0	0	23				
4	11:07	11:13	65	2.7	24				
5	11:16	11:22	60	2.5	25				
6	11:22	11:28	40	1.7	26				
7	11:28	11:34	25	1.0	27				
8	11:36	12:01	180	9.0	28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

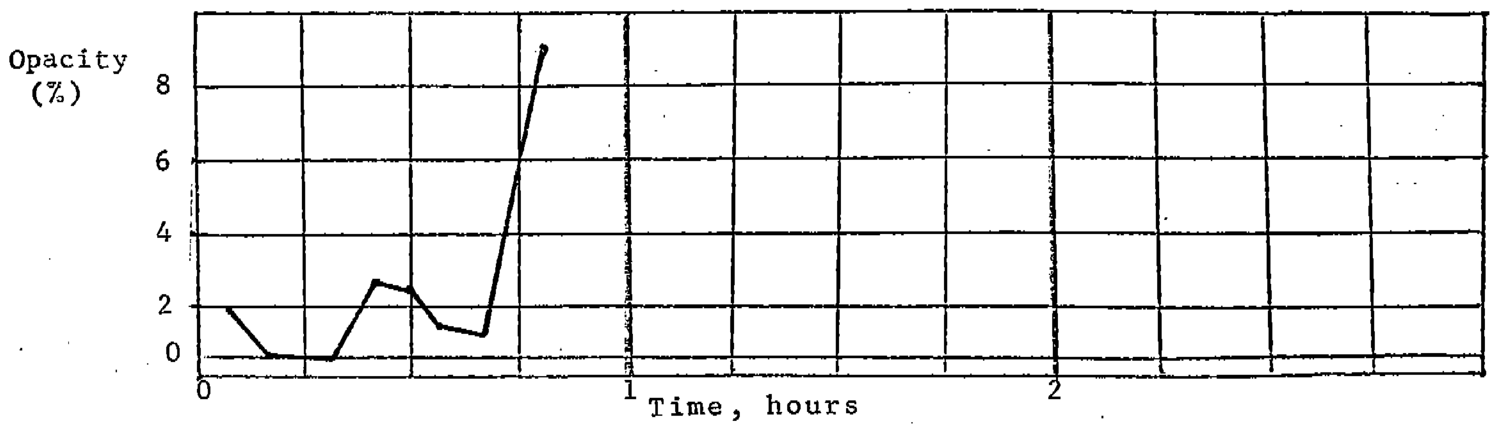


TABLE III-6

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20/76
Type of Plant: Talc Manufacturing
Type of Discharge: Process
Location of Discharge: Primary Crusher
Height of Point of Discharge: In room
Description of Sky: N/A
Wind Direction: N/A
Wind Velocity: N/A
Color of Plume: White
Detached Plume: N/A
Observer No.: 2
Duration of Observation: 1.5 hrs.
Distance from Observer to Discharge Point: approx. 5'
Direction of Observer from Discharge Point: W
Height of Observation Point: Floor
Description of Background: Semi-dusty room air; semi-well lit; wooden wall background

SUMMARY OF AVERAGE OPACITY									
Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	12:58	13:04	0	0	21				
2	13:06	13:12	80	3.3	22				
3	13:12	13:18	60	2.5	23				
4	13:18	13:24	75	3.1	24				
5	13:24	13:30	50	2.1	25				
6	13:33	13:39	40	1.7	26				
7	13:39	13:45	N	N	27				
8	13:45	13:51	50	2.1	28				
9	13:51	13:57	20	.8	29				
10	13:57	14:03	25	1.3	30				
11	14:11	14:17	20	.8	31				
12	14:17	14:23	15	.6	32				
13	14:23	14:29	45	1.9	33				
14	14:29	14:35	30	1.3	34				
15	14:35	14:41	90	3.8	35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

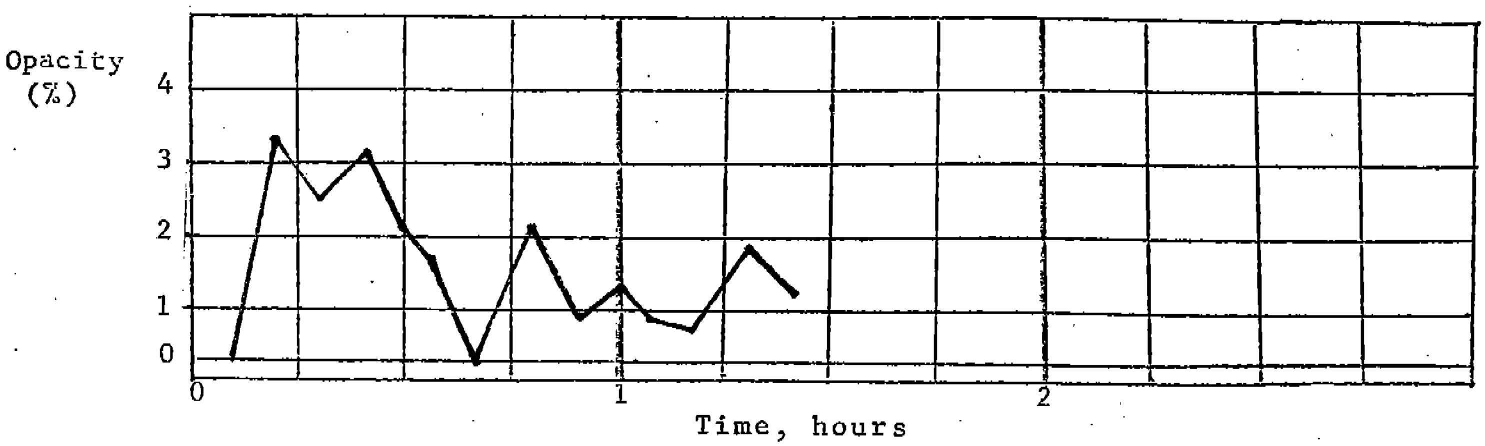


TABLE III-7

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20-21/76
Type of Plant: Talc Manufacturing
Type of Discharge: Process
Location of Discharge: Vertical Mill
Height of Point of Discharge: In room
Description of Sky: N/A
Wind Direction: N/A
Wind Velocity: N/A
Color of Plume: White
Detached Plume: N/A
Observer No.: 2
Duration of Observation: 1.5 hrs.
Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: W
Height of Observation Point: floor
Description of Background: Clear room air; well lit; dark ceiling

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	14:57	15:03	N	N	21				
2	15:03	15:09	N	N	22				
3	15:09	15:15	N	N	23				
4	15:15	15:21	N	N	24				
5	15:21	15:27	N	N	25				
6	15:27	15:33	N	N	26				
7	15:33	15:39	N	N	27				
8	15:39	15:45	N	N	28				
9	15:45	15:51	N	N	29				
10	15:51	15:57	N	N	30				
11	15:57	16:00	N	N	31				
12	07:41	07:47	N	N	32				
13	07:47	07:53	N	N	33				
14	07:53	07:59	N	N	34				
15	07:59	08:05	N	N	35				
16	08:05	08:10	N	N	36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

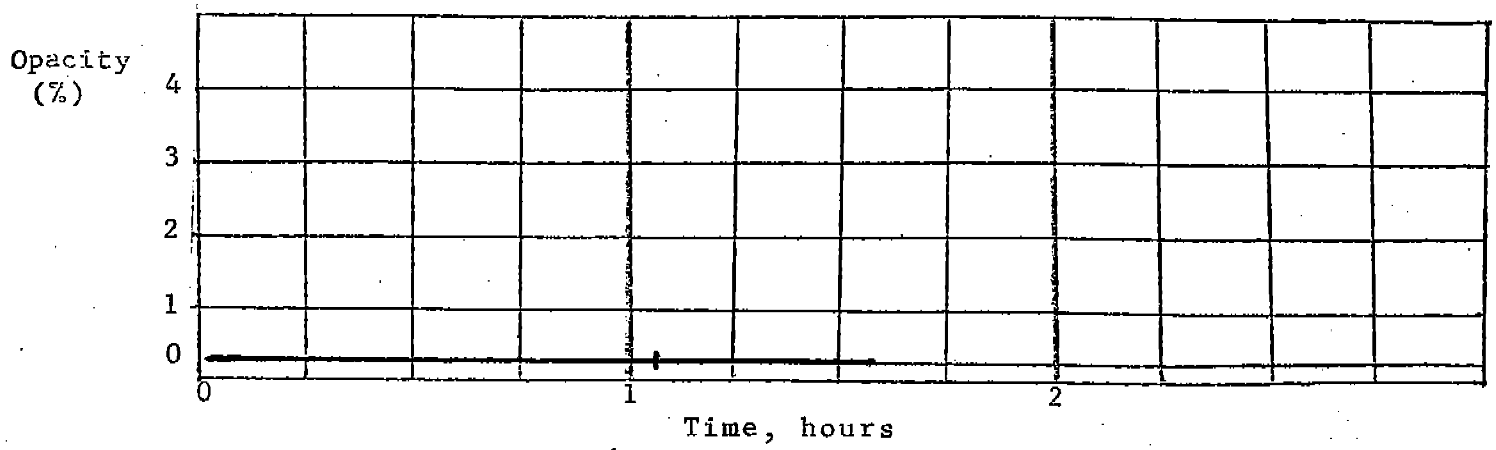


TABLE III-8

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/21/76
Type of Plant: Talc Manufacturing
Type of Discharge: Process
Location of Discharge: Secondary Crusher
Height of Point of Discharge: In room
Description of Sky: N/A
Wind Direction: N/A
Wind Velocity: N/A
Color of Plume: White
Detached Plume: N/A
Observer No.: 2
Duration of Observation: 1 hr.
Distance from Observer to Discharge Point: approx. 5'
Direction of Observer from Discharge Point: S
Height of Observation Point: Floor
Description of Background: Clear room air; semi-well lit; wooden background

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	08:20	08:26	0	0	21				
2	08:26	08:32	0	0	22				
3	08:32	08:38	5	0.2	23				
4	08:38	08:44	10	0.4	24				
5	08:44	08:50	15	0.6	25				
6	08:51	08:57	5	0.2	26				
7	08:57	09:03	5	0.2	27				
8	09:03	09:09	0	0	28				
9	09:09	09:15	5	0.2	29				
10	09:15	09:21	10	0.4	30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

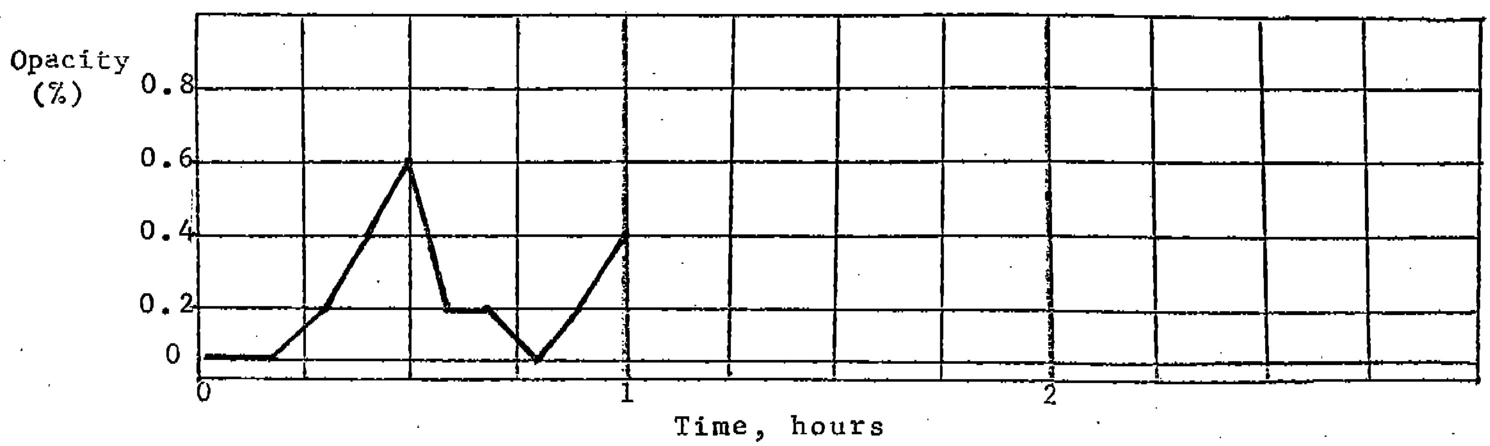


TABLE III-9

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/21/76 Type of Plant: Talc Manufacturing
Type of Discharge: Process Location of Discharge: Bagger
Height of Point of Discharge: In room Description of Sky: N/A
Wind Direction: N/A Wind Velocity: N/A
Color of Plume: White Detached Plume: N/A
Observer No.: 2 Duration of Observation: 1 hr.
Distance from Observer to Discharge Point: approx. 10'
Direction of Observer from Discharge Point: W
Height of Observation Point: Floor
Description of Background: Clear room air; well lit; light wall background

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	10:07	10:13	0	0	21				
2	10:13	10:20	5	0.2	22				
3	10:20	10:24	10	0.6	23				
4	10:55	11:01	5	0.2	24				
5	11:05	11:11	20	0.8	25				
6	11:12	11:17	0	0	26				
7	11:19	11:25	N	N	27				
8	11:25	11:31	0	0	28				
9	11:31	11:37	45	1.9	29				
10	11:37	11:46	0	0	30				
11	11:46	11:49	0	0	31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Sketch Showing How Opacity Varied With Time:

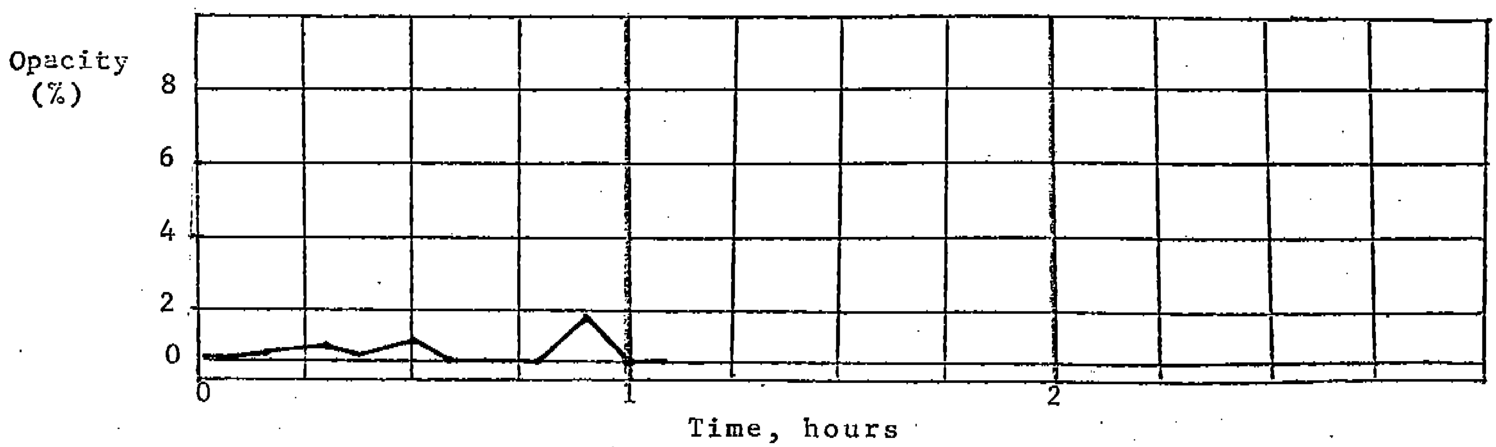


TABLE III-10

SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20/76
Type of Discharge: Stack
Height of Point of Discharge: 30'
Wind Direction: 290° NW
Color of Plume: White
Observer No.: 1
Type of Plant: Magnesia Prep. Plant
Location of Discharge: Baghouse Outlet
Description of Sky: Overcast
Wind Velocity: 4-7 mi/hr
Detached Plume: N/A
Duration of Observation: 2:22 min.
Distance from Observer to Discharge Point: approx. 100 '
Direction of Observer from Discharge Point: 160° SE
Height of Observation Point: approx. 36'
Description of Background: Hills and trees

SUMMARY OF AVERAGE OPACITY

Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	08:35	08:41	0	0	21	10:35	10:41	5	0.2
2	08:41	08:47	5	0.2	22	10:41	10:47	5	0.2
3	08:47	08:53	5	0.2	23	10:47	10:53	10	0.4
4	08:53	08:59	5	0.2	24	10:53	10:58	5	0.25
5	08:59	09:05	5	0.2	25				
6	09:05	09:11	5	0.2	26				
7	09:11	09:17	10	0.4	27				
8	09:17	09:23	5	0.2	28				
9	09:23	09:29	5	0.2	29				
10	09:29	09:35	5	0.2	30				
11	09:35	09:41	0	0	31				
12	09:41	09:47	10	0.4	32				
13	09:47	09:53	0	0	33				
14	09:53	09:59	0	0	34				
15	09:59	10:05	5	0.2	35				
16	10:05	10:11	5	0.2	36				
17	10:11	10:17	10	0.4	37				
18	10:17	10:23	5	0.2	38				
19	10:23	10:29	0	0	39				
20	10:29	10:35	10	0.4	40				

Sketch Showing How Opacity Varied With Time:

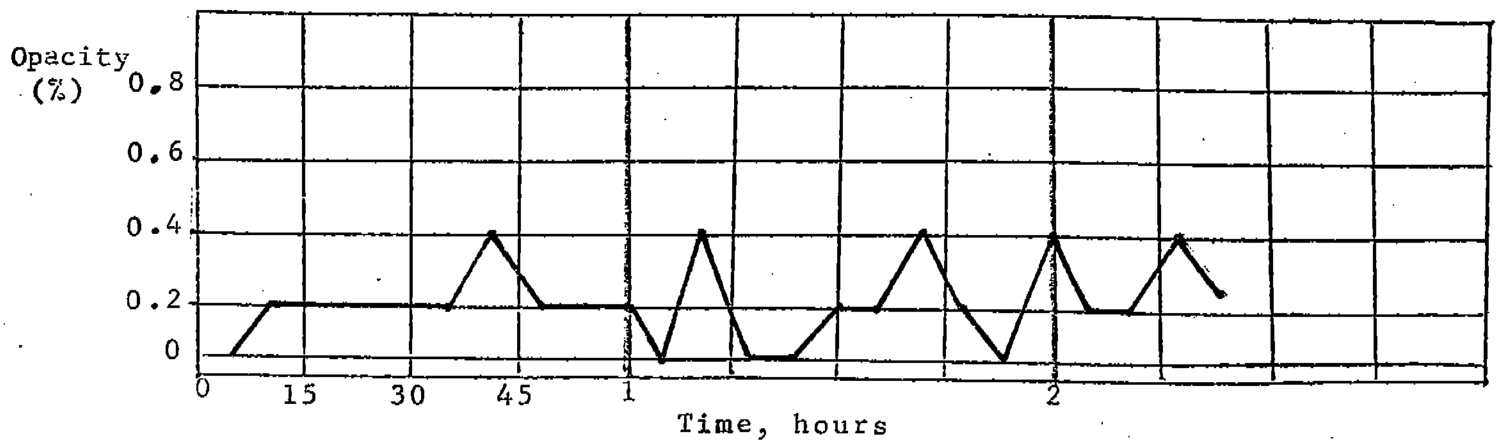


TABLE III-11
SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/20/76
Type of Discharge: Stack
Height of Point of Discharge: 30'
Wind Direction: 290° NW
Color of Plume: White
Observer No.: 1
Type of Plant: Magnesia Prep. Plant
Location of Discharge: Baghouse Outlet
Description of Sky: Overcast - Rain
Wind Velocity: 4-7 mi/hr
Detached Plume: N/A
Duration of Observation: 2:05 min.
Distance from Observer to Discharge Point: 100'
Direction of Observer from Discharge Point: 160° SE
Height of Observation Point: approx. 36'
Description of Background: Hills and trees

SUMMARY OF AVERAGE OPACITY									
Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	12:54	13:00	0	0	21	14:54	14:59	0	0
2	13:00	13:06	0	0	22				
3	13:06	13:12	0	0	23				
4	13:12	13:18	5	0.2	24				
5	13:18	13:24	5	0.2	25				
6	13:24	13:30	10	0.4	26				
7	13:30	13:36	5	0.2	27				
8	13:36	13:42	5	0.2	28				
9	13:42	13:48	15	0.6	29				
10	13:48	13:54	15	0.6	30				
11	13:54	14:00	5	0.2	31				
12	14:00	14:06	0	0	32				
13	14:06	14:12	5	0.2	33				
14	14:12	14:18	0	0	34				
15	14:18	14:24	5	0.2	35				
16	14:24	14:30	0	0	36				
17	14:30	14:36	5	0.2	37				
18	14:36	14:42	5	0.2	38				
19	14:42	14:48	0	0	39				
20	14:48	14:54	0	0	40				

Sketch Showing How Opacity Varied With Time:

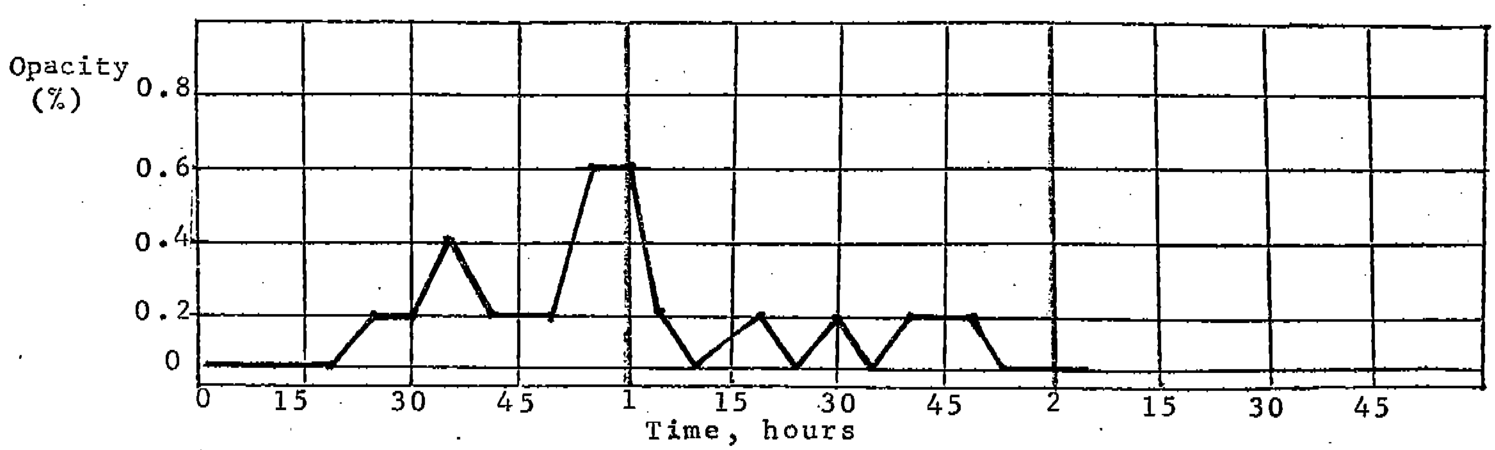


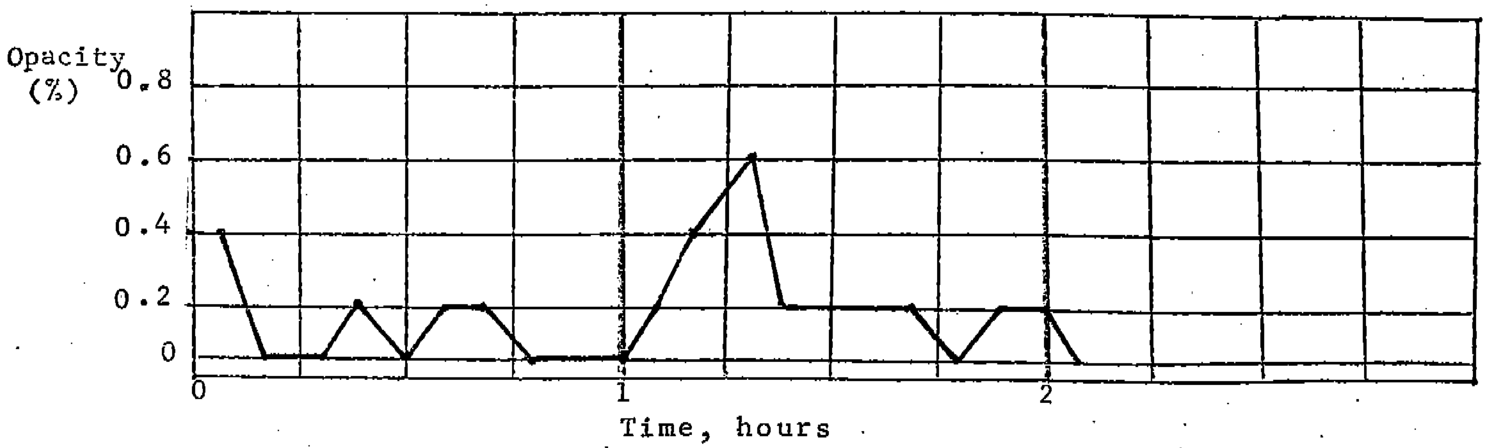
TABLE III-12
SUMMARY OF VISIBLE EMISSIONS

Eastern Magnesia Talc Company
Johnson, Vermont

Date: 10/21/76
Type of Discharge: Stack
Height of Point of Discharge: 30'
Wind Direction: 60° NE
Color of Plume: White
Observer No.: 1
Type of Plant: Magnesia Prep. Plant
Location of Discharge: Baghouse Outlet
Description of Sky: Overcast - Rain
Wind Velocity: 8-12 mi/hr - Gust up to 20
Detached Plume: N/A
Duration of Observation: approx. 2 hrs.
Distance from Observer to Discharge Point: approx. 100'
Direction of Observer from Discharge Point: 160° SE
Height of Observation Point: approx. 36'
Description of Background: Hills and trees

SUMMARY OF AVERAGE OPACITY									
Set Number	Time		Opacity		Set Number	Time		Opacity	
	Start	End	Sum	Average		Start	End	Sum	Average
1	08:00	08:06	10	0.4	21	10:00	10:05	0	0
2	08:06	08:12	0	0	22				
3	08:12	08:18	0	0	23				
4	08:18	08:24	5	0.2	24				
5	08:24	08:30	0	0	25				
6	08:30	08:36	5	0.2	26				
7	08:36	08:42	5	0.2	27				
8	08:42	08:48	0	0	28				
9	08:48	08:54	0	0	29				
10	08:54	09:00	0	0	30				
11	09:00	09:06	5	0.2	31				
12	09:06	09:12	10	0.4	32				
13	09:12	09:18	15	0.6	33				
14	09:18	09:24	5	0.2	34				
15	09:24	09:30	5	0.2	35				
16	09:30	09:36	5	0.2	36				
17	09:36	09:42	5	0.2	37				
18	09:42	09:48	0	0	38				
19	09:48	09:54	5	0.2	39				
20	09:54	10:00	5	0.2	40				

Sketch Showing How Opacity Varied With Time:



with the emission testing, while the in-plant measurements do not always correspond with the source testing measurements. No opacity measurements of fugitive emissions outside the plant were taken during the study, as specified by the EPA Project Officer.

The in-plant opacity measurements reflect only the opacity of the fugitive leaks observed around seams, edges, or collection hoppers on the process equipment; they do not necessarily reflect the magnitude of the observed emissions. For example, small leaks around the perimeter of the Roller Mill were observed at the edges of an access door. The apparent absolute amount of visible emissions appeared to be slight; however, the emissions were relatively opaque near the source. The plumes then dissipated rapidly into the room air. No in-plant source was observed to contribute significantly to the overall opacity of the workroom air — which in general was of zero opacity except on October 21, a windy day, when settled dust contributed to generally higher room air opacities in some locations. Some opacity data taken at the bagging operation were elevated above typical levels when the operator "blew out" the bagging machine of residual material at the end of a batch. This practice constituted a very small portion of the total time required for bagging a given batch of product material as indicated in Tables III-3 and III-5.

The visible emissions at the baghouse outlet stack were observed to be cyclic with a visible plume being produced for several seconds every 20 seconds when the bags were subjected to automatic pulse cleaning. At all other times, visible emissions at the outlet stack were nearly zero. Appendix C includes the visible emissions field data sheets.

Particle Size Sampling Results

Particle size samples were taken at Baghouse Inlets 1, 2, and 3. Tables IV-1, IV-2, and IV-3 display the results of the particle size analyses on samples taken at these inlet locations, respectively. Figures 1, 2, and 3 present the log-normal, graphical plots of these size distributions, respectively.

Figure 1 shows that the geometric mean particle size at Inlet No. 1 was found to be approximately 15 microns, with 67 percent greater than 10 microns in diameter. Figure 2 shows that the geometric mean particle size at Inlet No. 2 was approximately six microns, with 15 percent greater than 10 microns. Finally, Figure 3 shows that the geometric mean particle size measured at Inlet No. 3 was approximately nine microns, with 42 percent greater than 10 microns. No particle size measurements were made in Baghouse Inlets 1-A or 1-B, or the outlet stack.

TABLE IV-1

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 1

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Characteristic Diameter of Particles (microns)	Weight (gm)	Size Distribution by Weight	
		Percent	Cumulative Percent
>55.4	1.564	8.7	100.0
43.9 - 55.4	0.066	0.4	91.3
34.9 - 43.9	0.755	4.2	90.9
27.7 - 34.9	1.547	8.6	86.7
22.0 - 27.7	1.911	10.6	78.1
17.4 - 22.0	1.979	10.9	67.5
13.8 - 17.4	1.724	9.5	56.6
11.0 - 13.8	1.517	8.4	47.1
8.7 - 11.0	1.498	8.3	38.7
6.9 - 8.7	1.636	9.0	30.4
5.5 - 6.9	1.291	7.1	21.4
4.4 - 5.5	1.035	5.7	14.3
3.5 - 4.4	0.866	4.8	8.6
3.0 - 3.5	0.132	0.7	3.8
2.5 - 3.0	0.219	1.2	3.1
2.0 - 2.5	0.158	0.9	1.9
1.5 - 2.0	0.100	0.6	1.0
1.0 - 1.5	0.051	0.3	0.4
0.5 - 1.0	0.017	0.09	0.1
<0.5	0.002	0.01	<0.1
TOTAL	18.068	100.0	—

TABLE IV-2

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 2

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Characteristic Diameter of Particles (microns)	Weight (gm)	Size Distribution by Weight	
		Percent	Cumulative Percent
>29.0	0.002	0.04	100.0
23.7 - 29.0	0.010	0.2	100.0
18.8 - 23.7	<0.005	<0.1	99.8
14.9 - 18.8	0.014	0.3	99.7
11.9 - 14.9	0.113	2.3	99.4
9.4 - 11.9	0.799	16.2	97.1
7.5 - 9.4	1.849	37.6	80.9
5.9 - 7.5	1.210	24.6	43.3
4.7 - 5.9	0.552	11.2	18.7
3.7 - 4.7	0.191	3.9	7.5
3.0 - 3.7	0.076	1.5	3.6
2.4 - 3.0	0.040	0.8	2.1
1.9 - 2.4	0.047	1.0	1.3
1.5 - 1.9	0.005	0.1	0.3
1.0 - 1.5	0.007	0.1	0.2
0.5 - 1.0	0.002	0.04	0.1
<0.5	0.0003	0.007	<0.1
TOTAL	4.922	100.0	—

TABLE IV-3

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Characteristic Diameter of Particles (microns)	Weight (gm)	Size Distribution by Weight	
		Percent	Cumulative Percent
>43.9	0.014	0.09	100.0
34.9 - 43.9	0.118	0.7	99.9
27.7 - 34.9	0.207	1.3	99.2
22.0 - 27.7	0.544	3.4	97.9
17.4 - 22.0	1.258	7.8	94.5
13.8 - 17.4	2.148	13.4	86.7
11.0 - 13.8	2.633	16.4	73.3
8.7 - 11.0	2.601	16.2	56.9
6.9 - 8.7	2.585	16.1	40.7
5.5 - 6.9	1.929	12.0	24.7
4.4 - 5.5	0.810	5.1	12.6
3.5 - 4.4	0.230	1.4	7.5
3.0 - 3.5	0.457	2.9	6.1
2.5 - 3.0	0.207	1.3	3.2
2.0 - 2.5	0.144	0.9	1.9
1.5 - 2.0	0.088	0.6	1.0
1.0 - 1.5	0.043	0.3	0.4
0.5 - 1.0	0.014	0.09	0.1
<0.5	0.002	0.01	<0.1
TOTAL	16.032	100.0	—

