Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

Commonwealth of Pennsylvania
Environmental Resources
January 9, 1992

Subject: Source Test Review

To: Data File
HRI, Inc.
The General Crushed Stone Company
Lake Ariel (Lake Township), Wayne County

From: William Schneider
Air Pollution Control Engineer
Division of Technical Services and Monitoring
Bureau of Air Quality Control

Through: Chief, Source Testing and Monitoring Section

The General Crushed Stone Company in Lake Ariel operates an asphalt batch plant. Emissions are controlled by a baghouse. Spotts, Stevens and McCoy, Inc. conducted PA DER modified Method 5 particulate testing and Method 9 opacity testing on August 14-15, 1991 in the baghouse exhaust stack. A pretest protocol was approved by the Department. All tests are acceptable to the Department.

The following results were extracted from the test report:

Run No.	Gr./DSCF	Lbs./Hr.[1]	Opacity	Dryer Feed Rate (TPH)[2]
HRI-1	0.010	1.94	0	279
HRI-2	0.010	1.81	0	
HRI-3	0.008	1.37	0	258
Allowable	0.04		20	

1 As corrected by me. The reported results used a stack diameter of 72 inches in computing the area instead of 48 inches.

2 Rated Capacity = 360 TPH. The operating levels were reduced in this test because the rated capacity was based on a feed moisture content of 5%. The actual feed moisture content was 9% to 11% which reduced the capacity of production.

cc: File #64-303-006
Babu Patel, Northeast Regional Office
Krishnan Ramamurthy, A&C
EPA/RSL
Reading File - Source Testing

WSegtf

DEPARTMENT OF ENVIRONMENTAL RESOURCES

BUREAU OF AIR QUALITY CONTROL

OBSERVER'S CHECKLIST

SOURCE TESTING

PROCESS INFORMATION

Co.: BRI, Inc.

Observer: Michael Safko

Source Tested: Asphalt Plant

Co. Contact: Jim Bogen

Tested by: Spotts, Stevens & McCoy

Pretest Procedure Submitted? yes

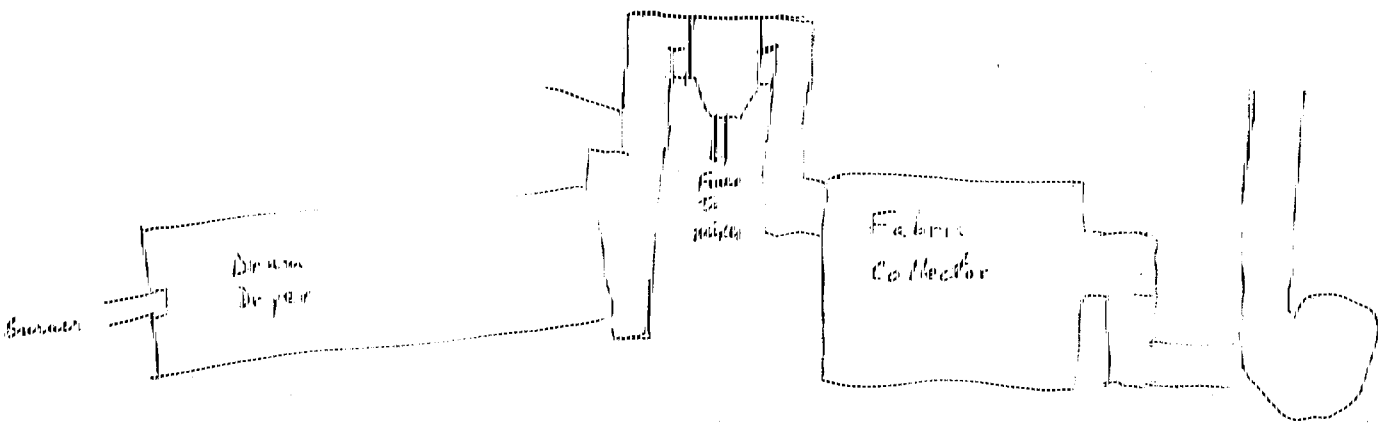
Process Flow (sketch both material and gas flows)

Location: Lake Township Angus County

Date of Test: 8-14-91

Pollutant Sampled: Particulate

Approved by DER? yes



Process rated operating parameters:

Process operating rate during test: The rated capacity of the plant (360 TPH) is based upon a moisture content of 5% in the feed material. Given the feed material was 6% and 8% during the test, the production rate was reduced.

Type of collection equipment: Rafeek Corp. equipment. The plant produces most of its product during the hot period of the day.

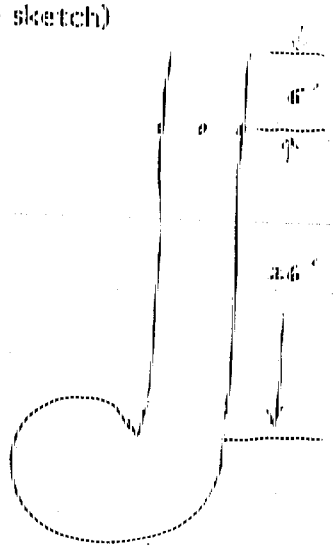
Type of process data recorded: Production Tonnage and moisture content of the feed material.

PORT LOCATION AND VELOCITY TRAVERSE

3.10 [illegible] 72 [illegible]
8-7

Dimensions of flue at sampling plane: 48"

Port location (make sketch)



26 feet downstream from [illegible]

6 feet upstream from [illegible]

4 ports

12 points per port

Points according to FEDERAL REGISTER "Method 1"?

(Note: no points within 1 in. of wall)

1.01, 3.22, 5.66, 8.50, 11.00, 17.01, 30.99, 34.00, 39.50, 42.34, 44.74, 46.99 (3 [illegible])

Verification of absence of cyclonic flow if expected? yes, no cyclonic flow

General condition of sampling equipment (Clean? Appears to be well maintained, etc.)

Type "S" pitot tube? yes

Manometer level? yes

Recent calibration of pitot tubes: yes, [illegible]

Pitot correction factors: .84

Probe markings accurate?

