93-CEM-01

FINAL TEST REPORT
FOR

USEPA TEST PROGRAM
CONDUCTED AT
CHANEY ENTERPRISES CEMENT PLANT
WALDORF, MARYLAND

U. S. EPA CONTRACT NO. 68D20029
EMB WORK ASSIGNMENT NO. 2-17

February 1994

ETS, Inc.
1401 Municipal Road, Roanoke, Virginia 24012

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1.0 INTRODUCTION

1.1 Summary

The U.S. Environmental Protection Agency (EPA), Office of Air Quality Planning and Standards (OAQPS), Emission Inventory Branch (EIB) is responsible for developing and maintaining air pollution emission factors for industrial processes. EIB, in collaboration with the Maryland Redi-Mix Concrete Association, is currently studying the cement manufacturing industry. The purpose of this study is to develop emission factors for the operations used within typical concrete batching facilities. The Emission Measurement Branch (EMB) of OAQPS coordinated the emission measurement activities at this plant. ETS Incorporated (ETS, Inc.) conducted the ambient and source measurements. EPA personnel collected samples of the process materials and obtained process data during testing.

EPA/EIB and the Maryland Redi-Mix Concrete Association considered the Chaney Enterprises Batch Plant Number 1, located in Waldorf, Maryland, to be a representative concrete batching operation. The following areas of the manufacturing facility were sampled;

1) dry batch loading operation,
2) central mixing loading operation,
3) Lehigh Cement silo filling operation,
4) Newcem™ silo filling operation,
5) process material samples,
6) roadway area surface samples.

A facility site plan showing the layout of the operation and the sampling locations is presented in Figure 1.1-1.

The test program was conducted from September 7, 1993 through September 10, 1993. Air sampling was conducted at the inlet and outlet ducting of the baghouse. The baghouse inlet was sampled for Total Suspended Particulate (TSP), particulate matter less than or equal to ten microns (PM_{10}) and metals emissions. The baghouse outlet was sampled for TSP and PM_{10}. The targeted metals are listed in Table 1.1-1. Process materials from the delivery, storage and handling areas were analyzed for moisture and sieve size. The process samples of Newcem™ and Lehigh Cement were also analyzed for the targeted metals listed in Table 1.1-1.

TABLE 1.1-1: Targeted Metals for Chaney Enterprises (Waldorf, Maryland)

METAL
arsenic
beryllium
cadmium
chromium
lead
manganese
mercury
nickel
phosphorus
selenium

1.2 Test Program Personnel

The key personnel who coordinated the test program and their phone numbers are:

- ETS, Inc., Project Manager, Ken Appell 703/265-0004
- EIB Technical Coordinator, Ron Meyers 919/541-5407
- EMB Field Test Coordinator, John Brown 919/541-0200
- Chaney Enterprises, Bob Stall 301/932-5000

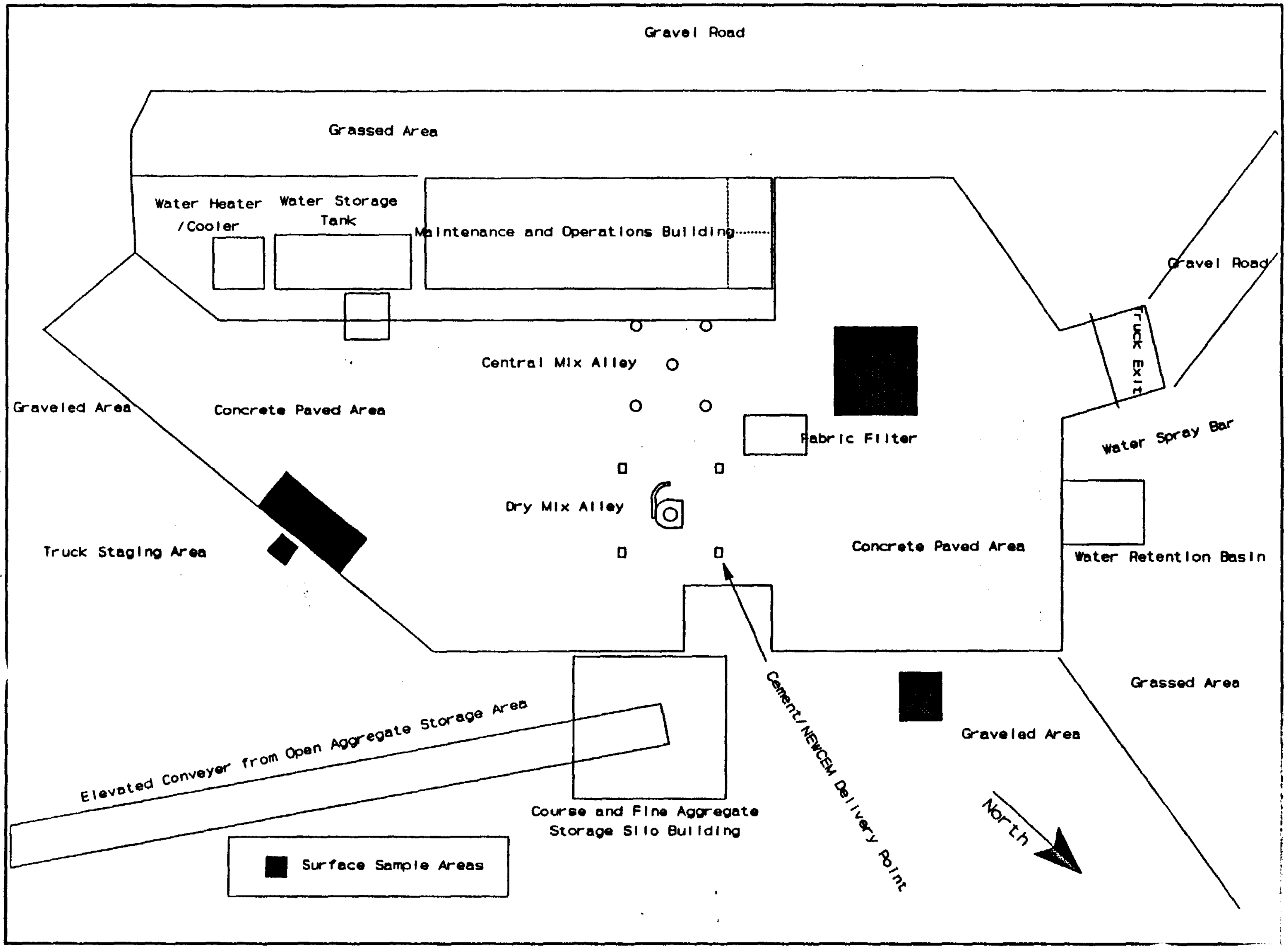


Figure 1.1-1: Schematic Overview of Chaney Enterprises Waldorf, MD Plant.

2.0 PLANT AND SAMPLING LOCATION DESCRIPTION

The Chaney Enterprises concrete batching operation is located in Waldorf, Maryland. This facility consists of juxtapositioned central mix and dry batch plants along with ancillary areas used for delivery, storage and material handling. The air sampling was conducted in the inlet and outlet ducting of the baghouse. Process material samples were obtained from storage bins, paved and unpaved roadway sections, and delivery tanker trucks.

2.1 Process Description and Operation

The Chaney Enterprises concrete batching facility produces cement for state and private construction jobs. The cement is produced by combining a variety of stone aggregates and specialty cements with water. Three types of specialty cements are currently used at this facility: (1) Capitol cement; (2) Lehigh cement; and (3) Newcem™. Batch plant No.1 consists of a central mix plant and a dry batch plant. Both plants use the same general operations, raw materials, material handing equipment (conveyors and storage silos), control room and baghouse. The central mix and dry batch plants differ in the form/state that the cement is delivered into the cement trucks.

The central mix plant uses a centrally located "master" mixing drum to blend several truck loads of cement at once. The cement that is produced in this operation is at its final composition when it is decanted into the cement trucks, i.e. water will not be added to the cement truck mix at the job site. The central mix plant is only used on heavy production days, since this plant is designed to load multiple trucks in a short amount of time and therefore can not easily accommodate sporadic cement orders.

The dry batch plant introduces the aggregate and specialty cements into each cement truck in a dry-state. Water for the mix is added at the job-site by the truck driver from a water tank located on top of the truck. Keeping the cement mix dry until it is required greatly cuts down on the chance of having the cement mix set-up within the truck mixer drum.

The general processes used at both the central mix and dry batch plants can be classified into four general operations;

(1) Aggregate Delivery and Storage,
(2) Lehigh Cement and Newcem™ Delivery and Storage,
(3) Dry-Batch Loading,
(4) Central Mixer Loading.

The typical batching operation starts at 6:00 a.m. and usually ceases at around 5:00 p.m. These hours are often extended during the summer months in accordance with customer demand. The central mixing operation is only used during the high production days.

2.1.1 Aggregate Delivery and Storage: The concrete batching facility receives its aggregate raw material from an adjacent mine owned by Chaney Enterprises. The stone is separated and washed at the mine site before delivery to the batching plant. The course aggregate used at the Waldorf plant includes No. 67 stone, No. 67 state-approved gravel, No. 57 Gemstar™ blue stone, pea-gravel, and a lightweight aggregate. Sieve analyses were performed on the No.67 state approved gravel using mesh sizes ranging from 1-inch to U.S. Standard Sieve No.8 mesh (0.0937-inch). The fine aggregate or sand mined at this site had an average moisture content of 5 weight percent. The sand moisture content ranged from 4.9 to 5.3 percent during the test program. On-site moisture and sieve analysis were performed using a U.S. Sieve Series ranging between No.4 (0.187 inches) to No.100 (0.0059 inches). Three sieve analysis were performed on the fine aggregate during the test period. The sieve analysis results showed that 2.5 to 2.7 percent of the material passed through the No.100 mesh.

The fine and course aggregate is transported via tractor trailer on an unpaved road to the site. This unpaved road is approximately one-mile in length and is occasionally sprayed with water as a dust abatement procedure.

The aggregate is stored in six open bins equipped with bottom grates that feed into an underground belt conveyor. The conveyor can then discharge the aggregate into the top of one of six overhead feed bins. Two bins are designated for sand only, while the remaining four hold various course aggregate. Below the holding bins are belt scales that are used to measure out the appropriate weights of each aggregate species required for the concrete batch being produced.

2.1.2 Lehigh Cement and Newcem™ Delivery and Storage: Tanker trucks deliver cement and Newcem™ from outside sources to the Chaney Enterprises facility. Three cement silos are used for storage and are located above the dry-batching area. These silos have the following designations;

- Silo No.1: Contains Newcem™ which is primarily composed of ground granulated scaling taken from the inside of blast furnaces,
- Silo No.2: Contains "Capital" or standard cement,
- Silo No.3: Contains "Lehigh" cement which is required for all state contracted cement.

The cement is pneumatically conveyed from the tanker trucks to the cement storage silos via an approximately 6-inch diameter flexible line. A Gardener-Denver Cyclo-Blower (a Rootes type blower) rated at 535 CFM @ 2000 RPM at 20 psig powered by a 50 hp electric motor at 1700 RPM provides the necessary pressure drop for transfer. The typical time to transfer approximately 25 tons of cement to any of the three silos at a normal operating pressure of 15 psig ranged from 30 to 45 minutes.

2.1.3 Dry-Batch and Central Mixer Loading: The production of concrete from the central mixer and dry-batching process proceeds in the following generalized manner;

Step 1: Approximately 75% of the total water required for the mix is introduced into either the central mixer or truck mixing drum.

Step 2: Course aggregate addition to the mix begins.

Step 3: Sand addition to the mix begins.

Step 4: Cement and Newcem™ addition to the mix begins.

Step 5: Cement and Newcem™ addition to the mix ends, after the required amount of each has been added to the mix.

Step 6: Aggregate addition to the mix ends, after the required amount of each type has been added to the mix.

The above six steps take approximately five minutes and nine minutes to load nine yards of concrete using the central mix and dry-batching processes, respectively. A truck loading log containing date, times and yardage loaded in Appendix E.

2.2 Pollution Control Description

The air pollution control equipment at the Chaney Enterprises facility consists of a centrally located pulse-jet reverse air type baghouse. The baghouse was a Model No. RA 140-S that is manufactured by C&W Manufacturing and Sales Co., Incorporated. The baghouse services the silo filling, dry-batch loading, and central mixer loading operations. For dry-batch loading, a movable shroud system is lowered to partially enclose the charging port of the mixing drum. A portion of the air and fugitive particulate emissions surrounding charging port are ducted to the baghouse. Capture efficiency of the dry-batch shroud system ranged from less than 50% to almost total capture. It was observed that the capture efficiency was an inverse function of wind speed. In addition, the capture efficiency of the newer cement trucks were judged to be greater than the older models. The capture efficiencies for each truck loading are given in Appendix E.

2.3 Air Emission and Process Sampling Locations

Emissions sampling was conducted at the baghouse common inlet duct and the baghouse outlet exhaust stack. These locations and sample points are shown schematically in Figures 2.3-1 through 2.3-3.

2.3.1 Baghouse Inlet Sampling Location: The dust collector inlet duct measures 14-inches in diameter. Two five-inch ports were installed 20-inches and 100-inches from the upstream and downstream flow disturbances, respectively. These upstream and downstream disturbance distances are in accordance with EPA Method 1. Figure 2.3-1 shows a schematic for the baghouse ducting and sampling locations. The duct was sampled using a total of twelve traverse points in accordance with EPA Method 2. Figure 2.3-2 is a detailed schematic of the traverse points. A pre-test cyclonic flow check was performed at this location in order to ensure proper flow conditions. The baghouse inlet passed the cyclonic flow check.

2.3.2 Baghouse Outlet Sampling Location: Prior to the test program, the baghouse exhausted directly to the atmosphere from a 17.5-inch by 18.5-inch flange located on the top of the dust collector. In order to provide an acceptable baghouse outlet test location, a 15-inch diameter plastic flexible pipe was attached to this flange. A schematic diagram of the outlet ducting is shown in Figure 2.3-1. Two five-inch diameter ports were installed into the plastic pipe at 60-inches and 48-inch from the upstream and downstream flow disturbances, respectively. These upstream and downstream disturbance distances are in accordance with EPA Method 1. At this location, twelve sampling and traverse points were used in accordance with EPA Method 2. Figure 2.3-3 is a detailed schematic of the outlet sampling and traverse points. A pre-test cyclonic flow check was performed at this location in order to ensure that the ribbed-pipe would not create any adverse flow conditions. The baghouse outlet passed the cyclonic flow check.

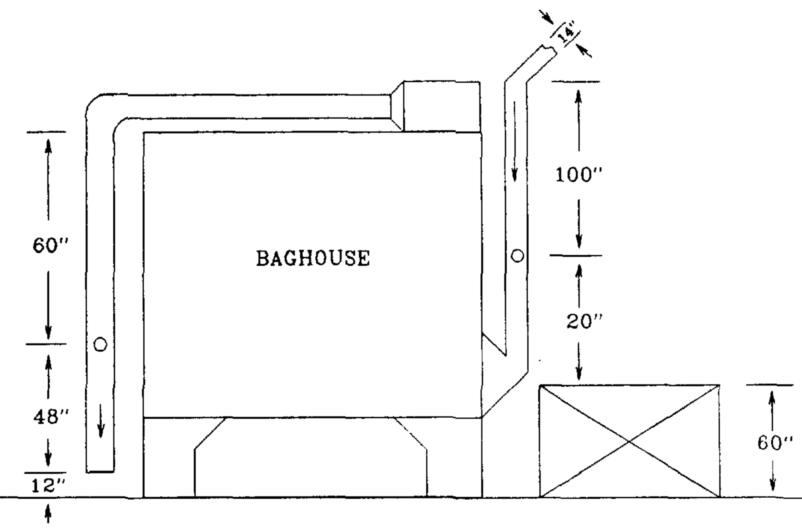
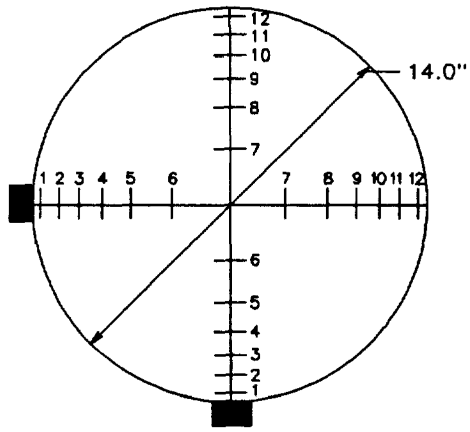


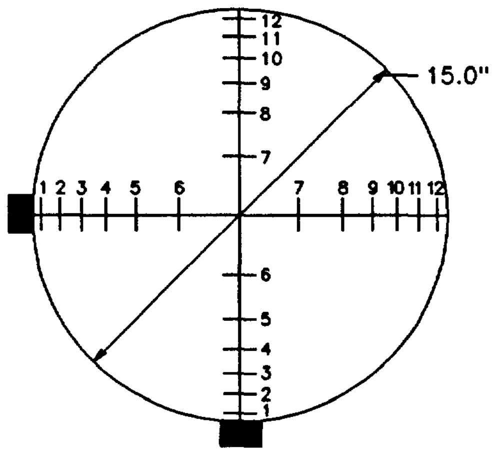
Figure 2.3-1 : Schematic Diagram of the Chaney Enterprises Baghouse at the Waldorf Batching Plant



POINT	% ID	DISTANCE FROM INSIDE OF PORT (inches)
1	2.1	0.30
2	6.7	0.94
3	11.8	1.65
4	17.7	2.48
5	25.0	3.50
6	35.6	4.98
7	64.4	9.02
8	75.0	10.50
9	82.3	11.52
10	88.2	12.35
11	93.3	13.06
12	97.9	13.70

INSIDE STACK DIAMETER	14.0 in	1.2 ft
DISTANCE UPSTREAM FROM DISTURBANCE	8.3 ft	7.1 DIA
DISTANCE DOWNSTREAM FROM DISTURBANCE	1.7 ft	1.4 DIA

Figure 2.3-2 : Baghouse Inlet Duct Sampling and Traverse Points Locations



POINT	% ID	DISTANCE FROM INSIDE OF PORT (inches)
1	2.1	0.32
2	6.7	1.00
3	11.8	1.77
4	17.7	2.66
5	25.0	3.75
6	35.6	5.33
7	64.4	9.67
8	75.0	11.25
9	82.3	12.34
10	88.2	13.23
11	93.3	14.00
12	97.9	14.68

INSIDE STACK DIAMETER	15.0 in	1.3 ft
DISTANCE UPSTREAM FROM DISTURBANCE	5.0 ft	4.0 DIA
DISTANCE DOWNSTREAM FROM DISTURBANCE	4.0 ft	3.2 DIA

Figure 2.3-3 : Baghouse Outlet Duct Sampling and Traverse Points Locations

3.0 SUMMARY AND DISCUSSION OF TEST RESULTS

3.1 Objectives and Test Matrix

The purpose of the test program was to develop emission factors for the operations used within a typical concrete batching facility.

The specific objectives of the test program for the Chaney Enterprises Cement Plant were:

(1) Measure the following emissions for the Lehigh Cement and Newcem™ delivery and storage operation:

- Particulate Matter
- PM_{10}
- Multiple Metals

(2) Measure the following emissions for the Dry-Batch loading operation:

- Particulate Matter
- PM_{10}
- Multiple Metals

(3) Measure the following emissions for the Central Mixer loading operation:

- Particulate Matter
- PM_{10}
- Multiple Metals

3.2 Test Matrix

Table 3.2-1 presents an overview of the sampling and analytical matrix for measuring emissions from the Chaney Enterprises Concrete Batching Plant. A more detailed delineation of the source test program is contained in the field test log located in Appendix A.

TABLE 3.2-1

OVERVIEW OF TEST PROGRAM FOR CHANEY ENTERPRISES CONCRETE BATCHING PLANT

PROCESS DESCRIPTION	SAMPLE LOCATION	DATE	RUN NO.	ANALYSIS MODE
DRY BATCH LOADING	BAGHOUSE INLET	09/07/93	TL-M201A-R1	PM10, TSP & MM
		09/07/93	TL-M201A-R2	PM10, TSP & MM
		09/08/93	TL-M201A-R4	PM10, TSP & MM
		09/09/93	TL-M201A-R9	PM10, TSP & MM
		09/09/93	TL-M201A-R14	PM10, TSP & MM
		09/10/93	TL-M201A-R15	PM10, TSP & MM
		09/10/93	TL-M201A-R16	PM10, TSP & MM
CENTRAL MIXER LOADING	BAGHOUSE INLET	09/09/93	TL-M201A-R10	PM10, TSP & MM
		09/09/93	TL-M201A-R11	PM10, TSP & MM
		09/09/93	TL-M201A-R12	PM10, TSP & MM
		09/09/93	TL-M201A-R13	PM10, TSP & MM
		09/10/93	TL-M201A-R17	PM10, TSP & MM
LEHIGH SILO FILLING	BAGHOUSE INLET	09/08/93	TL-M201A-R7	PM10, TSP & MM
DRY BATCH LOADING WITH NEWCEM SILO FILLING	BAGHOUSE INLET	09/08/93	TL-M201A-R5	PM10, TSP & MM
	BAGHOUSE INLET	09/09/93	TL-M201A-R8	PM10, TSP & MM
	BAGHOUSE INLET	09/10/93	TL-M201A-R18	PM10, TSP & MM
	BAGHOUSE OUTLET	09/08/93	CF-M201A-R2	PM10 & TSP
DRY BATCH LOADING WITH LEHIGH SILO FILLING	BAGHOUSE INLET	09/08/93	TL-M201A-R3	PM10, TSP & MM
CEMENT SILO FILLING	BAGHOUSE OUTLET	09/07/93	CF-M201A-R1	PM10 & TSP
DRY BATCH AND CENTRAL MIX LOADING	BAGHOUSE OUTLET	09/09/93	CF-M201A-R3	PM10 & TSP
DRY BATCH AND CENTRAL	BAGHOUSE OUTLET	09/10/93	CF-M201A-R4	PM10 & TSP

3.3 Field Test Changes, Problems, and Comments

3.3.1 Baghouse Inlet Sampling: The standard operating procedure used at the batching plant was not necessarily conducive to air emission sampling. The sampling problem involved isolating the air emissions from the tanker truck off-loading of specialty cement into its silo storage from the dry-batch or central mix loading when both these operations occurred simultaneously. This problem could not be solved by changing the standard operation at the facility due to economic factors. The problem was partially solved by; (1) only sampling the specific process when that operation was being performed independently; and (2) obtaining accurate operational logs and notes.

The Dry Batch Loading, Central Mixer Loading and Lehigh Silo Filling operations were successfully isolated during the sampling program. The problem of simultaneous operations was most evident when sampling for the Newcem™ Silo Filling process. It was impossible to separate the Newcem™ Silo Filling from the Dry Batch Loading during the test program. It was believed by the EMB that the Newcem™ Silo Filling emissions could be obtained by difference from the combined Dry Batch Loading and Newcem™ Silo Filling emissions. After reducing the data, it became apparent that a simple subtraction of the average Dry Batch Loading mass emission from the average Dry Batch Loading with Newcem™ Silo Filling to obtain an average Newcem™ Silo Filing emission would not be accurate.

3.3.2 Baghouse Outlet Sampling: The problem of isolating the emissions for a single operation also occurred at the baghouse outlet. This problem was compounded by the extremely long sampling times required in order to achieve a measurable filter catch. The run times of the last two baghouse outlet tests were extended to 12 hours in order to obtain an adequate sample. It should be noted that Chaney Enterprises replaced the filters in their baghouse one-week prior to testing.

3.3.3 Metals Analysis: The filters were combined according to the process sampled at the inlet to the baghouse and were analyzed for the targeted metals. This resulted in one metals analysis each for the Dry-Batch Loading, Central Mixer Loading, Lehigh Silo Filling, Dry Batch with Newcem™ Silo Filling, and Dry Batch Loading with Lehigh Silo Filling operations; therefore the metals results are not averages of separate filters from each run. The PM_{10} acetone washes did not undergo metals analysis. The metals emissions can only be considered to represent that present in the PM_{10} fraction within the particulate filter catch.

The zero-values that are reported in the summary tables are a result of the blank correction were both the filter and blank metals analyses were below detection limits. The detection limits for each target metal are listed with the raw laboratory data in Appendix D.3.

3.4 Summary of Results

The results of the emissions testing at the Chaney Enterprises concrete batching plant are summarized for the overall program in Table 3.4-1. The results are summarized by sampling run for the baghouse inlet and outlet particulate emissions in Tables 3.4-2 and 3.4-3, respectively. The moisture and sieve analysis and targeted metal concentrations for the process samples are given in Table 3.4-4.

TABLE 3.4-1

SUMMARY OF AVERAGE BAGHOUSE EMISSIONS

	BAGHOUSE INLET					
GAS PARAMETERS	DRY BATCH LOADING	CENTRAL MIXER LOADING	LEHIGH SILO FILLING	DBL + NSF	DBL + LSF	BAGHOUSE OUTLET
Temperature - F	75.0	70.9	73.0	72.3	66.2	78.3
Velocity - fps	51.98	49.03	53.78	54.45	52.44	42.24
Moisture - Wt%	2.97	2.47	1.15	3.23	3.47	1.2
Flow Rate - dscfm	3161	3017	3355	3316	3238	3013
D50	9.79	9.88	9.96	9.68	9.45	9.85
AVERAGE EMISSIONS						
PM10 Conc. - gr/dcsf	0.177	0.100	0.508	0.974	0.612	1.85E-04
PM10 Mass Rate - lb/hr	4.771	2.636	14.608	27.838	16.990	4.71E-03
TSP Conc. - gr/dscf	0.470	0.277	0.626	2.339	0.701	3.32E-04
TSP Mass Rate - lb/hr	12.668	7.078	18.004	65.912	19.456	8.44E-03
Targeted Metals - lb/hr						
Arsenic (As)	1.71E-05	7.37E-06	6.29E-05	1.15E-05	N/A	N/A
Beryllium (Be)	1.56E-06	0.00E+00	6.73E-07	6.51E-07	N/A	N/A
Cadmium (Cd)	8.62E-07	3.75E-07	8.75E-06	0.00E+00	N/A	N/A
Chromium (Cr)	3.05E-04	4.50E-05	9.42E-06	2.00E-05	N/A	N/A
Lead (Pb)	2.39E-05	1.21E-05	2.76E-05	0.00E+00	N/A	N/A
Manganese (Mn)	2.00E-03	1.94E-03	7.61E-03	5.62E-02	N/A	N/A
Mercury (Hg)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A
Nickel (Ni)	2.38E-04	1.04E-04	6.63E-04	1.22E-04	N/A	N/A
Phosphorus (P)	2.96E-04	1.25E-05	1.04E-03	0.00E+00	N/A	N/A
Selenium (Se)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A

Notes:

- DBL + NSF is defined as Dry Batch Loading with Newcem™ Silo Loading.
- DBL + LSF is defined as Dry Batch Loading with Lehigh Silo Loading.
- All particulate emission averages are time weighted.
- Targeted metal emissions do not represent averages, but represent analyses of filters that were combined from like process sampling runs. The metals analysis were made from the PM_{10} portion of the particulate catch.
- Zero-value emission rates result from a blank correction were both the filter and blank metal concentrations are non-detects.

TABLE 3.4-2

SUMMARY OF BAGHOUSE INLET EMISSIONS AND BATCHING OPERATIONS

TEST CONDITION/ RUN NO.	DATE	START TIME	END TIME	TEST TIME (MIN)	NO. OF TRUCKS LOADED	SILO FILLING (LBS)	CEMENT LOADED (YARDS)	CEMENT USED (LBS)	NEWCEM USED (LBS)	ESTIMATED CAPTURE EFFICIENCY	PARTICULATE EMISSIONS PM10 CONC. (gr/dscf)	PARTICULATE EMISSIONS PM10 MASS RATE (lb/hr)	PARTICULATE EMISSIONS TSP CONC. (gr/dscf)	PARTICULATE EMISSIONS TSP MASS RATE (lb/hr)
DRY BATCH LOADING														
TL-M201A-R1	09/07/93	10:21	13:26	56.8	15	0	95	48930	1130	UNKNOWN	0.319	8.655	0.369	10.020
TL-M201A-R2	09/07/93	14:45	15:42	30.2	6	0	41.5	29200	12250	UNKNOWN	0.160	4.013	0.214	5.358
TL-M201A-R4	09/08/93	07:30	09:00	30.0	5	0	45	27840	0	79	0.105	2.970	0.145	4.112
TL-M201A-R9	09/09/93	07:01	07:31	30.1	8	0	69	39110	0	78	0.056	1.588	0.125	3.583
TL-M201A-R14+	09/09/93	15:40	17:27	22.1	6	0	41	24340	10220	58	0.215	4.971	6.250	144.524
TL-M201A-R15	09/10/93	07:17	08:28	30.0	6	0	32.5	32650	3100	68	0.166	4.477	1.480	40.027
TL-M201A-R16	09/10/93	08:55	09:34	30.0	7	0	41.5	22010	0	60	0.131	3.470	0.581	15.351
Total:				142	32	0	229							
Time Weighted Average (when applicable)+:					6.4	0	45.8			71	0.177	4.771	0.470	12.668
+ Run TL-M201A-R14 was not included in the averaging due to failed isokinetics.														
CENTRAL MIXER LOADING														
TL-M201A-R10	09/09/93	08:57	09:27	30.1	5	0	45	30180	13900	90	0.060	1.529	0.085	2.154
TL-M201A-R11	09/09/93	09:28	10:13	30.2	6	0	50	52520	8870	98	0.066	1.622	0.255	6.320
TL-M201A-R12	09/09/93	10:20	11:38	30.2	6	0	36	36170	9300	99	0.013	0.309	0.573	14.119
TL-M201A-R13	09/09/93	14:11	14:41	29.9	5	0	44	28010	8700	99	0.123	3.422	0.165	4.600
TL-M201A-R17	09/10/93	12:32	13:45	27.2	8	0	72	44850	13900	99	0.252	6.708	0.310	8.274
Total:				147	30	0	247							
Time Weighted Average (when applicable):					6	0	49			97	0.100	2.636	0.277	7.078
LEHIGH SILO FILLING														
TL-M201A-R7	09/08/93	12:03	13:43	30.2	1	101000	0	0	0		0.508	14.608	0.626	18.004
DRY BATCH LOADING WITH NEWCEM SILO FILLING														
TL-M201A-R5	09/08/93	09:07	09:51	30.1	8	30095	34	11340	0	39	1.430	41.768	2.480	72.339
TL-M201A-R8	09/09/93	06:18	06:46	27.8	3	31721	27	14170	0	72	0.607	17.574	1.100	31.730
TL-M201A-R18	09/10/93	17:22	17:52	29.9	1	51900	5	4180	2380	65	0.857	23.359	3.350	91.223
Total:				87.8	12	113716	66							
Time Weighted Average (when applicable):					4	37905	22			58	0.974	27.838	2.339	65.912
DRY BATCH LOADING WITH LEHIGH SILO FILLING														
TL-M201A-R3	09/08/93	06:12	07:08	30.0	6	35541 *	50	27880	0	70	0.612	16.990	0.701	19.456
NO LOADING (BLANK)														
TL-M201A-R6	09/08/93	10:08	11:12	30.1	0		0			0	0.023	0.677	0.044	1.269

* The weight of Lehigh cement that was unloaded during this sampling run was estimated. The estimation was based on the total weight of the tanker truck delivery, delivery time and sample time.

TABLE 3.4-3

SUMMARY OF BAGHOUSE OUTLET PARTICULATE EMISSIONS

RUN I.D.	**CF-M201A-R1**	**CF-M201A-R2**	**CF-M201A-R3**	**CF-M201A-R4**	AVERAGE
DATE	09/07/93	09/08/93	09/09/93	09/10/93	
TIME STARTED	09:12	06:01	05:58	05:57	
TIME ENDED	13:38	12:01	17:58	17:57	
<u>SAMPLING PARAMETERS</u>					
Metered Volume - dcf	52.112	167.998	330.348	332.179	220.659
Corrected Volume - dscf	49.938	164.613	320.238	317.289	213.020
Total Test Time - min	114.0	359.4	719.9	720.0	478.3
% Isokinetics	100.9	102.7	102.0	105.5	102.8
D50	9.99	9.60	9.89	9.92	9.85
<u>GAS PARAMETERS</u>					
Gas Temperature - oF	81.0	80.7	73.6	78.0	78.3
Oxygen - %	20.9	20.9	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0	0.0	0.0
Moisture - %	1.16	2.01	0.91	0.81	1.2
<u>GAS FLOWRATE</u>					
Velocity - ft/sec	42.29	43.90	41.96	40.82	42.24
Actual Volume - acfm	3114	3232	3090	3006	3110
Standard Volume - dscfm	3017	3100	3031	2902	3013
<u>PM10 EMISSIONS</u>					
Concentration - gr/dscf	9.27E-05	1.22E-04	1.25E-04	4.00E-04	1.85E-04
Mass Rate - lb/hr	2.40E-03	3.24E-03	3.26E-03	9.94E-03	4.71E-03
<u>PM (>10 Microns) EMISSIONS</u>					
Concentration - gr/dscf	0.00E+00	0.00E+00	2.81E-04	3.07E-04	1.47E-04
Mass Rate - lb/hr	0.00E+00	0.00E+00	7.31E-03	7.63E-03	3.73E-03
<u>TSP</u>					
Concentration - gr/dscf	9.27E-05	1.22E-04	4.07E-04	7.06E-04	3.32E-04
Mass Rate - lb/hr	2.40E-03	3.24E-03	1.06E-02	1.76E-02	8.44E-03

TABLE 3.4-4

SUMMARY OF MOISTURE AND SIEVE ANALYSIS OF PROCESS SAMPLES

GRAVIMETRICS	LEHIGH CEMENT	NEWCEM	COURSE CHANEY STONE	COURSE BLACK AGGREGATE	ROAD MATERIAL #1	ROAD MATERIAL #2	ROAD MATERIAL #3	ROAD MATERIAL #4	SAND #1	SAND #2	SAND #3
Total Sample Weight - grams	1021	964	30617	27669	5614	30618	18371	6124	1531	1474	1474
Moisture - Wt%	0.13	0.06	3.28	0.61	2.28	2.57	3.75	1.10	4.88	4.87	5.26
SIEVE ANALYSIS (% LESS THAN)											
18 Mesh (1000 Microns)	100.0000	100.0000	0.7986	0.6671	80.7283	31.4991	45.3248	67.5700	67.7959	64.4076	65.8906
20 Mesh (850 Microns)	100.0000	100.0000	0.7518	0.6204	77.4965	29.8910	43.7446	64.7939	64.0654	60.9548	62.2850
25 Mesh (710 Microns)	100.0000	100.0000	0.7048	0.5841	73.8696	28.1036	41.9537	61.7676	59.5614	56.6469	57.8637
30 Mesh (600 Microns)	100.0000	100.0000	0.6573	0.5564	69.9362	26.1912	39.8177	58.4386	54.6202	51.8464	52.5921
35 Mesh (500 Microns)	100.0000	100.0000	0.6116	0.5322	64.4399	23.6581	36.6547	53.9497	47.3994	45.1271	45.1498
60 Mesh (250 Microns)	99.9641	100.0000	0.3887	0.4441	40.4359	13.1419	22.2666	34.0158	13.8562	13.1847	13.1844
80 Mesh (180 Microns)	99.9332	100.0000	0.2953	0.4134	32.1257	11.1004	17.5210	27.6511	6.1509	6.2578	6.3888
100 Mesh (150 Microns)	99.8979	99.9932	0.2547	0.3977	29.2318	9.9283	15.3925	24.8167	4.2995	4.3031	4.7627
200 Mesh (75 Microns)	99.4801	99.4616	0.1398	0.3535	16.9084	6.1310	9.1721	11.3746	1.8216	2.4295	2.4742
MULTI-METALS ANALYSIS (mg/kg)*											
Arsenic (As)	5.88	0.14+									
Beryllium (Be)	0.56	5.65									
Cadmium (Cd)	0.75	0.48									
Chromium (Cr)	39.1	20.6									
Lead (Pb)	13.0	0.07+									
Manganese (Mn)	768	2170									
Mercury (Hg)	0.09+	0.1+									
Nickel (Ni)	13.4	1.30									
Phosphorus (P)	345	69.4+									
Selenium (Se)	0.15+	0.16									

* Case 1 calculations substitute the detection limit value for all the non-detected species. The non-detection limit values are indicated with an "+".

3.4.1 Cement Delivery and Storage: The average mass emissions for TSP from the silo loading operations ranged from 18.004 lb/hr at 0.626 gr/dscf for Lehigh Cement to 65.9 lb/hr at 2.34 gr/dscf for the combined dry batch loading with Newcem™. It should be noted that there was only one sampling run obtained for the Lehigh silo filling. The particulate emissions are summarized in Table 3.4-1. Process batching data for each sampling run is summarized in Table 3.4-2

The targeted metals emissions for cement delivery and storage ranged from a high 5.62E-02 lb/hr of Mn to zero. The zero-value metals emissions are a result of below detection-limit levels occurring for both the analyzed filter and blank. The targeted metal emissions are summarized in Table 3.4-1.

3.4.2 Dry Batch Loading: The time weighted mass emissions for PM_{10} and TSP were 4.77 lb/hr at 0.177 gr/dscf and 12.668 lb/hr at 0.470 gr/dscf, respectively. The PM_{10} and TSP mass emissions for the six valid runs ranged from 1.6 to 8.7 lb/hr and 3.6 to 40.0 lb/hr, respectively. The particulate emissions are summarized in Table 3.4-1. Process batching data for each sampling run is summarized in Table 3.4-2

The targeted metals mass emissions ranged from 2.00E-3 lb/hr for Mn to zero for Hg and Se. The zero-value metals emissions are a result of below detection-limit levels occurring for both the analyzed filter and blank. The mass emissions and the targeted metal emissions for dry batch loading are summarized in Table 3.4-1.

3.4.3 Central Mixer Loading: The time weighted mass emissions for PM_{10} and TSP were 2.636 lb/hr at 0.100 gr/dscf and 7.078 lb/hr at 0.277 gr/dscf, respectively. The PM_{10} and TSP mass emissions for the five runs ranged from 0.31 to 6.7 lb/hr and 2.1 to 14.2 lb/hr, respectively. Process batching data for each sampling run is summarized in Table 3.4-2.

The targeted metals mass emissions ranged from 1.94E-3 lb/hr for Mn to zero or non-detected for Be, Hg and Se. The zero-value metals emissions are a result of below detection-limit levels occurring for both the analyzed filter and blank. The mass emissions and the targeted metal emissions for the Central Mixer Loading are summarized in Table 3.4-1.

3.4.4 Baghouse Outlet Emissions: The four runs that were made at the baghouse outlet produced an average TSP emissions rate of 0.0084 lb/hr at 0.00033 gr/dscf. The average PM_{10} emissions for these runs were 4.71E-03 lb/hr at 1.85E-04 gr/dscf. The outlet mass emissions are summarized in Table 3.4-1. Emission data for each outlet sampling run is summarized in Table 3.4-3.

3.4.5 Process Samples: The results of the moisture and sieve analysis done on the process samples are given in Table 3.4-4. The targeted metals analyses conducted on the Lehigh cement and Newcem™ are also shown in Table 3.4-4.

4.0 SAMPLING AND ANALYTICAL PROCEDURES FOR SOURCE TESTING

4.1 Sampling and Traverse Point Determination - EPA Method 1: EPA Method 1 procedures are used to determine suitability of test locations and to calculate the sampling and traverse points for each location. The results of EPA Method 1 analysis for each sampling location are provided in the following sections.

4.1.1 Sampling and Traverse Points for the Baghouse Inlet Duct: Figures 2.3-1 and 2.3-2 presents a schematic of the sampling and traverse points used at the baghouse inlet duct. A total of 12 points (6 points for each of two ports) were utilized for all pollutant and gas flowrate measurements.

4.1.2 Sampling and Traverse Points for the Baghouse Outlet Duct: A total of 12 points (6 points for each of two ports) were utilized for all gas flow rate measurements at the baghouse outlet. Figure 2.3-3 displays a schematic of the traverse points used to measure gas velocity, temperature, moisture.

4.2 Volumetric Measurements - EPA Method 2: EPA Reference Method 2 was used to measure the gas velocity in order to determine volumetric flow rates of the stack gases. Stainless steel Type-S pitot tubes were used to measure the gas velocity heads. The pitot tubes were calibrated against a NIST traceable pitot tube in accordance with Method 2 procedures. Calibrated Type-K thermocouples were used to determine stack gas temperatures. Velocity and temperature measurements were made at each of the traverse points determined by EPA Method 1.

4.3 Molecular Weight Determination - Ambient Air: The cement batching process does not involve any combustion processes. The process only involves the mixing of aggregate stone and cement with water; therefore the ambient air composition of 79% N_2 and 20.9% O_2 was used for the molecular weight determination.

4.4 Flue Gas Moisture Content - EPA Method 4: The flue gas moisture content was measured in conjunction with each of the pollutant tests according to the sampling and analytical procedures outlined in EPA Method 4. The flue gas moisture for each test was determined by gravimetric analyses of the water collected in the impinger train. All impingers were contained in an ice bath during the testing in order to assure complete moisture condensation of the sampled flue gas. Any moisture which was not condensed in the impingers was captured in the silica gel contained in the final impinger.

4.5 TSP and PM_{10} Sampling - EPA Method 201A: EPA Method 201A was used for determination of PM_{10} emissions. This procedure utilized an in-stack PM_{10} sizing device and an in-stack filter in conjunction with an EPA Method 5 train. Gravimetric emissions analyses were performed as described by EPA Method 5.

4.5.1 Sampling Train Description: The Method 201A train consisted of a cyclone followed by a 47 mm diameter glass fiber (Gelman) filter. These in-stack components were attached to an unheated stainless steel probe. The Method 201A sampling train is shown in Figure 4.5.1-1.

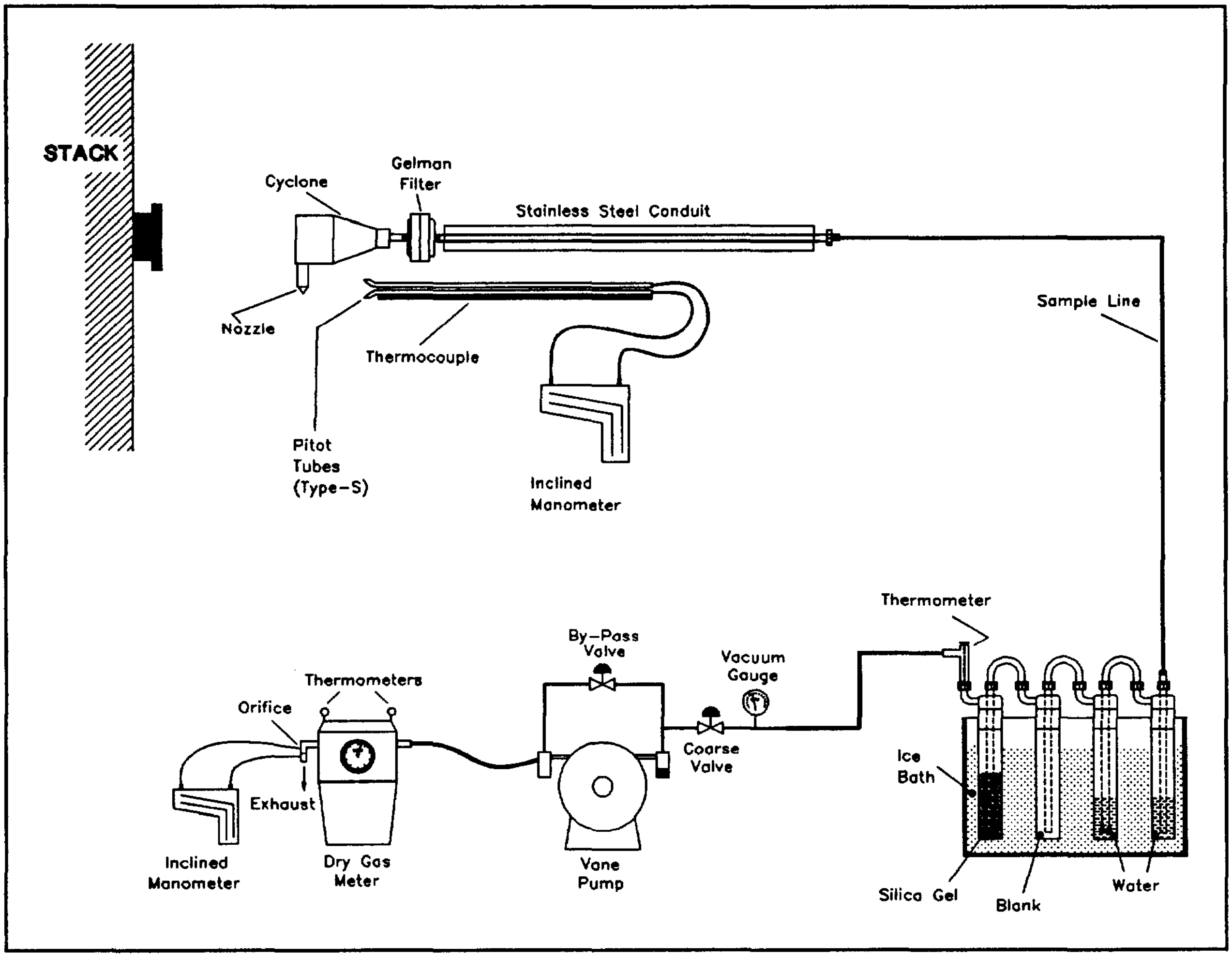


Figure 4.5.1-1: Method 201A Sampling Train

The stack gases were drawn through the cyclone where a portion of the airborne particulate is separated before it passes through a Gelman filter. The size fraction of the particles that have a 50 percent probability of exiting the cyclone through the Gelman filter are defined as the cyclone cut size (D_{50}). The required particle size for a valid test run ranges from 9 um to 11 um. After the sample gas passes through the Gelman filter, it then enters a stainless steel conduit which leads into a glass impinger train consisting of four impingers immersed in an ice bath. The first and second impingers each contained 100 milliliters of water. The third impinger was initially empty and the fourth impinger contained approximately 200 grams of color-indicating silica gel.

4.5.2 Pre-Test Preparation: Before sampling, a velocity traverse of the stack was performed. This traverse, along with a gas analysis of the stack gas, was used to determine the nozzle diameter(s) needed to maintain a flow rate through the cyclone to achieve a cut size of 10μm. A nozzle was selected by comparing the velocity heads from the velocity traverse with the Δp_{min} and Δp_{max} calculated for each nozzle. The nozzle was chosen to bracket all the Δp's from the velocity traverse. If one nozzle did not meet this criterion, then the nozzle was changed during the sampling run so that the velocity head at that sampling point was within the Δp_{min} and Δp_{max} for that nozzle. The details of the calculations are given in Appendix F.1.

Two additional pretest calculations were also needed. The orifice pressure head needed to maintain the necessary cyclone flow rate was calculated. And finally, dwell time for the first traverse point was calculated from the pretest traverse. These calculations are also detailed in Appendix F.1.

4.5.3 Sampling Train Operation: Throughout the sampling run the orifice pressure head was maintained at the pretest calculated value. If the stack gas temperature varied by more than 28°F from the pretest average temperature, then the orifice pressure head was determined using the pretest average ± 28°F.

The sampling train operation was modified from the standard Method 201A technique through the use of a single sampling point of average velocity. This sampling modification was brought about by the limited work area available for the test team. It was impractical and unsafe to attempt complete traverses, since the sampling probe would extend into the cement truck traffic during both the dry batch and central mix loading operations. The total test duration was determined by the process time of the plant operation being sampled. Nozzles were changed as necessary. Filters were also changed as necessary.

4.5.4 Sample Train Recovery: The filters were quantitatively recovered into their original tared and labeled foil wrappers at the end of the run. At this time, the particulate matter was quantitatively recovered using acetone from all of the surfaces from the cyclone exit to the front half of the in-stack filter holder, including the "turn around" cup inside the cyclone and the interior surfaces of the exit tube. The rinsings were placed into labeled glass bottles. The filters and rinsings were transported to the ETS laboratory for gravimetric analyses as described by EPA Method 5. The impinger water and silica gel were recovered as per EPA Method 4 procedures. A schematic of the recovery procedure are given Figure 4.5.4-1.

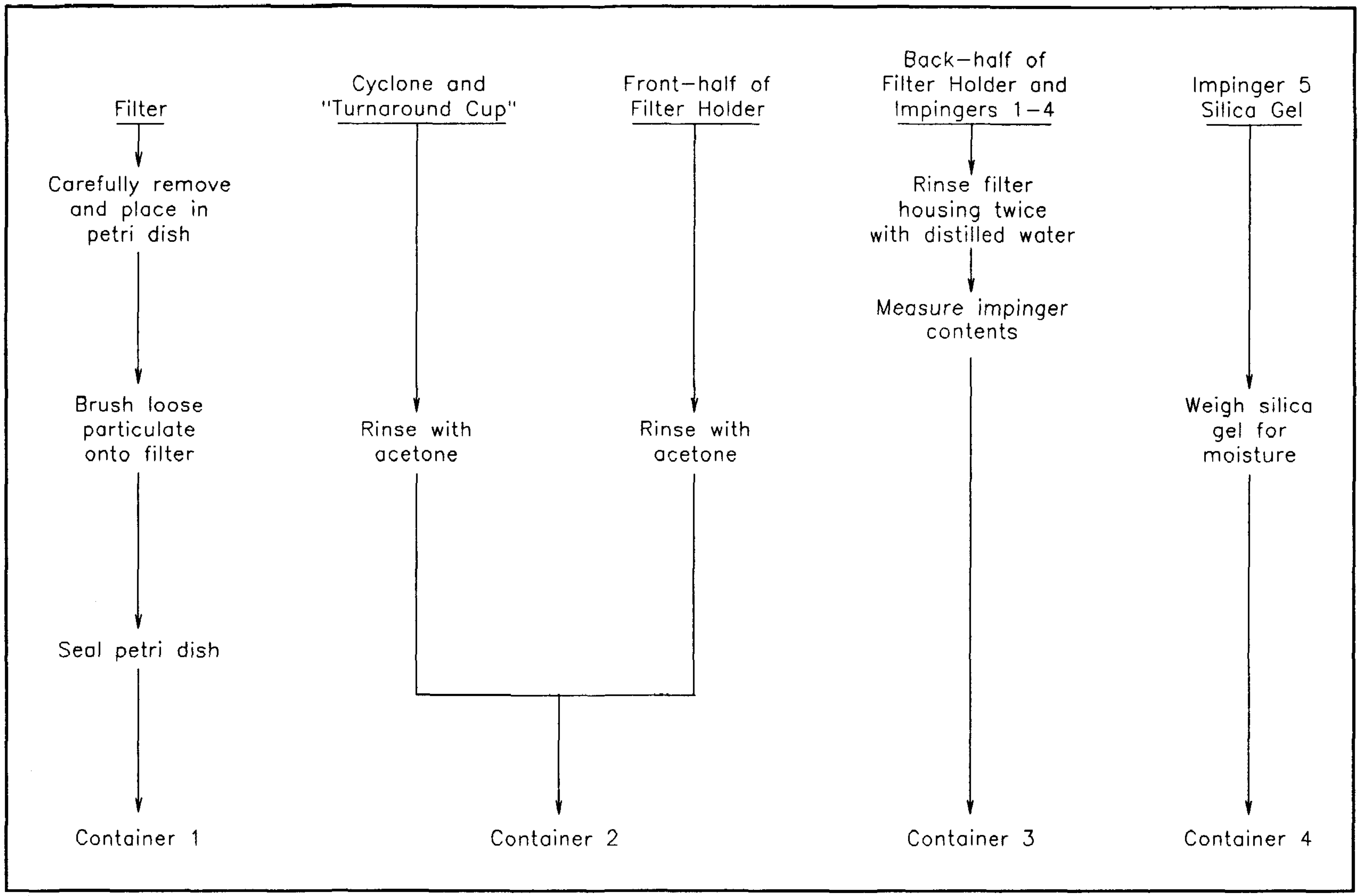


Figure 4.5.4-1: EPA Method 201A Recovery Procedure.

4.5.5 PM$_{10}$ Analyses - EPA Method 201A: Analyses of the glass fiber filters and cyclone acetone rinses from the Method 201A sampling were performed gravimetrically in accordance with EPA Method 5 procedures. The total PM$_{10}$ catch included the particulate collected in the acetone rinses from all of the surfaces from the cyclone exit to the front half of the in-stack filter holder, including the "turn around" cup inside the cyclone and the interior surfaces of the exit tube, as well as the particulate collected by the glass fiber filter. The Method 201A analysis procedure is schematically represented in Figure 4.5.5-1. Appendix D.1 contains the analytical data for the gravimetric PM$_{10}$ analyses.

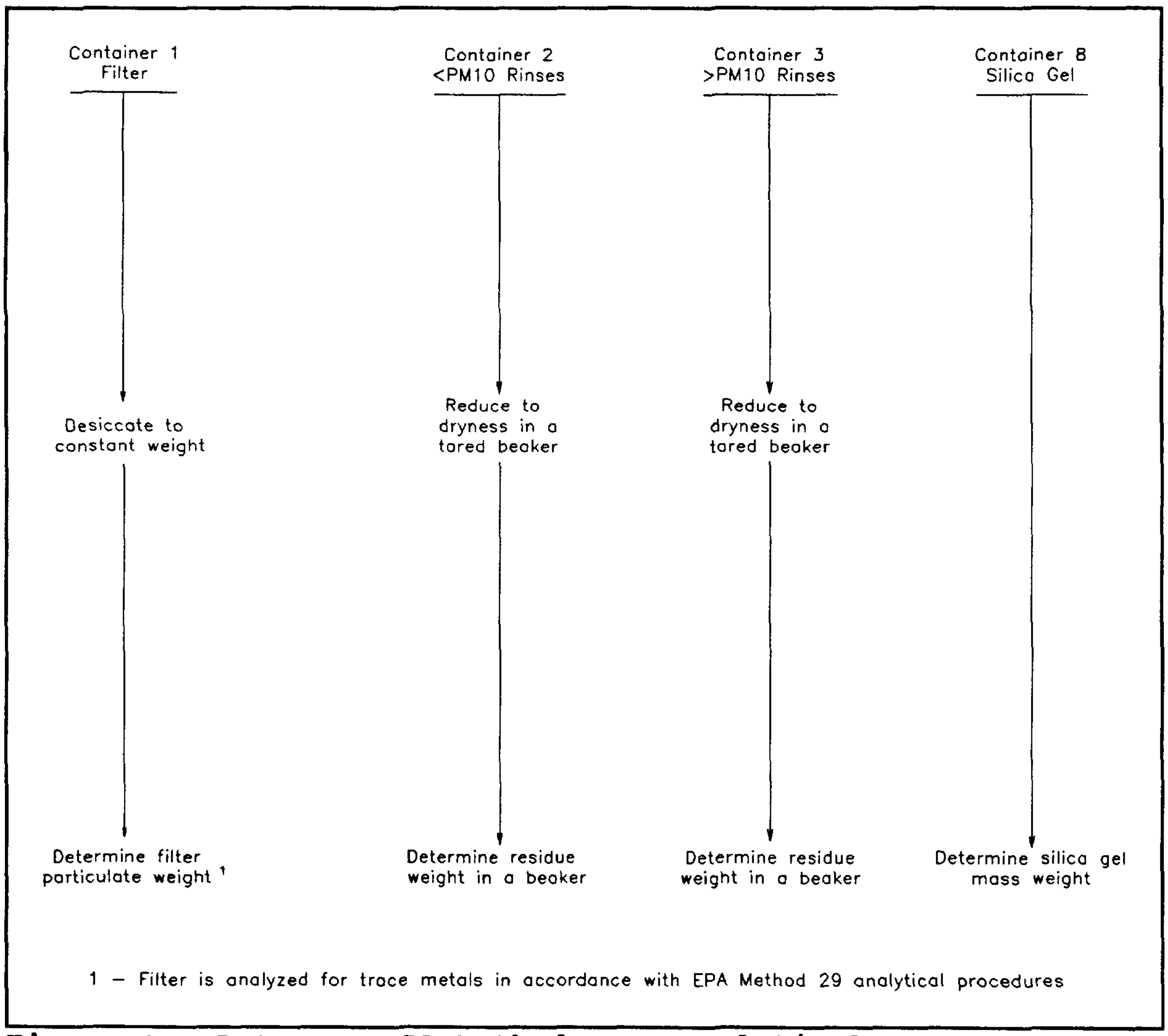


Figure 4.5.5-1: EPA Method 201A Analytical Procedure
Source: 40 CFR Part 51, Appendix M

4.5.6 Multi-Metals Analyses - EPA Multi-Metals: Only the filters from the Method 201A sampling were analyzed for arsenic, beryllium, cadmium, total chromium, lead, manganese, mercury, nickel, phosphorous, and selenium at the completion of the Method 5 gravimetrics. The filters that were used to sample similar process operations were combined into single filter samples by direction of the on-site EPA/EMB personnel.

The filters were prepared for analysis in accordance with the procedures given in the EPA 29 method. All digestions were performed using a 600-watt microwave digester and Teflon pressure relief vessels. After preparation, the samples were analyzed with a Perkin Elmer Plasma 2000 inductively coupled plasma (ICP) spectrometer for arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, phosphorous, and selenium. A Coleman 50A cold vapor spectrometer (CVAAS) was used to analyze the samples for mercury.

Duplicate analyses were performed on all metals samples. In addition, field blanks were also analyzed. Spikes were added to the samples to determine the metals recovery efficiencies. Appendix D.3 contains the multi-metals laboratory data.

5.0 FACILITY PROCESS DATA

The facility process data reflects the specific operating conditions of the facility during the testing. This data was collected by EPA/EIB personnel and contains the truck identification numbers, composition by weight of the cement loaded, the yards of cement loaded, and a shroud collection efficiency estimated for each load. This data was summarized in Table 3.4-2. The process data is contained in Appendix E and is organized by date.

6.0 QA/QC ACTIVITIES

Specific quality control (QC) procedures were followed to ensure the continuous production of useful and valid data throughout the course of this test program. The QC checks and procedures described in this section represent an integral part of the overall sampling and analytical scheme. Strict adherence to prescribed procedures is quite often the most applicable QC check. A discussion of both the sampling and analytical QC checks that were utilized during this program are presented below.

6.1 Equipment QC Procedures

6.1.1 Equipment Inspection and Maintenance: Each item of field test equipment was assigned a unique, permanent identification number. An effective preventive maintenance program was necessary to ensure data quality. Each item of equipment returning from the field was inspected before it was returned to storage. During the course of these inspections, items were cleaned, repaired, reconditioned, and recalibrated where necessary.

Each item of equipment transported to the field was inspected again before being packed to detect equipment problems which may originate during periods of storage. This minimizes lost time on the job site due to equipment failure.

Equipment failure in the field is unavoidable despite the most rigorous inspection and maintenance procedures. For this reason, ETS routinely transported to the job site spare equipment for all critical sampling train components.

6.1.2 Equipment Calibration: New items for which calibration was required were calibrated before initial field use. Equipment whose calibration status may change with use or time was inspected in the field before testing began and again upon return from each field use. When an item of equipment was found to be out of calibration, it was repaired and recalibrated or retired from service. All equipment was periodically recalibrated in full, regardless of the outcome of these regular inspections.

Calibrations are conducted in a manner, and at a frequency, which meets or exceeds U.S. EPA specifications. ETS followed the calibration procedures outlined in the EPA Methods, and those recommended within the Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III (EPA-600/4-77-027b, August, 1977). When these methods were inapplicable, ETS used methods such as those prescribed by the American Society for Testing and Materials (ASTM).

Data obtained during calibrations were recorded on standardized forms, which were checked for completeness and accuracy by the quality assurance director or the quality assurance manager. Data reduction and subsequent calculations were performed using ETS computer facilities. Calculations were checked at least twice for accuracy.

Emissions sampling equipment requiring calibration included pitot tubes, pressure gauges, thermometers, dry gas meters, and barometers. The following sections elaborate on the calibration procedures followed by ETS for these items of equipment.

6.1.2.1 Pitot Tubes: All Type-S pitot tubes used by ETS, whether separate or attached to a sampling probe, are constructed in-house. Each new pitot was calibrated in accordance with the geometric standards contained in EPA Method 2. A Type S pitot tube, constructed and positioned according to these standards, had a coefficient of 0.84 ± 0.02. This coefficient should not change as long as the pitot tube was not damaged. The actual coefficient of each pitot tube was determined using a wind tunnel calibration against a standard NIST traceable pitot tube. These calibrations were performed in accordance with EPA Method 2 procedures.

Each pitot tube was inspected visually upon return from the field. If a cursory inspection indicated damage or raised doubt that the pitot remained true to its original calibration, the pitot tube was refurbished as needed and recalibrated.

6.1.2.2 Impinger Thermometer: Prior to the start of testing, the thermometer used to monitor the temperature of the gas leaving the last impinger was compared with a mercury-in-glass thermometer which meets ASTM E-1 No. 63F specifications. The impinger thermometer was adjusted when necessary until it agreed within 2°F of the reference thermometer. If the thermometer was not adjustable, it was labeled with a correction factor.

6.1.2.3 Dry Gas Meter Thermometer: The thermometer used to measure the temperature of the metered gas sample was checked prior to each field trip against an ASTM mercury-in-glass thermometer. The dry gas meter thermometer was acceptable if the values agree within ± 5.4°F. Thermometers not meeting this requirement were adjusted or labeled with a correction factor.

6.1.2.4 Flue Gas Temperature Sensor: All thermocouples employed for the measurement of flue gas temperatures were calibrated upon receipt. Initial calibrations were performed at three points (ice bath, boiling water, and furnace). An ASTM mercury-in-glass thermometer was used as a reference. The thermocouple was acceptable if the agreement is within 1.5 percent (absolute) at each of the three calibration points.

On-site, prior to the start of testing, the reading from the flue gas thermocouple-potentiometer combination was compared with an ASTM mercury-in-glass reference thermometer. If the two agree within ± 1.5 percent (absolute), the thermocouple and potentiometer were considered to be in proper working order for the test series. After each field use, the thermocouple-potentiometer system was compared with an ASTM mercury-in-glass reference thermometer at a temperature within ± 10 percent of the average absolute flue gas temperature data. If the absolute temperatures agree within ± 1.5 percent, the temperature data were considered valid.

6.1.2.5 Dry Gas Meter and Orifice: Two procedures were used to calibrate the dry gas meter and orifice simultaneously. The full calibration was a complete laboratory procedure used to obtain the calibration factor of the dry gas meter. Full calibrations are performed over a wide range of orifice settings. A simpler procedure, the post test calibration, was designed to check whether the calibration factor had changed. Post test calibrations were performed after each field test series at an intermediate orifice setting (based on the test data) and at the maximum vacuum reached during the test.

Each metering system received a full calibration at the time of purchase and a post test calibration after each field use. If the calibration factor Y deviated by less than five percent from the initial value, the test data were acceptable. If Y deviated by more than 5 percent, the meter was recalibrated and the meter coefficient (initial or recalibrated) that yielded the lowest sample volume for the test runs was used. EPA Method 5 requires another full calibration anytime the post test calibration check indicates that Y had changed by more than 5 percent. Standard practice at ETS is to recalibrate the dry gas meter anytime Y was found to be outside the range of 0.98 to 1.02.

An orifice calibration factor was calculated for each flow setting during a full calibration. If the range of values did not vary by more than 0.15 in. H_2O over the range of 0.4 to 4.0 in. H_2O, the arithmetic average of the values obtained during the calibration was used.

6.2 Sampling QC Procedures

6.2.1 Pre-Test QC Checks and Procedures: The following pretest QC checks were conducted:

- All sampling equipment was thoroughly checked to ensure clean and operable components.
- Equipment was inspected for possible damage from shipment.

- The oil manometer used to measure pressure across the Type S pitot tube was leveled and zeroed.

- The number and location of the sampling traverse points were checked before taking measurements.

- The temperature measurement system was visually checked for damage and operability by measuring the ambient temperature prior to each traverse.

- All cleaned glassware and sample train components were kept sealed until train assembly.

- The sampling trains were assembled in an environment free from uncontrolled dust.

- Each sampling train was visually inspected for proper assembly.

- Pretest calculations determined the proper sampling nozzle size.

6.2.2 QC Checks and Procedures During Testing: The following checks and procedures will be conducted during testing:

- Readings of temperature and differential pressure were taken at each traverse point.

- All sampling data and calculations were recorded on preformatted data sheets.

- All calibration data forms were reviewed for completeness and accuracy.

- Any unusual occurrences were noted during each run on the appropriate data form.

- The project supervisor reviewed sampling data sheets daily during testing.

- The roll and pitch axis of the Type S pitot tube and the sampling nozzle were properly maintained.

- Leak check the train before and after any filter change.

- Conduct additional leak checks if the sampling time exceeded 4 hours.

- Maintained the probe, filter and impingers at the proper temperature.

- Maintained ice in the ice bath at all times.

- Make proper readings of the dry gas meter, delta P and delta H, temperature, and pump vacuum during sampling at each traverse point.

- Maintained isokinetic sampling within the requirements of each method.

6.2.3 <u>QC Checks and Procedures After Testing</u>:

- Visually inspect the sampling nozzle.

- Visually inspect the Type S pitot tube.

- Leak check each leg of the Type S pitot tube.

- Leak check the entire sampling train.

6.3 Analytical QA Procedures

All analytical QA procedures followed those given in each test method. Each test method along with the prescribed reference sections regarding auditing procedures are as follows:

Test Method		Reference
Method 29	-	Method 29, Section 7 of 40 CFR 60
Method 201A	-	Method 201A, Section 4 of 40 CFR 60

6.4 Analytical QC Procedures

All analyses for this program were performed using accepted laboratory procedures in accordance with the specified analytical protocols. Adherence to prescribed QC procedures ensured data of consistent and measurable quality. Analytical QC focused upon the use of control standards to provide a measure of analytical precision and accuracy. Also, specific acceptance criteria were defined for various analytical operations including calibrations, control standard analyses, drift checks, blanks, etc. The following general QC procedures were incorporated into the analytical effort:

- The on-site project supervisor reviewed all analytical data and QC data on a daily basis for completeness and acceptability.

- Analytical QC data was tabulated using the appropriate charts and forms on a daily basis.

- Copies of the QC data tabulation were submitted to the quality assurance manager following the completion of the test program.

- All hard copy raw data (i.e., strip charts, computer printouts, etc.) were maintained in organized files.

6.5 QA/QC Checks of Data Reduction

Calculations that were to be used in the field were checked by the QA officer prior to testing with predetermined data. The QA officer performed random checks in the field to insure data was being properly recorded. Upon completion of the testing, data was then transferred from the data sheets to the computer. This process was also reviewed and checked by the QA officer. When multiple tests were performed in one location, data from each test were compared.

6.6 Sample Identification and Custody

Each test run was assigned a unique run identification (i.d.) which consisted of a 3 digit code for the location, the test method and the specific test run. Labels were pre-printed with the test method, the container number, a unique client/sample i.d., a space to write in the run number described above and the contents of the sample container. As each sample was recovered, its sample label was attached and the sample number and contents were recorded in the chain of custody section of the run sheet. The run identification, the sample number and contents were then recorded in a bound field sample log that was maintained by the sample recovery person. A three way check was then made by the recovery person to insure that the sample label information, the log book information and the run sheet chain of custody all corresponded correctly.

When the samples were returned for analysis, the team leader again checked to see that the sample label information, the run sheet chain of custody and the field log book information all corresponded correctly. Any discrepancies were brought to the attention of the project manager. If any condition existed that may influence the integrity of the sample, it was noted and brought to the attention of the project manager (i.e. broken seals, leaking samples, improper storage temperature). All of the chain of custody information was entered into a database. A print out of the computerized field log was made and checked against the chain of custody on the test run sheet. A copy of the computerized chain of custody accompanied the samples to the location where they were to be analyzed. Each sample label was checked again against the computerized field log as it was sent from sample management.