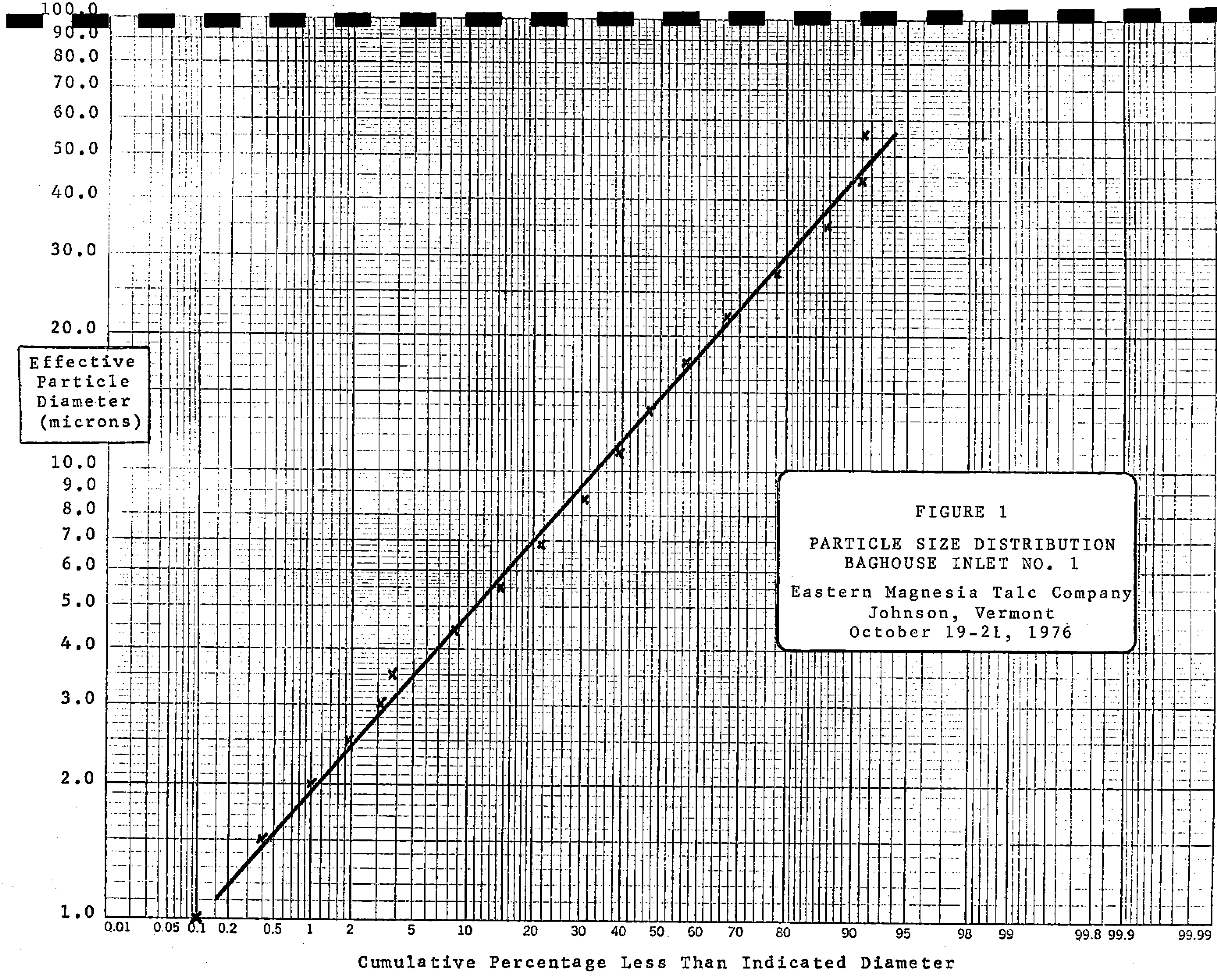


FIGURE 1

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 1

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

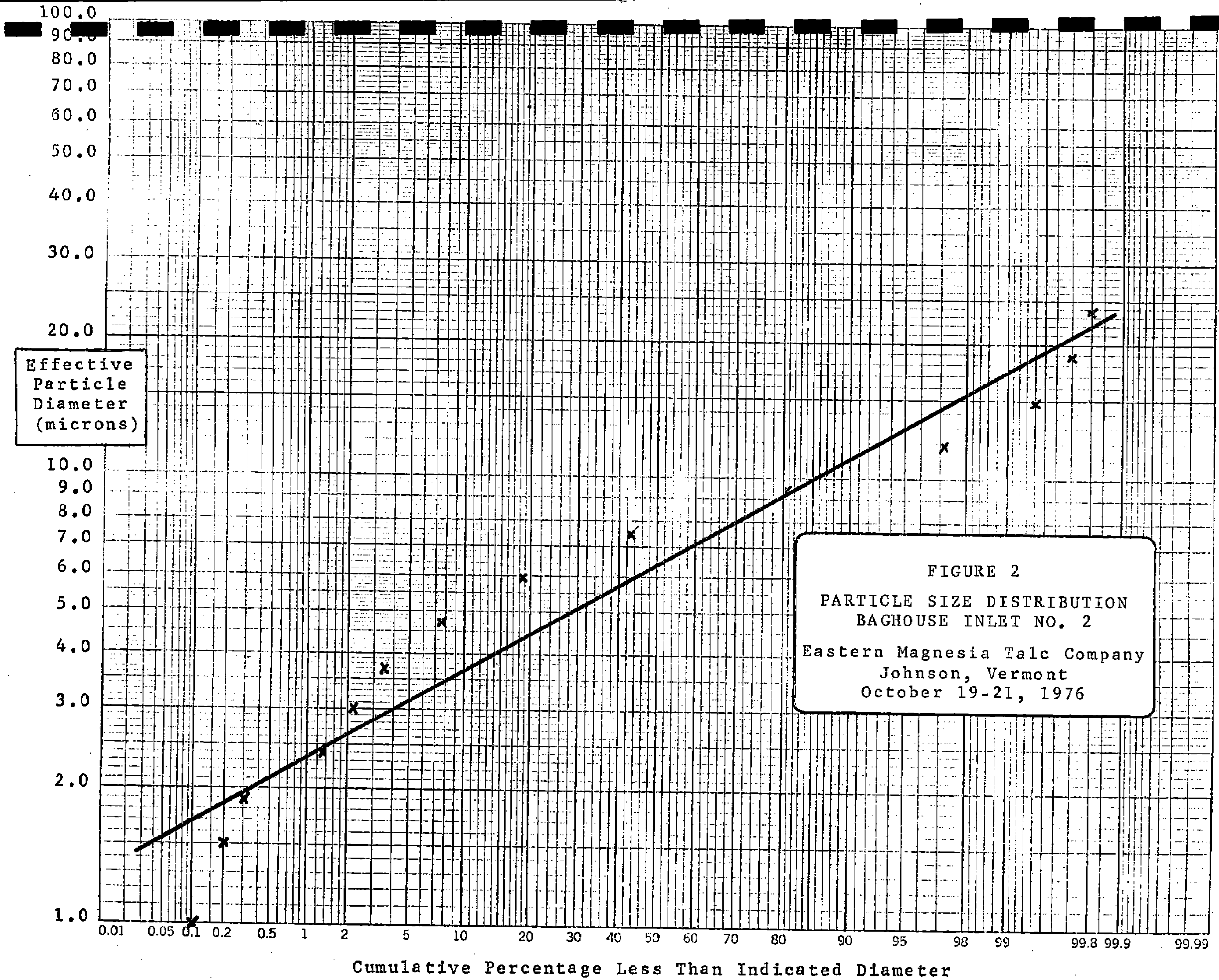


FIGURE 2

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 2

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

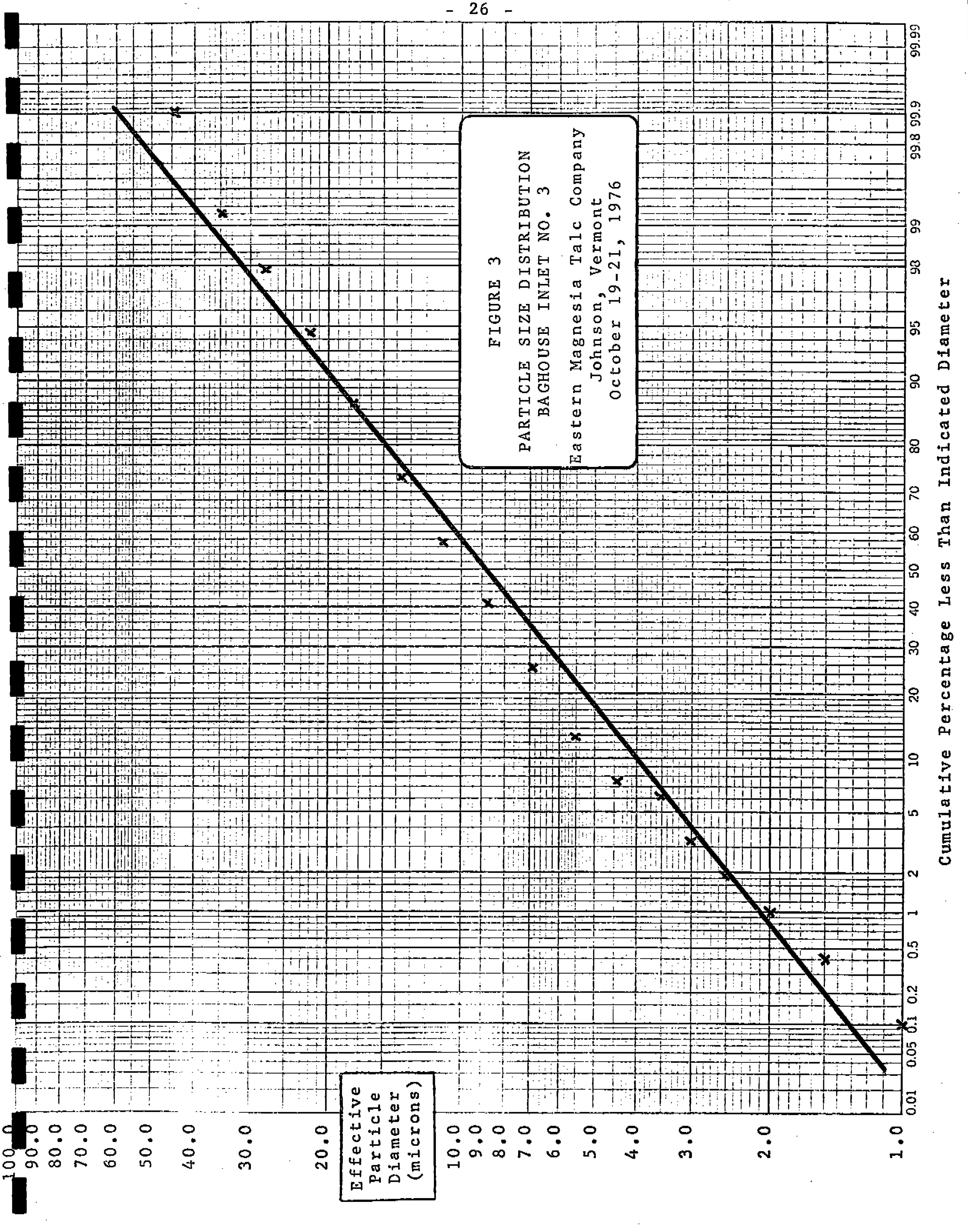


FIGURE 3

PARTICLE SIZE DISTRIBUTION
BAGHOUSE INLET NO. 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

III. LOCATION OF SAMPLING POINTS

Figure 4 depicts the baghouse whose emissions were measured in this study together with its vertical outlet stack. The outlet sampling location is positioned as shown on the 24-inch diameter vertical cylindrical stack, and thus was sampled from two ports separated by 90°, as required by EPA Method 1. Figure 5 is a diagram of the traverse points used at this location. The duct was divided into equal annular areas, and a total of 12 points were utilized during the initial velocity traverses.

Figure 6 depicts the sampling ducts for Inlets 1, 1-A, and 1-B. Inlet location No. 1 is a 22-1/2-inch diameter horizontal cylindrical duct, and thus was sampled from two ports separated by 90°, as required by EPA Method 1. Figure 7 is a diagram of the traverse points used at this location. The duct was divided into equal annular areas, and a total of 12 points were utilized during the initial velocity traverse.

Inlet locations 1-A and 1-B are both 4-inch diameter horizontal cylindrical ducts. They were both sampled from a single point, the center-line point, because of their small size. The velocity traverse was made using two ports separated by 90° as required by EPA Method 1. Figure 8 is a diagram of the traverse points used at each of these locations. The ducts were divided into equal annular areas, and a total of eight points were utilized during the initial velocity traverse. The flowrate at the center-line point was checked at the beginning and end of each traverse.

FIGURE 4

SCHEMATIC DIAGRAM OF
BAGHOUSE AND OUTLET SAMPLING LOCATION

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

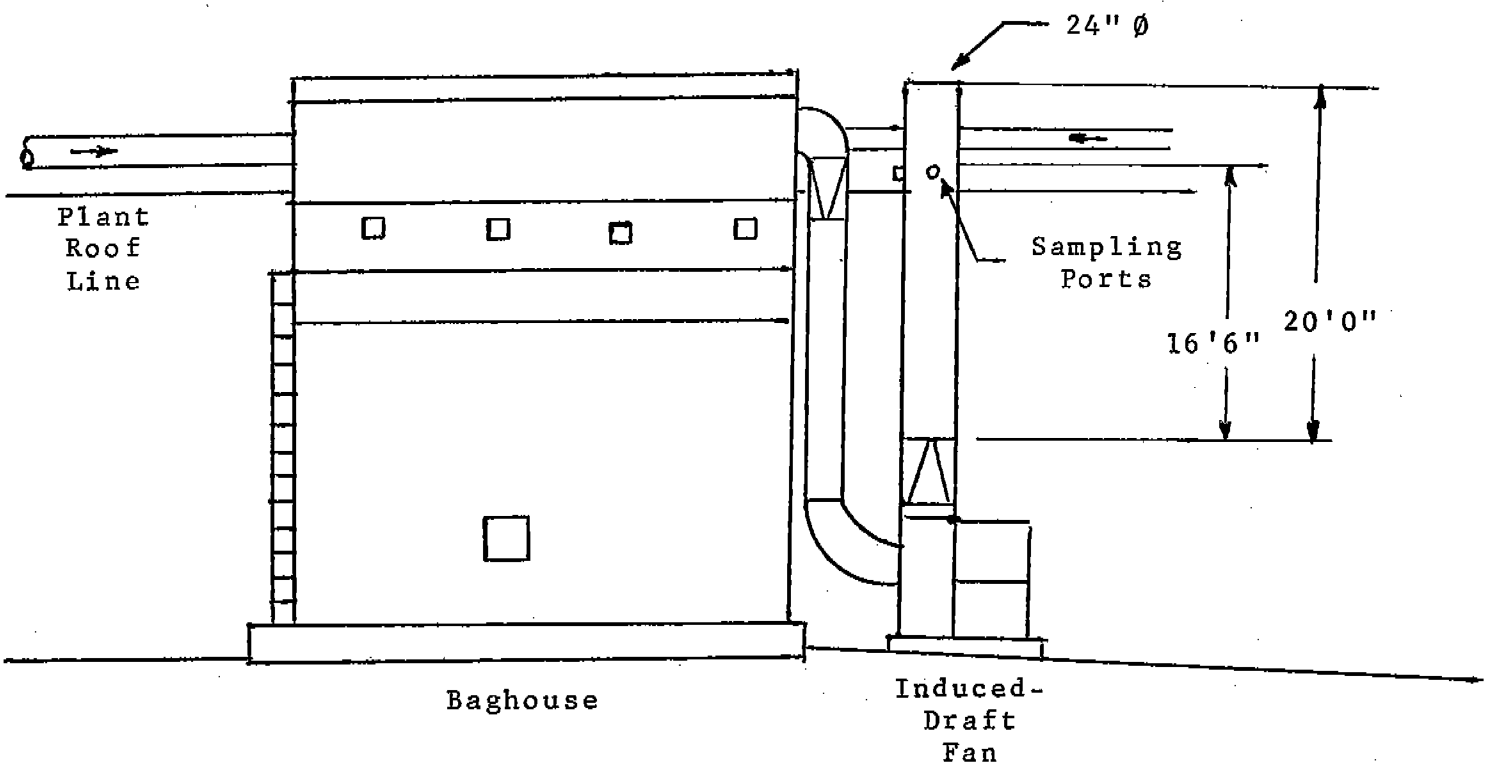


FIGURE 5

SCHEMATIC DIAGRAM OF SAMPLING POINT LOCATIONS
OUTLET STACK

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Position	Distance (inches)
1	1.1
2	3.5
3	7.1
4	16.9
5	20.5
6	22.9

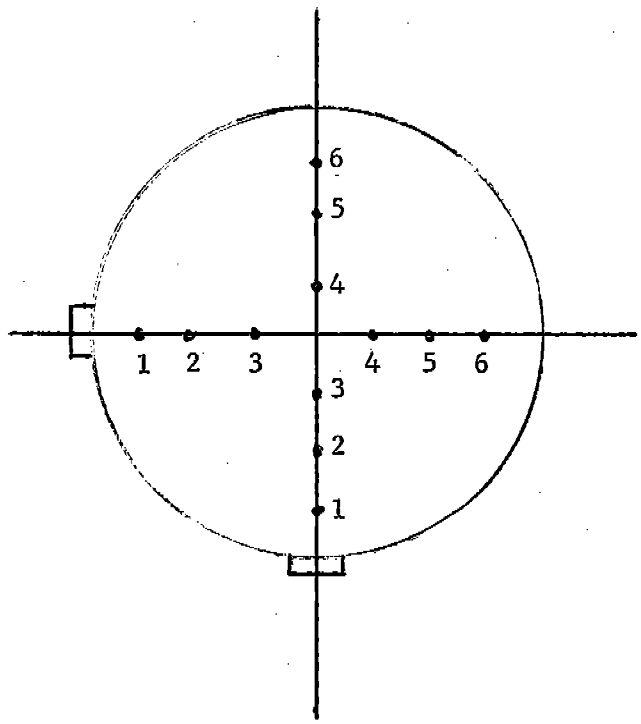


FIGURE 6

SCHEMATIC DIAGRAM OF BAGHOUSE
INLETS 1, 1-A, and 1-B

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

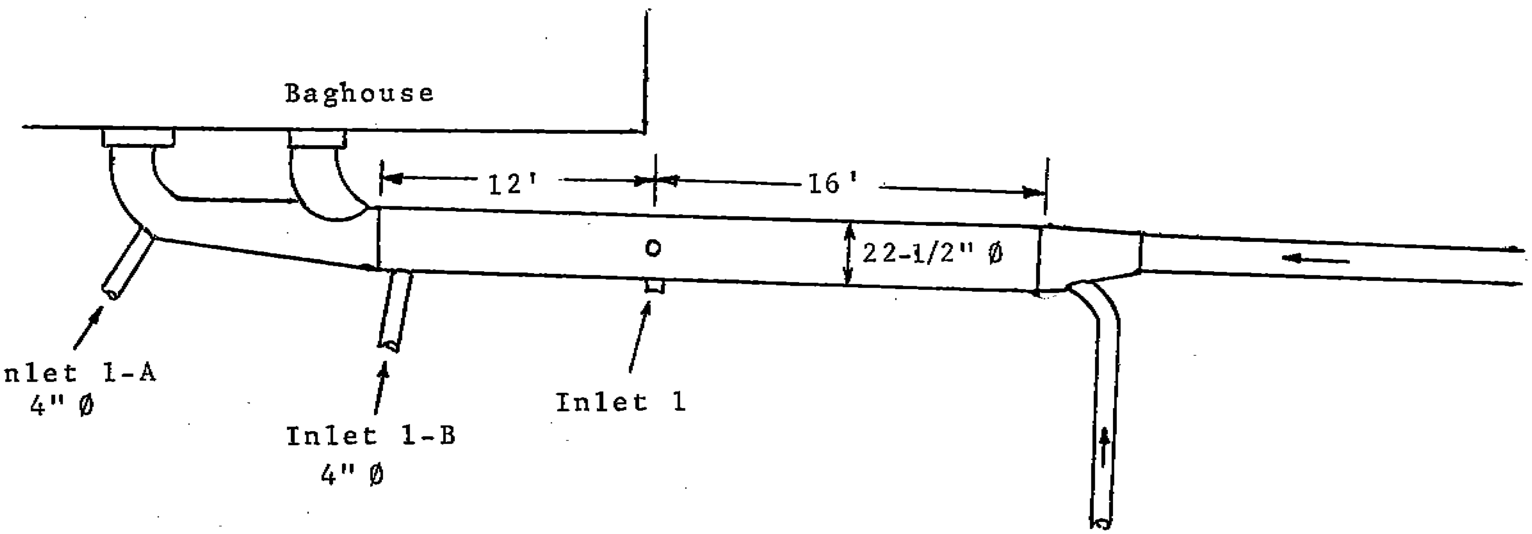


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FIGURE 7

SCHEMATIC DIAGRAM OF SAMPLING POINT LOCATIONS
INLET NO. 1

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Position	Distance (inches)
1	1.0
2	3.3
3	6.6
4	15.9
5	19.2
6	21.5

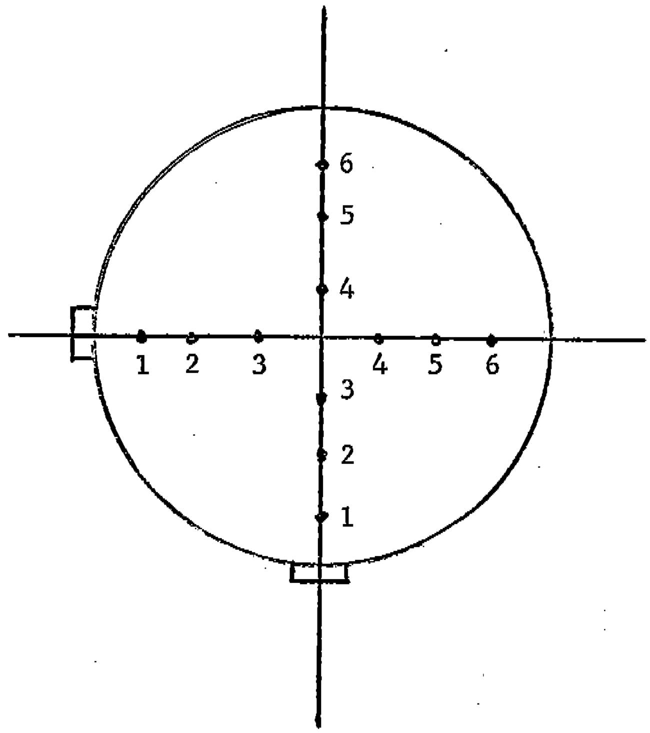


FIGURE 8

SCHEMATIC DIAGRAM OF SAMPLING POINT LOCATIONS
INLETS 1-A AND 1-B

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Position	Distance (inches)
1	0.3
2	1.0
3	3.0
4	3.7

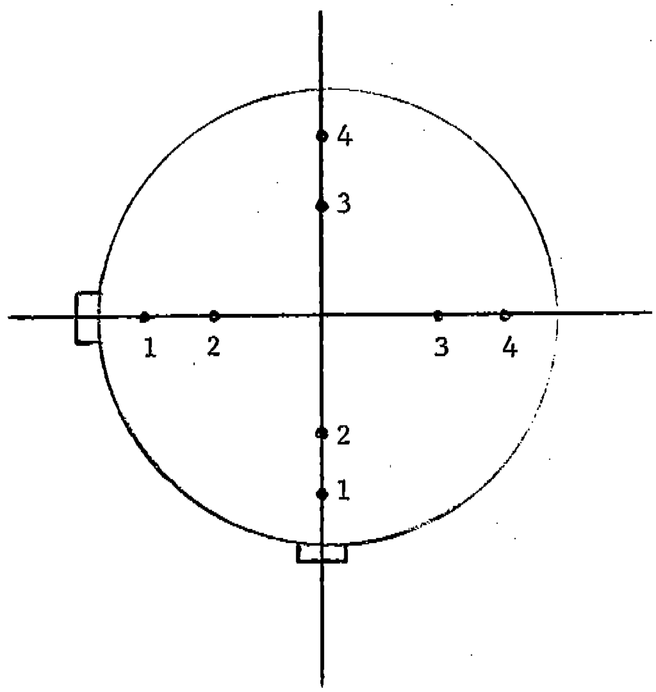


Figure 9 depicts baghouse inlet locations 2 and 3. The No. 2 inlet location is a 9-inch diameter horizontal cylindrical duct, and thus was sampled from two ports separated by 90°, as required by EPA Method 1. Figure 10 is a diagram of the traverse points used at this location. The duct was divided into equal annular areas, and a total of 12 points were utilized during the initial velocity traverse. Inlet No. 3 location is a 11-3/4-inch diameter horizontal cylindrical stack, and thus was sampled from two ports separated by 90°, as required by EPA Method 1. Figure 11 is a diagram of the traverse points used at this location. The duct was divided into equal annular areas, and a total of 12 points were utilized during the initial velocity traverse.

FIGURE 9

SCHEMATIC DIAGRAM OF
BAGHOUSE INLETS 2 AND 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

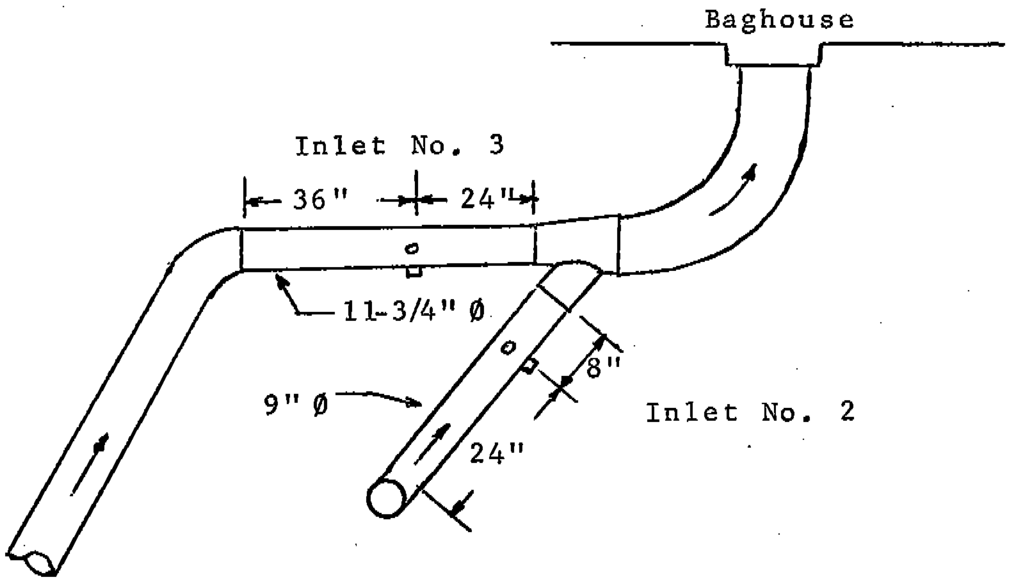


FIGURE 10

SCHEMATIC DIAGRAM OF SAMPLING POINT LOCATIONS
INLET NO. 2

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Position	Distance (inches)
1	0.4
2	1.3
3	2.6
4	6.4
5	7.7
6	8.6

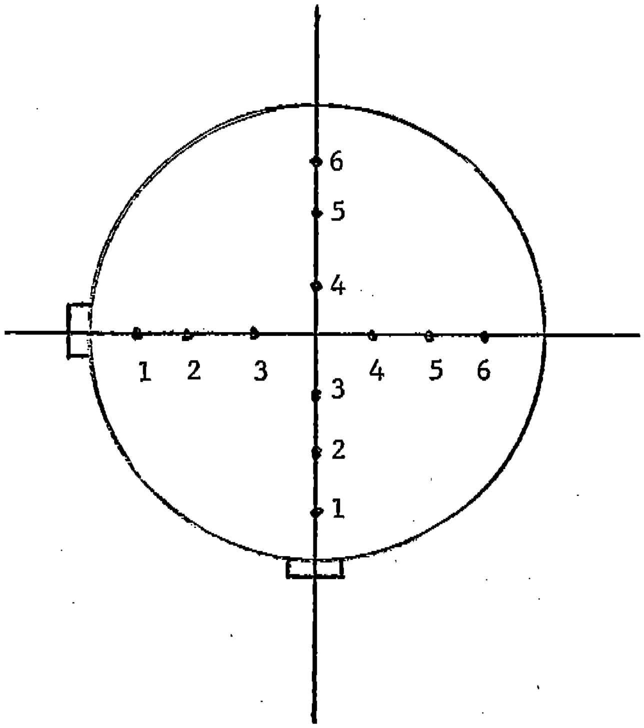
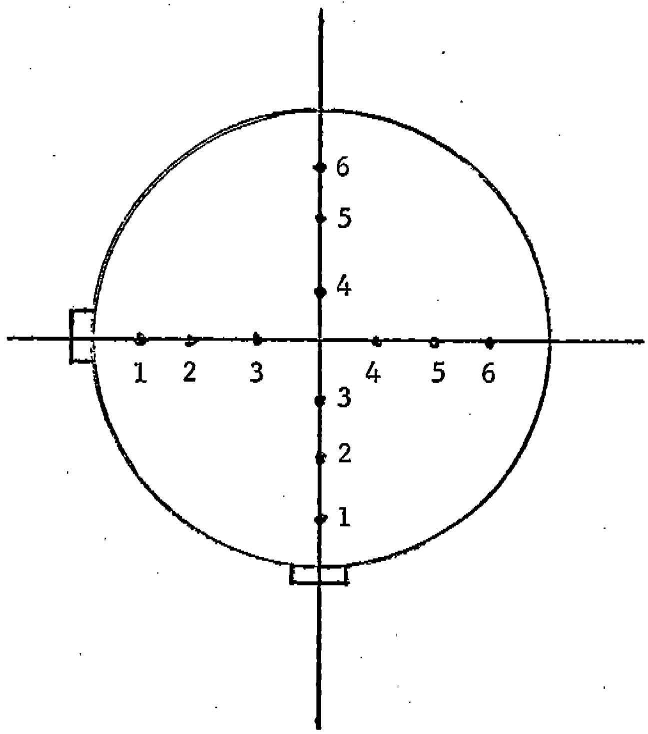


FIGURE 11

SCHEMATIC DIAGRAM OF SAMPLING POINT LOCATIONS
INLET NO. 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

Position	Distance (inches)
1	0.5
2	1.7
3	3.4
4	8.3
5	10.0
6	11.2



IV. SAMPLING AND ANALYTICAL PROCEDURES

All samples obtained at the baghouse outlet stack and inlet ducts 1-A and 1-B followed the procedures outlined in EPA draft Method 17 (see Appendix D). In this instance, a 47-millimeter Gelman filter holder was employed for in-stack filtration, as shown in Figure 12.

The test procedure for inlet ducts 1, 2, and 3 was a modification of EPA Method 17. The in-stack filter holder was replaced by a section of Teflon probe leading from the sampling nozzle out of the stack to a 110-millimeter stainless steel filter holder, as shown in Figure 13.

Particle size sampling at inlet ducts 1, 2, and 3 employed an alundum thimble connected to the nozzle by a 12-inch section of stainless steel probe followed by a 47-millimeter type SGA filter contained in a stainless steel Gelman filter holder. This sampling train is shown in Figure 14. Only the contents of the thimble were retained for analysis by microsieving at the Clayton Environmental Consultants laboratory. The portion of the sample found to be less than 45 microns was sent to Battelle Columbus Laboratories for further particle size determination by electronic particle counter methods.

All opacity data were obtained according to EPA Method 9.

Appendix E contains the sampling summary sheets. Appendices F and G present the particulate weight data and the calibration data, respectively. Appendix H presents example calculations.