Probe tip and pitot oriented correctly? yes

GAS ANALYSIS (Molecular Weight Determination)

Method:

Single point grab ____

Integrated ____

ORSAT ____

Fyrite ____

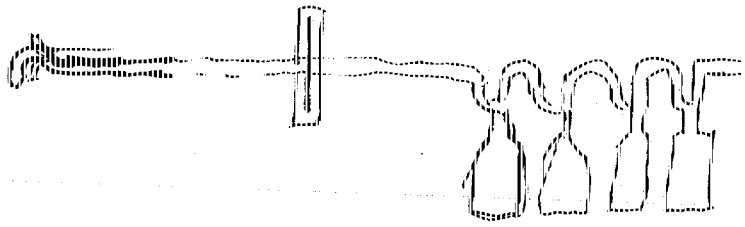
Flexible bag ____

Moisture content assumed: EPA IV ____ WB/DB ____ Pretest ____

Other ____

Sampling Train

Sampling time configuration (sketch)



Impinger contents 1st 150 ml DI (dilute HNO3) 2nd 150 ml DI 3rd Empty

4th 300 grams silica gel 5th

Standard EPA Method? EPA Method No.: Modifications _____

Initial leak check 0.02 cfm yes (optional)

Barometric Pressure _____ Measured on site 28.57 in Hg 28.79 in Hg other

Recent calibraton of dry gas meter: 8-7-97

Ice in impinger bath? yes

Nozzle size: 0.310

All points sampled 3 minutes

If all points not sampled, then points _____ sampled for _____ minutes each

Data readings recorded every 3 minutes

Check if recorded:

✓ Clock time

✓ Elapse time

✓ Point identification

✓ Velocity head

✓ Dry gas meter readings

✓ Meter inlet temperature

✓ Meter outlet temperature

✓ Filter box temperature

✓ Stack temperature

✓ Orifice reading

Probe temperature 250 °F

✓ Pump vacuum

✓ Impinger temperature 50 - 60°F

Probe temperature 250 °F

Filter box temperature 250 °F 266

Any unusual situations recorded: no

Appearance of effluent at atmospheric discharge points: clear 0% opacity

Modifications to standard procedures: no

Final readings recorded? _____

Total volume sampled: 63 ft³

Total sampling periods: 72 min 3 × 30 = 72

Final leak check 0.02 CFM @ 0.006 inches mercury (mandatory) ✓

All openings to sampling train plugged to prevent contamination? yes

Sample Recovery (if observed)

Clean-up area: Description end of synthetic exhaust stack, back of van - 2 cleans

Clean? ok

Probe Brushes:	Nylon Bristle? yes	Other _____	Clean? yes
Wash Bottles:	Glass? yes	Other _____	Clean? yes
Storage Containers	Glass? _____	Polyethylene? ✓	Clean? yes

Appearance of Glass Fiber Filter: clean

Any sample spilled: no

All sample exposed surfaces water rinsed: yes

All sample exposed surfaces acetone rinsed: yes

Additional rinses: _____

Sample jars tightly sealed and labeled? ____yes____

Blanks: Acetone _____ Distilled Water _____

Additional Comments:

ER-AQ-39 (5/73)

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Air Quality & Noise Control

File No. _____

VISIBLE EMISSIONS OBSERVATION RECORD

Description of Source: [illegible]

Observers Name: [illegible]

Owner of Source: [illegible]

Title: [illegible]

Location of Source: [illegible]

Date: [illegible]

PART OF MINUTES

MINUTES	0	1/4	1/2	3/4		0	1/4	1/2	3/4		0	1/4	1/2	3/4
00	0	0	0	0	20					40				
1					21					41				
2					22					42				
3					23					43				
4					24					44				
5					25					45				
6					26					46				
7					27					47				
8					28					AM 9:48	0	0	0	0
9					29					49	0	0	0	0
10					30					50	0	0	0	0
11					31					51	0	0	0	0
12					32					52	0	0	0	0
13					33					53	0	0	0	0
14					34					54	0	0	0	0
15					35					55	0	0	0	0
16					36					56	0	0	0	0
17					37					57	0	0	0	0
18					38					58	0	0	0	0
19					39					59	0	0	0	0

Hours:

From _____ to _____

OBSERVERS LOCATION

Street

Distance to Source 100

Wind Direction

Wind Velocity

Weather Conditions [illegible]

Plume Color [illegible]

SUMMARY

Opacity	No. of Readings	Total Time Minutes
<20%		
>20%		
>60%		

Other Comments:

GENERAL CRUSHED STONE

THE GENERAL CRUSHED STONE COMPANY
P O BOX 281, EASTON, PENNSYLVANIA 18044-0281
TEL: (215) 253-4271 FAX: (215) 253-5734

September 30, 1992

Mr. Babu Patel
Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Air Quality Control
667 North River Street
Wilkes Barre, PA 18705

RE: Compliance Emission Test
HRI, Inc.
Lake Ariel, PA
Asphalt Plant Exhaust
Lake Township
Wayne County

Dear Mr. Patel:

Enclosed please find two (2) copies of the Spotts, Stevens and McCoy, "Report of Particulate and Visible Emission Testing" for the facility mentioned above.

The report indicates that the average of the three (3) test runs was .009 Gr./DSCF with an opacity of 0 percent.

Should you have any questions, Mr. Patel, please call.

Thank you.

Very truly yours,

THE GENERAL CRUSHED STONE COMPANY

Vernon R. Snyder
Safety Director/Environmental Engineer

VRS/jlr
Enclosure
cc: FMoore
RHannan
JReeder
JBorgia

11/29

Berger

REPORT OF PARTICULATE AND VISIBLE EMISSION TESTING

HRI, INC.
THE GENERAL CRUSHED STONE COMPANY
LAKE ARIEL, PENNSYLVANIA

TESTING PERFORMED ON
ASPHALT BATCH PLANT
BAGHOUSE EXHAUST STACK

TESTS PERFORMED
AUGUST 14-15, 1991

AIR QUALITY
9101 -5 PM 3:02
PLANT SITE RESOURCE
UNIT 3 AIR POLLUTION
WILKES-BARRE REGION

SSM W.O. No. 1037-004

SCHUYLKILL STEVENS and McCOY, INC.
ENGINEERS • PLANNERS • SCIENTISTS

TABLE OF CONTENTS

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2.0	SUMMARY	1
3.0	SAMPLING AND ANALYTICAL PROCEDURES	1
4.0	DISCUSSION OF RESULTS	4