APPENDIX A.0
TEST LOG

TEST LOG
CHANEY ENTERPRISES
92-655 WA15

OPERATION	LOCATION	TEST PARAMETER	TEST METHOD	RUN I.D.	DATE	TIME START	TIME END
CEMENT SILO FILLING	BAGHOUSE OUTLET	TSP & PM10	M201A	CF-M201A-R1	09/07/93	09:12	09:49
						11:07	11:46
						13:00	13:38
				Total Sampling Time (min):			114
CEMENT SILO FILLING	BAGHOUSE OUTLET	TSP & PM10	M201A	CF-M201A-R2	09/08/93	06:01	12:01
				Total Sampling Time (min):			360
CEMENT SILO FILLING	BAGHOUSE OUTLET	TSP & PM10	M201A	CF-M201A-R3	09/09/93	05:58	17:58
				Total Sampling Time (min):			720
CEMENT SILO FILLING	BAGHOUSE OUTLET	TSP & PM10	M201A	CF-M201A-R4	09/10/93	05:57	17:57
				Total Sampling Time (min):			720
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R1	09/07/93	10:21	10:27
						11:14	11:25
						11:46	11:52
						12:09	12:24
						12:42	12:45
						13:10	13:26
				Total Sampling Time (min):			56.8
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R2	09/07/93	14:45	15:04
						15:14	15:17
						15:34	15:42
				Total Sampling Time (min):			30.2
DRY BATCH LOADING W/LEHIGH SILO FILLING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R3	09/08/93	06:12	06:28
						06:55	07:08
				Total Sampling Time (min):			30.0
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R4	09/08/93	07:30	07:36
						08:23	08:44
						08:55	09:00
				Total Sampling Time (min):			30.0

TEST LOG
CHANEY ENTERPRISES
92-655 WA15

OPERATION	LOCATION	TEST PARAMETER	TEST METHOD	RUN I.D.	DATE	TIME START	TIME END
DRY BATCH LOADING W/NEWCEM SILO FILLING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R5	09/08/93	09:07	09:13
						09:20	09:34
						09:39	09:42
						09:44	09:51
				Total Sampling Time (min):			30.1
NO LOADING (BLANK)	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R6	09/08/93	10:08	10:10
						10:28	10:38
						10:54	11:12
				Total Sampling Time (min):			30.1
LEHIGH SILO FILLING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R7	09/08/93	12:03	12:22
						13:31	13:43
				Total Sampling Time (min):			30.2
DRY BATCH LOADING W/NEWCEM SILO FILLING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R8	09/09/93	06:18	06:46
				Total Sampling Time (min):			27.8
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R9	09/09/93	07:01	07:31
				Total Sampling Time (min):			30.1
CENTRAL MIXER LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R10	09/09/93	08:57	09:27
				Total Sampling Time (min):			30.1
CENTRAL MIXER LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R11	09/09/93	09:28	09:30
						09:36	09:52
						09:59	10:08
						10:11	10:13
				Total Sampling Time (min):			30.2
CENTRAL MIXER LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R12	09/09/93	10:20	10:32
						10:39	10:44
						11:01	11:10
						11:14	11:19
						11:37	11:38
				Total Sampling Time (min):			30.2
CENTRAL MIXER LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R13	09/09/93	14:11	14:41
				Total Sampling Time (min):			29.9

TEST LOG
CHANEY ENTERPRISES
92-655 WA15

OPERATION	LOCATION	TEST PARAMETER	TEST METHOD	RUN I.D.	DATE	TIME START	TIME END
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R14	09/09/93	15:40	15:41
						16:10	16:23
						16:53	16:58
						17:19	17:21
						17:24	17:27
				Total Sampling Time (min):			22.1
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R15	09/10/93	07:17	07:38
						08:19	08:28
				Total Sampling Time (min):			30.0
DRY BATCH LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R16	09/10/93	08:55	09:17
						09:26	09:34
				Total Sampling Time (min):			30.0
CENTRAL MIXER LOADING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R17	09/10/93	12:32	12:35
						12:48	12:55
						13:19	13:23
						13:29	13:31
						13:34	13:45
				Total Sampling Time (min):			27
DRY BATCH LOADING W/NEWCEM SILO FILLING	BAGHOUSE INLET	TSP & PM10	M201A	TL-M201A-R18	09/10/93	17:22	17:52
				Total Sampling Time (min):			30

APPENDIX B.0
BAGHOUSE INLET APPENDICES

APPENDIX B.1
BAGHOUSE INLET: DATA AND RESULTS FOR EPA METHOD 201A TESTING

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	TL-M201A-R1	TL-M201A-R2	TL-M201A-R3
DATE	09/07/93	09/07/93	09/08/93
TIME STARTED	10:21	14:45	06:12
TIME ENDED	13:26	15:42	07:08
SAMPLING PARAMETERS			
Metered Volume - dcf	25.440	14.054	13.807
Corrected Volume - dscf	24.566	13.382	13.688
Total Test Time - min	56.8	30.2	30.0
% Isokinetics	99.6	110.4	102.8
D50	9.86	9.74	9.45
GAS PARAMETERS			
Gas Temperature - oF	77.8	84.0	66.2
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	3.05	2.44	3.47
GAS FLOWRATE			
Velocity - ft/sec	52.13	48.51	52.44
Actual Volume - acfm	3343	3112	3364
Standard Volume - dscfm	3166	2926	3238
PM10 EMISSIONS			
Concentration - gr/dscf	3.19E-01	1.60E-01	6.12E-01
Mass Rate - lb/hr	8.655	4.013	16.990
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	5.03E-02	5.36E-02	8.89E-02
Mass Rate - lb/hr	1.365	1.345	2.466
TOTAL PM			
Concentration - gr/dscf	3.69E-01	2.14E-01	7.01E-01
Mass Rate - lb/hr	10.020	5.358	19.456

RUN NUMBER	**TL-M201A-R1**	
DATE	09/07/93	
START TIME	10:21	
END TIME	13:26	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	30.04	in.Hg
Cp	0.84	
TEST DURATION	56.8	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	216.4	16.4

METHOD 1-4 RESULTS

Metered Volume	25.440	dcf
Volume @ Std.Cond.	24.566	dscf
% Water	3.05	%
% Isokinetics	99.6	%
Velocity	52.127	ft/sec
Actual Flow	3343	acfm
Std. Flow	3265	scfm
Dry Std. Flow	3166	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.506
%CO	0.0	Ps	29.761
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	77	-3.80	0.73	0.56	293.233	75	74
2	78		0.83	0.56	318.673	76	75
3	78		0.86	0.56		79	78
4	78		0.86	0.56		81	79
5	79		0.93	0.56		82	80
6	79		0.88	0.56		83	82
7	77		0.90	0.56		85	83
8	77		0.85	0.56		88	83
9	77		0.87	0.56		86	85
10	77		0.76	0.56		87	86
11	78		0.80	0.56		88	86
12	78		0.72	0.56		90	87
13					318.673		
AVG.	78	-3.80	0.83	0.56	25.440	82	

EPA METHOD 201A ANALYSES

RUN I.D. TL-M201A-R1

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00910	0.00910
Filter	0.49867	0.49867
TOTAL PM10	0.50777	0.50777
PM (>10 Microns):		
Probe Wash > 10 microns	0.08090	0.08012
TOTAL PM	0.58867	0.58789

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53633	1.03500	0.49867	NA
Probe Wash Residue <= PM10	64.95540	64.96450	0.00910	105.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	105.0
Max. Allowable Blank			0.00082	NA
Probe Wash Residue > PM10	64.63590	64.71680	0.08090	100.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00133	100
Max. Allowable Blank			0.00078	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.31893	0.05032	0.36925
Mass Rate (lb/hr)	8.655	1.365	10.020

D50 Calculations

RUN I.D. **TL-M201A-R1**

Stack Gas Viscosity (micropoise)	180.5827
Cyclone Flow Rate (dscf/min)	0.432504
Cyclone Flow Rate (acfm)	0.456947
D50	9.858647

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	181.3045
Cyclone Flow Rate (acfm)	0.449654

Dn	**vn**	**vmin**	**vmax**	**dPmin**	**dPmax**
0.136	74.29410	62.62068	91.53746	1.199912	2.563963
0.15	61.07305	52.33049	75.89916	0.837961	1.762739
0.164	51.09100	44.61678	64.14101	0.609131	1.258884
0.18	42.41184	37.96463	53.96848	0.441034	0.891239
0.197	35.40786	32.64655	45.80917	0.326128	0.642124
0.215	29.72728	28.37578	39.23744	0.246382	0.471102
0.233	25.31164	25.08785	34.16722	0.192593	0.357218
0.264	19.71625	20.96683	27.80611	0.134518	0.236589
0.3	15.26826	17.72535	22.81449	0.096140	0.159271
0.342	11.74843	15.16959	18.91133	0.070414	0.109436
0.39	9.03447	13.18310	15.92470	0.053180	0.077599

RUN NUMBER	**TL-M201A-R2**	
DATE	09/07/93	
START TIME	14:45	
END TIME	15:42	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	29.99	in.Hg
Cp	0.84	
TEST DURATION	30.2	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	207.1	7.1

METHOD 1-4 RESULTS

Metered Volume	14.054	dcf
Volume @ Std.Cond.	13.382	dscf
% Water	2.44	%
% Isokinetics	110.4	%
Velocity	48.512	ft/sec
Actual Flow	3112	acfm
Std. Flow	2999	scfm
Dry Std. Flow	2926	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.572
%CO	0.0	Ps	29.711
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	84	-3.80	0.56	0.58	318.767	87	87
2	84	-3.80	0.60	0.58	332.821	87	87
3	83		0.60	0.58		88	88
4	84		0.70	0.58		89	88
5	85		0.82	0.58		90	88
6	85		0.75	0.58		91	89
7	84		0.80	0.58		92	89
8	84		0.87	0.58		93	89
9	83		0.75	0.58		91	89
10	84		0.68	0.58		92	89
11	84		0.72	0.58		90	89
12	84		0.73	0.58		90	89
13					332.821		
AVG.	84	-3.80	0.72	0.58	14.054	89	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R2**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00760	0.00760
Filter	0.13118	0.13118
TOTAL PM10	0.13878	0.13878
PM (>10 Microns):		
Probe Wash > 10 microns	0.04740	0.04650
TOTAL PM	0.18618	0.18528

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.54192	0.67310	0.13118	NA
Probe Wash Residue <= PM10	66.62270	66.63030	0.00760	130.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	130.0
Max. Allowable Blank			0.00102	NA
Probe Wash Residue > PM10	64.32140	64.36880	0.04740	115.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00153	115
Max. Allowable Blank			0.00090	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.16002	0.05361	0.21364
Mass Rate (lb/hr)	4.013	1.345	5.358

D50 Calculations

RUN I.D. **TL-M201A-R2**

Stack Gas Viscosity (micropoise)	182.5445
Cyclone Flow Rate (dscf/min)	0.443108
Cyclone Flow Rate (acfm)	0.471443
D50	9.739134

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	183.3812
Cyclone Flow Rate (acfm)	0.456274

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	75.38787	63.53254	92.87746	1.221677	2.610866
0.15	61.97218	53.09008	77.00826	0.853082	1.794893
0.164	51.84317	45.26211	65.07637	0.620060	1.281771
0.18	43.03623	38.51133	54.75341	0.448891	0.907374
0.197	35.92914	33.11433	46.47333	0.331891	0.653690
0.215	30.16493	28.78015	39.80425	0.250697	0.479538
0.233	25.68428	25.44341	34.65886	0.195936	0.363574
0.264	20.00651	21.26127	28.20340	0.136818	0.240750
0.3	15.49304	17.97184	23.13774	0.097757	0.162034
0.342	11.92139	15.37848	19.17678	0.071580	0.111305
0.39	9.16748	13.36300	16.14607	0.054047	0.078904

RUN NUMBER	TL-M201A-R3					
DATE	09/08/93					
START TIME	06:12					
END TIME	07:08					
STACK DIAM.	14.0 inches					
NOZZLE I.D.	0.164 inches					
METER BOX GAMMA	0.9871					
METER BOX dH@	1.7019					
BAROMETRIC	30.01 in.Hg					
Cp	0.84					
TEST DURATION	30.0 minutes					

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	130.0	30.0
IMP.2	100.0	70.0	-30.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	210.4	10.4

METHOD 1-4 RESULTS

Metered Volume	13.807	dcf
Volume @ Std.Cond.	13.688	dscf
% Water	3.47	%
% Isokinetics	102.8	%
Velocity	52.443	ft/sec
Actual Flow	3364	acfm
Std. Flow	3354	scfm
Dry Std. Flow	3238	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.46
%CO	0.0	Ps	29.731
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	66	-3.80	0.90	0.60	332.935	67	66
2	67	-3.80	0.67	0.60		67	67
3	66		0.67	0.60		67	67
4	66		1.01	0.60		68	67
5	66		1.01	0.60		68	66
6	66		1.01	0.60		69	67
7	66		0.77	0.60		70	67
8	67		0.96	0.60	340.232	68	67
9	66		0.85	0.60	340.302	69	68
10	66		0.82	0.60		69	68
11	66		0.85	0.60		70	67
12	66		0.82	0.60		72	68
13					346.812		
AVG.	66	-3.80	0.86	0.60	13.807	68	

EPA METHOD 201A ANALYSES

RUN I.D. TL-M201A-R3

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.12830	0.12830
Filter	0.41478	0.41478
TOTAL PM10	0.54308	0.54308
PM (>10 Microns):		
Probe Wash > 10 microns	0.07970	0.07884
TOTAL PM	0.62278	0.62192

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53402	0.94880	0.41478	NA
Probe Wash Residue <= PM10	67.78370	67.91200	0.12830	145.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	145.0
Max. Allowable Blank			0.00114	NA
Probe Wash Residue > PM10	64.69470	64.77440	0.07970	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.61221	0.08887	0.70108
Mass Rate (lb/hr)	16.990	2.466	19.456

D50 Calculations

RUN I.D. **TL-M201A-R3**

Stack Gas Viscosity (micropoise)	177.4728
Cyclone Flow Rate (dscf/min)	0.456258
Cyclone Flow Rate (acfm)	0.4742
D50	9.447436

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	177.9815
Cyclone Flow Rate (acfm)	0.438926

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	72.52148	61.14359	89.36634	1.166105	2.491058
0.15	59.61588	51.10023	74.10230	0.814482	1.712771
0.164	49.87200	43.57175	62.62576	0.592169	1.223325
0.18	41.39992	37.07951	52.69708	0.428848	0.866181
0.197	34.56305	31.88936	44.73353	0.317196	0.624169
0.215	29.01801	27.72138	38.31961	0.239699	0.458013
0.233	24.70772	24.51259	33.37124	0.187419	0.347361
0.264	19.24583	20.49067	27.16310	0.130963	0.230141
0.3	14.90397	17.32688	22.29150	0.093643	0.154994
0.342	11.46812	14.83205	18.48204	0.068618	0.106546
0.39	8.81892	12.89253	15.56683	0.051846	0.075585

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	TL-M201A-R4	TL-M201A-R5	TL-M201A-R6
DATE	09/08/93	09/08/93	09/08/93
TIME STARTED	07:30	09:07	10:08
TIME ENDED	09:00	09:51	11:12
SAMPLING PARAMETERS			
Metered Volume - dcf	13.065	13.446	13.536
Corrected Volume - dscf	13.253	13.212	13.261
Total Test Time - min	30	30.1	30.1
% Isokinetics	97.3	94.2	94.5
D50	9.91	9.74	9.73
GAS PARAMETERS			
Gas Temperature - oF	66.2	69.0	69.0
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	0.71	3.14	2.99
GAS FLOWRATE			
Velocity - ft/sec	52.22	55.15	55.13
Actual Volume - acfm	3350	3537	3536
Standard Volume - dscfm	3310	3396	3401
PM10 EMISSIONS			
Concentration - gr/dscf	1.05E-01	1.43E+00	2.32E-02
Mass Rate - lb/hr	2.970	41.768	0.677
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	4.03E-02	1.05E+00	2.03E-02
Mass Rate - lb/hr	1.142	30.571	0.591
TOTAL PM			
Concentration - gr/dscf	1.45E-01	2.48E+00	4.35E-02
Mass Rate - lb/hr	4.112	72.339	1.269

RUN NUMBER	**TL-M201A-R4**	
DATE	09/08/93	
START TIME	07:30	
END TIME	09:00	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	1.0081	
METER BOX dH@	1.8580	
BAROMETRIC	30.01	in.Hg
Cp	0.84	
TEST DURATION	30.0	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	202.0	2.0

METHOD 1-4 RESULTS

Metered Volume	13.065	dcf
Volume @ Std.Cond.	13.253	dscf
% Water	0.71	%
% Isokinetics	97.3	%
Velocity	52.224	ft/sec
Actual Flow	3350	acfm
Std. Flow	3333	scfm
Dry Std. Flow	3310	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.759
%CO	0.0	Ps	29.668
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	66	-4.70	0.90	0.62	514.41	65	64
2	67	-4.60	0.67	0.62	527.475	64	64
3	66		0.67	0.62		66	65
4	66		1.01	0.62		66	65
5	66		1.01	0.62		66	65
6	66		1.01	0.62		67	65
7	66		0.77	0.62		68	66
8	67		0.96	0.62		70	67
9	66		0.85	0.62		71	66
10	66		0.82	0.62		72	67
11	66		0.85	0.62		72	67
12	66		0.82	0.62		70	67
13					527.475		
AVG.	66.17	-4.65	0.86	0.62	13.065	67	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R4**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.01070	0.01070
Filter	0.07924	0.07924
TOTAL PM10	0.08994	0.08994
PM (>10 Microns):		
Probe Wash > 10 microns	0.03520	0.03457
TOTAL PM	0.12514	0.12451

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53776	0.61700	0.07924	NA
Probe Wash Residue <= PM10	65.56720	65.57790	0.01070	110.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	110.0
Max. Allowable Blank			0.00086	NA
Probe Wash Residue > PM10	64.78790	64.82310	0.03520	80.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00107	80
Max. Allowable Blank			0.00063	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.10471	0.04025	0.14496
Mass Rate (lb/hr)	2.970	1.142	4.112

D50 Calculations

RUN I.D. **TL-M201A-R4**

Stack Gas Viscosity (micropoise)	179.5204
Cyclone Flow Rate (dscf/min)	0.441782
Cyclone Flow Rate (acfm)	0.447324
D50	9.909597

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	180.0293
Cyclone Flow Rate (acfm)	0.442883

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	73.17533	61.70236	90.17776	1.197480	2.557782
0.15	60.15337	51.56904	74.77661	0.836455	1.758718
0.164	50.32164	43.97321	63.19707	0.608192	1.256199
0.18	41.77318	37.42295	53.17937	0.440495	0.889510
0.197	34.87467	32.18647	45.14450	0.325845	0.641024
0.215	29.27963	27.98131	38.67321	0.246264	0.470419
0.233	24.93048	24.74389	33.68061	0.192575	0.356800
0.264	19.41935	20.68604	27.41701	0.134592	0.236431
0.3	15.03834	17.49389	22.50190	0.096258	0.159259
0.342	11.57152	14.97654	18.65835	0.070548	0.109499
0.39	8.89843	13.01934	15.71693	0.053314	0.077696

RUN NUMBER	**TL-M201A-R5**

DATE	09/08/93	
START TIME	09:07	
END TIME	09:51	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	30.01	in.Hg
Cp	0.84	
TEST DURATION	30.1	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	209.1	9.1

METHOD 1-4 RESULTS

Metered Volume	13.446	dcf
Volume @ Std.Cond.	13.212	dscf
% Water	3.14	%
% Isokinetics	94.2	%
Velocity	55.149	ft/sec
Actual Flow	3537	acfm
Std. Flow	3507	scfm
Dry Std. Flow	3396	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.496
%CO	0.0	Ps	29.716
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	71	-3.60	1.10	0.56	347.541	69	69
2	70	-4.40	1.20	0.56	360.987	70	69
3	70		0.85	0.56		71	69
4	72		0.95	0.56		72	70
5	74		1.10	0.56		73	71
6	74		1.40	0.56		74	71
7	65		0.88	0.56		75	71
8	67		0.80	0.56		76	72
9	67		0.63	0.56		76	73
10	65		0.84	0.56		77	73
11	66		0.85	0.56		77	73
12	67		0.85	0.56		77	73
13					360.987		
AVG.	69	-4.00	0.95	0.56	13.446	73	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R5**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.11400	0.11400
Filter	1.11445	1.11445
TOTAL PM10	1.22845	1.22845
PM (>10 Microns):		
Probe Wash > 10 microns	0.90000	0.89914
TOTAL PM	2.12845	2.12759

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53795	1.65240	1.11445	NA
Probe Wash Residue <= PM10	67.58250	67.69650	0.11400	130.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	130.0
Max. Allowable Blank			0.00102	NA
Probe Wash Residue > PM10	67.93820	68.83820	0.90000	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	1.43471	1.05010	2.48481
Mass Rate (lb/hr)	41.768	30.571	72.339

D50 Calculations

RUN I.D. **TL-M201A-R5**

Stack Gas Viscosity (micropoise)	178.4004
Cyclone Flow Rate (dscf/min)	0.438929
Cyclone Flow Rate (acfm)	0.457312
D50	9.738807

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	178.9613
Cyclone Flow Rate (acfm)	0.441943

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	73.01993	61.55970	89.97743	1.176593	2.513623
0.15	60.02563	51.44700	74.60820	0.821776	1.728249
0.164	50.21478	43.86649	63.05252	0.597446	1.234349
0.18	41.68446	37.32934	53.05532	0.432647	0.873959
0.197	34.80060	32.10326	45.03678	0.319986	0.629749
0.215	29.21745	27.90642	38.57853	0.241792	0.462088
0.233	24.87754	24.67541	33.59594	0.189044	0.350434
0.264	19.37811	20.62565	27.34483	0.132083	0.232158
0.3	15.00641	17.44004	22.43953	0.094434	0.156337
0.342	11.54694	14.92807	18.60375	0.069190	0.107457
0.39	8.87953	12.97532	15.66846	0.052272	0.076223

RUN NUMBER	TL-M201A-R6

DATE	09/08/93	
START TIME	10:08	
END TIME	11:12	
STACK DIAM.	14	inches
NOZZLE I.D.	0.16	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	30.01	in.Hg
Cp	0.84	
TEST DURATION	30.1	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	208.7	8.67

METHOD 1-4 RESULTS

Metered Volume	13.536	dcf
Volume @ Std.Cond.	13.261	dscf
% Water	2.99	%
% Isokinetics	94.5	%
Velocity	55.13	ft/sec
Actual Flow	3536	acfm
Std. Flow	3506	scfm
Dry Std. Flow	3401	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.512
%CO	0.0	Ps	29.716
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	71	-3.60	1.10	0.56	361.554	75	75
2	70	-4.40	1.20	0.56	375.090	74	74
3	70		0.85	0.56		74	74
4	72		0.95	0.56		75	74
5	74		1.10	0.56		76	74
6	74		1.40	0.56		73	73
7	65		0.88	0.56		74	73
8	67		0.80	0.56		74	73
9	67		0.63	0.56		75	73
10	65		0.84	0.56		75	73
11	66		0.85	0.56		76	73
12	67		0.85	0.56		76	73
13					375.090		
AVG.	69	-4.00	0.95	0.56	13.536	74	

EPA METHOD 201A ANALYSES

RUN I.D. TL-M201A-R6

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00010	0.00010
Filter	0.01987	0.01987
TOTAL PM10	0.01997	0.01997
PM (>10 Microns):		
Probe Wash > 10 microns	0.01830	0.01744
TOTAL PM	0.03827	0.03741

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53383	0.55370	0.01987	NA
Probe Wash Residue <= PM10	67.84130	67.84140	0.00010	105.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	105.0
Max. Allowable Blank			0.00082	NA
Probe Wash Residue > PM10	66.94940	66.96770	0.01830	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.02324	0.02029	0.04353
Mass Rate (lb/hr)	0.677	0.591	1.269

D50 Calculations

RUN I.D. **TL-M201A-R6**

Stack Gas Viscosity (micropoise)	178.5103
Cyclone Flow Rate (dscf/min)	0.440557
Cyclone Flow Rate (acfm)	0.458307
D50	9.726912

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	179.0712
Cyclone Flow Rate (acfm)	0.442141

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	73.05263	61.58778	90.01811	1.178330	2.517315
0.15	60.05251	51.47059	74.64204	0.822993	1.730792
0.164	50.23727	43.88672	63.08121	0.598334	1.236169
0.18	41.70313	37.34667	53.07957	0.433293	0.875251
0.197	34.81619	32.11829	45.05746	0.320466	0.630683
0.215	29.23054	27.91959	38.59636	0.242156	0.462776
0.233	24.88868	24.68715	33.61155	0.189330	0.350958
0.264	19.38679	20.63561	27.35769	0.132286	0.232507
0.3	15.01313	17.44858	22.45021	0.094580	0.156574
0.342	11.55211	14.93548	18.61273	0.069297	0.107621
0.39	8.88351	12.98184	15.67614	0.052354	0.076341

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	TL-M201A-R7	TL-M201A-R8	TL-M201A-R9
DATE	09/08/93	09/09/93	09/09/93
TIME STARTED	12:03	06:18	07:01
TIME ENDED	13:43	06:46	07:31
SAMPLING PARAMETERS			
Metered Volume - dcf	13.477	12.161	12.853
Corrected Volume - dscf	13.194	12.040	13.121
Total Test Time - min	30.2	27.8	30.1
% Isokinetics	95.0	93.5	95.3
D50	9.96	9.85	9.67
GAS PARAMETERS			
Gas Temperature - oF	73.0	66.1	66.1
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	1.15	2.78	4.23
GAS FLOWRATE			
Velocity - ft/sec	53.78	54.49	54.64
Actual Volume - acfm	3449	3495	3505
Standard Volume - dscfm	3355	3376	3335
PM10 EMISSIONS			
Concentration - gr/dscf	5.08E-01	6.07E-01	5.56E-02
Mass Rate - lb/hr	14.608	17.574	1.588
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	1.18E-01	4.89E-01	6.98E-02
Mass Rate - lb/hr	3.396	14.156	1.995
TOTAL PM			
Concentration - gr/dscf	6.26E-01	1.10E+00	1.25E-01
Mass Rate - lb/hr	18.004	31.730	3.583

RUN NUMBER	**TL-M201A-R7**
DATE	09/08/93
START TIME	12:03
END TIME	13:43
STACK DIAM.	14 inches
NOZZLE I.D.	0.164 inches
METER BOX GAMMA	0.9871
METER BOX dH@	1.7019
BAROMETRIC	30.01 in.Hg
Cp	0.84
TEST DURATION	30.2 minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	203.3	3.3

METHOD 1-4 RESULTS

Metered Volume	13.477	dcf
Volume @ Std.Cond.	13.194	dscf
% Water	1.15	%
% Isokinetics	95.0	%
Velocity	53.778	ft/sec
Actual Flow	3449	acfm
Std. Flow	3394	scfm
Dry Std. Flow	3355	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.711
%CO	0.0	Ps	29.720
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	73	-3.80	1.20	0.57	375.420	73	73
2	73	-4.10	1.10	0.57	388.897	74	74
3	73		0.93	0.57		75	74
4	73		0.86	0.57		76	74
5	73		0.81	0.57		76	74
6	73		0.89	0.57		76	74
7	73		0.74	0.57		77	75
8	73		0.77	0.57		74	74
9	73		0.75	0.57		74	74
10	73		0.92	0.57		74	74
11	73		0.98	0.57		75	74
12	73		0.88	0.57		76	74
13					388.897		
AVG.	73	-3.95	0.90	0.57	13.477	75	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R7**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.06930	0.06930
Filter	0.36507	0.36507
TOTAL PM10	0.43437	0.43437
PM (>10 Microns):		
Probe Wash > 10 microns	0.10180	0.10098
TOTAL PM	0.53617	0.53535

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53633	0.90140	0.36507	NA
Probe Wash Residue <= PM10	64.91420	64.98350	0.06930	115.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	115.0
Max. Allowable Blank			0.00090	NA
Probe Wash Residue > PM10	67.25290	67.35470	0.10180	105.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00140	105
Max. Allowable Blank			0.00082	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.50798	0.11809	0.62607
Mass Rate (lb/hr)	14.608	3.396	18.004

D50 Calculations

RUN I.D. **TL-M201A-R7**

Stack Gas Viscosity (micropoise)	180.8394
Cyclone Flow Rate (dscf/min)	0.436888
Cyclone Flow Rate (acfm)	0.449352
D50	9.955981

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	181.4739
Cyclone Flow Rate (acfm)	0.448132

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.04253	62.42192	91.23759	1.209926	2.584832
0.15	60.86625	52.16760	75.65314	0.845058	1.777209
0.164	50.91801	44.48094	63.93563	0.614374	1.269319
0.18	42.26823	37.85224	53.79843	0.444906	0.898719
0.197	35.28797	32.55299	45.66760	0.329053	0.647591
0.215	29.62662	28.29738	39.11892	0.248643	0.475180
0.233	25.22593	25.02112	34.06655	0.194401	0.360364
0.264	19.64949	20.91466	27.72791	0.135827	0.238737
0.3	15.21656	17.68443	22.75391	0.097111	0.160767
0.342	11.70865	15.13729	18.86442	0.071151	0.110502
0.39	9.00388	13.15719	15.88803	0.053754	0.078384

RUN NUMBER	**TL-M201A-R8**
DATE	09/09/93
START TIME	06:18
END TIME	06:46
STACK DIAM.	14 inches
NOZZLE I.D.	0.164 inches
METER BOX GAMMA	0.9871
METER BOX dH@	1.7019
BAROMETRIC	29.97 in.Hg
Cp	0.84
TEST DURATION	27.8 minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	207.3	7.3

METHOD 1-4 RESULTS

Metered Volume	12.161	dcf
Volume @ Std.Cond.	12.040	dscf
% Water	2.78	%
% Isokinetics	93.5	%
Velocity	54.490	ft/sec
Actual Flow	3495	acfm
Std. Flow	3472	scfm
Dry Std. Flow	3376	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.535
%CO	0.0	Ps	29.617
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	67	-4.70	1.30	0.56	389.247	65	65
2	66	-4.90	1.20	0.56	401.408	66	66
3	66		0.98	0.56		67	66
4	66		0.90	0.56		68	66
5	66		0.94	0.56		69	67
6	66		0.90	0.56		69	66
7	66		0.73	0.56		70	66
8	66		0.70	0.56		71	67
9	66		0.70	0.56		71	66
10	66		0.76	0.56		72	67
11	66		1.10	0.56		72	67
12	66		1.00	0.56		72	67
13					401.408		
AVG.	66	-4.80	0.93	0.56	12.161	68	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R8**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.02410	0.02410
Filter	0.44982	0.44982
TOTAL PM10	0.47392	0.47392
PM (>10 Microns):		
Probe Wash > 10 microns	0.38260	0.38174
TOTAL PM	0.85652	0.85566

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53558	0.98540	0.44982	NA
Probe Wash Residue <= PM10	67.18370	67.20780	0.02410	120.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	120.0
Max. Allowable Blank			0.00094	NA
Probe Wash Residue > PM10	67.55450	67.93710	0.38260	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.60737	0.48923	1.09661
Mass Rate (lb/hr)	17.574	14.156	31.730

D50 Calculations

RUN I.D. **TL-M201A-R8**

Stack Gas Viscosity (micropoise)	177.9634
Cyclone Flow Rate (dscf/min)	0.433082
Cyclone Flow Rate (acfm)	0.448566
D50	9.848584

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	178.4707
Cyclone Flow Rate (acfm)	0.440268

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	72.74327	61.32964	89.63893	1.171983	2.503652
0.15	59.79820	51.25550	74.32815	0.818581	1.721422
0.164	50.02452	43.70393	62.81645	0.595143	1.229497
0.18	41.52653	37.19177	52.85734	0.430997	0.870545
0.197	34.66875	31.98569	44.86938	0.318781	0.627308
0.215	29.10675	27.80491	38.43579	0.240893	0.460312
0.233	24.78328	24.58628	33.47224	0.188350	0.349100
0.264	19.30469	20.55201	27.24504	0.131610	0.231289
0.3	14.94955	17.37853	22.35849	0.094104	0.155763
0.342	11.50319	14.87607	18.53736	0.068954	0.107072
0.39	8.84589	12.93064	15.61322	0.052098	0.075957

RUN NUMBER	TL-M201A-R9	
DATE	09/09/93	
START TIME	07:01	
END TIME	07:31	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	1.0081	
METER BOX dH@	1.8580	
BAROMETRIC	29.97	in.Hg
Cp	0.84	
TEST DURATION	30.1	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	212.3	12.3

METHOD 1-4 RESULTS

Metered Volume	12.853	dcf
Volume @ Std.Cond.	13.121	dscf
% Water	4.23	%
% Isokinetics	95.3	%
Velocity	54.640	ft/sec
Actual Flow	3505	acfm
Std. Flow	3482	scfm
Dry Std. Flow	3335	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.378
%CO	0.0	Ps	29.617
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	67	-4.70	1.30	0.56	527.756	59	58
2	66	-4.90	1.20	0.56	540.609	60	59
3	66		0.98	0.56		61	60
4	66		0.90	0.56		62	60
5	66		0.94	0.56		63	61
6	66		0.90	0.56		64	61
7	66		0.73	0.56		66	62
8	66		0.70	0.56		67	62
9	66		0.70	0.56		67	62
10	66		0.76	0.56		67	63
11	66		1.10	0.56		68	63
12	66		1.00	0.56		69	63
13					540.609		
AVG.	66	-4.80	0.93	0.56	12.853	63	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R9**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00970	0.00970
Filter	0.03755	0.03755
TOTAL PM10	0.04725	0.04725
PM (>10 Microns):		
Probe Wash > 10 microns	0.05990	0.05935
TOTAL PM	0.10715	0.10660

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53465	0.57220	0.03755	NA
Probe Wash Residue <= PM10	67.19610	67.20580	0.00970	115.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	115.0
Max. Allowable Blank			0.00090	NA
Probe Wash Residue > PM10	67.53740	67.59730	0.05990	70.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00093	70
Max. Allowable Blank			0.00055	NA

PARTICULATE EMISSIONS:

	PM10	PM(>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.05557	0.06980	0.12536
Mass Rate (lb/hr)	1.588	1.995	3.583

D50 Calculations

RUN I.D. **TL-M201A-R9**

Stack Gas Viscosity (micropoise)	176.8906
Cyclone Flow Rate (dscf/min)	0.435908
Cyclone Flow Rate (acfm)	0.458313
D50	9.669222

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	177.3978
Cyclone Flow Rate (acfm)	0.438333

Dn	**vn**	**vmin**	**vmax**	**dPmin**	**dPmax**
0.136	72.42355	61.05520	89.24124	1.155136	2.467850
0.15	59.53538	51.02496	73.99743	0.806776	1.696762
0.164	49.80466	43.50624	62.53602	0.586531	1.211848
0.18	41.34401	37.02236	52.62035	0.424733	0.858016
0.197	34.51638	31.83886	44.66719	0.314125	0.618251
0.215	28.97882	27.67620	38.26158	0.237356	0.453642
0.233	24.67435	24.47151	33.31959	0.185571	0.344023
0.264	19.21984	20.45475	27.11943	0.129651	0.227902
0.3	14.88384	17.29512	22.25409	0.092690	0.153464
0.342	11.45264	14.80367	18.44958	0.067909	0.105478
0.39	8.80701	12.86692	15.53825	0.051302	0.074816

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	TL-M201A-R10	TL-M201A-R11	TL-M201A-R12
DATE	09/09/93	09/09/93	09/09/93
TIME STARTED	08:57	09:28	10:20
TIME ENDED	09:27	10:13	11:38
SAMPLING PARAMETERS			
Metered Volume - dcf	13.445	13.040	13.405
Corrected Volume - dscf	13.238	13.120	13.088
Total Test Time - min	30.1	30.2	30.2
% Isokinetics	108.2	109.6	109.9
D50	10.00	9.80	9.76
GAS PARAMETERS			
Gas Temperature - oF	67.1	67.1	67.1
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	0.05	3.10	3.74
GAS FLOWRATE			
Velocity - ft/sec	46.60	46.87	46.93
Actual Volume - acfm	2989	3006	3010
Standard Volume - dscfm	2965	2891	2875
PM10 EMISSIONS			
Concentration - gr/dscf	6.02E-02	6.55E-02	1.25E-02
Mass Rate - lb/hr	1.529	1.622	0.309
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	2.46E-02	1.90E-01	5.60E-01
Mass Rate - lb/hr	0.625	4.698	13.810
TOTAL PM			
Concentration - gr/dscf	8.48E-02	2.55E-01	5.73E-01
Mass Rate - lb/hr	2.154	6.320	14.119

RUN NUMBER	TL-M201A-R10						
DATE	09/09/93						
START TIME	08:57						
END TIME	09:27		**METHOD 4 DATA**				
STACK DIAM.	14	inches		INIT. (ml)	FINAL (ml)	NET (ml)	
NOZZLE I.D.	0.164	inches					
METER BOX GAMMA	0.9871		IMP.1	100.0	100.0	0.0	
METER BOX dH@	1.7019		IMP.2	100.0	100.0	0.0	
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	0.0	0.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	30.1	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	200.0	0.0	
Metered Volume	13.445	dcf	S.G.	200.0	200.1	0.1	
Volume @ Std.Cond.	13.238	dscf					
% Water	0.05	%	**METHOD 3 DATA**				
% Isokinetics	108.2	%	%O2	20.9		Md	28.836
Velocity	46.598	ft/sec	%CO2	0.0		Ms	28.831
Actual Flow	2989	acfm	%CO	0.0		Ps	29.639
Std. Flow	2966	scfm	%N2	79.1			
Dry Std. Flow	2965	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	68	-4.50	0.67	0.56	401.946	68	67
2	67	-4.50	0.62	0.56	415.391	68	67
3	67		0.62	0.56		69	68
4	67		0.62	0.56		70	68
5	67		0.84	0.56		71	68
6	67		0.84	0.56		72	68
7	67		0.61	0.56		73	69
8	67		0.57	0.56		74	70
9	67		0.47	0.56		75	70
10	67		0.62	0.56		76	70
11	67		0.92	0.56		77	71
12	67		0.87	0.56		78	71
13					415.391		
AVG.	67.08	-4.5	0.69	0.56	13.445	71	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R10**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00070	0.00070
Filter	0.05092	0.05092
TOTAL PM10	0.05162	0.05162
PM (>10 Microns):		
Probe Wash > 10 microns	0.02190	0.02112
TOTAL PM	0.07352	0.07274

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53338	0.58430	0.05092	NA
Probe Wash Residue <= PM10	80.46160	80.46230	0.00070	140.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	140.0
Max. Allowable Blank			0.00110	NA
Probe Wash Residue > PM10	65.16650	65.18840	0.02190	100.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00133	100
Max. Allowable Blank			0.00078	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.06017	0.02461	0.08478
Mass Rate (lb/hr)	1.529	0.625	2.154

D50 Calculations

RUN I.D. **TL-M201A-R10**

Stack Gas Viscosity (micropoise)	180.2309
Cyclone Flow Rate (dscf/min)	0.439792
Cyclone Flow Rate (acfm)	0.443571
D50	9.997423

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	180.7567
Cyclone Flow Rate (acfm)	0.444703

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	73.47605	61.95572	90.54819	1.207053	2.578238
0.15	60.40058	51.78074	75.08373	0.843140	1.772781
0.164	50.52844	44.15368	63.45659	0.613052	1.266243
0.18	41.94485	37.57648	53.39771	0.444013	0.896620
0.197	35.01799	32.31847	45.32981	0.328447	0.646147
0.215	29.39996	28.09602	38.83191	0.248229	0.474177
0.233	25.03293	24.84529	33.81878	0.194112	0.359649
0.264	19.49915	20.77075	27.52943	0.135665	0.238319
0.3	15.10014	17.56548	22.59411	0.097025	0.160529
0.342	11.61907	15.03778	18.73475	0.071110	0.110372
0.39	8.93500	13.07254	15.78124	0.053738	0.078315

RUN NUMBER	TL-M201A-R11						
DATE	09/09/93						
START TIME	09:28						
END TIME	10:13		**METHOD 4 DATA**				
STACK DIAM.	14	inches		INIT. (ml)	FINAL (ml)	NET (ml)	
NOZZLE I.D.	0.164	inches					
METER BOX GAMMA	1.0081		IMP.1	100.0	100.0	0.0	
METER BOX dH@	1.8580		IMP.2	100.0	100.0	0.0	
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	0.0	0.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	30.2	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	200.0	0.0	
Metered Volume	13.040	dcf	S.G.	200.0	208.9	8.9	
Volume @ Std.Cond.	13.120	dscf					
% Water	3.10	%	**METHOD 3 DATA**				
% Isokinetics	109.6	%	%O2	20.9		Md	28.836
Velocity	46.868	ft/sec	%CO2	0.0		Ms	28.5
Actual Flow	3006	acfm	%CO	0.0		Ps	29.639
Std. Flow	2983	scfm	%N2	79.1			
Dry Std. Flow	2891	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	68	-4.50	0.67	0.56	540.752	68	67
2	67	-4.50	0.62	0.56	553.792	69	68
3	67		0.62	0.56		69	68
4	67		0.62	0.56		70	68
5	67		0.84	0.56		71	69
6	67		0.84	0.56		72	69
7	67		0.61	0.56		74	70
8	67		0.57	0.56		74	70
9	67		0.47	0.56		72	70
10	67		0.62	0.56		73	70
11	67		0.92	0.56		73	71
12	67		0.87	0.56		74	71
13					553.792		
AVG.	67	-4.50	0.69	0.56	13.04		70

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R11**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00650	0.00650
Filter	0.04917	0.04917
TOTAL PM10	0.05567	0.05567
PM (>10 Microns):		
Probe Wash > 10 microns	0.16200	0.16122
TOTAL PM	0.21767	0.21689

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53783	0.58700	0.04917	NA
Probe Wash Residue <= PM10	66.30550	66.31200	0.00650	125.0
Acetone Blank Residue	65.54130	65.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	125.0
Max. Allowable Blank			0.00098	NA
Probe Wash Residue > PM10	67.34130	67.50330	0.16200	100.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00133	100
Max. Allowable Blank			0.00078	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.06547	0.18960	0.25506
Mass Rate (lb/hr)	1.622	4.698	6.320

D50 Calculations

RUN I.D. **TL-M201A-R11**

Stack Gas Viscosity (micropoise)	177.9674
Cyclone Flow Rate (dscf/min)	0.434449
Cyclone Flow Rate (acfm)	0.451988
D50	9.800659

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	178.493
Cyclone Flow Rate (acfm)	0.440631

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	72.80324	61.37809	89.71122	1.171057	2.501756
0.15	59.84750	51.29548	74.38768	0.817918	1.720099
0.164	50.06576	43.73754	62.86636	0.594648	1.228536
0.18	41.56076	37.21986	52.89890	0.430626	0.869850
0.197	34.69733	32.00936	44.90422	0.318497	0.626795
0.215	29.13075	27.82502	38.46520	0.240670	0.459925
0.233	24.80371	24.60365	33.49744	0.188170	0.348799
0.264	19.32060	20.56595	27.26497	0.131477	0.231079
0.3	14.96187	17.38982	22.37427	0.094003	0.155614
0.342	11.51268	14.88530	18.54991	0.068876	0.106963
0.39	8.85318	12.93832	15.62335	0.052036	0.075875

RUN NUMBER	TL-M201A-R12						
DATE	09/09/93						
START TIME	10:20						
END TIME	11:38		**METHOD 4 DATA**				
STACK DIAM.	14	inches		INIT.	FINAL	NET	
NOZZLE I.D.	0.164	inches		(ml)	(ml)	(ml)	
METER BOX GAMMA	0.9871		IMP.1	100.0	104.0	4.0	
METER BOX dH@	1.7019		IMP.2	100.0	100.0	0.0	
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	0.0	0.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	30.2	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	204.0	4.0	
Metered Volume	13.405	dcf	S.G.	200.0	206.8	6.8	
Volume @ Std.Cond.	13.088	dscf					
% Water	3.74	%	**METHOD 3 DATA**				
% Isokinetics	109.9	%	%O2	20.9		Md	28.836
Velocity	46.925	ft/sec	%CO2	0.0		Ms	28.43
Actual Flow	3010	acfm	%CO	0.0		Ps	29.639
Std. Flow	2987	scfm	%N2	79.1			
Dry Std. Flow	2875	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	68	-4.50	0.67	0.56	415.476	74	74
2	67	-4.50	0.62	0.56	428.881	74	74
3	67		0.62	0.56		75	74
4	67		0.62	0.56		76	75
5	67		0.84	0.56		77	75
6	67		0.84	0.56		75	75
7	67		0.61	0.56		75	75
8	67		0.57	0.56		75	75
9	67		0.47	0.56		76	75
10	67		0.62	0.56		77	75
11	67		0.92	0.56		76	75
12	67		0.87	0.56		77	76
13					428.881		
AVG.	67	-4.50	0.69	0.56	13.405	75	

EPA METHOD 201A ANALYSES

RUN I.D. TL-M201A-R12

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00690	0.00690
Filter	0.00372	0.00372
TOTAL PM10	0.01062	0.01062
PM (>10 Microns):		
Probe Wash > 10 microns	0.47670	0.47537
TOTAL PM	0.48732	0.48599

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53518	0.53890	0.00372	NA
Probe Wash Residue <= PM10	65.98030	65.98720	0.00690	80.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	80.0
Max. Allowable Blank			0.00063	NA
Probe Wash Residue > PM10	67.33730	67.81400	0.47670	170.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00227	170
Max. Allowable Blank			0.00133	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.01252	0.56041	0.57293
Mass Rate (lb/hr)	0.309	13.810	14.119

D50 Calculations

RUN I.D. **TL-M201A-R12**

Stack Gas Viscosity (micropoise)	177.4903
Cyclone Flow Rate (dscf/min)	0.433391
Cyclone Flow Rate (acfm)	0.453901
D50	9.757764

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	178.0159
Cyclone Flow Rate (acfm)	0.439771

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	72.66111	61.25608	89.53443	1.163553	2.485809
0.15	59.73067	51.19299	74.24066	0.812659	1.709115
0.164	49.96802	43.64965	62.74169	0.590812	1.220675
0.18	41.47963	37.14454	52.79354	0.427836	0.864270
0.197	34.62960	31.94408	44.81433	0.316423	0.622761
0.215	29.07388	27.76780	38.38775	0.239095	0.456955
0.233	24.75529	24.55262	33.42958	0.186932	0.346537
0.264	19.28289	20.52272	27.20912	0.130604	0.229571
0.3	14.93267	17.35273	22.32786	0.093373	0.154590
0.342	11.49020	14.85311	18.51089	0.068410	0.106253
0.39	8.83590	12.90999	15.59002	0.051682	0.075367

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	**TL-M201A-R13**	**TL-M201A-R14**	**TL-M201A-R15**
DATE	09/09/93	09/09/93	09/10/93
TIME STARTED	14:11	15:40	07:17
TIME ENDED	14:41	17:27	08:28
SAMPLING PARAMETERS			
Metered Volume - dcf	13.481	10.437	13.286
Corrected Volume - dscf	13.037	10.004	12.919
Total Test Time - min	29.9	22.1	30.0
% Isokinetics	97.7	122.3	99.8
D50	9.85	9.70	9.83
GAS PARAMETERS			
Gas Temperature - oF	79.0	79.0	79.0
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	2.32	1.12	2.97
GAS FLOWRATE			
Velocity - ft/sec	53.47	43.82	52.55
Actual Volume - acfm	3429	2811	3371
Standard Volume - dscfm	3253	2699	3146
PM10 EMISSIONS			
Concentration - gr/dscf	1.23E-01	2.15E-01	1.66E-01
Mass Rate - lb/hr	3.422	4.971	4.477
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	4.22E-02	6.03E+00	1.32E+00
Mass Rate - lb/hr	1.178	139.553	35.550
TOTAL PM			
Concentration - gr/dscf	1.65E-01	6.25E+00	1.48E+00
Mass Rate - lb/hr	4.600	144.524	40.027

RUN NUMBER	TL-M201A-R13					
DATE	09/09/93					
START TIME	14:11					
END TIME	14:41		**METHOD 4 DATA**			
STACK DIAM.	14	inches		INIT. (ml)	FINAL (ml)	NET (ml)
NOZZLE I.D.	0.164	inches				
METER BOX GAMMA	0.9871		IMP.1	100.0	100.0	0.0
METER BOX dH@	1.7019		IMP.2	100.0	100.0	0.0
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	0.0	0.0
Cp	0.84		IMP.4			0.0
TEST DURATION	29.9	minutes	IMP.5			0.0
			IMP.6			0.0
			IMP.7			0.0
METHOD 1-4 RESULTS			TOTAL	200.0	200.0	0.0
Metered Volume	13.481	dcf	S.G.	200.0	206.6	6.6
Volume @ Std.Cond.	13.037	dscf				
% Water	2.32	%	**METHOD 3 DATA**			
% Isokinetics	97.7	%	%O2	20.9	Md	28.836
Velocity	53.465	ft/sec	%CO2	0.0	Ms	28.584
Actual Flow	3429	acfm	%CO	0.0	Ps	29.661
Std. Flow	3330	scfm	%N2	79.1		
Dry Std. Flow	3253	dscfm	O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	79	-4.30	1.20	0.57	428.882	79	79
2	79	-4.10	1.20	0.57	442.363	79	79
3	79		0.85	0.57		79	79
4	79		0.75	0.57		79	79
5	79		0.79	0.57		80	79
6	79		1.00	0.57		81	79
7	79		0.66	0.57		82	80
8	79		0.74	0.57		82	80
9	79		0.56	0.57		82	79
10	79		0.84	0.57		83	80
11	79		1.00	0.57		84	81
12	79		1.00	0.57		85	80
13					442.363		
AVG.	79	-4.20	0.88	0.57	13.481	80	

EPA METHOD 201A ANALYSES
RUN I.D. TL-M201A-R13

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.02400	0.02400
Filter	0.07969	0.07969
TOTAL PM10	0.10369	0.10369
PM (>10 Microns):		
Probe Wash > 10 microns	0.03640	0.03569
TOTAL PM	0.14009	0.13938

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53711	0.61680	0.07969	NA
Probe Wash Residue <= PM10	64.19210	64.21610	0.02400	135.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	135.0
Max. Allowable Blank			0.00106	NA
Probe Wash Residue > PM10	64.66740	64.70380	0.03640	90.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00120	90
Max. Allowable Blank			0.00071	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.12272	0.04225	0.16497
Mass Rate (lb/hr)	3.422	1.178	4.600

D50 Calculations

RUN I.D. **TL-M201A-R13**

Stack Gas Viscosity (micropoise)	181.4202
Cyclone Flow Rate (dscf/min)	0.436023
Cyclone Flow Rate (acfm)	0.459859
D50	9.852618

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	182.165
Cyclone Flow Rate (acfm)	0.452179

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.71119	62.96957	92.04933	1.209773	2.585138
0.15	61.41592	52.62140	76.32307	0.844826	1.777273
0.164	51.37783	44.86420	64.49873	0.614105	1.269243
0.18	42.64994	38.17453	54.26891	0.444621	0.898555
0.197	35.60664	32.82642	46.06363	0.328768	0.647379
0.215	29.89417	28.53153	39.45484	0.248366	0.474945
0.233	25.45374	25.22504	34.35602	0.194136	0.360121
0.264	19.82694	21.08076	27.95901	0.135586	0.238499
0.3	15.35398	17.82102	22.93922	0.096896	0.160546
0.342	11.81439	15.25092	19.01406	0.070963	0.110304
0.39	9.08520	13.25334	16.01063	0.053591	0.078209

RUN NUMBER	**TL-M201A-R14**						
DATE	09/09/93						
START TIME	15:40						
END TIME	17:27		**METHOD 4 DATA**				
STACK DIAM.	14	inches		INIT. (ml)	FINAL (ml)	NET (ml)	
NOZZLE I.D.	0.164	inches					
METER BOX GAMMA	0.9871		IMP.1	100.0	100.0	0.0	
METER BOX dH@	1.7019		IMP.2	100.0	100.0	0.0	
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	0.0	0.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	22.1	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	200.0	0.0	
Metered Volume	10.437	dcf	S.G.	200.0	202.4	2.4	
Volume @ Std.Cond.	10.004	dscf					
% Water	1.12	%	**METHOD 3 DATA**				
% Isokinetics	122.3	%	%O2	20.9		Md	28.836
Velocity	43.822	ft/sec	%CO2	0.0		Ms	28.715
Actual Flow	2811	acfm	%CO	0.0		Ps	29.661
Std. Flow	2730	scfm	%N2	79.1			
Dry Std. Flow	2699	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	79	-4.30	1.20	0.57	442.363	84	84
2	79	-4.10	1.20	0.57	452.800	85	84
3	79		0.85	0.57		85	84
4	79		0.75	0.57		86	85
5	79		0.79	0.57		87	86
6	79		1.00	0.57		87	85
7	79		0.66	0.57		86	85
8	79		0.74	0.57		86	85
9	79		0.56	0.57		85	85
10	79		0.84	0.57		85	85
11							
12							
13					452.800		
AVG.	79	-4.20	0.86	0.57	10.437	85	

EPA METHOD 201A ANALYSES

RUN I.D. TL-M201A-R14

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.02320	0.02320
Filter	0.11611	0.11611
TOTAL PM10	0.13931	0.13931
PM (>10 Microns):		
Probe Wash > 10 microns	3.91210	3.91092
TOTAL PM	4.05141	4.05023

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53629	0.65240	0.11611	NA
Probe Wash Residue <= PM10	65.94280	65.96600	0.02320	125.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	125.0
Max. Allowable Blank			0.00098	NA
Probe Wash Residue > PM10	67.26960	71.18170	3.91210	150.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00200	150
Max. Allowable Blank			0.00118	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.21487	6.03215	6.24702
Mass Rate (lb/hr)	4.971	139.553	144.524

D50 Calculations

RUN I.D. **TL-M201A-R14**

Stack Gas Viscosity (micropoise)	182.3143
Cyclone Flow Rate (dscf/min)	0.452669
Cyclone Flow Rate (acfm)	0.471593
D50	9.702684

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	183.0591
Cyclone Flow Rate (acfm)	0.453787

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.97699	63.19777	92.37998	1.224128	2.615647
0.15	61.63442	52.81311	76.59805	0.854883	1.798286
0.164	51.56062	45.02860	64.73191	0.621442	1.284281
0.18	42.80168	38.31542	54.46598	0.449956	0.909230
0.197	35.73332	32.94854	46.23176	0.332733	0.655095
0.215	30.00053	28.63859	39.59972	0.251378	0.480626
0.233	25.54430	25.32051	34.48297	0.196503	0.364446
0.264	19.89748	21.16168	28.06349	0.137254	0.241383
0.3	15.40860	17.89043	23.02607	0.098099	0.162504
0.342	11.85642	15.31117	19.08709	0.071852	0.111661
0.39	9.11752	13.30638	16.07302	0.054268	0.079180

RUN NUMBER	TL-M201A-R15	
DATE	09/10/93	
START TIME	07:17	
END TIME	08:28	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	29.70	in.Hg
Cp	0.84	
TEST DURATION	30.0	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	208.4	8.4

METHOD 1-4 RESULTS

Metered Volume	13.286	dcf
Volume @ Std.Cond.	12.919	dscf
% Water	2.97	%
% Isokinetics	99.8	%
Velocity	52.551	ft/sec
Actual Flow	3371	acfm
Std. Flow	3243	scfm
Dry Std. Flow	3146	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.514
%CO	0.0	Ps	29.384
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	79	-4.00	0.98	0.57	452.944	71	71
2	79	-4.60	0.94	0.57	466.230	70	70
3	79		0.92	0.57		71	70
4	79		0.89	0.57		72	71
5	79		0.84	0.57		73	71
6	79		0.81	0.57		74	71
7	79		0.63	0.57		75	71
8	79		0.82	0.57		76	72
9	79		0.83	0.57		76	72
10	79		0.85	0.57		74	73
11	79		0.77	0.57		75	73
12	79		0.74	0.57		76	74
13					466.230		
AVG.	79	-4.30	0.84	0.57	13.286	73	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R15**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.01550	0.01550
Filter	0.12350	0.12350
TOTAL PM10	0.13900	0.13900
PM (>10 Microns):		
Probe Wash > 10 microns	1.10440	1.10369
TOTAL PM	1.2434	1.24269

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53780	0.66130	0.12350	NA
Probe Wash Residue <= PM10	67.14060	67.15610	0.01550	110.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	110.0
Max. Allowable Blank			0.00086	NA
Probe Wash Residue > PM10	67.40240	68.50680	1.10440	90.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00120	90
Max. Allowable Blank			0.00071	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.16601	1.31819	1.48421
Mass Rate (lb/hr)	4.477	35.550	40.027

D50 Calculations

RUN I.D. **TL-M201A-R15**

Stack Gas Viscosity (micropoise)	180.9408
Cyclone Flow Rate (dscf/min)	0.43064
Cyclone Flow Rate (acfm)	0.461524
D50	9.833309

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	181.6855
Cyclone Flow Rate (acfm)	0.452567

Dn	**vn**	**vmin**	**vmax**	**dPmin**	**dPmax**
0.136	74.77538	63.01288	92.12023	1.197168	2.558624
0.15	61.46869	52.65499	76.37973	0.835941	1.758947
0.164	51.42198	44.89037	64.54456	0.607579	1.256076
0.18	42.68659	38.19420	54.30523	0.439837	0.889160
0.197	35.63724	32.84082	46.09220	0.325181	0.640548
0.215	29.91986	28.54167	39.47709	0.245615	0.469880
0.233	25.47561	25.23190	34.37333	0.191954	0.356238
0.264	19.84397	21.08358	27.97007	0.134025	0.235876
0.3	15.36717	17.82080	22.94537	0.095753	0.158740
0.342	11.82454	15.24852	19.01648	0.070105	0.109033
0.39	9.09300	13.24950	16.01035	0.052929	0.077286

SUMMARY OF PARTICULATE EMISSIONS
TRUCK LOADING BAGHOUSE INLET

RUN I.D.	TL-M201A-R16	TL-M201A-R17	TL-M201A-R18
DATE	09/10/93	09/10/93	09/10/93
TIME STARTED	08:55	12:32	17:22
TIME ENDED	09:34	13:45	17:52
SAMPLING PARAMETERS			
Metered Volume - dcf	13.493	12.028	13.261
Corrected Volume - dscf	13.000	11.437	12.657
Total Test Time - min	30	27.2	29.9
% Isokinetics	102.5	98.5	97.0
D50	9.67	9.98	9.89
GAS PARAMETERS			
Gas Temperature - oF	74.4	74.4	81.3
Oxygen - %	20.9	20.9	20.9
Carbon Dioxide - %	0.0	0.0	0.0
Moisture - %	4.33	3.20	3.75
GAS FLOWRATE			
Velocity - ft/sec	51.70	51.59	53.72
Actual Volume - acfm	3316	3309	3446
Standard Volume - dscfm	3082	3111	3179
PM10 EMISSIONS			
Concentration - gr/dscf	1.31E-01	2.52E-01	8.55E-01
Mass Rate - lb/hr	3.470	6.708	23.287
PM (>10 Microns) EMISSIONS			
Concentration - gr/dscf	4.50E-01	5.87E-02	2.49E+00
Mass Rate - lb/hr	11.881	1.566	67.936
TOTAL PM			
Concentration - gr/dscf	5.81E-01	3.10E-01	3.35E+00
Mass Rate - lb/hr	15.351	8.274	91.223

RUN NUMBER	**TL-M201A-R16**	
DATE	09/10/93	
START TIME	08:55	
END TIME	09:34	
STACK DIAM.	14	inches
NOZZLE I.D.	0.164	inches
METER BOX GAMMA	0.9871	
METER BOX dH@	1.7019	
BAROMETRIC	29.70	in.Hg
Cp	0.84	
TEST DURATION	30.0	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	212.5	12.5

METHOD 1-4 RESULTS

Metered Volume	13.493	dcf
Volume @ Std.Cond.	13.000	dscf
% Water	4.33	%
% Isokinetics	102.5	%
Velocity	51.703	ft/sec
Actual Flow	3316	acfm
Std. Flow	3221	scfm
Dry Std. Flow	3082	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.367
%CO	0.0	Ps	29.417
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	75	-3.50	0.75	0.56	466.231	75	75
2	74	-4.20	0.80	0.56	479.724	75	74
3	74		0.74	0.56		76	75
4	74		0.75	0.56		77	75
5	74		0.98	0.56		78	75
6	74		0.97	0.56		79	76
7	75		0.66	0.56		81	77
8	75		0.64	0.56		81	77
9	75		0.70	0.56		82	77
10	75		0.70	0.56		83	77
11	74		1.10	0.56		79	78
12	74		1.00	0.56		80	78
13					479.724		
AVG.	74	-3.85	0.82	0.56	13.493	78	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R16**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.02410	0.02410
Filter	0.08656	0.08656
TOTAL PM10	0.11066	0.11066
PM (>10 Microns):		
Probe Wash > 10 microns	0.37980	0.37894
TOTAL PM	0.49046	0.48960

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.54124	0.62780	0.08656	NA
Probe Wash Residue <= PM10	64.36710	64.39120	0.02410	122.0
Acetone Blank Residue	67.18690	67.18690	0.00000	125.0
Applicable Acetone Blank			0.00000	122.0
Max. Allowable Blank			0.00096	NA
Probe Wash Residue > PM10	64.66060	65.04040	0.37980	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.13134	0.44976	0.58111
Mass Rate (lb/hr)	3.470	11.881	15.351

D50 Calculations

RUN I.D. **TL-M201A-R16**

Stack Gas Viscosity (micropoise)	178.8273
Cyclone Flow Rate (dscf/min)	0.433338
Cyclone Flow Rate (acfm)	0.466468
D50	9.669225

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	179.4877
Cyclone Flow Rate (acfm)	0.4465

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	73.77289	62.17212	90.88826	1.170690	2.501877
0.15	60.64459	51.95341	75.35906	0.817482	1.719972
0.164	50.73258	44.29317	63.68281	0.594188	1.228273
0.18	42.11430	37.68705	53.58103	0.430165	0.869506
0.197	35.15946	32.40570	45.47837	0.318048	0.626412
0.215	29.51873	28.16440	38.95219	0.240243	0.459530
0.233	25.13407	24.89917	33.91706	0.187767	0.348407
0.264	19.57793	20.80664	27.59993	0.131116	0.230710
0.3	15.16115	17.58769	22.64282	0.093685	0.155279
0.342	11.66601	15.04989	18.76674	0.068599	0.106666
0.39	8.97109	13.07757	15.80096	0.051797	0.075617

RUN NUMBER	TL-M201A-R17		
DATE	09/10/93		
START TIME	12:32		
END TIME	13:45		
STACK DIAM.	14	inches	
NOZZLE I.D.	0.164	inches	
METER BOX GAMMA	0.9871		
METER BOX dH@	1.7019		
BAROMETRIC	29.70	in.Hg	
Cp	0.84		
TEST DURATION	27.2	minutes	

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	208.0	8.0

METHOD 1-4 RESULTS

Metered Volume	12.028	dcf
Volume @ Std.Cond.	11.437	dscf
% Water	3.20	%
% Isokinetics	98.5	%
Velocity	51.592	ft/sec
Actual Flow	3309	acfm
Std. Flow	3214	scfm
Dry Std. Flow	3111	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.489
%CO	0.0	Ps	29.417
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	75	-3.50	0.75	0.56	479.780	82	83
2	74	-4.20	0.80	0.56	491.808	82	83
3	74		0.74	0.56		84	83
4	74		0.75	0.56		84	83
5	74		0.98	0.56		83	83
6	74		0.97	0.56		85	84
7	75		0.66	0.56		85	84
8	75		0.64	0.56		87	85
9	75		0.70	0.56		87	85
10	75		0.70	0.56		88	85
11	74		1.10	0.56		88	85
12	74		1.00	0.56		88	85
13					491.808		
AVG.	74	-3.85	0.82	0.56	12.028	85	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R17**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.04970	0.04970
Filter	0.13674	0.13674
TOTAL PM10	0.18644	0.18644
PM (>10 Microns):		
Probe Wash > 10 microns	0.04430	0.04352
TOTAL PM	0.23074	0.22996

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53736	0.67410	0.13674	NA
Probe Wash Residue <= PM10	65.00530	65.05500	0.04970	110.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	110.0
Max. Allowable Blank			0.00086	NA
Probe Wash Residue > PM10	67.49370	67.53800	0.04430	100.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00133	100
Max. Allowable Blank			0.00078	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.25153	0.05871	0.31024
Mass Rate (lb/hr)	6.708	1.566	8.274

D50 Calculations

RUN I.D. **TL-M201A-R17**

Stack Gas Viscosity (micropoise)	179.6597
Cyclone Flow Rate (dscf/min)	0.420479
Cyclone Flow Rate (acfm)	0.447377
D50	9.983947

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	180.3201
Cyclone Flow Rate (acfm)	0.448005

Dn	**vn**	**vmin**	**vmax**	**dPmin**	**dPmax**
0.136	74.02156	62.38555	91.19756	1.183796	2.529736
0.15	60.84901	52.13269	75.61627	0.826664	1.739159
0.164	50.90359	44.44690	63.90091	0.600886	1.242004
0.18	42.25626	37.81878	53.76533	0.435035	0.879252
0.197	35.27797	32.51987	45.63561	0.321667	0.633456
0.215	29.61823	28.26447	39.08766	0.242991	0.464717
0.233	25.21879	24.98839	34.03576	0.189926	0.352354
0.264	19.64392	20.88225	27.69760	0.132637	0.233342
0.3	15.21225	17.65253	22.72400	0.094781	0.157065
0.342	11.70534	15.10616	18.83497	0.069409	0.107904
0.39	9.00133	13.12710	15.85924	0.052414	0.076502

RUN NUMBER	**TL-M201A-R18**						
DATE	09/10/93						
START TIME	17:22						
END TIME	17:52						
STACK DIAM.	14	inches					
NOZZLE I.D.	0.164	inches					
METER BOX GAMMA	0.9871						
METER BOX dH@	1.7019						
BAROMETRIC	29.70	in.Hg					
Cp	0.84						
TEST DURATION	29.9	minutes					

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	208.1	218.5	10.5

METHOD 1-4 RESULTS

Metered Volume	13.261	dcf
Volume @ Std.Cond.	12.657	dscf
% Water	3.75	%
% Isokinetics	97.0	%
Velocity	53.723	ft/sec
Actual Flow	3446	acfm
Std. Flow	3303	scfm
Dry Std. Flow	3179	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.429
%CO	0.0	Ps	29.406
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	OUTLET (DegF)
1	82	-4.00	0.55	0.57	491.808	81	81
2	82	-4.00	0.76	0.57	505.069	81	81
3	82		0.80	0.57		82	81
4	82		0.81	0.57		82	81
5	81		0.95	0.57		83	82
6	81		0.87	0.57		84	82
7	81		1.00	0.57		84	82
8	81		1.10	0.57		85	82
9	81		1.00	0.57		85	82
10	81		0.92	0.57		85	82
11	81		0.85	0.57		85	82
12	81		0.83	0.57		85	82
13					505.069		
AVG.	81	-4.00	0.87	0.57	13.261	83	

EPA METHOD 201A ANALYSES

RUN I.D. **TL-M201A-R18**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.04310	0.04310
Filter	0.65789	0.65789
TOTAL PM10	0.70099	0.70099
PM (>10 Microns):		
Probe Wash > 10 microns	2.04610	2.04500
TOTAL PM	2.74709	2.74599

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53821	1.19610	0.65789	NA
Probe Wash Residue <= PM10	66.83650	66.87960	0.04310	80.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank			0.00000	80.0
Max. Allowable Blank			0.00063	NA
Probe Wash Residue > PM10	64.31280	66.35890	2.04610	140.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00187	140
Max. Allowable Blank			0.00110	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.85455	2.49299	3.34755
Mass Rate (lb/hr)	23.287	67.936	91.223

D50 Calculations

RUN I.D. **TL-M201A-R18**

Stack Gas Viscosity (micropoise)	180.9251
Cyclone Flow Rate (dscf/min)	0.422753
Cyclone Flow Rate (acfm)	0.45839
D50	9.893869

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	181.7127
Cyclone Flow Rate (acfm)	0.45351

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.93112	63.13817	92.30757	1.194089	2.552274
0.15	61.59671	52.75824	76.53389	0.833745	1.754528
0.164	51.52908	44.97703	64.67369	0.605946	1.252875
0.18	42.77550	38.26649	54.41264	0.438622	0.886854
0.197	35.71146	32.90160	46.18212	0.324255	0.638852
0.215	29.98218	28.59318	39.55288	0.244894	0.468607
0.233	25.52867	25.27627	34.43818	0.191372	0.355249
0.264	19.88530	21.11904	28.02116	0.133598	0.235193
0.3	15.39918	17.84933	22.98567	0.095433	0.158258
0.342	11.84917	15.27171	19.04839	0.069860	0.108685
0.39	9.11194	13.26867	16.03594	0.052736	0.077027

APPENDIX B.2
BAGHOUSE INLET: RAW FIELD SAMPLING DATA FOR EPA METHOD 201A TESTING

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Cheney Enterprises — Baghouse Inlet — DATE 9-7-93

START TIME 10:21 — TEST LOCATION Truck Loading — RUN NUMBER TL-m201A-R1

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	10:21		77	0.73	4.69	0.56	293.233	75	74		4
2	4.69	stop 10:27 start 11:14		78	0.83	4.69		295.3	76	75		4
3	9.4		-3.80	78	0.86	4.78		297.4	79	78		4
4	14.2			78	0.86	4.78		299.5	81	79		7
5	19.0	Stop 11:25 Start 11:46		79	0.93	4.97		301.7	82	80		5
6	24.0	Stop 11:52 Start 12:09		79	0.88	4.83		303.9	83	82		5
B1	28.8			77	0.90	4.89		306.1	85	83		5
2	33.7			77	0.85	4.75		308.3	88	83		6
3	38.5	stop 12:34 start 12:40	-3.80	77	0.87	4.80		310.5	86	85		5
4	43.3	Stop 12:45 Start 12:10		77	0.76	4.49		312.6	87	86		6
5	47.8			78	0.80	4.61		314.7	88	86		8
6	52.4			78	0.72	4.37		316.7	90	87		10
	56.8	13:26						318.673				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	106	Filter
	107	> PM10
		~~Filter~~
	108	< PM10
	110	SG

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 4.69

$t_1 / \sqrt{P_1}$ = 5.15

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	200	216.37
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vocelli
BAR. PRESS.	30.04
FILTER I.D.	692-152

Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Ent

DATE 9-7-93

START TIME 14:45

TEST LOCATION Truck Loading <Baghouse Inlet

RUN NUMBER TL-M201A-R2

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	14:45		84	0.56	2.22	0.58	318.767	87	87		3
2	2.2			84	0.60	2.30		319.9	87	87		3
3	4.5			83	0.60	2.30		320.9	88	88		4
4	6.8		-3.8	84	0.70	2.48		322.0	89	88		4
5	9.3			85	0.82	2.69		323.1	90	88		4
6	12.0			85	0.75	2.57		324.4	91	89		4
B1	14.6			84	0.80	2.66		325.6	92	89		4
2	17.3			84	0.87	2.77		326.8	93	89		4
3	20.1	Stop 15:04 Start 15:14		83	0.75	2.57		328.1	91	89		3
4	22.7	Stop 15:17 Start 15:34		84	0.68	2.45		329.3	92	89		4
5	25.2		-3.8	84	0.72	2.52		330.5	90	89		4
6	27.7			84	0.73	2.54		331.6	90	89		4
	30.2	15:42						332.821				

Dry Loading only

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	118	Filter
	119	7PM10
	120	<PM10
	122	Silica Gel

LEAK CHECK

Vacuum	10"				
Rate	0.006				

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4		
#5		

Dwell Time for Point 1 = 2.22

$t_1/\sqrt{P_1}$ = 2.97

METER BOX I.D.	#6
GAMMA	0.9821
DELTA H@	1.7019
OPERATOR	D. Vercellio
BAR. PRESS.	29.99
FILTER I.D.	92-150

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Cheney Enterprises

DATE 9-8-93

START TIME 06:12

TEST LOCATION Baghouse Inlet Truck Loading

RUN NUMBER TL-M201A-R3

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	6:12		66	0.90	2.56	0.60	332.935	67	66		3
2	2.6			67	0.67	2.21		334.2	67	67		3
3	4.8			66	0.67	2.21		335.1	67	67		4
4	7.0		-3.8	66	1.01	2.71		336.1	68	67		4
5	9.7			66	1.01	2.71		337.3	68	66		5
6	12.4			66	1.01	2.71		338.6	69	67		6
B1	15.1			66	0.77	2.37		339.7	70	67		8
16.2 2	17.5	stop 6:28 start 6:55		67	0.96	2.65	341.1	340.232 340.302	68	67		3
3	20.2			66	0.85	2.49		342.3	69	68		4
4	22.7			66	0.82	2.44		343.5	69	68		4
5	25.1		-3.8	66	0.85	2.49		344.7	70	67		5
6	27.6			66	0.82	2.44		345.7	72	68		6
	30.0	07:08		66				346.812				

Truck ~~Central Mix~~ TL Loading with Silo Filling

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	124	G. Filter
	125	> PM10
	126	< PM10
	128	SG

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 2.56

$t_1/\sqrt{P_1}$ = 2.70

IMPINGER VOLUMES

	Initial	Final
#1	100	130
#2	100	70
#3	0	0
#4 SG	200	210.43
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	30.01
FILTER I.D.	92-156

Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-8-93

START TIME 07:30

TEST LOCATION Baghouse Inlet Truck loading

RUN NUMBER TL-M201A-R4

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft. DV	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	07:30		66	0.96	2.56	0.62	514.410 ~~340.303~~	65	64		3
2	2.6			67	0.67	2.21		515.6	64	64		3
3	4.8	Stop 7:36 Start 08:23		66	0.67	2.21		516.8	66	65		4
4	7.0	-	-4.70	66	1.01	2.71		517.3	66	65		4
5	9.7			66	1.01	2.71		518.4	66	65		4
6	12.4			66	1.01	2.71		519.6	67	65		4
B1	15.1			66	0.77	2.37		520.8	68	66		4
2	17.5			67	0.96	2.65		521.9	70	67		4
3	20.2			66	0.85	2.49		523.1	71	66		4
4	22.7		-4.60	66	0.82	2.44		524.3	72	67		4
5	25.1			66	0.85	2.49		525.3	72	67		4
6	27.6	Stop 08:44 Start 08:58		66	0.82	2.44		526.4	70	67		4
	30.0	09:00						527.475				

No silo Loading

Dry Truck Loading

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	0130	G. Filter
	131	> PM10
	132	< PM10
	134	S. G

LEAK CHECK

Vacuum	8.0"				
Rate	0.008				

Dwell Time for Point 1 = 2.56

$t_1 / \sqrt{P_1}$ = 2.70

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	200	202.0
#5		

METER BOX I.D.	#8
GAMMA	1.0081
DELTA H@	1.8580
OPERATOR	D. Vocellis
BAR. PRESS.	30.01
FILTER I.D.	92-154

Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

TEST LOCATION Baghouse Inlet Truck Loading

DATE 9-8-93

START TIME 09:07

RUN NUMBER TL-M201A-R5

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	09:07		71	1.10	2.7	0.56	347.841 ~~346.812~~	69	69		2
2	2.7			70	1.20	2.82		348.8	70	69		2
3	5.5			70	0.85	2.37		350.0	71	69		4
4	7.9	stop 09:13 start 09:20	-3.60	72	0.95	2.51		351.1	72	70		3
5	10.4			74	1.10	2.70		352.2	73	71		4
6	13.1			74	1.40	3.05		353.4	74	71		6
B1	16.2			65	0.88	2.41		354.7	75	71		8
2	18.6			67	0.80	2.30		355.8	76	72		10
3	20.9	stop 09:34 start 09:39	-4.40	67	0.63	2.04		356.9	76	73		11
4	22.9	stop 0942 start 0944		65	0.84	2.36		357.8	77	73		12
5	25.3			66	0.85	2.37		359.0	77	73		15
6	27.7			67	0.85	2.37		360.0	77	73		17
	30.1	09:51						360.987				

w/ silo

~~New Const w/ Truck Loading~~

Nozzle #6

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	1376	Filter
	1377	>PM10
	138	<PM10
	140	Silica

LEAK CHECK

Vacuum	220
Rate	0.005

Dwell Time for Point 1 = 2.7

$t_1/\sqrt{P_1}$ = 2.57

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	56 200	209.07
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	30.01
FILTER I.D.	92-157

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-8-93

START TIME 10:08

TEST LOCATION Baghouse Inlet Truck Loading

RUN NUMBER TL-M201A-R6

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	10:08		71	1.10	2.7	0.56	361.554	75	75		3
2	2.7	Stop 10:10 Start 10:28		70	1.20	2.82		362.8	74	74		3
3	5.5			70	0.85	2.37		364.0	74	74		3
4	7.9		-3.6	72	0.95	2.51		365.1	75	74		4
5	10.4	Stop 10:38		74	1.10	2.70		366.2	76	74		4
6	13.1	Start 10:54		74	1.40	3.05		367.4	73	73		4
B1	16.2			65	0.88	2.41		368.8	74	73		4
2	18.6			67	0.80	2.36		369.9	74	73		4
3	20.9		-4.4	67	0.63	2.04		371.0	75	73		4
4	22.9			65	0.84	2.36		372.0	75	73		4
5	25.3			66	0.85	2.37		373.1	76	73		4
6	27.7			67	0.85	2.37		374.0	76	73		4
	30.1	11:12						375.090				

No Silo or Truck Loading

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	142	G. Filter
	143	> PM10
	144	< PM10
	146	SG.

LEAK CHECK

Vacuum	5.0"				
Rate	0.004				

Dwell Time for Point 1 = 2.7

$t_1/\sqrt{P_1}$ = 2.57

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	56 200	208.67
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	30.01
FILTER I.D.	92-158

Nozzle 3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises DATE 9-8-93

START TIME 12:03 TEST LOCATION Baghouse Inlet Truck Loading RUN NUMBER TL-M201A-R7

LeHi silo

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	12:03		73	1.20	2.89	0.57	375.420	73	73		4
2	2.89			73	1.10	2.77		376.6	74	74		4
3	~~5.5~~ 5.7 pr			73	0.93	2.55		378.0	75	74		3
4	8.3		-3.80	73	0.86	2.45		379.2	76	74		3
5	10.8			73	0.81	2.38		380.3	76	74		3
6	13.2			73	0.89	2.49		381.4	76	74		6
B1	15.7	Stop 12:22 Start 13:31		73	0.74	2.27		382.5	77	75		9
2	18.0			73	0.77	2.32		383.5	74	74		3
3	20.3			73	0.75	2.29		384.5	74	74		3
4	22.6		-4.10	73	0.92	2.53		385.6	74	74		4
5	25.1			73	0.98	2.61		386.7	75	74		5
6	27.7			73	0.88	2.48		387.8	76	74		6
	30.2	13:43						388.897				

#2

#3

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	154	Filter
	155	> pm10
	156	< pm10
	158	SG

LEAK CHECK

Vacuum	10.0"				
Rate	0.005				

Dwell Time for Point 1 = 2.89

$t_1/\sqrt{P_1}$ = 2.64

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	200	203.26
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	30.01
FILTER I.D.	92-159

Nozzle 3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-9-93

START TIME 06:18

TEST LOCATION Inlet Truck loading

RUN NUMBER TL-201A-R8

Silo #2

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	06:18		67	1.30	2.96	0.56	389.247	65	65		3
2	2.96			66	1.20	2.85		390.3	66	66		3
3	5.8			66	0.98	2.57		391.7	67	66		4
4	8.4		-4.7	66	0.90	2.47		393.0	68	66		5
5	10.9			66	0.94	2.52		394.1	69	67		6
6	13.4			66	0.90	2.47		395.1	69	66		7
B1	15.9			66	0.73	2.22		396.2	70	66		8
2	18.1			66	0.70	2.18		397.2	71	67		8
3	20.3			66	0.70	2.18		398.1	71	66		10
4	22.5		-4.9	66	0.76	2.27		399.1	72	67		14
5	24.8			66	1.10	2.73		400.1	72	67		16
6	27.5	~~Stop~~ ~~Start~~		66	1.00	2.60		401.3	72	67		17
27.8 2	~~30.1~~ 27.5	06:46						401.408				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	160	G. Filter
	161	>PM10
	162	<PM10
	164	S. G.

LEAK CHECK

Vacuum	20.0"				
Rate	0.015				

Dwell Time for Point 1 = 2.96

$t_1/\sqrt{P_1}$ = 2.60

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	~~26~~ 200	207.27
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.97
FILTER I.D.	92-162

Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-9-93

START TIME 07:01

TEST LOCATION Truck Loading

RUN NUMBER TL-M201A-R9

No 5.6

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	07:01		67	1.30	2.96	.56	527.756	59	58		3
2	2.96			66	1.20	2.85		529.0	60	59		3
3	5.8			66	0.98	2.57		530.3	61	60		3
4	8.4		-4.7	66	0.90	2.47		531.4	62	60		3
5	10.9			66	0.94	2.52		532.4	63	61		3
6	13.4			66	0.90	2.47		533.5	64	61		3
B1	15.9			66	0.73	2.22		534.6	66	62		3
2	18.1			66	0.70	2.18		535.5	67	62		3
3	20.3			66	0.70	2.18		536.4	67	62		3
4	22.5		-4.9	66	0.76	2.27		537.4	67	63		3
5	24.8			66	1.10	2.73		538.4	68	63		3
6	27.5			66	1.00	2.60		539.5	69	63		3
	30.1	07:31						540.609				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	166	G Filter
	167	> PM10
	168	< PM10
	170	S.G.