FIGURE 12

SCHEMATIC DIAGRAM OF PARTICULATE SAMPLING TRAIN
BAGHOUSE OUTLET STACK AND INLET DUCTS 1-A AND 1-B

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

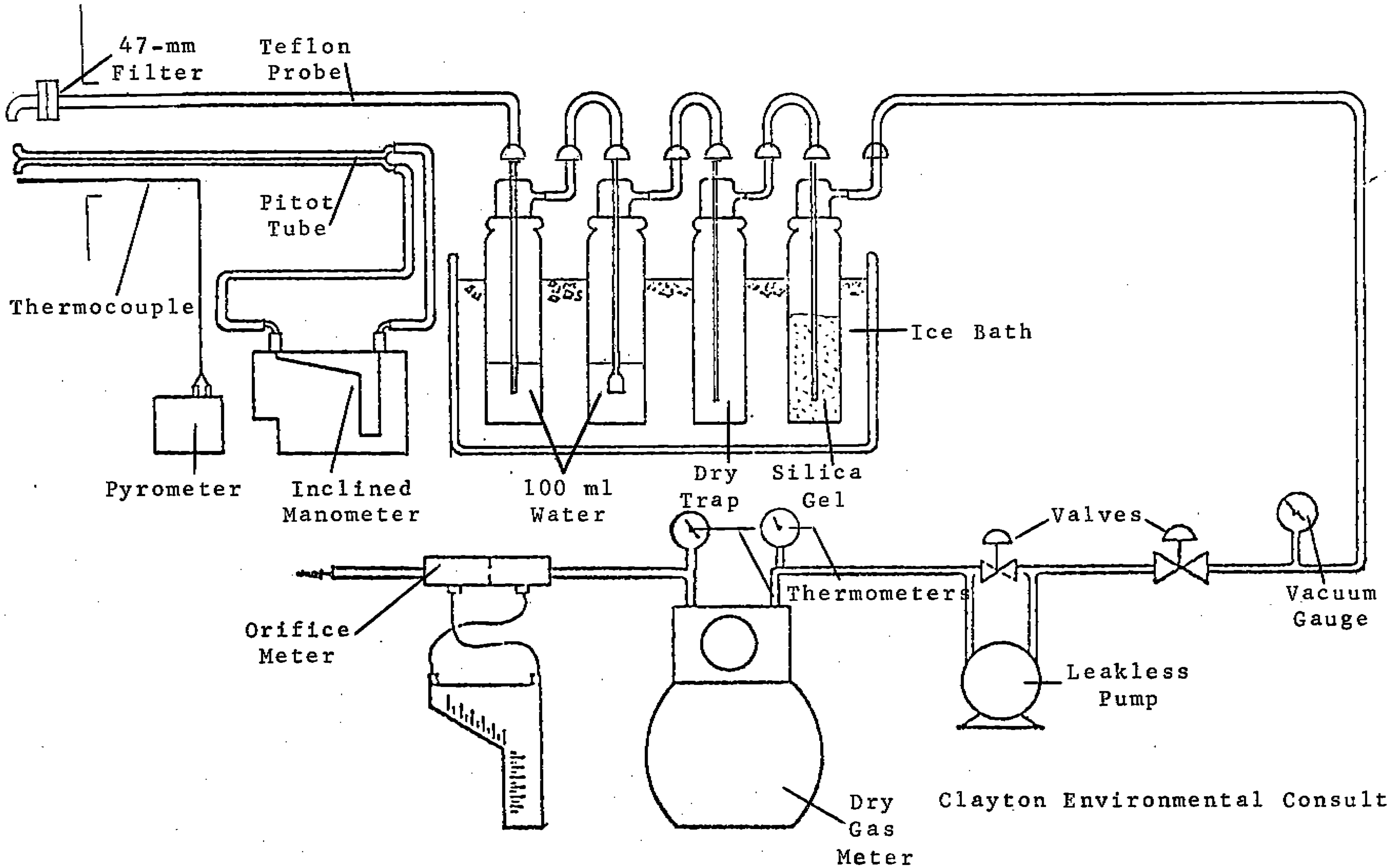


FIGURE 13

SCHEMATIC DIAGRAM OF PARTICULATE SAMPLING TRAIN
BAGHOUSE INLETS 1, 2, AND 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976

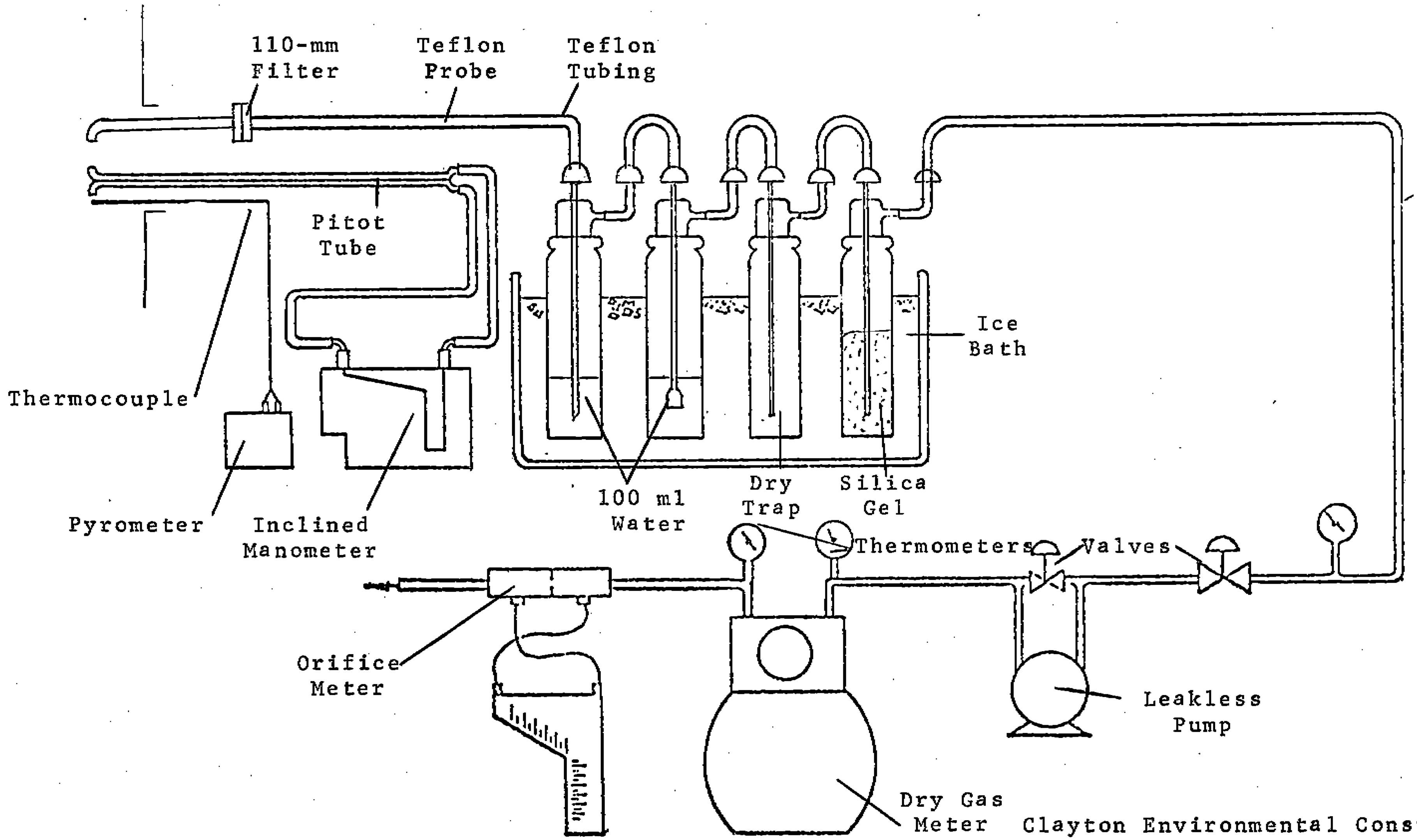
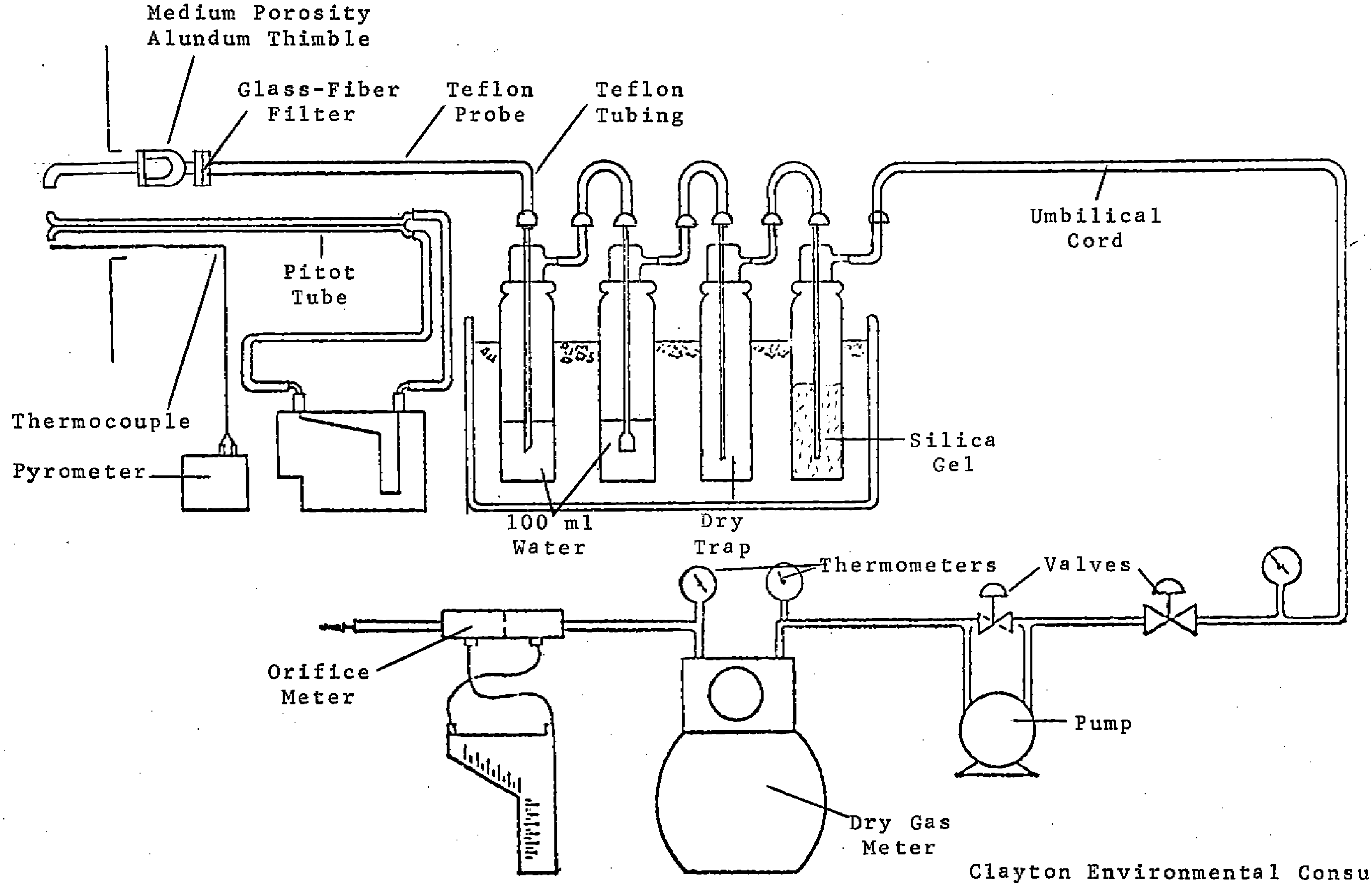


FIGURE 14

SCHEMATIC DIAGRAM OF PARTICLE SIZE SAMPLING TRAIN
BAGHOUSE INLETS 1, 2, AND 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 19-21, 1976



Clayton Environmental Consultants, Inc.

APPENDIX A

PROJECT PARTICIPANTS

<u>Clayton Environmental Consultants, Inc.</u>

Mary L. Fegan	Laboratory Technician
Harold P. Flood	Field Team Sampler
Thomas J. Geyer	Environmental Chemist
Richard J. Griffin	Field Team Sampler
Victor W. Hanson	Project Leader
Gerald E. Hawkins	Field Team Sampler
David J. Holmberg	Laboratory Supervisor
Helene M. Hysko	Data Processing
Thomas A. Loch	Visible Emissions Observer No. 2
John E. Mutchler, P.E.	Contract Manager
Nathan C. Riddle	Field Team Sampler
George M. Santorilla	Visible Emissions Observer No. 1
Justine H. Schroeder	Laboratory Technician
Kent D. Shoemaker	Environmental Chemist
Janet L. Vecchio	Data Processing

<u>U.S. Environmental Protection Agency</u>

Dennis Holzschuh	Project Officer
James Eddinger	Process Engineer

<u>Eastern Magnesia Talc Company</u>

J. Howard Shafer	General Manager
Roger Perkins	Plant Superintendent

APPENDIX B

PARTICULATE/PARTICLE SIZE FIELD DATA SHEETS

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT EPA Task 24 - Eastern Magnesia Talc Co. CREW ______

Sampling Station Baghouse Outlet Date 10/19/76 Time 13:00

Test No. Prelim. Traverse Pitot Tube No. 10 Manometer No. ______

Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
S-6	3.50	87	126.9	W-6	3.50	87	126.9
S-5	4.00	87	135.7	W-5	3.80	87	132.2
S-4	4.30	87	140.6	W-4	4.10	87	137.3
S-3	3.90	87	133.9	W-3	4.30	87	140.6
S-2	3.50	87	126.9	W-2	3.80	87	132.2
S-1	2.70	87	111.4	W-1	3.10	87	119.4
							130.3

Stack Wet Bulb Temperature, (°F) ______ Stack Dimensions 24"

A. Barometric Pressure, (In.Hg) 30.02

B. Static Pressure of Stack Gases, ($In.H_2O$) -3.4

C. Pitot Tube Correction Factor 0.822

D. Specific Gravity of Stack Gases Relative to Dry Air 1.0

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 29.77

F. Average Uncorrected Velocity, (ft/sec) 130.3 or 60 * F, (ft/min) 7820

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{\cancel{D}}}$, (ft/min) 6444

H. Area of Stack, (ft^2) 3.14

I. Actual Gas Flow Rate = G * H, (ACFM) 20,244

J. Average Stack Temperature, (°F) 87

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) 19443

where T_{std} = standard temperature, 68 °F

GDC-2

$\Delta m = 0.278 \frac{Tm}{Ts} H$

SAMPLING TRAIN DATA

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Discharge

Date: 10/20/76

Test Number: Particulate-1 (page 1 of 2)

Field Person: RJG, NCR

Filter Number: SGA-267-44 (47 mm)

Barometric Pressure ("Hg): 29.84

Stack Static Pressure ("H_2O): -3.4

Stack Dimensions: 24"

Plume Appearance:

Ambient Temperature (°F): 40

Record all Data Every 5 Minutes

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: —, Dia. (in.): 1/8

Pitot Tube No. 10, Corr. Factor: ~~0.833~~ 0.830

Meter Box No. RAC-2, Corr. Factor: ~~0.980~~ 0.98

Meter Isokinetic Factor: 1712

Assumed Moisture (%): 0.3

Condensate Volume (ml): 2

Silica Gel Weight Gain (g): 10.7

Leak Rate 0.015 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
S-6	0	8:48	4.10	75	947.501	60	56	1.10	—	35	1.0
	5	8:53	4.10	75	950.6	62	56	1.11	—	35	1.8
S-5	10	8:58	4.20	75	953.5	70	58	1.14	—	36	1.8
	15	9:03	4.35	76	956.5	76	60	1.18	—	36	2.0
S-4	20	9:08	4.50	78	959.5	79	63	1.23	—	36	2.0
	25	9:13	4.50	78	962.5	82	65	1.24	—	36	2.2
S-3	30	9:18	4.10	78	965.6	85	67	1.14	—	36	2.5
	35	9:23	4.10	78	968.6	87	70	1.14	—	36	2.5
S-2	40	9:28	3.60	78	971.6	90	72	1.01	—	37	2.8
	45	9:33	3.50	78	974.4	92	75	0.98	—	37	3.0
S-1	50	9:38	2.80	79	977.1	94	78	0.79	—	37	2.8
	55	9:43	2.80	80	979.7	95	80	0.79	—	37	3.0
	60	9:48			982.192						
AVERAGE (TOTAL)					( )						

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$\Delta m = 0.278 \frac{m}{T_s} H$

SAMPLING TRAIN DATA

Company: EPA Task 24 - Eastern Magnesia Talc Company
Source Designation: Baghouse Discharge
Date: 10/20/76
Test Number: Particulate-1 (page 2 of 2)
Field Person: RJG, NCR
Filter Number: SGA-267-44 (47 mm)
Barometric Pressure ("Hg):
Stack Static Pressure ("H_2O): -3.4
Stack Dimensions: 24"
Plume Appearance:
Ambient Temperature (°F): 40
Record all Data Every 5 Minutes

Filter Heater Setting: —
Probe Heater Setting: —
Nozzle Number: —, Dia. (in.): 1/8
Pitot Tube No. 10, Corr. Factor: 0.822
Meter Box No. RAC-2, Corr. Factor: 0.980
Meter Isokinetic Factor: 1712
Assumed Moisture (%): 0.3
Condensate Volume (ml): 2
Silica Gel Weight Gain (g): 10.7
Leak Rate 0.015 CFM at 15 "Hg

Traverse Point No.	Time		Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter			Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
	Sampling (min)	Clock			Volume (ft^3)	Temp (°F) Inlet	Temp (°F) Outlet				
W-6	60	9:51	4.10	82	982.192	96	83	1.16	—	38	4.0
	65	9:56	4.10	82	985.2	98	84	1.16	—	38	4.0
W-5	70	10:01	4.20	83	988.2	100	86	1.19	—	38	4.5
	75	10:06	4.10	83	991.2	102	87	1.16	—	38	4.8
W-4	80	10:11	4.60	84	994.4	102	88	1.30	—	38	5.2
	85	10:16	4.50	82	997.6	102	88	1.28	—	38	5.8
W-3	90	10:21	4.60	82	1000.8	102	89	1.31	—	38	6.5
	95	10:26	4.60	82	1004.0	103	89	1.31	—	38	6.8
W-2	100	10:31	3.80	82	1007.3	104	90	1.09	—	38	6.8
	105	10:36	3.70	82	1010.2	105	90	1.06	—	38	7.0
W-1	110	10:41	3.20	83	1013.1	105	91	0.91	—	38	7.0
	115	10:46	3.20	83	1015.9	105	92	0.91	—	38	7.0
	120	10:51			1018.610						
					71.109✓						
AVERAGE (TOTAL)				80°	(69.829)	92✓	77✓	1.11✓		37✓	4.0✓

$\Delta m = 0.278 \frac{T_m}{T_s} H$

SAMPLING TRAIN DATA

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Discharge

Date: 10/20/76

Test Number: Particulate-2 (page 1 of 2)

Field Person: RJG, NCR

Filter Number: SGA-267-45

Barometric Pressure ("Hg): 29.74

Stack Static Pressure ("H_2O): -3.4

Stack Dimensions: 24"

Plume Appearance:

Ambient Temperature(°F): 40

Record all Data Every 5 Minutes

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: —, Dia.(in.): 1/8

Pitot Tube No. 10, Corr.Factor: ~~0.822~~ .833

Meter Box No. RAC-2, Corr.Factor: ~~0.980~~ 0.982

Meter Isokinetic Factor: 1712

Assumed Moisture(%): 0.3

Condensate Volume(ml): 2

Silica Gel Weight Gain(g): 10.4

Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
W-6	0	12:53	4.10	82	19.263	80	74	1.13	—	38	2.0
	5	12:58	4.20	82	22.3	86	76	1.17	—	38	2.0
W-5	10	13:03	4.30	82	25.4	92	78	1.20	—	38	2.0
	15	13:08	4.70	84	28.5	96	81	1.32	—	38	2.2
W-4	20	13:13	4.60	84	31.7	99	83	1.30	—	38	2.2
	25	13:18	4.60	84	34.9	102	86	1.30	—	38	2.5
W-3	30	13:23	4.60	84	38.2	104	88	1.31	—	39	2.8
	35	13:28	4.60	84	41.4	106	90	1.31	—	39	3.0
W-2	40	13:33	3.80	84	44.6	108	92	1.09	—	39	3.0
	45	13:38	3.80	84	47.6	108	94	1.09	—	39	3.0
W-1	50	13:43	3.00	85	50.6	109	95	0.86	—	40	2.8
	55	13:48	2.90	85	53.3	109	96	0.83	—	40	2.8
	60	13:53			55.940						
AVERAGE (TOTAL)					( )						

SAMPLING TRAIN DATA $\Delta m = 0.278 \frac{T_m}{T_S} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Discharge

Date: 10/20/76

Filter Heater Setting: —

Test Number: Particulate -2 (page 2 of 2)

Probe Heater Setting: —

Field Person: RJG, NCR

Nozzle Number: —, Dia.(in.): 1/8

Filter Number: SGA-267-45

Pitot Tube No. 10, Corr. Factor: 0.822

Barometric Pressure ("Hg): 29.74

Meter Box No. RAC-2, Corr. Factor: 0.980

Stack Static Pressure ("H_2O): -3.4

Meter Isokinetic Factor: 1712

Stack Dimensions: 24"

Assumed Moisture (%): 0.3

Plume Appearance:

Condensate Volume (ml): 2

Ambient Temperature (°F): 45

Silica Gel Weight Gain (g): 10.4

Record all Data Every 5 Minutes

Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
S-6	60	13:59	4.20	84	55.940	104	96	1.20	—	40	2.5
	65	14:04	4.20	84	59.1	104	97	1.20	—	40	2.5
S-5	70	14:09	4.40	84	62.3	107	97	1.26	—	39	2.8
	75	14:14	4.40	84	65.5	108	97	1.26	—	39	3.0
S-4	80	14:19	4.60	84	68.7	109	97	1.32	—	40	3.0
	85	14:24	4.50	83	71.9	110	98	1.30	—	40	3.3
S-3	90	14:29	4.20	83	75.2	110	98	1.21	—	40	3.5
	95	14:34	4.10	83	78.3	110	98	1.18	—	40	3.5
S-2	100	14:39	3.60	83	81.4	110	98	1.04	—	40	3.5
	105	14:44	3.50	80	84.3	110	98	1.02	—	40	3.5
S-1	110	14:49	2.80	79	87.2	111	99	0.82	—	40	3.2
	115	14:54	2.60	80	89.8	112	100	0.76	—	40	3.2
	120	14:59			92.374						
					73.111 ✓						
AVERAGE (TOTAL)				83 ✓	(71.795) ✓	104 ✓	92 ✓ 98 ✓	1.15 ✓		39 ✓	2.8 ✓

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SAMPLING TRAIN DATA $\Delta m = 0.274 \frac{T_m}{T_s} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company
Source Designation: Baghouse Discharge
Date: 10/21/76
Test Number: Particulate-3 (page 1 of 2)
Field Person: RJG, NCR
Filter Number: SGA-267-48 (47mm)
Barometric Pressure ("Hg): ~~28.72~~ 28.62*
Stack Static Pressure ("H_2O): -3.4
Stack Dimensions: 24"
Plume Appearance:
Ambient Temperature(°F):
Record all Data Every 5 Minutes

Filter Heater Setting: —
Probe Heater Setting: —
Nozzle Number: —, Dia.(in.): 1/8
Pitot Tube No. 10, Corr.Factor: 0.822
Meter Box No. RAC-2, Corr.Factor: ~~0.980~~
Meter Isokinetic Factor: 1712 0.98
Assumed Moisture(%): 1.0
Condensate Volume(ml): 6
Silica Gel Weight Gain(g): 12.4
Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
S-6	0	8:00	4.0	87	93.020	78	68	1.07	—	46	1.5
	5	8:05	4.0	87	96.1	83	70	1.07	—	46	1.5
S-5	10	8:10	4.3	87	99.1	88	72	1.16	—	46	1.8
	15	8:15	4.3	86	102.2	90	74	1.17	—	46	1.8
S-4	20	8:20	4.4	84	105.2	91	76	1.20	—	47	1.8
	25	8:25	4.4	83	108.3	91	77	1.21	—	47	2.0
S-3	30	8:30	4.6	81	111.4	91	78	1.27	—	47	2.0
	35	8:35	4.1	81	114.6	91	79	1.13	—	47	2.0
S-2	40	8:40	3.6	81	117.7	90	79	0.99	—	46	2.0
	45	8:45	3.6	81	120.6	90	79	0.99	—	46	2.0
S-1	50	8:50	2.8	81	123.4	89	79	0.77	—	45	1.8
	55	8:55	2.8	80	125.9	88	79	0.77	—	45	2.0
	60	9:00			128.429						
AVERAGE (TOTAL)					( )						

Clayton Environmental Consultants, Inc.

SAMPLING TRAIN DATA $\Delta m = 0.274 \frac{T_m}{T_s} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Discharge

Date: 10/21/76

Test Number: Particulate-3 (page 2 of 2)

Field Person: RJG, NCR

Filter Number: SGA-267-48 (47 mm)

Barometric Pressure ("Hg): 28.62

Stack Static Pressure ("H_2O): -3.4

Stack Dimensions: 24"

Plume Appearance:

Ambient Temperature (°F):

Record all Data Every 5 Minutes

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: —, Dia. (in.): 1/8

Pitot Tube No. 10, Corr. Factor: 0.822

Meter Box No. RAC-2, Corr. Factor: 0.980

Meter Isokinetic Factor: 1712

Assumed Moisture (%): 1.0

Condensate Volume (ml): 6

Silica Gel Weight Gain (g): 12.4

Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
W-6	60	9:04	4.1	80	128.429	83	77	1.12	—	45	1.8
	65	9:09	4.3	80	131.5	84	77	1.18	—	45	2.0
W-5	70	9:14	4.4	80	134.5	84	76	1.21	—	44	2.0
	75	9:19	4.4	81	137.6	84	76	1.20	—	44	2.0
W-4	80	9:24	4.4	81	140.7	85	75	1.20	—	44	2.2
	85	9:28	4.4	81	143.8	85	75	1.20	—	45	2.5
W-3	90	9:34	4.2	81	146.9	85	75	1.15	—	45	2.5
	95	9:38	4.2	81	150.0	85	75	1.15	—	45	2.8
W-2	100	9:44	3.5	81	153.0	85	75	0.96	—	45	2.8
	105	9:49	3.5	81	155.8	85	75	0.96	—	45	2.8
W-1	110	9:54	2.6	81	158.6	85	75	0.71	—	45	2.5
	115	9:59	2.6	80	161.0	84	75	0.71	—	45	2.8
	120	10:04			163.419						
					70.399 ✓						
AVERAGE (TOTAL)				82 ✓	(69.132) ✓	86 ✓	76 ✓ (81)	1.06 ✓		46 ✓	2.1 ✓

Barometric Pressure at Test Start - 28.62

Barometric Pressure at Test End - 28.82

Clayton Environmental Consultants, Inc.

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT E.P.A. TASK 24 Tulk INITIAL: [illegible]

Sampling Station #1 Inlet

Test No. Preliminary [illegible] Date 10-19-76 Time 13:30

Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
V-6	1.4	75	79.37				
5	1.9	75	92.46				
4	1.8	75	89.99				
3	1.5	70	81.77				
2	1.2	70	73.14				
1	1.0	70	66.76				
H-6	~~[illegible]~~ 1.4	70	78.00				
5	~~[illegible]~~ 1.8	75	89.99				
4	~~[illegible]~~ 1.9	75	92.46				
3	2.0	70	94.42				
2	1.8	70	89.57				
1	1.4	70	78.00				
		72	83.99				

Stack Wet Bulb Temperature, (°F) ____ Stack Dimensions 22½" ID

A. Barometric Pressure, (In.Hg) 30.02

B. Static Pressure of Stack Gases, ($In.H_2O$) -7.2

C. Pitot Tube Correction Factor #19 0.843

D. Specific Gravity of Stack Gases Relative to Dry Air 1.00

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 29.49

F. Average Uncorrected Velocity, (ft/sec) 83.99 or 60 * F, (ft/min) 5039

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{D}}$, (ft/min) 4279

H. Area of Stack, (ft^2) 2.76

I. Actual Gas Flow Rate = G * H, (ACFM) 11810

J. Average Stack Temperature, (°F) 72

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) 11597

where T_{std} = standard temperature, 70 °F

GDC-2

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont talc
Source Designation: Inlet #1
Date: 10-20-76
Test Number: P-1
Field Person: GLPL JCH
Filter Number: SGA-267-03
Barometric Pressure ("Hg): 29.74
Stack Static Pressure ("H_2O): -7.2
Stack Dimensions: 22½" ID
Plume Appearance: —
Ambient Temperature(°F): 40
Record all Data Every 5 Minutes

Filter Heater Setting: —
Probe Heater Setting: —
Nozzle Number: 3/16, Dia.(in.): 0.188
Pitot Tube No. 19, Corr. Factor: .841
Meter Box No. RAC-4, Corr. Factor: 1.002
Meter Isokinetic Factor:
Assumed Moisture(%): 2.0
Condensate Volume(ml): 4.0
Silica Gel Weight Gain(g): 25.1
Leak Rate 0.005 CFM at 15 "Hg

38 Tin/Ts H 214.5 239.6

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
V-6	0	12:53	2.0	66	859.753	70	70	2.78	—	42	3.5
V-6	5	12:58	1.9	66	864.33	78	70	2.66	—	42	3.5
V-5	10	13:03	2.2	66	868.77	80	72	3.09	—	42	4.0
5	15	13:08	2.2	70	873.57	82	72	3.08	—	42	4.5
4	20	13:13	1.9	62	878.46	83	72	2.70	—	44	5.3
4	25	13:18	1.9	63	882.84	84	72	2.70	—	46	6.0
3	30	13:23	1.5	60	887.39	84	73	2.14	—	47	6.6
3	35	13:28	1.5	60	891.42	84	73	2.14	—	47	6.8
2	40	13:33	1.2	60	895.40	86	74	1.72	—	46	7.0
2	45	13:38	1.2	60	899.05	86	74	1.72	—	46	7.2
1	50	13:43	0.75	60	902.66	86	74	1.07	—	47	6.4
1	55	13:48	0.54	50	905.65	84	74	0.79	—	47	5.7
	60	13:53			908.211						
AVERAGE (TOTAL)					( )						

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont Tale

Source Designation: # 1 Inlet

Date: 10-20-76

Test Number: P-1

Field Person: [illegible] GAH

Filter Number:

Barometric Pressure ("Hg):

Stack Static Pressure ("H_2O):

Stack Dimensions:

Plume Appearance:

Ambient Temperature(°F):

Record all Data Every ______ Minutes

Filter Heater Setting:

Probe Heater Setting:

Nozzle Number: ____, Dia.(in.):

Pitot Tube No. ____, Corr.Factor:

Meter Box No. ____, Corr.Factor:

Meter Isokinetic Factor:

Assumed Moisture(%):

Condensate Volume(ml):

Silica Gel Weight Gain(g):

Leak Rate 0.013 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
H-6	60	14:00	1.7	60	908.211	78	74	2.42	—	42	8.5
H-6	65	14:05	1.5	60	912.12	85	75	2.15	—	44	9.5
5	70	14:10	1.4	60	916.12	88	76	2.01	—	45	9.5
5	75	14:15	1.5	58	920.00	90	76	2.17	—	45	10.0
4	80	14:20	1.6	60	923.98	90	76	2.31	—	45	11.0
4	85	14:25	1.7	60	928.12	91	77	2.45	—	45	11.8
3	90	14:30	1.5	59	932.34	92	77	2.17	—	44	11.5
3	95	14:35	1.6	57	936.46	92	77	2.33	—	46	12.0
2	100	14:40	1.7	58	940.59	92	78	2.47	—	46	12.4
2	105	14:45	1.5	58	944.83	93	78	2.18	—	46	12.5
1	110	14:50	1.5	50	948.92	94	78	2.22	—	46	12.5
1	115	14:55	1.4	58	952.99	94	78	2.04	—	46	12.5
	120	15:00			955.453						
					95.700						
AVERAGE (TOTAL)				60	(95.891)	86	75	2.23		45	8.3

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT EPA TASK 24 [illegible] INITIAL: [illegible]

Sampling Station #2 INLET

Test No. Preliminary Traverse Date 10-19-76 Time 13:15

Sampling Point	Velocity Pressure (In.H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure (In.H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
V - 6	5.6	170	172.25				
5	5.3	175	168.24				
4	4.9	170	161.13				
3	3.7	170	140.01				
2	3.6	170	138.41				
1	3.6	165	137.56				
H - 6	5.8	170	175.30				
5	5.7	170	173.78				
4	5.4	170	169.15				
3	4.0	170	145.58				
2	3.6	165	137.56				
1	3.7	150	137.77				
		168					

Stack Wet Bulb Temperature, (°F) ________ Stack Dimensions 9" ID

A. Barometric Pressure, (In.Hg) 30.02

B. Static Pressure of Stack Gases, (In.H_2O) -9.0

C. Pitot Tube Correction Factor #23 0.838

D. Specific Gravity of Stack Gases Relative to Dry Air 1.00

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 29.36

F. Average Uncorrected Velocity, (ft/sec) 154.70 or 60 * F, (ft/min) 9282

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{D}}$, (ft/min) 7852

H. Area of Stack, (ft^2) 0.442

I. Actual Gas Flow Rate = G * H, (ACFM) 3471

J. Average Stack Temperature, (°F) 168

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) 2874

where T_{std} = standard temperature, 70 °F

GDC-2

SAMPLING TRAIN DATA

Company: EPA TASK 24 [illegible]

Source Designation: Inlet # 2

Date: 10-20-76

Test Number: P-1

Field Person: [illegible]

Filter Number: 5GA-267-01

Barometric Pressure ("Hg): 29.81

Stack Static Pressure ("H_2O): -9.0

Stack Dimensions: 9" ID

Plume Appearance: ——

Ambient Temperature(°F): 54°

Record all Data Every 5 Minutes

Filter Heater Setting: ——

Probe Heater Setting: ——

Nozzle Number: 1/8, Dia.(in.): .125

Pitot Tube No. 23, Corr.Factor: .834

Meter Box No. [illegible]-4, Corr.Factor: 1.002

Meter Isokinetic Factor: 16.78

Assumed Moisture(%): 2

Condensate Volume(ml): 1.0

Silica Gel Weight Gain(g): 12.6

Leak Rate 0.014 CFM at 15 "Hg

0.269 T[illegible] (H)

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
V-5	0	08:48	6.6	160	788.383	58	56	1.48	—	40	3.6
V-5	5	08:53	6.5	160	791.73	66	60	1.47	—	40	3.6
V-5	10	8:58	6.6	170	795.15	70	62	1.51	—	40	4.0
V-5	15	9:03	6.6	160	798.50	74	64	1.51	—	40	4.0
V-4	20	9:08	5.9	160	801.82	74	64	1.35	—	40	3.9
V-4	25	9:13	5.8	160	805.00	76	66	1.34	—	40	3.9
3	30	9:18	4.2	160	808.18	76	67	0.97	—	40	3.5
3	35	9:23	4.4	155	811.04	76	68	1.02	—	40	3.6
2	40	9:28	4.1	155	813.83	77	68	0.95	—	40	3.5
2	45	9:33	4.1	155	816.58	77	68	0.95	—	40	3.5
2	50	9:38	4.0	155	818.75	82	71	0.94	—	40	3.9
2	55	9:43	4.0	155	821.87	82	72	0.94	—	40	3.8
	60	9:48			824.472						
AVERAGE (TOTAL)					( )						

Clayton Environmental Consultants, Inc.

SAMPLING TRAIN DATA

Company: EPA TASK 24

Source Designation: INLET #2

Date: 10-20-76

Test Number: P-1 Cont.