Tables and Figures

Table 2-1 Summary of Test Results - Baghouse Stack

Figure 3-1 Particulate Sample Train
Figure 3-2 Summary of Test Ports and Sample Points - Baghouse Stack
Figure 3-3 Asphalt Batch Plant - Schematic

APPENDICES

A Project Participants
B Production Data
C Analytical Results
D Field Data
E Computer Printout
F Calibration Data
G Sample Equations
H Standard Test Methods

REPORT OF PARTICULATE AND VISIBLE EMISSION TESTING

HRI, INC.
THE GENERAL CRUSHED STONE COMPANY
LAKE ARIEL, PA

TESTING PERFORMED ON
ASPHALT BATCH PLANT
BAGHOUSE EXHAUST STACK

TESTS PERFORMED
AUGUST 14-15, 1991

1.0 INTRODUCTION

Pursuant to a request from management, compliance particulate and visible emission tests were performed on the Asphalt Batch Plant's Baghouse Exhaust Stack.

A total of three tests were performed. All tests were performed at normal production rates.

2.0 SUMMARY

The emission test results are as follows:

Run No.	Location	Gr./DSCF (PADER)	Lbs./Hr. (PADER)	Gr./DSCF (Total)	Lbs./Hr. (Total)	Opacity %
HRI-1	Baghouse Exhaust	0.010	4.96	0.041	17.98	0
HRI-2	Baghouse Exhaust	0.010	4.08	0.094	36.38	0
HRI-3	Baghouse Exhaust	0.008	3.48	0.200	138.41	0
Average		0.009				0

The results of the average of the three test runs at the baghouse stack indicate the particulate matter was being exhausted at an average rate of 0.01 grains per dry standard cubic foot. Particulate matter being exhausted by Baghouse Exhaust is below the allowable of 0.04 grains per standard cubic foot.

The results of the average of the three test runs at the baghouse stack indicate the visible emissions were being exhausted at an average rate of 0 percent. This is below the allowable of 20 percent opacity.

TAB__ _-1

HRI
LAKE ARIEL, PA

ASPHALT BATCH PLANT

SUMMARY OF TEST RESULTS

DATE	8/14/91	8/14/91	8/15/91
LOCATION	BAGHOUSE STACK	BAGHOUSE STACK	BAGHOUSE STACK
START TIME	811	911	845
FLUE GAS CHARACTERISTICS			
Barometric Pressure, in. HG	28.57	28.79	28.68
Static Pressure, in. H2O	-0.33	-0.32	-0.35
Moisture, %	27.6	22.8	23.4
Temperature, °F	230	212	208
Velocity, FPM	3,241	2,739	2,843
DSCFM	48,578	45,372	46,794
ACFM	91,966	77,733	80,693
EMISSION RESULTS			
Particulate, Gr/DSCF	0.010	0.010	0.008
Particulate, Lbs/Hr	4.36	4.08	3.09
Average, Gr/dscf		0.010	
Allowable, Gr/DSCF		0.04	

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 The emission testing was performed by methods similar to those outlined in the Code of Federal Regulations, Title 40, Chapter 1, Subchapter C, Part 60, Appendix A, Method 5 - Determination of Particulate Emissions from Stationary Sources.

3.2 The sampling train used in this test is shown schematically in Figure 3-1 of the Appendix. The main components of the sampling train were:

3.2.1 Nozzle - stainless steel tip with sharp, tapered leading edge, 0.310 diameter tip.

3.2.2 Probe - sheathed stainless steel with heating system to keep the sample gases above the dew point.

3.2.3 Pitot Tube - S-type, attached to probe and inclined manometer, in order to monitor stack gas velocity at each traverse point.

3.2.4 Temperature Indicator - Thermocouple wire attached to probe and potentiometer to monitor stack temperature at each traverse point.

3.2.5 Filter Holder - Pyrex glass filter holder located in heated area. A Reeve Angel (934 AH) glass fiber filter was used.

3.2.6 Impingers - Four Greenburg-Smith impingers connected in series with glass ball joint fittings. The first, third and fourth impingers were modified by replacing the tip with a 1/2 inch I.D. glass tube extending to 1/2 inch from the bottom of the bottle. The first and second impingers each contained 150 ml of distilled water, and the third impinger was dry at the start of sampling. The fourth impinger contained 200 grams of preweighed silica gel to collect any remaining moisture in the gas stream before entering the vacuum pump.

3.2.7 Metering System - Vacuum gauge, leakless pump, flow adjust valves, thermometers capable of measuring temperatures to within 2°F., calibrated dry gas meter with 3% accuracy and calibrated orifice tube -- all necessary equipment needed to maintain isokinetic sampling rates and determine sample volume.

3.3 The sample location is described below.

3.3.1 Two sampling ports were located on 90° centers in the baghouse exhaust stack. Twenty-four (24) traverse points were sampled at the baghouse stack in order to obtain representative samples. Refer to Figure 3-2 for location of the traverse points.