LEAK CHECK

Vacuum	10"				
Rate	0.004				

Dwell Time for Point 1 = 2.96

$t_1/\sqrt{P_1}$ = 2.60

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	56 200	212.28
#5		

METER BOX I.D.	#8
GAMMA	1.0081
DELTA H@	1.8580
OPERATOR	D. Vecellio
BAR. PRESS.	29.97
FILTER I.D.	92-160

Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-9-93

START TIME 08:57

TEST LOCATION Inlet Truck Loading

RUN NUMBER TL-M201A-R10

WETM only

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	08:57		68	0.62	2.48	0.56	401.946	68	67		2
2	2.48			67	0.62	2.39		403.1	68	67		2
3	4.9			67	0.62	2.39		404.0	69	68		2
4	7.3		-4.5	67	0.62	2.39		405.1	70	68		2
5	9.7			67	0.84	2.78		406.2	71	68		2
6	12.5			67	0.84	2.78		407.4	72	68		2
B1	15.3			67	0.61	2.37		408.7	73	69		3
2	17.7			67	0.57	2.29		409.8	74	70		3
3	20.0			67	0.47	2.08		410.8	75	70		3
4	22.1		-4.5	67	0.62	2.39		411.7	76	70		3
5	24.5			67	0.92	2.91		412.8	77	71		3
6	27.4			67	0.87	2.83		414.1	78	71		3
	30.2	09:27						415.391				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
	172	G. Filter
	173	>PM10
	174	< PM10
	176	S. G

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 2.48 min

$t_1/\sqrt{P_1}$ = 3.03

Nozzle #3

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	S. G	196.16+14.43
#5		

METER BOX I.D.	#6
GAMMA	0.9971
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.97
FILTER I.D.	92-163

ΔH = 0.555

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-9-93

START TIME 09:28

TEST LOCATION Inlet Truck Loading

RUN NUMBER TL-M201A-R1

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	09:28		68	0.67	2.48	0.56	540.252	68	67		3
2	2.5	stop 09:30 start 09:36		67	0.62	2.39		541.9	69	68		3
3	4.9			67	0.62	2.39		542.9	69	68		3
4	7.3		-4.5	67	0.62	2.39		543.9	70	68		3
5	9.7			67	0.84	2.78		544.9	71	69		3
6	12.5			67	0.84	2.78		546.1	72	69		3
B1	15.3			67	0.61	2.37		547.3	74	70		3
2	17.7			67	0.57	2.29		548.3	74	70		3
3	20.0	stop 09:52 start 09:59		67	0.47	2.08		549.42	72	70		3
4	22.1		-4.5	67	0.62	2.39		550.3	73	70		3
5	24.5			67	0.92	2.91		551.4	73	71		3
6	27.4	stop 10:08 start 10:11		67	0.87	2.83		552.6	74	71		3
	30.2	10:13						553.792				

Wet Mix only

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	174	Filter
F2	179	10 PM10
F3	180	4 PM10
F5	182	5 Acetone

LEAK CHECK

Vacuum	10				
Rate	0.007				

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	200	~~211.57~~ 208.0
#5		

Dwell Time for Point 1 = 2.48

$t_1/\sqrt{P_1}$ = 3.03

METER BOX I.D.	#8
GAMMA	1.0081
DELTA H@	1.8580
OPERATOR	D. Vecellio
BAR. PRESS.	29.92
FILTER I.D.	92-165

Nozzle #

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises

DATE 9-9-93

START TIME 10:20

TEST LOCATION Inlet Truck Loading

RUN NUMBER JL-M201A-R12

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	10:20		68	0.67	2.48	0.56	415.476	74	74		3
2	2.5			67	0.62	2.39		416.6	74	74		3
3	4.9			67	0.62	2.39		417.7	75	74		3
4	7.3	stop 10:32	-4.5	67	0.62	2.39		418.7	76	75		3
5	9.7	start 10:37		67	0.84	2.78		419.9	77	75		3
6	12.5	Stop 10:44 start 11:01		67	0.84	2.78		421.1	75	75		3
B1	15.3			67	0.61	2.37		422.3	75	75		3
2	17.7			67	0.57	2.29		423.5	75	75		3
3	20.0			67	0.47	2.08		424.4	76	75		3
4	22.1	Stop 11:10	-4.5	67	0.62	2.39		425.4	77	75		3
5	24.5	Start 11:14		67	0.92	2.91		426.3	76	75		3
6	27.4	Stop 11:19 Start 11:32		67	0.87	2.83		427.6	77	76		3
	30.2	stop 11:38						428.881				

not Mix only

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	184	Filter
F2	185	> PM10
F3	186	< PM10
F5	188	Silica Gel

LEAK CHECK

Vacuum	5.0"				
Rate	0.004				

Dwell Time for Point 1 = 2.48

$t_1 / \sqrt{P_1}$ = 3.03

IMPINGER VOLUMES

	Initial	Final
#1	100	104
#2	100	100
#3	0	0
#4	SG 200	~~210.81~~ 206.9
#5		

METER BOX I.D.	#6
GAMMA	0.9821
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.97
FILTER I.D.	92-166

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney

DATE 9/9/93

START TIME 14:11

TEST LOCATION Inlet Truck Loading

RUN NUMBER TL-M201A-R13

17.x only

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A 1	0	14:11		75	1.2	2.9	0.57	428.882	75	75		3
2	2.9			75	1.2	2.9		430.16	75	75		3
3	5.8			75	.85	2.4		431.45	75	75		3
4	8.2		-4.3	75	.75	2.3		432.52	75	75		3
5	10.5			75	.75	2.4		433.54	80	75		3
6	12.9			75	1.0	2.7		434.61	81	75		3
B 1	15.6			75	.66	2.2		435.74	82	80		4
2	17.8			75	.74	2.3		436.85	82	80		4
3	20.1			75	.56	2.0		437.53	82	75		4
4	22.1		-4.1	75	.44	2.4		438.93	83	80		4
5	24.5			75	1.0	2.7		439.54	84	81		4
6	27.2			75	1.0	2.7	0.57	441.15	85	80		4
	29.9	14:41						442.363				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	190	Filter
F2	191	> PM10
F3	192	< PM10
F5	194	Silica Gel

LEAK CHECK

Vacuum	10.0"				
Rate	0.006				

Dwell Time for Point 1 = 2.93

$t_1 / \sqrt{P_1}$ = 2.67

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4		
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.97
FILTER I.D.	92-164

Nozzle #3

ΔH = 0.570 } nozzle #3

" T = 2.93 min

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney

DATE 5/5/93

START TIME 15:40

TEST LOCATION Inlet Track Loading

RUN NUMBER TL-M201A-214

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	8:40		75	1.2	2.5	.57	442.363	84	44		3
2	2.5	stop 15:41 Start 16:10		75	1.2	2.5		443.64	85	84		3
3	5.8			75	.85	2.4		444.50	85	84		3
4	8.2			75	.76	2.3		446.09	86	85		3
5	10.5		-4.3	75	.75	2.4		447.32	87	86		3
6	12.5	Stop 16:23 Start 16:53		75	1.0	2.7		448.4	87	85		4
B1	15.6			75	.64	2.2		449.7	86	85		4
2	17.8	Stop 16:58		75	.74	2.3		450.7	86	85		4
3	20.1	Start 17:19 Stop 17:21		75	.56	2.0		451.5	85	85		4
4	22.1	Start 17:24 Stop 17:37	-4.1	75	.84	2.4		452.8	85	85		4
5	24.5	Start		75	1.0	2.7						4
6	27.2			75	1.0	2.7	.57					4
	29.5											

Dry

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	202	Gelman Filter
F2	203	= PM10 Acetone Rinse
F3	204	= PM10 Acetone Rinse
F5	206	Silica gel

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 2.93

$t_1/\sqrt{P_1}$ = 2.67

Nozzle #3 0.164

IMPINGER VOLUMES

	Initial	Final
#1	100	150
#2	100	160
#3	0	0
#4	3G	202.4
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vacellio
BAR. PRESS.	29.97
FILTER I.D.	92-167

FIELD DATA SHEET FOR METHOD 201A

FACILITY Chaney

DATE 9/10/93

START TIME 7:17

TEST LOCATION Truck Loading Inlet

RUN NUMBER TL-M201A-R15

Dry Batch Loading only

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	7:17		79	.58	2.71	0.57	452.944	71	71		3
2	2.71			75	.94	2.64 or ~~2.68~~		454.1	70	70		3
3	5.4		-4.0	75	.92	2.63		455.3	71	70		3
4	8.0		~~-.40~~	75	.85	2.53		456.4	72	71		3
5	10.5			75	.84	2.51		457.5	73	71		3
6	13.0			75	.81	2.47		458.6	74	71		3
B1	15.5			75	.43	2.17		459.7	75	71		3
2	17.7		-4.6	75	.82	2.48		460.7	76	72		3
3	20.2	stop 07:38 start 8:19	~~.46~~	75	.83	2.50		461.9	76	72		3
4	22.7			75	.85	2.53		463.0	74	73		3
5	25.2			75	.77	2.40		464.1	75	73		3
6	27.6			75	.74	2.36		465.2	76	74		3
	30.0	[illegible]						466.230				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	208	Filter
F2	205	> PM10
F3	210	< PM10
F5	212	Silica Gel

LEAK CHECK

Vacuum	12				
Rate	0.005				

Dwell Time for Point 1 = 2.71

$t_1/\sqrt{P_1}$ = 2.74 or ~~2.68~~

IMPINGER VOLUMES

	Initial	Final
#1	100	108
#2	100	100
#3	0	0
#4	200 SG	202.4
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.70
FILTER I.D.	92-168

Nozzle #3 0.164

FIELD DATA SHEET FOR METHOD 201A

FACILITY Chaney Enterprises DATE 9-10-93

START TIME 08:55 TEST LOCATION Truck Loading Inlet RUN NUMBER TL-M201A-R16

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	08:55		75	0.75	2.41	0.56	466.231	75	75		2
2	2.41			74	0.80	2.49		467.3	75	74		2
3	4.9			74	0.74	2.39		468.4	76	75		2
4	7.3		-3.5	74	0.75	2.41		469.5	77	75		2
5	9.7			74	0.98	2.75		470.6	78	75		2
6	12.5			74	0.97	2.74		471.9	79	76		2
B1	15.2			75	0.66	2.26		473.1	81	77		2
2	17.5			75	0.64	2.22		474.1	81	77		2
3	19.7	stop 09:12		75	0.70	2.33		475.1	82	77		3
4	22.0	start 09:24	-4.2	75	0.70	2.33		476.1	83	77		3
5	24.3			74	1.10	2.92		477.2	79	78		3
6	27.2			74	1.00	2.78		478.5	80	78		3
	30.0	09:34						479.724				

Dry Batch only

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	314	Filter
F2	315	> PM10
F3	316	< PM10
F4	013	Silica Gel

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 2.41

$t_1/\sqrt{P_1}$ = 2.78

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	50 100	212.5
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.70
FILTER I.D.	92-100

ΔH = 0.563 Dwell time = 2.41 min Nozzle #3

FIELD DATA SHEET FOR METHOD 201A

FACILITY Chaney Enterprises DATE 9-10-93

START TIME 12:32 TEST LOCATION Truck Loading Inlet RUN NUMBER TL-M201A-R1

Wet Mil only

	Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
	A1	0	12:32		75	0.75	2.41	0.56	479.280	82	83		3
	2	2.41	stop 12:35		74	0.80	2.49		480.9	82	83		3
	3	4.9	start 12:48 stop 12:55		74	0.74	2.39		482.0	84	83		3
	4	7.3	start 13:19	-3.5	74	0.75	2.41		483.1	84	83		3
	5	9.7	stop 13:33		74	0.98	2.75		484.1	83	83		4
	6	12.5	start 13:29		74	0.97	2.74		485.4	85	84		4
	B1	15.2	stop 13:31 start 13:31		75	0.66	2.26		486.7	85	84		4
	2	17.5			75	0.64	2.22		487.7	87	85		4
	3	19.7			75	0.70	2.33		488.7	87	85		4
	4	22.0		-4.2	75	0.70	2.33		489.7	88	85		5
	5	24.3			74	1.10	2.92		490.8	88	85		5
26.5 rtrl	6	27.2	stop 13:45		74	1.00	2.78		491.808	88	85		
		30.0											

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	220	Filter
F2	221	> PM10
F3	222	< PM10
F5	224	SG

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 2.41

$t_1/\sqrt{P_1}$ = 2.78

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	SG 200	
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D Vecellio
BAR. PRESS.	29.70
FILTER I.D.	93-171

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Chaney Enterprises DATE 9-10-93

START TIME 17:22 TEST LOCATION Truck Loading Inlet RUN NUMBER TL-M201A-R8

Fly Ash

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	17:22		82	0.55	1.99	0.52	491.808	81	81		2
2	2.0			82	0.76	2.34		492.7	81	81		3
3	4.3			82	0.80	2.40		493.7	82	81		4
4	6.7		-4.0	82	0.81	2.41		494.8	82	81		4
5	9.1			81	0.95	2.62		495.8	83	82		7
6	11.7			81	0.87	2.50		497.0	84	82		7
B1	14.2			81	1.00	2.68		498.1	84	82		10
2	16.9			81	1.10	2.81		499.3	85	82		11
3	19.7			81	1.00	2.68		500.6	85	82		12
4	22.4		-4.0	81	0.92	2.57		501.8	85	82		13
5	25.0			81	0.85	2.47		502.9	85	82		16
6	27.5			81	0.83	2.44		504.0	85	82		17
	29.94	17:52						505.069				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	232	Gelman
F2	233	$>PM_{10}$
F3	234	$<PM_{10}$
F5	236	S.G.

LEAK CHECK

Vacuum	0.01				
Rate	20				

Dwell Time for Point 1 = 1.99

$t_1/\sqrt{P_1}$ = 2.68

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4		
#5		

METER BOX I.D.	#6
GAMMA	0.9871
DELTA H@	1.7019
OPERATOR	D. Vecellio
BAR. PRESS.	29.70
FILTER I.D.	92-161

APPENDIX C.0
BAGHOUSE OUTLET APPENDICES

APPENDIX C.1
BAGHOUSE OUTLET: DATA AND RESULTS FOR EPA METHOD 201A TESTING

RUN NUMBER	CF-M201A-R1	
DATE	09/07/93	
START TIME	09:12	
END TIME	13:38	
STACK DIAM.	15	inches
NOZZLE I.D.	0.180	inches
METER BOX GAMMA	0.9936	
METER BOX dH@	1.8576	
BAROMETRIC	30.04	in.Hg
Cp	0.84	
TEST DURATION	114.0	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	100.0	0.0
IMP.2	100.0	100.0	0.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	200.0	0.0
S.G.	200.0	212.4	12.4

METHOD 1-4 RESULTS

Metered Volume	52.112	dcf
Volume @ Std.Cond.	49.938	dscf
% Water	1.16	%
% Isokinetics	100.9	%
Velocity	42.294	ft/sec
Actual Flow	3114	acfm
Std. Flow	3053	scfm
Dry Std. Flow	3017	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.710
%CO	0.0	Ps	30.054
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	88	0.10	0.38	0.63	829.530	77	76
2	86	0.27	0.40	0.63	881.642	82	80
3	84		0.46	0.63		84	82
4	82		0.50	0.63		85	82
5	83		0.51	0.63		86	82
6	83		0.67	0.63		87	82
7	81		0.75	0.63		88	82
8	80		0.67	0.63		89	82
9	80		0.56	0.63		90	83
10	81		0.48	0.63		90	89
11	80		0.40	0.63		91	89
12	81		0.33	0.63		92	89
13	80		0.33	0.63		94	90
14	80		0.45	0.63		95	90
15	80		0.53	0.63		96	90
16	80		0.61	0.63		97	91
17	80		0.67	0.63		97	92
18	80		0.77	0.63		96	97
19	80		0.90	0.63		102	99
20	79		0.74	0.63		101	99
21	79		0.70	0.63		99	96
22	79		0.65	0.63		100	97
23	79		0.55	0.63		100	96
24	80		0.50	0.63			
25					881.642		
AVG.	81	0.19	0.56	0.63	52.112		90

EPA METHOD 201A ANALYSES

RUN I.D. **CF-M201A-R1**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00030	0.00030
Filter	0.00000	0.00000
TOTAL PM10	0.00030	0.00030
PM(>10 Microns):		
Probe Wash > 10 microns	0.00000	0.00000
TOTAL PM	0.0003	0.00030

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.54147	0.54147	0.00000	NA
		(Filter lost mass)		
Probe Wash Residue <= PM10	64.77950	64.77980	0.00030	120.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank		(Blank lost mass)	0.00000	120.0
Max. Allowable Blank			0.00094	NA
Probe Wash Residue > PM10	67.54390	67.54390	0.00000	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.00009	0.00000	0.00009
Mass Rate (lb/hr)	0.002	0.000	0.002

D50 Calculations

RUN I.D. **CF-M201A-R1**

Stack Gas Viscosity (micropoise)	182.7771
Cyclone Flow Rate (dscf/min)	0.437797
Cyclone Flow Rate (acfm)	0.452042
D50	9.997161

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	183.5595
Cyclone Flow Rate (acfm)	0.453794

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.97814	63.20717	92.38781	1.238198	2.640279
0.15	61.63536	52.82301	76.60619	0.864776	1.815299
0.164	11.00000	14.69951	18.15416	0.066967	0.101947
0.18	42.80234	38.32627	54.47487	0.455251	0.917937
0.197	35.73387	32.95983	46.24107	0.336688	0.661418
0.215	30.00099	28.65026	39.60943	0.254399	0.485308
0.233	25.54469	25.33247	34.49304	0.198890	0.368030
0.264	19.89778	21.17395	28.07406	0.138951	0.243798
0.3	15.40884	17.90284	23.03702	0.099335	0.164162
0.342	11.85660	15.32351	19.09826	0.072774	0.112826
0.39	9.11766	13.31848	16.08422	0.054975	0.080024

RUN NUMBER	CF-M201A-R2	
DATE	09/08/93	
START TIME	06:01	
END TIME	12:01	
STACK DIAM.	15	inches
NOZZLE I.D.	0.180	inches
METER BOX GAMMA	0.9926	
METER BOX dH@	1.8576	
BAROMETRIC	30.01	in.Hg
Cp	0.84	
TEST DURATION	359.4	minutes

METHOD 4 DATA

	INIT. (ml)	FINAL (ml)	NET (ml)
IMP.1	100.0	148.0	48.0
IMP.2	100.0	104.0	4.0
IMP.3	0.0	0.0	0.0
IMP.4			0.0
IMP.5			0.0
IMP.6			0.0
IMP.7			0.0
TOTAL	200.0	252.0	52.0
S.G.	200.0	219.8	19.8

METHOD 1-4 RESULTS

Metered Volume	167.998	dcf
Volume @ Std.Cond.	164.613	dscf
% Water	2.01	%
% Isokinetics	102.7	%
Velocity	43.899	ft/sec
Actual Flow	3232	acfm
Std. Flow	3164	scfm
Dry Std. Flow	3100	dscfm

METHOD 3 DATA

%O2	20.9	Md	28.836
%CO2	0.0	Ms	28.618
%CO	0.0	Ps	29.988
%N2	79.1		
O2+CO2	20.9		

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	83	-0.28	0.49	0.67	881.728	53	54
2	83	-0.32	0.59	0.67	1049.726	70	67
3	83		0.62	0.67		73	67
4	82		0.68	0.67		77	71
5	82		0.72	0.67		80	73
6	82		0.75	0.67		81	74
7	82		0.79	0.67		83	76
8	81		0.71	0.67		83	77
9	81		0.65	0.67		84	78
10	82		0.58	0.67		84	78
11	81		0.49	0.67		85	79
12	81		0.45	0.67		86	80
13	80		0.45	0.67		87	81
14	80		0.45	0.67		87	81
15	79		0.47	0.67		90	83
16	79		0.52	0.67		90	84
17	79		0.55	0.67		91	85
18	80		0.50	0.67		91	86
19	80		0.59	0.67		91	86
20	79		0.65	0.67		72	68
21	79		0.79	0.67		70	66
22	79		0.78	0.67		70	66
23	80		0.52	0.67		69	64
24	79		0.57	0.67		68	64
25					1049.73		
AVG.	81	-0.30	0.60	0.67	168.00	77	

EPA METHOD 201A ANALYSES

RUN I.D. **CF-M201A-R2**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00130	0.00130
Filter	0.00000	0.00000
TOTAL PM10	0.00130	0.00130
PM (>10 Microns):		
Probe Wash > 10 microns	0.00000	0.00000
TOTAL PM	0.0013	0.00130

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.65808	0.65808 (Filter lost mass)	0.00000	NA
Probe Wash Residue <= PM10	65.06550	65.06680	0.00130	120.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank		(Blank lost mass)	0.00000	120.0
Max. Allowable Blank			0.00094	NA
Probe Wash Residue > PM10	64.89840	64.89840	0.00000	130.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00173	130
Max. Allowable Blank			0.00102	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.00012	0.00000	0.00012
Mass Rate (lb/hr)	0.003	0.000	0.003

D50 Calculations

RUN I.D. **CF-M201A-R2**

Stack Gas Viscosity (micropoise)	182.0544
Cyclone Flow Rate (dscf/min)	0.458021
Cyclone Flow Rate (acfm)	0.47775
D50	9.595124

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	182.8298
Cyclone Flow Rate (acfm)	0.45262

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.78404	63.03923	92.14536	1.223472	2.614083
0.15	61.47581	52.68161	76.40432	0.854458	1.797249
0.164	11.00000	14.67606	18.13294	0.066312	0.101230
0.18	42.69153	38.22180	54.32973	0.449774	0.908756
0.197	35.64136	32.86899	46.11697	0.332618	0.654778
0.215	29.92332	28.57035	39.50224	0.251306	0.480414
0.233	25.47856	25.26097	34.39887	0.196459	0.364301
0.264	19.84627	21.11303	27.99620	0.137238	0.241307
0.3	15.36895	17.85029	22.97197	0.098099	0.162468
0.342	11.82591	15.27766	19.04326	0.071860	0.111649
0.39	9.09405	13.27792	16.03698	0.054279	0.079180

RUN NUMBER	**CF-M201A-R3**						
DATE	09/09/93						
START TIME	05:58						
END TIME	17:58		**METHOD 4 DATA**				
STACK DIAM.	15	inches		INIT. (ml)	FINAL (ml)	NET (ml)	
NOZZLE I.D.	0.180	inches					
METER BOX GAMMA	0.9936		IMP.1	100.0	120.0	20.0	
METER BOX dH@	1.8576		IMP.2	100.0	94.0	-6.0	
BAROMETRIC	29.97	in.Hg	IMP.3	0.0	2.0	2.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	719.9	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	216.0	16.0	
Metered Volume	330.348	dcf	S.G.	200.0	246.1	46.1	
Volume @ Std.Cond.	320.238	dscf					
% Water	0.91	%	**METHOD 3 DATA**				
% Isokinetics	102.0	%	%O2	20.9		Md	28.836
Velocity	41.960	ft/sec	%CO2	0.0		Ms	28.738
Actual Flow	3089.56	acfm	%CO	0.0		Ps	29.939
Std. Flow	3059.19	scfm	%N2	79.1			
Dry Std. Flow	3031.49	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	73	-0.40	0.41	0.63	49.789	70	70
2	74	-0.44	0.51	0.63	380.137	57	51
3	74		0.60	0.63		59	52
4	74		0.63	0.63		71	66
5	73		0.66	0.63		67	61
6	73		0.71	0.63		70	64
7	74		0.75	0.63		72	66
8	74		0.68	0.63		75	70
9	73		0.55	0.63		87	80
10	73		0.51	0.63		95	90
11	74		0.51	0.63		96	92
12	74		0.44	0.63		93	90
13	73		0.44	0.63		89	86
14	74		0.48	0.63		88	84
15	74		0.51	0.63		87	80
16	73		0.56	0.63		87	82
17	74		0.58	0.63		89	85
18	74		0.61	0.63		90	86
19	74		0.71	0.63		90	86
20	74		0.58	0.63		91	87
21	74		0.53	0.63		103	90
22	73		0.44	0.63		105	96
23	73		0.47	0.63		109	106
24	73		0.44	0.63		107	103
25					380.137		
AVG.	74	-0.42	0.55	0.63	330.348	83	

EPA METHOD 201A ANALYSES

RUN I.D. **CF-M201A-R3**

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00260	0.00260
Filter	0.00000	0.00000
TOTAL PM10	0.00260	0.00260
PM (>10 Microns):		
Probe Wash > 10 microns	0.00670	0.00584
TOTAL PM	0.0093	0.00844

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53725	0.53725 (Filter lost mass)	0.00000	NA
Probe Wash Residue <= PM10	64.25260	64.25520	0.00260	110.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank		(Blank lost mass)	0.00000	110.0
Max. Allowable Blank			0.00086	NA
Probe Wash Residue > PM10	65.25820	65.26490	0.00670	110.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00147	110
Max. Allowable Blank			0.00086	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.00013	0.00028	0.00041
Mass Rate (lb/hr)	0.003	0.007	0.011

D50 Calculations

RUN I.D. **CF-M201A-R3**

Stack Gas Viscosity (micropoise)	181.163
Cyclone Flow Rate (dscf/min)	0.444837
Cyclone Flow Rate (acfm)	0.453539
D50	9.888379

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	181.8082
Cyclone Flow Rate (acfm)	0.448006

Dn	vn	vmin	vmax	dPmin	dPmax
0.136	74.02168	62.41087	91.21686	1.218233	2.602316
0.15	60.84911	52.15995	75.63723	0.850911	1.789292
0.164	11.00000	14.62865	18.09005	0.066930	0.102350
0.18	42.25633	37.84953	53.78953	0.448055	0.904910
0.197	35.27803	32.55217	45.66140	0.331413	0.652091
0.215	29.61828	28.29810	39.11495	0.250452	0.478515
0.233	25.21883	25.02303	34.06434	0.195835	0.362919
0.264	19.64395	20.91802	27.72795	0.136852	0.240461
0.3	15.21228	17.68884	22.75571	0.097861	0.161954
0.342	11.70535	15.14239	18.86753	0.071713	0.111337
0.39	9.00135	13.16268	15.89204	0.054187	0.078989

RUN NUMBER	**CF-M201A-R4**						
DATE	09/10/93						
START TIME	05:57						
END TIME	17:57		**METHOD 4 DATA**				
STACK DIAM.	15	inches		INIT.	FINAL	NET	
NOZZLE I.D.	0.180	inches		(ml)	(ml)	(ml)	
METER BOX GAMMA	0.9936		IMP.1	100.0	100.0	0.0	
METER BOX dH@	1.8576		IMP.2	100.0	100.0	0.0	
BAROMETRIC	29.70	in.Hg	IMP.3	0.0	0.0	0.0	
Cp	0.84		IMP.4			0.0	
TEST DURATION	720	minutes	IMP.5			0.0	
			IMP.6			0.0	
			IMP.7			0.0	
METHOD 1-4 RESULTS			TOTAL	200.0	200.0	0.0	
Metered Volume	332.179	dcf	S.G.	200.0	254.9	54.9	
Volume @ Std.Cond.	317.289	dscf					
% Water	0.81	%	**METHOD 3 DATA**				
% Isokinetics	105.5	%	%O2	20.9		Md	28.836
Velocity	40.822	ft/sec	%CO2	0.0		Ms	28.748
Actual Flow	3006	acfm	%CO	0.0		Ps	29.669
Std. Flow	2925	scfm	%N2	79.1			
Dry Std. Flow	2902	dscfm	O2+CO2	20.9			

POINT	STACK TEMP (DegF)	STATIC (in.WC)	DP (in.WC)	DH (in.WC)	METER VOLUME (dcf)	METER TEMPERATURE INLET (DegF)	METER TEMPERATURE OUTLET (DegF)
1	78	-0.40	0.41	0.63	380.137	57	57
2	78	-0.44	0.45	0.63	712.316	65	64
3	78		0.50	0.63		73	70
4	78		0.54	0.63		77	72
5	78		0.61	0.63		80	74
6	78		0.65	0.63		84	77
7	78		0.69	0.63		87	79
8	78		0.58	0.63		88	81
9	78		0.54	0.63		89	83
10	78		0.47	0.63		90	85
11	78		0.41	0.63		91	86
12	78		0.41	0.63		91	86
13	78		0.43	0.63		93	87
14	78		0.45	0.63		95	88
15	78		0.45	0.63		97	88
16	78		0.49	0.63		100	89
17	78		0.56	0.63		104	94
18	78		0.59	0.63		100	91
19	78		0.61	0.63		94	88
20	78		0.68	0.63		92	86
21	78		0.51	0.63		93	87
22	78		0.49	0.63		95	90
23	78		0.45	0.63		96	91
24	78		0.41	0.63		99	97
25					712.316		
AVG.	78	-0.42	0.52	0.63	332.179	86	

EPA METHOD 201A ANALYSES

RUN I.D. CF-M201A-R4

SUMMARY

COMPONENT	NET (grams)	CORRECTED FOR BLANK (grams)
PM10:		
Probe Wash <= 10 microns	0.00230	0.00230
Filter	0.00592	0.00592
TOTAL PM10	0.00822	0.00822
PM (>10 Microns):		
Probe Wash > 10 microns	0.00670	0.00631
TOTAL PM	0.01492	0.01453

ANALYTICAL DATA

METHOD 201A COMPONENTS:

	TARE (grams)	FINAL (grams)	NET (grams)	VOLUME (ml)
Filter	0.53888	0.54480	0.00592	NA
Probe Wash Residue <= PM10	63.98750	63.98980	0.00230	60.0
Acetone Blank Residue	64.54130	64.54130	0.00000	100.0
Applicable Acetone Blank		(Blank lost mass)	0.00000	60.0
Max. Allowable Blank			0.00047	NA
Probe Wash Residue > PM10	64.98770	64.99440	0.00670	50.0
Acetone Blank Residue	66.33330	66.33450	0.00120	90.0
Applicable Acetone Blank			0.00067	50
Max. Allowable Blank			0.00039	NA

PARTICULATE EMISSIONS:

	PM10	PM (>10 Microns)	TOTAL PM
Actual Grain Loading (gr/dscf)	0.00040	0.00031	0.00071
Mass Rate (lb/hr)	0.010	0.008	0.018

D50 Calculations

RUN I.D. **CF-M201A-R4**

Stack Gas Viscosity (micropoise)	182.3014
Cyclone Flow Rate (dscf/min)	0.44068
Cyclone Flow Rate (acfm)	0.456702
D50	9.918651

dPmin and dPmax Calculations

Stack Gas Viscosity (micropoise)	183.0278
Cyclone Flow Rate (acfm)	0.45327

Dn	**vn**	**vmin**	**vmax**	**dPmin**	**dPmax**
0.136	74.89149	63.12871	92.27692	1.225479	2.618413
0.15	61.56413	52.75612	76.51319	0.855850	1.800216
0.164	11.00000	14.68405	18.14017	0.066305	0.101189
0.18	42.75287	38.27539	54.40674	0.450496	0.910243
0.197	35.69257	32.91482	46.18211	0.333146	0.655842
0.215	29.96632	28.60994	39.55781	0.251702	0.481190
0.233	25.51517	25.29576	34.44705	0.196765	0.364885
0.264	19.87479	21.14181	28.03511	0.137447	0.241689
0.3	15.39103	17.87435	23.00359	0.098246	0.162721
0.342	11.84290	15.29803	19.06921	0.071965	0.111819
0.39	9.10712	13.29545	16.05860	0.054357	0.079299

APPENDIX C.2
BAGHOUSE OUTLET: RAW FIELD SAMPLING DATA FOR EPA METHOD 201A TESTING

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Cheney Enterprises Baghouse Outlet DATE 9-7-93

START TIME 09:12 TEST LOCATION Cement Silo Filling RUN NUMBER CEF-M201A-R1

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	09:12		88	.38	4.2	0.63	825.530	77	76		4.0
2	4.2			86	.40	4.3	0.63	831.46	82	80		4.0
3	8.5			84	.46	4.6	0.63	833.42	84	82		4.0
4	13.1			82	.50	4.8	0.63	835.52	85	82		4.0
5	17.9		+0.1	83	.51	4.8	0.63	837.71	86	82		4.0
6	22.7			83	.67	5.5	0.63	839.50	87	82		4.0
7	28.2			81	.75	5.8	0.63	842.41	88	82		4.0
8	34			80	.67	5.5	0.63	845.0	89	82		4.0
36.9 9	39.5	9:45 / 11:27		80	.56	5.0	0.63	847.41	90	83		4.0
10	44.5			81	.48	4.7	0.63	849.68	90	85		4.0
11	49.2			80	.40	4.3	0.63	851.85	91	85		4.0
12	53.5			81	.33	3.9	0.63	853.78	92	85		4.0
	57.4							855.579				
B1	57.4			80	.33	3.9	0.63	855.579	94	90		4.0
2	61.3			80	.45	4.5	0.63	857.49	95	90		4.0
3	65.8			80	.53	4.9	0.63	859.72	96	90		4.0
4	70.7			80	.61	5.2	0.63	861.70	97	91		4.0
5	75.9	11:46 / 13:00	0.27	80	.67	5.5	0.63	864.05	97	92		4.0
6	81.4			80	.77	5.9	0.63	866.55	96	97		4.0
7	87.3			80	.90	6.4	0.63	869.284	102	99		4.0
8	93.7			79	.74	5.8	0.63	872.25	101	99		4.0
9	99.5			79	.70	6.1	0.63	874.92	99	96		4.0
10	105.6			79	.65	5.4	0.63	877.33	100	97		4.0
11	111.0			79	.55	5.0	0.63	880.26	100	98		4.0
END LAST Truck 12	114.0	13:34		80	.50	4.8	0.63	881.642				4.0

CHAIN [redacted]TODY INFORMATION

Container Number	Sample I.D.	Description
	112	Filter
	113	>PM10
	114	<PM10
	116	SG

LEAK CHECK

Vacuum	17"				
Rate	0.006				

Dwell Time for Point 1 = 4.14

$t_1/\sqrt{P_1}$ = 6.72

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	SG / 200gm	212.43
#5		

METER BOX I.D.	#9
GAMMA	0.9936
DELTA H@	1.8576
OPERATOR	Travis
BAR. PRESS.	30.04
FILTER I.D.	693-149

Nozzle #4

FIELD DATA SHEET FOR METHOD 201A

FACILITY Cleary Enterprises — Cement Silo Filling — DATE 9/8/93

START TIME 6:01 — TEST LOCATION Baghouse Outlet — RUN NUMBER CF-M201A-R2

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	6:01		83	.49	13.6	0.67	881.728	53	54		4
2	13.6			83	.59	15.0	0.67	887.88	70	67		4
3	28.6			83	.62	15.3	0.67	894.76	73	67		4
4	43.9			82	.68	16.0	0.67	901.87	77	71		4
5	59.9			82	.72	16.5	0.67	909.22	80	73		4
6	76.4			82	.75	16.9	0.67	916.87	81	74		4
7	93.3		-.28	82	.75	17.3	0.67	924.83	83	76		4
8	110.6			81	.71	16.4	0.67	932.75	83	77		4
9	127.0			81	.65	15.7	0.67	940.37	84	78		4
10	142.7			82	.58	14.8	0.67	947.47	84	78		4
11	157.5			81	.49	13.6	0.67	954.42	85	79		4
12	171.1			81	.45	13.0	0.67	960.54	86	80		4
	184.1							967.228				
B1	184.1			80	.45	13.0	0.67	967.228	87	81		4
2	197.1			80	.45	13.0	0.67	973.55	87	81		4
3	210.1			79	.47	13.3	0.67	979.47	90	83		4
4	223.4			79	.52	14.0	0.67	985.94	90	84		4
5	237.4			79	.55	14.4	0.67	992.25	91	86		4
6	251.8			80	.50	13.7	0.67	999.03	91	86		4
7	265.5		-.32	80	.59	15.0	0.67	1005.33	91	86		4
8	280.5			79	.65	15.7	0.67	1012.64	72	68		4
9	296.2			79	.77	17.3	0.67	1020.02	70	66		4
10	313.5			79	.78	17.2	0.67	1028.11	70	66		4
11	330.7			80	.52	14.0	0.67	1036.23	69	64		4
12	344.7	12:01		79	.57	14.7	0.67	1042.54	68	64		4

359.4 — 1049.728

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	144	Filter
F2	149	> PM10 Rinse
F3	150	< PM10 Rinse
F5	152	Silica Gel

LEAK CHECK

Vacuum	15				
Rate	0.012				

Dwell Time for Point 1 = [illegible] 13.63

$t_1/\sqrt{P_1}$ = 19.47

IMPINGER VOLUMES

	Initial	Final
#1	100	148
#2	100	104
#3	0	0
#4	50/200 gm	219.81
#5		

METER BOX I.D.	#9
GAMMA	9936
DELTA H@	1.8576
OPERATOR	Travis
BAR. PRESS.	30.01
FILTER I.D.	692-155

Nozzle 4

FIELD DATA SHEET FOR METHOD 201A

FACILITY Chaney Cement Silo Filling DATE 6/6/93

START TIME 5:56 TEST LOCATION Baghouse Outlet RUN NUMBER CF-M201A-R3

	Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
720 min. test run	A1	0	5:58		73	.41	25.9	0.63	49.789	70	70		2
	2	25.9			74	.51	28.9	0.63	61.39	57	51		2
	3	54.8			74	.60	31.3	0.63	74.35	59	52		2
	4	86.1			74	.63	32.1	0.63	88.38	71	66		2
	5	118.2			73	.66	32.8	0.63	103.12	67	61		2
	6	151			73	.71	34.1	0.63	118.46	70	64		2
	7	185.1		-.40	74	.75	35.0	0.63	134.23	72	66		2
	8	220.1			74	.68	33.3	0.63	149.14	75	70		2
	9	253.4			73	.55	30.0	0.63	164.39	87	80		2
	10	283.4			73	.51	28.9	0.63	177.96	95	90		2
	11	312.3			74	.51	28.9	0.63	191.59	94	92		2
	12	341.2			74	.44	26.8	0.63	204.71	93	90		2
13	B1	368			73	.44	26.8	0.63	216.88	89	86		2
14	2	394.8			74	.48	28.0	0.63	229.05	88	84		2
15	3	422.8			74	.51	28.9	0.63	241.76	87	80		2
16	4	451.7			73	.56	30.2	0.63	255.13	87	82		2
17	5	481.9			74	.58	30.8	0.63	269.1	89	85		2
18	6	512.7			74	.61	31.6	0.63	283.84	90	86		2
19	7	544.3		-.44	74	.71	34.1	0.63	298.26	90	86		2
20	8	578.4			74	.58	30.8	0.63	313.83	91	87		2
21	9	609.2			74	.53	29.4	0.63	329.10	103	90		2
22	10	638.6			73	.44	26.8	0.63	342.58	105	96		2
23	11	665.4			73	.47	27.7	0.63	354.86	109	106		2
24	12	693.1			73	.44	26.8	0.63	366.19	107	103		2
		719.9	17:58						380.137				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	196	Filter
F2	197	> PM10
F3	246	< PM10
F5	248	Silica Gel

LEAK CHECK

Vacuum	12				
Rate	0.004				

Dwell Time for Point 1 = 25.89

$t_1/\sqrt{P_1}$ = 40.4334

IMPINGER VOLUMES

	Initial	Final
#1	100	120
#2	100	94
#3	0	2
#4	56.220	246.07
#5		

METER BOX I.D.	#9
GAMMA	0.9936
DELTA H@	1.8576
OPERATOR	Travis
BAR. PRESS.	29.97
FILTER I.D.	692-153

Nozzle #4 0.180"

FIELD DATA SHEET FOR METHOD 201A

PAGE 1

FACILITY Cheney Cement Silo Filling DATE 9/10/93

START TIME 5:57 TEST LOCATION Baghouse Outlet RUN NUMBER UCFO-M201A-R4

Point	Sample Time	Clock Time	Static	Stack Temp.	Stack dP	Dwell Time	Meter dH	Meter Volume cu.ft.	Meter Temp. Inlet	Meter Temp. Outlet	Imp. Temp.	Meter Vac.
A1	0	5:57		78	.41	26.84	.63	380.137	57	57		2
2	26.8			78	.45	28.1	.63	392.39	65	64		2
3	54.9			78	.50	29.6	.63	405.19	73	70		2
4	84.5			78	.54	30.8	.63	418.71	77	72		2
5	115.3		-.10	78	.61	32.7	.63	432.77	80	74		2
6	148			78	.65	33.8	.63	447.70	84	77		2
7	181.8			78	.69	34.8	.63	463.13	87	79		2
8	216.6			78	.58	31.9	.63	479.01	88	81		2
9	248.5			78	.54	30.8	.63	493.58	89	83		2
10	279.3			78	.47	28.7	.63	507.64	90	85		2
11	308			78	.41	26.8	.63	520.74	91	86		2
12	334.8			78	.41	26.8	.63	532.97	91	86		2
B1	361.6			78	.43	27.5	.63	~~545.~~ 545.12	93	87		2
2	389.1			78	.45	28.1	.63	557.36	95	88		2
3	417.2			78	.45	28.1	.63	572.11	97	88		2
4	445.3			78	.49	29.3	.63	585.04	100	89		3
5	474.6		-0.44	78	.56	31.4	.63	598.52	104	94		3
6	506.0			78	.59	32.2	.63	612.97	100	91		2
7	538.2			78	.61	32.7	.63	628.02	94	88		2
8	571.4			78	.68	34.5	.63	643.07	92	86		2
9	605.9			78	.51	29.9	.63	656.57	93	87		2
10	635.8			78	.49	29.3	.63	670.17	95	90		2
11	665.1			78	.45	28.1	.63	683.43	96	91		2
12	693.2			78	.41	26.8	.63	698.55	99	97		2
	720	17:57						712.316				

CHAIN OF CUSTODY INFORMATION

Container Number	Sample I.D.	Description
F1	238	Filter
F2	239	> PM10
F3	240	< PM10
F5	242	Silica Gel

LEAK CHECK

Vacuum					
Rate					

Dwell Time for Point 1 = 26.84

$t_1/\sqrt{P_1}$ = 41.92

IMPINGER VOLUMES

	Initial	Final
#1	100	100
#2	100	100
#3	0	0
#4	~~56.30~~ 200	254.93
#5		

METER BOX I.D.	9
GAMMA	0.9936
DELTA H@	1.8576
OPERATOR	Travis
BAR. PRESS.	29.70
FILTER I.D.	92-169

Nozzle #4 0.180

APPENDIX D.0
LABORATORY DATA

APPENDIX D.1
GRAVIMETRIC DATA AND RESULTS

E T S , I N C .

F I E L D S A M P L E L O G

Contract No. 92-65515
Job I.D.
Test Method 201A

Print Date 01/31/94 Time 09:44:35
Page 1

Sample No.	Container No.	Other I.D.	Run I.D.	Sample Type	Volume,ml no Rinses	Volume,ml w/ Rinses	Analyst	Date	Comments
00100	F1	G92-0151	UBL -201-R0	Gelman Filter			PJB	09/13/93	
00101	F2		UBL -201-R0	>PM10 Acetone Rinse			PJB	09/13/93	
00102	F3		UBL -201-R0	<=PM10 Acetone Rinse			PJB	09/13/93	
00103	F4		UBL -201-R0	Impinger Liquids			PJB	09/13/93	
00104	F5		UBL -201-R0	Imp. 4 Silica Gel			PJB	09/13/93	
00105	F6		UBL -201-R0	TEDLAR BAG			PJB	09/13/93	
00106	F1	G92-0152	UTL -201-R1	Gelman Filter			PJB	09/13/93	
00107	F2		UTL -201-R1	>PM10 Acetone Rinse			PJB	09/13/93	
00108	F3		UTL -201-R1	<=PM10 Acetone Rinse			PJB	09/13/93	
00109	F4		UTL -201-R1	Impinger Liquids			PJB	09/13/93	
00110	F5		UTL -201-R1	Imp. 4 Silica Gel			PJB	09/13/93	
00111	F6		UTL -201-R1	TEDLAR BAG			PJB	09/13/93	
00112	F1	G92-0149	UCF -201-R1	Gelman Filter			PJB	09/13/93	
00113	F2		UCF -201-R1	>PM10 Acetone Rinse			PJB	09/13/93	
00114	F3		UCF -201-R1	<=PM10 Acetone Rinse			PJB	09/13/93	
00115	F4		UCF -201-R1	Impinger Liquids			PJB	09/13/93	
00116	F5		UCF -201-R1	Imp. 4 Silica Gel			PJB	09/13/93	
00117	F6		UCF -201-R1	TEDLAR BAG			PJB	09/13/93	
00118	F1	G92-0150	UTL -201-R2	Gelman Filter			PJB	09/13/93	
00119	F2		UTL -201-R2	>PM10 Acetone Rinse			PJB	09/13/93	
00120	F3		UTL -201-R2	<=PM10 Acetone Rinse			PJB	09/13/93	
00121	F4		UTL -201-R2	Impinger Liquids			PJB	09/13/93	
00122	F5		UTL -201-R2	Imp. 4 Silica Gel			PJB	09/13/93	
00123	F6		UTL -201-R2	TEDLAR BAG			PJB	09/13/93	
00124	F1	G92-0156	UTL -201-R3	Gelman Filter			PJB	09/13/93	
00125	F2		UTL -201-R3	>PM10 Acetone Rinse			PJB	09/13/93	
00126	F3		UTL -201-R3	<=PM10 Acetone Rinse			PJB	09/13/93	

E T S , I N C .

F I E L D S A M P L E L O G

Contract No. 92-65515
Job I.D.
Test Method 201A

Print Date 01/31/94
Page 2

Sample No.	Container No.	Other I.D.	Run I.D.	Sample Type	Volume,ml no Rinses	Volume,ml w/ Rinses	Analyst	Date	Comments
00127	F4		UTL -201-R3	Impinger Liquids			PJB	09/13/93	
00128	F5		UTL -201-R3	Imp. 4 Silica Gel			PJB	09/13/93	
00129	F6		UTL -201-R3	TEDLAR BAG			PJB	09/13/93	
00130	F1	G92-0154	UTL -201-R4	Gelman Filter			PJB	09/13/93	
00131	F2		UTL -201-R4	>PM10 Acetone Rinse			PJB	09/13/93	
00132	F3		UTL -201-R4	<=PM10 Acetone Rinse			PJB	09/13/93	
00133	F4		UTL -201-R4	Impinger Liquids			PJB	09/13/93	
00134	F5		UTL -201-R4	Imp. 4 Silica Gel			PJB	09/13/93	
00135	F6		UTL -201-R4	TEDLAR BAG			PJB	09/13/93	
00136	F1	G92-0157	UTL -201-R5	Gelman Filter			PJB	09/13/93	
00137	F2		UTL -201-R5	>PM10 Acetone Rinse			PJB	09/13/93	
00138	F3		UTL -201-R5	<=PM10 Acetone Rinse			PJB	09/13/93	
00139	F4		UTL -201-R5	Impinger Liquids			PJB	09/13/93	
00140	F5		UTL -201-R5	Imp. 4 Silica Gel			PJB	09/13/93	
00141	F6		UTL -201-R5	TEDLAR BAG			PJB	09/13/93	
00142	F1	G92-0158	UTL -201-R6	Gelman Filter			PJB	09/13/93	
00143	F2		UTL -201-R6	>PM10 Acetone Rinse			PJB	09/13/93	
00144	F3		UTL -201-R6	<=PM10 Acetone Rinse			PJB	09/13/93	
00145	F4		UTL -201-R6	Impinger Liquids			PJB	09/13/93	
00146	F5		UTL -201-R6	Imp. 4 Silica Gel			PJB	09/13/93	
00147	F6		UTL -201-R6	TEDLAR BAG			PJB	09/13/93	
00148	F1	G92-0155	UCF -201-R2	Gelman Filter			PJB	09/13/93	
00149	F2		UCF -201-R2	>PM10 Acetone Rinse			PJB	09/13/93	
00150	F3		UCF -201-R2	<=PM10 Acetone Rinse			PJB	09/13/93	
00151	F4		UCF -201-R2	Impinger Liquids			PJB	09/13/93	
00152	F5		UCF -201-R2	Imp. 4 Silica Gel			PJB	09/13/93	
00153	F6		UCF -201-R2	TEDLAR BAG			PJB	09/13/93	

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00155	F2		UTL -201-R7	>PM10 Acetone Rinse			PJB	09/13/93	
00156	F3		UTL -201-R7	<=PM10 Acetone Rinse			PJB	09/13/93	
00158	F5		UTL -201-R7	Imp. 4 Silica Gel			PJB	09/13/93	
00160	F1	G92-0162	UTL -201-R8	Gelman Filter			PJB	09/13/93	
00161	F2		UTL -201-R8	>PM10 Acetone Rinse			PJB	09/13/93	
00162	F3		UTL -201-R8	<=PM10 Acetone Rinse			PJB	09/13/93	
00163	F4		UTL -201-R8	Impinger Liquids			PJB	09/13/93	
00164	F5		UTL -201-R8	Imp. 4 Silica Gel			PJB	09/13/93	
00165	F6		UTL -201-R8	TEDLAR BAG			PJB	09/13/93	
00166	F1	G92-0160	UTL -201-R9	Gelman Filter			PJB	09/13/93	
00167	F2		UTL -201-R9	>PM10 Acetone Rinse			PJB	09/13/93	
00168	F3		UTL -201-R9	<=PM10 Acetone Rinse			PJB	09/13/93	
00169	F4		UTL -201-R9	Impinger Liquids			PJB	09/13/93	
00170	F5		UTL -201-R9	Imp. 4 Silica Gel			PJB	09/13/93	
00171	F6		UTL -201-R9	TEDLAR BAG			PJB	09/13/93	
00172	F1	G92-0163	UTL -201-R10	Gelman Filter			PJB	09/13/93	
00173	F2		UTL -201-R10	>PM10 Acetone Rinse			PJB	09/13/93	
00174	F3		UTL -201-R10	<=PM10 Acetone Rinse			PJB	09/13/93	
00175	F4		UTL -201-R10	Impinger Liquids			PJB	09/13/93	
00176	F5		UTL -201-R10	Imp. 4 Silica Gel			PJB	09/13/93	
00177	F6		UTL -201-R10	TEDLAR BAG			PJB	09/13/93	
00178	F1	G92-0165	UTL -201-R11	Gelman Filter			PJB	09/13/93	
00179	F2		UTL -201-R11	>PM10 Acetone Rinse			PJB	09/13/93	
00180	F3		UTL -201-R11	<=PM10 Acetone Rinse			PJB	09/13/93	
00181	F4		UTL -201-R11	Impinger Liquids			PJB	09/13/93	
00182	F5		UTL -201-R11	Imp. 4 Silica Gel			PJB	09/13/93	
00183	F6		UTL -201-R11	TEDLAR BAG			PJB	09/13/93	

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00184	F1	G92-0166	UTL -201-R12	Gelman Filter			PJB	09/13/93	
00185	F2		UTL -201-R12	>PM10 Acetone Rinse			PJB	09/13/93	
00186	F3		UTL -201-R12	<=PM10 Acetone Rinse			PJB	09/13/93	
00187	F4		UTL -201-R12	Impinger Liquids			PJB	09/13/93	
00188	F5		UTL -201-R12	Imp. 4 Silica Gel			PJB	09/13/93	
00189	F6		UTL -201-R12	TEDLAR BAG			PJB	09/13/93	
00190	F1	G92-0164	UTL -201-R13	Gelman Filter			PJB	09/13/93	
00191	F2		UTL -201-R13	>PM10 Acetone Rinse			PJB	09/13/93	
00192	F3		UTL -201-R13	<=PM10 Acetone Rinse			PJB	09/13/93	
00193	F4		UTL -201-R13	Impinger Liquids			PJB	09/13/93	
00194	F5		UTL -201-R13	Imp. 4 Silica Gel			PJB	09/13/93	
00195	F6		UTL -201-R13	TEDLAR BAG			PJB	09/13/93	
00196	F1	G92-0153	UCF -201-R3	Gelman Filter			PJB	09/13/93	
00197	F2		UCF -201-R3	>PM10 Acetone Rinse			PJB	09/13/93	
00198	F3		UCF -201-R3	<=PM10 Acetone Rinse			PJB	09/13/93	
00199	F4		UCF -201-R3	Impinger Liquids			PJB	09/13/93	
00200	F5		UCF -201-R3	Imp. 4 Silica Gel			PJB	09/13/93	
00201	F6		UCF -201-R3	TEDLAR BAG			PJB	09/13/93	
00202	F1	G92-0167	UTL -201-R14	Gelman Filter			PJB	09/13/93	
00203	F2		UTL -201-R14	>PM10 Acetone Rinse			PJB	09/13/93	
00204	F3		UTL -201-R14	<=PM10 Acetone Rinse			PJB	09/13/93	
00205	F4		UTL -201-R14	Impinger Liquids			PJB	09/13/93	
00206	F5		UTL -201-R14	Imp. 4 Silica Gel			PJB	09/13/93	
00207	F6		UTL -201-R14	TEDLAR BAG			PJB	09/13/93	
00208	F1	G92-0168	UTL -201-R15	Gelman Filter			PJB	09/13/93	
00209	F2		UTL -201-R15	>PM10 Acetone Rinse			PJB	09/13/93	
00210	F3		UTL -201-R15	<=PM10 Acetone Rinse			PJB	09/13/93	

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00211	F4		UTL -201-R15	Impinger Liquids			PJB	09/13/93	
00212	F5		UTL -201-R15	Imp. 4 Silica Gel			PJB	09/13/93	
00213	F6		UTL -201-R15	TEDLAR BAG			PJB	09/13/93	
00214	F1	G92-0170	UTL -201-R16	Gelman Filter			PJB	09/13/93	
00215	F2		UTL -201-R16	>PM10 Acetone Rinse			PJB	09/13/93	
00216	F3		UTL -201-R16	<=PM10 Acetone Rinse			PJB	09/13/93	
00217	F4		UTL -201-R16	Impinger Liquids			PJB	09/13/93	
00218	F5		UTL -201-R16	Imp. 4 Silica Gel			PJB	09/13/93	
00219	F6		UTL -201-R16	TEDLAR BAG			PJB	09/13/93	
00220	F1	G92-0171	UTL -201-R17	Gelman Filter			PJB	09/13/93	
00221	F2		UTL -201-R17	>PM10 Acetone Rinse			PJB	09/13/93	
00222	F3		UTL -201-R17	<=PM10 Acetone Rinse			PJB	09/13/93	
00223	F4		UTL -201-R17	Impinger Liquids			PJB	09/13/93	
00224	F5		UTL -201-R17	Imp. 4 Silica Gel			PJB	09/13/93	
00225	F6		UTL -201-R17	TEDLAR BAG			PJB	09/13/93	
00232	F1	G92-0172	UTL -201-R18	Gelman Filter			PJB	09/13/93	
00233	F2		UTL -201-R18	>PM10 Acetone Rinse			PJB	09/13/93	
00234	F3		UTL -201-R18	<=PM10 Acetone Rinse			PJB	09/13/93	
00235	F4		UTL -201-R18	Impinger Liquids			PJB	09/13/93	
00236	F5		UTL -201-R18	Imp. 4 Silica Gel			PJB	09/13/93	
00237	F6		UTL -201-R18	TEDLAR BAG			PJB	09/13/93	
00238	F1	G92-0169	UCF -201-R4	Gelman Filter			PJB	09/13/93	
00239	F2		UCF -201-R4	>PM10 Acetone Rinse	50.00000	50.00000	PJB	09/13/93	
00240	F3		UCF -201-R4	<=PM10 Acetone Rinse	60.00000	60.00000	PJB	09/13/93	
00241	F4		UCF -201-R4	Impinger Liquids			PJB	09/13/93	
00242	F5		UCF -201-R4	Imp. 4 Silica Gel			PJB	09/13/93	
00243	F6		UCF -201-R4	TEDLAR BAG			PJB	09/13/93	

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00244	F1	G92-0159	UTL -201-R7	Gelman Filter			PJB	09/13/93	

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Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) Beaker / Filter	Final Weight Data: Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
08/18/93-021	65.56720	09/16/93	13:42	66.11070	PJB	66.11100
G92-0151	0.53794	09/17/93	09:45	66.11100	PJB	
92-65515-00100						
UBL -201-R0						
08/17/93-027	66.33330	09/08/93	07:15	66.33450	TU	66.33450
	0.00000	09/08/93	14:03	66.66590	TU	
92-65515-00101		09/09/93	06:54	66.33500	TU	
UBL -201-R0		09/10/93	07:47	66.33450	TU	
90.00000						
90.00000						
08/17/93-031	64.54130	09/08/93	07:17	64.54020	TU	64.54100
	0.00000	09/08/93	13:58	64.54130	TU	
92-65515-00102		09/09/93	07:07	64.54100	TU	
UBL -201-R0						
100.00000						
100.00000						
05/28/93-016	64.14760	09/08/93	07:10	65.18140	TU	65.18260
G92-0152	0.53633	09/08/93	14:06	65.18490	TU	
92-65515-00106		09/09/93	07:00	65.18270	TU	
UTL -201-R1		09/10/93	07:49	65.18260	KA	
08/17/93-032	64.63590	09/08/93	07:16	64.71780	TU	64.71680
	0.00000	09/08/93	14:01	64.71710	TU	
92-65515-00107		09/09/93	07:04	64.71680	TU	
UTL -201-R1						
100.00000						
100.00000						

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Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) Beaker / Filter	Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
08/17/93-028	64.95540	09/08/93	08:08	64.96550	TU	64.96450
	0.00000	09/08/93	17:59	64.96670	TU	
92-65515-00108		09/09/93	07:05	64.96540	TU	
UTL -201-R1		09/10/93	07:45	64.96480	KA	
105.00000		09/10/93	15:24	64.96690	KA	
105.00000		09/16/93	13:59	64.96430	PJB	
		09/17/93	11:00	64.96450	PJB	
05/28/93-012	67.39920	09/08/93	07:14	67.93880	TU	67.93960
G92-0149	0.54147	09/08/93	14:00	67.93990	TU	
92-65515-00112		09/09/93	07:01	67.93960	TU	
UCF -201-R1						
08/17/93-024	67.54390	09/08/93	07:16	67.54340	TU	67.54320
	0.00000	09/08/93	14:04	67.54120	TU	
92-65515-00113		09/09/93	06:53	67.54280	TU	
UCF -201-R1		09/09/93	18:00	67.54320	TU	
110.00000						
110.00000						
08/17/93-023	64.77950	09/08/93	07:17	64.77980	TU	64.77980
	0.00000	09/09/93	14:04	64.77980	TU	
92-65515-00114						
UCF -201-R1						
120.00000						
120.00000						
05/28/93-021	65.08760	09/08/93	07:12	65.75980	TU	65.76070
G92-0150	0.54192	09/08/93	14:02	65.76250	TU	
92-65515-00118		09/09/93	06:52	65.75910	TU	
UTL -201-R2		09/09/93	14:17	65.76640	TU	
		09/09/93	20:30	65.76020	TU	
		09/10/93	07:37	65.76070	TU	

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Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
08/17/93-030	64.32140	09/08/93	08:10	64.36640	TU	64.36880
	0.00000	09/08/93	14:56	64.36870	TU	
92-65515-00119		09/09/93	07:02	64.36880	TU	
UTL -201-R2						
115.00000						
115.00000						
08/17/93-029	66.62270	09/08/93	11:28	66.62990	TU	66.63030
	0.00000	09/08/93	17:54	66.63060	TU	
92-65515-00120		09/09/93	06:57	66.63030	TU	
UTL -201-R2						
130.00000						
130.00000						
05/28/93-017	65.14170	09/08/93	11:18	66.08640	TU	66.09050
G92-0156	0.53402	09/08/93	08:55	66.08800	TU	
92-65515-00124		09/09/93	06:55	66.08700	TU	
UTL -201-R3		09/09/93	14:13	66.08080	TU	
		09/10/93	07:33	66.09000	TU	
		09/10/93	15:49	66.09050	TU	
08/17/93-026	64.69470	09/08/93	12:59	64.77550	TU	64.77440
	0.00000	09/09/93	07:03	64.77370	TU	
92-65515-00125		09/09/93	16:08	64.77670	TU	
UTL -201-R3		09/10/93	07:30	64.77480	TU	
110.00000		09/16/93	14:02	64.77440	PJB	
110.00000						
08/17/93-022	67.78370	09/08/93	12:57	67.91220	TU	67.91200
	0.00000	09/09/93	07:13	67.91040	TU	
92-65515-00126		09/09/93	14:07	67.91320	TU	
UTL -201-R3		09/09/93	20:10	67.91250	TU	
145.00000		09/10/93	07:11	67.91700	TU	
145.00000		09/16/93	14:00	67.91200	PJB	
		09/17/93	10:10	67.91200	PJB	

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Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
05/28/93-014	64.75190	09/08/93	12:55	65.37260	TU	65.36890
G92-0154	0.53776	09/09/93	07:17	65.37180	TU	
92-65515-00130		09/09/93	14:07	65.37280	TU	
UTL -201-R4		09/10/93	15:34	65.37420	TU	
		09/16/93	13:34	65.36930	PJB	
		09/17/93	09:41	65.36890	PJB	
08/17/93-025	64.78790	09/08/93	13:00	64.82340	TU	64.82310
	0.00000	09/09/93	07:49	64.82310	TU	
92-65515-00131						
UTL -201-R4						
80.00000						
80.00000						
08/17/93-021	65.56720	09/08/93	12:53	65.57720	TU	65.57790
	0.00000	09/09/93	07:17	65.57620	TU	
92-65515-00132		09/10/93	06:52	65.57820	TU	
UTL -201-R4		09/16/93	13:35	65.57790	PJB	
110.00000						
110.00000						
05/28/93-023	65.20650	09/08/93	12:56	66.85890	TU	66.85890
G92-0157	0.53795	09/09/93	07:15	66.85890	TU	
92-65515-00136						
UTL -201-R5						
08/17/93-044	67.93820	09/08/93	12:54	68.83840	TU	68.83820
	0.00000	09/09/93	07:19	68.83820	TU	
92-65515-00137						
UTL -201-R5						
110.00000						
110.00000						

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08/17/93-043	67.58250	09/08/93	14:10	67.69690	TU	67.69650
	0.00000	09/09/93	07:18	67.69650	TU	
92-65515-00138						
UTL -201-R5						
130.00000						
130.00000						
05/28/93-026	66.89160	09/08/93	14:12	67.44520	TU	67.44530
G92-0158	0.53383	09/09/93	07:04	67.44700	TU	
92-65515-00142		09/09/93	14:15	67.44340	TU	
UTL -201-R6		09/10/93	07:32	67.44650	TU	
		09/10/93	15:45	67.44890	TU	
		09/16/93	13:36	67.44560	PJB	
		09/17/93	09:35	67.44530	PJB	
08/17/93-040	66.94940	09/08/93	14:11	66.97060	TU	66.96770
	0.00000	09/09/93	07:14	66.96410	TU	
92-65515-00143		09/10/93	07:27	66.96770	TU	
UTL -201-R6		09/10/93	15:32	66.97140	TU	
110.00000		09/16/93	13:59	66.96780	PJB	
110.00000		09/17/93	10:50	66.96770	PJB	
08/17/93-036	67.84130	09/08/93	14:11	67.83950	TU	67.84140
	0.00000	09/09/93	07:20	67.84120	TU	
92-65515-00144		09/10/93	07:28	67.84270	TU	
UTL -201-R6		09/10/93	15:52	67.84530	TU	
105.00000		09/16/93	14:00	67.84190	PJB	
105.00000		09/17/93	10:15	67.84140	PJB	
05/28/93-025	66.41440	09/08/93	06:56	67.07030	TU	67.07000
G92-0155	0.65808	09/09/93	07:11	67.06750	TU	
92-65515-00148		09/09/93	14:09	67.08120	TU	
UCF -201-R2		09/10/93	07:16	67.07050	TU	
		09/16/93	13:31	67.07000	PJB	

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08/17/93-039	64.89840	09/09/93	06:57	64.89840	TU	64.89710
	0.00000	09/09/93	17:46	64.89750	TU	
92-65515-00149		09/10/93	15:43	64.89980	TU	
UCF -201-R2		09/16/93	14:03	64.89760	PJB	
130.00000		09/17/93	10:10	64.89710	PJB	
130.00000						
08/17/93-035	65.06550	09/09/93	07:10	65.06600	TU	65.06680
	0.00000	09/10/93	07:30	65.06790	TU	
92-65515-00150		09/10/93	15:26	65.06690	TU	
UCF -201-R2		09/16/93	14:03	65.06680	PJB	
120.00000						
120.00000						
08/17/93-042	67.25290	09/09/93	07:26	67.34110	TU	67.35470
	0.00000	09/09/93	14:00	67.35450	TU	
92-65515-00155		09/10/93	07:00	67.35470	TU	
UTL -201-R7						
105.00000						
105.00000						
08/17/93-038	64.91420	09/09/93	07:25	64.97610	TU	64.98350
	0.00000	09/09/93	14:00	64.98260	TU	
92-65515-00156		09/10/93	07:29	64.98340	KA	
UTL -201-R7		09/10/93	15:30	64.98600	KA	
115.00000		09/16/93	13:55	64.98370	PJB	
115.00000		09/17/93	11:16	64.98350	PJB	
05/28/93-020	65.10710	09/10/93	08:22	66.08230	KA	66.09250
G92-0162	0.53558	09/10/93	17:55	66.07540	KA	
92-65515-00160		09/16/93	13:35	66.09300	PJB	
UTL -201-R8		09/17/93	09:36	66.09250	PJB	

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Final Weight Data: Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
08/17/93-033	67.55450	09/10/93	08:17	67.88400	KA	67.93710
	0.00000	09/10/93	15:03	67.90780	KA	
92-65515-00161		09/16/93	14:02	67.93660	PJB	
UTL -201-R8		09/17/93	09:40	67.93710	PJB	
110.00000						
110.00000						
08/17/93-034	67.18370	09/09/93	18:14	67.15750	TU	67.20780
	0.00000	09/10/93	06:56	67.21010	KA	
92-65515-00162		09/16/93	14:02	67.20820	PJB	
UTL -201-R8		09/17/93	09:10	67.20780	PJB	
120.00000						
120.00000						
05/28/93-015	64.65440	09/10/93	08:24	65.18800	KA	65.22660
G92-0160	0.53465	09/10/93	14:40	65.18090	KA	
92-65515-00166		09/16/93	13:34	65.22700	PJB	
UTL -201-R9		09/17/93	09:36	65.22660	PJB	
08/17/93-041	67.53740	09/09/93	18:11	67.55860	TU	67.59730
	0.00000	09/10/93	07:07	67.59780	TU	
92-65515-00167		09/16/93	14:04	67.59730	PJB	
UTL -201-R9						
70.00000						
70.00000						
08/17/93-037	67.19610	09/09/93	18:11	67.17090	TU	67.20580
	0.00000	09/10/93	07:08	67.20170	TU	
92-65515-00168		09/10/93	15:54	67.20820	TU	
UTL -201-R9		09/16/93	14:08	67.20550	PJB	
115.00000		09/17/93	09:15	67.20580	PJB	
115.00000						

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
05/28/93-019	65.21650	09/10/93	08:12	65.77870	KA	65.80080
G92-0163	0.53338	09/10/93	15:16	65.80360	KA	
92-65515-00172		09/16/93	13:33	65.80120	PJB	
UTL -201-R10		09/17/93	09:36	65.80080	PJB	
05/28/93-022	65.16650	09/10/93	08:15	65.11700	KA	65.18840
	0.00000	09/10/93	15:01	65.16920	KA	
92-65515-00173		09/16/93	14:10	65.18890	PJB	
UTL -201-R10		09/17/93	10:48	65.18840	PJB	
100.00000						
100.00000						
05/28/93-024	80.46160	09/09/93	18:18	80.43610	KA	80.46230
	0.00000	09/10/93	06:54	80.46240	KA	
92-65515-00174		09/16/93	13:32	80.46230	PJB	
UTL -201-R10						
140.00000						
140.00000						
05/28/93-018	65.17790	09/10/93	08:18	65.73070	KA	65.76490
G92-0165	0.53783	09/10/93	15:09	65.74170	KA	
92-65515-00178		09/16/93	13:32	65.76540	PJB	
UTL -201-R11		09/17/93	09:40	65.76490	PJB	
09/01/93-001	67.34130	09/16/93	13:42	67.50380	PJB	67.50330
	0.00000	09/17/93	13:50	67.50330	PJB	
92-65515-00179						
UTL -201-R11						
100.00000						
100.00000						

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
09/01/93-002	66.30550	09/16/93	13:00	66.31170	PJB	66.31200
	0.00000	09/17/93	11:10	66.31200	PJBb	
92-65515-00180						
UTL -201-R11						
125.00000						
125.00000						
12/28/92-012	64.83920	09/10/93	08:20	65.38130	KA	65.37810
G92-0166	0.53518	09/10/93	15:12	65.41300	KA	
92-65515-00184		09/16/93	13:30	65.37810	PJB	
UTL -201-R12		09/17/93	09:43	65.37810	PJB	
09/01/93-003	67.33730	09/16/93	13:51	67.81370	PJB	67.81400
	0.00000	09/17/93	10:53	67.81400	PJB	
92-65515-00185						
UTL -201-R12						
170.00000						
170.00000						
09/01/93-004	65.98030	09/16/93	13:52	65.98770	PJB	65.98720
	0.00000	09/17/93	10:50	65.98720	PJB	
92-65515-00186						
UTL -201-R12						
80.00000						
80.00000						
12/09/92-013	64.50460	09/10/93	08:14	65.09750	KA	65.12140
G92-0164	0.53711	09/10/93	15:21	65.13650	KA	
92-65515-00190		09/16/93	13:30	65.12190	PJB	
UTL -201-R13		09/17/93	09:42	65.12140	PJB	

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
09/01/93-005	64.66740	09/16/93	13:40	64.70420	PJB	64.70380
	0.00000	09/17/93	10:50	64.70380	PJB	
92-65515-00191						
UTL -201-R13						
90.00000						
90.00000						
09/01/93-006	64.19210	09/16/93	13:52	64.21590	PJB	64.21610
	0.00000	09/17/93	11:00	64.21610	PJB	
92-65515-00192						
UTL -201-R13						
135.00000						
135.00000						
12/09/92-014	66.91420	09/09/93	18:20	67.45750	KA	67.45080
G92-0153	0.53725	09/10/93	07:55	67.41450	KA	
92-65515-00196		09/10/93	15:27	67.45470	KA	
UCF -201-R3		09/16/93	13:31	67.45090	PJB	
		09/17/93	09:40	67.45080	PJB	
09/01/93-017	65.25820	09/16/93	13:50	65.26530	PJB	65.26490
	0.00000	09/17/93	11:10	65.26490	PJB	
92-65515-00197						
UCF -201-R3						
110.00000						
110.00000						
09/01/93-018	64.25260	09/16/93	13:59	64.25510	PJB	64.25520
	0.00000	09/17/93	10:51	64.25520	PJB	
92-65515-00198						
UCF -201-R3						
110.00000						
110.00000						

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
12/28/92-013	64.85690	09/10/93	06:29	65.53650	KA	65.50930
G92-0167	0.53629	09/16/93	13:31	65.50960	PJB	
92-65515-00202		09/17/93	09:42	65.50930	PJB	
UTL -201-R14						
09/01/93-007	67.26960	09/16/93	13:35	71.18210	PJB	71.18170
	0.00000	09/17/93	10:10	71.18170	PJB	
92-65515-00203						
UTL -201-R14						
150.00000						
150.00000						
09/01/93-008	65.94280	09/16/93	13:54	65.96600	PJB	65.96600
	0.00000	09/17/93	11:10	65.96600	PJB	
92-65515-00204						
UTL -201-R14						
125.00000						
125.00000						
12/09/92-012	64.86760	09/16/93	13:45	65.52910	PJB	65.52890
G92-0168	0.53780	09/17/93	09:50	65.52890	PJB	
92-65515-00208						
UTL -201-R15						
09/01/93-009	67.40240	09/16/93	13:43	68.50670	PJB	68.50680
	0.00000	09/17/93	10:45	68.50680	PJB	
92-65515-00209						
UTL -201-R15						
90.00000						
90.00000						

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Final Weight Data: Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
12/28/92-014 G92-0170 92-65515-00214 UTL -201-R16	67.05880 0.54124	09/16/93 09/17/93	13:50 09:40	67.68710 67.68660	PJB PJB	67.68660
12/09/92-015 G92-0171 92-65515-00220 UTL -201-R17	65.11790 0.53736	09/16/93 09/17/93	13:43 09:50	65.79160 65.79200	PJB PJB	65.79200
09/01/93-013 92-65515-00221 UTL -201-R17 100.00000 100.00000	67.49370 0.00000	09/16/93 09/17/93	13:41 10:45	67.53850 67.53800	PJB PJB	67.53800
09/01/93-014 92-65515-00222 UTL -201-R17 110.00000 110.00000	65.00530 0.00000	09/16/93 09/17/93	13:43 09:53	65.05550 65.05500	PJB PJB	65.05500
12/09/92-016 G92-0172 92-65515-00232 UTL -201-R18	64.08130 0.53821	09/16/93 09/17/93	13:54 09:53	65.27790 65.27740	PJB PJB	65.27740

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94 Page 13

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
09/01/93-015	64.31280	09/16/93	13:42	66.35900	PJB	66.35890
	0.00000	09/17/93	11:02	66.35890	PJB	
92-65515-00233						
UTL -201-R18						
140.00000						
140.00000						
09/01/93-016	66.83650	09/16/93	13:43	66.87930	PJB	66.87960
	0.00000	09/17/93	10:59	66.87960	PJB	
92-65515-00234						
UTL -201-R18						
80.00000						
80.00000						
12/28/92-015	65.04520	09/16/93	13:49	65.59020	PJB	65.59000
G92-0169	0.53888	09/17/93	09:53	65.59000	PJB	
92-65515-00238						
UCF -201-R4						
09/01/93-020	64.98770	09/16/93	13:55	64.99430	PJB	64.99440
	0.00000	09/17/93	11:01	64.99440	PJB	
92-65515-00239						
UCF -201-R4						
50.00000						
50.00000						
09/01/93-021	63.98750	09/16/93	13:55	63.99000	PJB	63.98980
	0.00000	09/17/93	09:53	63.98980	PJB	
92-65515-00240						
UCF -201-R4						
60.00000						
60.00000						

ETS, Inc.
GRAVIMETRIC LABORATORY DATA
Final Beaker Weights

Job Number: 92-65515
Report Prepared on: 01/31/94

Beaker # / Filter # / Sample # / Run I.D. / Total Vol.,ml / Aliquot Vol.	Constant Tare Weight (g) / Beaker / Filter	Final Weight Data Date	Time	Weight (g)	Analyst	Constant Final Weight (g)
05/28/93-013	66.14510	09/09/93	07:27	67.04770	TU	67.04650
G92-0159	0.53633	09/09/93	14:12	67.05050	TU	
92-65515-00244		09/09/93	20:20	67.05900	TU	
UTL -201-R7		09/10/93	07:20	67.05790	TU	
		09/16/93	13:33	67.04690	PJB	
		09/17/93	09:43	67.04650	PJB	

APPENDIX D.2
MULTI-METALS DATA AND RESULTS

TRUCK LOADING BAGHOUSE INLET
SUMMARY OF METAL EMISSIONS

CASE 1 CALCULATIONS (1)

CONDITION		Dry Loading Only	Central Mix Only	New Cement & Truck Loading	Lehigh Silo Filling Only	New Cement & Truck Loading
SAMPLE I.D.		**TL-R2,4,9,14,15,16**	**TL-R10,11,12,13,17**	**TL-R5**	**TL-R7**	**TL-R18**
SAMPLING AND FLOWRATE <u>PARAMETERS</u>						
Sample Volume - dscf		75.68	63.92	13.21	13.19	12.66
Gas Flowrate - dscfm		3083	3019	3396	3355	3179
<u>METALS EMISSIONS - lb/hr</u>						
Arsenic	As	1.71E-05	7.37E-06	1.46E-05	6.29E-05	8.31E-06
Beryllium	Be	1.56E-06	0.00E+00	0.00E+00	6.73E-07	1.33E-06
Cadmium	Cd	8.62E-07	3.75E-07	0.00E+00	8.75E-06	0.00E+00
Chromium	Cr	3.05E-04	4.50E-05	3.91E-05	9.42E-06	0.00E+00
Lead	Pb	2.39E-05	1.21E-05	0.00E+00	2.76E-05	0.00E+00
Manganese	Mn	2.00E-03	1.94E-03	7.67E-02	7.61E-03	3.48E-02
Mercury	Hg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	Ni	2.38E-04	1.04E-04	1.30E-04	6.63E-04	1.14E-04
Phosphorus	P	2.96E-04	1.25E-05	0.00E+00	1.04E-03	0.00E+00
Selenium	Se	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
DRY LOADING ONLY

RUN NUMBER (2): **TL-R2,4,9,14,15,16**
COMBINED VOLUME (3) : 75.679 dscf
AVG. GAS FLOWRATE: 3083 dscfm

		LABORATORY DATA				METAL EMISSIONS	
		SAMPLE CATCH - micrograms				CONC.	MASS RATE
COMPONENT		SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As	3.60		0.43	3.17	1.4792	1.71E-05
Beryllium	Be	0.34		0.05	0.29	0.1353	1.56E-06
Cadmium	Cd	0.27		0.11	0.16	0.0747	8.62E-07
Chromium	Cr	60.1		3.59	56.51	26.3696	3.05E-04
Lead	Pb	5.84		1.40	4.44	2.0719	2.39E-05
Manganese	Mn	374		3.70	370.3	172.7954	2.00E-03
Mercury	Hg	* 2.00	*	2.00	0.00	0.0000	0.00E+00
Nickel	Ni	46.1		2.00	44.1	20.5787	2.38E-04
Phosphorus	P	155	*	100.00	55	25.6650	2.96E-04
Selenium	Se	* 0.20	*	0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
CENTRAL MIX ONLY

RUN NUMBER (2): **TL-R10,11,12,13,17**
COMBINED VOLUME (3) : 63.920 dscf
AVG. GAS FLOWRATE: 3019 dscfm

		LABORATORY DATA					METALS EMISSIONS	
		SAMPLE CATCH - micrograms					CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As		1.61		0.43	1.18	0.6519	7.37E-06
Beryllium	Be	*	0.02		0.05	0.00	0.0000	0.00E+00
Cadmium	Cd		0.17		0.11	0.06	0.0331	3.75E-07
Chromium	Cr		10.8		3.59	7.21	3.9834	4.50E-05
Lead	Pb		3.34		1.40	1.94	1.0718	1.21E-05
Manganese	Mn		315		3.70	311.30	171.9869	1.94E-03
Mercury	Hg	*	2.00	*	2.00	0.00	0.0000	0.00E+00
Nickel	Ni		18.7		2.00	16.70	9.2264	1.04E-04
Phosphorus	P		102	*	100.00	2.00	1.1050	1.25E-05
Selenium	Se	*	0.20	*	0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
NEW CEMENT AND TRUCK LOADING

RUN NUMBER: **TL-R5**
SAMPLE VOLUME : 13.212 dscf
GAS FLOWRATE: 3396 dscfm

		LABORATORY DATA SAMPLE CATCH - micrograms					METAL EMISSIONS	
COMPONENT			SAMPLE		BLANK	TOTAL	CONC. ug/dscm	MASS RATE lb/hr
Arsenic	As		0.86		0.43	0.43	1.1494	1.46E-05
Beryllium	Be	*	0.02		0.05	0.00	0.0000	0.00E+00
Cadmium	Cd		0.04		0.11	0.00	0.0000	0.00E+00
Chromium	Cr		4.74		3.59	1.15	3.0738	3.91E-05
Lead	Pb		1.24		1.4	0.00	0.0000	0.00E+00
Manganese	Mn		2260		3.70	2256.30	6030.89	7.67E-02
Mercury	Hg	*	2.00	*	2.00	0.00	0.0000	0.00E+00
Nickel	Ni		5.82		2.00	3.82	10.2105	1.30E-04
Phosphorus	P	*	100	*	100	0.00	0.0000	0.00E+00
Selenium	Se	*	0.20	*	0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS(1)

TRUCK LOADING BAGHOUSE INLET
OUTLET AT VARIOUS CONDITIONS

RUN NUMBER: **TL-R7**
SAMPLE VOLUME: 13.194 dscf
GAS FLOWRATE: 3355 dscfm

		LABORATORY DATA SAMPLE CATCH - micrograms			METAL EMISSIONS	
COMPONENT		SAMPLE	BLANK	TOTAL	CONC. ug/dscm	MASS RATE lb/hr
Arsenic	As	2.30	0.43	1.87	5.0052	6.29E-05
Beryllium	Be	0.07	0.05	0.02	0.0535	6.73E-07
Cadmium	Cd	0.37	0.11	0.26	0.6959	8.75E-06
Chromium	Cr	3.87	3.59	0.28	0.7494	9.42E-06
Lead	Pb	2.22	1.40	0.82	2.1948	2.76E-05
Manganese	Mn	230	3.70	226.3	605.70	7.61E-03
Mercury	Hg	* 2.00	* 2.00	0.00	0.0000	0.00E+00
Nickel	Ni	21.7	2.00	19.70	52.728	6.63E-04
Phosphorus	P	131	* 100	31.00	82.973	1.04E-03
Selenium	Se	* 0.20	* 0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
NEW CEMENT AND TRUCK LOADING

RUN NUMBER:	**TL-R18**
SAMPLE VOLUME:	12.657 dscf
GAS FLOWRATE:	3179 dscfm

		LABORATORY DATA SAMPLE CATCH - micrograms			METAL EMISSIONS	
COMPONENT		SAMPLE	BLANK	TOTAL	CONC. ug/dscm	MASS RATE lb/hr
Arsenic	As	0.68	0.43	0.25	0.6975	8.31E-06
Beryllium	Be	0.09	0.05	0.04	0.1116	1.33E-06
Cadmium	Cd	0.02	0.11	0.00	0.0000	0.00E+00
Chromium	Cr	2.32	3.59	0.00	0.0000	0.00E+00
Lead	Pb	1.12	1.4	0.00	0.0000	0.00E+00
Manganese	Mn	1050	3.70	1046.30	2919.30	3.48E-02
Mercury	Hg	* 2.00	* 2.00	0.00	0.0000	0.00E+00
Nickel	Ni	5.43	2.00	3.43	9.5701	1.14E-04
Phosphorus	P	* 100	* 100	0.00	0.0000	0.00E+00
Selenium	Se	* 0.20	* 0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".