Field Person: [illegible]

Filter Number:

Barometric Pressure ("Hg):

Stack Static Pressure ("H_2O):

Stack Dimensions:

Plume Appearance:

Ambient Temperature(°F):

Record all Data Every ______ Minutes

Filter Heater Setting:

Probe Heater Setting:

Nozzle Number: ____, Dia.(in.):

Pitot Tube No. ____, Corr.Factor:

Meter Box No. ____, Corr.Factor:

Meter Isokinetic Factor:

Assumed Moisture(%):

Condensate Volume(ml):

Silica Gel Weight Gain(g):

Leak Rate 0.010 CFM at 15 "Hg

Traverse Point No.	Time		Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter			Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
	Sampling (min)	Clock			Volume (ft^3)	Temp (°F) Inlet	Temp (°F) Outlet				
H-5	60	9:50	5.7	165	824.472	83	72	1.32	—	40	4.0
5	65	9:55	5.8	160	827.63	84	76	1.36	—	40	4.1
5	70	10:00	5.8	165	830.86	86	76	1.35	—	40	4.2
5	75	10:05	5.9	160	834.08	87	78	1.39	—	40	4.8
4	80	10:10	5.1	165	837.35	87	78	1.19	—	40	4.6
4	85	10:15	4.8	165	840.50	86	78	1.12	—	40	4.6
3	90	10:20	3.6	165	843.44	84	76	0.84	—	42	4.2
3	95	10:25	3.6	160	846.08	84	76	0.84	—	42	4.2
2	100	10:30	2.5	160	848.72	84	78	0.68	—	42	3.8
2	105	10:35	4.3	160	851.01	84	78	1.01	—	42	5.0
2	110	10:40	4.3	155	853.65	86	78	1.02	—	42	5.0
2	115	10:45	4.4	160	856.49	88	80	1.04	—	42	5.0
	120	10:50			859.400						
					71.017✓						
AVERAGE (TOTAL)				160✓	(71.159)✓	80✓	71✓	1.15✓	—	41✓	4.1✓

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT EPA Task 24 - Eastern Magnesia Talc Co. CREW ______

Sampling Station Inlet No. 3 Date 10/19/76 Time 13:30

Test No. Prelim. Traverse Pitot Tube No. 12 Manometer No. ______

Sampling Point	Velocity Pressure (In. H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure (In. H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
V-6	2.2	62	98.28	H-6	2.4	60	102.5
V-5	2.3	62	100.5	H-5	2.5	60	104.6
V-4	2.0	62	93.70	H-4	2.0	60	93.52
V-3	2.1	62	96.02	H-3	1.6	60	83.65
V-2	2.1	62	96.02	H-2	1.65	60	84.95
V-1	2.15	62	97.15	H-1	1.5	60	80.99
							94.32

Stack Wet Bulb Temperature, (°F) ______ Stack Dimensions ~~10 5/8"~~ (11 3/4)

A. Barometric Pressure, (In.Hg) 30.02

B. Static Pressure of Stack Gases, (In. H_2O) - 7.8

C. Pitot Tube Correction Factor 0.816

D. Specific Gravity of Stack Gases Relative to Dry Air 1.0

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 29.45

F. Average Uncorrected Velocity, (ft/sec) 94.32 or 60 * F, (ft/min) 5659

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{\cancel{D}}}$, (ft/min) 4654

H. Area of Stack, (ft^2) ~~0.616~~ 0.753

I. Actual Gas Flow Rate = G * H, (ACFM) ~~2867~~ 3505

J. Average Stack Temperature, (°F) 61

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) ~~2785~~ 3496

where T_{std} = standard temperature, 68 °F

GDC-2

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont Vale

Source Designation: Inlet # 3

Date: 10-21-76

Test Number: P-1

Field Person: [illegible] GEW

Filter Number: SGA-267-04 and 06

Barometric Pressure ("Hg): 28.62

Stack Static Pressure ("H_2O): -7.8

Stack Dimensions: 11 3/4 ID

Plume Appearance: — RAIN

Ambient Temperature (°F): 42°

Record all Data Every 5 Minutes

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: 3/16, Dia. (in.): .188

Pitot Tube No. 12, Corr. Factor: .827

Meter Box No. RAC-4, Corr. Factor: 1.002

Meter Isokinetic Factor: 1678

Assumed Moisture (%): 2.0

Condensate Volume (ml): [illegible]

Silica Gel Weight Gain (g):

Leak Rate 0.008 CFM at 15 "Hg

1.29 Tm/Ts H

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
V-5	0	8:00	2.5	43	957.537	68	64	3.37	—	46	3.8
V-5	5	8:05	2.4	46	962.30	76	66	3.25	—	46	4.0
V-5	10	8:10	2.4	45	967.16	80	78	3.30	—	46	5.0
V-5	15	8:15	2.3	45	972.16	83	70	3.15	—	48	5.5
4	20	8:20	1.7	45	976.99	84	71	2.33	—	50	5.5
4	25	8:25	1.5	45	981.26	84	72	2.06	—	50	5.8
3	30	8:30	1.5	45	985.25	84	73	2.06	—	50	6.0
3	35	8:35	1.4	45	989.13	84	74	1.93	—	50	6.4
2	40	8:40	1.6	45	992.94	84	74	2.20	—	50	7.5
2	45	8:45	2.1	45	997.11	84	74	2.89	—	50	9.8
2	50	8:50	2.4	45	1001.84	86	74	3.31	—	50	11.5
2	55	8:55	2.1	45	1006.83	87	74	2.90	—	50	12.0
	60	9:00			1011.594						
AVERAGE (TOTAL)					( )						

SAMPLING TRAIN DATA

Company: EPA TASK 24
Source Designation: #3 Inlet
Date: 10-21-76
Test Number: P-1
Field Person: THA CCH
Filter Number:
Barometric Pressure ("Hg): 28.74
Stack Static Pressure ("H_2O):
Stack Dimensions:
Plume Appearance:
Ambient Temperature (°F):
Record all Data Every ______ Minutes

Filter Heater Setting:
Probe Heater Setting:
Nozzle Number: ____, Dia. (in.):
Pitot Tube No. ____, Corr. Factor:
Meter Box No. ____, Corr. Factor:
Meter Isokinetic Factor:
Assumed Moisture (%):
Condensate Volume (ml): 2.0
Silica Gel Weight Gain (g): 22.2
Leak Rate ~~0.0125~~ 0.005 CFM at 15 "Hg
0.005

1.29

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
H-5	60	9:04	2.3	45	1011.694	86	74	3.17	—	50	12.0
H-5	65	9:09	2.3	45	1015.40	84	74	3.17	—	48	15.0
H-5	70	9:14		~~45~~	1021.194	~~88~~	~~74~~				
change paths ~~70~~		~~9:19~~			*						
5	70	9:32	2.5	45	1021.712	74	70	3.40	—	50	4.0
5	75	9:37	2.2	45	1026.50	78	70	3.00	—	50	4.2
4	80	9:42	2.1	45	1031.09	80	70	2.92	—	50	4.8
4	85	9:47	1.6	45	1035.80	80	70	2.19	—	48	4.9
3	90	9:52	1.7	45	1039.99	80	70	2.32	—	46	5.0
3	95	9:57	1.7	45	1044.22	80	70	2.32	—	46	5.3
2	100	10:02	1.8	45	1048.58	80	70	2.46	—	46	6.0
2	105	10:07	1.7	45	1052.87	80	70	2.32	—	46	6.5
2	110	10:12	1.8	45	1057.22	80	70	2.46	—	46	7.0
2	115	10:17	1.7	45	1061.46	80	70	2.32	—	46	7.8
	120	10:22			1065.816						
					Leak Check in middle						
					107.761						
AVERAGE (TOTAL)				45	(107.977)	81	71	2.70	—	48	6.9

76

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104.104

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT Task 24 CREW Hanson-Hawkins

Sampling Station Inlet 1A Date 10/21/76 Time 0845

Test No. Trial Pitot Tube No. 507 Manometer No. 0-5

Sampling Point	Velocity Pressure (In. H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure (In. H_2O)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
Top 1	1.0	48	65.36	Horz 1	1.0	48	65.36
2	1.2	48	71.60	2	1.2	48	71.60
3	1.0	48	65.36	3	1.3	48	74.52
4	1.0	48	65.36	4	1.2	48	71.60
	1						
℄	1.25				1.3		
	6536						

Stack Wet Bulb Temperature, (°F) — Stack Dimensions 4"

A. Barometric Pressure, (In.Hg) 29.87

B. Static Pressure of Stack Gases, (In. H_2O) -3.8

C. Pitot Tube Correction Factor 1.0 0.99

D. Specific Gravity of Stack Gases Relative to Dry Air 1.0

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 29.59

F. Average Uncorrected Velocity, (ft/sec) 68.8+ or 60 * F, (ft/min) 4130

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{D}}$, (ft/min) 4111

H. Area of Stack, (ft^2) .0873

I. Actual Gas Flow Rate = G * H, (ACFM) ~~360~~ 359

J. Average Stack Temperature, (°F) 48

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) 369

where T_{std} = standard temperature, 68 °F

GDC-2

SAMPLING TRAIN DATA $\Delta m = 2.04 \frac{T_m}{T_s} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Inlet 1A

Date: 10/21/76 Filter Heater Setting: —

Test Number: Particulate - 1 Probe Heater Setting: —

Field Person: RJG, NCR Nozzle Number: ____, Dia. (in.): 3/16

Filter Number: SGA - 286 - 14 Pitot Tube No. Std., Corr. Factor: 1.0

Barometric Pressure ("Hg): 28.88 Meter Box No. RAC-2, Corr. Factor: ~~0.980~~

Stack Static Pressure ("H_2O): -3.8 Meter Isokinetic Factor: 1712 | 0.982

Stack Dimensions: 4" Assumed Moisture (%): 1.0

Plume Appearance: ____ Condensate Volume (ml): ____

Ambient Temperature (°F): ____ Silica Gel Weight Gain (g): ____

Record all Data Every ____ Minutes Leak Rate 0 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
CL	0	12:12	1.50	48	166.320	68	65	3.2			
	1				166.928						
					.608✓						
AVERAGE (TOTAL)					(.597✓)						

GEORGE D. CLAYTON & ASSOCIATES
EXHAUST GAS VELOCITY AND FLOW RATE

PROJECT Task 24 CREW Hansen Hawkins

Sampling Station 1B Inlet Date 10/21/76 Time 0855

Test No. Trial Pitot Tube No. Std. Manometer No.

Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)	Sampling Point	Velocity Pressure ($In.H_2O$)	DB Temp (°F)	Uncorrected Velocity (Ft/sec)
Top 1	2.8	52	109.8	Horiz 1	3.0	52	113.66
2	3.0	52	113.66	2	3.6	52	124.5
3	3.2	52	117.38	3	3.3	52	119.20
4	3.0	52	113.66	4	3.0	52	113.66
Cl	3.3			Cl.	3.3		
V = 2.9 √VP FS 65.62							

Stack Wet Bulb Temperature, (°F) ________ Stack Dimensions 4"

A. Barometric Pressure, (In.Hg) 29.87

B. Static Pressure of Stack Gases, ($In.H_2O$) − 5.4

C. Pitot Tube Correction Factor ~~1.0~~ 0.99

D. Specific Gravity of Stack Gases Relative to Dry Air 1.0

E. Absolute Pressure of Stack Gases = A + (B/13.6), (In.Hg) 1 28.47

F. Average Uncorrected Velocity, (ft/sec) 115.69 or 60 * F, (ft/min) 6941

G. Corrected Velocity = $F * C\sqrt{\frac{29.92}{E} * \frac{1.00}{D}}$, (ft/min) ~~6966~~ 7044

H. Area of Stack, (ft^2) 0.0873

I. Actual Gas Flow Rate = G * H, (ACFM) ~~608~~ 615

J. Average Stack Temperature, (°F) 52

K. Standard Gas Flow Rate = $I * \left(\frac{T_{std} + 460}{J + 460}\right) * \left(\frac{E}{29.92}\right)$, (SCFM) 603

where T_{std} = standard temperature, 68 °F

GDC-2

$\Delta m = 0.403 \frac{T_m}{T_s} H$

SAMPLING TRAIN DATA

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: No. 1B Baghouse Inlet

Date: 10/21/76

Test Number: Particulate - 1

Field Person: RJG, NCR

Filter Number: SGA - 286 - 12

Barometric Pressure ("Hg): 28.88

Stack Static Pressure ("H_2O): - 5.4

Stack Dimensions: 4"

Plume Appearance:

Ambient Temperature (°F):

Record all Data Every ______ Minutes

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: ______, Dia. (in.): 1/8

Pitot Tube No. Std., Corr. Factor: 1.0

Meter Box No. RAC-2, Corr. Factor: ~~0.980~~ 0.982

Meter Isokinetic Factor: 1712

Assumed Moisture (%): 1.0

Condensate Volume (ml):

Silica Gel Weight Gain (g):

Leak Rate 0 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
CL	0	11:16	3.3	52	164.421	62	60	1.36			
	2:15				165.629						
					1.205						
AVERAGE (TOTAL)					(1.186)						

Clayton Environmental Consultants, Inc.

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont tile
Source Designation: #1 Inlet
Date: 10-21-76
Test Number: PS-1
Field Person: 9HPJ GEH
Filter Number: ET-760-01, 56A-286-4
Barometric Pressure ("Hg): 28.86
Stack Static Pressure ("H_2O): -7.2
Stack Dimensions: 22¼" ID
Plume Appearance: —
Ambient Temperature(°F): 50
Record all Data Every 5 Minutes

Filter Heater Setting: —
Probe Heater Setting: —
Nozzle Number: 3/16, Dia.(in.):
Pitot Tube No. 19, Corr.Factor:
Meter Box No. RAC-4, Corr.Factor:
Meter Isokinetic Factor: 16
Assumed Moisture(%): 2.0
Condensate Volume(ml): 4.0
Silica Gel Weight Gain(g): 9.2
Leak Rate 0.009 CFM at 15 "Hg
0.008 15

(1.38 X Tm/Ts) H 714.8

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
V-6	0	11:10	1.9	65	66.164	68	68	2.64	—	44	5.5
V-5	5	11:15	1.7	68	70.68	76	68	2.36	—	44	5.5
V-4	10	11:20	2.1	68	74.92	77	68	2.92	—	45	6.0
V-3	15	11:25	1.3	65	79.66	79	69	1.82	—	46	5.5
V-2	20	11:30	0.99	62	83.52	79	69	1.42	—	47	5.0
V-1	25	11:35	1.05	50	86.89	78	68	1.51	—	47	5.1
	30	11:40			90.310						
H-6	30	11:41	1.5	65	90.310	76	68	2.10	—	47	6.0
H-5	35	11:46	1.8	65	94.25	78	70	2.53	—	47	7.5
H-4	40	11:51	1.8	65	98.56	81	70	2.53	—	47	8.0
H-3	45	11:56	1.6	70	102.98	84	70	2.34	—	47	8.5
H-2	50	12:01	1.7	65	107.23	85	72	2.41	—	48	9.0
H-1	55	12:06	1.1	70	111.57	86	73	1.55	—	48	8.0
	60	12:11			115.127						
					48.963						
AVERAGE (TOTAL)				65	(48.767)	79	69	2.18	—		

74

Clayton Environmental Consultants, Inc.

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont Talc

Source Designation: Inlet # 2

Date: 10-19-76

Test Number: PS-1

Field Person: [illegible] CEH

Filter Number: ET-288-07, A-202-12

Barometric Pressure ("Hg): 29.92

Stack Static Pressure ("H_2O): -9.0

Stack Dimensions: 9" ID

Plume Appearance: —

Ambient Temperature(°F): 40°

Record all Data Every 5 Minutes

0.269 Tm/Ts H

Filter Heater Setting: —

Probe Heater Setting: —

Nozzle Number: 1/8, Dia.(in.):

Pitot Tube No. 23, Corr.Factor .838

Meter Box No. [illegible], Corr.Factor .996

Meter Isokinetic Factor: 1.628

Assumed Moisture(%): 2.0

Condensate Volume(ml):

Silica Gel Weight Gain(g):

Leak Rate 0.011 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
V-5	0	15:24	6.8	180	717.957	76	76	1.53	—	54	5.0
V-5	5	15:29	6.6	175	721.30	80	77	1.48	—	52	5.2
V-5	10	15:34	6.7	175	724.65	84	78	1.54	—	50	5.4
V-4	15	15:39	5.7	175	727.99	86	78	1.31	—	50	5.2
V-4	20	15:44	5.7	170	731.24	87	78	1.32	—	50	5.2
V-4	25	15:49	5.8	170	734.42	88	80	1.35	—	50	5.4
V-3	30	15:54	4.0	170	737.63	88	80	0.93	—	52	4.8
V-3	35	15:59	4.0	170	740.12	88	80	0.93	—	52	4.8
V-3	40	16:04	3.9	170	743.15	86	80	0.90	—	52	4.8
V-2	45	16:09	3.5	165	745.85	85	80	0.82	—	48	4.5
V-2	50	16:14	3.5	165	748.40	83	78	0.81	—	48	4.6
V-2	55	16:19	3.5	170	750.94	82	78	0.81	—	48	4.6
	60	16:24			753.500						
AVERAGE (TOTAL)					( )						

SAMPLING TRAIN DATA

Company: EPA TASK 24 Vermont Tale
Source Designation: Inlet #2
Date: 10-19-76
Test Number: PS-1 Inlet.
Field Person: SPG COH
Filter Number:
Barometric Pressure ("Hg):
Stack Static Pressure ("H_2O):
Stack Dimensions:
Plume Appearance:
Ambient Temperature(°F):
Record all Data Every ______ Minutes

Filter Heater Setting:
Probe Heater Setting:
Nozzle Number: ____, Dia.(in.):
Pitot Tube No. ____, Corr. Factor:
Meter Box No. ____, Corr. Factor:
Meter Isokinetic Factor:
Assumed Moisture(%):
Condensate Volume(ml): -5
Silica Gel Weight Gain(g): 1.6
Leak Rate 0.009 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter: Temp (°F) Inlet	Dry Gas Meter: Temp (°F) Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
H-6	60	16:24	6.0	175	753.560	82	78	1.37	—	47	5.9
H-6	65	16:29	6.3	170	756.56	82	76	1.45	—	47	6.0
H-5	70	16:34	6.4	170	759.96	82	76	1.47	—	47	6.0
H-4	75	16:39	5.4	170	763.28	82	75	1.24	—	46	6.0
H-4	80	16:44	5.5	175	766.42	82	75	1.25	—	46	6.0
H-4	85	16:49	5.5	170	769.54	82	75	1.26	—	46	6.0
H-3	90	16:54	3.6	170	772.62	82	74	0.83	—	46	5.2
H-3	95	16:59	3.5	170	775.36	80	74	0.80	—	46	5.2
H-3	100	17:04	3.6	165	777.77	79	74	0.83	—	46	5.2
H-2	105	17:09	3.6	160	780.34	79	73	0.84	—	46	5.2
H-2	110	17:14	3.5	160	782.92	78	72	0.81	—	46	5.2
H-2	115	17:19	3.6	160	785.46	77	71	0.85	—	46	5.2
	120	17:24			788.033						
					70.076						
AVERAGE (TOTAL)				170	(69.796)	83	77	1.11	—		

Clayton Environmental Consultants, Inc.

SAMPLING TRAIN DATA $\Delta m = 1.347 \frac{T_m}{T_s} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company

Source Designation: Baghouse Collector No. 3 Inlet

Date: 10/19/76 — Filter Heater Setting: —

Test Number: Particle Size - 1 (page 1 of 2) — Probe Heater Setting: —

Field Person: RJG, NCR — Nozzle Number: —, Dia. (in.): 3/16

Filter Number: ET-282-02 A-282-13 — Pitot Tube No. 12, Corr. Factor: 0.816

Barometric Pressure ("Hg): 29.92 — Meter Box No. RAC-2, Corr. Factor: 0.980

Stack Static Pressure ("H_2O): -7.8 — Meter Isokinetic Factor: 1712

Stack Dimensions: 10 5/8" — Assumed Moisture (%): 1.0

Plume Appearance: — Condensate Volume (ml): ~14

Ambient Temperature (°F): 45 — Silica Gel Weight Gain (g): 19.4

Record all Data Every 5 Minutes — Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
H-2	0	15:22	1.70	62	832.678	78	74	2.35	—	42	3.5
	5	15:27	1.75	62	836.8	84	74	2.43	—	42	3.8
	10	15:32	1.95	60	841.1	89	75	2.74	—	42	4.2
H-3	15	15:37	1.60	60	845.7	92	76	2.25	—	44	4.0
	20	15:42	1.60	56	849.8	93	77	2.28	—	44	4.0
	25	15:47	1.75	57	854.0	98	78	2.50	—	44	4.5
H-4	30	15:52	2.10	60	858.3	103	82	3.01	—	45	5.5
	35	15:57	2.15	60	863.1	107	85	3.10	—	45	5.8
	40	16:02	2.15	62	868.0	110	88	3.10	—	45	6.0
H-5	45	16:07	2.25	60	872.9	111	90	3.27	—	46	7.0
	50	16:12	2.45	58	877.9	113	92	3.58	—	46	8.0
	55	16:17	2.45	58	883.2	115	93	3.59	—	46	8.8
	60	16:22			888.492						
AVERAGE (TOTAL)					( )						

SAMPLING TRAIN DATA $\Delta m = 1.347 \frac{T_m}{T_s} H$

Company: EPA Task 24 - Eastern Magnesia Talc Company
Source Designation: No. 3 Baghouse Inlet
Date: 10/19/76
Test Number: Particle Size-1 (page 2 of 2)
Field Person: RJG, NCR
Filter Number: ET-282-02 A-282-13
Barometric Pressure ("Hg): 29.92
Stack Static Pressure ("H_2O): -7.8
Stack Dimensions: 10 5/8"
Plume Appearance:
Ambient Temperature (°F): 45
Record all Data Every 5 Minutes

Filter Heater Setting: —
Probe Heater Setting: —
Nozzle Number: —, Dia. (in.): 3/16
Pitot Tube No. 12, Corr. Factor: 0.816
Meter Box No. RAC-2, Corr. Factor: 0.980
Meter Isokinetic Factor: 1712
Assumed Moisture (%): 1.0
Condensate Volume (ml): -14
Silica Gel Weight Gain (g): 19.4
Leak Rate 0.01 CFM at 15 "Hg

Traverse Point No.	Time: Sampling (min)	Time: Clock	Velocity Pressure ("H_2O)	Stack Temp (°F)	Dry Gas Meter: Volume (ft^3)	Dry Gas Meter Temp (°F): Inlet	Dry Gas Meter Temp (°F): Outlet	Orifice Pressure Differential ("H_2O)	Filter Box Temp (°F)	Last Imp. Gas Temp (°F)	Sampling Train Static Pressure ("Hg)
	60	16:23	2.20	60	888.492	111	95	3.21	—	47	7.8
V-5	65	16:28	2.20	60	893.6	113	95	3.21	—	47	8.3
	70	16:33	2.15	60	898.6	115	96	3.15	—	47	9.1
V-4	75	16:38	1.85	58	903.6	117	97	2.73	—	47	9.2
	80	16:43	1.90	58	908.3	118	97	2.80	—	47	9.8
	85	16:48	1.95	59	912.9	119	97	2.87	—	47	10.5
V-3	90	16:53	2.10	59	917.7	120	99	3.10	—	46	12.0
	95	16:58	2.05	59	922.6	121	100	3.04	—	46	12.2
	100	17:03	2.05	59	927.5	119	100	3.03	—	46	12.5
V-2	105	17:08	2.05	55	932.4	120	100	3.06	—	46	14.0
	110	17:13	2.00	56	937.3	122	100	2.98	—	46	14.5
	115	17:18	2.00	56	942.2	122	100	2.98	—	46	15.0
	120	17:23			946.971						
AVERAGE (TOTAL)					( )						

APPENDIX C

VISIBLE EMISSIONS FIELD DATA SHEETS

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Company Name Eastern Magnesia

Plant Address

Date 10/19/76

Hours of Observation 1.5

Observer T. Loch.

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In Room

Observer's Location:

Distance to Discharge Point ~10'

Height of Observation Point Floor

Direction from Discharge Point W

Background Description Clear room Air; well lit; wooden wall background

Weather: Clear Overcast Partly Cloudy Other ________ Color ________

Wind Direction ________ Wind Velocity ________ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity min.	sec.	Opacity	Aggregate Time @ Opacity
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

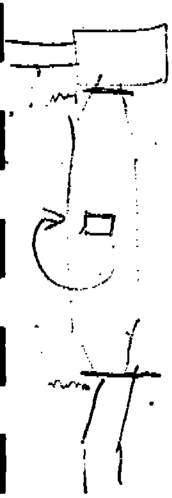
Company Name Eastern Magnesia Date 10/19/76

Plant Address ____________ Observer TAL

Stack Location Grinds Plant Observer's Location (Ball Mill 2) B

Weather Conditions N/A

09:59



HR	MIN	00	15	30	45	COMMENTS
0	00	N	N	N	N	"N" denotes "nothing" visible
	01	N	N	N	N	<5 are written as "0".
	02	N	N	N	N	Room Air Very Clear
	03	N	N	N	N	
	04	N	N	N	N	
	05	N	N	N	N	
	06	N	N	N	N	
	07	N	N	N	N	
	08	N	O	N	N	
	09	N	N	N	N	
	10	N	N	N	N	
	11	N	N	N	N	
	12	N	N	N	N	
	13	N	N	N	N	
	14	N	N	N	N	
	15	N	N	N	N	
	16	N	N	N	N	
	17	O	N	N	N	
	18	N	N	N	N	
	19	N	N	N	N	
	20	N	N	N	N	
	21	N	N	O	N	
	22	N	N	N	N	
	23	N	N	N	N	
	24	N	N	N	N	
	25	N	N	N	N	
	26	N	N	N	N	
	27	N	N	O	N	
	28	N	N	N	N	
	29	N	N	N	O	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Plant Address

Stack Location [illegible]

Weather Conditions N/A

Date 10/19/76

Observer [illegible]

Observer's Location (Pebble Mill 2 B cont.)

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
10:29	30	N	N	N	N	
	31	N	N	N	N	
	32	N	N	N	N	
	33	N	N	N	N	
	34	N	N	N	N	
	35	N	N	N	N	
	36	N	N	N	N	
	37	N	N	N	N	
	38	N	N	N	N	
	39	N	N	N	N	
	40	N	O	N	N	
	41	N	N	N	N	
	42	N	N	N	N	
	43	N	N	N	N	
	44	N	N	N	N	
	45	N	N	N	N	
	46	N	N	N	N	
	47	N	N	N	N	
	48	N	N	N	N	
	49	N	N	N	N	
	50	N	N	N	N	
	51	N	N	N	N	
	52	N	N	N	N	
	53	N	N	N	N	
	54	N	N	N	N	
	55	O	N	N	N	
	56	N	N	N	N	
	57	N	N	N	N	
	58	N	N	N	N	
	59	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Date 10/19/76

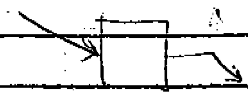
Plant Address

Observer [illegible]

Stack Location Inside

Observer's Location (Pebble Mill 2) B (cont)

Weather Conditions N/A

	HR	MIN	00	15	30	45	COMMENTS
10:59	1	00	N	N	N	N	
		01	N	N	N	N	
		02	N	N	N	5	Leakage. Beginning at [illegible]
		03	5	0	0	N	mill [illegible] -- Intermittent [illegible]
		04	N	N	N	N	rotating flange
		05	N	N	0	5	
		06	N	5	0	N	
		07	10	N	5	0	
		08	0	5	N	5	
		09	N	N	5	0	
		10	N	N	N	N	
		11	0	5	10	5	
		12	N	N	N	N	
		13	0	N	N	N	Operator made visual check -- no changes
		14	N	N	N	0	
		15	0	0	0	N	
		16	N	N	N	N	
		17	N	N	N	N	
		18	N	N	N	N	
		19	N	0	N	N	
		20	N	N	0	N	
		21	N	N	N	N	
		22	N	N	N	0	
		23	N	N	N	N	
		24	5	N	N	5	
		25	0	5	5	10	
		26	5	0	5	N	
		27	N	N	N	N	
		28	N	N	5	0	
11:29		29	N	0	5	0	

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date 10/19/76

Company Name Eastern Magnesia

Hours of Observation 1.5

Plant Address

Observer T. Loch.

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In Room

Observer's Location:

Distance to Discharge Point ~ 10'

Height of Observation Point Floor

Direction from Discharge Point N

Background Description Clear room Air; well lit; other equipment in background

Weather: Clear Overcast Partly Cloudy Other Color

Wind Direction Wind Velocity mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

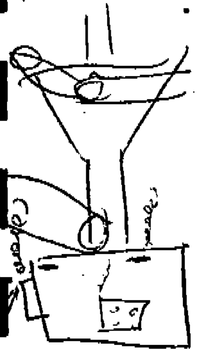
Company Name: EASTERN MAGNESIA | Date: 10/19/76

Plant Address: | Observer: TAL

Stack Location: INSIDE PLANT | Observer's Location: (Roller Mill) C

Weather Conditions: N/A

HR	MIN	00	15	30	45	COMMENTS
13:20	00	10	10	10	10	Only observed leakage at left
	01	10	10	10	10	side, as shown, door
	02	5	5	10	10	
	03	5	5	15	10	
	04	10	10	10	10	
	05	5	5	10	10	These readings represent small area of
	06	15	15	10	15	total perimeter + are time (not spatial)
	07	15	15	10	15	averages.
	08	10	10	10	20	
	09	20	25	30	20	
	10	15	15	15	20	
	11	20	20	15	10	E385
	12	10	15	10	15	
	13	15	15	15	15	
	14	15	15	15	10	
	15	10	15	10	10	
	16	25	20	15	15	350
	17	20	20	10	15	
	18	15	15	10	15	Small leaks on right + around
	19	10	10	15	10	upper left door perimeter.
	20	10	15	10	20	
	21	15	20	10	10	
	22	10	15	10	5	
	23	15	15	10	10	300
	24	10	20	20	25	
	25	25	15	15	15	
	26	20	10	15	10	
	27	15	10	25	25	
	28	15	10	15	10	
	29	20	15	10	15	355 390



RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Date 10/19/76

Plant Address Observer TBL

Stack Location Inside Observer's Location (Roller Mill) C (cont.)

Weather Conditions N/A

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
13:50:00	30	10	15	15	15	
	31	10	10	10	15	
	32	15	10	15	20	
	33	10	15	15	10	
	34	10	15	15	20	
	35	10	15	15	15	325
	36	10	15	15	20	
	37	10	10	15	20	
	38	20	20	20	15	
	39	10	10	15	15	
	40	15	15	20	15	
	41	10	10	15	15	355
	42	10	15	15	10	
	43	20	10	15	10	
	44	15	15	10	15	
	45	15	20	15	15	
	46	15	10	10	10	
	47	10	20	15	10	325
	48	10	10	10	10	
	49	5	10	10	10	
	50	10	10	10	10	
	51	10	10	10	20	
	52	10	15	10	15	
	53	10	5	10	10	250
	54	10	10	15	15	
	55	15	10	10	10	
	56	10	10	15	5	
	57	5	10	10	10	
	58	15	15	10	15	
	59	10	5	5	10	255

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Date 10/19/76

Plant Address

Observer RL

Stack Location Inside Plant

Observer's Location (Roller Mill) C (cont)

Weather Conditions N/A

	HR	MIN	TIME SECONDS 00	15	30	45	COMMENTS
14:20	1	00	5	10	10	10	
		01	5	5	5	10	
		02	5	10	10	5	
		03	5	5	5	10	
		04	5	5	5	5	
		05	0	10	5	10	160
		06	10	5	10	10	
		07	5	5	5	5	
		08	5	5	0	5	
		09	5	0	5	5	Operator sweeping floor in vicinity -- no
		10	10	5	5	5	5.4 visibility problem.
		11	5	5	5	5	130
		12	5	5	5	10	
		13	5	5	5	0	
		14	5	10	5	5	
		15	5	5	5	10	
		16	10	15	10	10	
		17	5	5	5	5	155
		18	5	5	10	10	
		19	5	10	10	5	Some visibility interference due to sweeping.
		20	5	5	5	0	Air Clear.
		21	5	5	5	5	
		22	5	0	0	5	
		23	5	5	5	0	120
		24	5	5	5	0	
		25	5	5	10	5	
		26	5	5	10	5	
		27	0	5	5	5	
		28	5	5	5	5	
14:50		29	10	5	15	5	135

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date 10/19/76 - 10/20/76

Company Name Eastern Magnesia

Hours of Observation 1.5

Plant Address

Observer T. Loch

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~10'

Height of Observation Point Floor

Direction from Discharge Point W

Background Description Clear room air; well lit; light wall background

Weather: Clear Overcast Partly Cloudy Other ______ Color ______

Wind Direction ______ Wind Velocity ______ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Date 10/19/76

Plant Address

Observer TRL

Stack Location Grinder Plant

Observer's Location (Bagger) H

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
15:03-0	00	N	N	N	N	Attesting reading above operators
	01	N	N	N	N	level; dust from bags + loading area
	02	N	N	N	N	drawn into exhaust system. (different B/H).
	03	N	N	N	N	
	04	N	N	N	N	
	05	N	N	N	N	"Nearby forklift traffic creating occasional
	06	N	N	N	N	dust cloud."
	07	N	N	N	N	
	08	N	N	N	N	
	09	N	N	N	N	Bagging stopped at 15:12; restart at 15:14
	10	N	N	N	N	
	11	N	N	N	N	
	12	N	N	N	O	
	13	N	N	N	N	
	14	N	N	N	N	
	15	N	N	N	O	
	16	5	N	N	N	
	17	N	N	N	N	
	18	N	N	N	N	
	19	N	N	N	N	
	20	N	N	N	N	
	21	N	N	N	N	
	22	N	N	N	N	
	23	N	N	N	N	
	24	N	N	N	N	
	25	N	N	N	N	Stopped at 15:30; restart at 15:31
	26	N	N	N	N	
	27	N	N	O	N	
	28	N	N	N	N	
	29	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name: Eastern Magnesia
Date: 10/19/76 - 10/20
Plant Address:
Observer: TRL
Stack Location: Sack Plant
Observer's Location: (Bagger) H (cont)
Weather Conditions: N/A

HR	MIN	00	15	30	45	COMMENTS
15:36-0	30	O	N	N	N	
	31	N	N	N	N	
	32	N	N	N	N	
	33	N	N	N	N	
	34	N	N	N	N	
	35	N	N	N	N	
	36	N	N	N	N	
	37	N	N	O	N	Direct loss: dust from spout -- negligible
	38	N	N	N	N	entrainment above loader.
	39	N	N	N	N	Stop at 15:45; restart at 15:46
	40	N	N	N	N	
	41	N	N	N	N	
	42	N	N	N	N	
	43	N	N	N	N	
	44	N	N	N	N	
	45	N	N	N	N	
	46	N	N	N	30	Blow Out at end of batch to
	47	50	70	50	10	prevent intermixing of batches.
15:54	48	5	O	N	N	
10/20 10:15	49	N	N	N	N	(Bagger had been operating at arrival to station H)
	50	N	N	N	N	
	51	N	N	N	N	
	52	N	N	O	N	
	53	N	N	10	N	Appears dust in bag discharge due to
	54	N	N	20	15	operator technique (i.e. different
	55	N	N	N	N	operator today)
10:22 11:03	56	N	N	N	N	System malfunction - at 10:22; Restart 11:03
	57	N	N	N	N	(Malf. was a burned out coil in feed control -- jumped for now)
	58	N	N	N	N	
	59	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia   Date 10/20/76

Plant Address   Observer [illegible]

Stack Location In Plant   Observer's Location (Bagger) H (cont)

Weather Conditions N/A

	HR	MIN	00	15	30	45	COMMENTS
11:06	1	00	N	N	N	0	
		01	0	0	5	5	
		02	0	5	10	10	
		03	5	10	5	10	
		04	N	N	N	N	
		05	N	N	N	N	Down 11:12; Restart 11:16
		06	N	N	0	0	
		07	5	5	5	0	
		08	0	N	N	N	
		09	N	5	10	0	
		10	5	0	0	5	
		11	5	5	5	0	
		12	0	0	0	5	60
		13	0	10	5	0	
		14	0	N	N	N	
		15	N	N	N	10	
		16	0	5	5	0	
		17	5	0	0	0	
		18	0	0	0	0	40
		19	N	N	N	N	
		20	N	N	N	N	
		21	0	N	5	0	
		22	N	N	N	N	Down 11:33, Restart 11:36
		23	0	N	10	5	
		24	0	0	5	0	25
		25	0	N	N	N	
		26	N	N	N	N	
		27	N	N	N	0	
		28	N	N	N	N	
		29	20	60	60	40	Blowout for next batch

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing
Date 10/20/76
Company Name Eastern Magnesia
Hours of Observation 1.5
Plant Address
Observer To Lock

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~5'

Height of Observation Point Floor

Direction from Discharge Point S

Background Description Clear room air; semi-well lit, wooden background

Weather: Clear Overcast Partly Cloudy Other ______ Color ______

Wind Direction ______ Wind Velocity ______ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

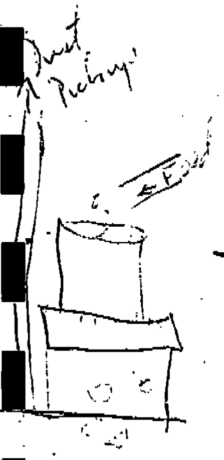
Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
0	min.	sec.	55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name: Eastern Magnesia
Date: 10/20/76
Plant Address:
Observer: TAL
Stack Location: Inside Plant
Observer's Location: Secondary Crusher (A_2)
Weather Conditions: N/A



8:12

HR	MIN	00	15	30	45	COMMENTS
0	00	N	N	N	N	
	01	N	N	N	N	
	02	N	N	N	N	Down @ 8:15; Restart 8:16
	03	N	N	N	N	
	04	N	N	N	N	
	05	N	O	N	N	Trace Dust as Crusher fills to capacity in upper
	06	N	N	N	N	holding chamber; operator unplugging bottom.
	07	N	N	N	N	
	08	N	N	N	N	
	09	N	N	N	N	
	10	N	N	N	N	
	11	N	N	N	N	
	12	N	N	N	N	
	13	N	N	N	N	
	14	N	N	N	N	
	15	N	N	N	N	
	16	N	N	N	N	
	17	N	N	N	N	
	18	N	N	N	N	
	19	N	N	N	N	
	20	N	N	N	N	
	21	N	N	N	N	
	22	N	N	N	N	
	23	N	N	N	N	
	24	N	N	N	N	
	25	N	N	N	N	
	26	N	N	N	N	
	27	N	N	N	N	
	28	N	N	N	N	
	29	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Date 10/20/76

Plant Address

Observer TAL

Stack Location Inside Plant

Observer's Location Secondary Crusher (A_2) (Cont.)