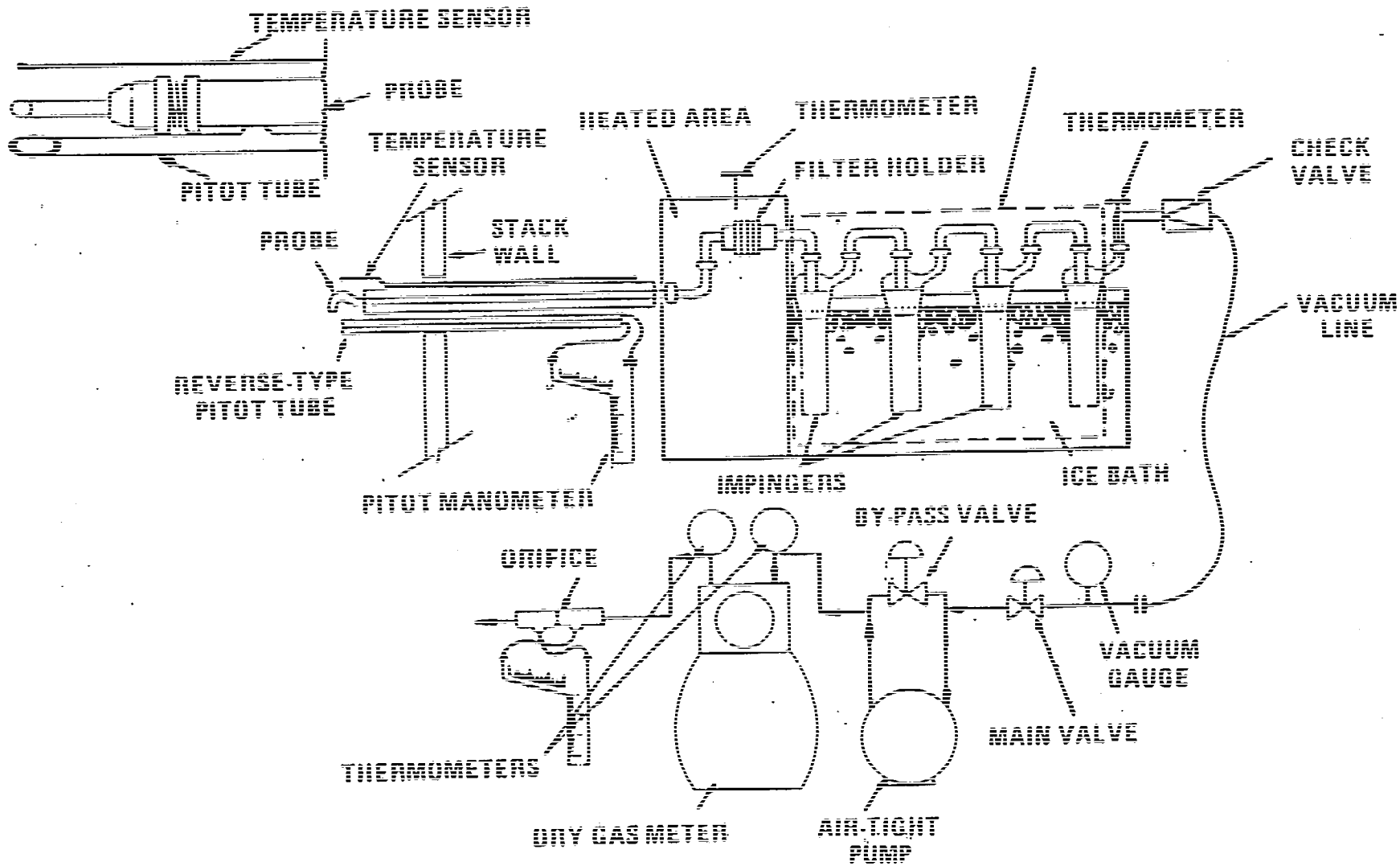
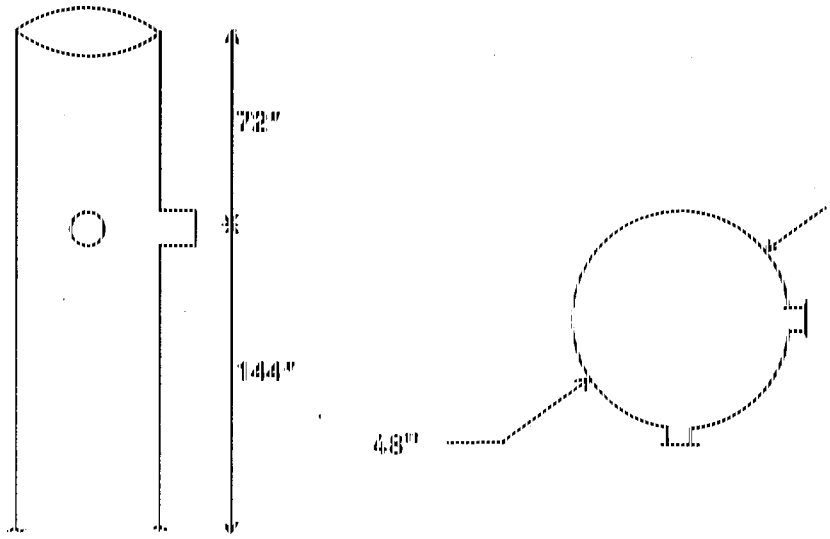


FIGURE 3-1

HRI, Inc.
The General Crushed Stone Company
Lake Ariel Facility
EPA Method 5 Sampling Train



SAMPLE POINT	DISTANCE FROM PORT, INCHES
1	1.01
2	3.22
3	5.66
4	8.50
5	12.00
6	17.09
7	30.91
8	36.00
9	39.50
10	42.34
11	44.78
12	46.99

FIGURE 3-2

HRI, Inc.
The General Crushed Stone Company
Lake Ariel Facility
Sample Port and Traverse Point Location
Scrubber Stack

3.4 Before testing, the complete sampling train was leak checked to 15 inches of mercury vacuum.

3.5 The required sampling time for the test, to maintain a 1 hour minimum test time and 50 DSCF sample volume, was 72 minutes for all three tests. The volume collected was in excess of the 50 DSCF required by PADER regulations.

3.6 After testing, the sample train was again leak tested. The leak test vacuum was above the highest vacuum recorded during the test.

3.7 After the leak check, the sampling train was cleaned up in the following manner:

3.7.1 The probe was removed from the sample train. It was then rinsed with DI water, brushed three times and again rinsed with DI water and placed into container number 1. Container number 2 was then used to collect the acetone wash of the probe.

3.7.2 The nozzle was also rinsed into container number 1 with DI water, brushed, and rinsed again with DI water. It was then rinsed with acetone into container number 2.

3.7.3 The filter holder was then removed from the sampling train and sealed. After the testing was completed for the day, the filter holder was cleaned up. The filter was removed and placed into its petri dish. The front half of the filter holder was rinsed with DI water, brushed and rinsed again with the DI water and put into container number 1. The front half of the filter holder was then rinsed into container number 2 with acetone. The back half of the filter holder was then rinsed with DI water into container number 3 -- the impinger water wash, and then with acetone into container number 4 -- the impinger acetone wash.

3.7.4 The final volumes of the first, second and third impinger were measured and placed into container number 3. The impingers and connecting glassware were then rinsed into container number 3 with DI water, then into container number 4 with acetone.