TRUCK LOADING BAGHOUSE INLET
SUMMARY OF METAL EMISSIONS

CASE 2 CALCULATIONS (1)

CONDITION		Dry Loading Only	Central Mix Only	New Cement & Truck Loading	Lehigh Silo Filling Only	New Cement & Truck Loading
SAMPLE I.D.		**TL-R2,4,9,14,15,16**	**TL-R10,11,12,13,17**	**TL-R5**	**TL-R7**	**TL-R18**
SAMPLING AND FLOWRATE PARAMETERS						
Sample Volume - dscf		75.68	63.92	13.21	13.19	12.66
Gas Flowrate - dscfm		3083	3019	3396	3355	3179
METALS EMISSIONS - lb/hr						
Arsenic	As	1.71E-05	7.37E-06	1.46E-05	6.29E-05	8.31E-06
Beryllium	Be	1.56E-06	0.00E+00	0.00E+00	6.73E-07	1.33E-06
Cadmium	Cd	8.62E-07	3.75E-07	0.00E+00	8.75E-06	0.00E+00
Chromium	Cr	3.05E-04	4.50E-05	3.91E-05	9.42E-06	0.00E+00
Lead	Pb	2.39E-05	1.21E-05	0.00E+00	2.76E-05	0.00E+00
Manganese	Mn	2.00E-03	1.94E-03	7.67E-02	7.61E-03	3.48E-02
Mercury	Hg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	Ni	2.38E-04	1.04E-04	1.30E-04	6.63E-04	1.14E-04
Phosphorus	P	8.35E-04	6.37E-04	0.00E+00	4.41E-03	0.00E+00
Selenium	Se	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
DRY LOADING ONLY

RUN NUMBER (2): **TL-R2,4,9,14,15,16**
COMBINED VOLUME (3) : 75.679 dscf
AVG. GAS FLOWRATE: 3083 dscfm

			LABORATORY DATA				**METAL EMISSIONS**	
			SAMPLE CATCH - micrograms				CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As		3.60		0.43	3.17	1.4792	1.71E-05
Beryllium	Be		0.34		0.05	0.29	0.1353	1.56E-06
Cadmium	Cd		0.27		0.11	0.16	0.0747	8.62E-07
Chromium	Cr		60.1		3.59	56.51	26.3696	3.05E-04
Lead	Pb		5.84		1.40	4.44	2.0719	2.39E-05
Manganese	Mn		374		3.70	370.3	172.7954	2.00E-03
Mercury	Hg	*	0.00	*	0.00	0.00	0.0000	0.00E+00
Nickel	Ni		46.1		2.00	44.1	20.5787	2.38E-04
Phosphorus	P		155	*	0.00	155	72.3286	8.35E-04
Selenium	Se	*	0.00	*	0.00	0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
CENTRAL MIX ONLY

RUN NUMBER (2): **TL-R10,11,12,13,17**
COMBINED VOLUME (3) : 63.920 dscf
AVG. GAS FLOWRATE: 3019 dscfm

			LABORATORY DATA					METALS EMISSIONS	
			SAMPLE CATCH - micrograms					CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK		TOTAL	ug/dscm	lb/hr
Arsenic	As		1.61		0.43		1.18	0.6519	7.37E-06
Beryllium	Be	*	0.00		0.05		0.00	0.0000	0.00E+00
Cadmium	Cd		0.17		0.11		0.06	0.0331	3.75E-07
Chromium	Cr		10.8		3.59		7.21	3.9834	4.50E-05
Lead	Pb		3.34		1.40		1.94	1.0718	1.21E-05
Manganese	Mn		315		3.70		311.3	171.99	1.94E-03
Mercury	Hg	*	0.00	*	0.00		0.00	0.0000	0.00E+00
Nickel	Ni		18.7		2.00		16.7	9.2264	1.04E-04
Phosphorus	P		102	*	0.00		102.0	56.35	6.37E-04
Selenium	Se	*	0.00	*	0.00		0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
NEW CEMENT AND TRUCK LOADING

RUN NUMBER: **TL-R5**
SAMPLE VOLUME : 13.212 dscf
GAS FLOWRATE: 3396 dscfm

			LABORATORY DATA				METAL EMISSIONS	
			SAMPLE CATCH - micrograms				CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As		0.86		0.43	0.43	1.1494	1.46E-05
Beryllium	Be	*	0.00		0.05	0.00	0.0000	0.00E+00
Cadmium	Cd		0.04		0.11	0.00	0.0000	0.00E+00
Chromium	Cr		4.74		3.59	1.15	3.0738	3.91E-05
Lead	Pb		1.24		1.40	0.00	0.0000	0.00E+00
Manganese	Mn		2260		3.70	2256.3	6030.89	7.67E-02
Mercury	Hg	*	0.00	*	0.00	0.00	0.0000	0.00E+00
Nickel	Ni		5.82		2.00	3.82	10.21	1.30E-04
Phosphorus	P	*	0.00	*	0.00	0.00	0.0000	0.00E+00
Selenium	Se	*	0.00	*	0.00	0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
OUTLET AT VARIOUS CONDITIONS

RUN NUMBER: **TL-R7**
SAMPLE VOLUME: 13.194 dscf
GAS FLOWRATE: 3355 dscfm

			LABORATORY DATA				METAL EMISSIONS	
			SAMPLE CATCH - micrograms				CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As		2.30		0.43	1.87	5.0052	6.29E-05
Beryllium	Be		0.07		0.05	0.02	0.0535	6.73E-07
Cadmium	Cd		0.37		0.11	0.26	0.6959	8.75E-06
Chromium	Cr		3.87		3.59	0.28	0.7494	9.42E-06
Lead	Pb		2.22		1.40	0.82	2.1948	2.76E-05
Manganese	Mn		230		3.70	226.3	605.70	7.61E-03
Mercury	Hg	*	0.00	*	0.00	0.00	0.0000	0.00E+00
Nickel	Ni		21.70		2.00	19.70	52.7282	6.63E-04
Phosphorus	P		131	*	0.00	131.00	350.63	4.41E-03
Selenium	Se	*	0.00	*	0.00	0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

TRUCK LOADING BAGHOUSE INLET
NEW CEMENT AND TRUCK LOADING

RUN NUMBER: **TL-R18**
SAMPLE VOLUME: 12.657 dscf
GAS FLOWRATE: 3179 dscfm

			LABORATORY DATA					METAL EMISSIONS	
			SAMPLE CATCH - micrograms					CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK		TOTAL	ug/dscm	lb/hr
Arsenic	As		0.68		0.43		0.25	0.6975	8.31E-06
Beryllium	Be		0.09		0.05		0.04	0.1116	1.33E-06
Cadmium	Cd		0.02		0.11		0.00	0.0000	0.00E+00
Chromium	Cr		2.32		3.59		0.00	0.0000	0.00E+00
Lead	Pb		1.12		1.40		0.00	0.0000	0.00E+00
Manganese	Mn		1050		3.70		1046.3	2919.30	3.48E-02
Mercury	Hg	*	0.00	*	0.00		0.00	0.0000	0.00E+00
Nickel	Ni		5.43		2.00		3.43	9.5701	1.14E-04
Phosphorus	P	*	0.00	*	0.00		0.00	0.0000	0.00E+00
Selenium	Se	*	0.00	*	0.00		0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

CEMENT SILO FILLING OUTLET
OUTLET AT VARIOUS COMBINATIONS

RUN NUMBER (2): **CF-R2,3,4**
COMBINED VOLUME (3) : 802.140 dscf
AVG. GAS FLOWRATE: 3011 dscfm

			LABORATORY DATA				METAL EMISSIONS	
			SAMPLE CATCH - micrograms				CONC.	MASS RATE
COMPONENT			SAMPLE		BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As		0.75		0.43	0.32	0.0141	1.59E-07
Beryllium	Be		0.05		0.05	0.00	0.0000	0.00E+00
Cadmium	Cd		0.07		0.11	0.00	0.0000	0.00E+00
Chromium	Cr		6.40		3.59	2.81	0.1237	1.40E-06
Lead	Pb		2.33		1.40	0.93	0.0409	4.62E-07
Manganese	Mn		11.2		3.70	7.50	0.3302	3.72E-06
Mercury	Hg	*	2.00	*	2.00	0.00	0.0000	0.00E+00
Nickel	Ni		5.38		2.00	3.38	0.1488	1.68E-06
Phosphorus	P	*	100	*	100	0.00	0.0000	0.00E+00
Selenium	Se	*	0.20	*	0.20	0.00	0.0000	0.00E+00

Notes:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters.
The detection limit values are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

CEMENT SILO FILLING OUTLET
OUTLET AT VARIOUS COMBINATIONS

RUN NUMBER (2): **CF-R2,3,4**
COMBINED VOLUME (3) : 802.140 dscf
AVG. GAS FLOWRATE: 3011 dscfm

		LABORATORY DATA			METAL EMISSIONS	
		SAMPLE CATCH - micrograms			CONC.	MASS RATE
COMPONENT		SAMPLE	BLANK	TOTAL	ug/dscm	lb/hr
Arsenic	As	0.75	0.43	0.32	0.0141	1.59E-07
Beryllium	Be	0.05	0.05	0.00	0.0000	0.00E+00
Cadmium	Cd	0.07	0.11	0.00	0.0000	0.00E+00
Chromium	Cr	6.40	3.59	2.81	0.1237	1.40E-06
Lead	Pb	2.33	1.40	0.93	0.0409	4.62E-07
Manganese	Mn	11.20	3.70	7.50	0.3302	3.72E-06
Mercury	Hg	* 0.00	* 0.00	0.00	0.0000	0.00E+00
Nickel	Ni	5.38	2.00	3.38	0.1488	1.68E-06
Phosphorus	P	* 0.00	* 0.00	0.00	0.0000	0.00E+00
Selenium	Se	* 0.00	* 0.00	0.00	0.0000	0.00E+00

Notes:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters.
The instances where a zero value is used are indicated with an "*".
(2) The sample is comprised of filters from the identified test runs.
(3) The volume of air sampled represents the combined total of the sample volumes of the individual test runs.

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

NEWCEM
PROCESS SAMPLE

RUN NUMBER (2): **NEWCEM**
TOTAL WEIGHT: 964 g

			METAL EMISSIONS CONCENTRATION		
COMPONENT			mg/kg		mg
Arsenic	As	*	0.14	*	0.15
Beryllium	Be		5.65		5.86
Cadmium	Cd		0.48		0.50
Chromium	Cr		20.6		21.4
Lead	Pb	*	0.07	*	0.07
Manganese	Mn		2170		2251
Mercury	Hg	*	0.10	*	0.10
Nickel	Ni		1.30		1.35
Phosphorus	P	*	69.4	*	72.0
Selenium	Se		0.16		0.17

Note:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters
The detection limit values are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

NEWCEM
PROCESS SAMPLE

RUN NUMBER (2): **NEWCEM**
TOTAL WEIGHT: 964 g

			METAL EMISSIONS CONCENTRATION		
COMPONENT			mg/kg		mg
Arsenic	As	*	0.00	*	0.00
Beryllium	Be		5.65		5.86
Cadmium	Cd		0.48		0.50
Chromium	Cr		20.6		21.4
Lead	Pb	*	0.00	*	0.00
Manganese	Mn		2170		2251
Mercury	Hg	*	0.00	*	0.00
Nickel	Ni		1.30		1.35
Phosphorus	P	*	0.0	*	0.0
Selenium	Se		0.16		0.17

Note:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters. The instances where a zero value is used are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 1 CALCULATIONS (1)

LEHIGH CEMENT
PROCESS SAMPLE

RUN NUMBER (2): **LEHIGH**
TOTAL WEIGHT: 1021 g

		METAL EMISSIONS CONCENTRATION	
COMPONENT		mg/kg	mg
Arsenic	As	5.88	5.76
Beryllium	Be	0.56	0.55
Cadmium	Cd	0.75	0.73
Chromium	Cr	39.1	38.3
Lead	Pb	13.0	12.7
Manganese	Mn	768	752
Mercury	Hg	* 0.09	* 0.09
Nickel	Ni	13.4	13.1
Phosphorus	P	345	338
Selenium	Se	* 0.15	* 0.15

Note:
(1) Case 1 calculations substitute the detection limit value for all of the non-detected parameters The detection limit values are indicated with an "*".

SUMMARY OF METALS EMISSIONS
CASE 2 CALCULATIONS (1)

LEHIGH CEMENT
PROCESS SAMPLE

RUN NUMBER (2): **LEHIGH**
TOTAL WEIGHT: 1021 g

COMPONENT			METAL EMISSIONS CONCENTRATION mg/kg	mg
Arsenic	As		5.88	5.76
Beryllium	Be		0.56	0.55
Cadmium	Cd		0.75	0.73
Chromium	Cr		39.1	38.3
Lead	Pb		13.0	12.7
Manganese	Mn		768	752
Mercury	Hg	*	0.00	0.00
Nickel	Ni		13.4	13.1
Phosphorus	P		345	338
Selenium	Se	*	0.00	0.00

Note:
(1) Case 2 calculations substitute a value of zero for all of the non-detected parameters. The instances where a zero value is used are indicated with an "*".

APPENDIX D.3
MULTI-METALS RAW LABORATORY DATA

RECEIVED OCT 13 1993

WA 1-15

ETS, Inc.
1401 Municipal Road N.W.
Roanoke, VA 24012
ATTN: Dr. Ted Handel

Re: Laboratory Analysis
ETSAS Client No. 6593

REPORT DATE/NUMBER: October 13, 1993 / 227

ANALYSIS FOR: Arsenic, Beryllium, Cadmium, Chromium, Lead, Manganese, Mercury, Nickel, Phosphorous, Selenium

METHOD OF ANALYSIS: Metals by ICP, GFAAS, CVAAS

SAMPLE ANALYSIS DATA

Lab ID: 146771 Client ID: TL-R7 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: LEHIGH SILO FILLING ONLY
METALS/ELEMENTS RESULTS:

Arsenic ——— 2.30 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Beryllium ——— 0.07 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total

Cadmium ——— 0.37 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

Chromium ——— 3.87 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead ——— 2.22 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

Manganese ——— 230 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury ——— < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146771 (continued)

Nickel — 21.7 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus — 131 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

Selenium — < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146772 Client ID: TL-R2,4,9,14,15,16 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: DRY LOADING ONLY

Arsenic — 3.60 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Beryllium — 0.34 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.20 ug,total

Cadmium — 0.27 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

Chromium — 60.1 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead — 5.84 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

Manganese — 374 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury — < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

Nickel — 46.1 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus — 155 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146772 (continued)
Selenium — < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146773 Client ID: TL-R10,11,12,13,17 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: CENTRAL MIX ONLY
Arsenic — 1.61 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total
Beryllium — < 0.02 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total
Cadmium — 0.17 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total
Chromium — 10.8 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.10 ug,total
Lead — 3.34 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total
Manganese — 315 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total
Mercury — < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total
Nickel — 18.7 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total
Phosphorus — 102 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total
Selenium — < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146774 Client ID: TL-R5 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: NEWCHEM & TRUCK LOADING
Arsenic — 0.86 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

REPORT CONTINUED ON NEXT PAGE

ETS, Inc.
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SAMPLE ANALYSIS DATA

Lab ID: 146774 (continued)

Beryllium —— < 0.02 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total

Cadmium —— 0.04 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

Chromium —— 4.74 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead —— 1.24 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

Manganese —— 2260 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury —— < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

Nickel —— 5.82 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus —— < 100 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

Selenium —— < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146775 Client ID: TL-R18 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: NEWCHEM & TRUCK LOADING

Arsenic —— 0.68 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Beryllium —— 0.09 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total

Cadmium —— 0.02 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146775 (continued)

Chromium —— 2.32 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead —— 1.12 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

Manganese —— 1050 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury —— < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

Nickel —— 5.43 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus —— < 100 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

Selenium —— < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146776 Client ID: CF-R2,3,4 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: OUTLET/VARIOUS COMBINATIONS

Arsenic —— 0.75 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Beryllium —— 0.05 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total

Cadmium —— 0.07 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

Chromium —— 6.40 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead —— 2.33 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146776 (continued)

Manganese — 11.2 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury — < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

Nickel — 5.38 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus — < 100 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

Selenium — < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146777 Client ID: BLNK-R0 Matrix: FILTER
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: FIELD BLANK

Arsenic — 0.43 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Beryllium — 0.05 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.02 ug,total

Cadmium — 0.11 ug,total
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.01 ug,total

Chromium — 3.59 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.00 ug,total

Lead — 1.40 ug,total
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.10 ug,total

Manganese — 3.70 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.50 ug,total

Mercury — < 2.00 ug,total
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 2.00 ug,total

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146777 (continued)

Nickel — 2.00 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 2.00 ug,total

Phosphorus — < 100 ug,total
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 100 ug,total

Selenium — < 0.20 ug,total
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.20 ug,total

Lab ID: 146778 Client ID: NEWCHEM Matrix: SOLID
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: PROCESS SAMPLE

Arsenic — < 0.14 mg/kg
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.14 mg/kg

Beryllium — 5.65 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.35 mg/kg

Cadmium — 0.48 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.35 mg/kg

Chromium — 20.6 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.69 mg/kg

Lead — < 0.07 mg/kg
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.07 mg/kg

Manganese — 2170 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.04 mg/kg

Mercury — < 0.10 mg/kg
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 0.10 mg/kg

Nickel — 1.30 mg/kg
└>Analysis Date: 10/13/93 by: JW
└>Method: GFAAS; Det Limit= 0.14 mg/kg

Phosphorus — < 69.4 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 69.4 mg/kg

REPORT CONTINUED ON NEXT PAGE

SAMPLE ANALYSIS DATA

Lab ID: 146778 (continued)

Selenium — 0.16 mg/kg
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.14 mg/kg

Lab ID: 146779 Client ID: LEHIGH CEMENT Matrix: SOLID
Other ID: 92-655-WA15 Collected by: ETS, INC.
Collection Date: / / Time: Received at ETSAS: 09/20/93
Description: PROCESS SAMPLE

Arsenic — 5.88 mg/kg
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.15 mg/kg

Beryllium — 0.56 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.38 mg/kg

Cadmium — 0.75 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.38 mg/kg

Chromium — 39.1 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 0.76 mg/kg

Lead — 13.0 mg/kg
└>Analysis Date: 10/12/93 by: JW
└>Method: GFAAS; Det Limit= 0.08 mg/kg

Manganese — 768 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.15 mg/kg

Mercury — < 0.09 mg/kg
└>Analysis Date: 10/12/93 by: MG
└>Method: CVAAS; Det Limit= 0.09 mg/kg

Nickel — 13.4 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 1.53 mg/kg

Phosphorus — 345 mg/kg
└>Analysis Date: 10/11/93 by: KO
└>Method: ICP; Det Limit= 76.3 mg/kg

Selenium — < 0.15 mg/kg
└>Analysis Date: 10/11/93 by: JW
└>Method: GFAAS; Det Limit= 0.15 mg/kg

REPORT CONTINUED ON NEXT PAGE

If we may be of further assistance, please contact us at any time.

Sincerely,
ETS ANALYTICAL SERVICES, INC.

Susanne H. Deegan

Susanne H. Deegan, Project Manager

NOTIFICATION OF INCOMING SAMPLES

INITIAL ✓ UPDATE ____

CONTRACT NO. 92-655 WA 15 DATE: 9/17/93

CONTACT NAME: EPA Project - Chaney Cement RECEIVED BY: ____

PROJECT MANAGER: Ken Appell / Tony Underwood BLANKS INCLUDED W/ NOTIFICATION: (1) Blank

EXPECTED DATE OF SAMPLE DELIVERY: Monday 9/20/93

REQUESTED DATE OF REPORT: End of Month 10/1/93.

* Hours Billed in this Pay period if Possible.

EPA METHOD	# OF RUNS	TYPE OF SAMPLE	SAMPLES/ RUN	ANALYSIS FOR	METHOD OF ANALYSIS	DETECTION LIMIT
201A	9	FILTER (6)	3 INDIVIDUAL	Arsenic, Be, Cadmium,	Metals	Lowest Possible
			3 COMBINATIONS	Chromium, Lead,		
				Manganese, Mercury		
		PROCESS (2)		Nickel, Phosphorus		
				Selenium		
		BLANK (1)	1 INDIVIDUAL			

92-655 WA 15
EPA -
Keep track of hours

COMMENTS: INDIVIDUAL FILTERS : INLET RUN 7, Run 5, Run 18
COMBO FILTERS FOR ANALYSIS: INLET R2, 4, 9, 14, 15
INLET R10, 11, 12, 13,
OUTLET R 2, 3, 4
2 PROCESS GRAB SAMPLES LABELED : - NEW CEM
- LEHIGH

Proudly serving industry and government since 1973. Providing: Toxic Emission Measurement & Control

A subsidiary of ETS International, Inc.

September 20, 1993

Ms. Cheryl Daniel
ETS Analytical Services, Inc.
1401 Municipal Road, N.W.
Roanoke, VA 24012

RE: ETS, Inc. Contract #92-655 WA 15
EPA Contract for Chaney Cement
9 Samples for Metals Analysis

ETS, Inc. and ETSAS, Inc. to charge Hours to EPA Contract #92-655 WA15

Dear Cheryl,

This letter accompanies 25 sample runs to be combined as follows for metals analysis, making a total of 9 actual samples for analysis.

Run Numbers	Sample Type	Analysis Mode
TL - R7	Lehigh Silo Filling Only	Single filter
TL - R2,4,9,14,15,16	Dry Loading Only	Combined Filter
TL - R10,11,12,13,17	Central Mix Only	Combined Filter
TL - R5	Newchem & Truck Loading	Single Filter
TL - R18	Newchem & Truck Loading	Single Filter
CF - R2,3,4	Outlet/Various Combinations	Combined Filter
BLNK - R0	Field Blank	Single Filter
Newchem	Process Sample	Composite
Lehigh Cement	Process Sample	Composite

Ten (10) target metals to be tested for are:

Arsenic	Chromium	Nickel
Beryllium	Lead	Phosphorus
Cadmium	Manganese	Selenium
	Mercury	

These samples require a 17 (seventeen) calendar day turnaround - please forward results to Project Manager Ken Appell, or Sample Manager Terry Williamson.

Sincerely,

Pamela J. Broadwell

Pamela J. Broadwell
Sample Prep/Technician

APPENDIX D.4
SIEVE AND MOISTURE LABORATORY DATA

DUST MOISTURE CONTENT

ETS CONTRACT: 92-655 WA 15
SITE : CHANEY ENTERPRISES

ETS ID	CLIENT ID	SAMPLE TYPE	CRUCIBLE INT. WT. (grams)	CRUCIBLE+DUST INT. WT. (grams)	CRUCIBLE+DUST WT.AFTER DRYING (grams)		% MOISTURE
6166D	S-77-003-023	COURSE CHANEY STONE	64.5860	133.2718	131.1924		3.03
			67.6537	124.1940	122.1947		3.54
						AVG.	3.28
6167D	S-77-003-024	COURSE BLACK AGGREGATE	67.1700	132.7634	132.3868		0.57
			64.4239	142.9217	142.4082		0.65
						AVG.	0.61
6168D	S-77-003-025	ROAD MATERIAL #1	64.5483	155.9046	153.8182		2.28
	S-77-003-026	(20'x20' CONCRETE SECTION)	71.7035	147.3621	145.6465		2.27
	S-77-003-027					AVG.	2.28
	S-77-003-028						
6169D	S-77-003-029	ROAD MATERIAL #2	64.9363	154.4158	152.0111		2.69
	S-77-003-030	(5'x5' UNPAVED DRIVEWAY)	64.3879	150.3888	148.2731		2.46
	S-77-003-031					AVG.	2.57
	S-77-003-032						
6170D	S-77-003-033	ROAD MATERIAL #3	65.1522	144.9826	142.1004		3.61
	S-77-003-034	(4'x4' UNPAVED DRIVEWAY)	67.4042	141.2610	138.3855		3.89
						AVG.	3.75
6171D	S-77-003-035	ROAD MATERIAL #4	64.6324	157.8009	156.8489		1.02
	S-77-003-036	(8'x14' CONCRETE SECTION)	64.7574	156.7083	155.6268		1.18
	S-77-003-037					AVG.	1.10
	S-77-003-038						
6172D	S-77-003-020	SAND #1	67.1710	141.5891	137.9856		4.84
			65.0070	138.8816	135.2495		4.92
						AVG.	4.88
6173D	S-77-003-021	SAND #2	77.0103	149.4062	145.9804		4.73
			64.3271	151.0175	146.6835		5.00
						AVG.	4.87
6174D	S-77-003-022	SAND #3	64.2192	152.1243	147.4744		5.29
			64.7696	145.7578	141.5290		5.22
						AVG.	5.26
6175D	S-77-003-041	LEHIGH CEMENT	64.8418	116.2033	116.1378		0.13
			67.1245	114.3182	114.2585		0.13
						AVG.	0.13
6176D	S-77-003-042	NEWCEM	66.3469	123.2025	123.1678		0.06
			67.2196	110.9859	110.9633		0.05
						AVG.	0.06

SAMPLE WEIGHTS

ETS CONTRACT: 92-655 WA 15
SITE : CHANEY ENTERPRISES

ETS ID	CLIENT ID	SAMPLE TYPE	SAMPLE WEIGHT (grams)	TOTAL WEIGHT (grams)
6166D	S-77-003-023	COURSE CHANEY STONE	30617	30617
6167D	S-77-003-024	COURSE BLACK AGGREGATE	27669	27669
6168D	S-77-003-025	ROAD MATERIAL #1	1588	5614
	S-77-003-026	(20'x20' CONCRETE SECTION)	1474	
	S-77-003-027		1531	
	S-77-003-028		1021	
6169D	S-77-003-029	ROAD MATERIAL #2	8958	30618
	S-77-003-030	(5'x5' UNPAVED DRIVEWAY)	3289	
	S-77-003-031		9299	
	S-77-003-032		9072	
6170D	S-77-003-033	ROAD MATERIAL #3	8902	18371
	S-77-003-034	(4'x4' UNPAVED DRIVEWAY)	9469	
6171D	S-77-003-035	ROAD MATERIAL #4	794	6124
	S-77-003-036	(8'x14' CONCRETE SECTION)	1928	
	S-77-003-037		1814	
	S-77-003-038		1588	
6172D	S-77-003-020	SAND #1	1531	1531
6173D	S-77-003-021	SAND #2	1474	1474
6174D	S-77-003-022	SAND #3	1474	1474
6175D	S-77-003-041	LEHIGH CEMENT	1021	1021
6176D	S-77-003-042	NEWCEM	964	964

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : COURSE CHANEY STONE
SAMPLE ID : S-77-003-023
ETS ID : 6166D

AS-IS SAMPLE WT.(grams):
SAMPLE A : 125.7098
SAMPLE B : 118.7805
SAMPLE C : 104.0029

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE : 1000 MICRONS	A	124.8946	0.6485
	B	118.3313	0.3782
	C	102.5789	1.3692
	AVERAGE		0.7986
20 MESH SAMPLE : 850 MICRONS	A	0.0459	0.6120
	B	0.0199	0.3614
	C	0.0907	1.2820
	AVERAGE		0.7518
25 MESH SAMPLE : 710 MICRONS	A	0.0385	0.5813
	B	0.0266	0.3390
	C	0.0915	1.1940
	AVERAGE		0.7048
30 MESH SAMPLE) : 600 MICRONS	A	0.0425	0.5475
	B	0.0212	0.3212
	C	0.0945	1.1031
	AVERAGE		0.6573
35 MESH SAMPLE : 500 MICRONS	A	0.0381	0.5172
	B	0.0027	0.3189
	C	0.1086	0.9987
	AVERAGE		0.6116
60 MESH SAMPLE : 250 MICRONS	A	0.1989	0.3590
	B	0.1162	0.2211
	C	0.4291	0.5861
	AVERAGE		0.3887
80 MESH SAMPLE : 180 MICRONS	A	0.0988	0.2804
	B	0.0525	0.1769
	C	0.1638	0.4286
	AVERAGE		0.2953
100 MESH SAMPLE : 150 MICRONS	A	0.0444	0.2451
	B	0.0204	0.1597
	C	0.0721	0.3593
	AVERAGE		0.2547
200 MESH SAMPLE : 75 MICRONS	A	0.1364	0.1366
	B	0.0741	0.0973
	C	0.1807	0.1856
	AVERAGE		0.1398

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : COURSE BLACK AGGREGATE
SAMPLE ID : S-77-003-024
ETS ID : 6167D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 103.5015
SAMPLE B : 102.1805
SAMPLE C : 99.428

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE :	A	102.8546	0.6250
1000 MICRONS	B	101.5519	0.6152
	C	98.6712	0.7612
	AVERAGE		0.6671
20 MESH SAMPLE :	A	0.0527	0.5741
850 MICRONS	B	0.0395	0.5765
	C	0.0502	0.7107
	AVERAGE		0.6204
25 MESH SAMPLE :	A	0.0422	0.5333
710 MICRONS	B	0.0294	0.5478
	C	0.0392	0.6712
	AVERAGE		0.5841
30 MESH SAMPLE :	A	0.0277	0.5066
600 MICRONS	B	0.023	0.5252
	C	0.0337	0.6373
	AVERAGE		0.5564
35 MESH SAMPLE :	A	0.0288	0.4787
500 MICRONS	B	0.0232	0.5025
	C	0.0218	0.6154
	AVERAGE		0.5322
60 MESH SAMPLE :	A	0.0874	0.3943
250 MICRONS	B	0.0879	0.4165
	C	0.0934	0.5215
	AVERAGE		0.4441
80 MESH SAMPLE :	A	0.0312	0.3641
180 MICRONS	B	0.0297	0.3875
	C	0.0328	0.4885
	AVERAGE		0.4134
100 MESH SAMPLE :	A	0.0127	0.3519
150 MICRONS	B	0.0114	0.3763
	C	0.0234	0.4650
	AVERAGE		0.3977
200 MESH SAMPLE :	A	0.0455	0.3079
75 MICRONS	B	0.0445	0.3327
	C	0.0449	0.4198
	AVERAGE		0.3535

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : ROAD MATERIAL #1
SAMPLE ID : S-77-003-025, S-77-003-026
S-77-003-027, S-77-003-028
ETS ID : 6168D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 88.9037
SAMPLE B : 91.2554
SAMPLE C : 90.3571

		SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE	:	A	17.3670	80.4654
1000 MICRONS		B	17.4974	80.8259
		C	17.2641	80.8935
		AVERAGE		80.7283
20 MESH SAMPLE	:	A	2.8100	77.3047
850 MICRONS		B	2.9129	77.6339
		C	3.0202	77.5510
		AVERAGE		77.4965
25 MESH SAMPLE	:	A	3.2978	73.5952
710 MICRONS		B	3.2070	74.1196
		C	3.3042	73.8941
		AVERAGE		73.8696
30 MESH SAMPLE	:	A	3.4920	69.6674
600 MICRONS		B	3.5277	70.2538
		C	3.6205	69.8873
		AVERAGE		69.9362
35 MESH SAMPLE	:	A	4.9391	64.1118
500 MICRONS		B	4.9014	64.8827
		C	5.0259	64.3250
		AVERAGE		64.4399
60 MESH SAMPLE	:	A	22.1645	39.1809
250 MICRONS		B	21.5662	41.2499
		C	21.1870	40.8769
		AVERAGE		40.4359
80 MESH SAMPLE	:	A	7.5646	30.6722
180 MICRONS		B	7.6197	32.9001
		C	7.2937	32.8048
		AVERAGE		32.1257
100 MESH SAMPLE	:	A	2.5520	27.8017
150 MICRONS		B	2.5239	30.1343
		C	2.7517	29.7595
		AVERAGE		29.2318
200 MESH SAMPLE	:	A	11.1765	15.2302
75 MICRONS		B	11.1112	17.9584
		C	11.0441	17.5368
		AVERAGE		16.9084

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : ROAD MATERIAL #2
SAMPLE ID : S-77-003-029, S-77-003-030
S-77-003-031, S-77-003-032
ETS ID : 6169D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 115.5966
SAMPLE B : 114.9551
SAMPLE C : 131.5139

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE :	A	81.8541	29.1899
1000 MICRONS	B	83.6407	27.2405
	C	81.4507	38.0669
	AVERAGE		31.4991
20 MESH SAMPLE :	A	1.5988	27.8068
850 MICRONS	B	1.7638	25.7062
	C	2.5077	36.1601
	AVERAGE		29.8910
25 MESH SAMPLE :	A	1.8351	26.2193
710 MICRONS	B	1.9000	24.0534
	C	2.7907	34.0381
	AVERAGE		28.1036
30 MESH SAMPLE :	A	2.0000	24.4891
600 MICRONS	B	1.9722	22.3378
	C	3.0135	31.7467
	AVERAGE		26.1912
35 MESH SAMPLE :	A	2.7293	22.1281
500 MICRONS	B	2.5596	20.1112
	C	3.9606	28.7351
	AVERAGE		23.6581
60 MESH SAMPLE :	A	11.8615	11.8670
250 MICRONS	B	10.4629	11.0094
	C	16.0260	16.5494
	AVERAGE		13.1419
80 MESH SAMPLE :	A	0.4745	11.4565
180 MICRONS	B	2.2633	9.0406
	C	4.9254	12.8042
	AVERAGE		11.1004
100 MESH SAMPLE :	A	1.2160	10.4045
150 MICRONS	B	1.2781	7.9287
	C	1.7790	11.4515
	AVERAGE		9.9283
200 MESH SAMPLE :	A	3.3828	7.4782
75 MICRONS	B	3.2248	5.1235
	C	7.4440	5.7913
	AVERAGE		6.1310

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : ROAD MATERIAL #3
SAMPLE ID : S-77-003-033, S-77-003-034
ETS ID : 6170D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 101.3473
SAMPLE B : 102.6210
SAMPLE C : 129.4660

		SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE	:	A	62.1036	38.7220
1000 MICRONS		B	59.2837	42.2304
		C	58.2314	55.0219
		AVERAGE		45.3248
20 MESH SAMPLE	:	A	1.3511	37.3889
850 MICRONS		B	1.6892	40.5844
		C	2.2804	53.2605
		AVERAGE		43.7446
25 MESH SAMPLE	:	A	1.5130	35.8960
710 MICRONS		B	2.0080	38.6277
		C	2.4896	51.3375
		AVERAGE		41.9537
30 MESH SAMPLE	:	A	1.8101	34.1099
600 MICRONS		B	2.2708	36.4149
		C	3.1192	48.9282
		AVERAGE		39.8177
35 MESH SAMPLE	:	A	2.5658	31.5782
500 MICRONS		B	3.2957	33.2033
		C	4.8496	45.1824
		AVERAGE		36.6547
60 MESH SAMPLE	:	A	12.5303	19.2145
250 MICRONS		B	14.1565	19.4084
		C	22.0163	28.1769
		AVERAGE		22.2666
80 MESH SAMPLE	:	A	3.9041	15.3623
180 MICRONS		B	4.6452	14.8818
		C	7.5843	22.3188
		AVERAGE		17.5210
100 MESH SAMPLE	:	A	1.4039	13.9771
150 MICRONS		B	1.5778	13.3443
		C	4.4830	18.8561
		AVERAGE		15.3925
200 MESH SAMPLE	:	A	5.4674	8.5824
75 MICRONS		B	5.9067	7.5885
		C	9.7237	11.3454
		AVERAGE		9.1721

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : ROAD MATERIAL #4
SAMPLE ID : S-77-003-035, S-77-003-036
S-77-003-037, S-77-003-038
ETS ID : 6171D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 107.3682
SAMPLE B : 82.7396
SAMPLE C : 61.8609

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE :	A	36.6120	65.9005
1000 MICRONS	B	28.9636	64.9943
	C	17.4354	71.8152
	AVERAGE		67.5700
20 MESH SAMPLE :	A	3.1019	63.0115
850 MICRONS	B	2.3158	62.1954
	C	1.6333	69.1749
	AVERAGE		64.7939
25 MESH SAMPLE :	A	3.2209	60.0116
710 MICRONS	B	2.5163	59.1541
	C	1.8792	66.1371
	AVERAGE		61.7676
30 MESH SAMPLE :	A	3.5639	56.6923
600 MICRONS	B	2.6595	55.9398
	C	2.1364	62.6835
	AVERAGE		58.4386
35 MESH SAMPLE :	A	4.6447	52.3663
500 MICRONS	B	3.6217	51.5626
	C	2.9467	57.9201
	AVERAGE		53.9497
60 MESH SAMPLE :	A	20.5645	33.2131
250 MICRONS	B	16.0174	32.2038
	C	13.1700	36.6304
	AVERAGE		34.0158
80 MESH SAMPLE :	A	6.7187	26.9555
180 MICRONS	B	4.9367	26.2373
	C	4.2497	29.7606
	AVERAGE		27.6511
100 MESH SAMPLE :	A	2.4891	24.6372
150 MICRONS	B	2.3716	23.3709
	C	2.0530	26.4419
	AVERAGE		24.8167
200 MESH SAMPLE :	A	12.1117	13.3567
75 MICRONS	B	10.5435	10.6279
	C	10.0849	10.1394
	AVERAGE		11.3746

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : SAND #1
SAMPLE ID : S-77-003-020
ETS ID : 6172D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 65.6162
SAMPLE B : 49.6691
SAMPLE C : 63.0473

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE :	A	22.5231	65.6745
1000 MICRONS	B	13.8081	72.1998
	C	21.7428	65.5135
	AVERAGE		67.7959
20 MESH SAMPLE :	A	2.3771	62.0517
850 MICRONS	B	1.8849	68.4049
	C	2.3793	61.7397
	AVERAGE		64.0654
25 MESH SAMPLE :	A	2.9240	57.5955
710 MICRONS	B	2.3655	63.6424
	C	2.7069	57.4462
	AVERAGE		59.5614
30 MESH SAMPLE :	A	3.1784	52.7516
600 MICRONS	B	2.6779	58.2509
	C	2.8927	52.8581
	AVERAGE		54.6202
35 MESH SAMPLE :	A	4.6383	45.6828
500 MICRONS	B	4.0153	50.1668
	C	4.1040	46.3487
	AVERAGE		47.3994
60 MESH SAMPLE :	A	21.8546	12.3761
250 MICRONS	B	17.7650	14.4001
	C	19.8954	14.7924
	AVERAGE		13.8562
80 MESH SAMPLE :	A	4.6734	5.2537
180 MICRONS	B	4.0318	6.2828
	C	4.9658	6.9161
	AVERAGE		6.1509
100 MESH SAMPLE :	A	1.1122	3.5587
150 MICRONS	B	1.0021	4.2652
	C	1.1611	5.0744
	AVERAGE		4.2995
200 MESH SAMPLE :	A	1.2985	1.5798
75 MICRONS	B	1.2722	1.7039
	C	1.8242	2.1811
	AVERAGE		1.8216

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : SAND #2
SAMPLE ID : S-77-003-021
ETS ID : 6173D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 68.0576
SAMPLE B : 52.9852
SAMPLE C : 56.8493

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE : 1000 MICRONS	A	23.2034	65.9062
	B	20.8235	60.6994
	C	18.9779	66.6172
	AVERAGE		64.4076
20 MESH SAMPLE : 850 MICRONS	A	2.6786	61.9704
	B	1.4552	57.9530
	C	2.0899	62.9410
	AVERAGE		60.9548
25 MESH SAMPLE : 710 MICRONS	A	3.0578	57.4775
	B	2.2709	53.6671
	C	2.3563	58.7962
	AVERAGE		56.6469
30 MESH SAMPLE : 600 MICRONS	A	3.3992	52.4829
	B	2.4611	49.0222
	C	2.7072	54.0341
	AVERAGE		51.8464
35 MESH SAMPLE : 500 MICRONS	A	4.7323	45.5295
	B	3.4600	42.4921
	C	3.7943	47.3598
	AVERAGE		45.1271
60 MESH SAMPLE : 250 MICRONS	A	22.4281	12.5749
	B	15.6087	13.0335
	C	18.9957	13.9456
	AVERAGE		13.1847
80 MESH SAMPLE : 180 MICRONS	A	4.9191	5.3471
	B	3.4323	6.5556
	C	4.0220	6.8708
	AVERAGE		6.2578
100 MESH SAMPLE : 150 MICRONS	A	1.2460	3.5163
	B	1.0039	4.6609
	C	1.2159	4.7320
	AVERAGE		4.3031
200 MESH SAMPLE : 75 MICRONS	A	1.4822	1.3384
	B	0.4618	3.7894
	C	1.4618	2.1606
	AVERAGE		2.4295

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : SAND #3
SAMPLE ID : S-77-003-022
ETS ID : 6174D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 64.8829
SAMPLE B : 60.5951
SAMPLE C : 88.3700

		SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE	:	A	24.1272	62.8142
1000 MICRONS		B	21.5506	64.4351
		C	25.8990	70.6925
		AVERAGE		65.9806
20 MESH SAMPLE	:	A	2.5161	58.9363
850 MICRONS		B	2.2224	60.7675
		C	3.1296	67.1511
		AVERAGE		62.2850
25 MESH SAMPLE	:	A	2.8357	54.5658
710 MICRONS		B	2.6742	56.3542
		C	3.9591	62.6709
		AVERAGE		57.8637
30 MESH SAMPLE	:	A	3.4613	49.2312
600 MICRONS		B	3.1390	51.1739
		C	4.6834	57.3712
		AVERAGE		52.5921
35 MESH SAMPLE	:	A	4.7134	41.9667
500 MICRONS		B	4.4916	43.7615
		C	6.7602	49.7213
		AVERAGE		45.1498
60 MESH SAMPLE	:	A	19.4577	11.9777
250 MICRONS		B	19.0593	12.3079
		C	30.4468	15.2675
		AVERAGE		13.1844
80 MESH SAMPLE	:	A	4.1259	5.6187
180 MICRONS		B	3.9310	5.8206
		C	6.6636	7.7269
		AVERAGE		6.3888
100 MESH SAMPLE	:	A	1.0640	3.9789
150 MICRONS		B	0.4627	5.0570
		C	2.1868	5.2523
		AVERAGE		4.7627
200 MESH SAMPLE	:	A	1.2603	2.0364
75 MICRONS		B	1.0926	3.2539
		C	2.7573	2.1322
		AVERAGE		2.4742

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : LEHIGH CEMENT
SAMPLE ID : S-77-003-041
ETS ID : 6175D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 37.8118
SAMPLE B : 33.4625
SAMPLE C : 62.8966

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE : 1000 MICRONS	A	0.0000	100.0000
	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
20 MESH SAMPLE : 850 MICRONS	A	0.0000	100.0000
	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
25 MESH SAMPLE : 710 MICRONS	A	0.0000	100.0000
	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
30 MESH SAMPLE : 600 MICRONS	A	0.0000	100.0000
	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
35 MESH SAMPLE : 500 MICRONS	A	0.0000	100.0000
	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
60 MESH SAMPLE : 250 MICRONS	A	0.0300	99.9207
	B	0.0000	100.0000
	C	0.0179	99.9715
	AVERAGE		99.9641
80 MESH SAMPLE : 180 MICRONS	A	0.0241	99.8569
	B	0.0000	100.0000
	C	0.0182	99.9426
	AVERAGE		99.9332
100 MESH SAMPLE : 150 MICRONS	A	0.0067	99.8392
	B	0.0195	99.9417
	C	0.0188	99.9127
	AVERAGE		99.8979
200 MESH SAMPLE : 75 MICRONS	A	0.1547	99.4301
	B	0.1394	99.5251
	C	0.2690	99.4850
	AVERAGE		99.4801

SIEVE ANALYSIS RESULTS FOR EPA - CHANEY ENTERPRISES

ETS CONTRACT : 92-655 WA 15
SAMPLE TYPE : NEWCEM
SAMPLE ID : S-77-003-042
ETS ID : 6176D

AS-IS SAMPLE WT.(grams) :
SAMPLE A : 45.2652
SAMPLE B : 45.7977
SAMPLE C : 53.3226

	SAMPLE	SAMPLE WEIGHT (grams)	PERCENT LESS THAN
18 MESH SAMPLE :	A	0.0000	100.0000
1000 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
20 MESH SAMPLE :	A	0.0000	100.0000
850 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
25 MESH SAMPLE :	A	0.0000	100.0000
710 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
30 MESH SAMPLE :	A	0.0000	100.0000
600 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
35 MESH SAMPLE :	A	0.0000	100.0000
500 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
60 MESH SAMPLE :	A	0.0000	100.0000
250 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
80 MESH SAMPLE :	A	0.0000	100.0000
180 MICRONS	B	0.0000	100.0000
	C	0.0000	100.0000
	AVERAGE		100.0000
100 MESH SAMPLE :	A	0.0000	100.0000
150 MICRONS	B	0.0000	100.0000
	C	0.0109	99.9796
	AVERAGE		99.9932
200 MESH SAMPLE :	A	0.5703	98.7401
75 MICRONS	B	0.1182	99.7419
	C	0.0409	99.9029
	AVERAGE		99.4616

APPENDIX E.0

PROCESS DATA (COMPILED BY EPA PERSONNEL)

APPENDIX E.1
OVERALL PROCESS OBSERVATIONS

RECEIVED DEC 2 7 1993

PROCESS OBSERVATIONS

From September 7, 1993 to September 10, 1993 particulate emission testing of the concrete batching operations at the Chaney Enterprises facility in Waldorf, Maryland was conducted. Ron Myers of the U.S Environmental Protection Agency Emission Inventory Branch and John Brown of the U.S Environmental Protection Agency Emission Measurement Branch documented the process operations during the test program. Plant personnel contacted to obtain this information included Dennis Stiner, Plant Manager and Jim Finotti, Plant Operator.

The facility consists of adjacent central mix and dry mix batch plants. Figure P1 is a plan view of the facility tested. Figure P2 is a picture of the exit end of the facility. Details of the picture are as following:

The delivery of cement or NEWCEM by tanker truck on is shown on the far left,

the aggregate storage building is behind and above the end of the delivery truck,

the dry batch side of the facility to the right of the aggregate storage building (a concrete delivery truck is being loaded in the bay),

the cement and NEWCEM storage silos are above the dry batch loading side of the facility,

the central mix side of the facility is to the right of the dry batch side,

the fabric filter which is the common control device for all of the facility is located between and in front of the dry batch and central mix alleys, and

the control and maintenance building is on the far right with the control room on the second floor.

Figures P3 and P4 are pictures of the exit and entrance views of the facility to show more detail of the dry batch and central mix plants.

The materials for both plants are handled together until just prior to being introduced into the central mix drum or the drum on the concrete mixing truck. The central mix drum is used only during high production days. In addition it can only be used for concretes which can be made with a relatively higher water content and for individual mixes of more that about 6 yards.

The typical operating times for the facility are from 6:00 a.m to 5:00 p.m., although the plant operates past 5:00 p.m. to complete orders of concrete that are required by customers. Raw materials for the concrete produced at the Waldorf facility include a variety of course aggregate, sand (fine aggregate), portland cement, ground granulated blast furnace slag (Newcem™), water and various admixes.

The sand that is used has a moisture content of about 6% and ranged from 4.4% to 8.8% during the test program. A moisture and sieve analysis is performed by the plant whenever concrete is produced for a job for the state of Maryland. The sieve analysis performed by the plant includes sieve sizes form 4 mesh to less than 100 mesh. During the test period three analysis were performed and the percentage of material passing the 100 mesh sieve was from 2.5 to 2.7 percent.

The course aggregate used at the plant includes No. 67 stone, No. 67 state-approved gravel, No. 57 Genstar™ blue stone, pea gravel and lightweight aggregate. The majority of the concrete is made with the No. 67 stone and the No. 57 blue stone Although sieve analysis were performed on the No. 67 state approved gravel used, the sieve sizes included analysis from 1 inch to 8 mesh only.

The sand and the course aggregates are stored in open bins which have bottom gates that open and pass the material to an underground conveyor. Material is added to the open bins with dump trucks or front end loaders. The conveyor transports the sand and course aggregate from the open bins to the top of one of six overhead feed bins. Two of the bins hold sand and the remaining four hold gravel. Directly below the feed bins is a scale which weighs the amounts of sand, gravel, cement and if required Newcem™ as required for the concrete being produced.

The production of concrete begins by adding about 75% of the required water for the mix into the central mixer or truck mixing drum. Following this water, the introduction of the course aggregate begins, followed by sand and then cement and Newcem™. The addition of the cement and Newcem™ stop first followed by the sand and the course aggregate. Lastly, the balance of the water is added to the drum.

A central fabric filter is used to control particulate emissions during silo filling, dry batch loading and central mix loading. The fabric filter was a Model No. RA 140 S - IS manufactured by C & W Manufacturing and Sales Co. Inc. in Mansfield, TX. The Fabric Filter module is shown at the center of Figure P3 between the dry batch and central mix alleys (adjacent to the drivers door of the concrete delivery truck which is in the dry batch alley). For dry batch loading, a movable hood system is lowered to partially enclosed the mix drum opening on the truck. Figure P5, P6, and P7 are pictures of the dry batch loading operations with the movable hood system down and extended. The air and fugitive particulate emissions surrounding drum opening are ducted to the fabric filter.

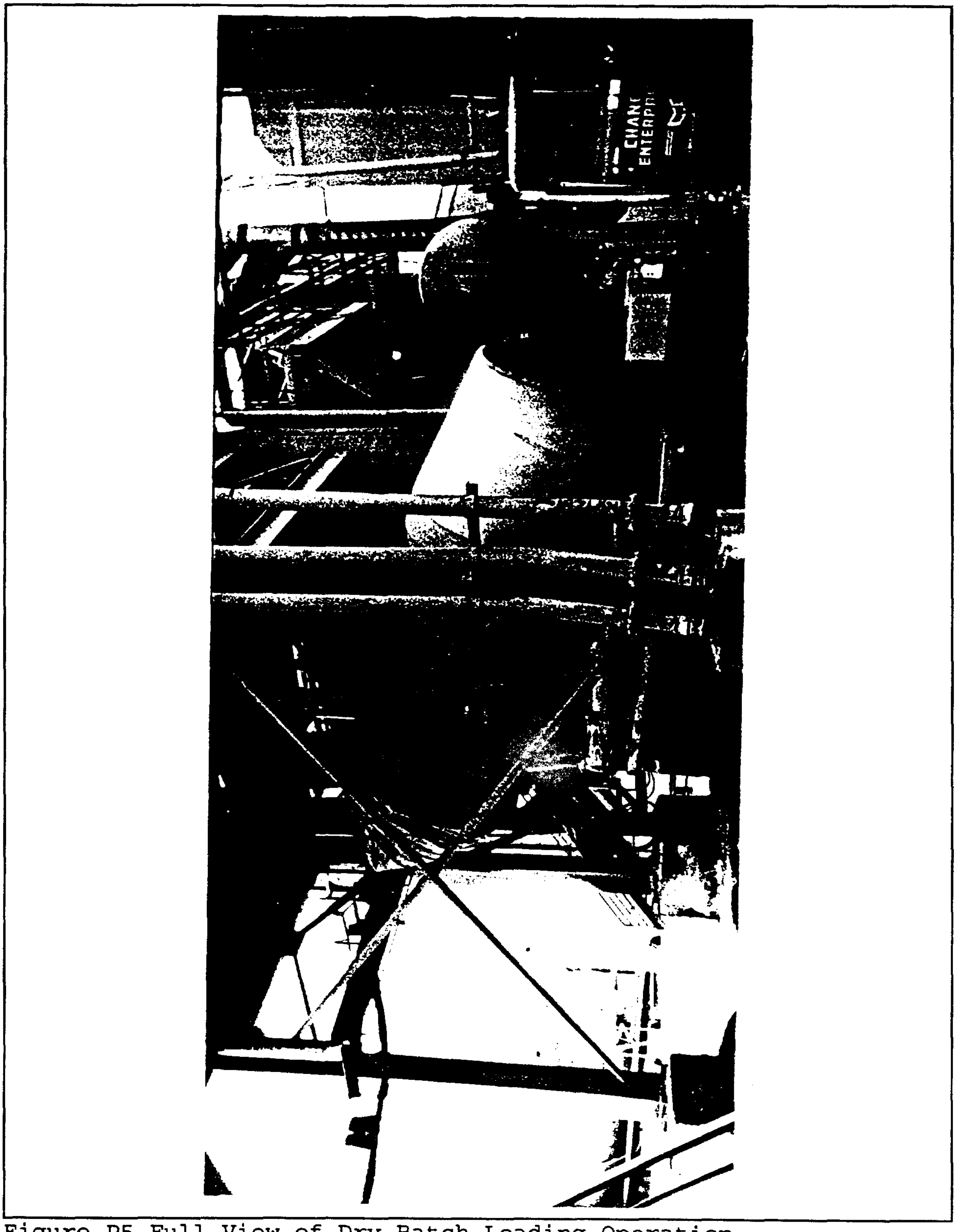


Figure P5 Full View of Dry Batch Loading Operation.

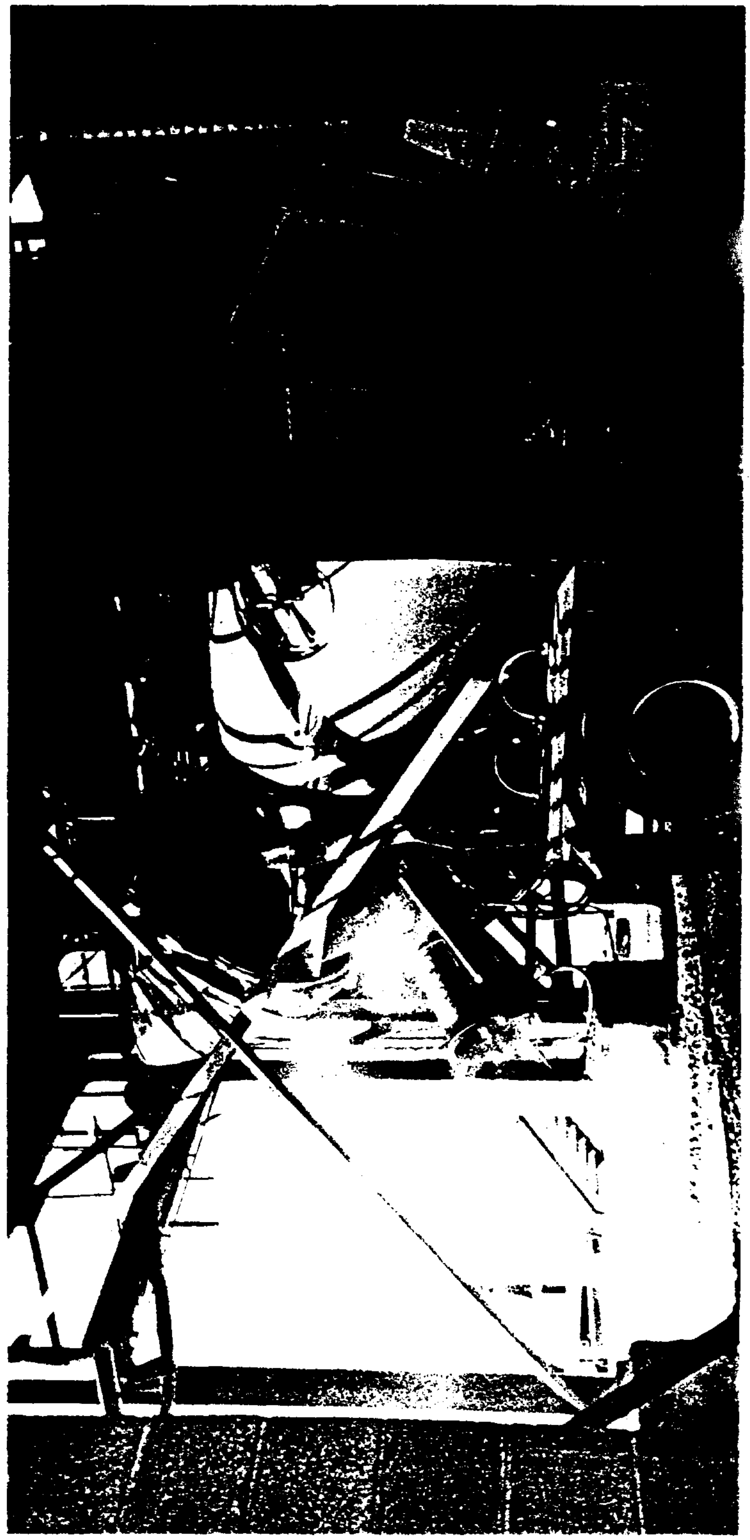


Figure P6 Close Up of Dry Batch Loading With Visible Dust Below Concrete Delivery Chute.

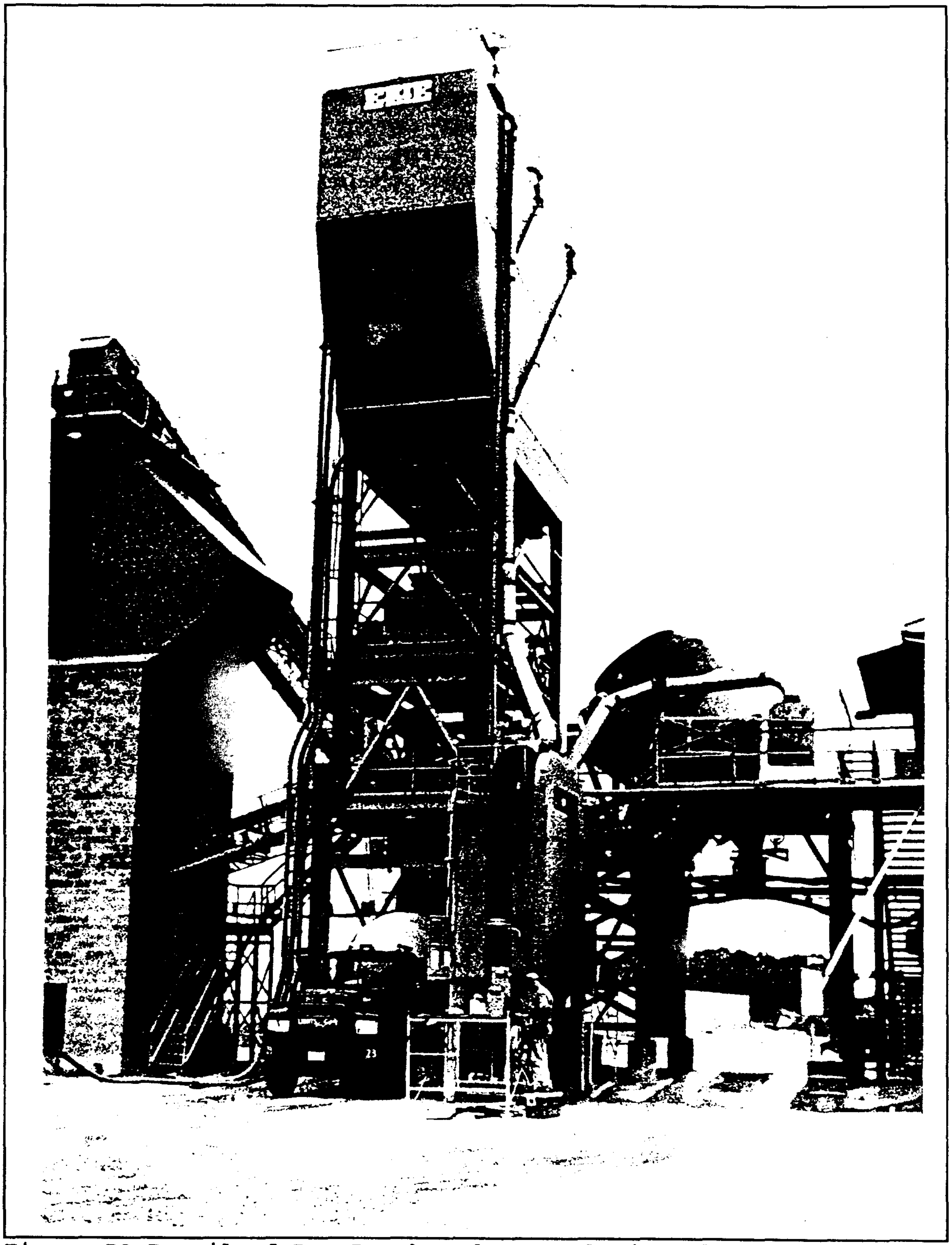


Figure P3 Detail of Dry Batch and Central Mix Alleys from Exit End of Facility.

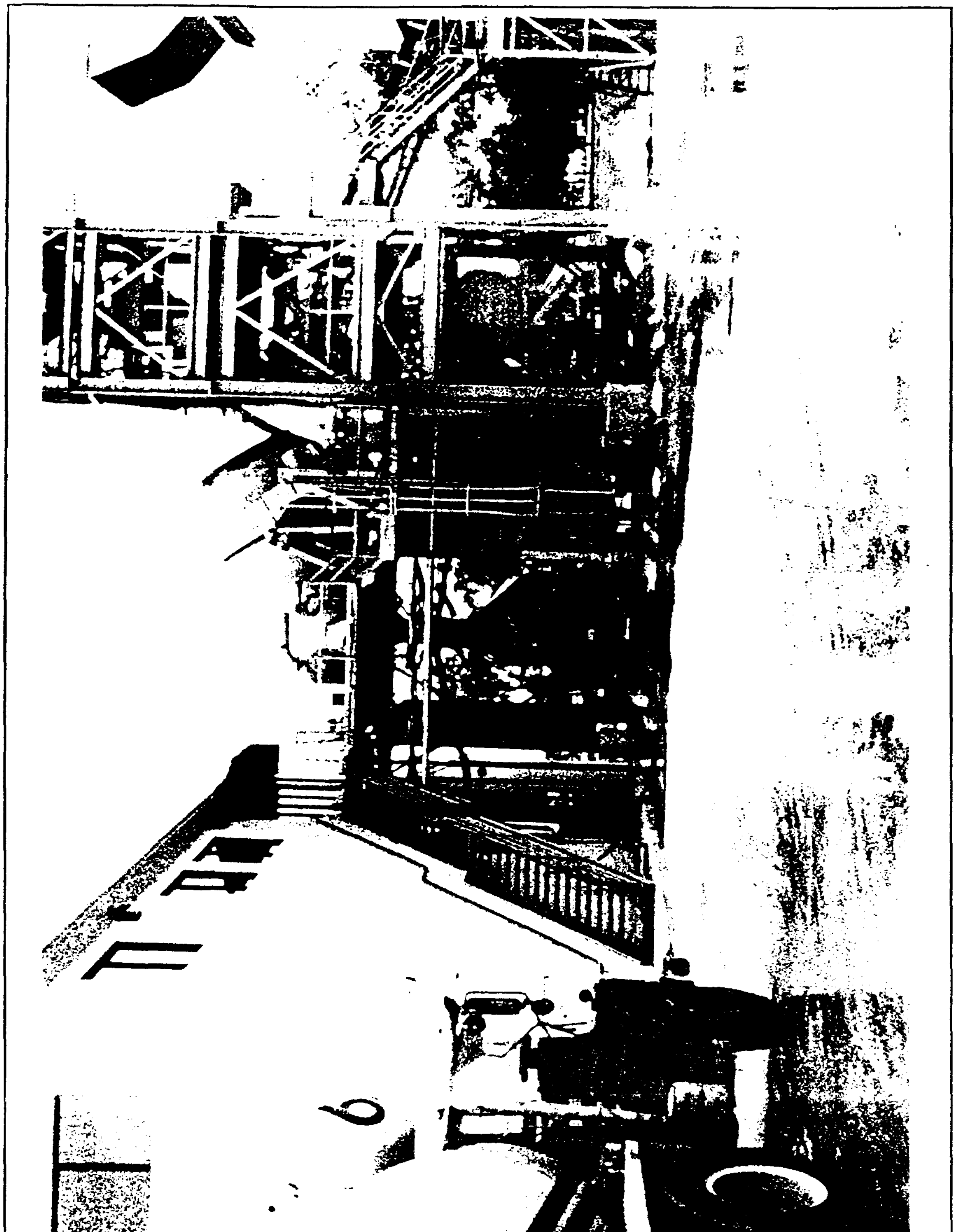


Figure P4 Detail of Dry Batch and Central Mix Alleys of Concrete Batch Facility shown from Entance Side.

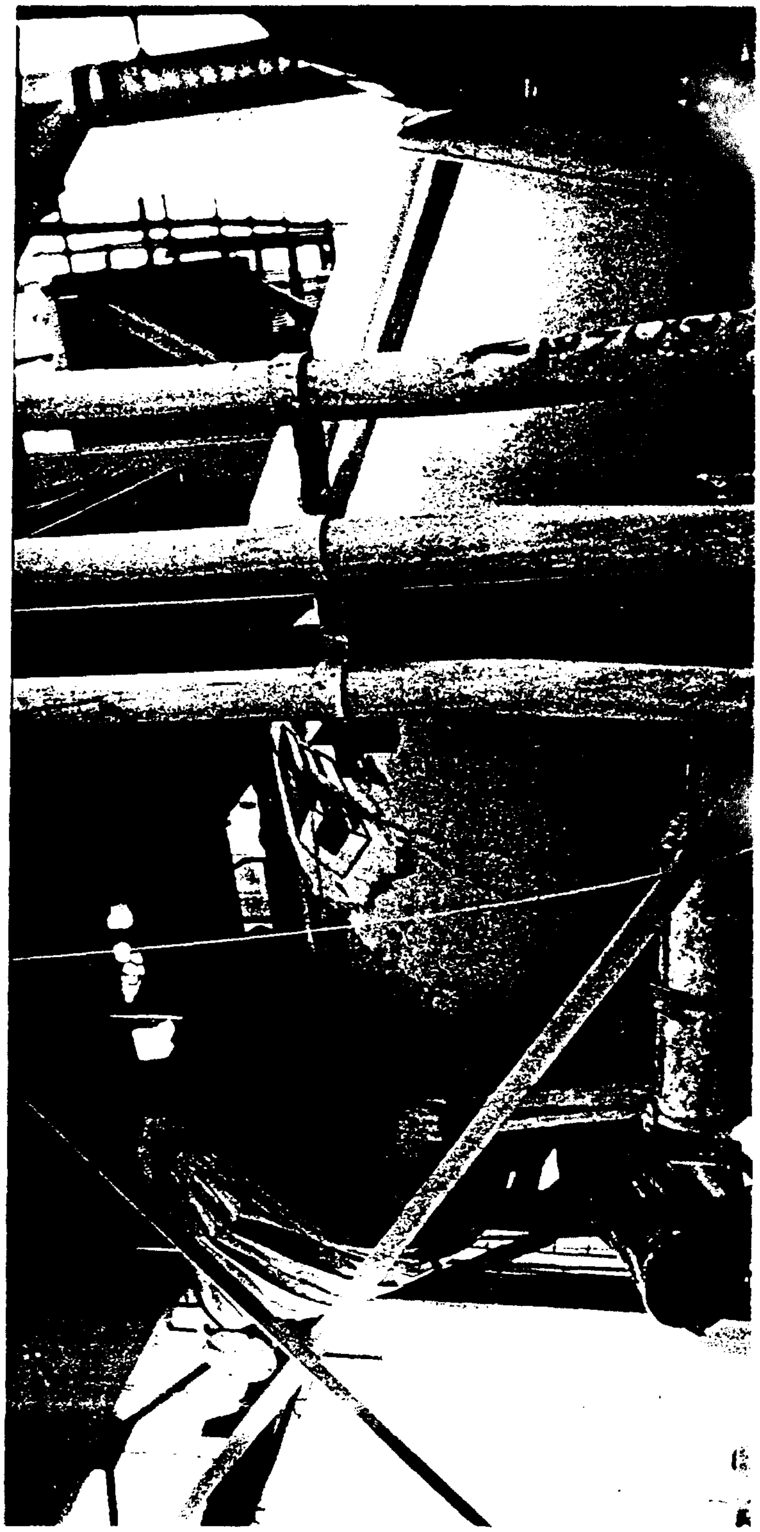


Figure P7 Close Up of Dry Batch Loading With Visible Dust Above Movable Hood System.