Weather Conditions N/A

	TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
8:43		30	N	N	N	N	
		31	N	N	N	N	
		32	N	N	N	N	Room Air Very Clear
		33	N	N	N	N	
		34	N	N	N	N	
		35	N	N	N	N	
		36	N	N	N	N	
		37	N	N	N	N	
		38	N	N	N	N	
		39	N	N	N	N	
		40	N	N	N	N	
		41	N	N	N	N	
8:55		42	N	N	N	N	Down at 8:57; Restart at 9:04
		43	N	N	N	N	(New Load from Primary Crusher Start)
8:57 / 9:04		44	N	N	N	N	
		45	N	N	N	N	
		46	N	N	N	N	
		47	N	N	N	N	
		48	N	N	N	N	
		49	N	N	N	N	
		50	N	N	0	0	(Some dust near top of crusher holding bin;
9:10		51	0	0	0	N	stops when feed stops and crusher still
		52	N	0	0	N	running.) Feed runs about 90% of crush time)
		53	0	N	N	N	
		54	N	N	N	N	
		55	N	N	N	N	
		56	N	5	0	5	
9:26		57	N	5	0	10	
		58	N	0	0	N	
9:15		59	0	0	N	0	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Date 10/20/76

Plant Address ______ Observer TAL

Stack Location Inside Plant Observer's Location Secondary Crusher (Az) (cont)

Weather Conditions N/A

	HR	MIN	00	15	30	45	COMMENTS
9:19	1	00	N	N	O	O	
		01	N	O	O	N	
		02	N	N	O	N	
		03	N	N	N	N	
		04	N	N	N	N	
		05	N	N	N	N	(Process sample taken by EPA)
		06	N	N	N	N	
		07	N	N	N	N	
		08	N	N	N	N	
		09	N	N	N	N	
9:29		10	N	N	N	N	
		11	N	N	O	O	
		12	N	N	N	N	
		13	N	N	N	N	
		14	N	N	N	N	
		15	N	N	N	N	
9:35		16	N	N	N	N	Stop @ 9:36; Restart @ 9:54
9:36		17	N	N	N	N	(May have begun another new load)
9:54		18	N	N	N	N	
		19	N	N	N	N	
		20	N	N	N	N	
		21	N	N	N	N	
		22	N	N	N	N	
		23	N	N	N	N	
		24	N	N	N	N	
		25	N	N	N	N	
		26	N	N	N	N	
		27	N	N	N	N	
		28	N	N	N	N	
10:05		29	N	N	N	N	

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date 10/20/76

Company Name Eastern Magnesia

Hours of Observation 1.5

Plant Address

Observer T. Loch

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~5'

Height of Observation Point Floor

Direction from Discharge Point W

Background Description Semi-dusty room air; semi-well lit; wooden wall background

Weather: Clear Overcast Partly Cloudy Other ______ Color ______

Wind Direction ______ Wind Velocity ______ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia | Date 10/20/76

Plant Address | Observer TBL

Stack Location In Plant | Observer's Location Primary Crusher (A,)

Weather Conditions N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
12:58 0	00	N	N	O	N	Air somewhat hazy -- no interference normally.
	01	N	N	N	—	"—" denotes cannot read due to dust fall
13:00	02	—	—	—	N	when truck dumps load (i.e. vibrations)
	03	N	N	N	N	
	04	N	N	N	N	
13:04	05	N	N	N	N	Down @ 13:04 (blockage); restart 13:06
13:06	06	N	N	N	N	
	07	N	N	N	N	Down @ 13:09 (blockage); restart 13:10.
	08	5	10	10	10	Leakage at lower pickup point near
	09	10	5	5	N	loose cover plate.
	10	O	O	O	5	(Air hammer for breaking large piece)
	11	O	10	5	5	50
	12	15	5	10	5	
	13	O	N	N	N	
	14	N	10	O	5	
	15	N	O	5	5	Some leakage also observed from seams
	16	N	O	O	N	of wooden columns conveying dust + rock
	17	N	O	O	N	to secondary crusher?
	18	N	O	10	5	
	19	O	5	O	O	
	20	O	O	5	O	
	21	O	O	N	N	
	22	N	5	10	10	
	23	10	5	5	5	
	24	5	O	5	O	
	25	10	O	10	N	
	26	N	N	N	N	
	27	N	5	O	10	
	28	5	O	O	N	
[illegible]	29	N	N	N	O	Air Hammering

RECORD OF VISIBLE EMISSIONS

Company Name [illegible] Date 10/20/76

Plant Address Observer Tal

Stack Location [illegible] Observer's Location Primary Crusher A, (cont)

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
13:33	30	N	10	15	0	Down 13:33 ; Restart 13:35
	31	N	N	0	5	
	32	5	0	5	0	
	33	N	N	N	0	
	34	N	N	N	N	
13:35	35	N	N	N	N	Down @ 13:41 ; Restart @ 13:42
	36	N	N	N	N	
	37	N	N	N	N	
	38	N	N	N	N	Finer material into primary crusher
	39	N	N	N	N	minimizes visible emissions at base
	40	N	N	N	N	plate + none visible at top of crusher
	41	N	N	N	N	where material dumped from hopper to
	42	N	N	N	N	crusher.
	43	N	5	N	N	
	44	N	0	0	N	
	45	N	0	0	0	
	46	5	15	0	10	
	47	5	10	0	0	
	48	N	0	N	0	
	49	5	0	N	N	
	50	N	N	5	0	
	51	N	0	N	5	
	52	0	N	N	0	
	53	0	N	5	N	
	54	N	5	N	0	
	55	10	N	N	N	Down 14:02 ; restart 14:04
	56	0	0	0	10	
	57	0	N	0	N	
	58	0	N	0	—	Truck Unloading
	59	—	—	—	N	Down 14:08

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Plant Address

Stack Location In Plant

Weather Conditions N/A

Date 10/20/76

Observer TA

Observer's Location Primary Crusher (A) (cont)

HR	MIN	00	15	30	45	COMMENTS
14:11-1	00	N	N	N	O	Restart @ 14:11
	01	N	O	N	N	
	02	5	N	5	5	
	03	O	N	N	5	
	04	O	O	N	N	
	05	N	N	N	O	
	06	O	N	O	5	
	07	N	N	N	N	Stop @ 14:19; Restart @ 14:20
	08	N	N	O	5	
	09	O	N	N	N	
	10	N	N	O	N	EPA getting process sample.
	11	5	N	O	N	
	12	N	O	O	N	
	13	N	N	N	N	
	14	N	O	N	O	
	15	N	N	N	5	
	16	10	10	O	O	
	17	O	5	O	15	
	18	5	O	O	O	
	19	5	5	O	N	
	20	O	N	O	N	
	21	O	10	O	N	
	22	O	O	5	O	
	23	N	N	O	O	
	24	5	5	10	O	
	25	10	O	N	5	
	26	O	N	10	O	
	27	O	15	10	5	(Large Rock crushed)
	28	O	O	5	O	
14:40	29	O	10	O	N	

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date 10/20/76

Company Name Eastern Magnesia

Hours of Observation 1.5

Plant Address

Observer T. Locht

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~10'

Height of Observation Point Floor

Direction from Discharge Point W

Background Description Clear room air; well lit; dark ceiling.

Weather: Clear Overcast Partly Cloudy Other ______ Color ______

Wind Direction ______ Wind Velocity ______ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White?

Plume Dispersion Behavior: Looping Coning Fanning Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity min.	sec.	Opacity	Aggregate Time @ Opacity
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Date 10/20/76

Plant Address

Observer TAL

Stack Location In Plant

Observer's Location (Vertical Mill) D

Weather Conditions N/A

	HR	MIN	00	15	30	45	COMMENTS
14:57	0	00	N	N	N	N	Air Clear in Room
		01	N	N	N	N	
		02	N	N	N	N	
		03	N	N	N	N	
		04	N	N	N	N	
		05	N	N	N	N	
		06	N	N	N	N	
		07	N	N	N	N	
		08	N	N	N	N	
		09	N	N	N	N	
		10	N	N	N	N	
		11	N	N	N	N	
		12	N	N	N	N	
		13	N	N	N	N	
		14	N	N	N	N	
		15	N	N	N	N	
		16	N	N	N	N	
		17	N	N	N	N	
		18	N	N	N	N	
		19	N	N	N	N	
		20	N	N	N	N	
		21	N	N	N	N	
		22	N	N	N	N	
		23	N	N	N	N	
		24	N	N	N	N	
		25	N	N	N	N	
		26	N	N	N	N	
		27	N	N	N	N	
		28	N	N	N	N	
		29	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Date 10/20/76

Plant Address ______ Observer [illegible]

Stack Location In Plant Observer's Location (Vertical Mill D (out)

Weather Conditions N/A

TIME						COMMENTS
HR	MIN	SECONDS 00	15	30	45	
15:27-0	30	N	N	N	N	
	31	N	N	N	N	
	32	N	N	N	N	
	33	N	N	N	N	
	34	N	N	N	N	
	35	N	N	N	N	
	36	N	N	N	N	
	37	N	N	N	N	
	38	N	N	N	N	
	39	N	N	N	N	
	40	N	N	N	N	
	41	N	N	N	N	
	42	N	N	N	N	
	43	N	N	N	N	
	44	N	N	N	N	
	45	N	N	N	N	
	46	N	N	N	N	
	47	N	N	N	N	
	48	N	N	N	N	
	49	N	N	N	N	
	50	N	N	N	N	
	51	N	N	N	N	
	52	N	N	N	N	
	53	N	N	N	N	
	54	N	N	N	N	
	55	N	N	N	N	
	56	N	N	N	N	
	57	N	N	N	N	
	58	N	N	N	N	
	59	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name: Eastern Magnesia
Date: 10/20/76 — 10/21/76

Plant Address:
Observer: [illegible]

Stack Location: In Plant
Observer's Location: (Vertical Mill D (cont.)

Weather Conditions: N/A

HR	MIN	SECONDS 00	15	30	45	COMMENTS
15:57	00	N	N	N	N	
15:59	01	N	N	N	N	Stop @ 15:59
07:41	02	N	N	N	N	Restart 10/21 @ 7:41
	03	N	N	N	N	
	04	N	N	N	N	
	05	N	N	N	N	
	06	N	N	N	N	
	07	N	N	N	N	
	08	N	N	N	N	
	09	N	N	N	N	
	10	N	N	N	N	
	11	N	N	N	N	
	12	N	N	N	N	
	13	N	N	N	N	
	14	N	N	N	N	
	15	N	N	N	N	
	16	N	N	N	N	
	17	N	N	N	N	
	18	N	N	N	N	
	19	N	N	N	N	
	20	N	N	N	N	
	21	N	N	N	N	Dust flowing off shelf of nearby window —
	22	N	N	N	N	no visibility problems
	23	N	N	N	N	
	24	N	N	N	N	
	25	N	N	N	N	
	26	N	N	N	N	
	27	N	N	N	N	
	28	N	N	N	N	
8:09	29	N	N	N	N	

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date 10/21/76

Company Name Eastern Magnesia

Hours of Observation 1.0 HR

Plant Address

Observer T. Loch.

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~ 5'

Height of Observation Point Floor

Direction from Discharge Point S

Background Description Clear room air; semi-well lit; wooden background

Weather: Clear Overcast Partly Cloudy Other ________ Color ________

Wind Direction ________ Wind Velocity ________ mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Date 10/21/76

Plant Address ______ Observer TAL

Stack Location In Plant Observer's Location Secondary Crusher A2

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
8:20 0	00	O	N	N	N	Room Air Slightly Hazy (due to outside
	01	N	N	N	N	winds) -- no visibility problem (cf. 10/20)
	02	N	N	N	N	
	03	N	N	N	N	
	04	N	N	N	N	
	05	N	N	N	O	
	06	N	N	O	O	
	07	N	N	N	N	
	08	N	N	N	N	
	09	N	N	N	N	
	10	N	N	N	N	
	11	N	N	N	N	
	12	N	N	N	N	
	13	N	N	N	N	
	14	N	N	N	O	
	15	N	N	N	N	
	16	N	N	N	N	
	17	5	N	N	N	
	18	5	O	N	N	
	19	N	N	N	5	
	20	N	O	O	N	
	21	N	O	O	N	
	22	N	N	O	O	
	23	N	N	N	N	
	24	N	N	N	N	
	25	O	N	N	N	
	26	N	N	O	N	
	27	N	5	5	5	Seemingly high flow rate of material into hopper
	28	N	O	N	N	
	29	N	O	N	N	Stop @ 8:50

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia

Plant Address

Stack Location In Plant

Weather Conditions N/A

Date 10/21/76

Observer Tsh

Observer's Location (Secondary Crusher) A_2 (Cont)

HR	MIN	00	15	30	45	COMMENTS
8:51 0	30	N	O	O	N	Restart 8:51
	31	N	N	N	5	
	32	O	O	N	O	
	33	N	N	N	N	
	34	N	N	N	N	
	35	N	N	N	N	
	36	O	N	N	5	
	37	N	N	N	N	
	38	N	N	N	N	
	39	N	N	N	N	
	40	N	N	N	N	
	41	N	N	N	N	
	42	N	N	N	N	
	43	N	N	N	O	
	44	N	N	N	N	
	45	N	N	N	N	
	46	N	N	N	N	
	47	N	N	N	N	
	48	N	N	N	N	
	49	N	N	N	N	
	50	O	N	N	N	
	51	N	N	N	N	Stop @ 9:13; Restart 9:14
	52	N	O	5	N	
	53	O	N	N	N	
	54	N	N	N	N	
	55	N	N	5	N	
	56	5	O	N	N	
	57	N	N	N	N	
	58	N	N	N	N	
	59	N	O	N	N	End of 1 hr. requested add'l readings.

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Talc Manufacturing

Date

Company Name Eastern Magnesia

Hours of Observation

Plant Address

Observer

Type of Discharge STACK OTHER Process

Discharge Location In Plant

Height of Point of Discharge In room

Observer's Location:

Distance to Discharge Point ~10'

Height of Observation Point Floor

Direction from Discharge Point W

Background Description Clear room air, well lit; light wall background

Weather: Clear Overcast Partly Cloudy Other Color

Wind Direction Wind Velocity mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other White

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other N/A

Estimated Distance Plume Visible N/A

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia — Date 10/21/76

Plant Address ______ — Observer Tal

Stack Location In Plant — Observer's Location (Bagger) H

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
10:07 0	00	N	N	N	N	
	01	N	N	N	O	
	02	N	N	O	N	
	03	N	N	O	N	
	04	N	N	N	N	
	05	N	N	N	N	
	06	N	N	N	N	
	07	N	N	N	N	Stop @ 10:15; Restart 10:16
	08	N	N	N	N	
	09	N	N	N	N	
	10	N	N	N	5	
	11	O	O	O	N	
	12	O	N	N	N	
	13	N	N	N	O	
	14	N	N	N	N	Stop 10:23; Restart 10:47
	15	5	N	5	N	Stop 10:48; Restart 10:52
10:55	16	N	N	O	N	Stop 10:52; Restart 10:55
56	17	5	O	O	O	(10:23 - 10:5[illegible]
	18	N	N	N	N	
	19	N	N	N	N	
	20	N	N	N	N	
11:00	21	N	N	N	N	Stop @ 11:01; Restart @ 11:05
11:05	22	N	N	N	N	
	23	N	N	O	O	
	24	O	O	N	N	
	25	N	N	N	N	
	26	N	N	20	O	On bag removal.
	27	N	N	N	N	
	28	N	N	N	N	
	29	N	N	N	N	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Date 10/21/76

Plant Address

Observer TAL

Stack Location Sn Plant

Observer's Location (Bagger) H (cont)

Weather Conditions N/A

HR	MIN	00	15	30	45	COMMENTS
11:14 - 0	30	N	N	N	N	
	31	O	N	N	O	
	32	N	N	N	N	
	33	N	N	N	N	Down 11:16 ; Restart 11:19
	34	N	N	N	N	
	35	N	N	N	N	
	36	N	N	N	N	
	37	N	N	N	N	
	38	N	N	N	N	
	39	N	N	N	N	
	40	N	N	N	N	
	41	O	N	N	N	
	42	N	N	O	N	
	43	N	N	N	N	
	44	N	N	N	N	
	45	N	N	N	O	
	46	N	O	O	O	
	47	O	O	N	N	
	48	N	N	5	O	
	49	O	30	10	O	Bag Broke.
	50	N	O	O	N	Down 11:40 ; Restart 11:44
	51	N	N	N	N	
	52	N	N	N	N	
	53	N	N	N	N	
	54	N	N	N	N	
	55	N	N	N	N	
	56	N	N	N	O	
	57	N	N	N	N	
	58	N	N	N	N	
	59	N	N	N	N	End one hour add. readings.

APPENDIX D

EPA DRAFT METHOD 17

EPA DRAFT METHOD 17

METHOD 17—DETERMINATION OF PARTICULATE EMISSIONS FROM STATIONARY SOURCES (IN-STACK FILTRATION METHOD)

Introduction. Particulate matter is not an absolute quantity; rather it is a variable which is a function of temperature and pressure. For this reason, particulate matter emission regulations and/or associated test methods must define or take cognizance of the temperature and pressure at which particulate matter is to be measured. If temperature is not defined, and if the effect of temperature upon the quantity of particulate in an effluent gas is unknown, then the particulate emission regulation may be variable. The range of pressure which exist from source to source is of negligible importance.

In Method 5, 250° F is established as a nominal reference temperature. Thus, where Method 5 is specified under an applicable subpart, particulate matter is defined with respect to temperature. In order to maintain this indicated temperature, Method 5 includes a heated glass sample probe and a heated filter holder. This equipment is cumbersome and requires care in its operation. Therefore, where particulate matter concentrations (over the normal range of temperature associated with a specified source category) are known to be independent of temperature, it is desirable to eliminate the glass probe and heating system, and sample at stack temperature.

This method describes an in-stack sampling system and sampling procedures for use where particulate matter concentrations are independent of temperature. It may be used to conduct performance tests under 40 CFR 60.8 within specified conditions, or when approved by the Administrator.

1. Principle and applicability

1.1 Principle. Particulate matter is withdrawn isokinetically from a gas stream and collected on a glass fiber filter maintained at stack temperature. The particulate matter mass is determined gravimetrically after removal of uncombined water.

1.2 Applicability. This method applies to the measurement of particulate matter emissions from stationary sources and is used to determine compliance with new source performance standards, when specifically provided for in an applicable subpart of the standards. This method is not applicable when stack gases are saturated with water vapor or when the projected cross-sectional are of the probe extension-filter holder assembly (when inserted halfway into the stack) covers more than 3% of the stack cross-sectional area (see Section 4.1.2).

2. Apparatus

2.1 Sampling train. A schematic of the sampling train used in this method is shown in Figure 17-1. Construction details for many, but not all, of the train components are given in APTD-0581; for changes from the APTD-0581 document and for allowable modifications to Figure 17-1, consult with the Administrator.

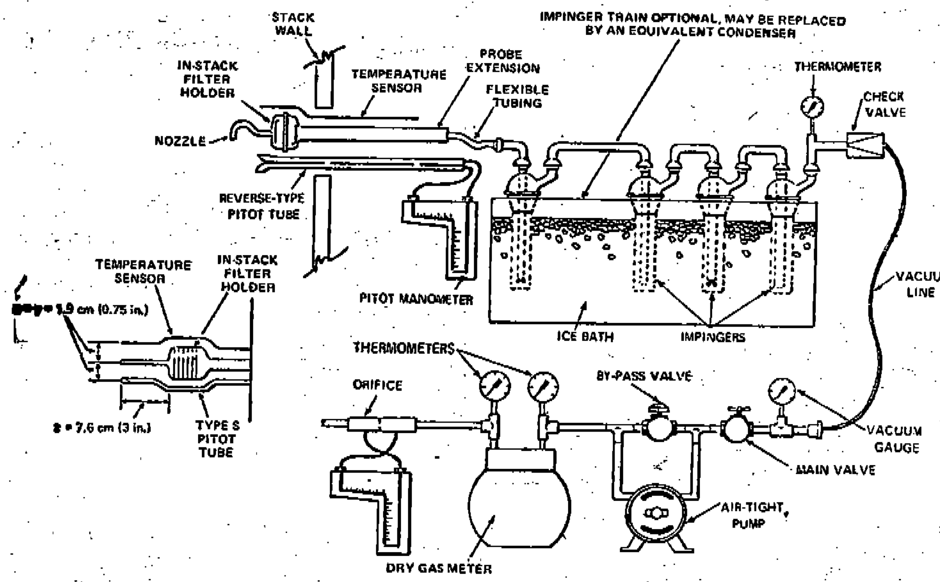


Figure 17-1. Particulate-sampling train, equipped with in-stack filter.

The operating and maintenance procedures for many of the sampling train components are described in APTD-0576. Since correct usage is important in obtaining valid results, all users should read the APTD-0576 document and adopt the operating and maintenace procedures outlined in it, unless otherwise specified herein.

2.1.1 Probe nozzle—Stainless steel (316) with sharp, tapered leading edge. The angle of taper shall be ≤30° and the taper shall be on the outside to preserve a constant internal diameter. The probe nozzle shall be of the button-hook or elbow design, unless otherwise approved by the Administrator. The nozzle shall be constructed from seamless stainless steel tubing. Other configurations and construction material may be used subject to approval from the Administrator.

A range of sizes suitable for isokinetic sampling should be available, e.g., 0.32 cm (1/8 in.) up to 1.27 cm (1/2 in.) (or larger if higher volume sampling trains are used) inside diameter (ID) nozzles in increments of 0.16 cm (1/16 in.). Each nozzle shall be calibrated according to the procedures outlined in the calibration section.

2.1.2 Filter Holder. The in-stack filter holder shall be constructed of borosilicate or quartz glass or stainless steel; if a gasket is used, it shall be made of silicone rubber, teflon, or stainless steel. Other holder and gasket materials may be used with approval from the Administrator. The filter holder shall be designed to provide a positive seal against leakage from the outside or around the filter.

2.1.3 Probe Extension—Any suitable rigid probe extension may be used after the filter holder. Flexible tubing may also be used between the probe extension and the condenser.

2.1.4 Pitot tube—Type S, or other device approved by the Administrator, attached to probe extension to allow constant monitoring of the stack gas velocity. The face openings of the pitot tube and the probe nozzle shall be adjacent and parallel to each other, not necessarily in the same plane, during sampling. The free space between the nozzle and pitot tube (see Figure 17-1) shall be at least 1.9 cm (0.75 in.). The free space shall be set based on a 1.3 cm (0.5 in.) ID nozzle. If the sampling train is designed for sampling at higher flow rates than that described in APTD-0581, thus necessitating the use of larger sized nozzles, the largest sized nozzle shall be used to set the free space. In addition, to minimize aerodynamic interactions between the pitot tube and filter holder, there shall be a distance of at least 3 inches between the center line of the pitot tube impact openings and the leading edge of the filter holder (see Figure 17-1).

The pitot tube must meet the criteria specified in Method 2, and be calibrated separately (i.e., apart from its assembly configuration) according to the procedures outlined in that method for the calibration of isolated Type S pitot tubes.

2.1.5 Differential pressure gauge—Inclined manometer capable of measuring velocity head within 10% of the minimum measured value or ±0.013 mm (0.0005 in.), whichever is greater. Below a differential pressure of 1.3 mm (0.05 in.) water guage, micromanometers with sensitivities of 0.013 mm (0.0005 in.) should be used. However, micromanometers are not easily adaptable to field conditions and are not easy to use with pulsating flow. Thus, methods or other devices acceptable to the Administrator may be used when conditions warrant.

2.1.6 Condenser—Any system that cools the sample gas stream (e.g., impingers connected in series, as in Method 5) and allows measurement of both the water condensed and the moisture leaving the condenser, each to within 1 ml or 1 g. The moisture leaving the condenser can be measured either by: (1) monitoring the temperature and pressure at the exit of the condenser and using Dalton's law; or (2) passing the sample gas stream through a silica gel trap with exit gases kept below 20° C (68° F) and determining the weight gain.

If means other than silica gel are used to determine the amount of moisture leaving the condenser, it is recommended that silica gel still be used between the condenser system and pump to prevent moisture condensation in the pump and metering devices.

2.1.7 Metering system—Vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 3° C (5.4° F), dry gas meter with 2% accuracy, and related equipment, or equivalent, as required to maintain an isokinetic sampling rate and to determine sample volume. Sampling trains utilizing metering systems designed for higher flow rates than that described in APTD-0581 or APTD-0576 may be used provided that the specifications in section 2 of this method are met. When the metering system is used in conjunction with a pitot tube, the system shall enable checks of isokinetic rates.

2.1.8 Barometer—Mercury, aneroid, or other barometers capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby weather bureau station, in which case the station value (which is the absolute barometric pressure) shall be requested and an adjustment for elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice versa for elevation decrease.

2.1.9 Gas density determination equipment—Temperature and pressure gauges and gas analyzer as described in Methods 2 and 3.

2.1.10 Temperature and pressure gauges—If Dalton's law is used, to monitor temperature and pressure at condenser outlet. The temperature gauge shall have an accuracy of 1° C (2° F). The pressure gauge shall be capable of measuring pressure to within 2.5 mm. Hg (0.1 in. Hg). If silica gel is used in the condenser system the temperature and pressure must be measured before the silica gel component.

2.2 Sample recovery.

2.2.1 Probe nozzle brush—Nylon bristles with stainless steel wire handle. The brush shall be properly sized and shaped to brush out the probe nozzle.

2.2.2 Glass wash bottles—Two.

2.2.3 Glass sample storage containers—Chemically resistant, borosilicate glass bottles, for acetone washes, 500 ml or 1,000 ml. Screw cap closures shall be teflon rubber-backed liners or of such construction so as to be leak free and prevent chemical attack from the acetone. (Narrow mouth glass bottles have been found to be less prone to leakage.) Other types of containers must be approved by the Administrator.

2.2.4 Petri dishes—For filter samples; glass or polyethylene, unless otherwise specified by the Administrator.

2.2.5 Graduated cylinder and/or balance—To measure condensed water to within 1 ml. or 1 g. Graduated cylinders shall have subdivisions no greater than 2 ml. Most laboratory balances are capable of weighing to the nearest 0.5 g or less. Any of these balances are suitable for use here and in section 2.3.4.

2.2.6 Plastic storage containers—Air tight containers to store silica gel.

2.2.7 Funnel and rubber policeman—To aid in transfer of silica gel to container; not necessary if silica gel is weighed in the field.

2.3 Analysis.

2.3.1 Glass weighing dishes.

2.3.2 Desiccator.

2.3.3 Analytical balance—To measure to within 0.1 mg.

2.3.4 Balance—To measure to within 0.5 g.

2.3.5 Beakers—250 ml.

2.3.6 Hygrometer—To measure the relative humidity of the laboratory environment.

2.3.7 Temperature gauge—To measure the temperature of the laboratory environment.

3. *Reagents*

3.1 Sampling.

3.1.1 Filters—The in-stack filters shall be glass mats or thimble fiber filters, without organic binders, and shall exhibit at least 99.95% efficiency (≤0.05% penetration) on 0.3 micron dioctyl phthalate smoke particles. The filter efficiency tests shall be conducted in accordance with ASTM standard method D 2986–71. Test data from the supplier's quality control program is sufficient for this purpose.

3.1.2 Silica gel—Indicating type, 6–16 mesh. If previously used, dry at 175° C (350° F) for 2 hours. New silica gel may be used as received.

3.1.3 Crushed ice.

3.1.4 Stopcock grease—Acetone insoluble, heat stable silicone grease. This is not necessary if screw-on connectors with Teflon sleeves, or similar, are used.

3.2 Sample recovery.

3.2.1 Acetone—Reagent grade, ≤0.001% residue, in glass bottles. Acetone from metal containers generally has a high residue blank and should not be used. Sometimes, suppliers transfer acetone to glass bottles from metal containers. Thus, acetone blanks shall be run prior to field use and only acetone with low blank values (≤0.001%) shall be used.

3.3 Analysis.

3.3.1 Acetone—Same as 3.2.1.

3.3.2 Desiccant—Anhydrous calcium sulfate, indicating type.

4. *Procedure*

4.1 Sampling. The sampling shall be conducted by competent personnel experienced with this test procedure.

4.1.1 Pretest preparation. All the components shall be maintained and calibrated according to the procedure described in APTD–0576, unless otherwise specified herein.

Weigh approximately 200–300 g of silica gel in air tight containers to the nearest 0.5 g. Record the total weight, both silica gel and container, on each container. Larger portions of silica gel may be used, but care should be taken during sampling that the gel is not entrained and carried out of its holder. As an alternative, the silica gel may be weighed directly in its impinger or sampling holder just prior to train assembly.

Check filters visually against light for irregularities and flaws or pinhole leaks. Label filters of proper size on the back side near the edge using numbering machine ink. As an alternative, label the shipping containers (glass or plastic petri dishes) and keep the filters in these containers at all times except during sampling and weighing.

Desiccate the filters at 20±5.6° C (68±10° F) and ambient pressure for at least 24 hours and weigh at 6 or more hour intervals to a constant weight, i.e., 0.5 mg change from previous weighing, and record results to the nearest 0.1 mg. During each weighing the filter must not be exposed to the laboratory atmosphere for a period greater than 2 minutes and a relative humidity above 50%.

4.1.2 Preliminary determinations. Select the sampling site and the minimum number of sampling points according to Method 1 or as specified by the Administrator. Make a projected area model of the probe extension-filter holder assembly, with the pitot tube impact openings positioned along the centerline of the stack, as shown in Figure 17–2. If the estimated cross-section blockage, calculated as shown in Figure 17–2, exceeds 3 percent of the duct cross sectional area, then either one of the following shall be done: (1) a suitable out-stack filtration method can be used instead of in-stack filtration; or (2) a special in-stack assembly, designed to minimize blockage effects, can be used. For details concerning the latter approach, consult with the Administrator.

Determine the stack pressure, temperature, and the range of velocity heads using Method 2; determine the moisture content using Approximation Method 4 or its alternatives for the purpose of making isokinetic sampling rate calculations. Estimates may be used. However, final results will be based on actual measurements made during the test.

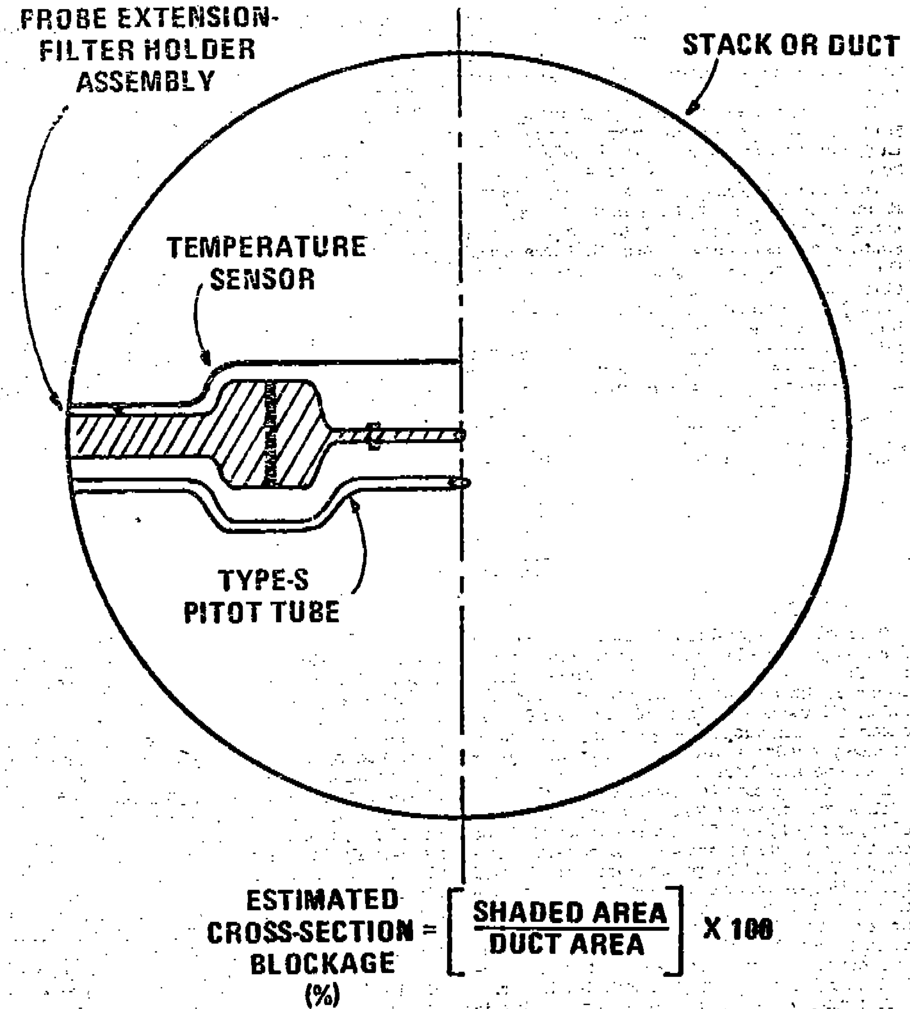


Figure 17-2. Projected-area model of cross-section blockage (approximate average for a sample traverse) caused by in-stack filter holder-probe extension assembly.

Select a nozzle size based on the range of velocity heads such that it is not necessary to change the nozzle size in order to maintain isokinetic sampling rates. During the run, do not change the nozzle size. Ensure that the differential pressure gauge is capable of measuring the minimum velocity head value to within 10%, or as specified by the Administrator.

Select a probe extension length such that all traverse points can be sampled. Consider sampling from opposite sides for large stacks to reduce the length of probes.

Select a total sampling time greater than or equal to the minimum total sampling time specified in the test procedures for the specific industry such that the sampling time per point is not less than 2 min. (or some greater time interval if specified by the Administrator) and the sample volume taken will exceed the required minimum total gas sample volume specified in the test procedures for the specific industry. The latter is based on an approximate average sampling rate. Note also that the minimum total sample volume is corrected to standard conditions.

It is recommended that half-integral or integral numbers of minutes be sampled at each point in order to avoid timekeeping errors.

In some circumstances, e.g., batch cycles, it may be necessary to sample for shorter times at the traverse points and to obtain smaller gas sample volumes. In these cases, the Administrator's approval must first be obtained.