3.7.5 The silica gel in the fourth impinger was transferred into its container and reweighed.

3.8 The samples were analyzed individually, by the methods outlined below for determination of soluble and insoluble particulate matter in each sample:

3.8.1 Container number 1, containing the DI water washings of the nozzle, probe and front half of the filter holder, was desiccated to a constant weight.

3.8.2 Container number 2, containing the acetone wash of the nozzle, probe and front half of the filter holder, was desiccated to a constant weight.

3.8.3 The glass fiber filter was removed from its petri dish and desiccated to a constant weight.

3.8.4 The impinger water sample, container number 3, was filtered through a 0.22 micron filter. This filter was also dried down to a constant weight.

3.8.5 The soluble portion of container number 3 was dried down to a constant weight.

3.8.6 The acetone impinger wash, container number 4, was dried down to a constant weight.

3.9 The final PADER particulate weight consists of nozzle, probe and front half filter holder washes, the weight of the glass fiber filter and the 0.22 micron filtration of the impinger water.

3.10 The Spotts, Stevens and McCoy, Inc. Chemistry Laboratory performed all analytical work for this project.

4.0 DISCUSSION OF RESULTS

4.1 Sample Run HRI-1

A PADER weight of 44.5 mg of particulate was collected in the sampling train during the test. Based on a volumetric flow rate of 48,578 DSCFM at the stack, the particulate concentration was calculated to be 0.010 grains per dry standard cubic foot and 4.36 pounds per hour.

A total weight of 174.2 mg of particulate was collected in the sampling train during the test. Based on a volumetric flow rate of 48,578 DSCFM at the stack, the particulate concentration was calculated to be 0.041 grains per dry standard cubic foot and 17.08 pounds per hour.

The visible emissions were measured to be 0% opacity.

4.2 Sample Run HRI-2

A PADER weight of 39.9 mg of particulate was collected in the sampling train during the test. Based on a volumetric flow rate of 45,372 DSCFM at the stack, the particulate concentration was calculated to be 0.010 grains per dry standard cubic foot and 4.08 pounds per hour.

A total weight of 355.9 mg of particulate was collected in the sampling train during the test. Based on volumetric flow rate of 45,372 DSCFM at the stack, the particulate concentration was calculated to be 0.094 grains per dry standard cubic foot and 36.38 pounds per hour.

The visible emissions were measured to be 0% opacity.

4.3 Sample Run HRI-3

A PADER weight of 30.5 mg of particulate was collected in the sample train during the test. Based on a volumetric flow rate of 46,794 DSCFM at the stack, the particulate concentration was calculated to be 0.008 grains per dry standard cubic foot and 3.08 pounds per hour.

A total weight of 381.8 mg of particulate was collected in the sampling train during the test. Based on a volumetric flow rate of 46,794 DSCFM at the stack, the particulate concentration was calculated to be 0.200 grains per dry standard cubic foot and 138.41 pounds per hour.

The visible emissions were measured to be 0% opacity.

4.4 Sample Run Average

The average of the three sample runs at the Baghouse exhaust stack is 0.010 grains per dry standard cubic foot. This is below the allowable concentration of 0.04 grains per dry standard cubic foot.

The average of the three visible emission runs were measured to be 0% opacity. This is below the allowable of 20% opacity.

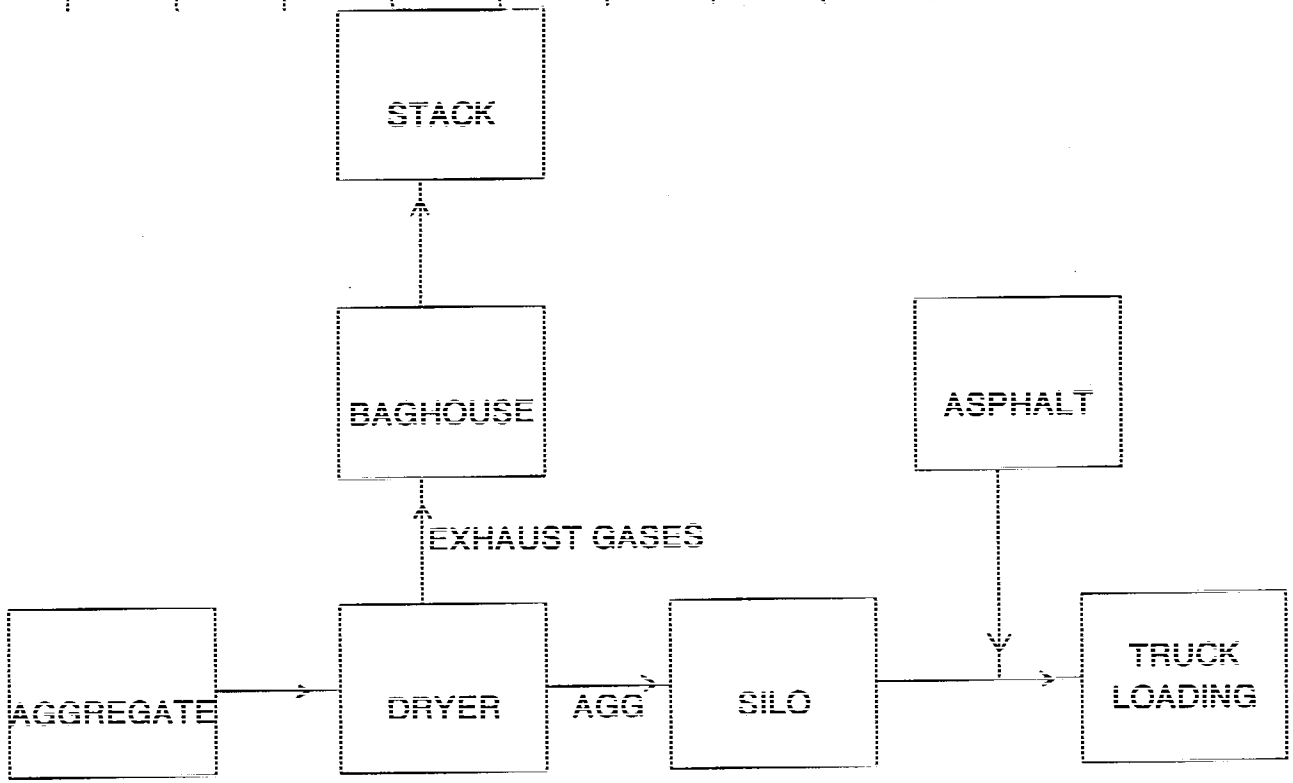


FIGURE 3-3

HRI, Inc.
The General Crushed Stone Company
Lake Ariel Facility
Asphalt Plant Schematic