Figures P6 and P7 show some dust which was not captured by the hooding system. In Figure P6 the dust is visible above and to the left of the concrete delivery shute of the truck. In Figure P7 the dust is visible above and to the right of the hood system. Capture efficiency of the dry batch hooding system ranged from less than 50% capture to almost complete capture. It appeared that the capture of the particulate was sensitive to wind direction and speed. In addition, it appeared that newer truck designs allowed more effective capture of emissions. For central mix loading, a separate movable hood system is rotated to cover the exit opening of the central mix drum. This hood mates with the opening to effect a tight seal around the delivery opening of the drum. Air is therefore pulled through the central mix drum and capturing the particulate generated at the feed opening of the drum. Figure P8 is a picture of the central mix drum with the movable hood rotated to cover the concrete delivery opening of the drum.

Cement and Newcem™ are delivered by tanker trucks. A delivery operation is shown in Figure P2. The material is pneumatically transferred into one of three storage silos. Silo No. one is for Newcem™, silo No. two is for unspecified cement and silo No. three is for state specified cement. The air pump on site which is available for pneumatic transfer is a GARDENER DENVER Cyclo Blower (a Rootes type blower) which is rated at 535 CFM @ 2000 RPM at 20 psig. The blower is powered by a 50 Hp electric motor which turns at 1770 RPM. According to the plant manager, the typical maximum pressure used to transfer the material is 15 psig. The time to transfer the approximately 50,000 pounds of cement or Newcem™ to the silos ranged from 30 to 45 minutes.

During the testing period, information was collected on the time for each concrete batch to be specified, the raw materials used and concrete produced for each batch, the estimated capture efficiency of the ventilation system for the central mix and the dry mix loading systems, cement and Newcem™ delivery times, amount of material delivered and moisture and sieve analysis performed by the facility.

In addition, process material samples and roadway surface material were collected for moisture and sieve analysis. Four samples of the material on the roadways near the plant were collected by sweeping the material off of the surface.

> A 20 ft by 20 ft area of the paved area at the exit of the batch facility approximately 70 ft NW of the center of the drum mix ally was swept clean and placed in four one liter jars. The sample was labeled "sample 1 paved road material".

> A 5 ft by 5 ft area of unpaved road approximately 65 ft NNW of the center of the truck mix ally was swept of the surface

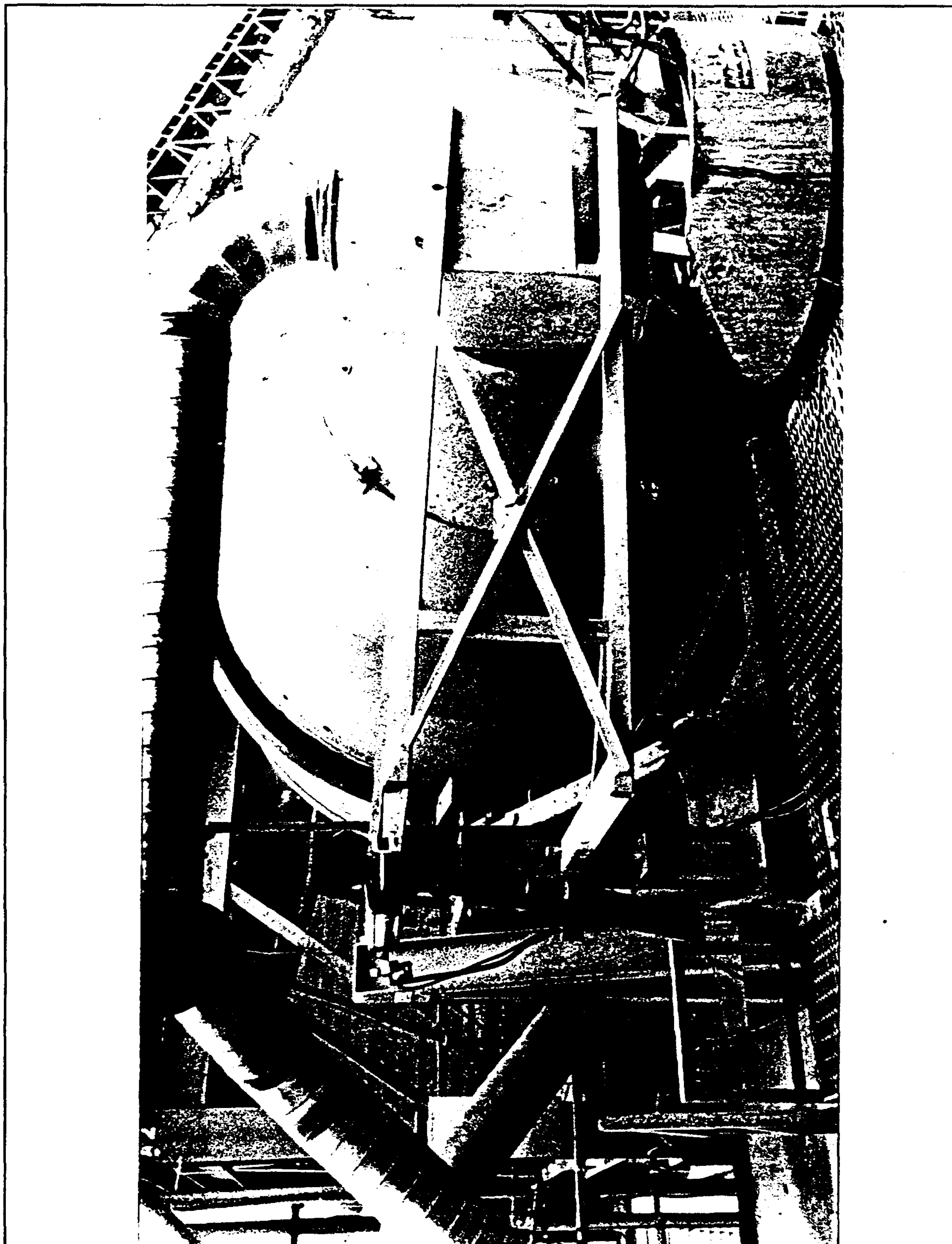


Figure P8 Central Mix Drum With Movable Hood System Over Concrete Delivery Opening.

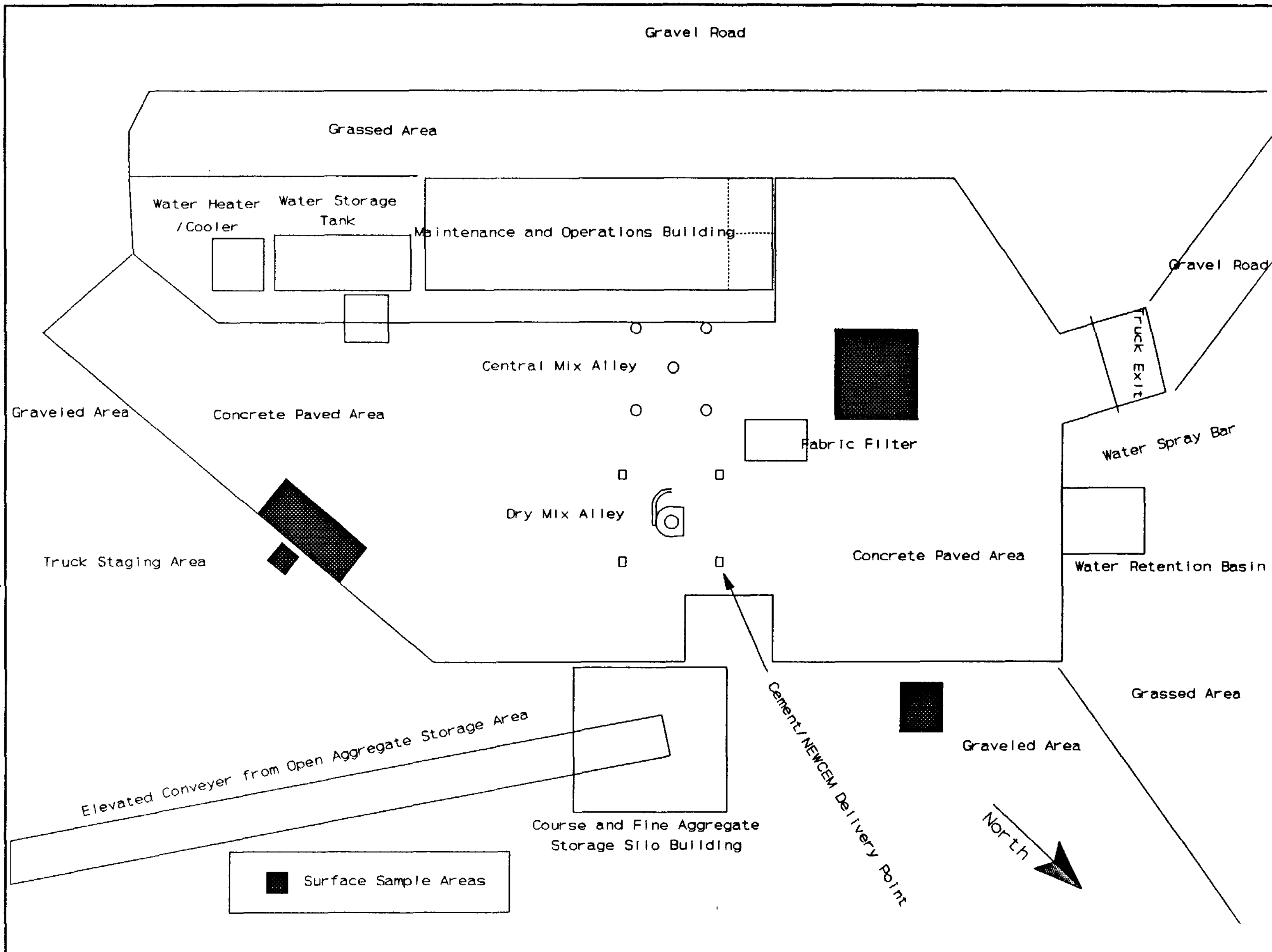


Figure P1. Plan view of Chaney Enterprises Waldorf, MD plant.

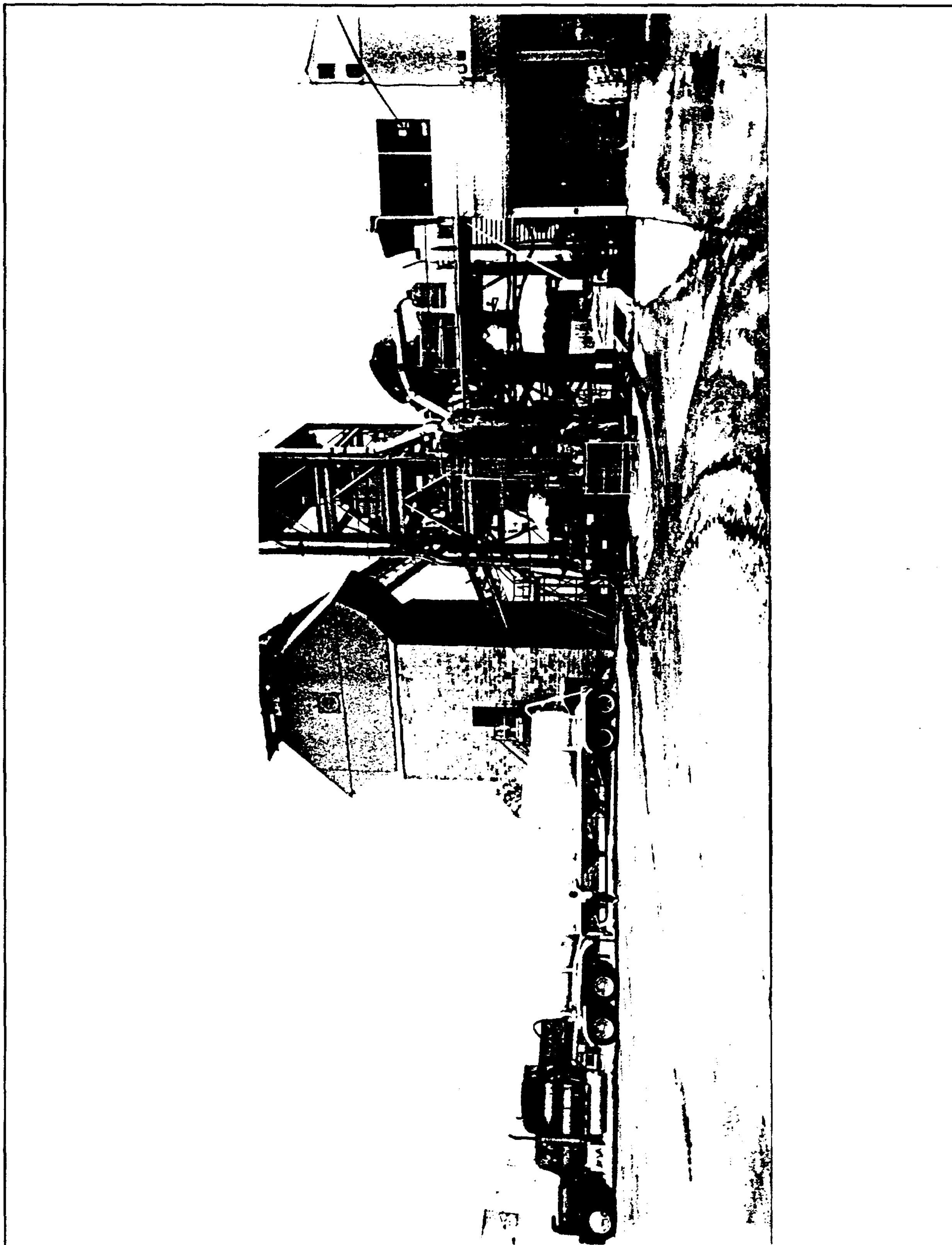


Figure P2 Full width view of exit side of Cheney Enterprises Waldorf, MD Concrete Batch Facility.

material and placed in four 6" diameter by 12" high plastic containers. The sample was labeled "sample 2 unpaved road material".

A 8 ft by 14.5 ft area of the paved area at the truck staging area located approximately 120 ft SE of the center of the truck mix ally was swept clean and placed in four one liter jars. The sample was labeled "sample 4 paved road material".

A 4 ft by 4 ft area of unpaved road approximately 125 ft SE of the center of the truck mix ally was swept of the surface material and placed in two 6" diameter by 12" high plastic containers. The sample was labeled "sample 3 unpaved road material".

Process materials collected included 1) a five gallon bucket of No. 67 course aggregate, 2) a five gallon bucket of No. 57 Genstar™ bluestone, 3) ~~tree~~ three one liter containers of sand, 4) a one liter sample of Lehigh cement and 5) a one liter sample of Newcem™.

Process information collected during each day of emission testing at Cheney Concrete Company batch facility number 1 in Waldorf, MD is as follows.

APPENDIX E.2
PROCESS DATA FROM 09/07/93

APPENDIX E.2.1
COMPILED PROCESS DATA

9/7/93

OUTLET EMISSION TESTING

Emission testing at the outlet of the fabric filter occurred during the following approximate times.

9:12 AM to 9:50 AM
11:07 AM to 11:46 AM
1:00 PM to 1:35 PM

during this period the following activities occurred:

9:12 - 9:50	Silo #2 was filled with 50,200 lbs of Lehigh portland cement using a pneumatic transfer system.
11:07 - 11:50	Silo #2 was filled with 50,000 lbs of Lehigh portland cement using a pneumatic transfer system.
1:00 - 1:35	Silo #2 was filled with 50,000 lbs of Lehigh portland cement using a pneumatic transfer system.

Dry batch loading of concrete delivery trucks was as follows:

At 9:23, truck #107 was filled with 3950# of cement and 0# of NEWCEM to make 7 yards of concrete.

At 9:28, truck #89 was filled with 2830# of cement and 0# of NEWCEM to make 5 yards of concrete.

At 9:34, truck #91 was filled with 3960# of cement and 0# of NEWCEM to make 6.5 yards of concrete.

At 9:38, truck #59 was filled with 560# of cement and 0# of NEWCEM to make 1 yards of concrete.

At 9:40, truck #60 was filled with 1120# of cement and 0# of NEWCEM to make 2 yards of concrete.

At 11:12, truck #70 was filled with 3800# of cement and 5050# of NEWCEM to make 9 yards of concrete.

At 11:17, truck #111 was filled with 3810# of cement and 5060# of NEWCEM to make 9 yards of concrete.

At 11:38, truck #69 was filled with 2250# of cement and 0# of NEWCEM to make 4 yards of concrete.

At 11:44, truck #57 was filled with 3930# of cement and 0# of NEWCEM to make 6 yards of concrete.

At 1:08, truck #51 was filled with 3740# of cement and 0# of NEWCEM to make 8 yards of concrete.

At 1:13, truck #59 was filled with 4560# of cement and 0# of NEWCEM to make 7.5 yards of concrete.

At 1:18, truck #105 was filled with 5040# of cement and 0# of NEWCEM to make 9 yards of concrete.

At 1:22, truck #81 (#2 on batching report) was filled with 4220# of cement and 0# of NEWCEM to make 9 yards of concrete.

At 1:28, truck #91 was filled with 5490# of cement and 0# of NEWCEM to make 9 yards of concrete.

At 1:33, truck #2 was filled with 2440# of cement and 0# of NEWCEM to make 4 yards of concrete.

A total of 150,200 lbs of cement was pneumatically transferred into silos and 51,700 lbs of dry cement and 10,110 lbs of NEWCEM were transferred into trucks during the outlet sampling times.

INLET EMISSION TESTING

Emission testing Run number 1 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
10:20 AM to 10:26 AM	6 min
11:14 AM to 11:25 AM	11 min
11:40 AM to 11:55 AM	15 min
12:10 PM to 12:24 PM	14 min
12:42 PM to 12:46 PM	4 min
1:11 PM to 1:26 PM	15 min
TOTAL	61 min

During this emission testing, cement was being pneumatically conveyed into silos during the second documented delivery for 11 minutes and during the third documented delivery for 15 minutes. The amount of cement transferred during these periods is estimated at

(50,000 #/43 min)*11 min = 12,790 lbs and

(50,000 #/35 min)* 15 min = 21,428 lbs

for a total of 34,218 lbs of cement.

Dry batch loading of concrete delivery trucks was as follows:

At 10:19, truck #64 was filled with 940# of cement and 0# of NEWCEM to make 2 yards of concrete.

At 10:22, truck #23 was filled with 2590# of cement and 0# of NEWCEM to make 5.5 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 11:12, truck #70 was filled with 3800# of cement and 5050# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 11:17, truck #111 (70 on batching report) was filled with 3810# of cement and 5060# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 11:38, truck #69 was filled with 2250# of cement and 0# of NEWCEM to make 4 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 11:44, truck #57 was filled with 3930# of cement and 0# of NEWCEM to make 6 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 11:48, truck #61 was filled with 1690# of cement and 0# of NEWCEM to make 3 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 12:07, truck #105 (61 on batching report) was filled with 5020# of cement and 0# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 12:12, truck #92 was filled with 2820# of cement and 0# of NEWCEM to make 6 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 12:16, truck #65 was filled with 1870# of cement and 0# of NEWCEM to make 3 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 12:20, truck #89 was filled with 1490# of cement and 0# of NEWCEM to make 3 yards of concrete. Approximately 80 to

90% of the dust generated by the batching operation was captured by the ventilation system.

At 12:40, truck #56 was filled with 850# of cement and 1130# of NEWCEM to make 2 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 1:08, truck #51 was filled with 3740# of cement and 0# of NEWCEM to make 8 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 1:13, truck #59 was filled with 4560# of cement and 0# of NEWCEM to make 7.5 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

At 1:18, truck #105 was filled with 5040# of cement and 0# of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 1:22, truck #81 (2 on batching report) was filled with 4220# of cement and 0# of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

Emission testing Run number 2 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
2:45 PM to 3:04 PM	6 min
3:14 PM to 3:17 PM	11 min
3:34 PM to 3:42 PM	15 min
TOTAL	32 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

At 2:46, truck #69 was filled with 1490# of cement and 2980# of NEWCEM to make 4.5 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 2:49, truck #23 was filled with 680# of cement and 0# of NEWCEM to make 1 yards of concrete. Approximately 80 to 90%

of the dust generated by the batching operation was captured by the ventilation system.

At 2:52, truck #56 was filled with 2340# of cement and 4640# of NEWCEM to make 9 yards of concrete. Approximately 50 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 2:59, truck #65 was filled with 2330# of cement and 4630# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 3:12, truck #70 was filled with 5060# of cement and 0# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 3:32, truck #105 was filled with 5050# of cement and 0# of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

The following pages include (1) a transcribed batching report log with operations during outlet times in bold, and operations during inlet testing shaded, (2) copies of the batching report generated by the plant, (3) Handwritten notes taken during observations of the operations, (4) copies of the bills of lading for cement delivered during testing operations and the PCC PLANT GRADATION WORKSHEET reporting moisture and sieve analysis results conducted by the plant on 9/7/93.

9/12/95 Dennis Stiner :

Outlet Sampling of FF started at 8:12 and unloading of Portland Cement into silo #2 started at the same time. Silo filling ended at 9:50. ~~###~~ 50,200# of cement from Lehigh was delivered.

@ 11:30
12:00
about
3 trucks
using
new cem

Inlet sampling during truck loading (reg load) started @ 10:20 ended @ 10:26

2 yd Truck #64
5.5 yd #23 approximately 80% (90) of the dust was captured by the hooding system.

stopped @ 10:26

Outlet sampling of FF resumed at 11:07 and unloading of ~~Lehigh~~ portland cement into silo #2 started at the same time. Silo filling ended at 11:50 sampling ended at 11:46 50,000# of cement transferred

Inlet sampling using new cem during truck loading started at 11:14 end @ 11:25

9 yd Truck #70 (14) approximately 70-80% of the dust was captured

9 yd Truck #111 approximately 70-80% of dust was captured

9/7/93 ②

Inlet sampling during truck loading of regular concrete sta 11:40 ended 11:55

4yd Truck #69 approximately 70-80% of dust emitted was captured by hoodin

6yd Truck #57 approximately 70-80% of dust emitted was captured by hooding

3yd Truck #61 approximately 70-80% of dust emitted was captured by hooding

Inlet sampling during truck loading of ~~regut~~ started at 12:10 ended at 12:24

9yd Truck #105 approximately 70-80% of dust was captured by hoodin

6yd Truck # 92 approximately 80-90% of dust was captured by hooding

3yd Truck # 65 approximately 80-90% of dust was captured by hoodin

3yd Truck #89 approximately 80-90% of dust was captured by hooding

9/7/93

Inlet sampling during truck loading started at 12:42

2 yd Truck # 56 approximately 70-80% of dust was collected by hooding

Outlet sampling during delivery of portland cement from Lehigh started at 1:00 and ended at about 1:35
50,000 # of cement transferred to silo #2

Inlet sampling during truck loading started at 1:11

8 yd Truck # 51 approximately 60-70% of dust was collected by hooding

7.5 yd Truck # 59 approximately 50-60% of dust was collected by hooding - dust was visible outside the hood as far forward as the drum bearing and from the ground to the lower part of the boot

9 yd Truck # 105 approximately 60-70% of dust was collected by hooding

9 yd Truck # 81 approximately 60-70% of dust was collected by hooding

9/17/93 (4)

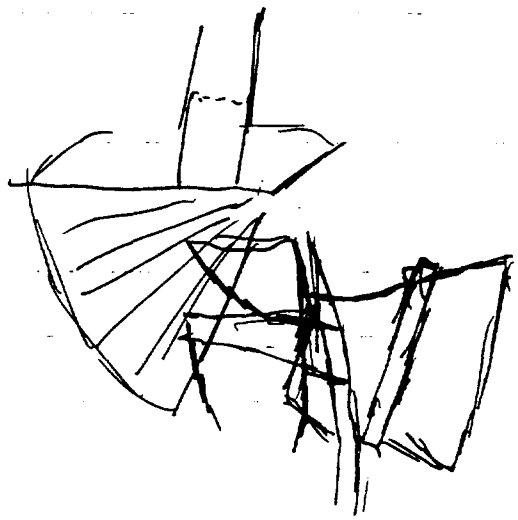
2nd inlet sampling begun ~~2:45~~ 2:46

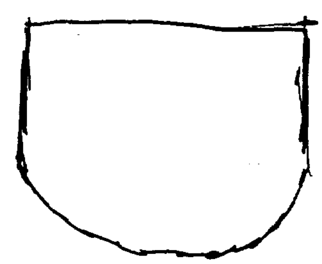
~~Truck 111~~

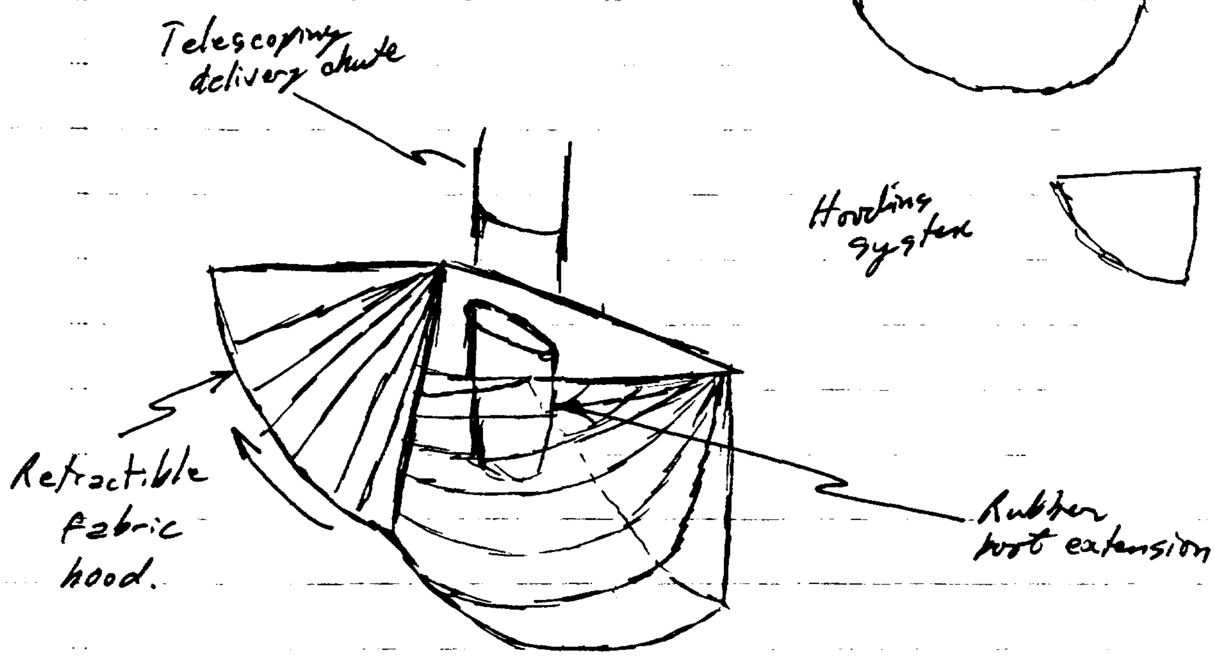
Truck 111 — sampling did not start until after cement loaded

Truck #69 70-88% capture
Truck #23 80-90% capture
Truck #56 ~~8~~60-70% capture
Truck #65 70-80% capture

end 3:05
start 3:15
Truck #70 70-80% capture
end 3:17
start 3:35
Truck #105 70-80% capture
splout → Truck #57 35-40% capture






Telescoping delivery chute
Hoodling system
Retractible fabric hood.
Rubber boot extension

APPENDIX E.2.2
BATCH LOADING COMPUTER LOG

AGG WAITING FOR LOW Sep 7 4:37

00204014 00100203

	CMT 1 NEW CEM	CMT 2 SROCOPLA	CMT 3 LEHIGH	CMT 4
ACTUAL USAGE SINCE 09/03/93	0	0	0	
TARGET USAGE	0	0	0	
MANUAL USAGE	0	0	0	
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00
ACTUAL USAGE SINCE 09/03/93	0	0	0	
TARGET USAGE	0	0	0	
MANUAL USAGE	0	0	0	
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00
BEGINNING BALANCE ON 09/03/93	73660	265950	119810	
RECEIVED TO DATE	0	0	0	0
SHIPPED TO DATE	0	0	0	0
BALANCE ON HAND	73660	265950	119810	0

PRESS PgDn TO VIEW NEXT GROUP   PRESS prtSc TO PRINT THIS PAGE

PRESS PgUp TO VIEW LAST GROUP   PRESS ESCAPE TO EXIT THIS COMMAND

AGG = 00000 CMT = 00000 WAT = 00000

AUTOMATIC 82 04 00 f1 00 00 76 f3   REPORTS

TICKET 047413

Sep 7, 1993 Job No. 0 Mix No. 601 8.50 yds DLVD 0.00 Truck 51 Plant 1

\# 1 6 BAG AE   moisture %

SAND 11670 (1.50/ 0.50) (6.00)   SROCOPLA 4760 (0.10/ 0.70)   Daravair 29

\# 67 6 26570 (1.00)

H_2O gal H_2O lb

WATER 147/1225 (0.00/ 0.00)   TRIM -3.00 — gal that could be added per yard

MAX WATER 272/023

AGG TARE 0 0 CMT TARE 10 10

TIME : 6:38:53 am

TICKET 047414

Sep 7, 1993 Job No. 0 Mix No. 652 9.00 yds DLVD 0.00 Truck 105 Plant 1

6.5 BAG WR

SAND 11830 (1.50/ 0.50) (6.00)   LEHIGH 5490 (0.10/ 0.70)   Polyheed 275

\# 67 6 28550 (1.00)

WATER 195/1624 (0.00/ 0.00)   TRIM -1.00

MAX WATER 307/005

AGG TARE 0 0 CMT TARE 10 10

TIME : 6:47:29 am

SAND 12400 (1.50/ 0.50) (6.00) LEHIGH 5060 (0.10/ 0.70) Daravair 32
67 6 28200 (1.00)

WATER 156/1299 (0.00/ 0.00) TRIM -3.00
MAX WATER 268/024

AGG TARE -10 0 CMT TARE 10 10
TIME : 6:52:55 am

TICKET 047416

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 69 Plant 1
6 BAG AE

SAND 12270 (1.50/ 0.50) (6.00) LEHIGH 5060 (0.10/ 0.70) Daravair 31
67 6 28070 (1.00)

WATER 156/1299 (0.00/ 0.00) TRIM -3.00
MAX WATER 268/025

AGG TARE 0 10 CMT TARE 0 10
TIME : 6:57:37 am

TICKET 047417

Sep 7, 1993 Job No. 0 Mix No. 5233 9.00 yds DLVD 0.00 Truck 23 Plant 1

SAND 12260 (1.50/ 0.50) (6.00) GROUDFLA 4250+ (0.10/ 0.70) Daravair 15
[illegible] 29200 (0.30) Polyheed 216

WATER 154/1263 (0.00/ 0.00) TRIM -2.00
MAX WATER 265/010

AGG TARE 0 10 CMT TARE 0 10
TIME : 7:03:34 am

TICKET 047418

Sep 7, 1993 Job No. 0 Mix No. 622 9.00 yds DLVD 0.00 Truck 59 Plant 1
[illegible]

SAND [illegible] LEHIGH [illegible] Polyheed 275
67 6 [illegible] (1.00)

WATER 166/1549 (0.00/ 0.00) TRIM -2.00
MAX WATER 307/014

AGG TARE [illegible] CMT TARE 0 10
TIME : 7:07:57 am

TICKET 047419

Sep 7, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 91 Plant 1
3000 PSI PLAIN

SAND 12780 (1.50/ 0.50) (6.00) SRUCOPLA 4480 (0.10/ 0.70) Polyheed 134
67 6 29480 (1.00)

WATER 176/1466 (0.00/ 0.00) TRIM -2.00
MAX WATER 302/013

AGG TARE 0 0 CMT TARE 10 10
TIME : 7:13:00 am

TICKET 047420

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 96 Plant 1
6 BAG AE

SAND 12330 (1.50/ 0.50) (6.00) SRUCOPLA 5050 (0.10/ 0.70) Daravair 32
67 6 28250 (1.00)

WATER 166/1383 (0.00/ 0.00) TRIM -2.00
MAX WATER 288/014

AGG TARE 0 10 CMT TARE 10 10
TIME : 7:17:45 am

TICKET 047421

Sep 7, 1993 Job No. 0 Mix No. 551 6.00 yds DLVD 0.00 Truck 111 Plant 1
5.5 BAG AE

SAND 7620 (1.50/ 0.50) (6.00) SRUCOPLA 3100 (0.10/ 0.70) Daravair 14
67 6 18920 (1.00)

WATER 1.6/ 962 (0.00/ 0.00) TRIM -2.00
MAX WATER 194/009

AGG TARE 0 0 CMT TARE 10 0
TIME : 7:22:16 am

TICKET 047422

Sep 7, 1993 Job No. 0 Mix No. 632 9.00 yds DLVD 0.00 Truck 80 Plant 1
6.5 BAG WR

SAND 11830 (1.50/ 0.50) (6.00) SRUCOPLA 5480 (0.10/ 0.70) Polyheed 275
67 6 28620 (1.00)

AGG TARE -10 0 CMT TARE 0 0
TIME : 7:26:35 am

TICKET 047423

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 69 Plant 1
6 BAG AE

SAND 12350 < 1.50/ 0.50> (6.00) SRGCOPLA 5050 < 0.10/ 0.70> Daravair 31
67 B 28070 (1.00)

WATER 165/1374 < 0.00/ 0.00> TRIM -2.00
MAX WATER 288/015

AGG TARE 0 10 CMT TARE 0 10
TIME : 7:31:54 am

TICKET 047424

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 70 Plant 1
6 BAG AE

SAND 12410 < 1.50/ 0.50> (6.00) SRGCOPLA 5050 < 0.10/ 0.70> Daravair 31
67 B 28260 (1.00)

WATER 165/1374 < 0.00/ 0.00> TRIM -2.00
MAX WATER 288/014

AGG TARE [illegible] 10 CMT TARE 10 20
TIME : [illegible] am

TICKET 047425

[illegible] Job No. [illegible] Mix No. 673 9.00 yds DLVD 0.00 Truck 55 Plant 1
[illegible] BAG AE F.G. CLASS A

[illegible] SRGCOPLA [illegible] Daravair 39
[illegible]

WATER [illegible] TRIM -2.00
MAX WATER [illegible]

AGG TARE [illegible] CMT TARE [illegible]
TIME : [illegible] am

TICKET 047426

[illegible] Truck [illegible] Plant [illegible]

SAND 12000 < 1.50/ 0.50> (6.00) SRDCOPLA 4480 < 0.10/ 0.70> Daravair 32
67 G 28730 (1.00) Polyheed 135

WATER 172/1433 < 0.00/ 0.00> TRIM -1.00
MAX WATER 284/005

AGG TARE 0 10 CMT TARE 10 10
TIME : 7:47:26 am

TICKET 047427

Sep 7, 1993 Job No. 0 Mix No. 607 9.00 yds DLVD 0.00 Truck 57 Plant 1
6 BAG PEA AE

SAND 13370 < 1.50/ 0.50> (6.00) SRDCOPLA 5060 < 0.10/ 0.70> Daravair 14
PEA GRA 27640 (0.75)

WATER 195/1624 < 0.00/ 0.00> TRIM -1.00
MAX WATER 308/004

AGG TARE 10 10 CMT TARE 10 10
TIME : 7:52:55 am

TICKET 047428

Sep 7, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 61 Plant 1
5 BAG AE WR

SAND 12620 < 1.50/ 0.50> (6.00) SRDCOPLA 4220 < 0.10/ 0.70> Daravair 14
67 G 29410 (1.00) Polyheed 129*

WATER 151/1258 < 0.00/ 0.00> TRIM -1.00
MAX WATER 266/003

AGG TARE 10 10 CMT TARE 0 10
TIME : 7:59:55 am

TICKET 047429

Sep 7, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 72 Plant 1
5 BAG AE WR

SAND 12640 < 1.50/ 0.50> (6.00) SRDCOPLA 4220 < 0.10/ 0.70> Daravair 14
67 G 29440 (1.00) Polyheed 127

WATER 151/1258 < 0.00/ 0.00> TRIM -1.00
MAX WATER 266/003

TICKET 047430

Sep 7, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 56 Plant 1
5 BAG AE WR

SAND 12650 (1.50/ 0.50) (6.00) SRDLDPLA 4250+ (0.10/ 0.70) Daravair 14
67 B 29280 (1.00) Polyneed 125

WATER 152/1266 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/002

AGG TARE 0 10 CMT TARE 10 10
TIME : 8:11:00 am

TICKET 047431

Sep 7, 1993 Job No. 0 Mix No. 647 9.00 yds DLVD 0.00 Truck 49 Plant 1

SAND 13160 (1.50/ 0.50) (6.00) LEHIGH 5470 (0.10/ 0.70) Daravair 39
BLUE STD 26510 (0.75) 122R/Poz 171

WATER 166/1383 (0.00/ 0.00) TRIM -1.00
MAX WATER 282/005

AGG TARE 10 10 CMT TARE 0 20
TIME : 8:16:53 am

TICKET 047432

Sep 7, 1993 Job No. 0 Mix No. 632 9.00 yds DLVD 0.00 Truck 55 Plant 1
5.5 BAG WR

SAND 11820 (1.50/ 0.50) (6.00) SRDLDPLA 5470 (0.10/ 0.70) Polyneed 276+
67 B 28620 (1.00)

WATER 195/1624 (0.00/ 0.00) TRIM -1.00
MAX WATER 307/005

AGG TARE 0 10 CMT TARE 10 20
TIME : 8:22:24 am

TICKET 047433

Sep 7, 1993 Job No. 0 Mix No. 5233 6.50 yds DLVD 0.00 Truck 105 Plant 1

SAND [illegible] SRDLDPLA [illegible] (0.10/ 0.70) Daravair 11
[illegible] (0.50) Polyneed 156

WATER [illegible] TRIM [illegible]

AGG TARE 0 0 CMT TARE 10 20
TIME : 8:27:07 am

TICKET 047434

Sep 7, 1993 Job No. 0 Mix No. 616 8.00 yds DLVD 0.00 Truck 65 Plant 1
6 BAG PEA SYNGZD

SAND 11480 (1.50/ 0.50) (6.00) SRDCOPLA 4490 (0.10/ 0.70) Polyheed 315
PEA GRA 24230 (0.75) 122-H.E. 544*

WATER 182/1516 (0.00/ 0.00) TRIM -2.00
MAX WATER 296/013

AGG TARE 0 0 CMT TARE 10 20
TIME : 8:53:46 am

TICKET 047435

Sep 7, 1993 Job No. 0 Mix No. 510 2.50 yds DLVD 0.00 Truck 23 Plant 1
3000 PSI PLAIN

SAND 3520 (1.50/ 0.50) (6.00) SRDCOPLA 1250 (0.10/ 0.70) Polyheed 37
67 G 8240 (1.00)

WATER 29/ 242 (0.00/ 0.00) TRIM -9.99
MAX WATER 084/024

AGG TARE 0 0 CMT TARE 10 10
TIME : 8:59:29 am

TICKET 047436

Sep 7, 1993 Job No. 0 Mix No. 601 8.00 yds DLVD 0.00 Truck 59 Plant 1
6 BAG AE

SAND 10820 (1.50/ 0.50) (6.00) SRDCOPLA 4500 (0.10/ 0.70) Daravair 27
67 G 25120 (1.00)

WATER 146/1216 (0.00/ 0.00) TRIM -2.00
MAX WATER 256/015

AGG TARE -10 0 CMT TARE 10 10
TIME : 9:07:20 am

TICKET 047437

Sep 7, 1993 Job No. 0 Mix No. 673 9.00 yds DLVD 0.00 Truck 80 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 10990 (1.50/ 0.50) (6.00) SROCOPLA 5490 (0.10/ 0.70) Daravair 39
67 G 27870 (1.00)

WATER 173/1441 (0.00/ 0.00) TRIM -2.00
MAX WATER 286/014

AGG TARE 0 10 CMT TARE 10 20
TIME : 9:14:39 am

TICKET 047438

Sep 7, 1993 Job No. 0 Mix No. 601 7.00 yds DLVD 0.00 Truck 107 Plant 1
6 BAG AE

SAND 9570 (1.50/ 0.50) (6.00) SROCOPLA 3950 (0.10/ 0.70) Daravair 24
67 G 21900 (1.00)

WATER 126/1066 (0.00/ 0.00) TRIM -2.00
MAX WATER 224/012

AGG TARE 0 0 CMT TARE 10 10
TIME : 9:23:55 am

TICKET 047439

Sep 7, 1993 Job No. 0 Mix No. 601 5.00 yds DLVD 0.00 Truck 89 Plant 1
6 BAG AE

SAND 6570 (1.50/ 0.50) (6.00) SROCOPLA 2830 (0.10/ 0.70) Daravair 17
67 G 15770 (1.00)

WATER 91/ 758 (0.00/ 0.00) TRIM -2.00
MAX WATER 160/008

AGG TARE 0 0 CMT TARE 10 10
TIME : 9:26:57 am

TICKET 047440

Sep 7, 1993 Job No. 0 Mix No. 547 6.50 yds DLVD 0.00 Truck 91 Plant 1

SAND 9490 (1.50/ 0.50) (6.00) LEHIGH 3960 (0.10/ 0.70) Daravair 27
BLUE STI 20570 (0.75) 1EER/Poz 126

WATER 113/ 941 (0.00/ 0.00) TRIM -2.00
MAX WATER 218/011

10

AGG TARE 0 0 CMT TARE [illegible]

TIME : 9:34:34 am

TICKET 047441

Sep 7, 1993 Job No. 0 Mix No. 601 1.00 yds DLVD 0.00 Truck 59 Plant 1

6 BAG AE

SAND 1410 < 1.50/ 0.50) (6.00) SRUCOPLA 560 < 0.10/ 0.70) Daravair 3

67 B 3040 (1.00)

WATER 9/ 75 < 0.00/ 0.00) TRIM -9.99

MAX WATER 032/011

AGG TARE 0 0 CMT TARE 0 0

TIME : 9:38:30 am

TICKET 047442

Sep 7, 1993 Job No. 0 Mix No. 601 2.00 yds DLVD 0.00 Truck 60 Plant 1

6 BAG AE

SAND 2740 < 1.50/ 0.50) (6.00) SRUCOPLA 1120 < 0.10/ 0.70) Daravair 7

67 B 6180 (1.00)

WATER 20/ 167 < 0.00/ 0.00) TRIM -9.99

MAX WATER 064/020

AGG TARE -10 -10 CMT TARE 0 10

TIME : 9:40:02 am

TICKET 047443

Sep 7, 1993 Job No. 0 Mix No. 607 2.50 yds DLVD 0.00 Truck 105 Plant 1

6 BAG PEA AE

SAND [illegible] < 1.50/ 0.50) (6.00) SRUCOPLA 1420 < 0.10/ 0.70) Daravair 5

PEA GRA [illegible] (0.75)

WATER 57/ 420 < 0.00/ 0.00) TRIM -2.00

MAX WATER 066/005

AGG TARE -10 -10 CMT TARE 0 10

TIME : 9:44:[illegible] am

TICKET 047444

Sep 7, 1993 Job No. 0 Mix No. 512 8.00 yds DLVD 0.00 Truck 2 Plant 1

3000 PSI AE

WATER 144/1200 (0.00/ 0.00) TRIM -2.00
MAX WATER 252/013

AGG TARE -10 10 CMT TARE 10 10
TIME : 9:58:01 am

TICKET 047445

Sep 7, 1993 Job No. 0 Mix No. 201 9.00 yds DLVD 0.00 Truck 55 Plant 1
201 S.H.A. MIX #2

SAND 11800 (1.50/ 0.50) (6.00) LEHIGH 5060* (0.10/ 0.70) MicroAir 32*
S.H.A.#6 27580 (0.30) 322-N 253

WATER 151/1258 (0.00/ 0.00) TRIM -5.00
MAX WATER 302/056

AGG TARE 10 20 CMT TARE 10 10
TIME : 10:14:05 am

TICKET 047446

Sep 7, 1993 Job No. 0 Mix No. 500 2.00 yds DLVD 0.00 Truck 64 Plant 1
5 [illegible] MIX

SAND 2540 (1.50/ 0.50) (6.00) ESSROC/LEH 940 (0.10/ 0.70)
67 B 6670 1.00)

WATER 25/ 208 (0.00/ 0.00) TRIM -9.99
MAX WATER 071/020

AGG TARE 10 0 CMT TARE 10 10
TIME : [illegible]

12

TICKET 047447

Sep 7, 1993 Job No. 0 Mix No. 503 5.50 yds DLVD 0.00 Truck 23 Plant 1
5 BAG AE WR

SAND 7560 (1.50/ 0.50) (6.00) SRDCOPLA 2590 (0.10/ 0.70) Daravair 8
67 G 18090 (1.00) Polyheed 78

WATER 43/ 358 (0.00/ 0.00) TRIM -9.99
MAX WATER 163/052

AGG TARE 0 10 CMT TARE 10 0
TIME : 10:22:16 am

TICKET 047448

Sep 7, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 23 Plant 1
#67 GRAVEL

67 G 24270 (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -9.99
MAX WATER 000/-29

AGG TARE 0 0 CMT TARE 0 0
TIME : 10:57:26 am

TICKET 047449

Sep 7, 1993 Job No. 0 Mix No. 601 1.50 yds DLVD 0.00 Truck 53 Plant 1
6 BAG AE

SAND 2060 (1.50/ 0.50) (6.00) SRDCOPLA 660+ (0.10/ 0.70) Daravair 5
67 G 4670 (1.00)

WATER 18/ 153 (0.00/ 0.00) TRIM -9.99
MAX WATER 048/014

AGG TARE -10 -10 CMT TARE 0 10
TIME : 11:02:21 am

TICKET 047450

Sep 7, 1993 Job No. 0 Mix No. 6011 9.00 yds DLVD 0.00 Truck 70 Plant 1
601 BAG AE 75.22 NEWCEM

SAND 11200 (1.50/ 0.50) (6.00) SRDCOPLA 3800 (0.10/ 0.70) Daravair 31
67 G 28110 (1.00) NEW CEM 5050

MAX WATER 286/005

AGG TARE -10 10 CMT TARE 0 10
TIME : 11:12:37 am

///

TICKET 047451

Sep 7, 1993 Job No. 0 Mix No. 6011 9.00 yds DLVD 0.00 Truck 70 Plant 1
601 BAG AE 75\25 NEWCEM

SAND 11290 < 1.50/ 0.50> (6.00) SKOCOPLA 3810 < 0.10/ 0.70> Daravair 31
67 B 28010 (1.00) NEW CEM 5060

WATER 180/1499 < 0.00/ 0.00> TRIM -1.00
MAX WATER 286/005

AGG TARE 0 10 CMT TARE 10 10
TIME : 11:17:42 am

TICKET 047452

Sep 7, 1993 Job No. 0 Mix No. 201 4.00 yds DLVD 0.00 Truck 69 Plant 1
201 S.H.A. MIX #2

SAND 5310 < 1.50/ 0.50> (6.00) LEHIGH 2250 < 0.10/ 0.70> MicroAir 16*
S.H.A.#6 12360 (0.30) 322-N 114*

WATER 46/ 383 < 0.00/ 0.00> TRIM -5.99
MAX WATER 134/046

AGG TARE 0 0 CMT TARE 10 10
TIME : 11:32:04 am

TICKET 047453

Sep 7, 1993 Job No. 0 Mix No. 103 6.00 yds DLVD 0.00 Truck 57 Plant 1
3000 PSI GROUT

SAND 15780 (1.50/ 0.50) (6.00) SRGCOPLA 3930 (0.10/ 0.70) 322-N 279*

WATER 210/1749 (0.00/ 0.00) TRIM -3.00
MAX WATER 338/012

AGG TARE -10 10 CMT TARE 0 10
TIME : 11:44:26 am

TICKET 047454

Sep 7, 1993 Job No. 0 Mix No. 601 3.00 yds DLVD 0.00 Truck 61 Plant 1
6 BAG AE

SAND 4190 (1.50/ 0.50) (6.00) SRGCOPLA 1690 (0.10/ 0.70) Daravair 10
67 G 9370 (1.00)

WATER 30/ 250 (0.00/ 0.00) TRIM -9.99
MAX WATER 096/030

AGG TARE 0 0 CMT TARE 10 20
TIME : 11:48:31 am

-105

TICKET 047455

Sep 7, 1993 Job No. 0 Mix No. 201 9.00 yds DLVD 0.00 Truck 61 Plant 1
201 S.H.A. MIX #2

SAND 11600 (1.50/ 0.50) (4.20) LEHIGH 5020 (0.10/ 0.70) MicroAir 32*
S.H.A.55 27150 (0.70) 322-N 254*

WATER 194/1616 (0.00/ 0.00) TRIM -2.00
MAX WATER 302/034

AGG TARE 0 10 CMT TARE 10 20
TIME : 12:07:30 pm

TICKET 047456

Sep 7, 1993 Job No. 0 Mix No. 500 6.00 yds DLVD 0.00 Truck 92 Plant 1
5 BAG MIX

SAND [illegible] (1.50/ 0.50) (4.20) SRGCOPLA 2220 (0.10/ 0.70)
67 G [illegible] (1.00)

AGG TARE 0 10 CMT TARE 10 10
TIME : 12:12:57 pm

TICKET 047457

Sep 7, 1993 Job No. 0 Mix No. 653 3.00 yds DLVD 0.00 Truck 65 Plant 1
6.5 BAG AE WR

SAND 3810 < 1.50/ 0.50> (4.20) LEHIGH 1670* < 0.10/ 0.70> Daravair 14
S.H.A.#6 9310 (0.70) Polyheed 95*

WATER 36/ 300 < 0.00/ 0.00> TRIM -9.99
MAX WATER 090/029

AGG TARE 0 0 CMT TARE 10 10
TIME : 12:16:36 pm

TICKET 047458

Sep 7, 1993 Job No. 0 Mix No. 511 3.00 yds DLVD 0.00 Truck 69 Plant 1
3000 PSI AE

SAND 3560 < 1.50/ 0.50> (4.20) SRBCOPLA 1450 < 0.10/ 0.70> Daravair 11
67 G 9440 (1.00) Polyheed 44

WATER 38/ 317 < 0.00/ 0.00> TRIM -9.99
MAX WATER 095/031

AGG TARE 0 0 CMT TARE 0 0
TIME : 12:20:40 pm

TICKET 047459

Sep 7, 1993 Job No. 0 Mix No. 6011 2.00 yds DLVD 0.00 Truck 56 Plant 1
6.0 BAG AE 75% RENIEW

SAND 2410 < 1.50/ 0.50> (4.20) SRBCOPLA 650 < 0.10/ 0.70> Daravair 7
67 G 6460 (1.00) NEW CEM 1150

WATER 26/ 217 < 0.00/ 0.00> TRIM -9.99
MAX WATER 064/021

AGG TARE CMT TARE
TIME [illegible]

TICKET 047460

Sep 7, 1993 Job No. 0 Mix No. 500 5.00 yds DLVD 0.00 Truck 53 Plant 1
5 BAG

67 B 26420 (1.00)

WATER 192/1599 (0.00/ 0.00) TRIM -2.00
MAX WATER 284/016

AGG TARE. 0 10 CMT TARE 0 10
TIME : 1:08:36 pm

TICKET 047461

Sep 7, 1993 Job No. 0 Mix No. 647 7.50 yds DLVD 0.00 Truck 59 Plant 1

SAND 10850 (1.50/ 0.50) (4.20) LEHIGH 4560 (0.10/ 0.70) Daravair 32
BLUE STO 23550 (0.75) 122R/Poz 144

WATER 153/1274 (0.00/ 0.00) TRIM -2.00
MAX WATER 235/015

AGG TARE 0 10 CMT TARE 10 10
TIME : 1:13:55 pm

TICKET 047462

Sep 7, 1993 Job No. 0 Mix No. 201 9.00 yds DLVD 0.00 Truck 105 Plant 1
201 S.H.A. MIX #2

SAND 11660 (1.50/ 0.50) (4.20) LEHIGH 5040 (0.10/ 0.70) MicroAir 32*
S.H.A.#6 27360 (0.70) 322-N 254*

WATER 177/1474 (0.00/ 0.00) TRIM -4.00
MAX WATER 302/051

AGG TARE 0 10 CMT TARE 10 10
TIME : 1:18:56 pm

-81?

TICKET 047463

Sep 7, 1993 Job No. 0 Mix No. 500 9.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG MIX

SAND [illegible] (1.50/ 0.50) (4.20) SHREDDFLA 4220 (0.10/ 0.70)
67 B [illegible] (1.00)

WATER 198/1649 (0.00/ 0.00) TRIM -4.00
MAX WATER 320/057

AGG TARE 10 10 CMT TARE 0 10
TIME : 1:22:45 pm

TICKET 047464

Sep 7, 1993 Job No. 0 Mix No. 647 9.00 yds DLVD 0.00 Truck 91 Plant 1

SAND 13050 (1.50/ 0.50) (4.20) LEHIGH 5490 (0.10/ 0.70) Daravair 38
BLUE STO 28330 (0.75) 122R/Poz 171

WATER 166/1383 (0.00/ 0.00) TRIM -4.00
MAX WATER 282/034

AGG TARE 0 10 CMT TARE 0 20
TIME : 1:28:54 pm

TICKET 047465

Sep 7, 1993 Job No. 0 Mix No. 653 4.00 yds DLVD 0.00 Truck 2 Plant 1
6.5 BAG AE WR

SAND 4940 (1.50/ 0.50) (4.20) LEHIGH 2440 (0.10/ 0.70) Daravair 16
S.M.A.#6 12320 (0.70) Polyheed 121

WATER 68/ 566 (0.00/ 0.00) TRIM -5.00
MAX WATER 120/020

AGG TARE 10 10 CMT TARE 10 10
TIME : 1:33:24 pm

TICKET 047466

Sep 7, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 55 Plant 1
3000 PSI PLAIN

SAND 12490 (1.50/ 0.50) (4.20) BROOGFLA 4470 (0.10/ 0.70) Polyheed 134
67 G 29210 (1.00)

WATER 194/1333 (0.00/ 0.00) TRIM -4.00
MAX WATER 302/084

AGG TARE 0 10 CMT TARE 0 10
TIME : 1:36:02 pm

TICKET 047467

Sep 7, 1993 Job No. 0 Mix No. 506 9.00 yds DLVD 0.00 Truck 107 Plant 1
3 BAG MIX

SAND 12760 (1.50/ 0.50) (4.20) BROOGFLA 4210 (0.10/ 0.70)
67 G 29210 (1.00)

WATER 188/1648 (0.00/ 0.00) TRIM -4.00

MAX WATER 320/037

18

AGG TARE 10 10 CMT TARE 0 10
TIME : 1:40:30 pm

TICKET 047468

Sep 7, 1993 Job No. 0 Mix No. 701 9.00 yds DLVD 0.00 Truck 70 Plant 1
7 BAG AE

SAND 10160 < 1.50/ 0.50> (4.20) SRDCOPLA 5900 < 0.10/ 0.70> Daravair 32
67 G 26980 (1.00)

WATER 191/1591 < 0.00/ 0.00> TRIM -4.00
MAX WATER 297/035

AGG TARE 0 10 CMT TARE 10 20
TIME : 1:45:06 pm

TICKET 047469

Sep 7, 1993 Job No. 0 Mix No. 103 6.00 yds DLVD 0.00 Truck 57 Plant 1
3000 PSI GROUT

SAND 15460 < 1.50/ 0.50> (4.20) SRDCOPLA 3930 < 0.10/ 0.70> 322-N 279*

WATER 248/2066 < 0.00/ 0.00> TRIM -2.00
MAX WATER 338/010

AGG TARE 0 10 CMT TARE 10 10
TIME : 1:57:04 pm

TICKET 047470

Sep 7, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 89 Plant 1
#57 GRAVEL

67 G 24180 < 1.50/ 0.50> (1.00)

WATER 0/ 0 < 0.00/ 0.00> TRIM -2.00
MAX WATER 000/-29

AGG TARE 0 0 CMT TARE 0 0
TIME : 2:01:09 pm

TICKET 047471

Sep 7, 1993 Job No.

19 SAND 0 (1.50/ 0.50) (4.20) SRDCOPLA 0 (0.10/ 0.70)
67 6 0 (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -2.00
MAX WATER 320/320

AGG TARE -10 0 CMT TARE 0 0
TIME : 2:07:33 pm

TICKET 047472

Sep 7, 1993 Job No. 0 Mix No. 201 9.00 yds DLVD 0.00 Truck 105 Plant 1
201 S.H.A. MIX #2

SAND 11670 (1.50/ 0.50) (4.20) LEHIGH 5050 (0.10/ 0.70) MicroAir 33*
S.H.A.#6 27410 (0.70) 322-N 254*

WATER 178/1466 (0.00/ 0.00) TRIM -4.00
MAX WATER 302/052

AGG TARE -10 10 CMT TARE 0 20
TIME : 2:32:28 pm

TICKET 047473

Sep 7, 1993 Job No. 0 Mix No. 500 9.00 yds DLVD 0.00 Truck 53 Plant 1
5 BAG MIX

SAND 12830 (1.50/ 0.50) (4.20) SRDCOPLA 4230 (0.10/ 0.70)
67 6 29600 (1.00)

WATER 198/1649 (0.00/ 0.00) TRIM -4.00
MAX WATER 320/037

AGG TARE 10 10 CMT TARE 10 20
TIME : 2:36:46 pm

TICKET 047474

Sep 7, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 111 Plant 1
3000 PSI PLAIN

SAND 12640 (1.50/ 0.50) (4.20) SRDCOPLA 4470 (0.10/ 0.70) Polyheed 135
67 6 29210 (1.00)

WATER 184/1533 (0.00/ 0.00) TRIM -4.00
MAX WATER 302/033

AGG TARE 10 20 CMT TARE 10 20
TIME : 2:41:15 pm

TICKET 047475

Sep 7, 1993 Job No. 0 Mix No. 7023 4.50 yds DLVD 0.00 Truck 69 Plant 1
702M5 5000 PSI

SAND 5730 < 1.50/ 0.50) (4.20) SRGCOPLA 1490 < 0.10/ 0.70) Polyheed 148
67 6 14100 (1.00) NEW CEM 2980*

WATER 73/ 608 < 0.00/ 0.00) TRIM -6.00
MAX WATER 144/031

AGG TARE 10 10 CMT TARE 10 20
TIME : 2:46:23 pm

TICKET 047476

Sep 7, 1993 Job No. 0 Mix No. 701 1.00 yds DLVD 0.00 Truck 23 Plant 1
7 BAG AE

SAND 1210 < 1.50/ 0.50) (4.20) SRGCOPLA 680* < 0.10/ 0.70) Daravair 5
67 6 3480* (1.00)

WATER 14/ 117 < 0.00/ 0.00) TRIM -9.99
MAX WATER 033/010

AGG TARE 0 0 CMT TARE 20 20
TIME : 2:49:26 pm

TICKET 047477

Sep 7, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 56 Plant 1

SAND 14280 < 1.50/ 0.50) (4.20) SRGCOPLA 2340 < 0.10/ 0.70) Polyheed 141*
67 6 25250 (1.00) NEW CEM 4640 Daravair 52

WATER 191/1591 < 0.00/ 0.00) TRIM -2.00
MAX WATER 297/016

AGG TARE -10 10 CMT TARE 20 20
TIME : 2:52:22 pm

TICKET 047478

Sep 7, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 65 Plant 1

SAND 14560 < 1.50/ 0.50) (4.20) SRGCOPLA 2530 < 0.10/ 0.70) Polyheed 140
67 6 25600 (1.00) NEW CEM 4630 Daravair 52

WATER [illegible] TRIM -2.00

AGG TARE 0 10 CMT TARE 20 20
TIME : 2:59:16 pm

TICKET 047479

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 70 Plant 1
6 BAG AE

SAND 12160 (1.50/ 0.50) (4.20) SRULOPLA 5060 (0.10/ 0.70) Daravair 31
67 6 27920 (1.00)

WATER 190/1583 (0.00/ 0.00) TRIM -2.00
MAX WATER 268/018

AGG TARE 0 10 CMT TARE 20 20
TIME : 3:12:02 pm

TICKET 047480

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 105 Plant 1
6 BAG AE

SAND 12210 (1.50/ 0.50) (4.20) SRULOPLA 5050 (0.10/ 0.70) Daravair 31
67 6 28040 (1.00)

WATER 190/1583 (0.00/ 0.00) TRIM -2.00
MAX WATER 268/0.7

AGG TARE 0 10 CMT TARE 20 20
TIME : 3:32:41 pm

TICKET 047481

Sep 7, 1993 Job No. Mix No. 5591 9.00 yds DLVD 0.00 Truck 55 Plant 1

SAND [illegible] (1.50/ 0.50) (4.20) SRULOPLA 5550 (0.10/ 0.70) Polyheed 141*
67 6 [illegible] (1.00) NEW CEM 4640 Daravair 32

WATER [illegible] (0.00/ 0.00) TRIM -2.00

TICKET 047479

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 70 Plant 1
6 BAG AE

SAND 12160 < 1.50/ 0.50) (4.20) SRGCOPLA 5060 < 0.10/ 0.70) Daravair 31
67 6 27920 (1.00)

WATER 190/1583 < 0.00/ 0.00) TRIM -2.00
MAX WATER 288/018

AGG TARE 0 10 CMT TARE 20 20
TIME : 3:12:02 pm

TICKET 047480

Sep 7, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 105 Plant 1
6 BAG AE

SAND 12210 < 1.50/ 0.50) (4.20) SRGCOPLA 5050 < 0.10/ 0.70) Daravair 31
67 6 28040 (1.00)

WATER 190/1583 < 0.00/ 0.00) TRIM -2.00
MAX WATER 288/017

AGG TARE 0 10 CMT TARE 20 20
TIME : 3:32:41 pm

TICKET 047481

Sep 7, 1993 Job No. Mix No. 5691 9.00 yds DLVD 0.00 Truck 55 Plant 1

SAND [illegible] < 1.50/ 0.50) (4.20) SRGCOPLA 2330 < 0.10/ 0.70) Polyheed 141*
67 6 [illegible] (1.00) NEW CEM 4640 Daravair 32

WATER 191/1551 < 0.00/ 0.00) TRIM -2.00
MAX WATER 257/016

AGG TARE [illegible] 10 CMT TARE 20 20
TIME : 3:5[illegible] pm

TICKET 047482

Sep 7, 1993 Job No. 0 Mix No. 601 4.00 yds DLVD 0.00 Truck 96 Plant 1
6 BAG AE

SAND 5300 (1.30/ 0.50) (4.20) SKOLOPLA 2250 (0.10/ 0.70) Daravair 14
67 6 12360 (1.00)

WATER 847 700 (0.00/ 0.00) TRIM -2.00
MAX WATER 128/009

AGG TARE 10 10 CMT TARE 10 20
TIME : 4:04:54 pm

APPENDIX E.2.3
LEHIGH CEMENT DELIVERY INVOICES

LEHIGH CEMENTS

PERMANENT ADDRESS ALLENTOWN, PA.

Agent's No. ______

From--LEHIGH PORTLAND CEMENT COMPANY

At UNION BRIDGE, MD.

By ______ (Originating Carrier)

THIS MEMORANDUM is an acknowledgement that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

DELIVER TO

Date 9/1/92

(Mail Address of Consignee--For Purposes of Notification Only)

CHARLES CO. CONC. CO. INC.
PICKUP AT UNION BRIDGE, MD. FOR
WALDORF, MARYLAND

DANGER

See instructions on reverse side.

Route/Delivering Carrier

CUSTOMER

LPC CO. NO.	41-25845	CONTRACT NO. PO. C83378	TIME ARRIVED		TIME LEFT
CUSTOMER'S ORDER NO.			CAR INITIAL		CAR OR TRAILER NO.

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate
	Lehigh Portland Cement	1			
	Lehigh Masonry Cement				

WE CERTIFY THE CEMENT TO MEET
CHEMICAL & PHYSICAL TEST REQUIREMENTS OF
...
LOADED ...

MD. STATE CERT # ....

Loaded into silo #2
from 9:12 to 9:50

50200 LB

BULK WEIGHT (In Pounds)	
GROSS	LB
TARE	LB
NET	LB
NET TONS	TONS

If This Car Develops Bad Order And Will Be Delayed in Excess Of 24 Hours, Please Wire Notice To:
LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ______ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED--NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

PER-- ______

RECEIVED BY ______ (Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted: ______ (Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per ______ Agent

No. 482921 4

Rev 1/91

EXTRA COPY #2

LEHIGH CEMENTS

PERMANENT ADDRESS -- ALLENTOWN, PA.

Agent's No.

From--LEHIGH PORTLAND CEMENT COMPANY

At

By UNION BRIDGE, MD.
(Originating Carrier)

THIS MEMORANDUM is an acknowledgement that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

DELIVER TO

Date 9/1/92
(Mail Address of Consignee—For Purposes of Notification Only)

CHARLES CO. CONC. CO., INC.
PICKUP AT UNION BRIDGE, MD. FOR
WALDORF, MARYLAND

DANGER
See instructions on reverse side.

Route/Delivering Carrier

LPC CO. NO.	CUSTOMER	CONTRACT NO.		TIME ARRIVED	1015 A	TIME LEFT	1052
CUSTOMER'S ORDER NO.	11-25845	PO. 022998		CAR INITIAL		CAR OR TRAILER NO.	5

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement	1	25.50			
	Lehigh Masonry Cement					

loaded into silo #2

WE CERTIFY THE CEMENT TO MEET ... 01 SEP 92 ...
... LOADED ... CUST. ID
MD. STATE CONT# J8 61,000

BULK WEIGHT (In Pounds)	
GROSS	[illegible] LB
TARE	22300 LB
NET	51000 LB

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ____________ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED--NOT PREPAID

NET TONS 25.50

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

Dennis Stine

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

PER--

RECEIVED BY CARRIER INDICATED ABOVE

Per ____________ Agent

RECEIVED BY ____________ (Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted: ____________ (Customer's Signature)

No. 482944 6

Rev. 1/91

EXTRA COPY #1

LEHIGH CEMENTS

PERMANENT ADDRESS — ALLENTOWN, PA.

Agent's No.

UNION BRIDGE, MD.

At

By

(Originating Carrier)

From--LEHIGH PORTLAND CEMENT COMPANY

THIS MEMORANDUM is an acknowledgement that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

DELIVER TO

Date 9/15/93

(Mail Address of Consignee—For Purposes of Notification Only)

CHARLES CO. CONC. CO. INC.
PICKUP AT UNION BRIDGE, MD. FOR
WALDORF, MARYLAND

DANGER
See instructions on reverse side.

Route/Delivering Carrier

CUSTOMER

LPC CO. NO.	11-25945	CONTRACT NO. PO. C2398	TIME ARRIVED		TIME LEFT	8:58 A
CUSTOMER'S ORDER NO.			CAR INITIAL		CAR OR TRAILER NO.	1

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement	1	25.50			
	Lehigh Masonry Cement					

loaded 9:15 dk. #2

WE CERTIFY THE CEMENT TO MEET
CHEMICAL & PHYSICAL REQUIREMENTS
MENTS OF MD.STATE SPECS. AND WAS
LOADED FROM BIN ...
MD.STATE CONTR #.................

09 SEP 93 08:57

CUST. IP

J 3 51,000

CEMENT IB

BULK WEIGHT (In Pounds)	
GROSS	79000 LB
TARE	28000 LB
NET	51000 LB
NET TONS	25.50 TONS

If This Car Develops Bad Order And Will Be Delayed in Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ____________________
(Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED-- NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

PER--

RECEIVED BY CARRIER INDICATED ABOVE

Per ____________________ Agent

RECEIVED BY

____
(Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted:

____
(Customer's Signature)

No. 482932 1

Rev 1/91

EXTRA COPY #1

APPENDIX E.3
PROCESS DATA FROM 09/08/93

APPENDIX E.3.1
COMPILED PROCESS DATA

Transcribed Batching Report Log

September 8, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
3[	2[	06:10 AM	64	65	9	11,360	8.8	27,990	1	5,470		39	1,000
3[	2[	06:17 AM	91	65	9	12,580	8.8	28,440	1	5,070		31	1,050
3[	2[	06:24 AM	105	65	9	12,060	8.8	27,850	0.4	5,020		288	1,083
3[	2[	06:52 AM	51	75	9	12390	8.8	29,130	1	4,210		22	1,058
3[	2[	06:59 AM	107	75	9	12700	8.8	28,370	1	5,050		31	1,050
3[	2[	07:04 AM	89	75	5	6,440	8.8	15,720	0.4	3,060		175	600
	2[	07:08 AM	23		9	12,190	8.8	27,790	0.4	5,040		285	1,158
	2[	07:12 AM	59		8	10,000	8.8	24,850	1	4,860		34	1,091
	2[	07:17 AM	1		8	0	0	24,190	1	0		0	0
	2[	07:23 AM	111		9	11,560	8.8	28,320	0.4	5,470		317	1,150
4[?	2[	07:32 AM	96	75 est	9	12,470	8.8	29,130	1	4,220		22	1,141
	2[	07:37 AM	105	72	9	12,110	8.8	27,920	0.4	5,010		286	1,158
	2[	07:42 AM	2	62	9	13,190	8.8	29,890	1	4,630		0	1,274
	2[	07:47 AM	80	65	9	12,610	8.8	28,470	1	5,080		31	1,125
	2[	07:53 AM	70		8	21,610	8.8	0	0	5,240		370	1,908
	2[	07:58 AM	60	65	5	6,790	8.8	16,190	1	2,500		93	450
	2[	08:01 AM	56	55	9	11,560	8.8	28,240	0.4	5,470		315	1,150
	2[	08:07 AM	49	60	9	12,950	8.8	29,740	1	4,220		141	925
	2[	08:11 AM	57	65	9	12,790	8.8	29,590	1	4,220		141	925
	2[	08:18 AM	23	75	5	6,660	8.8	15,470	0.4	2,800		162	641
4[	2[	08:22 AM	53	75	9	12,300	8.8	29,150	1	4,240		22	1,133
4[	2[	08:27 AM	66	75	9	11,700	8.8	28,220	0.4	5,470		315	1,150
4[	2[	08:31 AM	65	77	9	12,800	8.8	29,700	1	4,230		141	925
4[	2[	08:37 AM	64	85	9	12,570	8.8	28,430	1	5,050		31	1,125
4[	2[	08:54 AM	2	85 est	9	11,760	7.7	28,520	1	4,630		21	1,341
	2[	09:02 AM	91 (81)	45	4	5,590	7.7	12,540	1	2,250		14	417
5[	2[	09:04 AM	105	85	7	8,850	7.7	21,860	0.4	4,250		246	983
5[	2[	09:08 AM	51	75 est	2	2,840	7.7	6,730	1	1,030			158
5[	2[	09:19 AM	23	75 est	9	13,400	7.7	28,670	0.75	5,470		209	1,166
5[	2[	09:25 AM	92	0 VE	8	0	0	24,260	1	0		0	0
5[	2[	09:37 AM	107	0 VE	8	0	0	24,520	1	0		0	0

Transcribed Batching Report Log

September 8, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
5[	2[	09:46 AM	107 (55)	0 VE	8	0	0	24,670	1	0		0	0
5[	2[	09:49 AM	107 (96)	0 VE	8	0	0	24,140	1	0		0	0
5[	2[	09:54 AM	17	75	1.0	1,460	7.7	3,430	1	590		5	58
	2[	09:56 AM	111	0 VE	8	0	0	24,240	1	0		0	0
	2[	10:00 AM	80	75	9	11,680	7.7	28,520	1	4,630		21	1,349
6[	2[	10:05 AM	2		1	1,380	7.7	3,440	1	470		18	33
	2[	10:19 AM	60		2.5	3,490	7.7	8,170	1	1,170		40	100
	2[	10:22 AM	89		8	0	0	24,260	1	0		0	0
	2[	10:36 AM	64		9	13,280	8.8	30,090	1	4,220		0	1,308
	2[	10:42 AM	70		9	13,370	8.8	30,060	1	4,210		0	1,308
	2[	10:48 AM	53		4	4,970	7.7	12,390	1	2,470		18	292
	2[	11:17 AM	91		9	10,460	7.7	27,220	1	5,910		32	1,474
	2[	11:27 AM	23		8	0	0	24,200	1	0		0	0
	2[	12:37 PM	2		4	5,650	7.7	13,090	1	1,880		63	192
	2[	12:41 PM	51		9	12,470	7.7	28,260	1	5,070		31	1,250
	2[	12:53 PM	17		8.5	12,680	8.8	28,490	1	3,970		0	1,233
	2[	12:58 PM	105		3	3,780	7.7	9,440	0.4	1,850		105	317
	2[	01:08 PM	60		9	12,650	8.8	29,410	1	5,050		0	1,374
	2[	01:33 PM	80		9	12,650	8.8	29,290	1	5,060		0	1,374
Totals during inlet spl 3. (Identified by shaded areas.)				70	50	67530	8.80	157500	0.80	27880	0	586	5841
Totals during inlet spl 4. (Identified by shaded ares.)				79	54	73600	8.616	173150	0.9	27840	0	552	6815
Totals during inlet spl 5. (Identified by shaded ares.)				79	51.	26550	3.85	158280	0.893	11340	0	460	2365
Totals during inlet spl 6. (Identified by shaded ares.)				75	1	1,380	7.7	3,440	1	470		18	33
Totals during outlet spl 1. (Identified by bold print.)				76 est	332	151,130	7.846	325,610	0.72	57,440	0	2,210	13,447

9/8/93

OUTLET EMISSION TESTING

Emission testing at the outlet of the fabric filter occurred during the following approximate times.

6:01 AM to 12:01 PM

during this period the following activities occurred:

6:00 - 6:45	Silo #2 was filled with 50,400 lbs of ESSROC portland cement using a pneumatic transfer system.
6:45 - 7:25	Silo #2 was filled with 50,300 lbs of ESSROC portland cement using a pneumatic transfer system.
7:35 - 8:15	Silo #2 was filled with 50,220 lbs of ESSROC portland cement using a pneumatic transfer system.
9:05 - 9:50	Silo #1 was filled with 50,160 lbs of NEWCEM portland cement using a pneumatic transfer system.
11:40 - 12:23	Silo #3 was filled with 50,000 lbs of Lehigh portland cement using a pneumatic transfer system.
1:20 - 2:00	Silo #3 was filled with 50,000 lbs of Lehigh ESSROC portland cement using a pneumatic transfer system.