4.1.3 Preparation of collection train. During preparation and assembly of the sampling train, keep all openings where contamination can occur covered until just prior to assembly or until sampling is about to begin.

If impingers are used to condense stack gas moisture prepare them as follows: place 100 ml of water in each of the first two impingers; leave the third impinger empty; and transfer approximately 200–300 g or more, if necessary, of preweighed silica gel from its container to the fourth impinger; alternatively, if a balance is available in the field, the silica gel can be weighed out in a tared impinger, and its weight gain determined in the field. Place the silica gel container in a clean place for later use in the sample recovery. If some means other than impingers is used to condense moisture, prepare the condenser (and, if appropriate, silica gel for condenser outlet) for use.

Using a tweezer or clean disposable surgical gloves, place a labeled (identified) and weighed filter in the filter holder. Be sure that the filter is properly centered and the gasket properly placed so as not to allow the sample gas stream to circumvent the filter. Check filter for tears after assembly is completed. Mark the probe extension with heat resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

Unless otherwise specified by the Administrator, attach a temperature sensor to the probe extension so that the sensor extends beyond the leading edge of the probe extension and does not touch any metal. The sensor should be positioned at least 1.9 cm (0.75 in.) from both the pitot tube and probe nozzle to avoid interference with the gas flow (see Figure 17–1).

Assemble the train as in Figure 17–1, using (if applicable) a very light coat of silicone grease on all ground glass joints and greasing only the outer portion (see APTD–0576) to avoid possibility of contamination by the silicone grease. Place crushed ice around the impingers (if applicable).

4.1.4 Leak check procedure—After the sampling train has been assembled, a leak check of the filter holder shall be conducted as follows: Plug the inlet to the probe nozzle with a material that will be able to withstand the stack temperature; alternatively, the proble nozzle can be removed and the inlet to the filter holder plugged. Insert the holder into the stack and wait approximately 5 minutes (or longer, if necessary) to allow the system to come to equilibrium with the temperature of the stack gas stream. Turn on the pump and draw a vacuum of at least 380 mm Hg (15 in. Hg). Determine the leakage rate, if any. A leakage rate in excess of 4% of the average sampling rate or 0.00057 m^3/min. (0.02 cfm), whichever is less, is unacceptable.

The following leak check instructions for the sampling train described in APTD–0576 and APTD–0581 may be helpful. Start the pump with by-pass valve fully open and coarse adjust valve completely closed. Partially open the coarse adjust valve and slowly close the by-pass valve until 380 mm Hg (15 in. Hg) vacuum is reached. Do not reverse direction of by-pass valve. If 380 mm Hg (15 in. Hg) is exceeded, either leak check at this higher vacuum or end the leak check as shown below and start over.

When the leak check is completed, first slowly remove the plug from the inlet to the probe nozzle and immediately turn off the vacuum pump. This prevents the water in the condenser from being forced backward and keeps silica gel from being entrained backward.

Leak checks shall be conducted as described whenever the train is disengaged, e.g., for silica gel or filter changes during the test, prior to each test run, and at the completion of each test run. If leaks are found to be in excess of the acceptable rate, the test will be considered invalid. To reduce lost time due to leakage occurrences, it is recommended that leak checks be conducted between port changes at the highest vacuum reading drawn during that sampling traverse.

PLANT ______
LOCATION ______
OPERATOR ______
DATE ______
RUN NO. ______
SAMPLE BOX NO. ______
METER BOX NO. ______
METER ΔHg ______
C FACTOR ______
PITOT TUBE COEFFICIENT, C_p ______

SCHEMATIC OF STACK CROSS SECTION

AMBIENT TEMPERATURE ______
BAROMETRIC PRESSURE ______
ASSUMED MOISTURE, % ______
PROBE EXTENSION LENGTH, m (ft) ______
NOZZLE IDENTIFICATION NO. ______
AVERAGE CALIBRATED NOZZLE DIAMETER, cm (in.) ______
LEAK RATE, m^3/min (cfm) ______

TRAVERSE POINT NUMBER	SAMPLING TIME (θ), min.	STATIC PRESSURE mm Hg (in Hg)	STACK TEMPERATURE (T_S) °C (°F)	VELOCITY HEAD (ΔP_S), mm (in.) H_2O	PRESSURE DIFFERENTIAL ACROSS ORIFICE METER mm H_2O (in. H_2O)	GAS SAMPLE VOLUME m^3 (ft^3)	GAS SAMPLE TEMPERATURE AT DRY GAS METER INLET °C (°F)	GAS SAMPLE TEMPERATURE AT DRY GAS METER OUTLET °C (°F)	TEMPERATURE OF GAS LEAVING CONDENSER OR LAST IMPINGER, °C (°F)
TOTAL							Avg.	Avg.	
AVERAGE							Avg.		

Figure 17-3. Particulate field data.

4.1.5 Particulate train operation—During the sampling run, maintain the isokinetic sampling rate to within 10% (unless otherwise specified by the Administrator) of true isokinetic.

For each run, record the data required on the example data sheet shown in Figure 17–3. Be sure to record the initial dry gas meter reading. Record the dry gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made, and when samplying is halted. Take other data point readings at least once at each sample point during each time increment and additional readings when significant changes (20% variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer.

Clean the portholes prior to the test run to minimize the chance of sampling the deposited material. To begin sampling, remove the nozzle cap and verify that the pitot tube and probe extension are properly positioned. Position the nozzle at the first traverse point with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions. Nomographs, which aid in the rapid adjustment of the isokinetic sampling rate without excessive computations, are available for use whenever the Type S pitot tube coefficient is 0.85±0.02, and the stack gas equivalent density (molecular weight) is 29±4. APTD–0576 details the procedure for using these nomographs. If C_p and M_d are outside the above stated ranges, do not use the nomograph unless appropriate steps (see Reference 7.7) are taken to compensate for the deviations.

When the stack is under significant negative pressure (height of impinger stem), take care to close the coarse adjust valve before inserting the probe into the stack. If necessary, the pump may be turned on with the coarse adjust valve closed.

When the probe is in position, block off the openings around the probe and porthole to prevent unrepresentative dilution of the gas stream.

Traverse the stack cross section, as required by Method 1 or as specified by the Administrator, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe extension through the portholes, to minimize chance of extracting deposited material.

During the test run, take appropriate steps (e.g., adding crushed ice to the impinger ice bath) to maintain a temperature of less than 20° C (68° F) at the condenser outlet; this will prevent excessive moisture losses. Also, periodically check the level and zero of the manometer.

If the pressure drop across the filter becomes to high, making isokinetic sampling difficult to maintain, the filter may be replaced in the midst of a sample run. It is recommended that another complete filter holder-nozzle assembly be used rather than attempting to change the filter itself. After the new filter holder-nozzle assembly is installed, conduct a leak check. The particulate weight shall include the summation of all filter assembly catches.

A single train shall be used for the entire sample run, except for filter and silica gel changes. However, if approved by the Administrator, two or more trains may be used for a single test run when there are two or more ducts or sampling ports. The results shall be the total of all sampling train catches.

At the end of the sample run, turn off the pump, remove the probe extension-filter holder-nozzle assembly from the stack, and record the final dry gas meter reading. Perform a leak check at a vacuum equal to or greater than the maximum reach during sampling. Calculate percent isokinetic (see calculation section) to determine whether another test run should be made. If there is difficulty in maintaining isokinetic rates due to source conditions, consult with the Adminstrator for possible variance on the isokinetic rates.

4.2 Sample recovery. Proper cleanup procedure begins as soon as the probe extension-filter holder-nozzle assembly is removed from the stack at the end of the sampling period. Allow the assembly to cool.

When the assembly can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over it to prevent losing or gaining particulate matter. Do not cap off the probe tip tightly while the sampling train is cooling down as this would create a vacuum in the filter holder, and force condenser water backward.

Before moving the sample train to the cleanup site, disconnect the filter holder-probe nozzle assembly from the probe extension; cap the open inlet of the probe extension. Be careful not to lose any condensate, if present. Remove the umbilical cord from the condenser outlet and cap the outlet. If a flexible line is used between the first impinger or condenser and the probe extension, disconnect the line at the probe extension and let any condensed water or liquid drain into the impingers or condenser. After wiping off the silicone grease (if applicable) cap off the condenser inlet. Ground glass stoppers, plastic caps, or serum caps (whichever are appropriate) may be used to close these openings.

Transfer both the filter holder-probe nozzle and condenser assemblies to the cleanup area. This area should be clean and protected from the wind so that the chances of contaminating or losing the sample will be minimized.

Save a portion of the acetone used for cleanup as a blank. Place about 200 ml of this acetone taken directly from the wash bottle being used in a glass sample container labeled "acetone blank."

Inspect the train prior to and during disassembly and note any abnormal conditions. Treat the samples as follows:

Container No. 1. Carefully remove the filter from the filter holder and place in its identified petri dish container. Use a pair of tweezers and/or clean disposable surgical gloves to handle the filter. If it is necessary to fold the filter, do so such that the particulate cake is inside the fold. Quantitatively remove any particulate matter and/or filter which adheres to the filter holder gasket by carefully using a dry nylon bristle brush and/or a sharp-edged blade and place into this container. Seal the container.

Container No. 2. Taking care to see that dust on the outside of the probe nozzle or other exterior surfaces does not get into the sample, quantitatively recover particulate matter or any condensate from the probe nozzle, fitting, and front half of the filter holder by washing these components with acetone and placing the wash into a glass container in the following manner; note that distilled water may be used instead of acetone when approved by the Administrator or shall be used when specified by the Administrator; in these cases, save a water blank and follow Administrator's directions on analysis;

Carefully remove the proble nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nylon bristle brush. Brush until acetone rinse shows no visible particles, after which make a final rinse of the inside surface with acetone.

Brush and rinse with acetone the inside parts of the fitting in a similar way until no visible particles remain. A funnel may be used to aid in transferring liquid washes to the container. Rinse the brush with acetone and quantitatively collect these washings in the sample container. Between sampling runs, keep brushes clean and protected from contamination.

After ensuring that all joints are wiped clean of silicone grease (if applicable), clean the inside of the front half of the filter holder by rubbing the surfaces with a nylon bristle brush and rinsing with acetone. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. After all acetone washings and particulate matter are collected in the sample container, tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether or not leakage occurred during transport. Label container to clearly identify its contents.

Container No. 3. Note color of indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel back to its original container and seal. A funnel may make it easier to pour the silica gel without spilling, and a rubber policeman may be used as an aid in removing the silica gel. It is not necessary to remove the small amount of dust particles that may adhere to the walls and are difficult to remove. Since the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, follow the procedure under "Analysis."

Condenser water. Treat the condenser or impinger water as follows: make a notation of any color or film in the liquid catch. Measure the condensate to within ±1 ml by using a graduated cylinder or, if available, to within ±0.5 g by using a balance. Record the condensate volume or weight. This information is required to calculate the moisture content of the effluent gas. Discard the liquid after measuring and recording the volume or weight.

4.3 Analysis. Record the data required on the example sheet shown in Figure 17-4. Handle each sample container as follows:

Container No. 1. Leave in shipping container or transfer the filter and any loose particulate from the sample container to a tared glass weighing dish and desiccate for 24 hours in a desiccator containing anhydrous calcium sulfate. Weight to a constant weight and report the results to the nearest 0.1 mg. For purposes of this section 4.3, the term "constant weight" means a difference of no more than 0.5 mg or 1% of total weight less tare weight, whichever is greater, between two consecutive weighings, with no less than 6 hours of desiccation time between weighings and no more than 2 minutes exposure to the laboratory atmosphere (must be less than 50% relative humidity) during weighing.

Plant __________

Date __________

Run No. __________

Relative Humidity __________

Amount liquid lost during transport __________

Acetone blank volume, ml __________

Acetone wash volume, ml __________

Acetone blank concentration, mg/g (equation 17-4) __________

Acetone wash blank, mg (equation 17-5) __________

CONTAINER NUMBER	WEIGHT OF PARTICULATE COLLECTED, mg		
	FINAL WEIGHT	TARE WEIGHT	WEIGHT GAIN
1			
2			
TOTAL			
		Less acetone blank	
		Weight of particulate matter	

	VOLUME OF LIQUID WATER COLLECTED		
	CONDENSATE VOLUME, ml	SILICA GEL WEIGHT, g	
FINAL			
INITIAL			
LIQUID COLLECTED			
TOTAL VOLUME COLLECTED		g*	ml

CONVERT WEIGHT OF WATER TO VOLUME BY DIVIDING TOTAL WEIGHT INCREASE BY DENSITY OF WATER (1g/ml)

$$\frac{\text{INCREASE, g}}{\text{1 g/ml}} = \text{VOLUME WATER, ml}$$

Figure 17-4. Analytical data.

Container No. 2. Note level of liquid in container and confirm on analysis sheet whether or not leakage occurred during transport. Measure the liquid in this container either volumetrically to ±1 ml or gravimetrically to ±0.5 g. Transfer the contents to a tared 250 ml beaker, and evaporate to dryness at ambient temperature and pressure. Desiccate for 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.

Container No. 3. Weigh the spent silica gel to the nearest 0.5 g using a balance. This step may be conducted in the field.

"Acetone Blank" Container, Measure acetone in this container either volumetrically or gravimetrically. Transfer the acetone to a tared 250 ml beaker and evaporate to dryness at ambient temperature and pressure. Desiccate for 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.

5. *Calibration*

Maintain a laboratory log of all calibrations.

5.1 Probe nozzle. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in.). Make 3 separate measurements using different diameters each time and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in.).

When nozzles become nicked, dented, or corroded, they shall be reshaped, sharpened, and recalibrated before use.

Each nozzle shall be permanently and uniquely identified.

5.2 Pitot tube. The pitot tube shall be calibrated separately (i.e., apart from its assembly configuration) according to the procedures outlined in Method 2 for Calibration of isolated Type S pitot tubes.

5.3 Dry gas meter and orifice meter. Both meters shall be calibrated according to the procedure outlined in APTD-0576. When a diaphragm pump is used, assure that there is no leak.

5.4 Temperature gauges. Calibrate dial and liquid filled bulb thermometers and thermocouple-potentiometer systems against mercury-in-glass thermometers. Ice bath and boiling water (corrected for barometric pressure) are acceptable reference points. For other devices, check with the Administrator.

6. *Calculations*

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculation.

6.1 Nomenclature.

A_n=Cross sectional area of nozzle, m² (ft²).
B_{ws}=Water vapor in the gas stream, proportion by volume.
C_a=Acetone blank residue concentration, mg/g.
c_s=Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, g/dscm (g dscf).
I=Percent of isokinetic sampling.
m_n=Total amount of particulate matter collected, mg.
M_w=Molecular weight of water, 18 g/g-mole (18 lb/lb-mole).
m_a=Mass of residue of acetone after evaporation, mg.
P_{bar}=Barometric pressure at the sampling site, mm Hg (in. Hg).
P_s=Absolute stack gas pressure, mm Hg (in. Hg).
P_{std}=Standard absolute pressure, 760 mm Hg (29.92 in. Hg).
R=Ideal gas constant, 0.06236 mm Hg-m³/°K-g-mole (21.83 in. Hg-ft³/°R-lb-mole).
T_m=Absolute average dry gas meter temperature (see Figure 17-3), °K (°R).
T_s=Absolute average stack gas temperature (see Figure 17-3), °K (°R).
T_{std}=Standard absolute temperature, 293° K (528° R).
V_a=Volume of acetone blank, ml.
V_{aw}=Volume of acetone used in wash, ml.
V_{lc}=Total volume of liquid collected in condenser and silica gel (see Figure 17-4), ml.
V_m=Volume of gas sample as measured by dry gas meter, dcm (dcf).
$V_{m(std)}$=Volume of gas sample measured by the dry gas meter corrected to standard conditions, dscm (dscf).
$V_{w(std)}$=Volume of water vapor in the gas sample corrected to standard conditions, scm (scf).
v_s=Stack gas velocity, calculated by Method 2, Equation 2-7 using data obtained from Method 17, m/sec (ft/sec).
W_a=Weight of residue in acetone wash, mg.
ΔH=Average pressure differential across the orifice meter (see Figure 17-3), mm H_2O (in. H_2O).
ρ_a=Density of acetone, mg/ml (see label on bottle).
ρ_w=Density of water, 1 g/ml (0.00220 lb/ml).
θ=Total sampling time, min.
13.6=Specific gravity of mercury.
60=sec/min.
100=Conversion to percent.

6.2 Average dry gas meter temperature and average orifice pressure drop. See data sheet (Figure 17-3).

6.3 Dry gas volume. Correct the sample volume measured by the dry gas meter to standard conditions (20° C, 760 mm Hg or 68° F, 29.92 in. Hg) by using Equation 17-1.

$$V_{m(std)}=V_m\left(\frac{T_{std}}{T_m}\right)\left[\frac{P_{bar}+\frac{\Delta H}{13.6}}{P_{std}}\right]=KV_m\left[\frac{P_{bar}+\Delta H/13.6}{T_m}\right] \qquad \text{Equation 17-1}$$

where:
K=0.3855 °K/mm Hg for metric units
=17.65 °R/in. Hg for English units

6.4 Volume of water vapor.

$$V_{w(std)}=V_{lc}\left(\frac{\rho_w}{M_w}\right)\left(\frac{RT_{std}}{P_{std}}\right)=KV_{lc} \qquad \text{Equation 17-2}$$

where
K=0.00134 m³/ml for metric units
=0.0472 ft³/ml for English units

6.5 Moisture content.

$$B_{ws}=\frac{V_{w(std)}}{V_{m(std)}+V_{w(std)}} \qquad \text{Equation 17-3}$$

6.6 Acetone blank concentration.

$$C_a=\frac{m_a}{V_a\rho_a} \qquad \text{Equation 17-4}$$

6.7 Acetone wash blank.

$$W_a=C_aV_{aw}\rho_a \qquad \text{Equation 17-5}$$

6.8 Total particulate weight. Determine the total particulate catch from the sum of the weights obtained from containers 1 and 2 less the acetone blank (see Figure 17-4).

6.9 Particulate concentration.

$$c_s=(0.001\ \text{g/mg})\ (m_n/V_{m(std)}) \qquad \text{Equation 17-6}$$

6.10 Conversion factors:

From	To	Multiply by
scf	m³	0.0283
g/ft³	gr/ft³	15.4
g/ft³	lb/ft³	2.205×10^{-3}
g/ft³	g/m³	35.31

6.11 Isokinetic variation.

6.11.1 Calculations from raw data.

$$= \frac{100\ T_s[KV_{lc}+(V_m/T_m)(P_{bar}+\Delta H/13.6)]}{60\ \theta v_s P_s A_n} \qquad \text{Equation 17-7}$$

where:
K=0.00346 mm Hg-m³/ml-°K for metric units
=0.00267 in. Hg-ft³/ml-°R for English units

6.11.2 Calculations from intermediate values.

$$I=\frac{T_s V_{m(std)} P_{std}\ 100}{T_{std} v_s \theta A_n P_s\ 60\ (1-B_{ws})}$$

$$=K\frac{T_s V_{m(std)}}{P_s v_s A_n \theta (1-B_{ws})} \qquad \text{Equation 17-8}$$

where:
K=4.323 for metric units
=0.0944 for English units

6.12 (Acceptable results. If 90% ≤I≤ 110%, the results are acceptable. If the results are low in comparison to the standards and I is beyond the acceptable range, the Administrator may option to accept the results. Use reference 7.4 to make judgments. Otherwise, reject the results and repeat the test.

7. References

7.1 Addendum to Specifications for Incinerator Testing at Federal Facilities, PHS, NCAPC, Dec. 6, 1967.

7.2 Martin, Robert M., Construction Details of Isokinetic Source Sampling Equipment, Environmental Protection Agency, APTD-0581.

7.3 Rom, Jerome J., Maintenance, Calibration, and Operation of Isokinetic Source Sampling Equipment, Environmental Protection Agency, APTD-0576.

7.4 Smith, W. S., R. T. Shigehara, and W. F. Todd, A Method of Interpreting Stack Sampling Data, Paper presented at the 63rd Annual Meeting of the Air Pollution Control Association, St. Louis, Mo., June 14-19, 1970.

7.5 Smith, W. S., et al., Stack Gas Sampling Improved and Simplified with New Equipment APCA paper No. 67-119, 1967.

7.6 Specifications for Incinerator Testing at Federal Facilities, PHS, NCAPC, 1967.

7.7 Shigehara, R. T., Adjustments in the EPA Nomograph for Different Pitot Tube Coefficients and Dry Molecular Weights, Stack Sampling News 2:4-11, Oct. 1974.

[FR Doc.76-27786 Filed 9-23-76;8:45 am]

APPENDIX E

SAMPLING SUMMARY SHEETS

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company   Location Johnson, Vermont

Sampled Source Baghouse Outlet

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-1	10/20/76	12	1.11	29.84	69.829	85	67.7	12.7	0.5982	0.8762	0.9912
P-2	10/20/76	12	1.15	29.74	71.795	98	67.7	12.4	0.5840	0.8549	0.9915
P-3	10/21/76	12	1.06	28.72	69.132	81	65.0	18.4	0.8666	1.3167	0.9868

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X (T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-1	29	28.90	-0.25	29.59	0.830	46.203	6715	80	120	0.125	102.1
P-2	29	28.91	-0.25	29.49	0.830	46.532	6773	83	120	0.125	102.2
P-3	29	28.85	-0.25	28.47	0.830	45.794	6791	82	120	0.125	101.6

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)} \qquad \%M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w \qquad M_d = \frac{100 - \%M}{100}$$

$$MW_d = (\%CO_2 \times \tfrac{44}{100}) + (\%O_2 \times \tfrac{32}{100}) + (\%CO + \%N_2) \times \tfrac{28}{100}$$

$$MW = MW_d \times M_d + 18\,(1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\%I = \frac{1{,}032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔP_s) and the absolute stack temperature from each sampling point.

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company   Location Johnson, Vermont

Sampled Source Baghouse Inlet No. 1

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-2	10/20/76	12	2.23	29.74	95.891	81	93.6	29.1	1.37	1.44	0.9856

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X(T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-2	29	28.84	-0.53	29.32	0.841	28.220	4179	60	120	0.188	98.0

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)}$$

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w$$

$$M_d = \frac{100 - \% M}{100}$$

$$MW_d = (\%CO_2 \times \frac{44}{100}) + (\%O_2 \times \frac{32}{100}) + (\%CO + \%N_2) \times \frac{28}{100}$$

$$MW = MW_d \times M_d + 18 (1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\%I = \frac{1,032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔPs) and the absolute stack temperature from each sampling point.

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company Location Johnson, Vermont

Sampled Source Baghouse Inlet No. 2

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-1	10/20/76	8	1.15	29.81	71.159	76	70.0	13.6	0.6406	0.9062	0.9909

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X(T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-1	29	28.90	-0.66	29.15	0.834	54.976	8089	160	120	0.125	102.3

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)}$$

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w$$

$$M_d = \frac{100 - \% M}{100}$$

$$MW_d = (\%CO_2 \times \tfrac{44}{100}) + (\%O_2 \times \tfrac{32}{100}) + (\%CO + \%N_2) \times \tfrac{28}{100}$$

$$MW = MW_d \times M_d + 18\,(1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\% I = \frac{1{,}032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔP_s) and the absolute stack temperature from each sampling point.

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company Location Johnson, Vermont

Sampled Source Baghouse Inlet No. 3

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-3	10/21/76	8	2.7	28.62	107.977	76	102	24.2	1.1398	1.1001	0.9890

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X(T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-3	29	28.88	-0.57	28.05	0.827	31.418	4674	45	120	0.188	97.1

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)}$$

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w$$

$$M_d = \frac{100 - \% M}{100}$$

$$MW_d = (\% CO_2 \times \tfrac{44}{100}) + (\% O_2 \times \tfrac{32}{100}) + (\% CO + \% N_2) \times \tfrac{28}{100}$$

$$MW = MW_d \times M_d + 18\,(1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\% I = \frac{1.032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p' Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔP_s) and the absolute stack temperature from each sampling point.

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company — Location Johnson, Vermont

Sampled Source Baghouse Inlet No. 1A

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-4	10/21/76	1	3.2	28.88	0.597	67	0.582	0	0	0	1

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X(T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-4	29	29	-0.28	28.60	0.99	27.604	4859	48	1	0.1875	62.2

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)}$$

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w$$

$$M_d = \frac{100 - \% M}{100}$$

$$MW_d = (\%CO_2 \times \tfrac{44}{100}) + (\%O_2 \times \tfrac{32}{100}) + (\%CO + \%N_2) \times \tfrac{28}{100}$$

$$MW = MW_d \times M_d + 18\,(1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\% I = \frac{1{,}032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔPs) and the absolute stack temperature from each sampling point.

SAMPLING SUMMARY SHEET

Plant Eastern Magnesia Talc Company   Location Johnson, Vermont

Sampled Source Baghouse Inlet No. 1B

Run	Date	N_p	P_m	P_b	V_m	T_m	$V_{m_{std}}$	V_w	$V_{w_{gas}}$	%M	M_d
P-5	10/21/76	1	1.36	28.88	1.186	61	1.16	0	0	0	1

Run	MW_d	MW	P_{st}	P_s	C_p	$\sqrt{\Delta P_s X(T_s+460)}^c$	V_s	T_s	T_t	D_n	%I
P-5	29	29	-0.397	28.48	0.99	41.104	7251	52	2.25	0.125	84.4

$$V_{m_{std}} = \frac{17.65 \times V_m \left(P_b + \frac{P_m}{13.6}\right)}{(T_m + 460)}$$

$$\% M = \frac{100 \times V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$V_{w_{gas}} = 0.0471 \times V_w$$

$$M_d = \frac{100 - \% M}{100}$$

$$MW_d = (\% CO_2 \times \tfrac{44}{100}) + (\% O_2 \times \tfrac{32}{100}) + (\% CO + \% N_2) \times \tfrac{28}{100}$$

$$MW = MW_d \times M_d + 18\,(1 - M_d)$$

$$P_s = P_b \pm P_{st}$$

$$V_s = 5120.8 \times Cp \times \sqrt{\Delta P_s \times (T_s + 460)} \left[\frac{1}{P_s \times MW}\right]^{1/2}$$

$$\% I = \frac{1{,}032 \times (T_s + 460) \times V_{m_{std}}}{V_s \times T_t \times P_s \times M_d \times (D_n)^2}$$

N_p Total No. of Sampling Points

P_m Average Orifice Pressure Drop, in. H_2O

P_b Barometric Pressure, in. Hg. Absolute

V_m Volume of Dry Gas at Meter Conditions, DCF

T_m Average Meter Temperature, °F

$V_{m_{std}}$ Volume of Dry Gas at STP, DSCF[a]

V_w Total H_2O Collected in Impingers and Silica Gel, ml

$V_{w_{gas}}$ Volume of Water Vapor Collected at STP, SCF[b]

% M % Moisture by Volume

M_d Mole Fraction of Dry Gas

% CO_2 Volume % Dry

% O_2 Volume % Dry

% CO Volume % Dry

% N_2 Volume % Dry

MW_d Molecular Weight of Stack Gas, Dry Basis

MW Molecular Weight of Stack Gas, Wet Basis

P_{st} Static Pressure of Stack Gas, in. Hg

P_s Stack Gas Pressure, in. Hg Absolute

C_p' Pitot Tube Coefficient

V_s Stack Gas Velocity at Stack Conditions, fpm.

T_s Average Stack Temperature °F

T_t Net Time of Test, Min.

D_n Sampling Nozzle Diameter, in.

% I Percent Isokinetic

[a] Dry standard cubic feet at 68°F, 29.92 in. Hg.

[b] Standard conditions at 68°F, 29.92 in. Hg.

[c] $\sqrt{\Delta P_s \times (T_s + 460)}$ is determined by averaging the square root of the product of the velocity head (ΔPs) and the absolute stack temperature from each sampling point.

APPENDIX F

PARTICULATE WEIGHT DATA

SUMMARY OF PARTICULATE WEIGHT FRACTIONS

BAGHOUSE OUTLET

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
1	Water Probe Rinse	96.3328	96.2921	0.0407	<0.0001	0.0407
	Acetone Probe Rinse	101.9048	101.9011	0.0037	0.0008	0.0029
	Filter	0.3026	0.1391	0.1635	<0.0001	0.1635
	Front-half Total	-	-	-	-	0.2071
	Impinger Contents and Back-half Water Rinse	100.7233	100.6456	0.0777	<0.0001	0.0777
	Total Particulate	-	-	-	-	0.2848
2	Water Probe Rinse	99.7200	99.7154	0.0046	<0.0001	0.0046
	Acetone Probe Rinse	99.9463	99.9437	0.0026	0.0010	0.0016
	Filter	0.4207	0.1267	0.2940	<0.0001	0.2940
	Front-half Total	-	-	-	-	0.3002
	Impinger Contents and Back-half Water Rinse	101.3505	101.3408	0.0097	<0.0001	0.0097
	Total Particulate	-	-	-	-	0.3099

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE OUTLET

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
3	Water Probe Rinse	101.9234	101.9203	0.0031	<0.0001	0.0031
	Acetone Probe Rinse	99.2124	99.2084	0.0040	0.0010	0.0030
	Filter	0.4037	0.1279	0.2758	<0.0001	0.2758
	Front-half Total	-	-	-	-	0.2819
	Impinger Contents and Back-half Water Rinse	101.1451	101.1412	0.0039	<0.0001	0.0039
	Total Particulate	-	-	-	-	0.2858
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE INLET NO. 1

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particu-late (gm)	Applicable Blank Value (gm)	Blank Corrected Particu-late (gm)
2	Water Probe Rinse	100.9417	98.1232	2.8185	<0.0001	2.8185
	Acetone Probe Rinse	101.3016	101.2684	0.0332	0.0013	0.0319
	Filter Catch Filter	48.5750 2.7642	- 0.7995	48.5750 1.9647	- 0.0015	48.5750 1.9632
	Front-half Total	-	-	-	-	53.3886
	Impinger Contents and Back-half Water Rinse	100.2071	100.2048	0.0023	<0.0001	0.0023
	Total Particulate	-	-	-	-	53.3909
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE INLET NO. 2

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
1	Water Probe Rinse	101.9851	101.5848	0.4003	<0.0001	0.4003
	Acetone Probe Rinse	99.5624	99.2532	0.3092	0.0017	0.3075
	Filter	5.8075	0.8024	5.0051	0.0015	5.0036
	Front-half Total	-	-	-	-	5.7114
	Impinger Contents and Back-half Water Rinse	99.4644	99.4630	0.0014	<0.0001	0.0014
	Total Particulate	-	-	-	-	5.7128
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE INLET NO. 3

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
3	Water Probe Rinse	97.6731	97.5345	0.1386	<0.0001	0.1386
	Acetone Probe Rinse	105.4183	105.3896	0.0287	0.0011	0.0276
	Filters	9.6337 12.1777	0.8012 0.7981	8.8325 11.3796	0.0015 0.0015	8.8310 11.3781
	Front-half Total	-	-	-	-	20.3753
	Impinger Contents and Back-half Water Rinse	100.1840	100.1819	0.0021	<0.0001	0.0021
	Total Particulate	-	-	-	-	20.3774
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE INLET NO. 1-A

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
4	Water Probe Rinse	94.5653	94.5031	0.0622	0.0051	0.0571
	Acetone Probe Rinse	91.3467	91.3409	0.0058	0.0001	0.0057
	Filter	2.5018	0.1271	2.3747	0.0015	2.3732
	Front-half Total	-	-	-	-	2.4360
	Impinger Contents and Back-half Water Rinse	-	-	-	-	-
	Total Particulate	-	-	-	-	-
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

SUMMARY OF PARTICULATE WEIGHT FRACTIONS
BAGHOUSE INLET NO.1-B

Eastern Magnesia Talc Company
Johnson, Vermont
October 20-21, 1976

Test No.	Fraction	Final Weight (gm)	Tare Weight (gm)	Weight of Particulate (gm)	Applicable Blank Value (gm)	Blank Corrected Particulate (gm)
5	Water Probe Rinse	93.4885	93.3583	0.1302	0.0084	0.1218
	Acetone Probe Rinse	93.1900	93.1799	0.0101	0.0001	0.0100
	Filter	0.6877	0.1368	0.5509	0.0015	0.5494
	Front-half Total	-	-	-	-	0.6812
	Impinger Contents and Back-half Water Rinse	-	-	-	-	-
	Total Particulate	-	-	-	-	-
	Water Probe Rinse					
	Acetone Probe Rinse					
	Filter					
	Front-half Total					
	Impinger Contents and Back-half Water Rinse					
	Total Particulate					

APPENDIX G

CALIBRATION DATA

METER AND ORIFICE CALIBRATION

Date 10/16/76 Calibrator G. E. Hawkins Meter Box Number ______

Barometric Pressure Pb ("Hg) 29.58 Gas Meter Number RAC #2

	Orifice Manometer Setting, Δm (in. H_2O)	Gas Volume Wet Test Meter V_w (ft^3)	Gas Volume Dry Gas Meter V_d (ft^3)	Temperature: Wet Test Meter t_w (°F)	Temperature: Dry Gas Meter Inlet t_{di} (°F)	Temperature: Dry Gas Meter Outlet t_{do} (°F)	Temperature: Dry Gas Meter Average t_d (°F)	Vacuum Wet Test Meter P_w (in. H_2O)	Time θ (min)	Meter Correction Factor (γ)	K_m
Stop	(0.5)	5865.00	782.220		88	80	84				
Start		5860.00	777.000	72	90	78	84	.05	12.82 / 12:49	0.978	0.1301
Average		(5) 5.00	5.220				84				
Stop	(1.0)	5870.00	787.421		88	80	84				
Start		5865.00	782.220	72	88	80	84	.05 [illegible]	9.20 / 9:12	0.980	0.1282
Average		(5) 5.00	5.201				84				
Stop	(2.0)	5880.00	797.862		94	83	88.5				
Start		5870.00	787.427	72	89	80	84	[illegible] .05	13.25 / 13:15	0.979	0.1258
Average		(10) 10.00	10.435				86				
Stop	(3.0)	5890.00	808.335		98	85	91.5	.05			
Start		5880.00	797.862	72	94	83	88.50	[illegible]	10.87 / 10:52	0.980	0.1252
Average		(10) 10.00	10.473				90				
Stop	(4.0)	5900.00	818.808		99	86	92.5	.05			
Start		5890.00	808.335	72	98	85	91.5	[illegible]	9.45 / 9:27	0.981	0.1248
Average		(10) 10.00	10.473				92				
Stop	(5.0)	5910.00	829.262		100	87	93.50	.05			
Start		5900.00	818.808	72	99	86	92.50	[illegible]	8.45 / 8:27	0.982	0.1248
Average		(10) 10.00	10.454				93				
									AVERAGE	0.980	0.1265

$$P_w = P_b - \frac{P_w}{13.6} \qquad P_d = P_b + \frac{\Delta m}{13.6} \qquad K_m = \frac{V_w}{\theta}\sqrt{\frac{P_w}{T_w\,\Delta m}}$$

$$\gamma = \frac{V_w\,P_w\,(t_d + 460)}{V_d\,P_d\,(t_w + 460)}$$

Isokinetic Factor (ISO) $= \frac{27.40}{(\overline{K_m})^2} = \frac{27.40}{(\quad)^2} =$ 1712