APPENDICES

APPENDIX A

PROJECT PARTICIPANTS

APPENDIX A

PROJECT PARTICIPANTS

Field Sampling Participants:

David J. Hofmann	Project Manager
Jeff Jessell	Engineering Technician
Aric Althouse	Engineering Technician

Laboratory Participants:

Vaughan O'Neill	Chemist

APPENDIX B

PRODUCTION DATA

Time	Magnetic	AC Temp	Sam Temp	Mag Temp
12:43	3.3	310	335	375
1:49	3.3	305	320	340
1:15	3.6	305	320	360

Time	Magnetic	AC Temp	Sam Temp	Mag Temp
6:45	4.0	250	295	365
6:50	3.8	400	380	350
7:05	3.1	300	310	370
7:10	3.8	295	320	360
7:35	3.2	300	310	350
7:50	2.9	300	325	355

HRI-1

HRI-2

9:11	0.8	305	300	210
9:29	2.0	305	310	360
9:46	3.5	305	300	345
9:02	3.4	305	320	360
10:20	2.2	300	320	340
10:37	2.3	300	320	343
10:57	2.9	300	315	360

HRI-3

6:45	2.9	310	300	320
7:00	2.3	310	300	336
7:15	1.7	310	300	350
7:37	1.8	310	300	340
7:49	1.8	310	305	365

Product Loads - Line Report
REPORT DATE: 08/14/91

DATE: 08/15/91 TIME: 08:33 PLANT ID: 065 PAGE: 1

Pdt Id	Product Name	Price	Loads	Tons	Loads	Mk Tons
4119	BCDC 19	23.00	10	216.55	11	226.55
4130	BIN P	25.00	2	16.54	4	44.55
4131	BIN F	25.00	2	39.95	13	254.90
4140	TOP	29.00	2	15.02	110	2069.88
4146	FB2 TOP	0.00	0	0.00	55	1205.78
4147	F B2 BIN	0.00	0	0.00	37	813.67
4150	F TOP 50	30.00	0	0.00	2	22.00
		Report Total	16	288.06	232	4637.33

Total Transactions: 63 Material Charge: 0.00 Haul Charge: 0.00 Tax Charge: 0.00 Total Charge: 0.00

MATERIAL USAGE (ACTUAL MATERIAL BATCHED)

BIN NO	MATL	ASPHALT USAGE	PRODUCT TOTALS	
5 #4	31.18	38.11	TOP	443.18
#3	119.36		BINDER	28.01
#2	99.13		F. BINDER	107.96
#1	23.03			
AF	5.35			

* ADD 151.52 TONS (MATERIAL USED IN BINS)