Dry batch loading of concrete delivery trucks was as follows:

At 06:10 AM truck number 64 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 06:17 AM truck number 91 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 06:24 AM truck number 105 was filled with 5,020 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 06:52 AM truck number 51 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 06:59 AM truck number 107 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:04 AM truck number 89 was filled with 3,060 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 07:08 AM truck number 23 was filled with 5,040 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:12 AM truck number 59 was filled with 4,860 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 07:17 AM truck number 1 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 07:23 AM truck number 111 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:32 AM truck number 96 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:37 AM truck number 105 was filled with 5,010 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:42 AM truck number 2 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:47 AM truck number 80 was filled with 5,080 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 07:53 AM truck number 70 was filled with 5,240 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 07:58 AM truck number 60 was filled with 2,500 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 08:01 AM truck number 56 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:07 AM truck number 49 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:11 AM truck number 57 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:18 AM truck number 23 was filled with 2,800 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 08:22 AM truck number 53 was filled with 4,240 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:27 AM truck number 66 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:31 AM truck number 65 was filled with 4,230 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:37 AM truck number 64 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:54 AM truck number 2 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 09:02 AM truck number 91 was filled with 2,250 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 09:04 AM truck number 105 was filled with 4,250 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete.

At 09:08 AM truck number 51 was filled with 1,030 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete.

At 09:19 AM truck number 23 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 09:25 AM truck number 92 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 09:37 AM truck number 107 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 09:46 AM truck number 107 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 09:49 AM truck number 107 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 09:54 AM truck number 17 was filled with 590 pounds of portland cement and 0 pounds of NEWCEM to make 1.05 yards of concrete.

At 09:56 AM truck number 111 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 10:00 AM truck number 80 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:05 AM truck number 2 was filled with 470 pounds of portland cement and 0 pounds of NEWCEM to make 1 yard of concrete.

At 10:19 AM truck number 60 was filled with 1,170 pounds of portland cement and 0 pounds of NEWCEM to make 2.5 yards of concrete.

At 10:22 AM truck number 89 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 10:36 AM truck number 64 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:42 AM truck number 70 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:48 AM truck number 53 was filled with 2,470 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 11:17 AM truck number 91 was filled with 5,910 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:27 AM truck number 23 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel.

At 12:37 PM truck number 2 was filled with 1,880 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 12:41 PM truck number 51 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 12:53 PM truck number 17 was filled with 3,970 pounds of portland cement and 0 pounds of NEWCEM to make 8.5 yards of concrete.

At 12:58 PM truck number 105 was filled with 1,850 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 01:08 PM truck number 60 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 01:33 PM truck number 80 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

A total of 301,080 lbs of cement and NEWCEM were pneumatically transferred into silos and 57,440 lbs of dry cement and no NEWCEM were transferred into trucks during the outlet sampling times.

INLET EMISSION TEST RUN 3

Emission testing Run number 3 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
6:12 AM to 6:28 AM	16 min
6:55 AM to 7:08 AM	13 min
TOTAL	29 min

During this emission test, cement was being pneumatically conveyed into silos during the first documented delivery for 16 minutes and during the second documented delivery for 13 minutes. The amount of cement transferred during these periods is estimated at

(50,400 #/45 min)*16 min = 17,920 lbs and
(50,300 #/30 min)* 13 min = 21,797 lbs
for a total of 39,717 lbs of cement.

Dry batch loading of concrete delivery trucks was as follows:

At 06:10 AM truck number 64 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 06:17 AM truck number 91 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 06:24 AM truck number 105 was filled with 5,020 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 06:52 AM truck number 51 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 06:59 AM truck number 107 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 07:04 AM truck number 89 was filled with 3,060 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement which was transferred into concrete trucks was 27,880 pounds to make 50 yards of concrete.

INLET EMISSION TEST RUN 4

Emission testing Run number 4 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	**DURATION**
7:30 AM to 7:36 AM	6 min

8:23 AM to 8:44 AM	21 min
8:55 AM to 9:00 AM	5 min
TOTAL	32 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

At 07:17 AM truck number 1 (80 by observation) was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. No visible emissions exited the concrete truck.

At 07:32 AM truck number 96 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 08:22 AM truck number 53 was filled with 4,240 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Both observers estimated that approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 08:27 AM truck number 66 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Both observers estimated that approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 08:31 AM truck number 65 was filled with 4,230 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Observer one estimated that approximately 70 to 80% and observer two estimated that approximately 75 to 85% of the dust generated by the batching operation was captured by the ventilation system.

At 08:37 AM truck number 64 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 08:54 AM truck number 2 (observed number 80) was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 40 to 50% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement which was transferred into concrete trucks was 27,840 pounds to make 54 yards of concrete.

INLET EMISSION TEST RUN 5

Emission testing Run number 5 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
9:07 AM to 9:13 AM	6 min
9:20 AM to 9:34 AM	21 min
9:39 AM to 9:42 AM	5 min
9:44 AM to 9:55 AM	5 min
TOTAL	32 min

During this emission test, NEWCEM was being pneumatically conveyed into silo number 1 for approximately 27 minutes. The amount of NEWCEM transferred during this period is estimated at (50,160 #/45 min)*27 min = 30,095 lbs

Dry batch loading of concrete delivery trucks was as follows:

At 09:04 AM truck number 105 was filled with 4,250 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 09:08 AM truck number 51 was filled with 1,030 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete. The capture efficiency of the ventilation system was not observed.

At 09:19 AM truck number 23 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. The capture efficiency of the ventilation system was not observed.

At 09:25 AM truck number 92 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel. No visible emissions exited the concrete truck.

At 09:37 AM truck number 107 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel. No visible emissions exited the concrete truck.

At 09:46 AM truck number 107 (observed number was 55) was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel. No visible emissions exited the concrete truck.

At 09:49 AM truck number 107 (observed number was 96) was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of gravel. No visible emissions exited the concrete truck.

> At 09:54 AM truck number 17 was filled with 590 pounds of portland cement and 0 pounds of NEWCEM to make 1.05 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

INLET EMISSION TEST RUN 6

Emission testing Run number 6 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
10:08 AM to 10:10 AM	6 min
10:28 AM to 10:38 AM	21 min
10:54 AM to 11:12 AM	5 min
TOTAL	32 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

> At 10:05 AM truck number 2 (observed truck number 22) was filled with 470 pounds of portland cement and 0 pounds of NEWCEM to make 1 yard of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

The following pages include (1) a transcribed batching report log with operations during outlet times in bold, and operations during inlet testing shaded, (2) copies of the batching report generated by the plant, (3) Handwritten notes taken during observations of the operations, (4) copies of the bills of lading for cement delivered during testing operations and the PCC PLANT GRADATION WORKSHEET reporting moisture and sieve analysis results conducted by the plant on 9/8/93.

9/8/93

At 5:20 the tanker deliver-ing portland cement from ESSROC cement company. 50,400# of cement is to be delivered. Delivery started at 6:00 am

second tanker began delivering immediately after first complete at 6:45. ~~Second~~ delivery was 50,300# delivery ended at 7:25

Truck loading started at 6:12

truck loading and cement loading in silo simultaneously

Truck #64	60-70% capture	[6:10]
Truck #91	60-70% capture	[6:17]
Truck #105	60-70% capture	[6:24]
Truck #51	70-80% capture	[6:52]
Truck #107	70-80% capture	[6:59]
Truck #89	70-80% capture inlet spling ended	[7:04]
~~Truck #86~~		
Truck #23	— no inlet sampling	[7:08]
Truck #59	no inlet sampling	[7:12]
Truck #86	no inlet sampling	[7:17]
Truck #111	no inlet sampling	[7:23]

inlet spl (#3)

~~Truck #96~~

Truck #80 no emissions visible

Truck #96 [7:32]

delivered 50,220# 8:15

inlet spl (#4)

Truck loading only

Third tanker of copely cement arrive at 7:35 ended ~~8:00~~

Truck #105	60-80% capture (John)	70-80% (Ron)	[7:37]
Truck #22	50-70% (John)	60-70% (Ron)	[7:42]
#90? Truck #80	60-70% (John)	60-70% (Ron)	[7:47]
Truck #60	60-70% John		[7:58]

Truck #56	50-60% capture (John)		[8:01]
Truck #49	50-60% capture (John)	60-70% (Ron)	[8:0
Truck #57	60-70% capture (John)	60-70% (Ron)	[8:1
Truck #23	70-80% capture (John)		[8:16
Truck #53	70-80% capture (John)	70-80% (Ron)	[8:
Truck #66	70-80% capture (John)	70-80% (Ron)	[8:2
Truck #65	75-85% capture (John)	70-80% (Ron)	[8:3
Truck #64		80-90% (Ron)	[8:3
Truck #81	40-50% capture (John)		[9:02
Truck #105	80-90% capture (John)		[9:04]
Truck #23			[9:19]
Truck #92	no emissions visible		[9:25]
Truck #107	no emissions visible		[9:37] [9:46]
Truck #55	no emissions visible	sampling stopped	
Truck #96	no emissions visible		[9:49]
Truck #17	70-80% capture (John)		[9:54]
Truck #111	no emissions visible		[9:56]
Truck #22	50-60% capture		
Truck #64	80-90% (John)	80-90% (Ron)	10:36
Truck #70	70-80% (John)	70-80% (Ron)	10:42
Truck #53	70-80% (John)	70-80% (Ron)	10:48

inlet sple cont

Load of New cem started delivery @ 9:05 ended at 9:50 50,160#

Splat inlet 10:08-11:12

Tanker to deliver Lehigh cement into silo #3 arrived at 11:39. Loading began at 11:40 and ended at 12:23 inlet sampling started at 12:04 and continued till 2:20 Tanker delivered 51,000# cement

Tanker delivering Lehigh cement into silo #3 arrived about 1:30-1:35 to deliver 50,000# cement
Inlet sampling resumed at
Inlet sampling stopped at 1:48

inlet spike concurrent w/ silo filling

Truck #80 90-80% capture (dow) ② ≈ 1:36 and ③ 1:41

It sprinkled off and on most of the day. There were times when rain was more than a sprinkle. The ground and pavement was wet all day

APPENDIX E.3.2
BATCH LOADING COMPUTER LOG

FILLING BIN 3 Sep 8 9:44:20 am

04e34470 00100203

	AGG 1 SAND	AGG 2 SAND	AGG 3 # 67 G	AGG 4 PEA GRA
ACTUAL USAGE SINCE 09/07/93	309040	6790	322140	0
TARGET USAGE	308951	6784	322803	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.03%	0.09%	-0.21%	0.00%
ACTUAL USAGE SINCE 09/07/93	309040	6790	322140	0
TARGET USAGE	308951	6784	322803	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.03%	0.09%	-0.21%	0.00%
BEGINNING BALANCE ON 09/07/93	0	0	0	0
RECEIVED TO DATE	0	0	0	0
SHIPPED TO DATE	309040	6790	322140	0
BALANCE ON HAND	-309040	-6790	-322140	0

PRESS PgDn TO VIEW NEXT GROUP PRESS prtSc TO PRINT THIS PAGE
PRESS PgUp TO VIEW LAST GROUP PRESS ESCAPE TO EXIT THIS COMMAND

AGG = 00010 CMT = 00020 WAT = 00000
AUTOMATIC B2 04 00 F1 00 00 Fe F5

TICKET 047517

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 107 Plant 1
#67 GRAVEL

67 G 24670* (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -1.00
MAX WATER 000/-50

AGG TARE 10 10 CMT TARE 20 20
TIME 9:45:01 am

TICKET 047518

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 107 Plant 1
#67 GRAVEL

67 G 24,47[illegible] (1.5[illegible] (0.50) (1.00)

2

MAX WATER 000/-29

AGG TARE 10 10 CMT TARE 20 20
TIME : 9:49:14 am

TICKET 047519

Sep 8, 1993 Job No. 0 Mix No. 601 1.05 yds DLVD 0.00 Truck 17 Plant 1
6 BAG AE

SAND 1460 (1.50/ 0.30) (7.70) SRDLOFLA 590 (0.10/ 0.70) Daravair 5
67 G 3430* (1.00)

WATER 7/ 58 (0.00/ 0.00) TRIM -9.99
MAX WATER 054/011

AGG TARE 0 10 CMT TARE 20 20
TIME : 9:54:27 am

TICKET 047520

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 111 Plant 1
#67 GRAVEL

67 G 24240 (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -9.99
MAX WATER 000/-29

AGG TARE 10 10 CMT TARE 20 20
TIME : 9:56:31 am

TICKET 047521

Sep 8, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 80 Plant 1
5.5 BAG AE

SAND 11680 (1.50/ 0.50) (7.70) SRDLOFLA 4630 (0.10/ 0.70) Daravair 21
67 G 26520 (1.00)

WATER 162/1349 (0.00/ 0.00) TRIM -1.00
MAX WATER 292/002

AGG TARE 10 20 CMT TARE 20 20
TIME : 10:00:23 am

TICKET 047522

67 G 3440* (1.00) Polyheed 16*

WATER 4/ 33 (0.00/ 0.00) TRIM -9.99
MAX WATER 030/011

AGG TARE 20 10 CMT TARE 20 20
TIME : 10:05:39 am

TICKET 047523
Sep 8, 1993 Job No. 0 Mix No. 503 2.50 yds DLVD 0.00 Truck 60 Plant 1
5 BAG AE WR

SAND 3490 (1.50/ 0.50) (7.70) SRGCGPLA 1170 (0.10/ 0.70) Daravair 4
67 G 8170 (1.00) Polyheed 36*

WATER 12/ 100 (0.00/ 0.00) TRIM -9.99
MAX WATER 074/024

AGG TARE 10 20 CMT TARE 20 20
TIME : 10:19:33 am

TICKET 047524
Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 89 Plant 1
#67 GRAVEL

67 G 24260 (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -2.00
MAX WATER 000/-25

AGG TARE 10 10 CMT TARE 20 20
TIME : 10:22:56 am

TICKET 047525
Sep 8, 1993 Job No. 0 Mix No. 500 9.00 yds DLVD 0.00 Truck 64 Plant 1
5 BAG MIX

SAND 1[illegible] (1.50/ 0.50) (6.50) SRGCGPLA 4220 (0.10/ 0.70)
67 G [illegible] (1.00)

WATER 157/1308 (0.00/ 0.00) TRIM -1.00
MAX WATER 320/002

AGG TARE [illegible] 30 CMT TARE 20 30
TIME : 10:36:27 am

TICKET 047526

Sep 8, 1993 Job No. 0 Mix No. 500 9.00 yds DLVD 0.00 Truck 70 Plant 1
5 BAG MIX

SAND 13370 < 1.50/ 0.50> (8.80) SRDCOPLA 4210 < 0.10/ 0.70>
67 G 30060 (1.00)

WATER 157/1308 < 0.00/ 0.00> TRIM -1.00
MAX WATER 320/002

AGG TARE 30 20 CMT TARE 20 20
TIME : 10:42:49 am

TICKET 047527

Sep 8, 1993 Job No. 0 Mix No. 673 4.00 yds DLVD 0.00 Truck 53 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 4970 < 1.50/ 0.50> (7.70) SRDCOPLA 2470* < 0.10/ 0.70> Daravair 18
67 G 12390 (1.00)

WATER 35/ 292 < 0.00/ 0.00> TRIM -9.99
MAX WATER 127/037

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:48:18 am

TICKET 047528

Sep 8, 1993 Job No. 0 Mix No. 701 9.00 yds DLVD 0.00 Truck 91 Plant 1
7 BAG AE

SAND 10480 < 1.50/ 0.50> (7.70) SRDCOPLA 5910 < 0.10/ 0.70> Daravair 32
67 G 27220 (1.00)

WATER 177/1474 < 0.00/ 0.00> TRIM -1.00
MAX WATER 297/003

AGG TARE 20 30 CMT TARE 10 20
TIME : 11:17:04 am

TICKET 047529

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 23 Plant 1
WET GRAVEL

67 G 24200 < 1.50/ 0.50> (1.00)

WATER 0/ 0 < 0.00/ 0.00> TRIM [illegible]

AGG TARE 20 10 CMT TARE 20 20
TIME : 11:27:34 am

TICKET 047530

Sep 8, 1993 Job No. 0 Mix No. 505 4.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG AE W/ RET ??

SAND 5650 (1.50/ 0.50) (7.70) SRCCOPLA 1880 (0.10/ 0.70) Daravair 6
67 6 13090 (1.00) 122R/Poz 57

WATER 23/ 192 (0.00/ 0.00) TRIM -9.99
MAX WATER 121/037

AGG TARE 10 20 CMT TARE 20 20
TIME : 12:37:43 pm

TICKET 047531

Sep 8, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 31 Plant 1
6 BAG AE

SAND 12470 (1.50/ 0.50) (7.70) SRCCOPLA 5070 (0.10/ 0.70) Daravair 31
67 6 28260 (1.00)

WATER 150/1250 (0.00/ 0.00) TRIM -1.00
MAX WATER 288/004

AGG TARE 10 30 CMT TARE 20 20
TIME : 12:41:20 pm

TICKET 047532

Sep 8, 1993 Job No. [illegible] Mix No. 500 8.50 yds DLVD 0.00 Truck 17 Plant 1
5 BAG AIR

SAND 12150 (1.50/ 0.50) (5.50) SRCCOPLA 3970 (0.10/ 0.70)
67 6 28490 (1.00)

WATER 148/1233 (0.00/ 0.00) TRIM -1.00
MAX WATER 303/[illegible]

AGG TARE 20 [illegible] CMT TARE 20 20
TIME : 12:58:25 pm

TICKET 047533

Sep 8, 1993 Job No. [illegible] Mix No. 653 3.00 yds DLVD 0.00 Truck 103 Plant 1
[illegible]

S.M.A.#6 9440 (0.40) Polyheed 91

WATER 38/ 317 (0.00/ 0.00) TRIM -5.00
MAX WATER 090/013

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:58:33 pm

TICKET 047534

Sep 8, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 60 Plant 1
6 BAG

SAND 12650 (1.50/ 0.50) (8.80) SRDCOPLA 5050 (0.10/ 0.70)
67 E 29410 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -1.00
MAX WATER 317/0-2

AGG TARE 10 20 CMT TARE 20 20
TIME : 1:08:22 pm

TICKET 047535

Sep 8, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 80 Plant 1
6 BAG

SAND 12650 (1.50/ 0.50) (8.80) SRDCOPLA 5060 (0.10/ 0.70)
67 E 29290 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -1.00
MAX WATER 317/0-2

AGG TARE 20 20 CMT TARE 20 20
TIME : 1:33:40 pm

loading started @ 1:36 and finished at 1:41

7

AGG WAITING FOR LOW Sep 8 4:16:29

00802414 00100203

	CMT 1 NEW CEM	CMT 2 SROCOFLA	CMT 3 LEHIGH	CMT
ACTUAL USAGE SINCE 09/07/93	0	0	0	
TARGET USAGE	0	0	0	
MANUAL USAGE	0	0	0	
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.
ACTUAL USAGE SINCE 09/07/93	0	0	0	
TARGET USAGE	0	0	0	
[illegible]	0	0	0	

RECEIVED TO DATE 0 0 0
SHIPPED TO DATE 59830 185160 52520
BALANCE ON HAND

PRESS PgDn TO VIEW NEXT GROUP
PRESS PgUp TO VIEW LAST GROUP

PRESS prtSc TO PRINT THIS PAGE
PRESS ESCAPE TO EXIT THIS COMMAND

AGG = 00000 CMT = 00010 WAT = 00000
AUTOMATIC 82 04 00 f1 00 00 7c f3

REPORTS

TICKET 047486

Sep 8, 1993 Job No. 0 Mix No. 673 9.00 yds DLVD 0.00 Truck 64 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 11360 < 1.50/ 0.50> (8.80) SRDCOPLA 5470 < 0.10/ 0.70> Daravair 39
67 S 27990 (1.00)

WATER 120/1000 < 0.00/ 0.00> TRIM -4.00
MAX WATER 288/026

AGG TARE -10 20 CMT TARE 10 20
TIME : 6:10:38 am

TICKET 047487

Sep 8, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 91 Plant 1
6 BAG AE

SAND 12550 < 1.50/ 0.50> (8.80) SRDCOPLA 5070 < 0.10/ 0.70> Daravair 31
67 S 28440 (1.00)

WATER 126/1050 < 0.00/ 0.00> TRIM -2.00
MAX WATER 288/010

AGG TARE 10 10 CMT TARE 20 20
TIME : 6:17:27 am

TICKET 047488

Sep 8, 1993 Job No. 0 Mix No. 80[illegible] 9.00 yds DLVD 0.00 Truck 105 Plant 1
[illegible] Mix #8

SAND 13[illegible] < 1.50/ 0.50> (8.80) LEHIGH 50[illegible] < 0.10/ 0.70> MicroAir 33*
[illegible] (0.40) 222-N 255*

WATER 130/1033 (0.00/ 0.00) TRIM -2.00
MAX WATER 302/035

AGG TARE 10 20 CMT TARE 20 20
TIME : 6:24:05 am

Sep 8, 1993 Job No. 0 Mix No. 501 9.00 yds DLVD 0.00 Truck 51 Plant 1
5 BAG AE

SAND 12390 (1.50/ 0.50) (8.80) SRDCOPLA 4210 (0.10/ 0.70) Daravair 22
67 B 29130 (1.00)

WATER 127/1058 (0.00/ 0.00) TRIM -2.00
MAX WATER 286/008

AGG TARE 10 20 CMT TARE 10 20
TIME : 6:52:55 am

TICKET 047490

Sep 8, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 107 Plant 1
6 BAG AE

SAND 12700 (1.50/ 0.50) (8.80) SRDCOPLA 5050 (0.10/ 0.70) Daravair 31
67 B 28370 (1.00)

WATER 126/1050 (0.00/ 0.00) TRIM -2.00
MAX WATER 288/009

AGG TARE 10 20 CMT TARE 20 20
TIME : 6:59:10 am

TICKET 047491

Sep 8, 1993 Job No. 0 Mix No. 653 5.00 yds DLVD 0.00 Truck 89 Plant 1
6.5 BAG AE WR

SAND 6440 (1.50/ 0.50) (8.80) LEHIGH 3020 (0.10/ 0.70) Daravair 23
S.H.A.#8 15730 (0.40) Polyheed 152

WATER 72/ 600 (0.00/ 0.00) TRIM -2.00
MAX WATER 151/005

AGG TARE 10 10 CMT TARE 20 20
TIME : 7:04:20 am

TICKET 047492

Sep 8, 1993 Job No. 0 Mix No. 801 9.00 yds DLVD 0.00 Truck 23 Plant 1
801 S.H.A MIX #8

SAND [illegible] (1.50/ 0.50) (8.8[illegible]) LEHIGH 5040 (0.10/ 0.70) MicroAir 32*
S.H.A.#8 27790 (0.4[illegible]) 322-N 253

WATER 139/1158 (0.10/ 0.00) TRIM -1.00
[illegible]

AGG TARE 10 10 CMT TARE 20 20
TIME : 7:08:19 am

TICKET 047493

Sep 8, 1993 Job No. 0 Mix No. 673 8.00 yds DLVD 0.00 Truck 39 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 10000 < 1.50/ 0.50) (8.80) SRGCOPLA 4860 < 0.10/ 0.70) Daravair 34
67 G 24850 (1.00)

WATER 131/1091 < 0.00/ 0.00) TRIM -1.00
MAX WATER 254/0-1

AGG TARE 10 10 CMT TARE 20 20
TIME : 7:12:52 am

TICKET 047494

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 1 Plant 1
#67 GRAVEL

67 G 24190 < 1.50/ 0.50) (1.00)

WATER 0/ 0 < 0.00/ 0.00) TRIM -1.00
MAX WATER 000/-29

AGG TARE 0 0 CMT TARE 20 20
TIME : 7:17:11 am

TICKET 047495

Sep 8, 1993 Job No. 0 Mix No. [illegible] 9.00 yds DLVD 0.00 Truck 111 Plant 1
6.5 BAG AE WR

SAND [illegible] < 1.50/ 0.50) (8.80) SRGCOPLA 5470 < 0.10/ 0.70) Daravair 41
[illegible] (0.40) Polyheed 276*

WATER 138/1150 < 0.00/ 0.00) TRIM -1.00
MAX WATER [illegible]