10/25/71 From EPA Truck #74

Barometric Pressure Pb ("Hg) 29.41 Calibrator G.E.H. Gas Meter Number Rdc #2

	Orifice Manometer Setting, Δm (in. H_2O)	Gas Volume Wet Test Meter V_w (ft^3)	Gas Volume Dry Gas Meter V_d (ft^3)	Temperature: Wet Test Meter t_w (°F)	Temperature: Dry Gas Meter Inlet t_{di} (°F)	Temperature: Dry Gas Meter Outlet t_{do} (°F)	Temperature: Dry Gas Meter Average t_d (°F)	Vacuum Wet Test Meter P_w (in. H_2O)	Time θ (min)	γ	K_m
Stop	0.5	6045.00	195.917		84°	75°	79.5				
Start	29.45	6040.00	190.742	69°	86	74°	80	.02	12:51	0.985	0.130
Average		(5) 5	5.175		95	85	80				
Stop	1.0	6050.00	201.109		88°	77°	82.50				
Start	29.48	6045.00	195.917	70	84°	75°	79.50	.02	9:14	0.981	0.128
Average		(5) 5	5.192		90	91	81				
Stop	2.0	6060.00	211.516		92	80	86.00				
Start	29.56	6050.00	201.109	70	88°	77°	82.50	.02	13:10	0.981	0.127
Average		(10) 10.00	10.407		90	88.5	84				
Stop	3.0	6070.00	221.942		96	82	89.00				
Start	29.63	6060.00	211.516	70	92	80	~~88.00~~ 86.00	.05	10:50	0.984	0.126
Average		(10) 10.00	10.426		94	91	88				
Stop	4.0	6080.00	232.370		98	83	90.50				
Start	29.70	6070.00	221.942	70	96	82	89.00	.05	9:25	0.985	0.12[illegible]
Average		(10) 10.00	10.428		99	93.5	90				
Stop	5.0	6090.00	242.798		100	84	92				
Start	29.78	6080.00	232.370	70	98	83	90.50	.05	8:27	0.985	0.125
Average		(10) 10.00	10.428		99	93.5	91				
									AVERAGE	0.984	0.127

$P_w = P_b - \frac{P_w}{13.6}$ $\quad P_d = P_b + \frac{\Delta m}{13.6}$ $\quad K_m = \frac{V_w}{\theta}\sqrt{\frac{P_w}{T_w \Delta m}}$

$\gamma = \frac{V_w P_w (t_d + 460)}{V_d P_d (t_w + 460)}$

Factor in isokinetic equation $= \frac{27.40}{(K_m)^2} = \frac{27.40}{(\quad)^2} =$ 1699

METER AND ORIFICE CALIBRATION

Date 10/16/76 Calibrator G. E. Hawkins Meter Box Number

Barometric Pressure Pb ("Hg) 29.58 Gas Meter Number KMC # 1

	Orifice Manometer Setting, Δm (in. H_2O)	Gas Volume Wet Test Meter V_w (ft^3)	Gas Volume Dry Gas Meter V_d (ft^3)	Temperature: Wet Test Meter t_w (°F)	Temperature: Dry Gas Meter Inlet t_{di} (°F)	Temperature: Dry Gas Meter Outlet t_{do} (°F)	Temperature: Dry Gas Meter Average t_d (°F)	Vacuum Wet Test Meter P_w (in. H_2O)	Time θ (min)	Meter Correction Factor (γ)	K_m
Stop	(0.5)	5980.00	670.243		80	80	80		12.55		
Start		5975.00	665.155	73	80	80	80	.05	12:33	0.994	0.1327
Average		(5) 5.00	5.088				80				
Stop	(1.0)	5985.00	675.342		86	80	83		8.92		
Start		5980.00	670.243	73	80	80	80	.05	8:55	0.991	0.1321
Average		(5) 5.00	5.099				81.5				
Stop	(2.0)	5995.00	685.543		90	82	86		13.13		
Start		5985.00	675.342	73	86	80	83	.05	13:08	0.996	0.1267
Average		(10) 10.00	10.201				84.5				
Stop	(3.0)	6005.00	695.774		94	84	89		10.66		
Start		5995.00	685.543	73	90	82	86	.05	10:37	0.997	0.1281
Average		(10) 10.00	10.231				87.5				
Stop	(4.0)	6015.18	706.173		94	84	89		9.70		
Start		6005.00	695.774	73	94	84	89	.05	9:42	0.997	0.1236
Average		(10) 10.18	10.399				89				
Stop	(5.0)	6025.00	716.215		94	86	90		8.40		
Start		6015.18	706.173	73	94	84	89	.05	8:24	0.996	0.1232
Average		(10) 9.82	10.042				89.5				
									AVERAGE	0.996	0.1278

$$P_w = P_b - \frac{P_w}{13.6} \qquad P_d = P_b + \frac{\Delta m}{13.6} \qquad K_m = \frac{V_w}{\theta}\sqrt{\frac{P_w}{T_w \, \Delta m}}$$

$$\gamma = \frac{V_w \, P_w \, (t_d + 460)}{V_d \, P_d \, (t_w + 460)}$$

Isokinetic Factor (ISO) $= \frac{27.40}{(\bar{K}_m)^2} = \frac{27.40}{(\quad)^2} =$ 1678

10/25/76 FROM ... #24

Barometric Pressure Pb ("Hg) 29.40 Calibrator G.E.H. Gas Meter Number RM #4

	Orifice Manometer Setting, Δm (in. H_2O)	Gas Volume Wet Test Meter V_w (ft^3)	Gas Volume Dry Gas Meter V_d (ft^3)	Temperature: Wet Test Meter t_w (°F)	Temperature: Dry Gas Meter Inlet t_{di} (°F)	Temperature: Dry Gas Meter Outlet t_{do} (°F)	Temperature: Dry Gas Meter Average t_d (°F)	Vacuum Wet Test Meter P_w (in. H_2O)	Time θ (min)	γ	K_m
Stop	0.5	6095.00	119.274		74	70	72				
Start	[illegible]	6090.00	114.284	68	70	70	70	.02	12:34	1.006	0.133
Average		(5)	4.990		[illegible]	[illegible]	71				
Stop	1.0	6100.00	124.284		80	70	75°				
Start	[illegible]	6095.00	119.274	68	74	70	72°	.02	8:48	1.007	0.134
Average		(5)	5.010		77	70	74				
Stop	2.0	6110.03	134.364		86	76	81°				
Start	[illegible]	6100.00	124.284	68	80	70	75°	.02	13:10	1.009	[illegible]
Average		(10) 10.03	10.080		[illegible]	73	78				
Stop	3.0	6120.00	144.430		90	80	85°				
Start	[illegible]	6110.03	134.364	68	86°	76°	81°	.02	10:31	1.011	0.13[illegible]
Average		(10) 9.97	10.066		88	78	83				
Stop	4.0	6130.00	154.554		90	80	85				
Start	[illegible]	6120.00	144.430	68	90	80	85°	.05	9:24	[illegible]	[illegible]
Average		(10) 10.00	10.124		[illegible]	80	85				
Stop	5.0	6140.12	164.910		92	82	87				
Start	[illegible]	6130.00	154.554	68	90	80	85	.06	8:33	1.008	[illegible]
Average		(10) 10.12	10.256		91	81	86				
									AVERAGE	1.008	[illegible]

$$P_w = P_b - \frac{P_w}{13.6} \qquad P_d = P_b + \frac{\Delta m}{13.6} \qquad K_m = \frac{V_w}{\theta}\sqrt{\frac{P_w}{T_w \Delta m}}$$

$$\gamma = \frac{V_w\, P_w\, (t_d + 460)}{V_d\, P_d\, (t_w + 460)}$$

Factor in isokinetic equation $= \frac{27.40}{(K_m)^2} = \frac{27.40}{(\quad)^2} =$ [illegible]

PITOT TUBE CALIBRATION

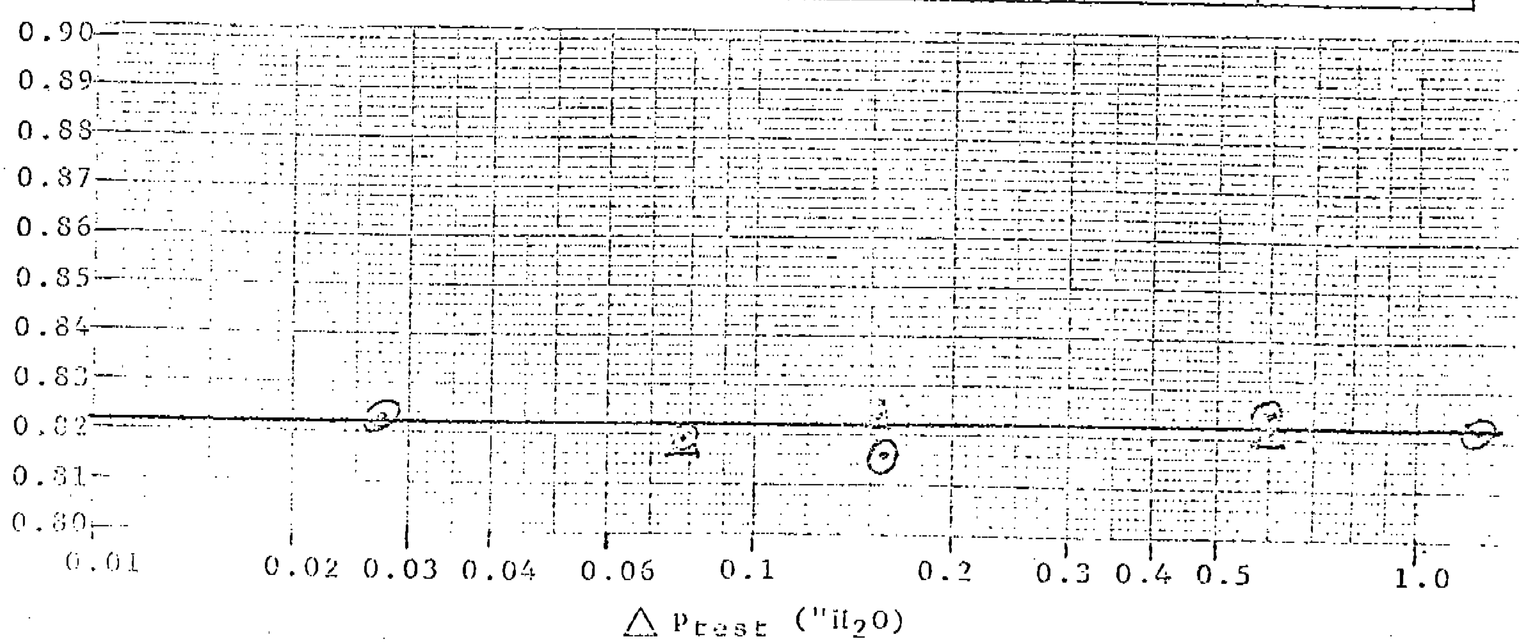
$$C_{p_{test}} = 0.99 \sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 10

Standard Pitot Tube No. ______

Calibrator: NCR Date: OCT 7, '76 Client: EPA VERMONT

Anticipated ΔP_{std}	ΔP_{std}	A		B	
		ΔP_{test}	$\Delta C_{p_{test}}$	ΔP_{test}	$\Delta C_{p_{test}}$
0.02	0.0188	0.0272	0.823	0.	0.
0.04	0.	0.	0.	0.	0.
0.06	0.0539	0.0780	0.819	0.0780	0.819
0.08	0.	0.	0.	0.	0.
0.10	0.	0.	0.	0.	0.
0.12	0.1022	0.1566	0.818	0.1546	0.824
0.16	0.	0.	0.	0.	0.
0.20	0.	0.	0.	0.	0.
0.30	0.	0.	0.	0.	0.
0.50	0.3800	0.547	0.825	0.5508	0.822
0.70	0.	0.	0.	0.	0.
0.80	ϕ.0546	ϕ.530	0.822	0.	0.



Clayton Environmental Consultants

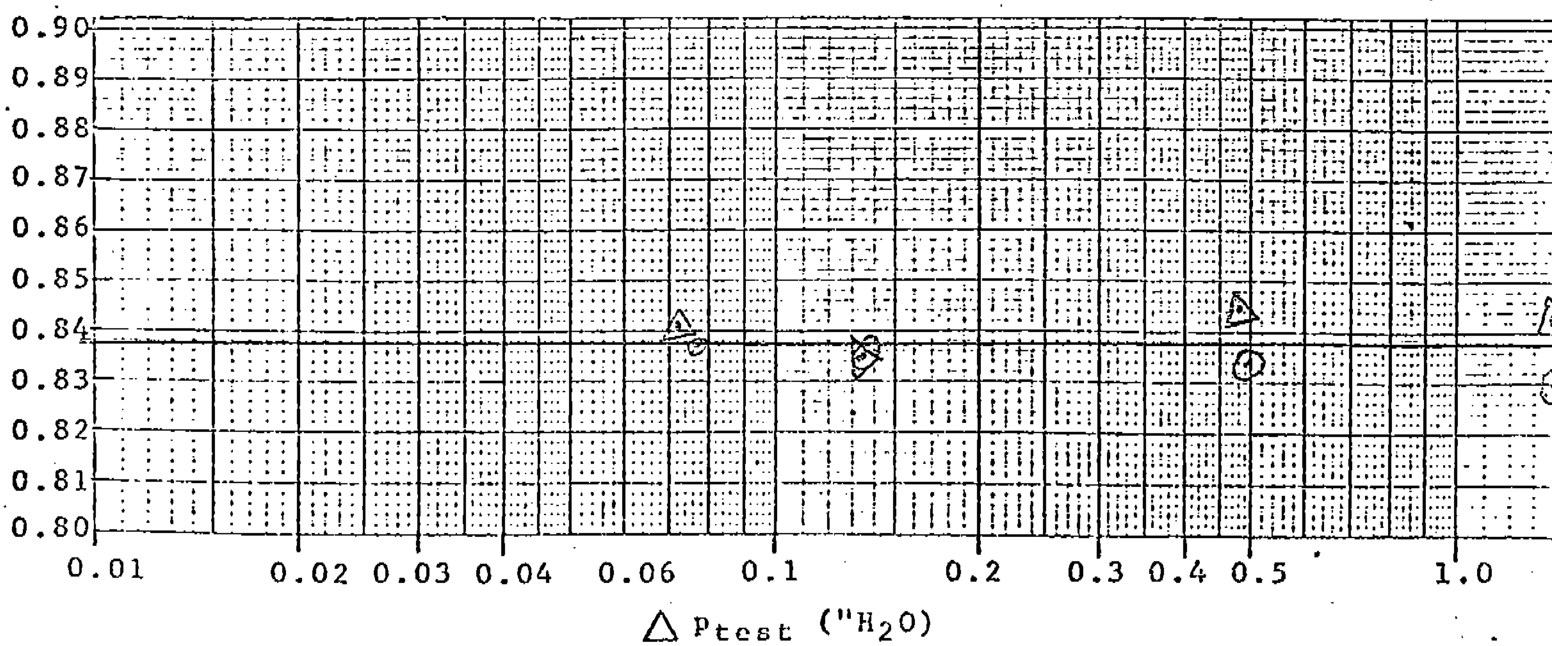
$$C_{p_{test}} = 0.99 \sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 10

Standard Pitot Tube No. ______

Calibrator: R J Griffin Date: 10/26/76 Client: post - EPA Task 24 Vermont

Anticipated ΔP_{std}	ΔP_{std}	A ⊙		B △	
		ΔP_{test}	$\Delta C_{p_{test}}$	ΔP_{test}	$\Delta C_{p_{test}}$
0.02	0.	0.	0.	0.	0.
0.04	0.052	0.	0.	0.072	0.841 ✓
0.06	0.055	0.077	0.837 ✓	0.	0.
0.08	0.094	0.	0.	0.132	0.835 ✓
0.10	0.096	0.135	0.835 ✓	0. [redacted]	0.
0.12	0.	0.	0.	0.	0.
0.16	0.	0.	0.	0.	0.
0.20	0.	0.	0.	0.	0.
0.30	0.350	0.	0.	0.481	0.844 ✓
0.50	0.351	0.494	0.834 ✓	0.	0.
0.70	0.990	0.	0.	[redacted]1.370	0.842 ✓
0.80	0.991	[redacted]1.410	0.830 ✓	0.	0.



PITOT TUBE CALIBRATION

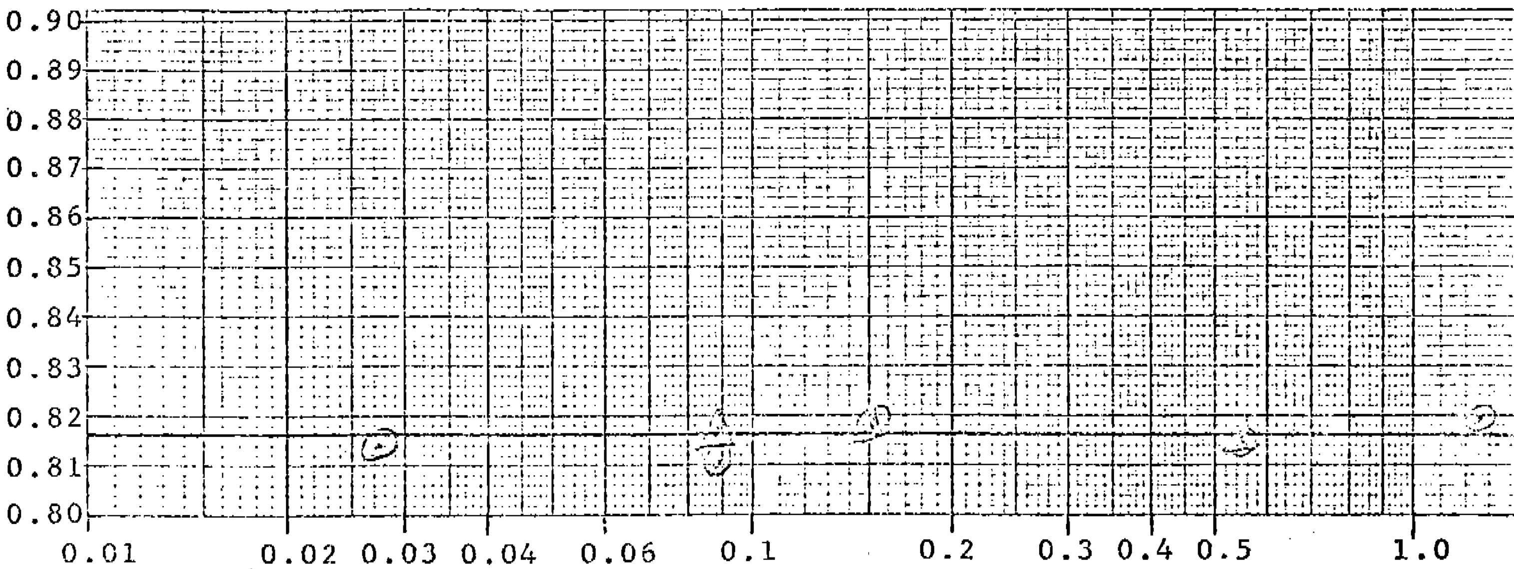
$$C_{p\,test} = 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 12

Standard Pitot Tube No. ______

Calibrator: NCR Date: OCT 13 '75 Client: EPA VERMONT

Anticipated ΔP_{std}	ΔP_{std}	A ⊙		B △	
		ΔP_{test}	$\Delta C_{p\,test}$	ΔP_{test}	$\Delta C_{p\,test}$
0.02	0.0184	0.0272	0.814	0.	0.
0.04	0.	0.	0.	0.	0.
0.06	0.	0.	0.	0.	0.
0.08	0.0528	0.0788	0.810	0.0778	0.816
0.10	0.	0.	0.	0.	0.
0.12	0.	0.	0.	0.	0.
0.16	0.1028	0.1502	0.819	0.1504	0.818
0.20	0.	0.	0.	0.	0.
0.30	0.	0.	0.	0.	0.
0.50	0.3718	0.5488	0.815	0.5466	0.816
0.70	0.	0.	0.	0.	0.
0.80	Ø.0338	Ø.512	0.819	0.	0.



Clayton Environmental Consultants

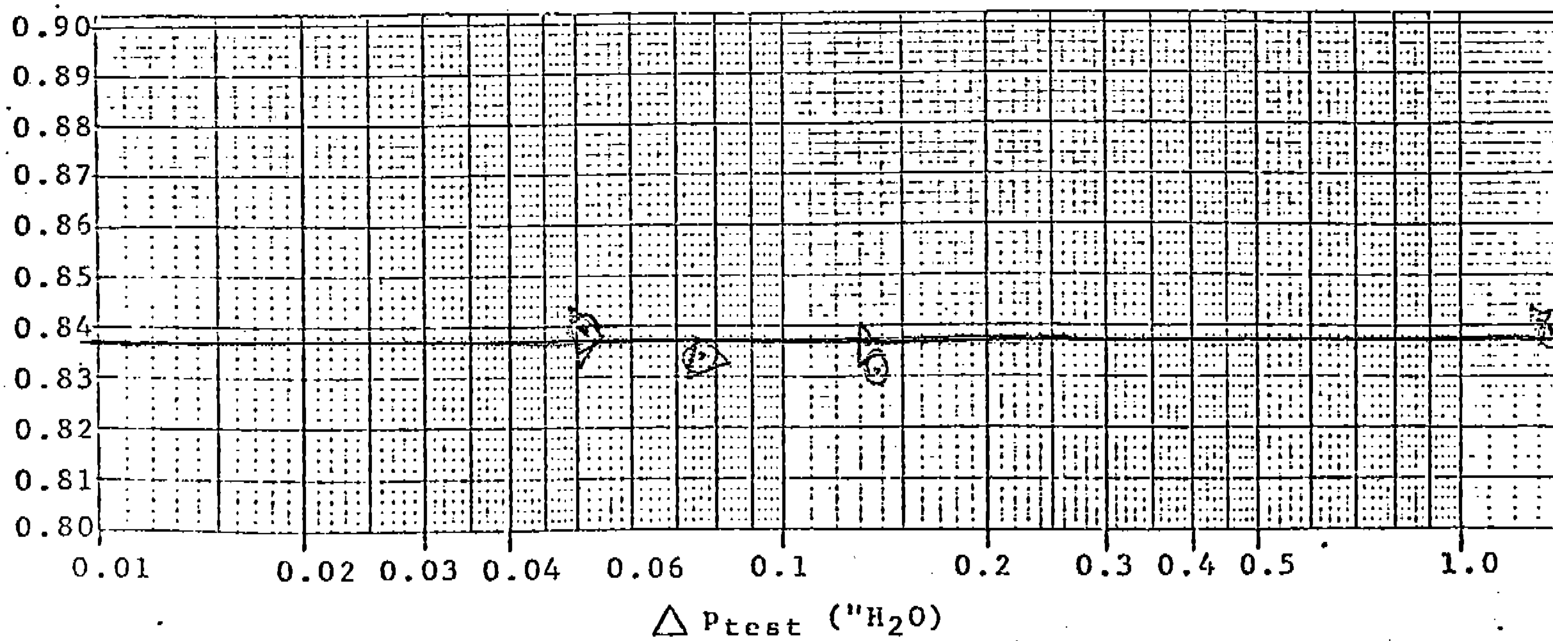
$$C_{p_{test}} = 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 12

Standard Pitot Tube No. ______

Calibrator: R T Griffin Date: 10/26/76 Client: Dart - EPA Task 24

Anticipated ΔP_{std}	ΔP_{std}	A ⊙ ΔP_{test}	A ⊙ $\Delta C_{p_{test}}$	B △ ΔP_{test}	B △ $\Delta C_{p_{test}}$
0.02	0.___	0.___	0.___	0.___	0.___
0.04	0.054	0.076	0.834 ✓	0.076	0.834 ✓
0.06	0.___	0.___	0.___	0.___	0.___
0.08	0.___	0.___	0.___	0.___	0.___
0.10	0.098	0.139	0.831 ✓	0.137	0.837 ✓
0.12	0.___	0.___	0.___	0.___	0.___
0.16	0.___	0.___	0.___	0.___	0.___
0.20	0.___	0.___	0.___	0.___	0.___
0.30	0.366	0.510	0.839 ✓	0.510	0.839 ✓
0.50	0.___	0.___	0.___	0.___	0.___
0.70	0.___	0.___	0.___	0.___	0.___
0.80	1.001	1.393	0.839 ✓	1.389	0.840 ✓



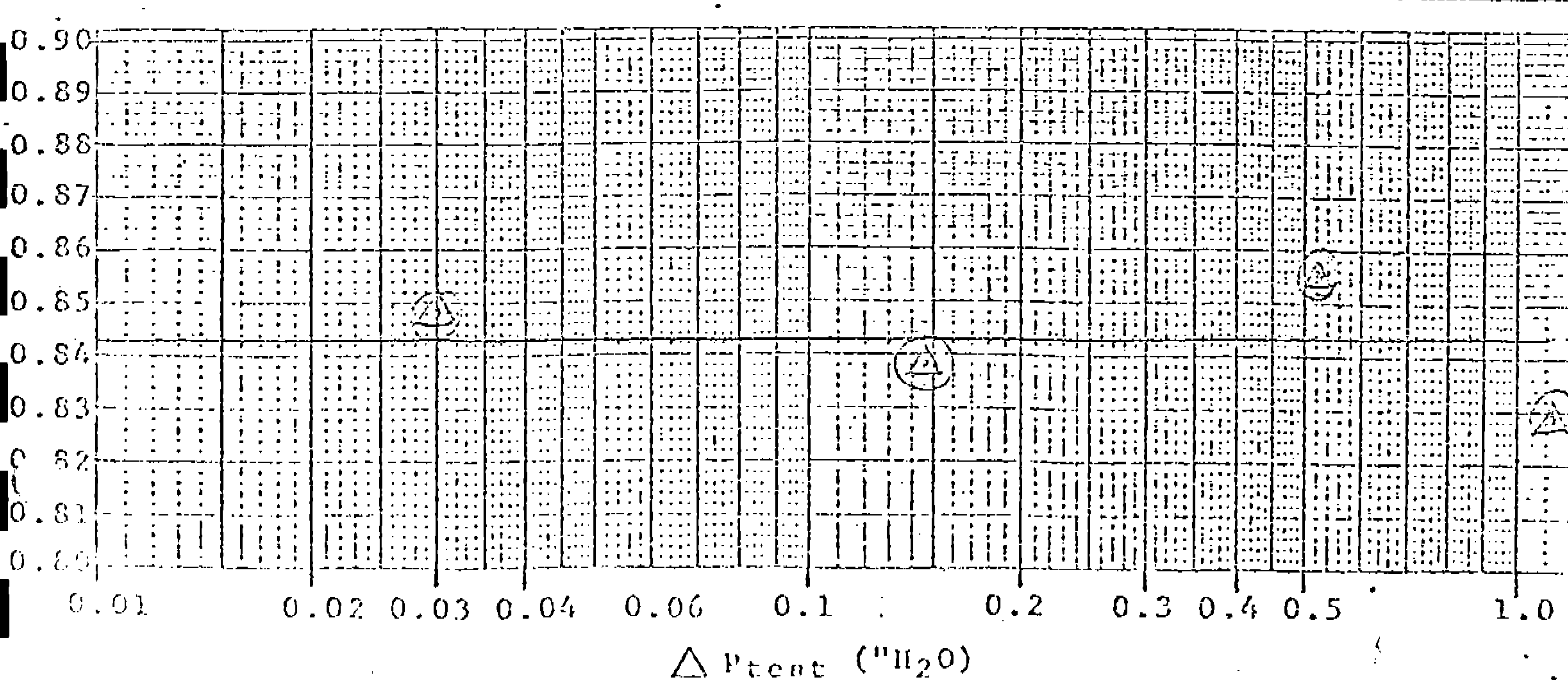
$C_{p_{test}} \doteq 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$

Pitot Tube Type S Pitot Tube No. 19

Standard Pitot Tube No. ______

Calibrator: GEH. Date: 10/6/76 Client: From EPA Task #25

Anticipated ΔP_{std}	ΔP_{std}	A ΔP_{test}	A $\Delta C_{p_{test}}$	B ΔP_{test}	B $\Delta C_{p_{test}}$
0.02	0.022	0.030	0.848	0.030	0.848
0.04	0.	0.	0.	0.	0.
0.06	0.	0.	0.	0.	0.
0.08	0.	0.	0.	0.	0.
0.10	0.106	0.148	0.838	0.148	0.838
0.12	0.	0.	0.	0.	0.
0.16	0.	0.	0.	0.	0.
0.20	0.	0.	0.	0.	0.
0.30	0.392	0.526	0.855	0.526	0.855
0.50	0.	0.	0.	0.	0.
0.70	0.	0.	0.	0.	0.
0.80	0. 1.036	0. 1.476	0.829	0. 1.474	0.830



PITOT TUBE CALIBRATION

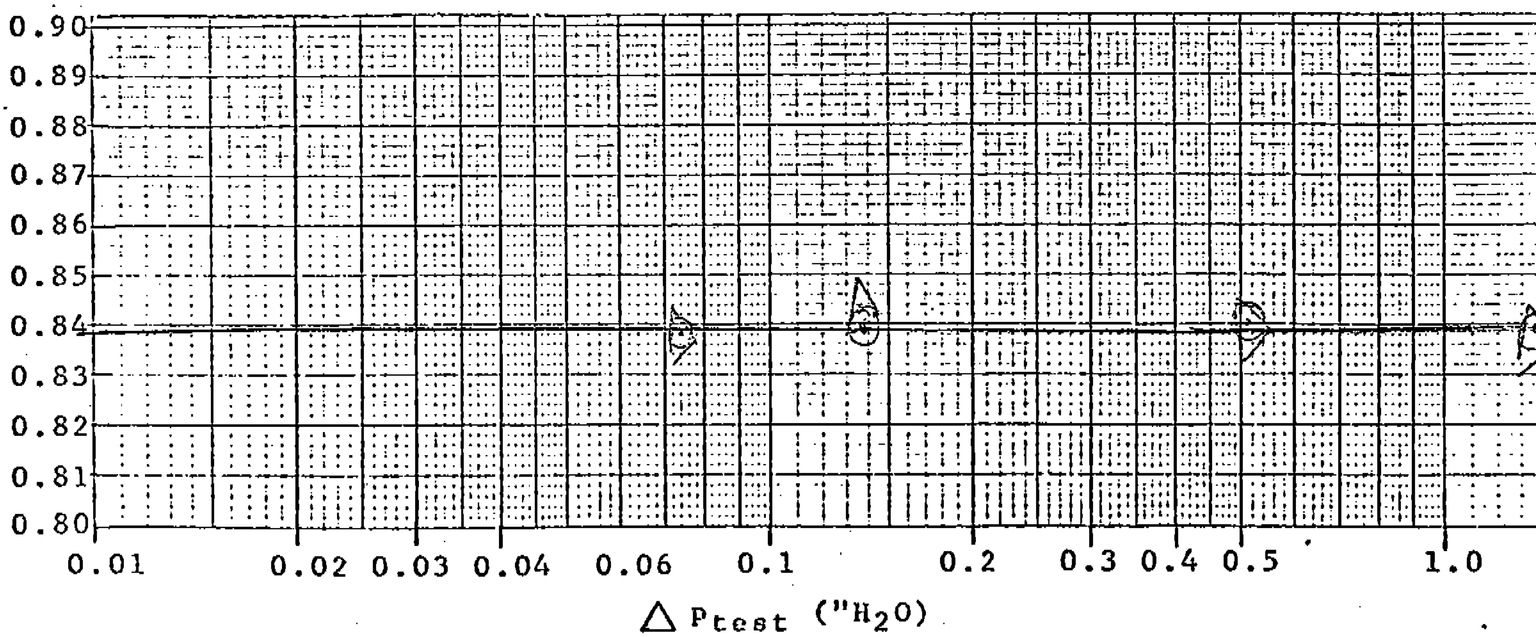
$$C_{p_{test}} = 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 19

Standard Pitot Tube No. ______

Calibrator: R J Griffin Date: 10/26/76 Client: post EPA Task 24 Vermont

Anticipated ΔP_{std}	ΔP_{std}	A ◯		B △	
		ΔP_{test}	$\Delta C_{p_{test}}$	ΔP_{test}	$\Delta C_{p_{test}}$
0.02	0.___	0.___	0.___	0.___	0.___
0.04	0.053	0.074	0.838	0.074	0.838
0.06	0.___	0.___	0.___	0.___	0.___
0.08	0.___	0.___	0.___	0.___	0.___
0.10	0.099	0.138	0.839	0.137	0.842
0.12	0.___	0.___	0.___	0.___	0.___
0.16	0.___	0.___	0.___	0.___	0.___
0.20	0.___	0.___	0.___	0.___	0.___
0.30	0.367	0.510	0.840	0.510	0.840
0.50	0.___	0.___	0.___	0.___	0.___
0.70	0.___	0.___	0.___	0.___	0.___
0.80	0.989	1.38	0.838	1.38	0.838