[illegible] REPORT DATE: 08/14/91

DATE: 08/15/91 TIME: 08:33 PLANT ID: 065 PAGE: 1

Ticket	RC	TC	Time	Date	Cus Id	S.O. Id	S.O. Info	Item	Sub	Sh	Car	Trk Id	Pdt Id	Net Lb	Price	$ Total
1186	A	0	05:43	08/14/91	976089	097676		4200	01	62		2714	4140	14086	29.00	0.00
196187	A	0	06:08	08/14/91	976062	097588	SR 4032	4203	03	62	522	522	4140	42060	29.00	0.00
196188	A	0	06:13	08/14/91	976062	097588	SR 4032	4203	03	62	666	666A	4140	35140	29.00	0.00
1189	A	0	06:18	08/14/91	976062	097588	SR 4032	4203	03	62	467	467A	4140	41976	29.00	0.00
1190	A	0	06:24	08/14/91	976062	097588	SR 4032	4203	03	62	486	486	4140	44942	29.00	0.00
196191	A	0	06:30	08/14/91	976062	097588	SR 4032	4203	03	62	595	595	4140	43938	29.00	0.00
1192	A	0	06:39	08/14/91	976062	097588	SR 4032	4203	03	62	445	445	4140	44982	29.00	0.00
1193	A	0	06:43	08/14/91	976062	097588	SR 4032	4203	03	62	536	536	4140	43990	29.00	0.00
196194	A	0	06:52	08/14/91	976062	097588	SR 4032	4203	03	62	989	989	4140	44015	29.00	0.00
196195	A	0	06:58	08/14/91	976062	097588	SR 4032	4203	03	62	674	674	4140	43971	29.00	0.00
1196	A	0	07:06	08/14/91	976062	097588	SR 4032	4203	03	62	054	054	4140	43078	29.00	0.00
196197	A	0	07:12	08/14/91	052740	050242				62		VT3	4130	36015	25.00	0.00
196198	A	0	07:15	08/14/91	052740	050242				62		V1	4130	20007	25.00	0.00
1199	A	0	07:23	08/14/91	031760	050236				62		LR1	4140	6003	25.00	0.00
1200	A	0	07:31	08/14/91	013820	050058				62	999	2706	4131	43935	25.00	0.00
196201	A	0	07:39	08/14/91	013820	050092				62		B1	4131	44001	25.00	0.00
1202	A	0	07:44	08/14/91	013820	050092				62		B2	4131	43994	25.00	0.00
1203	A	0	07:50	08/14/91	013820	050058				62	999	2703	4131	44015	25.00	0.00
196204	A	0	07:56	08/14/91	039660	051002	PO 3633592			62		2322063	4140	16022	29.00	0.00
196205	A	0	08:32	08/14/91	976062	097588	SR 4032	4203	03	62	522	522	4140	42007	29.00	0.00
1206	A	0	08:38	08/14/91	976062	097588	SR 4032	4203	03	62	666	666A	4140	35020	29.00	0.00
196207	A	0	08:44	08/14/91	976062	097588	SR 4032	4203	03	62	467	467A	4140	41864	29.00	0.00
196208	A	0	09:17	08/14/91	976062	097588	SR 4032	4203	03	62	486	486	4140	44950	29.00	0.00
1209	A	0	09:23	08/14/91	976062	097588	SR 4032	4203	03	62	595	595	4140	44011	29.00	0.00
1210	A	0	09:25	08/14/91	031760	050236				62		LR1	4140	5978	29.00	0.00
196211	A	0	09:30	08/14/91	976062	097588	SR 4032	4203	03	62	445	445	4140	45013	29.00	0.00
196212	A	0	09:36	08/14/91	976062	097588	SR 4032	4203	03	62	536	536	4140	43965	29.00	0.00
1213	A	0	09:41	08/14/91	976062	097588	SR 4032	4203	03	62	989	989	4140	44039	29.00	0.00
196214	A	0	09:47	08/14/91	013820	050058				62	999	2706	4131	44011	25.00	0.00
196215	A	0	09:53	08/14/91	976062	097588	SR 4032	4203	03	62	674	674	4140	43970	29.00	0.00
1216	A	0	09:59	08/14/91	976062	097588	SR 4032	4203	03	62	054	054	4140	43026	29.00	0.00
1217	A	0	10:15	08/14/91	976062	097588	SR 4032	4203	03	62	522	522	4140	42032	29.00	0.00
196218	A	0	10:21	08/14/91	976062	097588	SR 4032	4203	03	62	666	666A	4140	35063	29.00	0.00
1219	A	0	10:26	08/14/91	013820	050092				62		B1	4131	39966	25.00	0.00
1220	A	0	10:30	08/14/91	031760	050236				62		LR1	4140	4006	29.00	0.00
196221	A	0	10:42	08/14/91	976062	097588	SR 4032	4203	03	62	467	467A	4140	42094	29.00	0.00
196222	A	0	10:50	08/14/91	040860	051000	08-358956			62		7532064	4140	16076	29.00	0.00
1223	A	0	11:00	08/14/91	976062	097588	SR 4032	4203	03	62	486	486	4140	44987	29.00	0.00
196224	A	0	11:06	08/14/91	013820	050092				62		B2	4131	41977	25.00	0.00
196225	A	0	11:11	08/14/91	976062	097588	SR 4032	4203	03	62	595	595	4140	43909	29.00	0.00
1226	A	0	11:15	08/14/91	052740	050242				62		VT3	4140	27968	29.00	0.00
1227	A	0	11:18	08/14/91	052740	050242				62		V1	4140	14036	29.00	0.00
196228	A	0	11:24	08/14/91	976062	097588	SR 4032	4203	03	62	445	445	4140	44891	29.00	0.00
1229	A	0	11:31	08/14/91	976062	097588	SR 4032	4203	03	62	536	536	4140	43993	29.00	0.00
1230	A	0	11:38	08/14/91	976062	097588	SR 4032	4203	03	62	989	989	4140	43955	29.00	0.00
196231	A	0	12:19	08/14/91	976089	097676		4200	01	62		2714	4140	13923	29.00	0.00
196232	A	0	12:32	08/14/91	022100	050212				62		E1	4131	12129	25.00	0.00
1233	A	0	12:45	08/14/91	976062	097588	SR 4032	4203	03	62	674	674	4140	44049	29.00	0.00
196234	A	0	12:51	08/14/91	976062	097588	SR 4032	4203	03	62	054	054	4140	42952	29.00	0.00
196235	A	0	12:53	08/14/91	031760	050236				62		LR1	4140	4040	29.00	0.00
1236	A	0	13:15	08/14/91	976062	097588	SR 4032	4203	03	62	522	522	4140	42187	29.00	0.00
1237	A	0	13:19	08/14/91	976062	097588	SR 4032	4203	03	62	666	666A	4140	35230	29.00	0.00
196238	A	0	13:24	08/14/91	976062	097588	SR 4032	4203	03	62	467	467A	4140	42025	29.00	0.00

Tickets Performance Report

REPORT DATE: 08/14/91

DATE: 08/15/91 TIME: 08:34 PLANT ID: 065 PAGE: 2

Ticket	RC	TC	Time	Date	Cus Id	S.O. Id	S.O. Info	Item	Sub	Un	Car	Trk Id	Pct Id	Net Lb	Price	$ Total
5239	A	0	13:29	08/14/91	9760062	097588	SR 4032	4203	03	62	486	486	4140	44946	29.00	0.00
196240	A	0	13:33	08/14/91	9760062	097588	SR 4032	4203	03	62	595	595	4140	44003	29.00	0.00
196241	A	0	13:41	08/14/91	9760062	097588	SR 4032	4203	03	62	445	445	4140	44955	29.00	0.00
5242	A	0	13:49	08/14/91	9760062	097588	SR 4032	4203	03	62	536	536	4140	44083	29.00	0.00
5243	A	0	13:51	08/14/91	013829	050092				62		B1	4150	10004	30.00	0.00
196244	A	0	14:03	08/14/91	035813	051009				62		W2	4119	20009	23.00	0.00
5245	A	0	14:08	08/14/91	9760062	097588	SR 4032	4203	03	62	989	989	4140	44022	29.00	0.00
5246	A	0	14:34	08/14/91	9760062	097588	SR 4032	4203	03	62	574	574	4140	44001	29.00	0.00
196247	A	0	14:40	08/14/91	9760062	097588	SR 4032	4203	03	62	054	054	4140	42983	29.00	0.00
5248	A	0	15:05	08/14/91	9760062	097588	SR 4032	4203	03	62	522	522	4140	42039	29.00	0.00

Report Total 2276606 # of Tickets: 63

0611 - 0742

Batched (actual = 318.07 tons) add 100 tons due to large storage capacity bins full when plant was down

318.07
100.00
418.07 tons

(279 TPH)

0645 - 0806

Batched (actual = 261 tons) add 51.52 tons (258 TPH)