AGG TARE [illegible] CMT TARE 20 20
TIME : [illegible] am

TICKET 047496

Sep 8, 1993 Job No. 0 Mix No. 501 9.00 yds DLVD 0.00 Truck 96 Plant 1
[illegible]

```
                                        WATER      137/1141 < 0.00/ 0.00>         TRIM     -1.00
                                        MAX WATER  286/0-3

   AGG TARE   10   10   CMT TARE   20   20
    TIME :   7:32:23 am

                                                                                      TICKET 047497
Sep  8, 1993    Job No.        0     Mix No.  201       9.00 yds    DLVD     0.00     Truck 105  Plant    1
                  201 S.M.A. MIX #2

  SAND      12110  < 1.50/ 0.50> ( 8.80)     LEHIGH    5010  < 0.10/ 0.70>           MicroAir    32+
  S.M.A.#6 27920                 ( 0.40)                                             322-N      254+

                                        WATER      139/1158 < 0.00/ 0.00>         TRIM     -1.00
                                        MAX WATER  302/025

   AGG TARE   10   20   CMT TARE   20   20
    TIME :   7:37:31 am

                                                                                      TICKET 047498
Sep  8, 1993    Job No.        0     Mix No.  550       9.00 yds    DLVD     0.00     Truck   2  Plant    1
                  5.5 BAG

  SAND      13190  < 1.50/ 0.50> ( 8.80)     GROCOPLA  4630  < 0.10/ 0.70>
  # 67 E   29890                 ( 1.00)

                                        WATER      153/1274 < 0.00/ 0.00>         TRIM     -1.00
                                        MAX WATER  311/0-1

   AGG TARE   10   20   CMT TARE   20   20
    TIME :   7:42:19 am

                                                                                      TICKET 047499
Sep  8, 1993    Job No.        0     Mix No.  601       9.00 yds    DLVD     0.00     Truck  80  Plant    1
                  6 BAG AE

  SAND      [illegible]  < 1.50/ 0.50> ( 8.80)     GROCOPLA  5080  < 0.10/ 0.70>           Daravair    31
  # 67 E   [illegible]                 ( 1.00)

                                        WATER      135/1125 < 0.00/ 0.00>         TRIM     -1.00
                                        MAX WATER  288/001

   AGG TARE   10   20   CMT TARE   20   20
    TIME :   7:47:43 am
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TICKET 047500

Sep 8, 1993 Job No. 0 Mix No. 103 8.00 yds DLVD 0.00 Truck 70 Plant 1
3000 PSI GROUT

SAND 21610 < 1.50/ 0.50> (8.80) GROCOPLA 5240 < 0.10/ 0.70) 322-N 370

WATER 229/1908 < 0.00/ 0.00> TRIM -1.00
MAX WATER 450/-10

AGG TARE 10 30 CMT TARE 20 20
TIME : 7:53:47 am

TICKET 047501

Sep 8, 1993 Job No. 0 Mix No. 511 5.00 yds DLVD 0.00 Truck 60 Plant 1
3000 PSI AE

SAND 6790 < 1.50/ 0.50> (8.80) GROCOPLA 2500 < 0.10/ 0.70> Daravair 18
67 G 16190 (1.00) Polyheed 75

WATER 54/ 450 < 0.00/ 0.00> TRIM -5.00
MAX WATER 158/020

AGG TARE 20 20 CMT TARE 20 20
TIME : 7:58:00 am

TICKET 047502

Sep 8, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 56 Plant 1
6.5 BAG AE WR

SAND 11560 < 1.50/ 0.50> (8.80) GROCOPLA 5470 < 0.10/ 0.70> Daravair 41
S.R.A.#6 26240 (0.40) Polyheed 274

WATER 138/1.50 < 0.00/ 0.00> TRIM -1.00
MAX WATER 271/001

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:01:46 am

TICKET 047503

Sep 8, 1993 Job No. 0 Mix No. 508 9.00 yds DLVD 0.00 Truck 49 Plant 1
5 BAG AE WR

SAND 12950 < 1.50/ 0.50> (8.80) GROCOPLA 4220 < 0.10/ 0.70> Daravair 14
67 G 29740 (1.00) Polyheed 127

WATER 11./ 925 < 0.00/ 0.00> TRIM -1.00

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:07:02 am

TICKET 047504

Sep 8, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 57 Plant 1
5 BAG AE WR

SAND 12790 (1.50/ 0.50) (8.80) SRDCOPLA 4220 (0.10/ 0.70) Daravair 14
67 6 29590 (1.00) Polyheed 127

WATER 111/ 925 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/0-1

AGG TARE 30 30 CMT TARE 20 20
TIME : 8:11:54 am

TICKET 047505

Sep 8, 1993 Job No. 0 Mix No. 201 5.00 yds DLVD 0.00 Truck 23 Plant 1
201 S.H.A. MIX #2

SAND 6660 (1.50/ 0.50) (8.80) LEHIGH 2800 (0.10/ 0.70) MicroAir 19*
S.H.A.#6 15470 (0.40) 322-N 143*

WATER 77/ 641 (0.00/ 0.00) TRIM -1.00
MAX WATER 168/015

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:15:20 am

TICKET 047506

Sep 8, 1993 Job No. 0 Mix No. 501 9.00 yds DLVD 0.00 Truck 53 Plant 1
5 BAG AE

SAND 12300 (1.50/ 0.50) (8.80) SRDCOPLA 4240 (0.10/ 0.70) Daravair 22
67 S 29150 (1.00)

WATER 136/1133 (0.00/ 0.00) TRIM -1.00
MAX WATER 286/000

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:22:31 am

TICKET 047507

Sep 8, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 66 Plant 1
6.5 BAG AE WR

TICKET 047511

Sep 8, 1993 Job No. 0 Mix No. 601 4.00 yds DLVD 0.00 Truck 91 Plant 1
6 BAG AE

SAND 5590 (1.50/ 0.50) (7.70) SRQCOPLA 2250 (0.10/ 0.70) Daravair 14
67 B 12540 (1.00)

WATER 50/ 417 (0.00/ 0.00) TRIM -5.00
MAX WATER 128/018

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:02:02 am

TICKET 047512

Sep 8, 1993 Job No. 0 Mix No. 653 7.00 yds DLVD 0.00 Truck 105 Plant 1
6.5 BAG AE WR

SAND 8850 (1.50/ 0.50) (7.70) SRQCOPLA 4250 (0.10/ 0.70) Daravair 32
S.H.A.#6 21860 (0.40) Polyheed 214

WATER 118/ 983 (0.00/ 0.00) TRIM -1.00
MAX WATER 211/003

AGG TARE 10 20 CMT TARE 20 20
TIME : 9:04:59 am

TICKET 047513

Sep 8, 1993 Job No. 0 Mix No. 550 2.00 yds DLVD 0.00 Truck 51 Plant 1
5.5 BAG

SAND 2840 (1.50/ 0.50) (7.70) SRQCOPLA 1030 (0.10/ 0.70)
67 B 6730* (1.00)

WATER 19/ 158 (0.00/ 0.00) TRIM -9.99
MAX WATER 059/019

AGG TARE 10 10 CMT TARE 20 20
TIME : 9:08:57 am

TICKET 047514

Sep 8, 1993 Job No. 0 Mix No. 647 9.00 yds DLVD 0.00 Truck 28 Plant 1

SAND 13400 (1.50/ 0.50) (7.70) LEHIGH 5470 (0.10/ 0.70) Daravair 38
BLUE STO 28670 (0.75) 122R/Poz 171

WATER 140/1168 (0.00/ 0.00) TRIM -1.00
MAX WATER [illegible]

S.H.A.Wo 28220   (0.40)   Polyheed 274

WATER 138/1150 < 0.00/ 0.00)   TRIM -1.00
MAX WATER 271/0-1

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:27:37 am

TICKET 047508

Sep 8, 1993   Job No. 0   Mix No. 503   9.00 yds   DLVD 0.00   Truck 65 Plant 1
5 BAG AE WR

SAND 12800 < 1.50/ 0.50) (8.80)   SRDCOPLA 4230 < 0.10/ 0.70)   Daravair 14
67 6 29700 (1.00)   Polyheed 127

WATER 111/ 925 < 0.00/ 0.00)   TRIM -1.00
MAX WATER 266/0-1

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:31:52 am

TICKET 047509

Sep 8, 1993   Job No. 0   Mix No. 601   9.00 yds   DLVD 0.00   Truck 64 Plant 1
6 BAG AE

SAND 12570 < 1.50/ 0.50) (8.80)   SRDCOPLA 5050 < 0.10/ 0.70)   Daravair 31
67 6 28430 (1.00)

WATER 135/1125 < 0.00/ 0.00)   TRIM -1.00
MAX WATER 288/001

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:37:00 am

TICKET 047510

Sep 8, 1993   Job No. 0   Mix No. 551   9.00 yds   DLVD 0.00   Truck 2 Plant 1
5.5 BAG AE

SAND [illegible] < 1.50/ 0.50) (7.70)   SRDCOPLA 4[illegible] < 0.[illegible]/ 0.70)   Daravair 21
67 6 [illegible] (1.00)

WATER 161/1341 < 0.00/ 0.00)   TRIM -1.00
MAX WATER 292/002

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:54:08 am

TIME : 9:19:54 am

TICKET 047515

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 92 Plant 1
#67 GRAVEL

67 G 24260 < 1.50/ 0.50> (1.00)

WATER 0/ 0 < 0.00/ 0.00> TRIM -1.00
MAX WATER 000/-29

AGG TARE 30 30 CMT TARE 20 20
TIME : 9:25:16 am

TICKET 047516

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 107 Plant 1
#67 GRAVEL

67 G 24520 < 1.50/ 0.50> (1.00)

WATER 0/ 0 < 0.00/ 0.00> TRIM -1.00
MAX WATER 000/-29

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:37:18 am

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:19:54 am

TICKET 047515

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 92 Plant 1
#67 GRAVEL

67 G 24260 (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -1.00
MAX WATER 000/-29

AGG TARE 30 30 CMT TARE 20 20
TIME : 9:25:16 am

TICKET 047516

Sep 8, 1993 Job No. 0 Mix No. 115 8.00 yds DLVD 0.00 Truck 107 Plant 1
#67 GRAVEL

67 G 24520 (1.50/ 0.50) (1.00)

WATER 0/ 0 (0.00/ 0.00) TRIM -1.00
MAX WATER 000/-29

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:37:12 am

Sep 9, 1993   Job No.   0   Mix No. 115   8.00 yds   DLVD   0.00   Truck 55 Plant   1

[illegible] GRAVEL [illegible]

67 6   24260 (1.50/ 0.50) (1.00)

WATER   200/1666+(0.00/ 0.00)   TRIM   -3.00

MAX WATER   000/-229

AGG TARE   20   10   CMT TARE   20   20

TIME :   3:11:37 pm

TICKET 047616

Sep 9, 1993   Job No.   0   Mix No. 601   9.00 yds   DLVD   0.00   Truck 65 Plant   1

6 BAG AE

SAND   12320 (1.50/ 0.50) (6.70)   SRDCDPLA   5070 (0.10/ 0.70)   Daravair   31

67 6   28150   (1.00)

WATER   146/1216 (0.00/ 0.00)   TRIM   -3.00

MAX WATER   288/024

AGG TARE   10   20   CMT TARE   20   20

TIME :   3:29:57 pm

TICKET 047617

Sep 9, 1993   Job No.   0   Mix No. 501   1.50 yds   DLVD   0.00   Truck   2 Plant   1

5 BAG AE

SAND   2000 (1.50/ 0.50) (6.70)   SRDCDPLA   700 (0.10/ 0.70)   Daravair   4

67 6   4810   (1.00)

WATER   14/ 117 (0.00/ 0.00)   TRIM   -9.99

MAX WATER   048/015

AGG TARE   10   10   CMT TARE   20   20

TIME :   3:54:50 pm

TICKET 047618

Sep 9, 1993   Job No.   0   Mix No. 601   9.00 yds   DLVD   0.00   Truck 57 Plant   1

6 BAG AE

SAND   12420 (1.50/ 0.50) (6.70)   SRDCDPLA   5060 (0.10/ 0.70)   Daravair   32

67 6   28150   (1.00)

WATER   146/1216 (0.00/ 0.00)   TRIM   -3.00

MAX WATER   288/023

TICKET 047619

Sep 9, 1993 Job No. 0 Mix No. 601 7.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 9330 (1.50/ 0.50) (6.70) SRDCOPLA 3940 (0.10/ 0.70) Daravair 24
67 6 22000 (1.00)

WATER 113/ 941 (0.00/ 0.00) TRIM -3.00
MAX WATER 224/019

AGG TARE 10 20 CMT TARE 20 20
TIME : 4:14:36 pm

TICKET 047620

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 700 Plant 1
6 BAG AE

SAND 12470 (1.50/ 0.50) (6.70) SRDCOPLA 5050 (0.10/ 0.70) Daravair 31
67 6 28290 (1.00)

WATER 137/1141 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/032

AGG TARE 10 20 CMT TARE 20 20
TIME : 4:19:35 pm

TICKET 047621

Sep 9, 1993 Job No. 0 Mix No. 7033 9.00 yds DLVD 0.00 Truck 105 Plant 1
5000 PSI AVE

SAND 10620 (1.50/ 0.50) (6.70) SRDCOPLA 2950 (0.10/ 0.70) Daravair 35
67 6 27330 (1.00) NEW CEM 5890 Polyheed 297*

WATER 158/1316 (0.00/ 0.00) TRIM -3.00
MAX WATER 289/022

AGG TARE 20 20 CMT TARE 10 20
TIME : 4:31:31 pm

TICKET 047622

Sep 9, 1993 Job No. 0 Mix No. 5691 2.00 yds DLVD 0.00 Truck 23 Plant 1

SAND 3310 (1.50/ 0.50) (6.70) SRDCOPLA 530* (0.10/ 0.70) Polyheed 31

23

WATER 17/ 142 (0.00/ 0.00) TRIM -9.99
MAX WATER 066/019

AGG TARE 10 20 CMT TARE 20 20
TIME : 5:17:39 pm

TICKET 047625

Sep 9, 1993 Job No. 0 Mix No. 7033 5.00 yds DLVD 0.00 Truck 107 Plant 1
5000 PSI A\E

SAND 5760 (1.50/ 0.50) (6.70) SROCOPLA 1650 (0.10/ 0.70) Daravair 20
67 G 15210 (1.00) NEW CEM 3290 Polyheed 166*

WATER 78/ 650 (0.00/ 0.00) TRIM -5.00
MAX WATER 161/024

AGG TARE 10 20 CMT TARE 20 20
TIME : 5:22:56 pm

APPENDIX E.4.3
CEMENT DELIVERY INVOICES

ESSROC

Frederick

ESSROC Materials Inc.
Cement Group - East Coast Region

4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

Sold to: CHANEY ENTERPRISES — 79580.00

29060.00

Destination: WALDORF, MD PLANT - FOB FREDERICK, MD

50520 — 50520.00

Shipped from	Shipped via	Ticket No.	
FREDERICK, MD PLANT	PICK UP	37470	060

1	PICK ESSROC TYPE I - II	173	4	25.26	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

Special instructions:

ESSROC Materials Inc., Shipper

By

The cement listed hereon was delivered/received in good condition:

Firm

Trucker's Signature

Consignee (mdse. received in good condition)

Trailer number | Time of arrival

Permanent P.O. Address

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent

Per

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible, and wash exposed skin areas promptly with water. If any cement or mixtures get into the eyes, rinse immediately and repeatedly with water, and get prompt medical attention. Keep out of the reach of children.

ESSROC

Frederick

ESSROC Materials Inc.
Cement Group - East Coast Region

4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

Delive
orc

MD6000

Sold to CHANEY ENTERPRISES — 79220.00 Lbs. Gross

Consigned to — 28660.00 Lbs. Tare

Destination WALDORF,MD PLANT - FOB FREDERICK,MD

50560 — 50560.00 Lbs. Net

Shipped from	Shipped via	Ticket No.	
FREDERICK,MD PLANT	PICK UP	37475	060

1	PICK ESSROC TYPE I - II	173	5	25.28	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

Special instructions

ESSROC Materials Inc., Shipper

Per

The cement listed hereon was delivered/received in good condition.

Firm

Trucker's Signature X

Consignee (mdse. received in good condition)

Trailer number	Time of arrival			Bin
5		5:51	5:54	36

Consignee P.O. Address

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent

Per

CAUTION: Freshly mixed cement, mortar, concrete, grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixture gets into the eyes, rinse immediately and repeatedly with water and get prompt medical attention. Keep out of the reach of children.

LEHIGH CEMENTS

PERMANENT ADDRESS—ALLENTOWN, PA.

Agent's No. ______

From—LEHIGH PORTLAND CEMENT COMPANY

At UNION BRIDGE, MD.

By ______ (Originating Carrier)

THIS MEMORANDUM is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

DELIVER TO CHARLES CO. CONC. CO., INC.
PICKUP AT UNION BRIDGE, MD. FOR
WALDORF, MARYLAND

Date 9/4/62

(Mail Address of Consignee—For Purposes of Notification Only)

DANGER
See instructions on reverse side.

Route/Delivering Carrier CUSTOMER

11-23945 PO. C32398

LPC CO. NO.	CONTRACT NO.	TIME ARRIVED 9 A	TIME LEFT 9:15 A
CUSTOMER'S ORDER NO.		CAR INITIAL	CAR OR TRAILER NO. 4

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement	1	25.0			
	Lehigh Masonry Cement					

WE CERTIFY THE CEMENT TO MEET
CHEMICAL & PHYSICAL TEST REQUIRE
MENTS OF MD. STATE SPECS. AND WAS
LOADED FROM [illegible] BIN.

MD. STATE CONTR #.......... F.A.

[illegible] F.A.

BULK WEIGHT (In Pounds)	
GROSS	[illegible] LB
TARE 50,400	[illegible] LB
NET	[illegible] LB
NET TONS	25.00 TONS

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ______ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

PER ______

RECEIVED BY

______ (Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per ______ Agent

RECEIVED BY, with the following apparent loss or damage noted:

______ (Customer's Signature)

No. 483092 3

Rev 1/91

EXTRA COPY #1

LEHIGH
CEMENTS
PERMANENT ADDRESS — ALLENTOWN, PA.

Agent's No.

From--LEHIGH PORTLAND CEMENT COMPANY

At

By UNION BRIDGE, MD.
(Originating Carrier)

THIS MEMORANDUM is an acknowledgement that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

DELIVER TO

Date 9/7/92
(Mail Address of Consignee—For Purposes of Notification Only)

CHARLES CO. CONC. CO., INC.
PICKUP AT UNION BRIDGE, MD. FOR
WALDORF, MARYLAND

DANGER
See instructions on reverse side.

Route/Delivering Carrier CUSTOMER

11-23943 PO. C22599

LPC CO. NO.	CONTRACT NO.	TIME ARRIVED 11:35P	TIME LEFT 11:55P
CUSTOMER'S ORDER NO.		CAR INITIAL	CAR OR TRAILER NO. 5

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement	1	2555			
	Lehigh Masonry Cement					

WE CERTIFY THE CEMENT TO MEET ... CHEMICAL & PHYSICAL TEST REQUIREMENTS OF [illegible]STATE SPECS. AND WAS ... SEP 30 11:50 LOADED F[illegible] ... BIN.....
MD.STATE CONTR #................ JC CERT. ID [illegible]

BULK WEIGHT (In Pounds)	
GROSS	[illegible] LB
TARE	29500 LB
	51,100
NET	51100 LB

If This Car Develops Bad Order And Will Be Delayed in Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company
Per ____________ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED--NOT PREPAID

NET TONS 25.55 TONS

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

RECEIVED BY ____________ (Customer's Signature)

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER
PER--

RECEIVED BY CARRIER INDICATED ABOVE
Per ____________ Agent

RECEIVED BY, with the following apparent loss or damage noted: ____________ #2 (Customer's Signature)

No. 483112 9

v. 1/91

EXTRA COPY #1

APPENDIX E.5.3
CEMENT DELIVERY INVOICES

Deliv
or

ESSROC Materials Inc.
Cement Group - East Coast Region

4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

ESSROC

Frederick

B/L date	B/L number		Contract number	Customer order number	Customer number
9/10/93	7450	37488			22023000

MD0000

Sold to: CHANEY ENTERPRISES — 79500.00 Lbs. Gross

Consigned to: — 29040.00 Lbs. Tare

Destination: WALDORF, MD PLANT - FOB FREDERICK, MD — 50460.00 Lbs. Net

50,460#

Shipped from	Shipped via	Ticket No.	
FREDERICK, MD PLANT	PICK UP	37488	060

Ordered	Product description	Product code	Car or trailer number	Weight (tons)	BIN
1	PICK ESSROC TYPE I - II	173	4	25.23	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

Special instructions: THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

ESSROC Materials Inc., Shipper

Per WA

The cement listed hereon was delivered/received in good condition.

Firm

Trucker's Signature X

Consignee (mdse. received in good condition)

Trailer number	Time of arrival			Bin
4		4:09	4:13	36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent

Per

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. **Keep out of the reach of children.**

ESSROC

Frederick

Cement Group - East Coast Region
4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

Customer number [illegible]

MD0000

Sold to CHANEY ENTERPRISES — 79620.00 Lbs. Gross

Consigned to — 28720.00 Lbs. Tare

Destination WALDORF,MD PLANT - FOB FREDERICK,MD

50,900# — 50900.00 Lbs. Net

Shipped from	Shipped via	Ticket No.	
FREDERICK,MD PLANT	PICK UP	37492	060

Ordered	Product description	Product code	Carrier number	Weight (tons)	BIN
1	PICK ESSROC TYPE I - II	173	T-6	25.45	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

Special instructions THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

ESSROC Materials Inc., Shipper	The cement listed hereon was delivered/received in good condition.
Per [signature]	Firm Trucker's Signature X [signature]
Consignee (mdse. received in good condition)	

Trailer number	Time of arrival			Bin
T-6		4:47	4:50	36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.	Agent [handwritten] #2 Per

CAUTION: Freshly mix[ed] cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin whe[never] possible and wash expos[ed] skin areas promptly w[ith] water. If any cement mixtures get into the eye, rinse immediately and repeated[ly] with water and get prom[pt] medical attention. **Keep out of the reach of children.**

CUSTOMER

ESSROC

Frederick

ESSROC Materials Inc.
Cement Group - East Coast Region
4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

orc

[illegible]	Bill number	[illegible]	Contract number	Customer order number	Customer number
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22025000

MD0000

Sold to CHANEY ENTERPRISES — 79160.00 Lbs. Gross

Consigned to — 28600.00 Lbs. Tare

Destination WALDORF,MD PLANT - FOB FREDERICK,MD

50,900# 50560# — 50560.00 Lbs. Net

Shipped from	Shipped via	Ticket No.	
FREDERICK,MD PLANT	PICK UP	37497	060

Ordered	Product description	Product code	Car or trailer number	Weight (tons)	BIN
1	PICK ESSROC TYPE I - II	173	5	25.28	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

Special instructions ~~THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.~~

ESSROC Materials Inc., Shipper

Per ______

The cement listed hereon was delivered/received in good condition.

Firm ______

Trucker's Signature X ______

Consignee (mdse. received in good condition)

Trailer number	Time of arrival			Bin
5		5:48	5:51	36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91. ______

Agent ______

Per ______

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. **Keep out of the reach of children.**

ALL CLAIMS MUST BE MADE ON RECEIPT OF MDSE.

LEHIGH CEMENTS

From—LEHIGH PORTLAND CEMENT COMPANY

THIS MEMORANDUM

(Originating Carrier)

DELIVER TO

Date

DANGER
See instructions on reverse side

Route/Delivering Carrier

11411092

LPC CO. NO.	CONTRACT NO.	TIME ARRIVED		TIME LEFT	
CUSTOMER'S ORDER NO.		CAR INITIAL		CAR OR TRAILER NO.	

Number of bags	Description			Weight (Subject to Correction)		
	Lehigh Portland Cement					
	Lehigh Masonry Cement					

WE CERTIFY THE CEMENT TO MEET CHEMICAL & PHYSICAL TEST REQUIREMENTS OF THE STATE SPECS. AND WAS LOADED FROM UNION BRIDGE DIS...

MD-STATE CONTR #

10 SEP 93 08:30

CUST. ID 8

51,300#

CEMENT ID 1

BULK WEIGHT (In Pounds)	
GROSS	77200 LB
TARE	25900 LB
NET	51300 LB

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ________ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

NET TONS 25.65 TONS

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

#3

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

PER ________

RECEIVED BY ________ (Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted: ________ (Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per ________ Agent

No. 483153 3

ev. 1/91

EXTRA COPY #1

APPENDIX E.5
PROCESS DATA FROM 09/10/93

APPENDIX E.5.1
COMPILED PROCESS DATA

Transcribed Batching Report Log

September 10, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
	4[	06:14 AM	87		9	12,350	6.7	29,090	1	5,050		0	1,541
	4[	06:19 AM	65		9	12,270	6.7	28,830	1	4,250		22	1,299
	4[	06:32 AM	105		9	12,530	6.7	28,210	1	5,060		31	1,366
	4[	06:38 AM	107		9	11330	6.7	28,180	1	5,490		317	1,225
	4[	06:56 AM	91		9	11370	6.7	28,150	1	5,470		315	1,225
	4[	07:10 AM	23		9	11,430	6.7	28,350	1	5,470		317	1,225
15[	4[	07:15 AM	89	75	9	12,400	6.7	28,170	1	5,050		31	1,366
15[	4[	07:20 AM	111	67	9	12,290	6.7	28,420	1	5,070		31	1,366
15[	4[	07:27 AM	59	55	5.5	6,860	6.7	17,190	1	2,320	3,100	19	866
15[	4[	07:32 AM	65	75	9	13,270	6.7	27,720	0.75	5,050		14	1,533
	4[	07:38 AM	66		9	13,460	6.7	27,720	0.75	5,050		14	1,533
	4[	07:44 AM	80		9	12,490	6.7	29,650	1	4,680		0	1,533
	4[	07:49 AM	92		6	8,240	6.7	19,520	1	3,400		0	1,075
	4[	07:53 AM	96		9	12,400	6.7	28,170	1	5,070		31	1,374
	4[	07:57 AM	55		9	12,400	6.7	28,290	1	5,050		31	1,366
	4[	08:01 AM	69		9	12,560	6.7	29,280	1	4,240		141	1,175
	4[	08:06 AM	60		9	12,720	6.7	29,370	1	4,220		143	1,175
	4[	08:11 AM	56		9	10,930	6.7	27,750	1	5,480		39	1,441
15[	4[	08:17 AM	70	75	9	12,530	6.7	29,300	1	4,210		141	1,175
15[	4[	08:21 AM	57	55	9	11,400	6.7	28,290	1.3	5,480		315	1,225
15[	4[	08:28 AM	81	40	9	11,490	6.7	28,240	1.3	5,470		316	1,225
	4[	08:33 AM	49		8	10,450	6.7	25,220	1	4,120		18	1,291
	4[	08:38 AM	107		9	11,440	6.7	28,250	1.3	5,470		316	1,225
	4[	08:44 AM	50		9	11,690	6.7	28,470	1	4,630		21	1,449
	4[	08:49 AM	91		9	11,500	6.7	28,170	1.3	5,480		316	1,225
16[	4[	08:54 AM	61	65	5.75	7,820	6.7	18,030	1	3,230		20	875
16[	4[	08:59 AM	2	60	9	13,000	6.7	29,700	1	4,650		0	1,533
16[	4[	09:05 AM	107	70	1	1,170	6.7	3,270	1.3	620		36	58
16[	4[	09:07 AM	51	62	9	12,190	6.7	28,790	1	4,740		174	1,183
16[	4[	09:12 AM	23	55	3	3,970	6.7	9,560	1	1,600		59	200
16[	4[	09:25 AM	87	50	9	12,720	6.7	29,470	1	4,490		136	1,391

Transcribed Batching Report Log

September 10, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
16[	4[	09:30 AM	105	55	4.75	6,640	6.7	14,840	1	2,680		16	558
	4[	09:51 AM	53		2.5	3,750	6.7	7,660	0.75	1,420		4	342
	4[	09:54 AM	60		6.5	9,180	6.7	21,190	1	3,060		101	675
	4[	10:07 AM	57		9	13,290	6.7	28,640	0.75	5,480		209	1,216
	4[	10:23 AM	2		9	12,820	6.7	29,580	1	4,640		0	1,449
	4[	10:28 AM	59		9	12,730	6.7	29,700	1	4,490		135	1,308
	4[	10:34 AM	49		9	12,490	6.7	28,140	1	5,060		31	1,216
	4[	10:38 AM	107		6	8,600	6.7	19,750	1	3,090		0	866
	4[	10:42 AM	66		9	12,310	6.7	28,310	1	5,050		31	1,141
	4[	10:46 AM	89		9	11,050	6.7	27,760	1	5,500		39	1,216
	4[	10:50 AM	65		3	4,540	6.7	9,191	0.75	1,700		6	283
	4[	10:53 AM	55		9	12,370	6.7	28,260	1	5,060		31	1,141
	4[	10:57 AM	80		9	13,080	6.7	29,880	1	4,210		0	1,341
	4[	11:03 AM	50		9	12,770	6.7	29,650	1	4,470		134	1,233
	4[	11:07 AM	23		9	12,120	6.7	28,800	1	4,740		177	1,033
	4[	11:11 AM	92		6	8150	6.7	18,840	1	3,370		20	758
	4[	11:15 AM	2		9	12,950	6.7	29,590	1	4,630		0	1,308
	4[	11:20 AM	91		4	5,290	6.7	12,770	1	2,120		79	383
	4[	11:26 AM	87		9	12,380	6.7	28,210	1	5,060		31	1,141
	4[	11:32 AM	70		9	12,560	6.7	29,330	1	4,250		140	950
	4[	11:37 AM	105		9	11,650	6.7	28,880	1	4,630		21	1,299
	4[	11:46 AM	60		3	4,050	6.7	9,630	1	1,700		0	308
	4[	11:55 AM	61		9	14,620	6.7	28,570	1	2,330	4,630	171	1,175
	4[	12:17 PM	51		9	14,670	6.7	28,580	1	2,380	4,640	173	1,175
	4[	12:23 PM	59		9	14,770	6.7	28,560	1	2,340	4,660	173	1,175
	4[	12:26 PM	55		5.5	7,510	6.7	17,280	1	3,110		19	608
17[	4[	12:30 PM	66	99 est	9	12,470	6.7	28,180	1	5,090		31	1,216
	4[	12:36 PM	80		9	13,200	6.7	28,550	0.75	5,480		209	1,141
	4[	12:42 PM	53		1	1,450	6.7	3,180	0.75	620		25	67
	4[	12:43 PM	56		4	4,840	6.7	12,290	1	2,430		17	342
17[	4[	12:47 PM	57	99 est	9	14,760	6.7	28,670	1	2,340	4,630	173	1,100

Transcribed Batching Report Log

September 10, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
	4[	01:01 PM	57		0.5	840	6.7	1,510	0.75	310		14	25
17[	4[	01:16 PM	81	99 est	9	14,580	6.7	28,630	1	2,350	4,640	172	1,100
17[	4[	01:20 PM	49	99 est	9	12,440	6.7	28,340	1	5,060		31	1,141
17[	4[	01:23 PM	107	99 est	9	12,730	6.7	29,620	1	4,500		134	1,233
17[	4[	01:30 PM	65	99 est	9	11620	6.7	28,350	1	4,640		22	1,225
17[	4[	01:35 PM	50	99 est	9	14,630	6.7	28,560	1	2,340	4,630	173	1,100
17[	4[	01:40 PM	23	99 est	9	11,620	6.7	28,410	1	4,630		21	1,225
	4[	01:45 PM	92		9	14,580	6.7	28,610	1	2,320	4,630	173	1,100
	4[	01:49 PM	91		9	11,680	6.7	28,480	1	4,640		21	1,225
	4[	01:54 PM	601		9	12,370	6.7	28,460	1	5,130		31	1,141
	4[	01:59 PM	2		1.7	2,490	6.7	5,700	1	880		0	158
	4[	02:02 PM	2		9	13,090	6.7	29,780	1	3,180	4,220	0	1,349
	4[	02:08 PM	69		9	12,050	6.7	27,990	0.75	4,090	5,470	330	891
	4[	02:13 PM	55		9	13,170	6.7	29,770	1	3,170	4,220	0	1,349
	4[	02:16 PM	59		4.5	5,550	6.7	13,820	1	2,800		19	383
	4[	02:19 PM	51		9	12,360	6.7	28,200	1	5,100		31	1,141
	4[	02:22 PM	66		1.25	1,750	6.7	4,110	1	600		20	67
	4[	02:25 PM	105		9	11,560	6.7	28,370	1	4,720		21	1,225
	4[	02:31 PM	70		9	14,600	6.7	28,530	1	2,360	4,630	174	1,100
	4[	02:42 PM	56		1	1,590	6.7	3,690	1	290	510	21	67
	4[	02:45 PM	89		5	7,470	6.7	16,670	1.3	1,190	2,340	72	441
	4[	02:58 PM	80		0 9	0	6.7	0	1	0	0	0	0
	4[	03:10 PM	57		9	14,630	6.7	28,610	1	2,350	4,630	173	1,025
	4[	03:16 PM	65		9	14,760	6.7	28,620	1	2,330	4,630	172	1,025
	4[	03:27 PM	61		2	2,660	6.7	6,190	1	1,130		7	150
	4[	03:33 PM	23		4	6,610	6.7	12,650	1	1,050	2,060	74	275
	4[	03:36 PM	111		9	13,070	6.7	29,720	1	3,170	4,210	0	1,349
	4[	03:39 PM	81		5	8,160	6.7	15,870	1	1,300	2,590	96	350
	4[	03:43 PM	87		5	7,260	6.7	16,540	1	2,380		0	491
	4[	03:46 PM	59		9	13,170	6.7	29,750	1	3,170	4,220	0	1,349
	4[	03:48 PM	49		1.5	1,960	6.7	4,810	1	880		0	150

Transcribed Batching Report Log

September 10, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
	4[	**03:52 PM**	**2**		**0 9**	**0**	**6.7**	**0**	**1**	**0**		**0**	**0**
	4[	**03:54 PM**	**50**		**3**	**3,700**	**6.7**	**9,340**	**1**	**1,840**		**13**	**250**
	4[	**04:00 PM**	**17**		**3**	**4,300**	**6.7**	**9,920**	**1**	**1,490**		**45**	**258**
	4[	**04:03 PM**	**96**		**4**	**5,610**	**6.7**	**12,620**	**1**	**2,270**		**14**	**300**
	4[	**04:06 PM**	**56**		**2**	**2,850**	**6.7**	**6,250**	**1**	**1,130**		**7**	**150**
	4[	**04:09 PM**	**89**		**9**	**10,490**	**6.7**	**27,130**	**1**	**5,900**		**32**	**1,274**
	4[	**04:33 PM**	**69**		**8**	**0**	**6.7**	**24,180**	**1**	**0**		**0**	**0**
	4[	**04:46 PM**	**107**		**2.25**	**3,080**	**6.7**	**7,060**	**1**	**1,260**		**8**	**167**
	4[	**05:05 PM**	**70**		**3**	**4,450**	**6.7**	**10,100**	**1**	**1,060**	**1,410**	**0**	**292**
18[	**4[**	**05:28 PM**	**65**	**65**	**5**	**7,260**	**6.7**	**16,570**	**1**	**1,800**	**2,380**	**0**	**491**
Totals during inlet spl 15. (Identified by shaded areas.)				64	59.5	80240	6.7	187330	1.1	32650	3100	867	8756
Totals during inlet spl 16. (Identified by shaded ares.)				58	41.5	57510	6.7	133660	1	22010	0	441	5798
Totals during inlet spl 17. (Identified by shaded ares.)				99	72	104850	6.7	228760	1	30950	13900	757	9340
Totals during inlet spl 18. (Identified by shaded ares.)				65	5	7,260	6.7	16,570	1.0	1,800	2,380	0	491
Totals during outlet spl 3. (Identified by bold print.)				72 est	614.	854,840	6.7	1,955,991	1	312,650	49,470	6,773	83,981

9/10/93

OUTLET EMISSION TESTING

Emission testing at the outlet of the fabric filter occurred during the following approximate times.

6:00 AM to 6:12 PM

during this period the following activities occurred:

6:00 - 6:30	Silo #2 was filled with 50,460 lbs of ESSROC portland cement using a pneumatic transfer system.
6:30 - 7:13	Silo #2 was filled with 50,900 lbs of ESSROC portland cement using a pneumatic transfer system.
7:40 - 8:19	Silo #2 was filled with 50,560 lbs of Lehigh portland cement using a pneumatic transfer system.
≈10:45 - 11:30	Silo #3 was filled with 51,300 lbs of Lehigh portland cement using a pneumatic transfer system.
11:15 - 11:37	Silo #2 was filled with 51,000 lbs of Lehigh portland cement using a pneumatic transfer system. A one liter sample of this cement was obtained for moisture, sieve analysis and metals content.
1:48 - 2:30	Silo #2 was filled with 50,800 lbs of Lehigh portland cement using a pneumatic transfer system.
2:35 - ≈3:10	Silo #2 was filled with 51,200 lbs of Lehigh portland cement using a pneumatic transfer system.
5:24 - 6:01	Silo #1 was filled with 51,900 lbs of NEWCEM using a pneumatic transfer system. A one liter sample of this cement was obtained for moisture, sieve analysis and metals content.

Loading of concrete delivery trucks using the dry mix and central mix sides of the facility was as follows:

At 6:14 AM, truck number 87 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:19 AM, truck number 65 was filled with 4,250 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:32 AM, truck number 105 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:38 AM, truck number 107 was filled with 5,490 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:56 AM, truck number 91 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:10 AM, truck number 23 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:15 AM, truck number 89 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:20 AM, truck number 111 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:27 AM, truck number 59 was filled with 2,320 pounds of portland cement and 3,100 pounds of NEWCEM to make 5.5 yards of concrete.

At 7:32 AM, truck number 65 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:38 AM, truck number 66 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:44 AM, truck number 80 was filled with 4,680 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:49 AM, truck number 92 was filled with 3,400 pounds of portland cement and 0 pounds of NEWCEM to make 6 yards of concrete.

At 7:53 AM, truck number 96 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:57 AM, truck number 55 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:01 AM, truck number 69 was filled with 4,240 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:06 AM, truck number 60 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:11 AM, truck number 56 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:17 AM, truck number 70 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:21 AM, truck number 57 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:28 AM, truck number 81 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:33 AM, truck number 49 was filled with 4,120 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 8:38 AM, truck number 107 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:44 AM, truck number 50 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:49 AM, truck number 91 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:54 AM, truck number 61 was filled with 3,230 pounds of portland cement and 0 pounds of NEWCEM to make 5.75 yards of concrete.

At 8:59 AM, truck number 2 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:05 AM, truck number 107 was filled with 620 pounds of portland cement and 0 pounds of NEWCEM to make 1 yard of concrete.

At 9:07 AM, truck number 51 was filled with 4,740 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:12 AM, truck number 23 was filled with 1,600 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 9:25 AM, truck number 87 was filled with 4,490 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:30 AM, truck number 105 was filled with 2,680 pounds of portland cement and 0 pounds of NEWCEM to make 4.75 yards of concrete.

At 9:51 AM, truck number 53 was filled with 1,420 pounds of portland cement and 0 pounds of NEWCEM to make 2.5 yards of concrete.

At 9:54 AM, truck number 60 was filled with 3,060 pounds of portland cement and 0 pounds of NEWCEM to make 6.5 yards of concrete.

At 10:07 AM, truck number 57 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:23 AM, truck number 2 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:28 AM, truck number 59 was filled with 4,490 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:34 AM, truck number 49 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:38 AM, truck number 107 was filled with 3,090 pounds of portland cement and 0 pounds of NEWCEM to make 6 yards of concrete.

At 10:42 AM, truck number 66 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:46 AM, truck number 89 was filled with 5,500 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:50 AM, truck number 65 was filled with 1,700 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 10:53 AM, truck number 55 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:57 AM, truck number 80 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:03 AM, truck number 50 was filled with 4,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:07 AM, truck number 23 was filled with 4,740 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:11 AM, truck number 92 was filled with 3,370 pounds of portland cement and 0 pounds of NEWCEM to make 6 yards of concrete.

At 11:15 AM, truck number 2 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:20 AM, truck number 91 was filled with 2,120 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 11:26 AM, truck number 87 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:32 AM, truck number 70 was filled with 4,250 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:37 AM, truck number 105 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:46 AM, truck number 60 was filled with 1,700 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 11:55 AM, truck number 61 was filled with 2,330 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 12:17 PM, truck number 51 was filled with 2,380 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete.

At 12:23 PM, truck number 59 was filled with 2,340 pounds of portland cement and 4,660 pounds of NEWCEM to make 9 yards of concrete.

At 12:26 PM, truck number 55 was filled with 3,110 pounds of portland cement and 0 pounds of NEWCEM to make 5.5 yards of concrete.

At 12:30 PM, truck number 66 was filled with 5,090 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 12:36 PM, truck number 80 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 12:42 PM, truck number 53 was filled with 620 pounds of portland cement and 0 pounds of NEWCEM to make 1 yard of concrete.

At 12:43 PM, truck number 56 was filled with 2,430 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 12:47 PM, truck number 57 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:01 PM, truck number 57 was filled with 310 pounds of portland cement and 0 pounds of NEWCEM to make 0.5 yards of concrete.

At 1:16 PM, truck number 81 was filled with 2,350 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete.

At 1:20 PM, truck number 49 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:23 PM, truck number 107 was filled with 4,500 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:30 PM, truck number 65 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:35 PM, truck number 50 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:40 PM, truck number 23 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:45 PM, truck number 92 was filled with 2,320 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:49 PM, truck number 91 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:54 PM, truck number 601 was filled with 5,130 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:59 PM, truck number 2 was filled with 880 pounds of portland cement and 0 pounds of NEWCEM to make 1.7 yards of concrete.

At 2:02 PM, truck number 2 was filled with 3,180 pounds of portland cement and 4,220 pounds of NEWCEM to make 9 yards of concrete.

At 2:08 PM, truck number 69 was filled with 4,090 pounds of portland cement and 5,470 pounds of NEWCEM to make 9 yards of concrete.

At 2:13 PM, truck number 55 was filled with 3,170 pounds of portland cement and 4,220 pounds of NEWCEM to make 9 yards of concrete.

At 2:16 PM, truck number 59 was filled with 2,800 pounds of portland cement and 0 pounds of NEWCEM to make 4.5 yards of concrete.

At 2:19 PM, truck number 51 was filled with 5,100 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:22 PM, truck number 66 was filled with 600 pounds of portland cement and 0 pounds of NEWCEM to make 1.25 yards of concrete.

At 2:25 PM, truck number 105 was filled with 4,720 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:31 PM, truck number 70 was filled with 2,360 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 2:42 PM, truck number 56 was filled with 290 pounds of portland cement and 510 pounds of NEWCEM to make 1 yard of concrete.

At 2:45 PM, truck number 89 was filled with 1,190 pounds of portland cement and 2,340 pounds of NEWCEM to make 5 yards of concrete.

At 2:58 PM, truck number 80 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make nothing.

At 3:10 PM, truck number 57 was filled with 2,350 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 3:16 PM, truck number 65 was filled with 2,330 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 3:27 PM, truck number 61 was filled with 1,130 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete.

At 3:33 PM, truck number 23 was filled with 1,050 pounds of portland cement and 2,060 pounds of NEWCEM to make 4 yards of concrete.

At 3:36 PM, truck number 111 was filled with 3,170 pounds of portland cement and 4,210 pounds of NEWCEM to make 9 yards of concrete.

At 3:39 PM, truck number 81 was filled with 1,300 pounds of portland cement and 2,590 pounds of NEWCEM to make 5 yards of concrete.

At 3:43 PM, truck number 87 was filled with 2,380 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 3:46 PM, truck number 59 was filled with 3,170 pounds of portland cement and 4,220 pounds of NEWCEM to make 9 yards of concrete.

At 3:48 PM, truck number 49 was filled with 880 pounds of portland cement and 0 pounds of NEWCEM to make 1.5 yards of concrete.

At 3:52 PM, truck number 2 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make nothing.

At 3:54 PM, truck number 50 was filled with 1,840 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 4:00 PM, truck number 17 was filled with 1,490 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 4:03 PM, truck number 96 was filled with 2,270 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 4:06 PM, truck number 56 was filled with 1,130 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete.

At 4:09 PM, truck number 89 was filled with 5,900 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 4:33 PM, truck number 69 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 4:46 PM, truck number 107 was filled with 1,260 pounds of portland cement and 0 pounds of NEWCEM to make 2.25 yards of concrete.

At 5:05 PM, truck number 70 was filled with 1,060 pounds of portland cement and 1,410 pounds of NEWCEM to make 3 yards of concrete.

At 5:28 PM, truck number 65 was filled with 1,800 pounds of portland cement and 2,380 pounds of NEWCEM to make 5 yards of concrete.

A total of 356,220 pounds of cement and 51,900 pounds of NEWCEM were pneumatically transferred into silos and 312,650 lbs of dry cement and 49,470 lbs of NEWCEM were transferred into trucks or the central mixer during the outlet sampling times.

INLET EMISSION TEST RUN 15

Emission testing Run number 15 at the inlet of the fabric filter occurred during the following approximate time and duration.

TIMES	DURATION
7:17 AM to 7:38 AM	21 min
8:19 AM to 8:28 AM	9 min
TOTAL	30 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

At 7:15 AM, truck number 89 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 7:20 AM, truck number 111 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 7:27 AM, truck number 59 was filled with 2,320 pounds of portland cement and 3,100 pounds of NEWCEM to make 5.5 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

At 7:32 AM, truck number 65 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 8:17 AM, truck number 70 was filled with 4,210 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 8:21 AM, truck number 57 was filled with 5,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

At 8:28 AM, truck number 81 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 30 to 50% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement and NEWCEM which were transferred into concrete trucks was 32,650 pounds and 3,100 pounds to make 59.5 yards of concrete.

INLET EMISSION TEST RUN 16

Emission testing Run number 16 at the inlet of the fabric filter occurred during the following approximate times and duration.

TIMES	DURATION
8:55 AM to 9:17 AM	22 min
9:26 AM to 9:34 AM	8 min
TOTAL	30 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

At 8:54 AM, truck number 61 was filled with 3,230 pounds of portland cement and 0 pounds of NEWCEM to make 5.75 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 8:59 AM, truck number 2 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 9:05 AM, truck number 107 was filled with 620 pounds of portland cement and 0 pounds of NEWCEM to make 1 yard of concrete. Approximately 60 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 9:07 AM, truck number 51 was filled with 4,740 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 9:12 AM, truck number 23 was filled with 1,600 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

At 9:25 AM, truck number 87 was filled with 4,490 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system.

At 9:30 AM, truck number 105 was filled with 2,680 pounds of portland cement and 0 pounds of NEWCEM to make 4.75 yards of concrete. Approximately 40 to 70% of the dust generated by the batching operation was captured by the ventilation system.

INLET EMISSION TEST RUN 17

Emission testing Run number 17 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
12:32 PM to 12:35 PM	3 min
12:48 PM to 12:55 PM	7 min
1:19 PM to 1:23 PM	4 min
1:29 PM to 1:31 PM	2 min
1:39 PM to 1:45 PM	6 min
TOTAL	22 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Loading of concrete from the central mix drum into the delivery trucks was as follows:

At 12:30 PM, truck number 66 was filled with 5,090 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 12:47 PM, truck number 57 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:16 PM, truck number 81 was filled with 2,350 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:20 PM, truck number 49 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:23 PM, truck number 107 was filled with 4,500 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:30 PM, truck number 65 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:35 PM, truck number 50 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

At 1:40 PM, truck number 23 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. No visible emissions were observed from the central mix drum during batching operations.

The total quantity of cement and NEWCEM which were transferred into the central mix drum was 30,950 pounds and 13,900 pounds respectively to make 45 yards of concrete.

INLET EMISSION TEST RUN 18

Emission testing Run number 18 at the inlet of the fabric filter occurred during the following approximate time and durations.

TIME	DURATION
5:22 AM to 5:54 AM	32 min

During this emission testing, NEWCEM was being pneumatically conveyed into silo number 1.

At 5:28 PM, truck number 65 was filled with 1,800 pounds of portland cement and 2,380 pounds of NEWCEM to make 5 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

The following pages include (1) a transcribed batching report log with operations during outlet times in bold, and operations during inlet testing shaded, (2) copies of the batching report generated by the plant, (3) Handwritten notes taken during observations of the operations and (4) copies of the bills of lading for cement and NEWCEM delivered during testing operations.

[redacted]

(1)

9/10/93

At about 6:00 a tanker delivering ESSROC cement transferred cement into silo #2. Transfer was finished at 6:30. ~~50,500#~~ 50,460# was transferred

At 6:30 a tanker delivering ESSROC cement transferred cement into silo #2. 50,900# was transferred finished at 7:13

Inlet Sampling started at 7:17

	Capture Eff	
Truck #89 @ 7:17	60-80% (John)	70-90% (Ron)
Truck #111 @ 7:22	50-70% (John)	70-80% (Ron)
Truck #59 @ 7:29	50-60% (John)	50-60% Ron

some cement came out of the drum and went down the truck chute to the ground - heavy dust was seen coming out between the delivery chute and the horizontal part of the hood. dust was also not captured by the hood
Drum on truck appeared to be turning

Truck #65 @ 7:34	70-80% (John)	70-80% (Ron)

inlet sampling stopped @ 7:40

At 6:~~30~~ a tanker arrived to deliver ESSROC cement to silo #2 Transfer began at 7:40 end @ 8:14
50560# delivered

inlet spl resumed 8:20

Truck #70 @ 8:20	70-80% (John)	70-80% capture (Ron)
Truck #57 @ 8:24	50-60% (John)	50-60% capture Ron
Truck #81 @ 8:30	40-50% (John) generous	30-40% capture (Ron)

very large puffs of dust enveloped truck drum
a large amount of cement and some sand came out of the truck drum and in to the truck chute onto the ground.

turn off Truck loading only

inlet spl end @ 8:34

②

9/10/93

Inlet sampling Started at 8:55

Run #16 Truck loading order

			Capture eff	
Truck #61 @	8:57	60-70% (John)	60-70% capture (Ron)
Truck #22 @	9:01	50-60% (John)	60-70% capture (Ron)
Truck #107 @	9:06	60-70% (John)	70-80% capture (Ron)
Truck #51 @	9:09	50-70% (John)	60-70% capture (Ron)
Truck #23 @	9:15	50-60% (John)	50-60% capture (Ron)
Picture taken #9 on Roll - Truck #87 @	9:27	40-60% (John)	50% capture (Ron)
Truck #105 @	9:32	40-50% (John)	60-70% capture (Ron)

Inlet spl finished @ 9:36

At about 10:45 a tanker arrived and began transferring 51,300 # of Lehigh cement into silo #3. Finished transfer at 11:30

At 11:25 a tanker arrived with Lehigh cement Transfer into silo #2 began at 11:37

a process sample was collected for ~~m~~oisture and sieve analysis by ETS

51,000 # of cement was delivered

Transfer finished at 12:15

Inlet sampling started at 12:32

Run #17 central Mix loading only

~~Truck #59 @ 12:27~~

Truck #66 @ 12:35

Truck #58 @ 12:50

Truck #81 @ 1:20

Truck #49 @ 1:24

No Visible Emissions (John)

90-95% John

(3)

9/10/93

Truck #107 @ 1:29
Truck # 65 @ 1:34
Truck # 50 @ 1:38
Truck # 23 @ 1:44
— end run

Tanker began transferring Lehigh cement into silo #2 at 1:40 and ended at 2:30
50,800# of cement transferred

Tanker began transferring Lehigh cement into silo# 2. 51,200# of cement was transferred from 2:35 to

Inlet test 18

67 gravel
57 gongster Bluestone

Tanker began transferring of NEW CEM to silo # (51,900#) at 5:24 and finished at 6:01

Inlet sampling started at 5:22
Trucks loaded during NEW CEM transfer
Inlet sampling stopped at 5:54
Truck #65 @ 5:30 on dry side 60-70% capture (Ron)

Testing completed

Dennis is plant manager

Bags are 2 months old
36 Bags in two compartments

APPENDIX E.5.2
BATCH LOADING COMPUTER LOG

60,000

51,200±

AGG WAITING FOR LOW   Sep 10 4:35:57 am

00602414 00100203

	CMT 1 NEW CEM	CMT 2 SROCOPLA	CMT 3 LEHIGH	CMT 4
ACTUAL USAGE SINCE 09/09/93	0	0	0	0
TARGET USAGE	0	0	0	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00%
ACTUAL USAGE SINCE 09/09/93	0	0	0	0
TARGET USAGE	0	0	0	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00%
BEGINNING BALANCE ON 09/09/93	71820	265460	103190	0
RECEIVED TO DATE	0	0	0	0
SHIPPED TO DATE	0	0	0	0
BALANCE ON HAND	71820	265460	103190	0

PRESS PgDn TO VIEW NEXT GROUP   PRESS prtSc TO PRINT THIS PAGE

PRESS PgUp TO VIEW LAST GROUP   PRESS ESCAPE TO EXIT THIS COMMAND

AGG = 00010 CMT = 00010 WAT = 00000
AUTOMATIC   82 04 00 f1 00 00 9e f3   REPORTS

TICKET 047624

Sep 10, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 87 Plant 1
6 BAG

SAND 12350 (1.50/ 0.50) (6.70) SRUCOPLA 5050 (0.10/ 0.70)
67 6 29090 (1.00)

WATER 185/1541 (0.00/ 0.00) TRIM -2.00
MAX WATER 317/013

AGG TARE 10 20 CMT TARE 10 20
TIME : 6:14:22 am

TICKET 047625

Sep 10, 1993 Job No. 0 Mix No. 501 9.00 yds DLVD 0.00 Truck 65 Plant 1
5 BAG AE

SAND 12270 (1.50/ 0.50) (6.70) SRUCOPLA 4250* (0.10/ 0.70) Daravair 22
67 6 28830 (1.00)

WATER 156/1299 (0.00/ 0.00) TRIM -2.00
MAX WATER 266/011

AGG TARE 20 20 CMT TARE 20 20
TIME : 6:1[illegible]:15 am

TICKET 047626

Sep [illegible] Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 105 Plant 1
[illegible] BAG AE

SAND [illegible] (1.50/ 0.50) (6.70) SRUCOPLA 5060 (0.10/ 0.70) Daravair 31
67 6 [illegible] (1.00)

WATER 164/1366 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/004

AGG TARE [illegible] [illegible] CMT TARE [illegible] 20
TIME : [illegible] am

TICKET 047627

Sep 10, [illegible] Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 107 Plant 1
[illegible] BAG AE WR

3

S.H.A.#6 28180 (1.30) Polyneed 276*

WATER 147/1225 < 0.00/ 0.00) TRIM -1.00
MAX WATER 271/005

AGG TARE 10 30 CMT TARE 20 20
TIME : 6:38:18 am

TICKET 047628

Sep 10, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 91 Plant 1
6.5 BAG AE WR

SAND 11370 < 1.50/ 0.50) (6.70) SRUCOPLA 3470 < 0.10/ 0.70) Daravair 41
S.H.A.#6 28150 (1.30) Polyneed 274

WATER 147/1225 < 0.00/ 0.00) TRIM -1.00
MAX WATER 271/004

AGG TARE 20 20 CMT TARE 20 20
TIME : 6:56:45 am

TICKET 047629

Sep 10, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 23 Plant 1
6.5 BAG AE WR

SAND 11430 < 1.50/ 0.50) (6.70) SRUCOPLA 3470 < 0.10/ 0.70) Daravair 41
S.H.A.#6 28330 (1.30) Polyneed 276*

WATER 147/1225 < 0.00/ 0.00) TRIM -1.00
MAX WATER 271/004

AGG TARE 20 20 CMT TARE 20 20
TIME : 7:10:15 am

TICKET 047630

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 89 Plant 1
6 BAG AE

SAND 12400 < 1.50/ 0.50) (6.70) SRUCOPLA 5050 < 0.10/ 0.70) Daravair 31
67 6 28170 (1.00)

WATER 164/1366 < 0.00/ 0.00) TRIM -1.00
MAX WATER 288/005

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:15:00 am

TICKET 047631

[illegible] yds DLVD 0.00 Truck 111 Plant 1

SAND 12250 (1.50/ 0.50) (6.70) SRDCOPLA 5070 (0.10/ 0.70) Daravair 31
67 B 28420 (1.00)

WATER 184/1366 (0.00/ 0.00) TRIM -1.00
MAX WATER 288/006

AGG TARE 20 20 CMT TARE 20 20
TIME : 7:20:[illegible] am

TICKET 047632

Sep 10, 1993 Job No. 0 Mix No. 6011 3.50 yds DLVD 0.00 Truck 59 Plant 1
601 BAG AE 75\25 NEWCEM

SAND 6860 (1.50/ 0.50) (6.70) SRDCOPLA 2320 (0.10/ 0.70) Daravair 19
67 B 17190 (1.00) NEW CEM 3100

WATER 104/ 866 (0.00/ 0.00) TRIM -1.00
MAX WATER 175/003

AGG TARE 20 20 CMT TARE 20 20
TIME : 7:27:02 am

TICKET 047633

Sep 10, 1993 Job No. 0 Mix No. 607 9.00 yds DLVD 0.00 Truck 65 Plant 1
6 BAG PEA AE

SAND 13270 (1.50/ 0.50) (6.70) SRDCOPLA 5050 (0.10/ 0.70) Daravair 14
PEA GRA 27720 (0.75)

WATER 184/1533 (0.00/ 0.00) TRIM -1.00
MAX WATER 306/004

AGG TARE 20 30 CMT TARE 10 20
TIME : 7:32:28 am

TICKET 047634

Sep 10, 1993 Job No. 0 Mix No. 607 9.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG PEA AE

SAND 13460 (1.50/ 0.50) (6.70) SRDCOPLA 5050 (0.10/ 0.70) Daravair 14
PEA GRA 27720 (0.75)

WATER 184/1533 (0.00/ 0.00) TRIM -1.00
MAX WATER 308/003

TICKET 047635

Sep 10, 1993 Job No. 0 Mix No. 350 9.00 yds DLVD 0.00 Truck 80 Plant 1
5.5 BAG

SAND 12940 (1.50/ 0.50) (6.70) SROCOPLA 4680* (0.10/ 0.70)
67 6 29650 (1.00)

WATER 184/1533 (0.00/ 0.00) TRIM -1.00
MAX WATER 311/003

AGG TARE 30 30 CMT TARE 20 20
TIME : 7:44:24 am

TICKET 047636

Sep 10, 1993 Job No. 0 Mix No. 600 6.00 yds DLVD 0.00 Truck 92 Plant 1
6 BAG

SAND 8240 (1.50/ 0.50) (6.70) SROCOPLA 3400* (0.10/ 0.70)
67 6 19520 (1.00)

WATER 129/1075 (0.00/ 0.00) TRIM -1.00
MAX WATER 211/002

AGG TARE 30 30 CMT TARE 20 20
TIME : 7:49:54 am

TICKET 047637

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 96 Plant 1
6 BAG AE

SAND 12400 (1.50/ 0.50) (6.70) SROCOPLA 5070 (0.10/ 0.70) Daravair 31
67 6 28170 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -1.00
MAX WATER 288/004

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:53:19 am

TICKET 047638

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 55 Plant 1
6 BAG AE

SAND 12400 (1.50/ 0.50) (6.70) SROCOPLA 5X50 (0.10/ 0.70) Daravair 31

WATER 164/1366 (0.00/ 0.00) TRIM -1.00
MAX WATER 288/005

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:57:53 am

TICKET 047639

Sep 10, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 69 Plant 1
5 BAG AE WR

SAND 12560 (1.50/ 0.50) (6.70) SRGCOPLA 4240 (0.10/ 0.70) Daravair 14
67 G 29280 (1.00) Polyheed 127

WATER 141/1175 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/003

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:01:57 am

TICKET 047640

Sep 10, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 60 Plant 1
5 BAG AE WR

SAND 12720 (1.50/ 0.50) (6.70) SRGCOPLA 4220 (0.10/ 0.70) Daravair 15
67 G 29370 (1.00) Polyheed 128*

WATER 141/1175 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/002

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:06:26 am

TICKET 047641

Sep 10, 1993 Job No. 0 Mix No. 673 9.00 yds DLVD 0.00 Truck 56 Plant 1
6.5 BAG AE F.G. CLASS A

SAND 10930 (1.50/ 0.50) (6.70) SRGCOPLA 5480 (0.10/ 0.70) Daravair 39
67 G 27750 (1.00)

WATER 173/1441 (0.00/ 0.00) TRIM -1.00
MAX WATER 288/005

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:11:58 am

Sep 10, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 70 Plant 1
5.5 BAG AE WR

SAND 12530 (1.50/ 0.50) (6.70) SRDCOFLA 4210 (0.10/ 0.70) Daravair 14
67 G 29300 (1.00) Polyheed 127

WATER 141/1175 (0.00/ 0.00) TRIM -1.00
MAX WATER 266/003

AGG TARE 10 20 CMT TARE 20 20
TIME : 8:17:15 am

TICKET 047643

Sep 10, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 57 Plant 1
6.5 BAG AE WR

SAND 11400 (1.50/ 0.50) (6.70) SRDCOFLA 5480 (0.10/ 0.70) Daravair 41
S.H.A.#6 28290 (1.30) Polyheed 274

WATER 147/1225 (0.00/ 0.00) TRIM -1.00
MAX WATER 271/004

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:21:44 am

TICKET 047644

Sep 10, 1993 Job No. 0 Mix No. 653 9.00 yds DLVD 0.00 Truck 81 Plant 1
6.5 BAG AE WR

SAND 11490 (1.50/ 0.50) (6.70) SRDCOFLA 5470 (0.10/ 0.70) Daravair 41
S.H.A.#6 28240 (1.30) Polyheed 275

WATER 147/1225 (0.00/ 0.00) TRIM -1.00
MAX WATER 271/003

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:22:03 am

TICKET 047645

Sep 10, 1993 Job No. 0 Mix No. 551 8.00 yds DLVD 0.00 Truck 49 Plant 1
5.5 BAG AE

SAND 10450 (1.50/ 0.50) (6.70) SRDCOFLA 4120 (0.10/ 0.70) Daravair 18
67 G 25220 (1.00)

WATER 155/1291 (0.00/ 0.00) TRIM -1.00
MAX WATER 259/002

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:33:57 am

TICKET 047646

Sep 10, 1993 Job No. 0 Mix No. 633 9.00 yds DLVD 0.00 Truck 107 Plant 1
6.5 BAG AE WR

SAND 11440 < 1.50/ 0.50> (6.70) SRDCOPLA 5470 < 0.10/ 0.70> Daravair 42
S.H.A.#6 28250 (1.30) Polyheed 274

WATER 147/1225 < 0.00/ 0.00> TRIM -1.00
MAX WATER 271/004

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:38:53 am

TICKET 047647

Sep 10, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 50 Plant 1
5.5 BAG AE

SAND 11690 < 1.50/ 0.50> (6.70) SRDCOPLA 4630 < 0.10/ 0.70> Daravair 21
67 G 28470 (1.00)

WATER 174/1449 < 0.00/ 0.00> TRIM -1.00
MAX WATER 292/004

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:44:41 am

TICKET 047648

Sep 10, 1993 Job No. 0 Mix No. 633 9.00 yds DLVD 0.00 Truck 91 Plant 1
6.5 BAG AE WR

SAND 11500 < 1.50/ 0.50> (6.70) SRDCOPLA 5480 < 0.10/ 0.70> Daravair 41
S.H.A.#6 28170 (1.30) Polyheed 275

WATER 147/1225 < 0.00/ 0.00> TRIM -1.00
MAX WATER 271/003

AGG TARE 20 30 CMT TARE 10 20
TIME : 8:49:53 am

TICKET 047649

Sep 10, 1993 Job No. 0 Mix No. 601 3.75 yds DLVD 0.00 Truck 61 Plant 1
5 BAG AE

WATER 105/ 875 < 0.00/ 0.00> TRIM -1.00
MAX WATER 184/004

AGG TARE 20 30 CMT TARE 10 20
TIME : 8:54:40 am

TICKET 047650

Sep 10, 1993 Job No. 0 Mix No. 550 9.00 yds DLVD 0.00 Truck 2 Plant 1
5.5 BAG

SAND 13000 < 1.50/ 0.50> (6.70) SROCOPLA 4650 < 0.10/ 0.70>
67 B 29700 (1.00)

WATER 184/1533 < 0.00/ 0.00> TRIM -1.00
MAX WATER 311/002

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:59:35 am

TICKET 047651

Sep 10, 1993 Job No. 0 Mix No. 653 1.00 yds DLVD 0.00 Truck 107 Plant 1
6.5 BAG AE WR

SAND 1170 < 1.50/ 0.50> (6.70) SROCOPLA 620 < 0.10/ 0.70> Daravair 5
S.H.A.#8 3270* (1.50) Polyheed 31

WATER 7/ 58 < 0.00/ 0.00> TRIM -9.99
MAX WATER 030/010

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:03:21 am

TICKET 047652

Sep 10, 1993 Job No. 0 Mix No. 561 7.00 yds DLVD 0.00 Truck 51 Plant 1
3500 PSI AE

SAND 12190 < 1.50/ 0.50> (6.70) SROCOPLA 4740 < 0.10/ 0.70> Daravair 32
57 B 25790 (1.00) Polyheed 142

WATER 142/1163 < 0.00/ 0.00> TRIM -2.00
MAX WATER 278/012

AGG TARE 10 30 CMT TARE 20 20
TIME : 9:07:08 am

[illegible] Truck 23 Plant 1

SAND 3970 (1.50/ 0.50) (6.70) SRDCOPLA 1600 (0.10/ 0.70) Daravair 11
67 6 3560 (1.00) Polyheed 48

WATER 247 200 (0.00/ 0.00) TRIM -9.99
MAX WATER 091/028

AGG TARE 20 20 CMT TARE 10 20
TIME : 9:12:54 am

TICKET 047654

Sep 10, 1993 Job No. Mix No. 510 9.00 yds DLVD 0.00 Truck 87 Plant 1
3000 PSI PLAIN

SAND 12720 (1.50/ 0.50) (6.70) SRDCOPLA 4490 (0.10/ 0.70) Polyheed 136*
67 6 29470 (1.00)

WATER 167/1391 (0.00/ 0.00) TRIM -2.00
MAX WATER 302/012

AGG TARE 10 20 CMT TARE 20 20
TIME : 9:25:09 am

TICKET 047655

Sep 10, 1993 Job No. 0 Mix No. 601 4.75 yds DLVD 0.00 Truck 105 Plant 1
6 BAG AE

SAND 6640* (1.50/ 0.50) (6.70) SRDCOPLA 2680 (0.10/ 0.70) Daravair 16
67 6 14840 (1.00)

WATER 67/ 558 (0.00/ 0.00) TRIM -5.00
MAX WATER 152/022

AGG TARE 20 30 CMT TARE 20 20
TIME : 9:30:56 am

TICKET 047656

Sep 10, 1993 Job No. 0 Mix No. 607 2.50 yds DLVD 0.00 Truck 53 Plant 1
6 BAG PEA AE

SAND 3750 (1.50/ 0.50) (6.70) SRDCOPLA 1420 (0.10/ 0.70) Daravair 4
PEA GRA 7660 (0.75)

WATER 41/ 342 (0.00/ 0.00) TRIM -5.00
MAX WATER 086/011

LEHIGH
CEMENTS

From LEHIGH PORTLAND CEMENT COMPANY

THIS MEMORANDUM

Date

DELIVER TO

DANGER
See instructions on reverse side.

Route/Delivering Carrier

LPC SO NO.		CONTRACT NO.		TIME ARRIVED		TIME	
CUSTOMER'S ORDER NO.				CAR INITIAL		CAR OR TRAILER NO.	

Number of Bags	Description		Bags	Weight (Subject to Correction)		
	Lehigh Portland Cement					
	Lehigh Masonry Cement					
	WE CERTIFY THE SHIPMENT TO MEET					

CHEMICAL & PHYSICAL TEST REQUIREMENTS OF MD. STATE SPECS. AND WAS LOADED FROM ... EIN...

MD. STATE CONTR # ...

CUST. ID

51,000#

CEMENT ID

BULK WEIGHT (In Pounds)

GROSS 29900 LB

TARE 29900 LB

NET 51000 LB

NET TONS 25.50 TONS

If This Car Develops Bad Order And Will Be Delayed in Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ______________________
(Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

PER

RECEIVED BY CARRIER INDICATED ABOVE

Per ______________________ Agent

RECEIVED BY ______________________
(Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted: ______________________
(Customer's Signature)

No. 483174 9

Rev. 1/91

EXTRA COPY #2

LEHIGH CEMENTS

From — LEHIGH PORTLAND CEMENT COMPANY

THIS MEMORANDUM

DELIVER TO

Route/Delivering Carrier

DANGER
See instructions on reverse side.

LPC CO. NO.		CONTRACT NO.		TIME ARRIVED		TIME LEFT	
CUSTOMER'S ORDER NO.				CAR INITIAL		CAR OR TRAILER NO.	

Number of bags	Description						
	Lehigh Portland Cement						
	Lehigh Masonry Cement						

WE CERTIFY THE CEMENT ... CHEMICAL & PHYSICAL TEST REQUIRE... LOADED FROM ... 18 SEP 28 ...

... STATE CONST ... CUST. ID

50,800#

CEMENT ID

BULK WEIGHT (In Pounds)	
GROSS	7.... LB
TARE	2.... LB
NET	...... LB
NET TONS	... TONS

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To:
LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per _______________ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

PER _______________

RECEIVED BY _______________ (Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per _______________ Agent

RECEIVED BY, with the following apparent loss or damage noted:

_______________ (Customer's Signature)

No. 483184 8

v. 1/91

EXTRA COPY #2

LEHIGH CEMENTS

PERMANENT ADDRESS—ALLENTOWN, PA.

From—LEHIGH PORTLAND CEMENT COMPANY

At

By (Originating Carrier)

THIS MEMORANDUM

DELIVER TO

Date

(Mail Address of Consignee—For Purposes of Notification Only)

DANGER

See instructions on reverse side.

Route/Delivering Carrier

CUSTOMER

LPC CO. NO.		CONTRACT NO.		TIME ARRIVED		TIME LEFT	
CUSTOMER'S ORDER NO.				CAR INITIAL		CAR OR TRAILER NO.	

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement					
	Lehigh Masonry Cement					

WE CERTIFY THE CEMENT TO MEET

CHEMICAL & PHYSICAL TEST SPECIFICATIONS

LOADED FROM

ST. STATE CONTR #

CUST. ID

H 5 50,800 #

CEMENT ID

BULK WEIGHT (In Pounds)

GROSS LB

TARE LB

NET LB

NET TONS TONS

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

PER---

RECEIVED BY

(Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per Agent

RECEIVED BY, with the following apparent loss or damage noted:

(Customer's Signature)

No. 483184 8

ev. 1/91

EXTRA COPY #2

LEHIGH CEMENTS

PERMANENT ADDRESS ALLENTOWN, PA.

From LEHIGH PORTLAND CEMENT COMPANY

By (Originating Carrier)

THIS MEMORANDUM

DELIVER TO

VIRGINIA CONCRETE CO. INC.

Date (Mail Address of Consignee—For Purposes of Notification Only)

DANGER

See instructions on reverse side.

Route/Delivering Carrier

LPC CO. NO. 41 114 9 2	CONTRACT NO.	TIME ARRIVED 11:55	TIME LEFT 12:1
CUSTOMER'S ORDER NO.		CAR INITIAL	CAR OR TRAILER NO.

Number of bags	Description	Type	Tons	Hundredweight (Subject to Correction)	Class or Rate	
	Lehigh Portland Cement	I	25.60			
	Lehigh Masonry Cement					

CHEMICAL & PHYSICAL TEST CERTIFIED

LOADED

NO. STATE CORTF #............ 51200#

CEMENT ID

BULK WEIGHT (In Pounds)

GROSS LB

TARE LB

NET 51200 LB

NET TONS 25.60 TONS

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED-- NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

LEHIGH PORTLAND CEMENT COMPANY--SHIPPER

PER--

RECEIVED BY

(Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted:

(Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per Agent

No. 482980 0

ev. 1/91

EXTRA COPY #2

4

MEMORANDUM

FROM Blue Circle Cement Inc. FORM NO. 381396

Blue Circle Cement Inc. Shipper

Blue Circle Cement Inc.

Per

(SIGNATURE OF CONSIGNOR)

CONSIGNED TO/DESTINATION	SHIPPING PLANT AND DATE	CARRIER ROUTE	
7530-0005	20	329 TRUCK	03146 FREIGHT 1071
CHARLES COUNTY CONC CO INC	SPARROWS PT	PRICE TRUCKING INC	GROSS 79400
ACTON LANE			27500
WALDORF MD 20601	09-10-93	51,900	NET 51900

COMMENTS/SPECIAL INSTRUCTIONS

RT 301S TO WALDORF.3MI AF TER 301&5 MERGE,TRN LFT ONTO ACTON LANE (TOYOTA DLR ON CRNR) TAKE ACTON LANE TO 1ST CHARLES CTY PLANT 301-932-5019

WEIGHED BY

CHECKED BY/FOREMAN

CUSTOMER ORDER NO.	DELIVERY DATE & TIME	BILL OF LADING NO.	SEALS	CAR INITIALS/TRUCK NO.	FROM SILO
	09-10-93 ASAP	91701		105	B

PRODUCT CODE	QUANTITY WEIGHT	NO. PKGS.	COMMODITY	RATE	FREIGHT
101	TANKER		NEWCEM		PREPAID

* * *

WE CERTIFY THAT NEWCEM - GROUND IRON BLAST FURNACE SLAG MEETS THE REQUIREMENTS OF MARYLAND STATE SPECS - ASTM C-989 GRADE 120.

THIS SHIPMENT CONTAINS NEWCEM. INITIALS BELOW AUTHORIZE UNLOADING INTO DESIGNATED BIN.________

S.L.& C.

Blue Circle Cement Inc. Shipper,

Per

CUSTOMER REMARKS

RECEIVED AT DESTINATION - CUSTOMER/AGENT SIGNATURE DATE

ARRIVAL TIME

DEPARTURE TIME

Agent

Per

APPENDIX E.3.3
CEMENT DELIVERY INVOICES

ESSROC

Frederick

Cement Group - East Coast Region

Customer Service
(800) 522-8070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

79560.00	Lbs. Gross
29160.00	Lbs. Tare
50400.00	Lbs. Net

WALDORF, MD [illegible] FOR FREDERICK, MD

50,400

Shipped from	Shipped via	Ticket No.	
FREDERICK, MD PLANT	PICK UP	37446	060

4	PICK ESSROC TYPE I - II	179		25.20	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

Special instructions

ESSROC Materials Inc., Shipper

Per W. J

The cement listed hereon was delivered/received in good condition.

Firm

Trucker's Signature X

Consignee (mdse. received in good condition)

Trailer number	Time of arrival	4:10	4:13	Bin 36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent Bolt Co #2

Per

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. **Keep out of the reach of children.**

ALL CLAIMS MUST BE MADE ON RECEIPT OF MDSE.

CARRIER

ESSROC

Frederick

ESSROC Materials Inc.
Cement Group - East Coast Region

4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

Delive
ord

[illegible]	BL number [illegible]	[illegible]	Contract number	[illegible]	Customer order number	Customer number
[illegible]	[illegible] MD0000	[illegible]	[illegible]	[illegible]	[illegible]	22025000

Sold to CHANEY ENTERPRISES

Consigned to

Destination WALDORF,MD PLANT - FOB FREDERICK,MD

79020.00	Lbs. Gross
28720.00	Lbs. Tare
50300.00	Lbs. Net

50,300

Shipped from	Shipped via	Ticket No.	
FREDERICK,MD PLANT	PICK UP	37448	060

[illegible]	Product description	Product code	Car or trailer number	Weight (tons)	BIN
1	PICK ESSROC TYPE I - II	173	T-6	25.15	36

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

Special instructions

ESSROC Materials Inc., Shipper

Per

The cement listed hereon was delivered/received in good condition

Firm

Trucker's Signature X

Consignee (mdse. received in good condition)

Trailer number	Time of arrival			Bin
18		4:41	4:44	36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent

Per

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. **Keep out of the reach of children.**

ESSROC Frederick

ESSROC Materials Inc.
Cement Group - East Coast Region

4120 Buckeystown Pike
Frederick, MD 21702-1203

Customer Service
(800) 322-9070 within PA
(800) 523-9228 outside PA
(215) 759-6052 FAX

Delive
ord

B/L number | Customer number 22023000

Sold to: CHANEY ENTERPRISES

Consigned to

Destination: WALDORF,MD PLANT - FOB FREDERICK,MD

79000.00	Lbs. Gross
28780.00	Lbs. Tare
50220.00	Lbs. Net

50,220

Shipped from	Shipped via	Ticket No.	
FREDERICK,MD PLANT	PICK UP	37455	060

				Weight (tons)	BIN
1	PICK ESSROC TYPE I - II	173	5	25.11	36

THE CEMENT MEETS ALL REQ. OF MD STATE ROADS COMM.

"THANK YOU - WE APPRECIATE YOUR BUSINESS"

Special instructions

ESSROC Materials Inc., Shipper

Per

The cement listed hereon was delivered/received in good condition.

Firm

Trucker's Signature X

Consignee (mdse. received in good condition)

Trailer number	Time of arrival			Bin
		5:51	5:54	36

Permanent P.O. Address:

This will certify the Portland Cements contained in this shipment conform to ASTM specification C150, and Masonry Cements conform to ASTM specification C91.

Agent

Per

CAUTION: Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. **Keep out of the reach of children.**

LEHIGH CEMENTS

LEHIGH PORTLAND CEMENT COMPANY

THIS MEMORANDUM

DELIVER TO [illegible]

Date [illegible]

DANGER

See instructions on reverse side.

Route/Delivering Carrier [illegible]

LPC CO. NO.		CONTRACT NO.		TIME ARRIVED	[illegible]	TIME LEFT	[illegible]
CUSTOMER'S ORDER NO.				CAR INITIAL		CAR OR TRAILER NO.	

Number of bags	Description						
	Lehigh Portland Cement		2550				
	Lehigh Masonry Cement						

WE CERTIFY THE CEMENT TO MEET CHEMICAL & PHYSICAL TEST REQUIREMENTS OF MD.STATE SPECS. AND WAS LOADED FROM UNION BRIDGE BIN....

MD.STATE CONTR #.......... J-6

01 JAN 93 09:00

CUST. ID

CEMENT ID 1

BULK WEIGHT (In Pounds)	
GROSS	79800 LB
TARE	28800 LB
NET	51000 LB
NET TONS	25.50 TONS

51,000

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To: LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company
Per ______ (Signature of Consignor)

CHARGES ARE PREPAID UNLESS MARKED—NOT PREPAID

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER
PER—

RECEIVED BY ______ (Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE
Per ______ Agent

RECEIVED BY, with the following apparent loss or damage noted: #3 ______ (Customer's Signature)

No. 483026 1

Rev. 1/91

EXTRA COPY #1

LEHIGH CEMENTS

FROM LEHIGH PORTLAND CEMENT COMPANY

(Originating Carrier)

[illegible] MEMORANDUM

DELIVERED TO

Route/Delivering Carrier

DANGER
See instructions on reverse side.

	CONTRACTOR	TIME ARRIVED		TIME LEFT	
CUSTOMER'S ORDER NO.		CAR INITIAL		CAR OR TRAILER NO.	

	Lehigh Portland Cement		556			
	Lehigh Masonry Cement					

WE CERTIFY THE CEMENT TO MEET CHEMICAL & PHYSICAL TEST REQUIREMENTS OF MD. STATE SPECS. AND WAS LOADED FROM UNION BRIDGE BIN

MD. STATE CONTR #-----------------

J 6

01 JAN 93 11:10

CUST. ID

CEMENT ID

BULK WEIGHT (In Pounds)	
GROSS	79700 LB
TARE	28900 LB
NET	50800 LB
NET TONS	25.40 TONS

50,800

CHARGES ARE PREPAID UNLESS MARKED— NOT PREPAID

If This Car Develops Bad Order And Will Be Delayed In Excess Of 24 Hours, Please Wire Notice To:
LEHIGH PORTLAND CEMENT COMPANY

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Lehigh Portland Cement Company

Per ____________
(Signature of Consignor)

The description and weight indicated on this Bill of Lading are correct subject to verification by the respective Weight and Inspection Bureau according to Agreement.
LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

LEHIGH PORTLAND CEMENT COMPANY—SHIPPER

PER—

RECEIVED BY
(Customer's Signature)

RECEIVED BY, with the following apparent loss or damage noted:
#3
(Customer's Signature)

RECEIVED BY CARRIER INDICATED ABOVE

Per ____________ Agent

No. 483004 8

Rev. 1/91

EXTRA COPY #1

APPENDIX E.4
PROCESS DATA FROM 09/09/93

APPENDIX E.4.1
COMPILED PROCESS DATA

Transcribed Batching Report Log

September 9, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
8[	3[	06:26 AM	91	65	9	12,490	7.7	29,290	1	5,050		39	1,349
8[	3[	06:31 AM	64	85	9	11,710	7.7	28,570	1	4,650		21	1,266
8[	3[	06:45 AM	51	65	9	11,830	6	28,570	1	4,470		169	1,358
9[	3[	06:58 AM	105	75	8	10580	6	25,660	1	4,220		153	1,116
9[	3[	07:04 AM	89	85	9	11700	6	28,260	1	4,640		21	1,449
9[	3[	07:09 AM	65	85	9	12,880	6	29,510	1	4,650		0	1,533
9[	3[	07:14 AM	107	65	9	12,350	6	28,140	1	5,060		31	1,374
9[	3[	07:20 AM	111	85	8	17,130	6	25,400	0.75	5,610		24	900
9[	3[	07:24 AM	96	90	9	11,580	6	28,320	1	4,650		21	1,449
9[	3[	07:28 AM	92	75	9	11,710	6	28,300	1	4,670		21	1,449
9[	3[	07:32 AM	80	64	8	16,980	6	25,350	0.75	5,610		24	900
	3[	07:44 AM	60		9	12,500	6	29,230	1	4,220		142	1,175
	3[	08:23 AM	23		5	7,090	6	16,370	1	2,570		0	766
	3[	08:27 AM	70		9	12,230	6	29,130	1	5,050		0	1,616
	3[	08:32 AM	2		9	12,300	6	28,180	1	5,050		31	1,374
	3[	08:38 AM	56		8	16,980	6	25,410	0.75	5,610		24	966
	3[	08:43 AM	59		9	14,560	6	28,470	1	2,330	4,630	171	1,341
	3[	08:49 AM	57		5	6,670	6	15,340	0.4	2,860		152	775
	3[	08:52 AM	49		2	2,570	6	6,460	1	1,010		37	167
10[	3[	08:56 AM	69	99	9	14,510	6	28,510	1	2,320	4,630	172	1,416
10[	3[	09:00 AM	50	99	9	14,510	6	28,460	1	2,340	4,640	173	1,416
10[	3[	09:08 AM	55	99	9	14,510	6	28,470	1	2,330	4,630	171	1,416
10[	3[	09:13 AM	61	99	9	12,920	6	29,660	1	4,640		0	1,616
10[	3[	09:20 AM	91	55	9	11,680	6	28,370	1	4,650		21	1,524
	3[	09:30 AM	51		6.5	9,660	6	20,560	0.75	3,970		153	1,000
11[	3[	09:35 AM	66	99	8	10,900	6	24,960	1	4,490		27	1,291
11[	3[	09:39 AM	2 (81)	99	9	13,020	6	29,710	1	3,160	4,210	0	1,666
11[	3[	09:44 AM	65	99	9	12,280	6	28,050	1	5,050		31	1,449
11[	3[	09:50 AM	89	97	9	14,680	6	28,510	1	2,330	4,660	173	1,416
11[	3[	10:01 AM	60	97	6.85	9,540	6	22,240	1	3,200		107	950
	3[	10:07 AM	60		1	1,340	6	3,400	1	480		16	133

Transcribed Batching Report Log

September 9, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
11[	3[	10:09 AM	96	99	8	10,350	6	25,130	1	4,110		18	1,358
12[	3[	10:20 AM	105	99	9	11,710	6	28,290	1	4,630		21	1,449
12[	3[	10:23 AM	23	97	9	11,000	6	27,670	1	5,470		39	1,441
	3[	10:32 AM	111		9	13,200	6	28,490	0.75	5,490		209	1,316
12[	3[	10:37 AM	49	99	9	13,000	6	29,630	1	3,180	4,230	0	1,583
	3[	10:43 AM	92		9	19,180	6	28,700	0.75	6,310		27	1,083
	3[	10:52 AM	107		6.5	9,340	6	21,450	1	3,340		0	1,108
	3[	10:55 AM	59		4	5,820	6	13,190	1	1,440	1,870	0	433
	3[	10:58 AM	70		1	2,160	6	4,160	0.75	710		3	50
12[	3[	11:01 AM	69	99	9	12,230	6	28,070	1	5,060		31	1,374
12[	3[	11:12 AM	57	99	9	11,140	6	27,980	1	3,790	5,070	31	1,424
	3[	11:18 AM	80		2	2,480	6	6,290	1	1,040		6	183
12[	3[	11:33 AM	50	99	9	11,780	6.7	27,760	1.3	5,010		288	1,549
	3[	12:42 PM	81		7	10,220	6.7	23,140	1	2,460	3,270	0	1,158
	3[	12:45 PM	51		9	11,600	6.7	28,430	1	4,630		21	1,374
	3[	12:14 PM	66		2.25	2,990	6.7	6,970	1	1,260		8	167
	3[	12:16 PM	89		3	4,000	6.7	9,480	1	1,560		7	250
	3[	12:23 PM	61		4	5,620	6.7	12,610	1	2,260		14	300
	3[	12:39 PM	55		7	10,160	6.7	23,260	1	2,460	3,290	0	925
	3[	12:43 PM	65		1.5	1,850	6.7	4,740	1	770		4	125
	3[	01:00 PM	56		9	12,350	6.7	28,210	1	5,060		31	1,141
	3[	01:05 PM	91		9	12,310	6.7	28,150	1	5,070		31	1,141
	3[	01:08 PM	70		4	4,970	6.7	12,550	1.3	2,440		140	242
	3[	01:11 PM	2		7	11,920	6.7	23,260	0.75	3,270		0	1,091
	3[	01:20 PM	2		4.5	5,930	6.7	13,870	1.3	2,540		145	583
	3[	01:42 PM	105		9	14,740	6.7	28,660	1	2,320	4,640	173	1,175
	3[	01:46 PM	49		8	11,830	6.7	25,500	0.75	4,860		187	1,158
	3[	01:50 PM	49		9	14,580	6.7	28,560	1	2,350	4,630	171	1,250
13[	3[	01:55 PM	59		9	14,600	6.7	28,550	1	2,340	4,630	171	1,250
13[	3[	01:59 PM	69		8	13,050	6.7	25,400	1	2,060	4,140	152	1,108
13[	3[	02:05 PM	57		9	14,350	6.7	28,870	1	4,470		27	1,041

Transcribed Batching Report Log

September 9, 1993

Inlet Sample No.	Outlet Sample No.	Ticket Time	Truck No.	Estimated Capture Efficiency	Yards of Concrete Made	Sand (lbs)	Moisture (%)	Course Aggregate (lbs)	Moisture (%)	Portland Cement (lbs)	NEWCEM (lbs)	Addmixes (lbs)	Water (lbs)
13[	**3[**	**02:12 PM**	**23**		**9**	**10,320**	**6.7**	**27,170**	**1**	**5,890**		**32**	**1,499**
13[	**3[**	**02:17 PM**	**107**	**99**	**9**	**14,430**	**6.7**	**28,840**	**1**	**4,480**		**27**	**1,041**
	3[	**02:22 PM**	**80**		**9**	**13,110**	**6.7**	**29,710**	**1**	**3,170**	**4,210**	**0**	**1,491**
	3[	**02:28 PM**	**61**		**9**	**13,110**	**6.7**	**29,780**	**1**	**3,170**	**4,210**	**0**	**1,491**
	3[	**02:36 PM**	**66**		**9**	**12,400**	**6.7**	**28,390**	**1**	**5,060**		**31**	**1,216**
	3[	**02:40 PM**	**51**		**2.5**	**3,930**	**6.7**	**8,620**	**1**	**1,000**		**0**	**167**
	3[	**02:43 PM**	**56**		**7**	**10,120**	**6.7**	**23,130**	**1**	**2,460**	**3,280**	**0**	**1,100**
	3[	**02:46 PM**	**89**		**7**	**8,490**	**6.7**	**21,600**	**1**	**4,250**		**30**	**1,000**
	3[	**02:51 PM**	**55**		**9**	**12,420**	**6.7**	**28,160**	**1**	**5,050**		**31**	**1,216**
	3[	**03:11 PM**	**55**		**8**	**0**	**0**	**24,260**	**1**	**0**		**0**	**1,666**
	3[	**03:29 PM**	**65**		**9**	**12,320**	**6.7**	**28,150**	**1**	**5,070**		**31**	**1,216**
	3[	**03:54 PM**	**5**		**1.5**	**2,000**	**6.7**	**4,810**	**1**	**700**		**4**	**117**
14[	**3[**	**04:04 PM**	**57**	**50**	**9**	**12,430**	**6.7**	**28,190**	**1**	**5,060**		**32**	**1,216**
14[	**3[**	**04:14 PM**	**66**	**65**	**7**	**9,530**	**6.7**	**22,000**	**1**	**3,940**		**24**	**941**
14[	**3[**	**04:19 PM**	**700**	**40**	**9**	**12,470**	**6.7**	**28,290**	**1**	**5,050**		**31**	**1,141**
14[	**3[**	**04:51 PM**	**105**	**65**	**9**	**10,620**	**6.7**	**27,330**	**1**	**2,950**	**5,890**	**332**	**1,316**
14[	**3[**	**05:17 PM**	**23**	**65**	**2**	**3,310**	**6.7**	**6,280**	**1**	**530**	**1,040**	**38**	**142**
14[	**3[**	**05:22 PM**	**107**	**60**	**5**	**5,760**	**6.7**	**15,210**	**1**	**1,650**	**3,290**	**186**	**650**
Totals during inlet spl 8. (Identified by shaded areas.)				72	27	36,030	7.1	86,430	1	14,170	0	229	3,973
Totals during inlet spl 9. (Identified by shaded ares.)				78	69	104,910	6	218,940	0.9	39,110	0	295	10,170
Totals during inlet spl 10. (Identified by shaded ares.)				90.2	45	68,130	6	143,470	1	16,280	13,900	537	7,388
Totals during inlet spl 11. (Identified by shaded ares.)				84	49.8	70,770	6	158,600	6	22,340	8,870	356	8,130
Totals during inlet spl 12. (Identified by shaded ares.)				99	45	59,080	6	141,640	6	22,130	9,300	122	7,271
Totals during inlet spl 13. (Identified by shaded ares.)				99 est	44	66,750	6.7	138,830	1	19,240	8,770	409	5,939
Totals during inlet spl 14. (Identified by shaded ares.)				56	41	54,120	6.7	127,300	6.7	19,180	10,220	643	5,406
Totals during outlet spl 3. (Identified by bold print.)				83 est	589.	842,620	6.3	1,871,800	1	282,180	85,090	4,909	86,072

9/9/93

OUTLET EMISSION TESTING

Emission testing at the outlet of the fabric filter occurred during the following approximate times.

5:58 AM to 5:58 PM

during this period the following activities occurred:

6:02 - 6:45	Silo #2 was filled with 50,520 lbs of ESSROC portland cement using a pneumatic transfer system.
7:45 - 8:25	Silo #2 was filled with 50,560 lbs of ESSROC portland cement using a pneumatic transfer system.
11:43 - 12:25	Silo #3 was filled with 50,400 lbs of Lehigh portland cement using a pneumatic transfer system.
2:25 - ≈3:10	Silo #3 was filled with 50,100 lbs of Lehigh portland cement using a pneumatic transfer system.

Loading of concrete delivery trucks using the dry mix and central mix sides of the facility was as follows:

At 6:26 AM truck number 91 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:31 AM truck number 64 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:45 AM truck number 51 was filled with 4,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 6:58 AM truck number 105 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 7:04 AM truck number 89 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:09 AM truck number 65 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:14 AM truck number 107 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:20 AM truck number 111 was filled with 5,610 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 7:24 AM truck number 96 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:28 AM truck number 92 was filled with 4,670 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 7:32 AM truck number 80 was filled with 5,610 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 7:44 AM truck number 60 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:23 AM truck number 23 was filled with 2,570 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 8:27 AM truck number 70 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:32 AM truck number 2 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 8:38 AM truck number 56 was filled with 5,610 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 8:43 AM truck number 59 was filled with 2,330 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 8:49 AM truck number 57 was filled with 2,860 pounds of portland cement and 0 pounds of NEWCEM to make 5 yards of concrete.

At 8:52 AM truck number 49 was filled with 1,010 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete.

At 8:56 AM truck number 69 was filled with 2,320 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 9:00 AM truck number 50 was filled with 2,340 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete.

At 9:08 AM truck number 55 was filled with 2,330 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 9:13 AM truck number 61 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:20 AM truck number 91 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:30 AM truck number 51 was filled with 3,970 pounds of portland cement and 0 pounds of NEWCEM to make 6.5 yards of concrete.

At 9:35 AM truck number 66 was filled with 4,490 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 9:39 AM truck number 2 (81) was filled with 3,160 pounds of portland cement and 4,210 pounds of NEWCEM to make 9 yards of concrete.

At 9:44 AM truck number 65 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 9:50 AM truck number 89 was filled with 2,330 pounds of portland cement and 4,660 pounds of NEWCEM to make 9 yards of concrete.

At 10:01 AM truck number 60 was filled with 3,200 pounds of portland cement and 0 pounds of NEWCEM to make 6.85 yards of concrete.

At 10:07 AM truck number 60 was filled with 480 pounds of portland cement and 0 pounds of NEWCEM to make 1 yards of concrete.

At 10:09 AM truck number 96 was filled with 4,110 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 10:20 AM truck number 105 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:23 AM truck number 23 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:32 AM truck number 111 was filled with 5,490 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:37 AM truck number 49 was filled with 3,180 pounds of portland cement and 4,230 pounds of NEWCEM to make 9 yards of concrete.

At 10:43 AM truck number 92 was filled with 6,310 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 10:52 AM truck number 107 was filled with 3,340 pounds of portland cement and 0 pounds of NEWCEM to make 6.5 yards of concrete.

At 10:55 AM truck number 59 was filled with 1,440 pounds of portland cement and 1,870 pounds of NEWCEM to make 4 yards of concrete.

At 10:58 AM truck number 70 was filled with 710 pounds of portland cement and 0 pounds of NEWCEM to make 1 yards of concrete.

At 11:01 AM truck number 69 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 11:12 AM truck number 57 was filled with 3,790 pounds of portland cement and 5,070 pounds of NEWCEM to make 9 yards of concrete.

At 11:18 AM truck number 80 was filled with 1,040 pounds of portland cement and 0 pounds of NEWCEM to make 2 yards of concrete.

At 11:33 AM truck number 50 was filled with 5,010 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 12:42 PM truck number 81 was filled with 2,460 pounds of portland cement and 3,270 pounds of NEWCEM to make 7 yards of concrete.

At 12:45 PM truck number 51 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 12:14 PM truck number 66 was filled with 1,260 pounds of portland cement and 0 pounds of NEWCEM to make 2.25 yards of concrete.

At 12:16 PM truck number 89 was filled with 1,560 pounds of portland cement and 0 pounds of NEWCEM to make 3 yards of concrete.

At 12:23 PM truck number 61 was filled with 2,260 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 12:39 PM truck number 55 was filled with 2,460 pounds of portland cement and 3,290 pounds of NEWCEM to make 7 yards of concrete.

At 12:43 PM truck number 65 was filled with 770 pounds of portland cement and 0 pounds of NEWCEM to make 1.5 yards of concrete.

At 1:00 PM truck number 56 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:05 PM truck number 91 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 1:08 PM truck number 70 was filled with 2,440 pounds of portland cement and 0 pounds of NEWCEM to make 4 yards of concrete.

At 1:11 PM truck number 2 was filled with 3,270 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete.

At 1:20 PM truck number 2 was filled with 2,540 pounds of portland cement and 0 pounds of NEWCEM to make 4.5 yards of concrete.

At 1:42 PM truck number 105 was filled with 2,320 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete.

At 1:46 PM truck number 49 was filled with 4,860 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 1:50 PM truck number 49 was filled with 2,350 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:55 PM truck number 59 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:59 PM truck number 69 was filled with 2,060 pounds of portland cement and 4,140 pounds of NEWCEM to make 8 yards of concrete.

At 2:05 PM truck number 57 was filled with 4,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:12 PM truck number 23 was filled with 5,890 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:17 PM truck number 107 was filled with 4,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:22 PM truck number 80 was filled with 3,170 pounds of portland cement and 4,210 pounds of NEWCEM to make 9 yards of concrete.

At 2:28 PM truck number 61 was filled with 3,170 pounds of portland cement and 4,210 pounds of NEWCEM to make 9 yards of concrete.

At 2:36 PM truck number 66 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:40 PM truck number 51 was filled with 1,000 pounds of portland cement and 0 pounds of NEWCEM to make 2.5 yards of concrete.

At 2:43 PM truck number 56 was filled with 2,460 pounds of portland cement and 3,280 pounds of NEWCEM to make 7 yards of concrete.

At 2:46 PM truck number 89 was filled with 4,250 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete.

At 2:51 PM truck number 55 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 3:11 PM truck number 55 was filled with 0 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete.

At 3:29 PM truck number 65 was filled with 5,070 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 3:54 PM truck number 5 was filled with 700 pounds of portland cement and 0 pounds of NEWCEM to make 1.5 yards of concrete.

At 4:04 PM truck number 57 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 4:14 PM truck number 66 was filled with 3,940 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete.

At 4:19 PM truck number 700 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 4:51 PM truck number 105 was filled with 2,950 pounds of portland cement and 5,890 pounds of NEWCEM to make 9 yards of concrete.

At 5:17 PM truck number 23 was filled with 530 pounds of portland cement and 1,040 pounds of NEWCEM to make 2 yards of concrete.

At 5:22 PM truck number 107 was filled with 1,650 pounds of portland cement and 3,290 pounds of NEWCEM to make 5 yards of concrete.

A total of 202,580 lbs of cement was pneumatically transferred into silos and 282,180 lbs of dry cement and 85,090 lbs of NEWCEM were transferred into trucks or the central mixer during the outlet sampling times.

INLET EMISSION TEST RUN 8

Emission testing Run number 8 at the inlet of the fabric filter occurred during the following approximate time and duration.

TIMES	DURATION
6:18 AM to 6:46 AM	28 min

During this emission test, cement was being pneumatically conveyed into silos during the first documented delivery for 27 minutes. The amount of cement transferred during this period is estimated at

(50,520 #/43 min)*27 min = 31,721 lbs.

Dry batch loading of concrete delivery trucks was as follows:

At 6:26 AM truck number 91 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 6:31 AM truck number 64 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 6:45 AM truck number 51 was filled with 4,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement which was transferred into concrete trucks was 14,170 pounds to make 27 yards of concrete.

INLET EMISSION TEST RUN 9

Emission testing Run number 9 at the inlet of the fabric filter occurred during the following approximate time and duration.

TIMES	**DURATION**
7:01 AM to 7:31 AM	30 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Dry batch loading of concrete delivery trucks was as follows:

At 6:58 AM truck number 105 was filled with 4,220 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 7:04 AM truck number 89 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 7:09 AM truck number 65 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 7:14 AM truck number 107 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 7:20 AM truck number 111 was filled with 5,610 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. Approximately 80 to 90% of the dust generated by the batching operation was captured by the ventilation system.

At 7:24 AM truck number 96 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 90% of the dust generated by the batching operation was captured by the ventilation system.

At 7:28 AM truck number 92 was filled with 4,670 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 70 to 80% of the dust generated by the batching operation was captured by the ventilation system.

At 7:32 AM truck number 80 was filled with 5,610 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. Approximately 55 to 70% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement which was transferred into concrete trucks was 39,110 pounds to make 69 yards of concrete.

INLET EMISSION TEST RUN 10

Emission testing Run number 10 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
8:57 AM to 9:27 AM	30 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Loading of concrete from the central mix drum into the delivery trucks was as follows:

At 8:56 AM truck number 69 was filled with 2,320 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:00 AM truck number 50 was filled with 2,340 pounds of portland cement and 4,640 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:08 AM truck number 55 was filled with 2,330 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:13 AM truck number 61 was filled with 4,640 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:20 AM truck number 91 was filled with 4,650 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50 to 60% of the dust generated by the batching operation was captured by the ventilation system because it was not in place for the entire batching operation.

The total quantity of cement and NEWCEM which were transferred into the central mix drum was 16,280 pounds and 13,900 pounds respectively to make 45 yards of concrete.

INLET EMISSION TEST RUN 11

Emission testing Run number 11 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
9:28 AM to 9:30 AM	2 min
9:36 AM to 9:52 AM	16 min
9:59 AM to 10:08 AM	9 min
10:11 AM to 10:13 AM	2 min
TOTAL	29 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Central mix loading of concrete delivery trucks was as follows:

At 9:35 AM truck number 66 was filled with 4,490 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:39 AM truck number 2 (observed number 81) was filled with 3,160 pounds of portland cement and 4,210 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:44 AM truck number 65 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 9:50 AM truck number 89 was filled with 2,330 pounds of portland cement and 4,660 pounds of NEWCEM to make 9 yards of concrete. Approximately 95 to 99% of the dust generated by the batching operation was captured by the ventilation system.

At 10:01 AM truck number 60 was filled with 3,200 pounds of portland cement and 0 pounds of NEWCEM to make 6.85 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 10:09 AM truck number 96 was filled with 4,110 pounds of portland cement and 0 pounds of NEWCEM to make 8 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

The total quantity of cement and NEWCEM which were transferred into the central mix drum was 22,340 pounds and 8,870 pounds respectively to make 49.8 yards of concrete.

INLET EMISSION TEST RUN 12

Emission testing Run number 12 at the inlet of the fabric filter occurred during the following approximate times and durations.

TIMES	DURATION
10:20 AM to 10:32 AM	12 min
10:39 AM to 10:44 AM	5 min
11:01 AM to 11:10 AM	9 min
11:14 AM to 10:19 AM	5 min
11:37 AM to 10:38 AM	1 min
TOTAL	32 min

During this emission testing, no cement was being pneumatically conveyed into silos.

Central mix loading of concrete delivery trucks was as follows:

At 10:20 AM truck number 105 was filled with 4,630 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 10:23 AM truck number 23 was filled with 5,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 95 to 99% of the dust generated by the batching operation was captured by the ventilation system.

At 10:37 AM truck number 49 was filled with 3,180 pounds of portland cement and 4,230 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 11:01 AM truck number 69 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 11:12 AM truck number 57 was filled with 3,790 pounds of portland cement and 5,070 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

At 11:33 AM truck number 50 was filled with 5,010 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Greater than 99% of the dust generated by the batching operation was captured by the ventilation system.

INLET EMISSION TEST RUN 13

Emission testing Run number 13 at the inlet of the fabric filter occurred during the following approximate time and duration.

TIMES	DURATION
2:11 PM to 2:41 PM	30 min

These times appear in error since the observed trucks loaded were ticketed for an earlier time and that a tanker was delivering concrete from 2:25 and 3:10.

During this emission testing, no cement was being pneumatically conveyed into silos.

Central mix loading of concrete delivery trucks was as follows:

At 1:55 PM truck number 59 was filled with 2,340 pounds of portland cement and 4,630 pounds of NEWCEM to make 9 yards of concrete.

At 1:59 PM truck number 69 was filled with 2,060 pounds of portland cement and 4,140 pounds of NEWCEM to make 8 yards of concrete.

At 2:05 PM truck number 57 was filled with 4,470 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:12 PM truck number 23 was filled with 5,890 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

At 2:17 PM truck number 107 was filled with 4,480 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete.

INLET EMISSION TEST RUN 14

Emission testing Run number 14 at the inlet of the fabric filter occurred during the following approximate time and duration.

TIMES	DURATION
3:40 PM to 3:41 PM	1 min
4:10 PM to 4:23 PM	13 min
4:53 PM to 4:58 PM	5 min
5:19 PM to 5:21 PM	2 min
5:24 PM to 5:27 PM	3 min
TOTAL	24 min

Dry batch loading of concrete delivery trucks was as follows:

At 4:04 PM truck number 57 was filled with 5,060 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 50% of the dust generated by the batching operation was captured by the ventilation system.

At 4:14 PM truck number 66 was filled with 3,940 pounds of portland cement and 0 pounds of NEWCEM to make 7 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 4:19 PM truck number 700 was filled with 5,050 pounds of portland cement and 0 pounds of NEWCEM to make 9 yards of concrete. Approximately 30 to 50% of the dust generated by the batching operation was captured by the ventilation system.

At 4:51 PM truck number 105 was filled with 2,950 pounds of portland cement and 5,890 pounds of NEWCEM to make 9 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 5:17 PM truck number 23 was filled with 530 pounds of portland cement and 1,040 pounds of NEWCEM to make 2 yards of concrete. Approximately 60 to 70% of the dust generated by the batching operation was captured by the ventilation system.

At 5:22 PM truck number 107 was filled with 1,650 pounds of portland cement and 3,290 pounds of NEWCEM to make 5 yards of concrete. Approximately 50 to 70% of the dust generated by the batching operation was captured by the ventilation system.

The following pages include (1) a transcribed batching report log with operations during outlet times in bold, and operations during inlet testing shaded, (2) copies of the batching report generated by the plant, (3) Handwritten notes taken during observations of the operations, (4) copies of the bills of lading for cement delivered during testing operations and the PCC PLANT GRADATION WORKSHEET reporting moisture and sieve analysis results conducted by the plant on 9/9/93.

9/9/93

Tanker delivering ESSROC cement to silo #2 began transferring material at 6:07 ended at 6:45
50,520# of cement were delivered

Outlet sampling started at 5:58 and will continue

st inlet # data

Inlet sampling began @ 6:20

Truck 91 @ 6:29 60-70% capture
Truck 64 @ 6:33 80-90% capture
Truck 51 @ 6:47 60-70% capture

Inlet sampling stopped @ 7:02
" " started

Truck 105 @ 6:55/7:02 → 7:06 70-80% capture
Truck 89 @ 7:06 → 7:10 80-90% capture
Truck 65 @ 7:11 → 7:14 80-90% capture
Truck 107 @ 7:15 → 7:20 60-70% capture
Truck 111 @ 7:23 → 7:26 80-90% capture
Truck 96 @ 7:27 → 7:30 90% capture
Truck 92 @ 7:30 → 7:35 70-80% capture
Truck 80 @ 7:36 → 55-70 (John) 60-70% (Kord)

Inlet sampling stopped @ 7:340

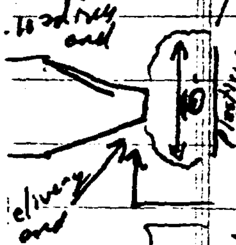
tanker delivering ESSROC cement into silo #2 began at 7:45 and ended at 8:25
50,560# of cement were delivered

9/9/93 ~~[illegible]~~ (2)

Central Mix inlet sampling

Truck # 69 @ 9:00 > 99% collection
Truck # 50 @ 9:05 > 99% collection
Truck # 55 @ 9:12 > 99% collection
Truck # 61 @ 9:16 > 99% collection
Truck # 91 @ 9:24 — no emission observed

inlet run on 9/9 Run 10



about 10 sec visible over a area around delivery hole

50-60% capture — hood was not in place when cement started - no emissions were observed from the loading end all were from the delivery end.

Truck #66 @ 9:32 > 99% collected
Truck #81 @ 9:42 > 99% collected
Truck # 65 @ 9:47 > 99% control/collected
Truck #89 @ 10:00 95 > 99% collection
wind speed increase to about 10 mph during gusts a small amount of dust escaped capture

inlet run on 9/9 Run 11

Truck #60 @ 10:05 > 99% capture (Ron) 95+ (John)
(one yard added on dry side to mix

Truck #96 @ 10:12 > 99% capture (Ron) No VE John

Truck #105 @ 10:22 > 99% capture

Truck #23 @ 10:27 > 99% (Ron) 95+ (John)
two small puffs escaped capture

Truck ~~[illegible]~~ 49 @ 10:39 > 99% capture
picture of ~~at~~ loading end of central mix drum taken

inlet run on 9/9 Run 12

Truck #69 @ 11:02 > 99% capture

Run 12 Truck # 57 @ 11:13 > 99% capture

Truck # ~~60~~ 50 @ 11:32 > 99% capture No VE when 3 ft from loading end

Tanker delivering Lehigh cement arrived and began transfering cement into silo #2 at 11:43 and finished at 12:25 50400 # of cement delivered

Inlet sgl started @ 1:51

Run 13

Truck ~~#9~~

Truck # 59

Truck # 69

Truck # 57

Truck # 23

Truck # 107 @ 2:20 95 - 99% capture whisp of dust from load end of dust during high wind gusts

Truck

Tanker delivering Lehigh cement arrived and began transfer at 2:25 - 3:10

51,100 # of cement delivered

Truck 2

Truck #57 @ 4:10 50% capture 2 min VE from Truck

Truck #66 @ 4:16 60-70% capture 1 min 15 sec VE

Truck #70 @ 4:20 30-50% capture 1 min VE

dust was visible from ground level to top of load out chute and aprox 6' out from side of load chute

Truck #105 @ 4:49 60-70% capture

Truck #23 @ 5:20 60-70% capture 38 sec of VE

Truck #107 5:25 60-70% capture (Ron) 1 min 9 sec of VE

50-60% (John

APPENDIX E.4.2
BATCH LOADING COMPUTER LOG

AGG WAITING FOR LOW Sep 9 4:48:45 a
00e02014 00100203

	CMT 1 NEW CEM	CMT 2 SROCOFLA	CMT 3 LEHIGH	CMT 4
ACTUAL USAGE SINCE 09/08/93	0	0	0	0
TARGET USAGE	0	0	0	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00
ACTUAL USAGE SINCE 09/08/93	0	0	0	0
TARGET USAGE	0	0	0	0
MANUAL USAGE	0	0	0	0
ACTUAL/TARGET VARIANCE	0.00%	0.00%	0.00%	0.00
BEGINNING BALANCE ON 09/08/93	105770	320330	127920	0
RECEIVED TO DATE	0	0	0	0
SHIPPED TO DATE	0	0	0	0
BALANCE ON HAND	105770	320330	127920	0

PRESS PgDn TO VIEW NEXT GROUP PRESS prtSc TO PRINT THIS PAGE
PRESS PgUp TO VIEW LAST GROUP PRESS ESCAPE TO EXIT THIS COMMAND

AGG = 00020 CMT = 00000 WAT = 00000
AUTOMATIC 82 04 00 f1 00 00 ee f3 REPORTS

TICKET 047544

Sep 9, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 91 Plant 1
6 BAG

SAND 12490 (1.50/ 0.50) (7.70) SROCOFLA 5050 (0.10/ 0.70)
67 6 29290 (1.00)

WATER 162/1349 (0.00/ 0.00) TRIM -3.00
MAX WATER 317/019

AGG TARE 20 30 CMT TARE 10 20
TIME : 6:26:17 am

TICKET 047545

Sep 9, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 64 Plant 1
5.5 BAG AE

SAND 11710 (1.50/ 0.50) (7.70) SROCOFLA 4650 (0.10/ 0.70) Daravair 21
67 6 28570 (1.00)

WATER 152/1266 (0.00/ 0.00) TRIM -2.00
MAX WATER 292/011

AGG TARE 20 30 CMT TARE 20 20
TIME : 6:31:31 am

TICKET 047557

Sep 9, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 70 Plant 1
6 BAG

SAND 12230 (1.50/ 0.50) (6.00) SRGCOPLA 5050 (0.10/ 0.70)
67 6 29130 (1.00)

WATER 194/1616 (0.00/ 0.00) TRIM -2.00
MAX WATER 317/015

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:27:31 am

TICKET 047558

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 2 Plant 1
6 BAG AE

SAND 12300 (1.50/ 0.50) (6.00) SRGCOPLA 5050 (0.10/ 0.70) Daravair 31
67 6 28180 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -2.00
MAX WATER 288/015

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:32:34 am

TICKET 047559

Sep 9, 1993 Job No. 0 Mix No. 913 8.00 yds DLVD 0.00 Truck 56 Plant 1
GUNITE POOL MIX

SAND 16980 (1.50/ 0.50) (6.00) SRGCOPLA 5610 (0.10/ 0.70) Daravair 24
PEA GRA 23410 (0.75)

WATER 116/ 966 (0.00/ 0.00) TRIM -2.00
MAX WATER 256/010

AGG TARE 20 40 CMT TARE 20 20
TIME : 8:38:32 am

TICKET 047560

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 59 Plant 1

SAND 14560 (1.50/ 0.50) (6.00) SRGCOPLA 2330 (0.10/ 0.70) Polyheed 139
67 6 28470 (1.00) NEW CEM 4630 Daravair 32

WATER 164/1366 (0.00/ 0.00) TRIM -2.00
MAX WATER

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:09:37 am

TICKET 047550

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 107 Plant 1
6 BAG AE

SAND 12350 (1.50/ 0.50) (6.00) SROCOPLA 5060 (0.10/ 0.70) Daravair 31
67 B 28140 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -2.00
MAX WATER 288/015

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:14:22 am

TICKET 047551

Sep 9, 1993 Job No. 0 Mix No. 913 8.00 yds DLVD 0.00 Truck 111 Plant 1
GUNITE POOL MIX

SAND 17130 (1.50/ 0.50) (6.00) SROCOPLA 5610 (0.10/ 0.70) Daravair 24
PEA GRA 25400 (0.75)

WATER 108/ 900 (0.00/ 0.00) TRIM -3.00
MAX WATER 256/017

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:20:05 am

TICKET 047552

Sep 9, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 96 Plant 1
5.5 BAG AE

SAND 11560 (1.50/ 0.50) (6.00) SROCOPLA 4650 (0.10/ 0.70) Daravair 21
67 B 28320 (1.00)

WATER 174/1449 (0.00/ 0.00) TRIM -2.00
MAX WATER 292/015

AGG TARE 30 30 CMT TARE 20 20
TIME : 7:24:20 am

TICKET 047553

Sep 9, 1993 Job No. 0 Mix No. [illegible] [illegible] yds DLVD 0.00 Truck 72 Plant 1
[illegible] BAG AE

SAND 11710 (1.50/ 0.50) (6.00) SRDCOPLA 4670* (0.10/ 0.70) Daravair 21
67 G 28300 (1.00)

WATER 174/1449 (0.00/ 0.00) TRIM -2.00
MAX WATER 292/014

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:28:30 am

TICKET 047554

Sep 9, 1993 Job No. 0 Mix No. 913 8.00 yds DLVD 0.00 Truck 80 Plant 1
GUNITE POOL MIX

SAND 16980 (1.50/ 0.50) (6.00) SRDCOPLA 5610 (0.10/ 0.70) Daravair 24
PEA GRA 25350 (0.75)

WATER 108/ 900 (0.00/ 0.00) TRIM -3.00
MAX WATER 256/018

AGG TARE 30 30 CMT TARE 20 20
TIME : 7:32:43 am

TICKET 047555

Sep 9, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 60 Plant 1
5 BAG AE WR

SAND 12500 (1.50/ 0.50) (6.00) SRDCOPLA 4220 (0.10/ 0.70) Daravair 14
67 G 29250 (1.00) Polyheed 128*

WATER 141/1175 (0.00/ 0.00) TRIM -2.00
MAX WATER 266/014

AGG TARE 20 30 CMT TARE 20 20
TIME : 7:44:37 am

TICKET 047556

Sep 9, 1993 Job No. 0 Mix No. 550 5.00 yds DLVD 0.00 Truck 23 Plant 1
5.5 BAG

SAND 7050 (1.50/ 0.50) (6.00) SRDCOPLA 2570 (0.10/ 0.70)
67 G 16370 (1.00)

WATER 92/ 766 (0.00/ 0.00) TRIM -4.00
MAX WATER 173/019

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:23:10 am

(1.00) NEW CEM 4640 Daravair 32

WATER 141/1175 (0.00/ 0.00) TRIM -3.00
MAX WATER 297/020

AGG TARE 0 20 CMT TARE 0 20
TIME : 1:42:09 pm

TICKET 047601

Sep 9, 1993 Job No. 0 Mix No. 647 8.00 yds DLVD 0.00 Truck 49 Plant 1

SAND 11830 (1.50/ 0.50) (6.70) LEHIGH 4860 (0.10/ 0.70) Daravair 34
BLUE STO 25500 (0.75) 122R/Poz 153

WATER 139/1158 (0.00/ 0.00) TRIM -1.00
MAX WATER 250/002

AGG TARE 20 30 CMT TARE 20 20
TIME : 1:46:03 pm

TICKET 047602

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 49 Plant 1

SAND 14580 (1.50/ 0.50) (6.70) SROCOFLA 2350* (0.10/ 0.70) Polyheed 139
67 B 28560 (1.00) NEW CEM 4630 Daravair 32

WATER 150/1250 (0.00/ 0.00) TRIM -2.00
MAX WATER 297/012

AGG TARE 30 30 CMT TARE 10 20
TIME : 1:50:19 pm

TICKET 047603

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 59 Plant 1

SAND 14600 (1.50/ 0.50) (6.70) SROCOFLA 2340 (0.10/ 0.70) Polyheed 139
67 B 28550 (1.00) NEW CEM 4630 Daravair 32

WATER 150/1250 (0.00/ 0.00) TRIM -2.00
MAX WATER 297/012

AGG TARE 20 30 CMT TARE 20 20
TIME : 1:55:16 pm

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                                                                                            TICKET 047604
Sep 9, 1993   Job No.        0    Mix No. 3691      8.00 yds   DLVD    0.00    Truck  69  Plant   1

   SAND      13030  ( 1.50/ 0.50) ( 6.70)    SRDCOPLA  2060  ( 0.10/ 0.70)          Polyheed   123
   # 67 6    25400                ( 1.00)    NEW CEM   4140                         Daravair    29

                                             WATER      183/1108 ( 0.00/ 0.00)      TRIM     -2.00
                                             MAX WATER  264/010

    AGG TARE   20   30   CMT TARE   20   20
     TIME :   1:59:22 pm
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                                                                                            TICKET 047605
Sep 9, 1993   Job No.        0    Mix No.  529      9.00 yds   DLVD    0.00    Truck  37  Plant   1

   SAND      14350  ( 1.50/ 0.50) ( 6.70)    SRDCOPLA  4470  ( 0.10/ 0.70)          Daravair    27
   # 67 6    28870                ( 1.00)

                                             WATER      125/1041 ( 0.00/ 0.00)      TRIM     -2.00
                                             MAX WATER  270/012

    AGG TARE   20   30   CMT TARE   20   20
     TIME :   2:05:58 pm
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                                                                                            TICKET 047606
Sep 9, 1993   Job No.        0    Mix No.  701      9.00 yds   DLVD    0.00    Truck  23  Plant   1
                 7 BAG AE

   SAND      10320  ( 1.50/ 0.50) ( 6.70)    SRDCOPLA  5890  ( 0.10/ 0.70)          Daravair    32
   # 67 6    27170                ( 1.00)

                                             WATER      180/1459 ( 0.00/ 0.00)      TRIM     -2.00
                                             MAX WATER  297/014

    AGG TARE   10   30   CMT TARE   20   20
     TIME :   2:12:46 pm
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                                                                                            TICKET 047607
Sep 9, 1993   Job No.        0    Mix No.  529      9.00 yds   DLVD    0.00    Truck 107  Plant   1

   SAND      14430  ( 1.50/ 0.50) ( 6.70)    SRDCOPLA  4480  ( 0.10/ 0.70)          Daravair    27
   # 67 6    28540                ( 1.00)

                                             WATER      125/1041 ( 0.00/ 0.00)      TRIM     -2.00
                                             MAX WATER  270/012
```

TICKET 047608

Sep 9, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 60 Plant 1
5 BAG NEWCEM

SAND 13110 < 1.50/ 0.50) (6.70) SRDCOPLA 3170 < 0.10/ 0.70)
67 6 29710 (1.00) NEW CEM 4210

WATER 179/1491 < 0.00/ 0.00) TRIM -2.00
MAX WATER 317/013

AGG TARE 20 20 CMT TARE 20 20
TIME : 2:22:02 pm

TICKET 047609

Sep 9, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 61 Plant 1
5 BAG NEWCEM

SAND 13110 < 1.50/ 0.50) (6.70) SRDCOPLA 3170 < 0.10/ 0.70)
67 6 29780 (1.00) NEW CEM 4210

WATER 179/1491 < 0.00/ 0.00) TRIM -2.00
MAX WATER 317/013

AGG TARE 20 30 CMT TARE 20 20
TIME : 2:28:25 pm

TICKET 047610

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 12400 < 1.50/ 0.50) (6.70) SRDCOPLA 5060 < 0.10/ 0.70) Daravair 31
67 6 22390 (1.00)

WATER 146/1216 < 0.00/ 0.00) TRIM -3.00
MAX WATER 298/023

AGG TARE 20 20 CMT TARE 20 20
TIME : 2:35:46 pm

TICKET 047611

Sep 9, 1993 Job No. 0 Mix No. 425 2.50 yds DLVD 0.00 Truck 51 Plant 1

SAND [illegible] SRDCOPLA [illegible] < 0.10/ 0.70)

2.

67 6 8620 (1.00)

WATER 20/ 167 < 0.00/ 0.00> TRIM -9.99
MAX WATER 081/024

AGG TARE 20 20 CMT TARE 20 20
TIME : 2:40:48 pm

TICKET 047612

Sep 9, 1993 Job No. 0 Mix No. 5001 7.00 yds DLVD 0.00 Truck 56 Plant 1
5 BAG NEWCEM

SAND 10120 (1.50/ 0.50) (6.70) SROCOFLA 2460 < 0.10/ 0.70>
67 6 23130 (1.00) NEW CEM 3280

WATER 132/1100 < 0.00/ 0.00> TRIM -3.00
MAX WATER 246/017

AGG TARE 10 20 CMT TARE 10 20
TIME : 2:43:23 pm

TICKET 047613

Sep 9, 1993 Job No. 0 Mix No. 673 7.00 yds DLVD 0.00 Truck 89 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 8490 (1.50/ 0.50) (6.70) SROCOFLA 4250 < 0.10/ 0.70> Daravair 30
67 6 21600 (1.00)

WATER 120/1000 < 0.00/ 0.00> TRIM -3.00
MAX WATER 223/019

AGG TARE 20 20 CMT TARE 20 20
TIME : 2:46:58 pm

TICKET 047614

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 55 Plant 1
6 BAG AE

SAND 12420 (1.50/ 0.50) (6.70) SROCOFLA 5050 < 0.10/ 0.70> Daravair 31
67 6 28160 (1.00)

WATER 146/1216 < 0.00/ 0.00> TRIM -3.00
MAX WATER 288/023

AGG TARE 10 30 CMT TARE 10 20
TIME : 2:51:26 pm

TICKET 047557

Sep 9, 1993 Job No. 0 Mix No. 600 9.00 yds DLVD 0.00 Truck 70 Plant 1
6 BAG

SAND 12230 (1.50/ 0.50) (6.00) SRDCOPLA 5050 (0.10/ 0.70)
67 6 28150 (1.00)

WATER 194/1616 (0.00/ 0.00) TRIM -2.00
MAX WATER 317/015

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:27:31 am

TICKET 047558

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 2 Plant 1
6 BAG AE

SAND 12300 (1.50/ 0.50) (6.00) SRDCOPLA 5050 (0.10/ 0.70) Daravair 31
67 6 28180 (1.00)

WATER 165/1374 (0.00/ 0.00) TRIM -2.00
MAX WATER 288/015

AGG TARE 20 30 CMT TARE 20 20
TIME : 8:32:34 am

TICKET 047559

Sep 9, 1993 Job No. 0 Mix No. 913 8.00 yds DLVD 0.00 Truck 56 Plant 1
GUNITE POOL MIX

SAND 16980 (1.50/ 0.50) (6.00) SRDCOPLA 5610 (0.10/ 0.70) Daravair 24
PEA GRA 25410 (0.75)

WATER 116/ 966 (0.00/ 0.00) TRIM -2.00
MAX WATER 256/010

AGG TARE 20 40 CMT TARE 20 20
TIME : 8:38:32 am

TICKET 047560

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 59 Plant 1

SAND 14560 (1.50/ 0.50) (6.00) SRDCOPLA 2530 (0.10/ 0.70) Polyheed 139
67 6 28470 (1.00) NEW CEM 4630 Daravair 32

AGG TARE 30 30 CMT TARE 20 20
TIME : 8:43:39 am

TICKET 047561

Sep 9, 1993 Job No. 0 Mix No. 201 5.00 yds DLVD 0.00 Truck 57 Plant 1
201 S.H.A. MIX #2

SAND 6670* (1.50/ 0.50) (6.00) LEHIGH 2860* (0.10/ 0.70) MicroAir 18*
S.H.A.#6 15340 (0.40) 322-R 142*

WATER 93/ 775 (0.00/ 0.00) TRIM -2.00
MAX WATER 168/022

AGG TARE 30 30 CMT TARE 20 20
TIME : 8:49:40 am

TICKET 047562

Sep 9, 1993 Job No. 0 Mix No. 511 2.00 yds DLVD 0.00 Truck 49 Plant 1
3000 PSI AE

SAND 2570 (1.50/ 0.50) (6.00) SROCOPLA 1010 (0.10/ 0.70) Daravair 7
67 6 6460 (1.00) Polyheed 30

WATER 20/ 167 (0.00/ 0.00) TRIM -9.99
MAX WATER 063/020

AGG TARE 20 20 CMT TARE 20 20
TIME : 8:52:41 am

TICKET 047563

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 69 Plant 1

SAND 14510 (1.50/ 0.50) (6.00) SROCOPLA 2320 (0.10/ 0.70) Polyheed 140
67 6 28510 (1.00) NEW CEM 4630 Daravair 32

WATER 170/1416 (0.00/ 0.00) TRIM -1.00
MAX WATER 297/005

AGG TARE 10 30 CMT TARE 20 20
TIME : 8:56:25 am

SAND 14510 (1.50/ 0.50) (6.00)   SRDCOPLA 2340 (0.10/ 0.70)   Polyheed 141
67 G 28460 (1.00)   NEW CEM 4640   Daravair 32

WATER 170/1416 (0.00/ 0.00)   TRIM -1.00
MAX WATER 297/005

AGG TARE 30 30 CMT TARE 20 20
TIME : 9:00:57 am

TICKET 047565

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 55 Plant 1

SAND 14510 (1.50/ 0.50) (6.00)   SRDCOPLA 2330 (0.10/ 0.70)   Polyheed 139
67 G 28470 (1.00)   NEW CEM 4630   Daravair 32

WATER 170/1416 (0.00/ 0.00)   TRIM -1.00
MAX WATER 297/005

AGG TARE 30 30 CMT TARE 20 20
TIME : 9:08:28 am

TICKET 047566

Sep 9, 1993 Job No. 0 Mix No. 550 9.00 yds DLVD 0.00 Truck 61 Plant 1
5.5 BAG

SAND 12920 (1.50/ 0.50) (6.00)   SRDCOPLA 4640 (0.10/ 0.70)
67 G 29660 (1.00)

WATER 194/1616 (0.00/ 0.00)   TRIM -1.00
MAX WATER 311/004

AGG TARE 20 30 CMT TARE 20 20
TIME : 9:13:09 am

TICKET 047567

Sep 9, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 91 Plant 1
5.5 BAG AE

SAND 11650 (1.50/ 0.50) (6.00)   SRDCOPLA 4650 (0.10/ 0.70)   Daravair 21
67 G 28870 (1.00)

WATER 183/1524 (0.00/ 0.00)   TRIM -1.00
MAX WATER 292/005

AGG TARE 40 30 CMT TARE 20 20
TIME : 9:20:01 am

TICKET 047568

Sep 9, 1993 Job No. 0 Mix No. 647 6.50 yds DLVD 0.00 Truck 31 Plant 1

SAND 9660 (1.50/ 0.50) (6.00) LEHIGH 3970 (0.10/ 0.70) Daravair 27
BLUE STG 20560 (0.75) 122R/Poz 126

WATER 120/1000 (0.00/ 0.00) TRIM -1.00
MAX WATER 203/003

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:30:04 am

TICKET 047569

Sep 9, 1993 Job No. 0 Mix No. 601 8.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 10900 (1.50/ 0.50) (6.00) SROCOPLA 4490 (0.10/ 0.70) Daravair 27
67 B 24960 (1.00)

WATER 155/1291 (0.00/ 0.00) TRIM -1.00
MAX WATER 256/006

AGG TARE 20 20 CMT TARE 20 20
TIME : 9:35:11 am

-811

TICKET 047570

Sep 9, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG NEWCEM

SAND 13020 (1.50/ 0.50) (6.00) SROCOPLA 3160 (0.10/ 0.70)
67 B 29710 (1.00) NEW CEM 4210

WATER 200/1666 (0.00/ 0.00) TRIM -1.00
MAX WATER 317/003

AGG TARE 20 40 CMT TARE 20 20
TIME : 9:39:20 am

TICKET 047571

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 65 Plant 1
6 BAG AE

SAND 12260 (1.50/ 0.50) (6.00) SROCOPLA 5050 (0.10/ 0.70) Daravair 31
67 B 28050 (1.00)

MAX WATER 280/00?