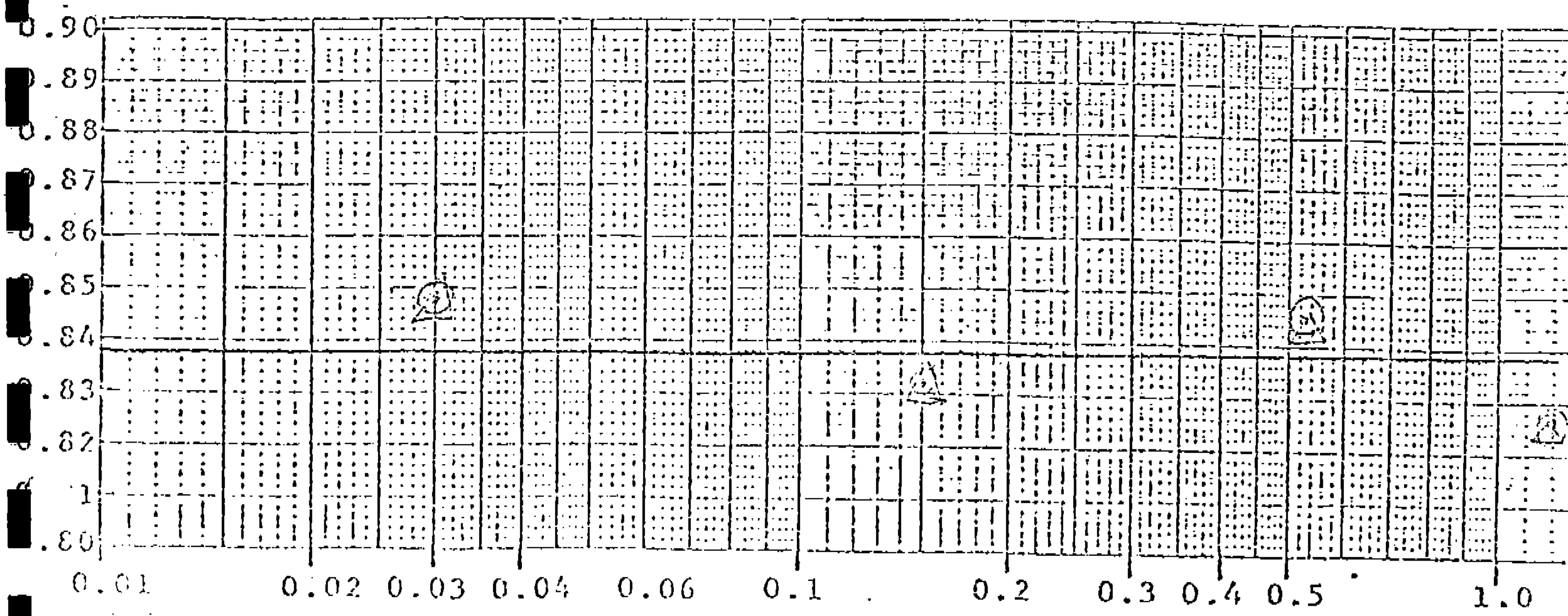
$C_{p_{test}} = 0.99 \sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$

Pitot Tube Type S Pitot Tube No. 23

Standard Pitot Tube No. ____________

Calibrator: GEK Date: 10/6/76 Client: FROM EPA-Task #25

Anticipated ΔP_{std}	ΔP_{std}	A		B	
		ΔP_{test}	$\Delta C_{p_{test}}$	ΔP_{test}	$\Delta C_{p_{test}}$
0.02	0.022	0.030	0.848	0.030	0.848
0.04	0.___	0.___	0.___	0.___	0.___
0.06	0.___	0.___	0.___	0.___	0.___
0.08	0.___	0.___	0.___	0.___	0.___
0.10	0.106	0.150	0.832	0.150	0.832
0.12	0.___	0.___	0.___	0.___	0.___
0.16	0.___	0.___	0.___	0.___	0.___
0.20	0.___	0.___	0.___	0.___	0.___
0.30	0.312	0.540	0.843	0.538	0.845
0.50	0.___	0.___	0.___	0.___	0.___
0.70	0.___	0.___	0.___	0.___	0.___
0.80	0. 1.036	0. 1.492	0.825	0. 1.490	0.826



ΔP_{test} ("H_2O)

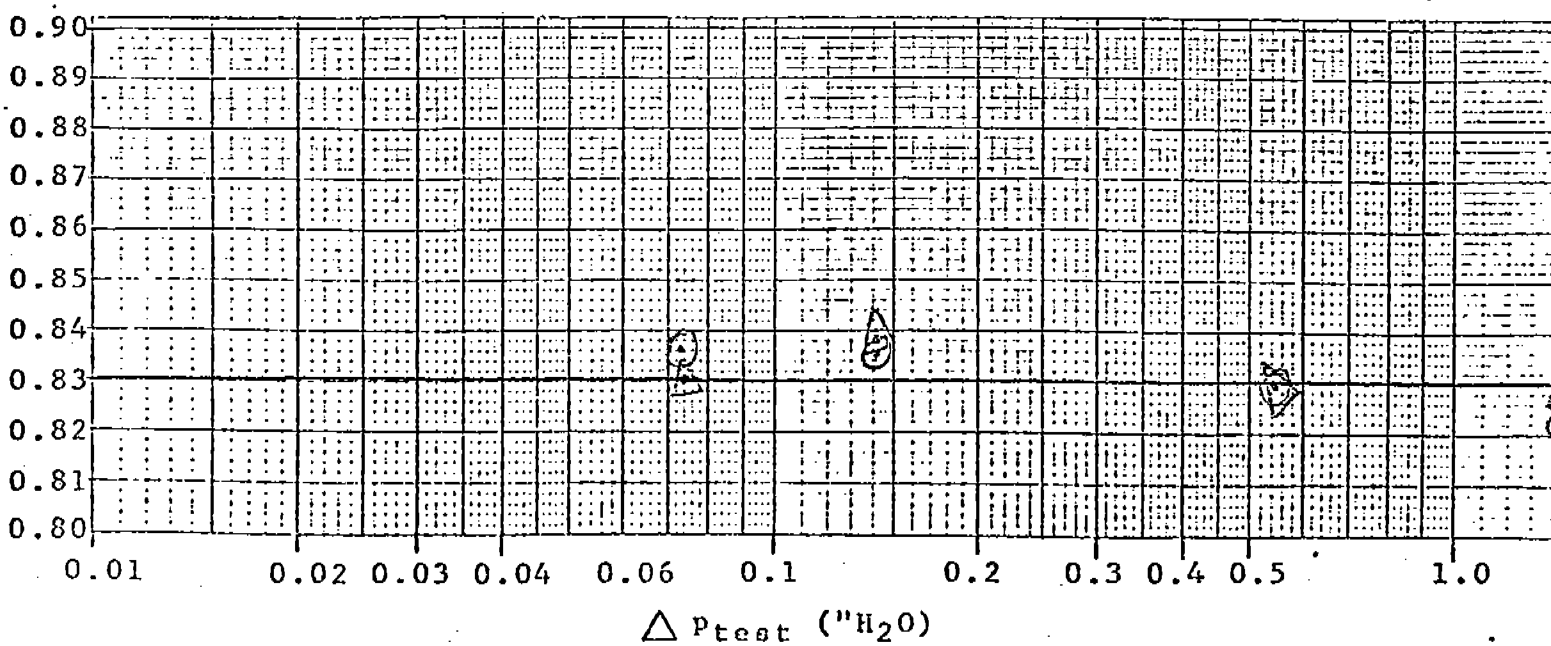
$$C_{P_{test}} \doteq 0.99\sqrt{\frac{\Delta P_{std}}{\Delta P_{test}}}$$

Pitot Tube Type S Pitot Tube No. 23

Standard Pitot Tube No. ______

Calibrator: R J Griffin Date: 10/26/76 Client: post. - EPA Task 24 Vermont

Anticipated ΔP_{std}	ΔP_{std}	A ⊙		B △	
		ΔP_{test}	$\Delta C_{P_{test}}$	ΔP_{test}	$\Delta C_{P_{test}}$
0.02	0.	0.	0.	0.	0.
0.04	0.052	0.073	0.836	0.074	0.830
0.06	0.	0.	0.	0.	0.
0.08	0.	0.	0.	0.	0.
0.10	0.101	0.142	0.835	0.141	0.838
0.12	0.	0.	0.	0.	0.
0.16	0.	0.	0.	0.	0.
0.20	0.	0.	0.	0.	0.
0.30	0.383	0.546	0.829	0.546	0.829
0.50	0.	0.	0.	0.	0.
0.70	0.	0.	0.	0.	0.
0.80	0.996	1.448	0.821	1.437	0.824



APPENDIX H

EXAMPLE CALCULATIONS

Nomenclature

A_s = Stack area, inches^2

C_f = Front half (probe & filter) particulate concentration, gr/DSCF

C_p = Pitot tube correction factor, dimensionless

C_t = Total particulate concentration, gr/DSCF

CM_f = Front half (probe & filter) particulate concentration, mg/DSm^3

CM_t = Total particulate concentration, mg/DSm^3

D_n = Sampling nozzle diameter, inches

ER_f = Emission rate of front half particulate, lb/hr

ER_t = Emission rate of total particulate, lb/hr

ERM_f = Emission rate of front half particulate, kg/hr

ERM_t = Emission rate of total particulate, kg/hr

M_d = Mole fraction of dry gas, g/g-mole

MW = Molecular weight of wet stack gas

MW_d = Molecular weight of dry stack gas

P_b = Barometric pressure, inches mercury

P_m = Average orifice pressure drop, inches water

P_s = Absolute stack gas pressure, inches mercury

P_{st} = Static pressure of stack gas, inches mercury

Q_s = Dry stack gas flowrate at standard conditions, DSCFM

SW_f = Front half sample weight, mg

SW_t = Total sample weight, mg

T_m = Average meter temperature, °F

T_s = Stack temperature, °F

T_t = Net time of test, minutes

V_m = Volume of dry gas at meter conditions, ft^3

$V_{m_{std}}$ = Volume of dry gas at standard conditions, DSCF

V_s = Stack gas velocity at stack conditions, fpm

V_w = Total condensate collected in sampling train, ml

$V_{w_{gas}}$ = Volume of water vapor at standard conditions, SCF

ΔP_s = Velocity pressure, inches water

%I = Percent of isokinetic variation, dimensionless

%M = Percent moisture, dimensionless

Calculation of Particulate Emissions

The dry volume of sampled gas corrected to standard conditions of 20°C and 760 mm Hg (29.92 in. Hg) is calculated as follows:

$$V_{m_{std}} = \frac{17.65 * V_m * P_b + \left(\frac{P_m}{13.6}\right)}{T_m + 460} .$$

The dry stack gas flowrate corrected to standard conditions is calculated using the following set of equations sequentially:

$$V_{w_{gas}} = 0.0471 * V_w$$

$$\%M = \frac{100 * V_{w_{gas}}}{V_{m_{std}} + V_{w_{gas}}}$$

$$M_d = \frac{100 - \%M}{100}$$

$$MW_d = (\%CO_2 * 44/100) + (\%O_2 * 32/100) + \left[(\%CO + \%N_2)*28/100\right]$$

$$MW = (MW_d * M_d) + 18(1 - M_d)$$

$$P_s = P_b + P_{st}$$

$$V_s = 5120.8 * C_p * \sqrt{\Delta P_s * (T_s + 460)} * \sqrt{\frac{1}{P_s * MW}}$$

$$Q_s = \frac{0.1225 * V_s * A_s * M_d * P_s}{T_s + 460}$$

The equation employed to determine percent of isokinetic variation is:

$$\%I = \frac{1032 * (T_s + 460) * V_{m_{std}}}{V_s * T_t * P_s * M_d * (D_n)^2}$$

To determine the concentration of particulate matter in grains per dry standard cubic foot (gr/DSCF), one of the following equations is used:

$$C_f = 0.01543 * \frac{SW_f}{V_{m_{std}}} \quad \text{and}$$

$$C_t = 0.01543 * \frac{SW_t}{V_{m_{std}}} \quad .$$

When metric units are desired, the concentration is calculated in milligrams per dry standard cubic meter (mg/DSm^3) as follows:

$$CM_f = \frac{SW_f}{(0.02832)(V_{m_{std}})} \quad \text{and}$$

$$CM_t = \frac{SW_t}{(0.02832)(V_{m_{std}})} \quad .$$

Front half particulate concentrations are obtained by summing the weight of particulate matter collected on the filter and all portions of the train preceding it. Total particulate concentration includes, in addition, any particulate matter collected in the impingers.

The emission rate of particulate matter can be calculated from the filterable or total particulate concentration using one of the following equations:

$$ER_f = 0.00857 * C_f * Q_s \quad \text{and}$$

$$ER_t = 0.00857 * C_t * Q_s \quad .$$

For metric units,

$$ERM_f = (1.70 * 10^{-6}) * CM_f * Q_s \quad \text{and}$$

$$ERM_t = (1.70 * 10^{-6}) * CM_t * Q_s \quad .$$

To avoid rounding errors it is preferable to carry out the calculation of concentration and emission rate in one operation.

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant MAGNESIA PREPRO. PLANT Date 10-20 76

Company Name EASTERN MAGNESIA TALC PLANT Hours of Observation

Plant Address Observer GEORGE M. SANTORILLA #1

Type of Discharge STACK OTHER

Discharge Location BAGHOUSE OUTLET plume at 320° NW

Height of Point of Discharge 30 FT

Observer's Location:

Distance to Discharge Point ≈ 100 FT

Height of Observation Point ≈ 36 FT

Direction from Discharge Point 160° SE

Background Description hills & Trees

Weather: Clear Overcast Partly Cloudy Other Color

Wind Direction 290° NW Wind Velocity 4-7 mi/hr

Plume Description:

Detached: Yes No

Color: Black White Other

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other COULD NOT TELL

Estimated Distance Plume Visible 12 FT

Summary of Observations:

Opacity	Aggregate Time @ Opacity (min.)	(sec.)	Opacity	Aggregate Time @ Opacity
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

* COULD NOT READ
GENERAL ~~OTHER~~ EMISSIONS

RECORD OF VISIBLE EMISSIONS

Company Name EASTERN MAGNESIA TALC PLANT

Plant Address

Stack Location CENTER OF PLANT S OF PLANT

Weather Conditions OVERCAST

Date 10-20-76

Observer GEORGE M SAVERILLA

Observer's Location 160' SE

(1)

TIME 8:35

HR	MIN	00	15	30	45	COMMENTS
						NOTES: PARTICULATE # 1
	00	O	O	O	O	Exhaust duct from
	01	O	O	*	O	hindered readings. Background emissions
	02	O	O	O	O	were greater than baghouse stack
	03	O	O	*	O	exhaust
	04	O	O	O	*	O - means <5 N - means nothing
	05	O	*	O	O	
	06	O	O	O	*	
	07	*	*	*	O	
	08	O	O	5	O	← (5) pulsed bag
	09	O	O	O	(*)	← pulsed but could not read (*), other emissions
	10	O	*	O	O	
	11	(*)	O	*	O	← pulsed (*) but could not read, other emissions
	12	O	O	O	O	
	13	O	5	*	*	(5) pulsed bag
	14	*	O	O	O	
	15	O	O	O	O	~~[illegible]~~ 8:50 P-1 started
	16	O	O	O	O	
	17	O	O	*	O	
	18	O	O	*	*	
	19	O	*	*	O	
	20	O	(O)	O	O	Pulsed bag (O)
	21	O	O	(O)	O	Pulsed bag (O)
	22	O	O	O	O	
	23	O	O	O	5	Pulsed bag (5)
	24	O	O	O	O	
	25	5	O	O	O	Pulsed bag (5)
	26	O	O	O	*	
	27	O	O	*	O	
	28	O	O	O	O	
	29	*	*	O	O	

Building ~~OOOOO~~

~ 100 Ft

observer

RECORD OF VISIBLE EMISSIONS

Company Name EASTERN MAGNESIA TALC PLANT

Date 10-20-76

Plant Address

Observer GEORGE M. SHAYORKLCA

Stack Location CENTER OF PLANT SOUTH OF BUILDING

Observer's Location 160° SE ≈ 100 FT FROM BAGHOUSE

Weather Conditions Overcast

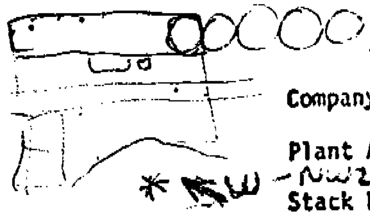
TIME 9:08

②

HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30	0	0	*	5	Pulsed Bag (5)
	31	0	0	0	0	
	32	0	0	*	0	* Could not read STACK OTHER EMISSIONS
	33	0	0	0	0	
	34	0	0	*	0	Pulsed Bag (0)
	35	0	0	0	0	
	36	*	0	5	0	Pulsed Bag (5)
	37	0	0	*	5	Pulsed Bag (5)
	38	0	0	*	0	
	39	0	0	0	0	
	40	0	0	0	0	
	41	0	0	0	0	
	42	0	5	0	0	(5) Pulsed Bag
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	*	0	0	
	46	0	0	0	0	
	47	*	*	0	0	
	48	0	5	0	0	Pulsed Bag (5)
	49	0	0	0	0	
	50	0	0	5	0	Pulsed Bag (5)
	51	0	0	0	0	
	52	*	0	*	0	
	53	*	0	*	0	
	54	0	*	0	0	Pulsed Bag (0)
	55	0	0	0	0	
	56	0	*	0	0	
	57	0	0	5	0	Pulsed Bag (5)
	58	0	0	0	0	
	59	0	0	0	0	

Plume Lasts ≈ 3 sec.

* Can't Read other emissions



RECORD OF VISIBLE EMISSIONS

Company Name EASTERN Magnesia TALC PLANT Date 10-20-76

Plant Address ______ Observer George M. Samorilla

* NW - NW290° Center of building
Stack Location S of Building

Observer's Location 160° SE ≈ 100FT South of Baghouse

Wind Direction Weather Conditions Overcast

(3)

HR	MIN	≈ 935 TIME SECONDS 00	15	30	45	COMMENTS * Can't read other emissions
	00	0	0	0	0	
	01	(0)	0	0	0	Pulsed Bag (0)
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	*	0	0	
	06	*	0	0	(5)	Pulsed Bag (5)
	07	0	0	0	0	
	08	(0)	0	0	0	Pulsed Bag (0)
	09	*	*	0	0	
	10	*	(5)	0	0	Pulsed Bag (5)
	11	0	0	(0)	0	Pulsed Bag (0)
	12	0	0	0	0	
	13	0	0	*	*	
	14	0	0	0	*	
	15	(0)	0	0	0	Pulsed Bag (0)
	16	0	0	0	0	
	17	0	0	0	0	
	18	0	0	0	0	
	19	*	0	0	0	
	20	0	*	0	0	
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	*	0	0	
	25	0	0	(0)	0	Pulsed Bag (0)
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	5	0	0	0	Pulsed Bag (5)

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Talc Plant Date 10-20-76

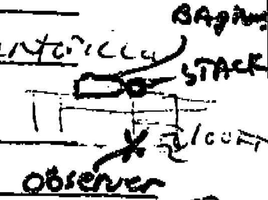
Plant Address

Stack Location Center of plant S of Building

Weather Conditions Overcast

Observer George M. Santoricco

Observer's Location 160' SE



(4)

TIME 10:05

HR	MIN	SECONDS 00	15	30	45	COMMENTS * Cannot read plume other emissions
	30	0	0	0	0	
	31	0	0	(5)	0	pulsed Bag
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	*	0	0	
	35	0	0	0	0	
	36	(5)	0	0	0	Pulsed Bag (5)
	37	0	0	0	0	
	38	0	0	(5)	0	Pulsed Bag (5)
	39	0	0	0	*	
	40	*	0	0	0	
	41	*	0	0	0	
	42	(5)	0	0	0	pulsed Bag (5)
	43	0	0	0	0	
	44	0	(0)	0	0	pulsed Bag (0)
	45	0	0	0	0	
	46	0	0	0	*	
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	0	
	51	0	(0)	0	0	Pulsed Bag (0)
	52	0	0	(5)	0	pulsed Bag (5)
	53	0	0	0	0	
	54	0	0	0	0	
	55	0	0	0	0	
	56	(5)	0	0	0	pulsed Bag (5)
	57	(5)	0	0	*	Pulsed Bag (5)
	58	0	0	0	0	
	59	0	*	*	0	

RECORD OF VISIBLE EMISSIONS

Company Name EASTERN MAGNESIA TALC PLANT Date 10-20-76

Plant Address Observer George M. SANTERELLA

W wind direction

Stack Location CENTER OF BUILDING SOUTH END OF BUILDING Observer's Location 16° SE 100 ft from stack

Weather Conditions Overcast

(5)

10:35 TIME

HR	MIN	00	15	30	45	COMMENTS
						* CANNOT READ STACK
	00	0	0	0	*	
	01	0	0	0	(5)	Pulsed Bag (5)
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	0	[redacted]
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	0	0	0	
	10	(5)	0	*	0	Pulsed Bag (5)
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	0	0	Pulsed Bag (0)
	14	*	0	0	(0)	Pulsed Bag (0)
	15	0	0	0	0	
	16	0	0	0	*	
	17	10	0	0	0	Pulsed Bag (10)
	18	*	0	0	0	
	19	0	0	0	0	
	20	0	0	5	0	Pulsed Bag (5)
	21	0	0	*	0	
	22	0	0	*	0	10:57 End of Observation
	23					
	24					
	25					
	26					
	27					
	28					
	29					

(1)

RECORD OF VISIBLE EMISSIONS

Company Name DASTOWN MAGNESIA TALL PLANT Date 10-20-76

Plant Address

Observer GEORGE M. SANTORILLA

Stack Location CENTER OF BUILDING SOUTH OF BUILDING

Observer's Location 160° SE @ 400 ft away

Weather Conditions OVERCAST + RAIN

TIME 12:54

HR	MIN	00	15	30	45	COMMENTS
						* COULD NOT SEE, OTHER EMISSIONS P-2
	30	0	0	*	0	
	31	0	0	*	0	
	32	0	0	0	0	
	33	0	(0)	*	0	PULSED BAG (0)
	34	0	0	0	0	
	35	0	0	*	0	STARTED TO RAIN
	36	0	0	0	0	
	37	*	0	0	0	
	38	0	0	0	0	
	39	(0)	0	0	0	PULSED BAG (0)
	40	0	(0)	0	0	PULSED BAG (0)
	41	0	0	0	0	
	42	0	0	(0)	*	Pulsed Bag (0)
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	0	0	
	47	(0)	*	0	0	PULSED BAG (0)
	48	*	0	*	0	
	49	0	0	5	0	PULSED BAG (5)
	50	0	*	0	0	
	51	0	0	0	0	
	52	0	0	0	*	
	53	(*)	0	0	0	PULSED BAG (*)
	54	0	0	*	0	
	55	0	(5)	0	0	PULSED BAG (5)
	56	0	0	*	0	
	57	0	0	(*)	0	PULSED BAG (*)
	58	*	0	0	0	
	59	0	*	0	*	

(2)

RECORD OF VISIBLE EMISSIONS

Company Name: EASTERN Magnesia TALC PLANT　　Date: 10-20-76

Plant Address: 　　Observer: GEORGE M. SANTORILLA

Stack Location: CENTER OF BLDG & SOUTH SIDE OF BUILDING　　Observer's Location: 160° SE @ 100 ft From STACK

Weather Conditions: OVERCAST & RAIN

TIME 1:24

HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30	0	0	*	0	
	31	0	0	0	0	
	32	0	5	0	0	PULSED BAG (5)
	33	*	0	0	0	
	34	*	0	5	*	PULSED BAG (5)
	35	0	*	0	*	
	36	0	0	0	5	PULSED BAG (5)
	37	*	0	*	0	
	38	0	0	0	0	
	39	0	0	0	0	
	40	0	0	*	0	
	41	0	0	(0)	0	PULSED BAG (0)
	42	0	0	*	*	
	43	0	0	*	5	PULSED BAG (5)
	44	0	0	*	*	
	45	*	*	*	*	* other emission in way
	46	0	*	*	*	
	47	*	0	0	0	
	48	0	5	0	0	PULSED BAG (5)
	49	0	0	5	0	PULSED BAG (5)
	50	0	0	0	(0)	PULSED BAG (0)
	51	0	*	0	0	
	52	0	0	0	0	
	53	5	*	*	0	PULSED BAG (5)
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	10	*	PULSED BAG (10)
	57	0	0	0	0	
	58	0	0	0	(5)	PULSED BAG (5)
	59	0	0	0	0	

3

RECORD OF VISIBLE EMISSIONS

Company Name: EASTON MAGNESIA TALC PLANT Date: 10-20-76

Plant Address: Observer: GEORGE M. SANTORICCA

Stack Location: CENTER OF BUILDING - SOUTH END OF BUILDING Observer's Location: 160° SE @ ≈ 100 ft from stack

Weather Conditions: OVERCAST & RAIN

1:54

HR	MIN	00	15	30	45	COMMENTS
						P-2 cont
	00	0	*	0	0	
	01	0	0	0	0	
	02	0	5	0	0	PULSED BAG (5)
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	0	0	
	06	0	0	0	(0)	PULSED BAG (5)
	07	0	0	0	0	
	08	(0)	0	0	0	PULSED BAG (0)
	09	0	0	0	*	
	10	0	0	0	0	
	11	*	0	0	*	
	12	0	0	0	5	PULSED BAG (5)
	13	0	0	0	*	
	14	*	0	0	0	
	15	(0)	0	0	0	PULSED BAG (0)
	16	0	0	0	*	
	17	0	0	0	0	
	18	0	*	0	0	
	19	0	0	(0)	0	PULSED BAG (0)
	20	0	0	0	*	PULSED BAG (*)
	21	0	0	0	0	
	22	0	0	0	0	
	23	0	0	0	0	
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	5	0	PULSED BAG
	27	0	0	*	0	
	28	0	0	0	0	
	29	0	0	0	0	

RECORD OF VISIBLE EMISSIONS

Company Name: ~~EASTERN~~ MAGNESIA TALC PLANT

Plant Address:

Stack Location: CENTER OF BUILDING SOUTH END OF BUILDING

Weather Conditions: RAIN

Date: 10-20-76

Observer: GEORGE M. SANTORELLA

Observer's Location: 160° SSE ±100 ft from STACK

2:24

TIME HR	MIN	SECONDS 00	15	30	45	COMMENTS
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	*	0	
	34	0	0	0	0	
	35	0	0	*	*	
	36	0	0	0	0	
	37	*	0	0	0	PULSED BAG (*)
	38	0	0	0	0	
	39	0	0	0	0	PULSED BAG (0)
	40	0	0	5	0	PULSED BAG (5)
	41	0	0	*	0	
	42	0	*	0	0	
	43	0	0	0	0	
	44	5	0	0	*	PULSED BAG (5)
	45	0	0	0	0	PULSED BAG (0)
	46	0	0	0	0	
	47	0	*	0	*	
	48	0	0	0	0	PULSED BAG (0)
	49	*	0	0	0	
	50	0	0	0	*	
	51	0	*	*	*	
	52	*	*	0	0	PULSED BAG (*)
	53	0	*	*	0	
	54	0	0	0	0	
	55	*	*	0	0	
	56	*	*	*	0	
	57	0	0	0	0	
	58	*	0	0	0	
	59	*	0	*	0	

RECORD OF VISIBLE EMISSIONS

Company Name Eastern Magnesia Talc Plant Date 10-20-76

Plant Address ______ Observer George M Santorilla

Stack Location Center of Building / South end of Building Observer's Location 160° SE @ ≈ 100 FT. From stack

Weather Conditions Rain

HR	MIN 2:54	SECONDS 00	15	30	45	COMMENTS A-2 cont
	00	0	*	0	*	
	01	0	*	*	0	
	02	0	*	*	0	
	03	0	0	0	0	Pulsed Bag (0)
	04	0	0	0	0	End of Readings 2:58
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

SUMMARY
RECORD OF VISIBLE EMISSIONS

Type of Plant Magnesia prep. plant

Date 10-21-76

Company Name Eastern Magnesia Talc Plant

Hours of Observation ______

Plant Address ______

Observer George M. Santarella

Type of Discharge STACK OTHER ______

Discharge Location Baghouse outlet, plume @ 320° NW

Height of Point of Discharge 30 ft

Observer's Location:

Distance to Discharge Point ≈100 FT

Height of Observation Point ≈36 FT

Direction from Discharge Point 160° SE

Background Description Hills & Trees

Weather: Clear Overcast Partly Cloudy Other Rain Color ______

Wind Direction 60° NE Wind Velocity ~~8-10~~ mi/hr
Gusts up to 20

Plume Description:

Detached: Yes No

Color: Black White Other ______

Plume Dispersion Behavior: Looping Coning Fanning

Lofting Fumigating Other Could not tell

Estimated Distance Plume Visible 12 FT

Summary of Observations:

Opacity	Aggregate Time @ Opacity		Opacity	Aggregate Time @ Opacity
	min.	sec.		
0			55	
5			60	
10			65	
15			70	
20			75	
25			80	
30			85	
35			90	
40			95	
45			100	
50				

RECORD OF VISIBLE EMISSIONS

Company Name: EASTERN MAGNESIUM
Date: 10-21-76

Plant Address: TALC PLANT
Observer: GEORGE M SANTORELLA

Stack Location: CENTER OF PLANT SOUTH OF BUILDING
Observer's Location: 160° SE @ ≈100 FT. FROM PLANT

Weather Conditions: OVERCAST & RAIN

60° NE WINDS

TIME 8:00

HR	MIN	00	15	30	45	COMMENTS
						CANNOT READ OTHER EMISSIONS P-3
	00	0	0	0	0	
	01	5	0	0	0	PULSED BAG (5)
	02	0	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	
	05	0	0	(5)	0	PULSED BAG (5)
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	(0)	0	0	0	PULSED BAG (0)
	10	0	(0)	0	0	PULSE BAG (0)
	11	0	0	0	0	
	12	0	0	0	0	
	13	0	0	(0)	0	PULSED BAG (0)
	14	0	0	0	0	
	15	0	0	0	0	
	16	(0)	0	0	0	PULSED BAG (0)
	17	0	0	0	0	
	18	0	0	0	0	
	19	0	0	0	0	
	20	*	0	0	(0)	PULSED BAG (0)
	21	0	0	0	0	
	22	0	0	0	0	
	23	(5)	0	0	0	PULSED BAG (5)
	24	0	0	0	0	
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	(0)	~~[illegible]~~ PULSED BAG (0)
	29	0	0	0	0	

(2)

RECORD OF VISIBLE EMISSIONS

WINDS ARE GUSTY

Company Name EASTERN MAGNESIA TALC PLANT

Plant Address

Stack Location CENTER OF PLANT SOUTH OF BUILDING

Weather Conditions RAIN

Date 10-21-76

Observer GEORGE M. SANTORELLA

Observer's Location 160° SE @ ≈100 ft from outlet stack

830 TIME

HR	MIN	00	15	30	45	COMMENTS P-3
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	0	0	5	0	PULSED BAG (5)
	35	0	0	0	0	
	36	0	0	0	(0)	PULSED BAG (0)
	37	0	0	0	0	
	38	5	0	0	0	PULSE BAG (5)
	39	0	0	0	0	
	40	0	(0)	0	0	PULSED BAG (0)
	41	0	0	0	(0)	PULSED BAG (0)
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	(0)	0	0	0	PULSED BAG (0)
	46	0	0	0	0	
	47	0	0	0	0	
	48	0	0	0	0	WINDS REALLY GUSTY
	49	0	0	(0)	0	PULSED BAG (0)
	50	0	0	0	(0)	PULSED BAG (0)
	51	0	0	0	0	
	52	0	0	0	0	
	53	(0)	0	0	0	PULSED BAG (0)
	54	0	0	0	0	
	55	0	(0)	0	0	PULSED BAG (0)
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	0	0	0	0	

7

RECORD OF VISIBLE EMISSIONS

Company Name EASTERN MAGNESIA TALC · PLANT

Date 10-21-76

Plant Address

Observer GEORGE M. SANTORILLA

Stack Location CENTER OF BUILDING SOUTH OF PLANT (OUTLET)

Observer's Location 110° SE OF BAGHOUSE @ 100 FT AWAY FROM OUTLET

Weather Conditions RAINY & WINDY

9:00 TIME

HR	MIN	SECONDS 00	15	30	45	COMMENTS P-3
	00	0	0	0	0	
	01	0	0	0	0	
	02	0	0	0	0	
	03	(0)	0	0	0	PULSED BAG (0)
	04	0	0	0	0	
	05	0	0	0	(5)	PULSED BAG (5)
	06	0	0	0	0	
	07	0	0	0	0	
	08	0	0	0	0	
	09	0	(*)	0	0	PULSED BAG *
	10	0	0	0	0	
	11	0	0	10	0	PULSED BAG (10)
	12	0	0	0	(5)	PULSED BAG (5)
	13	0	0	0	0	
	14	0	*	0	0	
	15	5	0	0	0	PULSED BAG (5)
	16	0	0	0	0	
	17	0	5	0	0	PULSED BAG 5
	18	0	0	(0)	0	PULSED BAG (0)
	19	0	0	0	0	
	20	0	0	0	0	
	21	0	*	0	0	
	22	5	0	0	0	PULSED BAG (5)
	23	0	0	0	0	
	24	0	5	0	0	PULSED BAG (5)
	25	0	0	0	0	
	26	0	0	0	0	
	27	0	0	0	0	
	28	0	0	0	0	
	29	(0)	0	0	0	PULSED BAG (0)

RECORD OF VISIBLE EMISSIONS

(4)

Company Name EASTERN MAGNESIA TALC PLANT

Date 10-21-76

Plant Address

Observer GEORGE M. SANTORIA

Stack Location CENTER OF BUILDING SOUTH OF BUILDING

Observer's Location

Weather Conditions RAIN & WINDY !!! + SNOW

930 TIME

HR	MIN	00	15	30	45	COMMENTS
						P-3
	30	0	0	0	0	
	31	0	0	0	0	
	32	0	0	0	0	
	33	0	0	0	0	
	34	5	0	0	0	PULSED BAG (5)
	35	0	0	0	0	
	36	0	0	0	0	
	37	5	0	0	0	PULSED BAG (5)
	38	0	0	0	0	
	39	0	(0)	0	0	PULSED BAG (0)
	40	0	0	0	0	
	41	0	0	0	0	PULSED BAG (0)
	42	0	0	0	0	
	43	0	0	0	0	
	44	0	0	0	0	
	45	0	0	0	0	
	46	0	0	(0)	0	PULSED BAG (0)
	47	0	0	0	0	
	48	0	0	0	0	
	49	0	0	0	0	
	50	0	0	0	(0)	PULSED BAG (0)
	51	0	0	0	0	
	52	0	0	0	0	
	53	0	5	0	0	PULSED BAG (5)
	54	0	0	0	0	
	55	0	0	0	0	
	56	0	0	0	0	
	57	0	0	0	0	
	58	0	0	0	0	
	59	5	0	0	0	PULSED BAG (5)

BAGHOUSE STACK

≈100ft

(5)

RECORD OF VISIBLE EMISSIONS

Company Name EASTERN MAGNESIA TALC PLANT

Plant Address

Stack Location ~~SOUTH END OF BUILDING~~ CENTER OF BUILDING

Weather Conditions RAIN.

Date ~~10-21~~ 10-21-76

Observer Location 160° SE @ ≈100 ft From STACK

Observer GEORGE M. SANTORELLA

HR	MIN	10:00 TIME SECONDS 00	15	30	45	COMMENTS
						P-3
	00	0	5	0	0	
	01	0	(0)	0	0	PULSED BH +0
	02	X	0	0	0	
	03	0	0	0	0	
	04	0	0	0	0	END OF OBSERVATION 10:05
	05					
	06					
	07					
	08					
	09					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					