AGG TARE 30 30 CMT TARE 20 20
TIME : 9:44:41 am

TICKET 047572

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 69 Plant 1

SAND 14680 < 1.50/ 0.50> (6.00) SRGCOPLA 2330 < 0.10/ 0.70> Polyheed 141+
67 G 28510 (1.00) NEW CEM 4660 Daravair 32

WATER 170/1416 < 0.00/ 0.00> TRIM -1.00
MAX WATER 297/004

AGG TARE 20 30 CMT TARE 20 20
TIME : 9:58:11 am

TICKET 047573

Sep 9, 1993 Job No. 0 Mix No. 503 6.85 yds DLVD 0.00 Truck 60 Plant 1
5 BAG AE WR

SAND 9540 < 1.50/ 0.50> (6.00) SRGCOPLA 3200 < 0.10/ 0.70> Daravair 10
67 G 22240 (1.00) Polyheed 97

WATER 114/ 950 < 0.00/ 0.00> TRIM -1.00
MAX WATER 203/004

AGG TARE 30 30 CMT TARE 20 20
TIME : 10:01:33 am

TICKET 047574

Sep 9, 1993 Job No. 0 Mix No. 503 1.00 yds DLVD 0.00 Truck 60 Plant 1
5 BAG AE WR

SAND 1340 < 1.50/ 0.50> (6.00) SRGCOPLA 480 < 0.10/ 0.70> Daravair 2
67 G 3400+ (1.00) Polyheed 14

WATER 16/ 135 < 0.00/ 0.00> TRIM -1.00
MAX WATER 030/002

AGG TARE 20 10 CMT TARE 20 20
TIME : 10:07:04 am

TICKET 047575

SAND 10350 < 1.50/ 0.50) (6.00) SRDCOPLA 4110 < 0.10/ 0.70) Daravair 18
67 B 25130 (1.00)

WATER 163/1358 < 0.00/ 0.00) TRIM -1.00
MAX WATER 259/004

AGG TARE 10 30 CMT TARE 20 20
TIME : 10:09:50 am

TICKET 047576

Sep 9, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 105 Plant 1
5.5 BAG AE

SAND 11710 < 1.50/ 0.50) (6.00) SRDCOPLA 4630 < 0.10/ 0.70) Daravair 21
67 B 28290 (1.00)

WATER 174/1449 < 0.00/ 0.00) TRIM -2.00
MAX WATER 292/014

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:20:10 am

TICKET 047577

Sep 9, 1993 Job No. 0 Mix No. 673 9.00 yds DLVD 0.00 Truck 23 Plant 1
6.5 BAG AE F.B. CLASS A

SAND 11000 < 1.50/ 0.50) (6.00) SRDCOPLA 5470 < 0.10/ 0.70) Daravair 39
67 B 27670 (1.00)

WATER 173/1441 < 0.00/ 0.00) TRIM -2.00
MAX WATER 286/014

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:23:58 am

TICKET 047578

Sep 9, 1993 Job No. 0 Mix No. 647 9.00 yds DLVD 0.00 Truck 111 Plant 1

SAND 15200 < 1.50/ 0.50) (6.00) LEHIGH 5490 < 0.10/ 0.70) Daravair 38
BLUE STO 28490 (0.75) 122R/Poz 171

WATER 156/1316 < 0.00/ 0.00) TRIM -2.00
MAX WATER 282/013

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:32:08 am

TIME : 11:26:54 am

TICKET 047674

Sep 10, 1993 Job No. 0 Mix No. 503 9.00 yds DLVD 0.00 Truck 70 Plant 1
5 BAG AE WR

SAND 12560 (1.50/ 0.50) (6.70) SRDCOPLA 4250+ (0.10/ 0.70) Daravair 14
67 B 29330 (1.00) Polyheed 126

WATER 114/ 950 (0.00/ 0.00) TRIM -4.00
MAX WATER 266/030

AGG TARE 20 30 CMT TARE 20 20
TIME : 11:32:30 am

TICKET 047675

Sep 10, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 105 Plant 1
5.5 BAG AE

SAND 11650 (1.50/ 0.50) (6.70) SRDCOPLA 4630 (0.10/ 0.70) Daravair 21
67 B 28880 (1.00)

WATER 156/1299 (0.00/ 0.00) TRIM -3.00
MAX WATER 292/022

AGG TARE 20 30 CMT TARE 10 20
TIME : 11:37:05 am

TICKET 047676

Sep 10, 1993 Job No. 0 Mix No. 600 3.00 yds DLVD 0.00 Truck 60 Plant 1
6 BAG

SAND 4050 (1.50/ 0.50) (6.70) SRDCOPLA 1700 (0.10/ 0.70)
67 B 9630 (1.00)

WATER 37/ 308 (0.00/ 0.00) TRIM -9.99
MAX WATER 106/030

AGG TARE 10 20 CMT TARE 10 20
TIME : 11:46:55 am

TICKET 047677

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 61 Plant 1

SAND 14620 < 1.50/ 0.50) (6.70) SROLOPLA 2360 < 0.10/ 0.70) Polyheed 141
67 G 28570 (1.00) NEW CEM 4630 Daravair 32

WATER 141/1175 < 0.00/ 0.00) TRIM -3.00
MAX WATER 297/021

AGG TARE 10 30 CMT TARE 20 20
TIME : 11:55:02 am

TICKET 047678

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 51 Plant 1

SAND 14670 < 1.50/ 0.50) (6.70) SROLOPLA 2380* < 0.10/ 0.70) Polyheed 141*
67 G 28580 (1.00) NEW CEM 4640 Daravair 32

WATER 141/1175 < 0.00/ 0.00) TRIM -3.00
MAX WATER 297/020

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:17:01 pm

TICKET 047679

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 59 Plant 1

SAND 14770 < 1.50/ 0.50) (6.70) SROLOPLA 2340 < 0.10/ 0.70) Polyheed 141*
67 G 28560 (1.00) NEW CEM 4660 Daravair 32

WATER 141/1175 < 0.00/ 0.00) TRIM -3.00
MAX WATER 297/020

AGG TARE 20 30 CMT TARE 20 20
TIME : 12:23:23 pm

TICKET 047680

Sep 10, 1993 Job No. 0 Mix No. 601 5.50 yds DLVD 0.00 Truck 55 Plant 1
6 SAS AE

SAND 75[illegible] < 1.50/ 0.50) (6.70) SROLOPLA 3710 < 0.10/ 0.70) Daravair 15
67 G 17280 (1.00)

WATER 73/ 608 < 0.00/ 0.00) TRIM -6.00
MAX WATER 176/031

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:26:22 pm

SAND [illegible] (1.50/ 0.50) (6.70) SRDCOPLA [illegible] (0.10/ 0.70) Baravair 6
[illegible] (1.00)

WATER 22/ 183 (0.00/ 0.00) TRIM -9.99
MAX WATER 065/021

AGG TARE 20 20 CMT TARE 20 20
TIME : 11:18:36 am

TICKET 047587

Sep 9, 1993 Job No. 0 Mix No. 201 9.00 yds DLVD 0.00 Truck 50 Plant 1
201 S.H.A. MIX 02

SAND 11780 (1.50/ 0.50) (6.70) LEHIGH 5010 (0.10/ 0.70) MicroAir 83*
S.H.A.#6 27760 (1.30) 322-N 255*

WATER 186/1549 (0.00/ 0.00) TRIM 5.00
MAX WATER 302/0-6

AGG TARE 10 30 CMT TARE 20 20
TIME : 11:33:18 am

TICKET 047588

Sep 9, 1993 Job No. 0 Mix No. 5001 7.00 yds DLVD 0.00 Truck 61 Plant 1
5 BAG NEWCEM

SAND 10220 (1.50/ 0.50) (6.70) SRDCOPLA 2460 (0.10/ 0.70)
67 6 23140 (1.00) NEW CEM 3270

WATER 139/1158 (0.00/ 0.00) TRIM -2.00
MAX WATER 246/009

AGG TARE 0 20 CMT TARE 0 20
TIME : 11:42:15 am

TICKET 047589

Sep 9, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 51 Plant 1
5.5 BAG AE

SAND [illegible] (1.50/ 0.50) (6.70) SRDCOPLA [illegible] (0.10/ 0.70) Baravair 21

WATER 165/1374 (0.00/ 0.00) TRIM -2.00
MAX WATER 292/014

AGG TARE 20 30 CMT TARE 20 20
TIME : 11:45:44 am

TICKET 047590

Sep 9, 1993 Job No. 0 Mix No. 601 2.25 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 2990 (1.50/ 0.50) (6.70) SRDLOPLA 1260 (0.10/ 0.70) Daravair 8
67 G 6970 (1.00)

WATER 20/ 167 (0.00/ 0.00) TRIM -9.99
MAX WATER 072/023

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:14:13 pm

TICKET 047591

Sep 9, 1993 Job No. 0 Mix No. 551 3.00 yds DLVD 0.00 Truck 69 Plant 1
5.5 BAG AE

SAND 4000* (1.50/ 0.50) (6.70) SRDLOPLA 1560 (0.10/ 0.70) Daravair 7
67 G 9480 (1.00)

WATER 30/ 250 (0.00/ 0.00) TRIM -9.99
MAX WATER 097/028

AGG TARE 10 20 CMT TARE 10 20
TIME : 12:16:51 pm

TICKET 047592

Sep 9, 1993 Job No. 0 Mix No. 601 4.00 yds DLVD 0.00 Truck 61 Plant 1
6 BAG AE

SAND 5620* (1.50/ 0.50) (6.70) SRDLOPLA 2260 (0.10/ 0.70) Daravair 14
67 G 12610 (1.00)

WATER 36/ 300 (0.00/ 0.00) TRIM -9.99
MAX WATER 128/038

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:23:06 pm

TICKET 047579

Sep 9, 1993   Job No.   0   Mix No. 5001   9.00 yds   DLVD   0.00   Truck 49 Plant 1
5 BAG NEWCEM

SAND   13000 < 1.50/ 0.50> (6.00)   SRDCOPLA 3180 < 0.10/ 0.70>
67 6   29630   (1.00)   NEW CEM   4230

WATER   190/1583 < 0.00/ 0.00>   TRIM   -2.00
MAX WATER 317/013

AGG TARE   20   30   CMT TARE   20   20
TIME : 10:37:22 am

TICKET 047580

Sep 9, 1993   Job No.   0   Mix No. 913   9.00 yds   DLVD   0.00   Truck 92 Plant 1
GUNITE POOL MIX

SAND   19180 < 1.50/ 0.50> (6.00)   SRDCOPLA 6310 < 0.10/ 0.70>   Daravair   27
PEA GRA 28700   (0.75)

WATER   130/1083 < 0.00/ 0.00>   TRIM   -2.00
MAX WATER 288/011

AGG TARE   30   30   CMT TARE   20   20
TIME : 10:43:26 am

TICKET 047581

Sep 9, 1993   Job No.   0   Mix No. 550   6.50 yds   DLVD   0.00   Truck 107 Plant 1
5.5 BAG

SAND   9340 < 1.50/ 0.50> (6.00)   SRDCOPLA 3340 < 0.10/ 0.70>
67 6   21450   (1.00)

WATER   133/1108 < 0.00/ 0.00>   TRIM   -2.00
MAX WATER 224/009

AGG TARE   20   30   CMT TARE   10   20
TIME : 10:53:21 am

TICKET 047582

Sep 9, 1993   Job No.   0   Mix No. 5001   4.00 yds   DLVD   0.00   Truck 59 Plant 1
5 BAG NEWCEM

SAND   5820 < 1.50/ 0.50> (6.00)   SRDCOPLA 1440* < 0.10/ 0.70>
67 6   13190   (1.00)   NEW CEM   1870

WATER [illegible] TRIM -9.99
MAX WATER [illegible]

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:55:57 am

TICKET 047583

Sep 9, 1993 Job No. 0 Mix No. 918 1.00 yds DLVD 0.00 Truck 70 Plant 1
GUNITE POOL MIX

SAND 2160 < 1.50/ 0.50> (6.00) SRDCOPLA 710 < 0.10/ 0.70> Daravair [illegible]
PEA GRA 4160* (0.75)

WATER 67/ 50 < 0.00/ 0.00> TRIM -9.99
MAX WATER 032/009

AGG TARE 20 20 CMT TARE 20 20
TIME : 10:58:49 am

TICKET 047584

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 69 Plant 1
6 BAG AE

SAND 12230 < 1.50/ 0.50> (6.00) SRDCOPLA 5060 < 0.10/ 0.70> Daravair 31
67 G 28070 (1.00)

WATER 165/1374 < 0.00/ 0.00> TRIM -2.00
MAX WATER 288/016

AGG TARE 20 30 CMT TARE 20 20
TIME : 11:01:12 am

TICKET 047585

Sep 9, 1993 Job No. 0 Mix No. 6011 9.00 yds DLVD 0.00 Truck 57 Plant 1
601 BAG AE 75\25 NEWCEM

SAND 11140 < 1.50/ 0.50> (6.00) SRDCOPLA 3790 < 0.10/ 0.70> Daravair 31
67 G 27960 (1.00) NEW CEM 5070

WATER 171/1424 < 0.00/ 0.00> TRIM -2.00
MAX WATER 288/015

AGG TARE 20 20 CMT TARE 10 20
TIME : 11:12:16 am

TICKET 047586

TICKET 047593

Sep 9, 1993 Job No. [illegible] Mix No. 5001 9.00 yds DLVD 0.00 Truck 55 Plant 1
[illegible] BAG [illegible]

SAND 10160 < 1.50/ 0.50) (6.70) SRDCOPLA 2460 < 0.10/ 0.70)
67 B 23260 (1.00) NEW CEM 3290

WATER 111/ 925 < 0.00/ 0.00> TRIM -6.00
MAX WATER 246/038

AGG TARE 20 30 CMT TARE 20 20
TIME : 12:39:23 pm

TICKET 047594

Sep 9, 1993 Job No. 0 Mix No. 551 1.50 yds DLVD 0.00 Truck 65 Plant 1
5.5 BAG AE

SAND 1850 < 1.50/ 0.50) (6.70) SRDCOPLA 770 < 0.10/ 0.70) Daravair 4
67 B 4740 (1.00)

WATER 15/ 125 < 0.00/ 0.00> TRIM -9.99
MAX WATER 049/016

AGG TARE 20 10 CMT TARE 20 20
TIME : 12:43:06 pm

TICKET 047595

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 56 Plant 1
6 BAG AE

SAND 12350 < 1.50/ 0.50) (6.70) SRDCOPLA 5060 < 0.10/ 0.70) Daravair 31
67 B 28210 (1.00)

WATER 137/1141 < 0.00/ 0.00> TRIM -4.00
MAX WATER 288/033

AGG TARE 10 30 CMT TARE 20 20
TIME : 1:00:26 pm

TICKET 047596

Sep 9, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 91 Plant 1
6 BAG AE

SAND 12310 < 1.50/ 0.50) (6.70) SRDCOPLA 5070 < 0.10/ 0.70) Daravair 31
67 B 28150 (1.00)

WATER 137/1141 < 0.00/ 0.00> TRIM -4.00
MAX WATER 288/033

TICKET 047597

Sep 9, 1993 Job No. 0 Mix No. 653 4.00 yds DLVD 0.00 Truck 70 Plant 1
6.5 BAG AE WR

SAND 4970 (1.50/ 0.50) (6.70) SRDCOPLA 2440 (0.10/ 0.70) Daravair 18
S.H.A.#6 12550 (1.30) Polyheed 122

WATER 29/ 242 (0.00/ 0.00) TRIM -9.99
MAX WATER 120/038

AGG TARE 20 30 CMT TARE 20 20
TIME : 1:08:16 pm

TICKET 047598

Sep 9, 1993 Job No. 0 Mix No. 506 7.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG W/ PEA GRAVEL

SAND 11920 (1.50/ 0.50) (6.70) SRDCOPLA 3270 (0.10/ 0.70)
PEA GRA 23260 (0.75)
*

WATER 131/1091 (0.00/ 0.00) TRIM -3.00
MAX WATER 253/016

AGG TARE 20 20 CMT TARE 20 10
TIME : 1:11:45 pm

TICKET 047599

Sep 9, 1993 Job No. 0 Mix No. 201 4.50 yds DLVD 0.00 Truck 2 Plant 1
201 S.H.A. MIX #2

SAND 5930 (1.50/ 0.50) (6.70) LEHIGH 2540* (0.10/ 0.70) MicroAir 16*
S.H.A.#6 13870 (1.30) 322-N 129*

WATER 70/ 583 (0.00/ 0.00) TRIM -2.00
MAX WATER 151/020

AGG TARE 20 20 CMT TARE 10 20
TIME : 1:20:02 pm

TICKET 047600

Sep 9, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 105 Plant 1

TICKET 047657

Sep 10, 1993 Job No. 0 Mix No. 503 6.50 yds BLVD 0.00 Truck 60 Plant 1

5 BAG AE WR

SAND 9180 (1.50/ 0.50) (6.70) SRDCOPLA 3060 (0.10/ 0.70) Daravair 10

67 6 21190 (1.00) Polyheed 91

WATER 81/ 675 (0.00/ 0.00) TRIM -4.00

MAX WATER 192/022

AGG TARE 10 20 CMT TARE 20 20

TIME : 9:54:01 am

6120

TICKET 047658

Sep 10, 1993   Job No.   0   Mix No. 647   9.00 yds   DLVD   0.00   Truck 57 Plant 1

SAND   13290 (1.50/ 0.50) (6.70)   LEHIGH   5480 (0.10/ 0.70)   Daravair   38
BLUE STO 28640   (0.75)   122R/Poz   171

WATER   196/1216 (0.00/ 0.00)   TRIM   -2.00
MAX WATER 282/013

AGG TARE   10   30   CMT TARE   20   20
TIME : 10:07:17 am

TICKET 047659

[illegible] Job No. 0 Mix No. 550 [illegible] yds DLVD 0.00 Truck 2 Plant 1
5.5 BAG

SAND 12820 (1.50/ 0.50) (6.70) SRDCOPLA 4640 (0.10/ 0.70)
67 6 29580 (1.00)

WATER 174/1449 (0.00/ 0.00) TRIM -2.00
MAX WATER 311/014

AGG TARE 20 20 CMT TARE 10 20
TIME : 10:23:47 am

TICKET 047660

Sep 10, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 59 Plant 1
3000 PSI PLAIN

SAND 12730 (1.50/ 0.50) (6.70) SRDCOPLA 4490 (0.10/ 0.70) Polyheed 135
67 6 29700 (1.00)

WATER 157/1308 (0.00/ 0.00) TRIM -3.00
MAX WATER 302/021

AGG TARE 20 30 CMT TARE 10 20
TIME : 10:28:53 am

TICKET 047661

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 49 Plant 1
6 BAG AE

SAND 12490 (1.50/ 0.50) (6.70) SRDCOPLA 5060 (0.10/ 0.70) Daravair 31
67 6 28140 (1.00)

WATER 146/1216 (0.00/ 0.00) TRIM -3.00
MAX WATER 288/023

AGG TARE 20 20 CMT TARE 20 20
TIME : 10:34:12 am

TICKET 047662

Sep 10, 1993 Job No. 0 Mix No. 550 6.00 yds DLVD 0.00 Truck 107 Plant 1
5.5 BAG

SAND 8600 (1.50/ 0.50) (6.70) SRDCOPLA 3090 (0.10/ 0.70)
67 6 19750 (1.00)

WATER 104/ 866 (0.00/ 0.00) TRIM -4.00

AGG TARE 20 20 CMT TARE 10 20
TIME : 10:38:36 am

TICKET 047663

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 12310 (1.50/ 0.50) (6.70) SRGCOPLA 5050 (0.10/ 0.70) Daravair 41
67 G 28310 (1.00)

WATER 137/1141 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/033

AGG TARE 10 30 CMT TARE 20 20
TIME : 10:42:09 am

TICKET 047664

Sep 10, 1993 Job No. 0 Mix No. 673 9.00 yds DLVD 0.00 Truck 89 Plant 1
6.5 BAG AE F.G. CLASS A

SAND 11050 (1.50/ 0.50) (6.70) SRGCOPLA 5500 (0.10/ 0.70) Daravair 39
67 G 27760 (1.00)

WATER 146/1216 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/031

AGG TARE 20 20 CMT TARE 20 20
TIME : 10:46:47 am

TICKET 047665

Sep 10, 1993 Job No. 0 Mix No. 607 3.00 yds DLVD 0.00 Truck 65 Plant 1
6 BAG FGR AE

SAND 4540 (1.50/ 0.50) (6.70) SRGCOPLA 1700 (0.10/ 0.70) Daravair 6
FG- FGR 9190 (0.75)

WATER 34/ 283 (0.00/ 0.00) TRIM -9.99
MAX WATER 103/028

AGG TARE 20 20 CMT TARE 20 20
TIME : 10:54:28 am

TICKET 047666

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 55 Plant 1
6 BAG AE

WATER 137/1141 < 0.00/ 0.00> TRIM -4.00
MAX WATER 288/032

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:53:17 am

TICKET 047667

Sep 10, 1993 Job No. 0 Mix No. 500 9.00 yds DLVD 0.00 Truck 80 Plant 1
5 BAG MIX

SAND 13080 < 1.50/ 0.50> (6.70) SRDCOPLA 4210 < 0.10/ 0.70>
67 6 29880 (1.00)

WATER 161/1341 < 0.00/ 0.00> TRIM -4.00
MAX WATER 320/034

AGG TARE 20 30 CMT TARE 20 20
TIME : 10:57:33 am

TICKET 047668

Sep 10, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 50 Plant 1
3000 PSI PLAIN

SAND 12770 < 1.50/ 0.50> (6.70) SRDCOPLA 4470 < 0.10/ 0.70> Polyheed 134
67 6 29650 (1.00)

WATER 148/1233 < 0.00/ 0.00> TRIM -4.00
MAX WATER 302/030

AGG TARE 20 30 CMT TARE 10 20
TIME : 11:03:07 am

TICKET 047669

Sep 10, 1993 Job No. 0 Mix No. 561 9.00 yds DLVD 0.00 Truck 23 Plant 1
3500 PSI AE

SAND 12120 < 1.50/ 0.50> (6.70) SRDCOPLA 4740 < 0.10/ 0.70> Daravair 32
67 6 28500 (1.00) Polyheed 145*

WATER 124/1033 < 0.00/ 0.00> TRIM -4.00
MAX WATER 273/030

AGG TARE 30 20 CMT TARE 20 20
TIME : 11:07:58 am

TICKET 047670

Sep 10, 1993 Job No. 0 Mix No. 601 6.00 yds DLVD 0.00 Truck 92 Plant 1
6 BAG AE

SAND 8130 (1.50/ 0.50) (6.70) SRUCOPLA 3370 (0.10/ 0.70) Daravair 20
67 G 18840 (1.00)

WATER 91/ 758 (0.00/ 0.00) TRIM -4.00
MAX WATER 192/028

AGG TARE 20 20 CMT TARE 10 20
TIME : 11:11:59 am

TICKET 047671

Sep 10, 1993 Job No. 0 Mix No. 550 9.00 yds DLVD 0.00 Truck 2 Plant 1
5.5 BAG

SAND 12950 (1.50/ 0.50) (6.70) SRUCOPLA 4630 (0.10/ 0.70)
67 G 29590 (1.00)

WATER 157/1308 (0.00/ 0.00) TRIM -4.00
MAX WATER 311/030

AGG TARE 20 30 CMT TARE 20 20
TIME : 11:15:35 am

TICKET 047672

Sep 10, 1993 Job No. 0 Mix No. 561 4.00 yds DLVD 0.00 Truck 91 Plant 1
3500 PSI AE

SAND 5290 (1.50/ 0.50) (6.70) SRUCOPLA 2120 (0.10/ 0.70) Daravair 14
67 G 12770 (1.00) Polyheed 65*

WATER 46/ 383 (0.00/ 0.00) TRIM -6.00
MAX WATER 121/022

AGG TARE 20 30 CMT TARE 20 20
TIME : 11:20:54 am

TICKET 047673

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 87 Plant 1
6 BAG AE

SAND 12360 (1.50/ 0.50) (6.70) SRUCOPLA 5060 (0.10/ 0.70) Daravair 31
67 G 28210 (1.00)

WATER 137/1141 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/033

TICKET 047681

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 66 Plant 1
6 BAG AE

SAND 12970 (1.50/ 0.50) (6.70) SRDCOPLA 5090+ (0.10/ 0.70) Daravair 31
67 B 28180 (1.00)

WATER 146/1216 (0.00/ 0.00) TRIM -3.00
MAX WATER 288/023

AGG TARE 20 30 CMT TARE 10 20
TIME : 12:30:19 pm

TICKET 047682

Sep 10, 1993 Job No. 0 Mix No. 647 9.00 yds DLVD 0.00 Truck 80 Plant 1

SAND 13200 (1.50/ 0.50) (6.70) LEHIGH 5480 (0.10/ 0.70) Daravair 38
BLUE STD 28550 (0.75) 122R/Poz 171

WATER 137/1141 (0.00/ 0.00) TRIM -3.00
MAX WATER 282/023

AGG TARE 20 30 CMT TARE 20 20
TIME : 12:36:16 pm

TICKET 047683

Sep 10, 1993 Job No. 0 Mix No. 647 1.00 yds DLVD 0.00 Truck 53 Plant 1

SAND 1450 (1.50/ 0.50) (6.70) LEHIGH 620 (0.10/ 0.70) Daravair 4
BLUE STD 3180 (0.75) 122R/Poz 21

WATER 8/ 67 (0.00/ 0.00) TRIM -9.99
MAX WATER 031/010

AGG TARE 30 20 CMT TARE 10 20
TIME : 12:42:03 pm

TICKET 047684

Sep 10, 1993 Job No. 0 Mix No. 673 4.00 yds DLVD 0.00 Truck 56 Plant 1
6.5 BAG AE P.B. CLASS A

SAND 4840 (1.50/ 0.50) (6.70) SRDCOPLA 2430 (0.10/ 0.70) Daravair 17
67 B 12290 (1.00)

WATER 41/ 342 (0.00/ 0.00) TRIM -9.99

AGG TARE 20 20 CMT TARE 20 20
TIME : 12:43:52 pm

TICKET 047685

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 57 Plant 1

SAND 14760 (1.50/ 0.50) (6.70) SRDCOFLA 2340 (0.10/ 0.70) Polyheed 141*
67 G 28670 (1.00) NEW CEM 4630 Daravair 32

WATER 132/1100 (0.00/ 0.00) TRIM -4.00
MAX WATER 297/029

AGG TARE 10 30 CMT TARE 20 20
TIME : 12:47:44 pm

TICKET 047686

Sep 10, 1993 Job No. 0 Mix No. 647 0.50 yds DLVD 0.00 Truck 57 Plant 1

SAND 840* (1.50/ 0.50) (6.70) LEHIGH 310 (0.10/ 0.70) Daravair 2
BLUE STO 1510 (0.75) 122R/Poz 12

WATER 37 25 (0.00/ 0.00) TRIM -9.99
MAX WATER 016/006

AGG TARE 20 10 CMT TARE 20 -20
TIME : 1:01:37 pm

TICKET 047687

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 61 Plant 1

SAND 14580 (1.50/ 0.50) (6.70) SRDCOFLA 2350* (0.10/ 0.70) Polyheed 140
67 G 28630 (1.00) NEW CEM 4640 Daravair 32

WATER 132/1100 (0.00/ 0.00) TRIM -4.00
MAX WATER 297/030

AGG TARE 10 30 CMT TARE 0 20
TIME : 1:16:27 pm

TICKET 047688

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 49 Plant 1
5 BAG AE

WATER 137/1141 < 0.00/ 0.00> TRIM -4.00
MAX WATER 288/032

AGG TARE 20 [illegible] CMT TARE 20 20
TIME : 1:20:26 pm

Sep 10, 1993 Job No. 0 Mix No. 510 9.00 yds DLVD 0.00 Truck 107 Plant 1 TICKET 047689
3000 PSI PLAIN

SAND 12730 < 1.50/ 0.50> (6.70) SRGCOPLA 4500 < 0.10/ 0.70> Polyheed 134
67 B 29620 (1.00)

WATER 148/1233 < 0.00/ 0.00> TRIM -4.00
MAX WATER 302/030

AGG TARE 20 30 CMT TARE 10 20
TIME : 1:25:37 pm

Sep 10, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 65 Plant 1 TICKET 047690
5.5 BAG AE

SAND 11620 < 1.50/ 0.50> (6.70) SRGCOPLA 4640 < 0.10/ 0.70> Daravair 22
67 B 28330 (1.00)

WATER 147/1225 < 0.00/ 0.00> TRIM -4.00
MAX WATER 292/031

AGG TARE 20 20 CMT TARE 10 10
TIME : 1:30:49 pm

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 50 Plant 1 TICKET 047691

SAND 14630 < 1.50/ 0.50> (6.70) SRGCOPLA 2340 < 0.10/ 0.70> Polyheed 141+
67 B 28560 (1.00) NEW CEM 4630 Daravair 32

WATER 132/1100 < 0.00/ 0.00> TRIM -4.00
MAX WATER 297/030

AGG TARE 20 30 CMT TARE 10 10
TIME : 1:35:57 pm

TICKET 047692

[illegible] Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 23 Plant 1
5.5 BAG AE

SAND 11620 (1.50/ 0.50) (6.70) SRDCOPLA 4630 (0.10/ 0.70) Daravair 21
67 B 28410 (1.00)

WATER 147/1225 (0.00/ 0.00) TRIM -4.00
MAX WATER 292/031

AGG TARE 20 30 CMT TARE 0 10
TIME : 1:40:31 pm

TICKET 047693

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 92 Plant 1

SAND 14580 (1.50/ 0.50) (6.70) SRDCOPLA 2320 (0.10/ 0.70) Polyheed 140
67 B 26610 (1.00) NEW CEM 4630 Daravair 33

WATER 132/1100 (0.00/ 0.00) TRIM -4.00
MAX WATER 297/030

AGG TARE 30 30 CMT TARE 10 10
TIME : 1:45:08 pm

TICKET 047694

Sep 10, 1993 Job No. 0 Mix No. 551 9.00 yds DLVD 0.00 Truck 91 Plant 1
5.5 BAG AE

SAND 11680 (1.50/ 0.50) (6.70) SRDCOPLA 4640 (0.10/ 0.70) Daravair 21
67 B 28480 (1.00)

WATER 147/1225 (0.00/ 0.00) TRIM -4.00
MAX WATER 292/031

AGG TARE 20 30 CMT TARE 10 20
TIME : 1:47:55 pm

TICKET 047695

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 601 Plant 1
6 BAG AE

SAND 12570 (1.50/ 0.50) (6.70) SRDCOPLA 5130+ (0.10/ 0.70) Daravair 31
67 B 28460 (1.00)

WATER 137/1141 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/032

[illegible]

TICKET 047696

Sep 10, 1993 Job No. 0 Mix No. 550 1.70 yds DLVD 0.00 Truck 2 Plant 1
5.5 BAG

SAND 2490 (1.50/ 0.50) (6.70) SRDCOPLA 880 (0.10/ 0.70)
67 B 5700 (1.00)

WATER 19/ 158 (0.00/ 0.00) TRIM -9.99
MAX WATER 059/016

AGG TARE 20 20 CMT TARE 20 20
TIME : 1:59:44 pm

TICKET 047697

Sep 10, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG NEWCEM

SAND 13090 (1.50/ 0.50) (6.70) SRDCOPLA 3180 (0.10/ 0.70)
67 B 29780 (1.00) NEW CEM 4220

WATER 162/1349 (0.00/ 0.00) TRIM -4.00
MAX WATER 317/030

AGG TARE 10 30 CMT TARE 10 10
TIME : 2:02:31 pm

TICKET 047698

Sep 10, 1993 Job No. 0 Mix No. 2121 9.00 yds DLVD 0.00 Truck 69 Plant 1

SAND 12050 (1.50/ 0.50) (6.70) SRDCOPLA 4090 (0.10/ 0.70) Daravair 59
BLUE STO 27990 (0.75) NEW CEM 5470 Polyheed 271*

WATER 107/ 891 (0.00/ 0.00) TRIM -5.00
MAX WATER 261/040

AGG TARE 20 20 CMT TARE 0 20
TIME : 2:06:59 pm

TICKET 047699

Sep 10, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 55 Plant 1
5 BAG NEWCEM

[redacted]
67 6 27770 (1.00) NEW CEM 4220

WATER 162/1349 < 0.00/ 0.00) TRIM -4.00
MAX WATER 317/029

AGG TARE 20 30 CMT TARE 20 20
TIME : 2:13:58 pm

TICKET 047700

Sep 10, 1993 Job No. 0 Mix No. 673 4.50 yds DLVD 0.00 Truck 59 Plant 1
6.5 BAG AE P.G. CLASS A

SAND 5550 < 1.50/ 0.50) (6.70) SRDCOPLA 2800+ < 0.10/ 0.70) Daravair 19
67 6 13820 (1.00)

WATER 46/ 383 < 0.00/ 0.00) TRIM -9.99
MAX WATER 143/042

AGG TARE 30 30 CMT TARE 20 20
TIME : 2:16:22 pm

TICKET 047701

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 51 Plant 1
6 BAG AE

SAND 12360 < 1.50/ 0.50) (6.70) SRDCOPLA 5100+ < 0.10/ 0.70) Daravair 31
67 6 28200 (1.00)

WATER 137/1141 < 0.00/ 0.00) TRIM -4.00
MAX WATER 266/033

AGG TARE 20 40 CMT TARE 20 20
TIME : 2:19:44 pm

TICKET 047702

Sep 10, 1993 Job No. 0 Mix No. 505 1.25 yds DLVD 0.00 Truck 66 Plant 1
5 BAG AE WR

SAND 1750 < 1.50/ 0.50) (6.70) SRDCOPLA 600+ < 0.10/ 0.70) Daravair 2
67 6 4110 (1.00) Polyheed 18

WATER 8/ 67 < 0.00/ 0.00) TRIM -9.99
MAX WATER 037/012

AGG TARE 30 20 CMT TARE 20 20
TIME : 2:22:41 pm

SAND 13170 (1.50/ 0.50) (6.70) SRDCOPLA 3170 (0.10/ 0.70)
67 6 29770 (1.00) NEW CEM 4220

WATER 162/1349 (0.00/ 0.00) TRIM -4.00
MAX WATER 317/029

AGG TARE 20 30 CMT TARE 20 20
TIME : 2:13:58 pm

Sep 10, 1993 Job No. 0 Mix No. 673 4.50 yds DLVD 0.00 Truck 59 Plant 1 TICKET 047700
6.5 BAG AE F.G. CLASS A

SAND 5550 (1.50/ 0.50) (6.70) SRDCOPLA 2800* (0.10/ 0.70) Daravair 19
67 6 13820 (1.00)

WATER 46/ 383 (0.00/ 0.00) TRIM -9.99
MAX WATER 143/042

AGG TARE 30 30 CMT TARE 20 20
TIME : 2:16:22 pm

Sep 10, 1993 Job No. 0 Mix No. 601 9.00 yds DLVD 0.00 Truck 51 Plant 1 TICKET 047701
6 BAG AE

SAND 12360 (1.50/ 0.50) (6.70) SRDCOPLA 5100* (0.10/ 0.70) Daravair 31
67 6 28200 (1.00)

WATER 137/1141 (0.00/ 0.00) TRIM -4.00
MAX WATER 288/033

AGG TARE 20 40 CMT TARE 20 20
TIME : 2:19:44 pm

Sep 10, 1993 Job No. 0 Mix No. 503 1.25 yds DLVD 0.00 Truck 66 Plant 1 TICKET 047702
5 BAG AE WR

SAND 1750 (1.50/ 0.50) (6.70) SRDCOPLA 600* (0.10/ 0.70) Daravair 2
67 6 4110 (1.00) Polyheed 18

WATER 8/ 67 (0.00/ 0.00) TRIM -9.99
MAX WATER 037/012

AGG TARE 30 20 CMT TARE 20 20
TIME : 2:22:41 pm

TICKET 047703

[illegible] Job No. [illegible] Mix No. [illegible]531 9.00 yds DLVD 0.00 Truck 105 Plant 1
3.5 BAG AE

SAND 11560 (1.50/ 0.50) (6.70) SRDCOPLA 4720* (0.10/ 0.70) Daravair 21
67 B 28370 (1.00)

WATER 147/1225 (0.00/ 0.00) TRIM -4.00
MAX WATER 292/032

AGG TARE 10 30 CMT TARE 20 20
TIME : 2:25:41 pm

TICKET 047704

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 70 Plant 1

SAND 14600 (1.50/ 0.50) (6.70) SRDCOPLA 2360* (0.10/ 0.70) Polyheed 142*
67 B 28530 (1.00) NEW CEM 4630 Daravair 32

WATER 132/1100 (0.00/ 0.00) TRIM -4.00
MAX WATER 297/030

AGG TARE 20 30 CMT TARE 20 20
TIME : 2:31:43 pm

TICKET 047705

Sep 10, 1993 Job No. 0 Mix No. 5691 1.00 yds DLVD 0.00 Truck 56 Plant 1

SAND 1590 (1.50/ 0.50) (6.70) SRDCOPLA 290* (0.10/ 0.70) Polyheed 17*
67 B 3690* (1.00) NEW CEM 510 Daravair 4

WATER 8/ 67 (0.00/ 0.00) TRIM -9.99
MAX WATER 033/010

AGG TARE 20 20 CMT TARE -20 10
TIME : 2:42:57 pm

TICKET 047706

Sep 10, 1993 Job No. 0 Mix No. 5023 5.00 yds DLVD 0.00 Truck 89 Plant 1
50EN5 3000 PSI

SAND 7470 (1.50/ 0.50) (6.70) SRDCOPLA 1190* (0.10/ 0.70) Polyheed 72*
S.H.A.#6 16670 (1.30) NEW CEM 2340

WATER 53/ 441 (0.00/ 0.00) TRIM -5.00
MAX WATER 155/[illegible]

TIME : 2:43:33 pm

TICKET 047707

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 60 Plant 1

SAND 0 (1.50/ 0.50) (6.70) SROCOPLA 0 (0.10/ 0.70) Polyheed 0
67 G 0 (1.00) NEW CEM 0 Daravair 0

WATER 0/ 0 (0.00/ 0.00) TRIM -5.00
MAX WATER 297/297

AGG TARE 20 30 CMT TARE 20 20
TIME : 2:58:51 pm

TICKET 047708

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 57 Plant 1

SAND 14630 (1.50/ 0.50) (6.70) SROCOPLA 2350* (0.10/ 0.70) Polyheed 141*
67 G 28610 (1.00) NEW CEM 4630 Daravair 32

WATER 123/1025 (0.00/ 0.00) TRIM -5.00
MAX WATER 297/039

AGG TARE 0 30 CMT TARE 20 20
TIME : 3:10:43 pm

TICKET 047709

Sep 10, 1993 Job No. 0 Mix No. 5691 9.00 yds DLVD 0.00 Truck 63 Plant 1

SAND 14720 (1.50/ 0.50) (6.70) SROCOPLA 2330 (0.10/ 0.70) Polyheed 140
67 G 28820 (1.00) NEW CEM 4630 Daravair 32

WATER 123/1023 (0.00/ 0.00) TRIM -5.00
MAX WATER 297/068

AGG TARE 30 30 CMT TARE 20 20
TIME : 3:16:27 pm

TICKET 047710

Sep 10, 1993 Job No. 0 Mix No. 601 2.00 yds DLVD 0.00 Truck 61 Plant 1
& SAG HE

[illegible] (1.50/ 0.50) (6.70) SRGCOPLA 1150 (0.10/ 0.70) Daravair 7
67 6 6190 (1.00)

WATER 18/ 150 (0.00/ 0.00) TRIM -9.99
MAX WATER 064/020

AGG TARE 20 20 CMT TARE 20 20
TIME : 3:27:26 pm

TICKET 047711

Sep 10, 1993 Job No. 0 Mix No. 5691 4.00 yds DLVD 0.00 Truck 23 Plant 1

SAND 6610 (1.50/ 0.50) (6.70) SRGCOPLA 1050+ (0.10/ 0.70) Polyheed 60
67 6 12650 (1.00) NEW CEM 2060 Daravair 14

WATER 33/ 275 (0.00/ 0.00) TRIM -9.99
MAX WATER 132/038

AGG TARE 10 20 CMT TARE 20 20
TIME : 3:33:44 pm

TICKET 047712

Sep 10, 1993 Job No. 0 Mix No. 5001 9.00 yds DLVD 0.00 Truck 111 Plant 1
5 BAG NEWCEM

SAND 15070 (1.50/ 0.50) (6.70) SRGCOPLA 3170 (0.10/ 0.70)
67 6 29720 (1.00) NEW CEM 4210

WATER 162/1349 (0.00/ 0.00) TRIM -4.00
MAX WATER 317/030

AGG TARE 10 20 CMT TARE 20 20
TIME : 3:36:45 pm

TICKET 047713

Sep 10, 1993 Job No. 0 Mix No. 5691 5.00 yds DLVD 0.00 Truck 81 Plant 1

SAND 8150 (1.50/ 0.50) (6.70) SRGCOPLA 1300 (0.10/ 0.70) Polyheed 79
67 6 15670 (1.00) NEW CEM 2590 Daravair 18

WATER 42/ 350 (0.00/ 0.00) TRIM -9.99
MAX WATER 165/047

AGG TARE 20 20 CMT TARE 20 20
TIME : 3:29:24 pm

TICKET 047714

Sep 10, 1993 Job No. [illegible] Mix No. 500 3.00 yds DLVD 0.00 Truck 67 Plant 1
5 BAG MIX

SAND 7260 (1.50/ 0.50) (6.70) SRDCOPLA 2380+ (0.10/ 0.70)
67 B 16340 (1.00)

WATER 59/ 491 (0.00/ 0.00) TRIM -9.99
MAX WATER 178/049

AGG TARE 20 20 CMT TARE 20 20
TIME : 3:43:03 pm

TICKET 047715

Sep 10, 1993 Job No. 20 Mix No. 5001 9.00 yds DLVD 0.00 Truck 59 Plant 1
5 BAG NEWCEM

SAND 13170 (1.50/ 0.50) (6.70) SRDCOPLA 3170 (0.10/ 0.70)
67 B 29750 (1.00) NEW CEM 4220

WATER 162/1349 (0.00/ 0.00) TRIM -4.00
MAX WATER 317/029

AGG TARE 10 20 CMT TARE 20 20
TIME : 3:46:41 pm

TICKET 047716

Sep 10, 1993 Job No. 0 Mix No. 600 1.50 yds DLVD 0.00 Truck 49 Plant 1
6 BAG

SAND 1960 (1.50/ 0.50) (6.70) SRDCOPLA 880+ (0.10/ 0.70)
67 B 4810 (1.00)

WATER 18/ 150 (0.00/ 0.00) TRIM -9.99
MAX WATER 053/015

AGG TARE 20 10 CMT TARE 10 20
TIME : 3:48:48 pm

TICKET 047717

Sep 10, 1993 Job No. [illegible] Mix No. 5001 9.00 yds DLVD 0.00 Truck 2 Plant 1
5 BAG NEWCEM

TICKET 047718

Sep 10, 1993   Job No.   0   Mix No. 673   3.00 yds   DLVD   0.00   Truck 50 Plant 1

6.5 BAG AE F.G. CLASS A

SAND   3700 (1.50/ 0.50) (6.70)   SRDCOPLA 1840 (0.10/ 0.70)   Daravair 13

67 6   9340   (1.00)

WATER   30/ 250 (0.00/ 0.00)   TRIM -9.99

MAX WATER 095/029

AGG TARE 20 20 CMT TARE 20 20

TIME : 3:54:39 pm

TICKET 047719

Sep 10, 1993   Job No.   0   Mix No. 510   3.00 yds   DLVD   0.00   Truck 17 Plant 1

3000 PSI PLAIN

SAND   4300 (1.50/ 0.50) (6.70)   SRDCOPLA 1490 (0.10/ 0.70)   Polyheed 45

67 6   9920   (1.00)

WATER   31/ 258 (0.00/ 0.00)   TRIM -9.99

MAX WATER 101/029

AGG TARE 10 10 CMT TARE 20 20

TIME : 4:00:37 pm

TICKET 047720

Sep 10, 1993   Job No.   0   Mix No. 601   4.00 yds   DLVD   0.00   Truck 96 Plant 1

6 BAG AE

SAND   5610* (1.50/ 0.50) (6.70)   SRDCOPLA 2270* (0.10/ 0.70)   Daravair 14

67 6   12620   (1.00)

WATER   36/ 300 (0.00/ 0.00)   TRIM -9.99

MAX WATER 128/038

AGG TARE 20 10 CMT TARE 20 20

TIME : 4:03:48 pm

TICKET 047721

Sep 10, 1993   Job No.   0   Mix No. 601   2.00 yds   DLVD   0.00   Truck 56 Plant 1

6 BAG AE

[illegible] 2250 [illegible] (1.00)

WATER 18/ 150 < 0.00/ 0.00)   TRIM -9.99
MAX WATER 064/019

AGG TARE 10 10 CMT TARE 20 20
TIME : 4:06:30 pm

TICKET 047722

Sep 10, 1993   Job No.   0   Mix No. 701   9.00 yds   DLVD   0.00   Truck 69 Plant 1
7 BAG AE

SAND 10490 < 1.50/ 0.50) (6.70)   GRDCOPLA 5900 < 0.10/ 0.70)   Daravair 32
67 6 27130 (1.00)

WATER 153/1274 < 0.00/ 0.00)   TRIM -5.00
MAX WATER 297/040

AGG TARE 0 30 CMT TARE 20 20
TIME : 4:09:16 pm

TICKET 047723

Sep 10, 1993   Job No.   0   Mix No. 115   8.00 yds   DLVD   0.00   Truck 69 Plant 1
#67 GRAVEL

67 6 24160 < 1.50/ 0.50) (1.00)

WATER 0/ 0 < 0.00/ 0.00)   TRIM -9.99
MAX WATER 000/-29

AGG TARE [illegible] 0 CMT TARE 20 20
TIME : 4:33:30 pm

TICKET 047724

Sep [illegible] 1993   Job No.   0   Mix No. 601   2.25 yds   DLVD   0.00   Truck 107 Plant 1
6 BAG AE

SAND [illegible] [illegible] 1.50/ 0.50) (6.70)   GRDCOPLA 1260 < 0.10/ 0.70)   Daravair 6
67 6 [illegible] (1.00)

WATER 20/ 167 < 0.00/ 0.00)   TRIM -9.99
MAX WATER 072/022

AGG TARE -10 10 CMT TARE 10 20
TIME : [illegible] pm

TICKET 047725

Sep 10, 1993 Job No. 0 Mix No. 5001 3.00 yds DLVD 0.00 Truck 70 Plant 1

5 BAG NEWCEM

SAND 4450* (1.50/ 0.50) (6.70) SROCOPLA 1060 (0.10/ 0.70)

67 G 10100 (1.00) NEW CEM 1410

WATER 35/ 292 (0.00/ 0.00) TRIM -9.99

MAX WATER 106/028

AGG TARE 0 10 CMT TARE 20 20

TIME : 3:05:26 pm

TICKET 047726

Sep 10, 1993 Job No. 0 Mix No. 5001 5.00 yds DLVD 0.00 Truck 65 Plant 1

5 BAG NEWCEM

SAND 7260 (1.50/ 0.50) (6.70) SROCOPLA 1800* (0.10/ 0.70)

67 G 16570 (1.00) NEW CEM 2380*

WATER 59/ 491 (0.00/ 0.00) TRIM -9.99

MAX WATER 176/047

AGG TARE 10 10 CMT TARE 10 20

TIME : 3:28:17 pm

MATERIAL USAGE REPORT DATE : 9/10/93

MATERIAL NAME	BEGINNING BALANCE 09/09/93	RECEIVED TO DATE	SHIPPED TO DATE	BALANCE ON HAND	USAGE SINCE ACTUAL USAGE	09/09/93 TARGET USAGE	USAGE SINCE ACTUAL USAGE	09/09/93 TARGET USAGE
SAND	0	0	795890	-795890	795890	794302	795890	794302
SAND	0	0	209900	-209900	209900	210202	209900	210202
# 67 G	0	0	1085820	-1085820	1085820	1089551	1085820	1089551
FEA GRA	0	0	37270	-37270	37270	37882	37270	37882
BLUE STD	0	0	49040	-49040	49040	49267	49040	49267
S.M.A.#6	0	0	128970	-128970	128970	129306	128970	129306
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
NEW CEM	71820	51900	34790	88930	34790	35341	34790	35341
SROCOPLA	265460	304820	338960	231320	338960	339154	338960	339154
LEHIGH	103190	51300	11890	142600	11890	11915	11890	11915
	0	0	0	0	0	0	0	0
MicroAir	55680	0	0	55680	0	0	0	0
322-N	54197	0	0	54197	0	0	0	0
Polyheed	124757	0	5369	119388	5369	5362	5369	5362
122R/Poz	50333	0	375	49958	375	371	375	371
122-H.E.	87132	0	0	87132	0	0	0	0
Rheo-Sul	50688	0	0	50688	0	0	0	0
Daravair	44202	0	1836	42366	1836	1831	1836	1831
WATER	0	0	11463	-11463	11463	11559	11463	11559

APPENDIX F.0
EQUATIONS AND CALCULATIONS

APPENDIX F.1
EPA METHOD 201A CALCULATIONS

CALCULATIONS FOR EPA METHOD 201A

Determination of cyclone flow rate and orifice pressure head:

Molecular weight of stack gas, dry basis, M_d:

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

where M_d = lb/lbmol.

Molecular weight of stack gas, wet basis, M_w:

$$M_w = M_d(1 - B_{ws}) + 18(B_{ws})$$

where B_{ws} = moisture fraction of the stack gas;
M_w = lb/lbmol.

Absolute stack pressure, P_s:

$$P_s = P_{bar} + \frac{P_g}{13.6}$$

where P_{bar} = barometric pressure ("Hg);
P_g = stack static pressure ("H_2O);
P_s = "Hg.

Viscosity of stack gas, μ_s:

$$\mu_s = 152.418 + 0.2552 t_s + 3.2355 x 10^{-5} t_s^2 + 0.53147(\%O_2) - 74.143 B_{ws}$$

where t_s = average stack temperature (°F);
μ_s = micropoise.

Cyclone flow rate, Q_s:

$$Q_s = 0.002837 \mu_s \left[\frac{(t_s + 460)}{M_w P_s}\right]^{0.2949}$$

where Q_s = ft^3/min.

Orifice pressure head, ΔH, needed for cyclone flow rate:

$$\Delta H = \left[\frac{Q_s(1-B_{ws})P_s}{t_s+460}\right]^2 \frac{(t_m+460)M_d 1.083\,\Delta H_@}{P_{bar}}$$

where t_m = meter temperature (°F);
ΔH = "H_2O.

Equations for Nozzle Selection:

Nozzle velocity, v_n:

$$v_n = \frac{3.056\,Q_s}{D_n^2}$$

where D_n = nozzle diameter (in.);
v_n = ft/sec.

Minimum and maximum velocities, v_{min} and v_{max}, in ft/sec:

Calculate R_{min}:

$$R_{min} = 0.2457 + \sqrt{0.3072 - \frac{0.2603\sqrt{Q_s}\,\mu_s}{v_n^{1.5}}}$$

If R_{min} is less than 0.5 or imaginary then:

$$v_{min} = 0.5\,v_n$$

Otherwise use:

$$v_{min} = v_n R_{min}$$

Calculate R_{max}:

$$R_{max} = 0.4457 + \sqrt{0.5690 + \frac{0.2603\sqrt{Q_s}\mu_s}{v_n^{1.5}}}$$

If R_{max} is greater than 1.5 then:

$$v_{max} = 1.5 v_n$$

Otherwise use:

$$v_{max} = v_n R_{max}$$

Minimum and maximum velocity head values, Δp_{min} and Δp_{max}:

$$\Delta p_{min} = 1.3686x10^{-4} \frac{P_s M_w v_{min}^2}{(t_s + 460)\, C_p^2}$$

$$\Delta p_{max} = 1.3686x10^{-4} \frac{P_s M_w v_{max}^2}{(t_s + 460)\, C_p^2}$$

where C_p = pitot coefficient
Δp_{min} and Δp_{max} = "H_2O.

Dwell time:

Dwell time at first traverse point, t_1:

$$t_1 = \frac{\theta}{N}\sqrt{\frac{\Delta p_1'}{\Delta p_{avg}'}}$$

where θ = total run time (min);
N = total number of traverse points;
$\Delta p'_1$ = velocity head at the first traverse point (from a previous traverse) ("H_2O);
$\Delta p'_{avg}$ = the square of the average square root of the Δp's (from a previous traverse) ("H_2O);
t_1 = min.

CALCULATIONS FOR EPA METHOD 201A (continued)

Dwell time at subsequent traverse points, t_n:

$$t_n = \frac{t_1}{\sqrt{\Delta p_1}}\sqrt{\Delta p_n} \quad ,n=2,3,\ldots N$$

Δp_n = measured velocity head at point n ("H_2O);
Δp_1 = measured velocity heat at point 1 ("H_2O);
t_n = min.

Determination of D_{50}:

Stack gas viscosity, μ_{cyc}:

$$\mu_{cyc} = C_1 + C_2 T_s + C_3 T_s^2 + C_4 f_{O_2} - C_5 B_{ws}$$

where C_1 = 51.05 micropoise;
C_2 = 0.207 micropoise/R;
C_3 = 3.24×10^{-5} micropoise/R_2;
C_4 = 53.147 micropoise/fraction O_2;
C_5 = 74.143 micropoise/fraction H_2O;
T_s = average absolute stack gas temperature (R);
f_{02} = stack gas O_2 volume fraction, dry basis;
B_{ws} = stack gas moisture volume fraction;
μ_{cyc} = micropoise.

Total cyclone flow rate at standard conditions, $Q_{s(std)}$:

$$Q_{s(std)} = \frac{V_{m(std)}}{\theta}$$

where $V_{m(std)}$ = volume of gas measured by DGM corrected to standard conditions (dscf);
θ = total sampling time (min);
$Q_{s(std)}$ = dscf/min.

PM_{10} flow rate, at actual cyclone conditions, Q_s:

$$Q_s = \frac{T_s}{K_1 P_s}\left[Q_{s(std)} + \frac{V_{w(std)}}{\theta}\right]$$

CALCULATIONS FOR EPA METHOD 201A (continued)

where K_1 = 17.64 R/"Hg;
$V_{w(std)}$ = volume of water vapor in gas sample at standard conditions (scf);
Q_s = ft_3/min.

Diameter of particles having a 50% probability of penetration, D_{50}:

$$D_{50} = \beta_1 \left[\frac{T_s}{M_w P_s}\right]^{0.2091} \left[\frac{\mu_{cyc}}{Q_s}\right]^{0.7091}$$

where β_1 = 0.15625
D_{50} = μm.

APPENDIX F.2
EPA MULTI-METALS CALCULATIONS

METALS CALCULATIONS

1. Total sample weight - W_i (micrograms)

$$W_i = [m_{filter} - mb_{filter}]$$

where m_{filter} = total sample weight collected in the filters (micrograms)

mb_{filter} = filter blank correction (micrograms)

2. Gas Concentration - Cm_i (mg/dscm)

$$Cm_i = \frac{W_i \times 35.3145}{1000 x V_{m(std)}}$$

where W_i = total sample weight of (i) (micrograms)

Vm(std) = the volume of gas sampled at STP (dscf)

35.3145 = cubic feet per cubic meter

1000 = micrograms per mg

3. The mass flow rate of substance (i), G_i (lb/hr), is:

$$G_i = \frac{W_i \times Q_{sd} \times 60}{V_{m(std)} \times 10^6 \times 453.593}$$

where W_i = total sample weight of (i) (micrograms)

Vm(std) = the volume of gas sampled at STP (dscf)

Q_{sd} = stack gas flow rate (dscfm)

60 = min/hr

10^6 = micrograms per gram

453.593 = grams/lb

APPENDIX G
METERBOX CALIBRATION SHEETS

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BXG - #1

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vocolla Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	301	0.33
		400	400	0
		500	500	0
		600	601	0.17
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.09

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BX6 - #2

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vocello Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	300	0
		400	400	0
		500	500	0
		600	601	0.17
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.06

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BY6- #3

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vocollio Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	301	0.33
		400	400	0
		500	500	0
		600	601	0.17
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.09

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BXG - #4

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vercellio Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	200	0
		300	301	0.33
		400	400	0
		500	500	0
		600	600	0
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.03

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BX6- # 5

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vecellio Reference: Mercury-in-glass: HH71-CAL-K

Other: ________

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	200	0
		300	301	0.33
		400	400	0
		500	500	0
		600	600	0
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.03

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BX6-#6

Ambient Temperature: 76 °F Barometric pressure: 28.70 "Hg

Calibrator: D. Vecellio Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	200	0
		300	301	0.33
		400	400	0
		500	500	0
		600	600	0
		700	700	0
		800	800	0
		900	900	0
			Average % difference	0.03

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 28 October 1992 Thermocouple No.: BX6 - #7

Ambient Temperature: 76 °F Barometric pressure: 28.76 "Hg

Calibrator: D. Vecellio Reference: Mercury-in-glass: HH01-CAL-K

Other: ____________

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	200	0
		300	301	0.33
		400	400	0
		500	500	0
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	0.03

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

E T S , I N C .

METER CONSOLE CALIBRATION FORM

Contract No. 92-65515 Print Date 09/14/93
Job I.D.

Meter Box No.: 8
Delta H: 1.8438
Gamma: 1.0077

Analyst: WCH
Calibration Date: 09/14/93
Test Meter No. 9548
Barometric Pressure 28.99

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	214.567	224.957	10.390	71.0	71.0	71.00	554.511	564.940	10.429	71.0	71.0	73.0	77.0	73.00	26.0	1.81117	0.99875
2	1.0	225.139	235.475	10.336	70.0	70.0	70.00	565.118	575.508	10.390	77.0	73.0	75.0	82.0	76.75	18.5	1.83328	1.00492
3	1.5	235.596	246.828	11.232	70.0	70.0	70.00	575.629	586.901	11.272	81.0	75.0	76.0	84.0	79.00	16.5	1.84467	1.00953
4	2.0	247.007	259.864	12.857	70.0	70.0	70.00	587.080	600.024	12.944	83.0	76.0	78.0	87.0	81.00	16.5	1.87018	1.00878
5	2.5	260.089	274.522	14.433	70.0	70.0	70.00	600.258	614.771	14.513	85.0	78.0	79.0	89.0	82.75	16.5	1.84909	1.01199
6	3.0	274.742	285.257	10.515	70.0	70.0	70.00	615.010	625.588	10.578	88.0	79.0	79.0	89.0	83.75	11.0	1.85461	1.01213

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 29 October 1992 Thermocouple No.: BX8 - #4

Ambient Temperature: 76 °F Barometric pressure: 28.81 "Hg

Calibrator: D Vecellio Reference: Mercury-in-glass: HHT-CAL-K

Other: ____

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	302	0.67
		400	401	0.25
		500	502	0.40
		600	604	0.67
		700	704	0.57
		800	805	0.63
		900	905	0.56
			Average % difference	0.39

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 29 October 1992 Thermocouple No.: BX8 - #5

Ambient Temperature: 76 °F Barometric pressure: 28.81 "Hg

Calibrator: D. Vecellio Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	101	1.00
		200	201	0.50
		300	302	0.67
		400	401	0.25
		500	501	0.20
		600	604	0.67
		700	704	0.57
		800	804	0.50
		900	905	0.56
	—		Average % difference	0.45

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 29 October 1992 Thermocouple No.: BX8 - #6

Ambient Temperature: 76 °F Barometric pressure: 28.81 "Hg

Calibrator: D. Vercellino Reference: Mercury-in-glass: AH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	303	1.00
		400	402	0.50
		500	502	0.40
		600	604	0.67
		700	705	0.71
		800	805	0.63
		900	906	0.67
			Average % difference	0.46

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 29 October 1992 Thermocouple No.: BX8 - #7

Ambient Temperature: 76 °F Barometric pressure: 28.81 "Hg

Calibrator: D. Vocellio Reference: Mercury-in-glass: HH71-CAL-K

Other: ______

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	303	1.00
		400	402	0.50
		500	501	0.20
		600	604	0.67
		700	704	0.57
		800	804	0.50
		900	905	0.56
			Average % difference	0.41

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
 2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

E T S , I N C .

METER CONSOLE CALIBRATION FORM

Contract No. 93-972

Print Date 09/29/93

Job I.D.

Meter Box No.: 6
Delta H: 1.7440
Gamma: 0.9801

Analyst: wch
Calibration Date: 09/29/93
Test Meter No. 9548
Barometric Pressure 29.01

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	526.027	536.208	10.181	74.0	76.0	75.00	769.677	780.108	10.431	75.0	73.0	82.0	77.0	76.75	24.5	1.68721	0.97799
2	1.0	536.573	550.094	13.521	76.0	77.0	76.50	780.478	794.360	13.882	82.0	77.0	87.0	80.0	81.50	23.0	1.68070	0.98059
3	1.5	550.665	560.558	9.893	76.0	78.0	77.00	794.947	805.110	10.163	86.0	80.0	82.0	88.0	84.00	14.0	1.74001	0.98239
4	2.0	562.436	576.191	13.755	77.0	79.0	78.00	807.040	821.135	14.095	79.0	78.0	81.0	88.0	81.50	17.0	1.78437	0.97727
5	2.5	576.522	587.770	11.248	79.0	79.0	79.00	821.473	832.990	11.517	87.0	81.0	82.0	90.0	85.00	12.5	1.79846	0.98130
6	3.0	588.060	600.461	12.401	79.0	80.0	79.50	833.294	846.005	12.711	88.0	82.0	84.0	93.0	86.75	12.5	1.77310	0.98126

E T S , I N C .

METER CONSOLE CALIBRATION FORM

Contract No. 93-945 Print Date 09/03/93

Job I.D.

Meter Box No.: 6
Delta H: 1.7019
Gamma: 0.9871

Analyst: wch
Calibration Date: 09/03/93
Test Meter No. 9548
Barometric Pressure 28.91

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	973.577	986.161	12.584	71.0	74.0	72.50	224.520	237.354	12.834	73.0	72.0	75.0	78.0	74.50	30.0	1.65302	0.98295
2	1.0	986.445	997.572	11.127	74.0	74.0	74.00	237.643	249.011	11.368	78.0	75.0	77.0	83.0	78.25	19.0	1.69379	0.98409
3	1.5	997.733	1007.61	9.881	74.0	74.0	74.00	249.183	259.294	10.111	82.0	77.0	79.0	86.0	81.00	14.0	1.74037	0.98630
4	2.0	1007.82	1018.45	10.629	74.0	74.0	74.00	259.494	270.376	10.882	84.0	79.0	79.0	87.0	82.25	13.0	1.72515	0.98682
5	2.5	1018.60	1030.57	11.971	74.0	74.0	74.00	270.536	282.769	12.233	86.0	79.0	81.0	89.0	83.75	13.0	1.69535	0.99015
6	3.0	1030.75	1040.81	10.059	74.0	75.0	74.50	282.963	293.228	10.265	88.0	81.0	82.0	90.0	85.25	10.0	1.70342	0.99207

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-30-93 Thermocouple No.: #1 Box 7

Ambient Temperature: ______ °F Barometric pressure: ______ "Hg

Calibrator: C K Ferguson Reference: Mercury-in-glass: ______

Other: HH71-[illegible]

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	30	6.25
		100	98	2.0
		200	200	0
		300	300	0
		400	401	-0.25
		500	501	-0.2
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.709

a Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

b Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

CTS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-30-93 Thermocouple No.: #3 Box 9

Ambient Temperature: ________ °F Barometric pressure: ________ "Hg

Calibrator: C Ferguson Reference: Mercury-in-glass: ________

Other: HH71-CAL-K

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	30	6.25
		100	98	2.0
		200	199	.5
		300	300	0
		400	399	.25
		500	499	.2
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.836

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-30-93 Thermocouple No.: #2 Box 9

Ambient Temperature: ______ °F Barometric pressure: ______ "Hg

Calibrator: C Ferguson Reference: Mercury-in-glass: ______

Other: HH71-Cal-K

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	30	6.25
		100	98	2.0
		200	199	.5
		300	300	0
		400	399	.25
		500	498	.4
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.855

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-31-93 Thermocouple No.: ES Rxg

Ambient Temperature: ______ °F Barometric pressure: ______ "Hg

Calibrator: C Ferguson Reference: Mercury-in-glass: ______

Other: HF7-61-5

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	30	6.25
		100	98	2
		200	199	.5
		300	300	.0
		400	399	.25
		500	499	.2
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.836

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-31-93 Thermocouple No.: #4 [illegible]

Ambient Temperature: ______ °F Barometric pressure: ______ "Hg

Calibrator: C. [illegible] Reference: Mercury-in-glass: ______

Other: H-71-Cal-K

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	30	6.25
		100	98	2
		200	199	.5
		300	300	0
		400	400	0
		500	499	.2
		600	601	-.167
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.798

a Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath

2) Furnace

b Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-31-87 Thermocouple No.: #7 Box 9

Ambient Temperature: ______ °F Barometric pressure: ______ "Hg

Calibrator: C. Ferguson Reference: Mercury-in-glass: ______

Other: [illegible]

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	31	3.125
		100	99	1
		200	200	0
		300	300	0
		400	399	.25
		500	499	.2
		600	600	0
		701	701	0
		800	800	0
		901	901	0
	--		Average % difference	.416

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

ITS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 03-31-93 Thermocouple No.: #6 - Box 9

Ambient Temperature: ________ °F Barometric pressure: ________ "Hg

Calibrator: C Ferguson Reference: Mercury-in-glass: ________

Other: H H71-CAL-K

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		32	31	3.125
		100	98	2.0
		200	200	0
		300	300	0
		400	399	.25
		500	499	.2
		600	600	0
		700	700	0
		800	800	0
		900	900	0
	—		Average % difference	.507

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath
2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

E T S , I N C .

METER CONSOLE CALIBRATION FORM

Contract No. 92-811 Print Date 08/30/93
Job I.D.

Meter Box No.: 8
Delta H: 1.8580
Gamma: 1.0081

Analyst: CF Chris Ferguson
Calibration Date: 08/30/93
Test Meter No. 9548
Barometric Pressure 28.90

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	813.945	824.096	10.151	72.0	74.0	73.00	435.946	446.139	10.193	74.0	72.0	79.0	75.0	75.00	25.5	1.83779	0.99835
2	1.0	824.442	836.430	11.988	73.0	73.0	73.00	446.490	458.496	12.006	78.0	75.0	82.0	77.0	78.00	21.5	1.86302	1.00531
3	1.5	836.601	846.820	10.219	73.0	72.0	72.50	458.669	468.908	10.239	80.0	77.0	86.0	78.0	80.25	15.0	1.86064	1.00872
4	2.0	847.333	857.595	10.262	72.0	72.0	72.00	469.426	479.718	10.292	83.0	78.0	88.0	79.0	82.00	13.0	1.83839	1.01068
5	2.5	857.951	873.669	15.718	72.0	72.0	72.00	480.063	495.822	15.759	85.0	79.0	90.0	80.0	83.50	18.0	1.87273	1.01252
6	3.0	873.987	885.441	11.454	72.0	72.0	72.00	496.148	507.643	11.495	87.0	80.0	92.0	81.0	85.00	12.0	1.87567	1.01305

ETS, INC.

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 29 October 1992 Thermocouple No.: BX8 - #3

Ambient Temperature: 76 °F Barometric pressure: 28.81 "Hg

Calibrator: D. Vorelltor Reference: Mercury-in-glass: HH71-CAL-K

Other: ____________

Reference point No.[a]	Source* (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference,[b] %
		0	0	0
		30	30	0
		100	100	0
		200	201	0.50
		300	302	0.67
		400	401	0.25
		500	501	0.20
		600	604	0.67
		700	700	0
		800	804	0.50
		900	905	0.56
			Average % difference	0.30

[a] Every 100°F for each reference point when using furnace up to 500°F.

* Source: 1) Ice bath

2) Furnace

[b] Percent difference ≤ 1.5%

$$\frac{\text{Ref. temp. °F - thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

E T S , I N C .

METER CONSOLE CALIBRATION FORM

Contract No. 93-959T

Print Date 08/25/93

Job I.D.

Meter Box No.: 9
Delta H: 1.8576
Gamma: 0.9936

Analyst: wch
Calibration Date: 08/25/93
Test Meter No. 9548
Barometric Pressure 29.01

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	496.584	506.925	10.341	77.0	75.0	76.00	762.634	773.101	10.467	79.0	77.0	78.0	82.0	79.00	26.0	1.84096	0.99223
2	1.0	507.246	517.322	10.076	75.0	74.0	74.50	773.427	783.651	10.224	81.0	78.0	78.0	83.0	80.00	18.0	1.84494	0.99315
3	1.5	517.457	528.770	11.313	74.0	74.0	74.00	783.793	795.267	11.474	83.0	78.0	78.0	85.0	81.00	16.5	1.83781	0.99511
4	2.0	528.891	539.079	10.188	74.0	74.0	74.00	795.392	805.749	10.357	84.0	78.0	80.0	87.0	82.25	13.0	1.87126	0.99384
5	2.5	539.281	550.683	11.402	74.0	74.0	74.00	805.928	817.420	11.492	76.0	76.0	76.0	83.0	77.75	13.0	1.88312	0.99284
6	3.0	550.850	562.412	11.562	73.0	74.0	73.50	817.608	829.251	11.643	76.0	75.0	77.0	85.0	78.25	12.0	1.86730	0.99432

ETS, INC.

METER CONSOLE CALIBRATION FORM

Contract No. 93-977 Print Date 09/28/93
Job I.D.

Meter Box No.: 9
Delta H: 1.8955
Gamma: 1.0004

Analyst: wch
Calibration Date: 09/28/93
Test Meter No. 9548
Barometric Pressure 28.87

Run	Orf Set	Initial Test	Final Test	Volume Test	Init Temp	Finl Temp	Test Temp	Initial Box	Final Box	Volume Box	I-I Temp	I-O Temp	F-I Temp	F-O Temp	Temp	Time	Delta H	Gamma
1	0.5	370.187	380.423	10.236	71.0	72.0	71.50	715.359	725.656	10.297	72.0	71.0	74.0	78.0	73.75	26.0	1.87472	0.99701
2	1.0	380.689	392.556	11.867	72.0	72.0	72.00	725.929	737.910	11.981	78.0	74.0	77.0	83.0	78.00	21.5	1.89604	0.99911
3	1.5	392.730	403.087	10.357	72.0	72.0	72.00	738.106	748.589	10.483	82.0	77.0	85.0	78.0	80.50	15.5	1.93164	0.99995
4	2.0	403.373	413.490	10.117	72.0	72.0	72.00	748.881	759.033	10.152	84.0	78.0	85.0	78.0	81.25	13.0	1.89606	1.00874
5	2.5	417.460	428.833	11.373	72.0	73.0	72.50	763.125	774.544	11.419	75.0	74.0	83.0	76.0	77.00	13.0	1.89389	0.99803
6	3.0	429.343	446.605	17.262	73.0	73.0	73.00	775.057	792.453	17.396	83.0	76.0	78.0	87.0	81.00	18.0	1.88085	0.99955