261 + 51.52 = 235 TPH

Product Code Listing Report

REPORT DATE: 08/15/91

DATE: 08/15/91 TIME: 08:36 PLANT ID: 065 PAGE: 1

Pdt Id	Product Name	Price	Loads	Tons	Loads	Mk Tons
4119	BCBC 19	21.00	10	216.55	11	226.55
4130	BIN P	25.00	2	16.54	4	44.55
4131	BIN F	25.00	2	39.95	13	254.90
4140	TOP	29.00	2	15.02	110	2069.89
4146	F02 TOP	0.00	0	0.00	55	1205.79
4147	F B2 BIN	0.00	0	0.00	37	813.67
4150	F TOP 50	30.00	0	0.00	2	22.00
		Report Total	16	288.06	232	4637.33

Total Transactions: 16 Material Charge: 0.00 Haul Charge: 0.00 Tax Charge: 0.00 Total Charge: 0.00

MAGE: 4/15/91 DENNIS

Tickets Performance Report

REPORT DATE: 08/15/91

DATE: 08/15/91 TIME: 08:36 PLANT ID: 065 PAGE: 1

Ticket	HC	TC	Time	Date	Cus Id	S.O. Id	S.O. Info	Item	Sub	Un	Car	Trk Id	Rct Id	Net Lb	Price	$ Total
6249	A	0	07:00	08/15/91	976100	097711		3050	01	62	522	522	4119	42053	23.00	0.00
196250	A	0	07:06	08/15/91	976100	097711		3050	01	62	666	666A	4119	35016	23.00	0.00
196251	A	0	07:11	08/15/91	976100	097711		3050	01	62	467	467A	4119	42041	23.00	0.00
6252	A	0	07:17	08/15/91	976100	097711		3050	01	62	486	486	4119	45029	23.00	0.00
6253	A	0	07:26	08/15/91	976100	097711		3050	01	62	595	595	4119	43995	23.00	0.00
196254	A	0	07:30	08/15/91	052740	050242				62		V3	4130	16030	25.00	0.00
6255	A	0	07:33	08/15/91	052740	050242				62		V2	4130	17042	25.00	0.00
6256	A	0	07:39	08/15/91	976100	097711		3050	01	62	445	445	4119	45007	23.00	0.00
196257	A	0	07:44	08/15/91	976100	097711		3050	01	62	536	536	4119	43990	23.00	0.00
6258	A	0	07:51	08/15/91	976100	097711		3050	01	62	989	989	4119	44019	23.00	0.00
6259	A	0	07:58	08/15/91	976100	097711		3050	01	62	444	444A	4119	47985	23.00	0.00
196260	A	0	08:06	08/15/91	976100	097711		3050	01	62	674	674	4119	43953	23.00	0.00
196261	A	0	08:10	08/15/91	052740	050242				62		V13	4140	24021	29.00	0.00
6262	A	0	08:12	08/15/91	031760	050236				62		LB1	4140	6020	29.00	0.00
6263	A	0	08:18	08/15/91	013820	050092				62		B1	4131	39937	25.00	0.00
196264	A	0	08:23	08/15/91	013820	050092				62		B2	4131	39951	25.00	0.00

Report Total 576089 # of Tickets: 16

STARTED Feeding MATERIAL 6:30 AM

MATERIAL USAGE PRINT

Raw Material

Agg Name		
8664	0117.424	Tons
8663	0041.840	Tons
8662	0029.887	Tons
M.F.	0004.431	Tons
8661	0082.061	Tons
	0000.000	Tons
	0000.000	Tons
Agg Total	00275.643	Tons

Asp Name		
8691	0012.414	Tons
	0000.000	Tons
Asp Total	00012.414	Tons
Grand Total	00288.057	Tons

Print

Product Totals

Pdt Id	Pdt Name		
4119	BCBC 19	0216.55	Tons
4130	BIN P	0016.54	Tons
4140	TOP	0015.02	Tons
4131	BIN F	0039.95	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
		0000.00	Tons
-------	Remaining	0000.00	Tons
	Grand Total	00288.06	Tons

Thu Aug 15/91 08:37:49 Libra Systems

APPENDIX C

ANALYTICAL RESULTS

SSM /Laboratories

ANALYTICAL REPORT

CLIENT: The General Crushed Stone Co.
Attn: Vernon Snyder
P O Box 231
Easton PA 18044-0231

PROJECT: 107513
PO NO:
REPORTED: 29-AUG-91
RECEIVED: 19-AUG-91
WORK ORDER: 1037-004

REPORT TO: D.J.Hofmann
SSM/Spotts, Stevens & McCoy, Inc.

PROJECT DESCRIPTION: Stack-Asphalt Incinerator

SAMPLING DATE: - - BY: DJH

	UNITS	RESULT
SAMPLE: 1029230		
HRI-1 Samples 8/13-15/91		
Particulate Weight - Wash Solutions		
Wt - Wash Soln' (0.22u filter)	mg	17.5
Wt - Acetone Impinger	mg	54.4
Wt - Acetone Probe	mg	11.3
Wt - Water Probe	mg	15.4
Wt - Water Impinger	mg	75.3
Particulate Weight - Filter	mg	0.3
SAMPLE: 1029231		
HRI-2 Samples 8/13-15/91		
Particulate Weight - Wash Solutions		
Wt - Wash Soln' (0.22u filter)	mg	15.1
Wt - Acetone Impinger	mg	241.3
Wt - Acetone Probe	mg	11.0
Wt - Water Probe	mg	9.3
Wt - Water Impinger	mg	74.7
Particulate Weight - Filter	mg	4.5
SAMPLE: 1029232		
HRI-3 Samples 8/13-15/91		
Particulate Weight - Wash Solutions		
Wt - Wash Soln' (0.22u filter)	mg	14.6
Wt - Acetone Impinger	mg	277.5
Wt - Acetone Probe	mg	8.8
Wt - Water Probe	mg	7.0
Wt - Water Impinger	mg	73.8
Particulate Weight - Filter	mg	0.1

Respectfully submitted,

Vaughan J. O'Neill,
Group Leader, Physical Testing

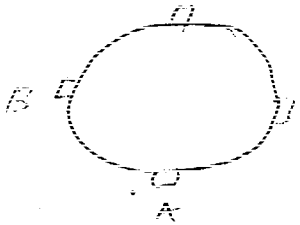
30 Noble Street ■ P.O. Box 6527 ■ Reading, PA 19611-0527 ■ 215/376-4595 or 215/376-6581 ■ Fax: 215/376-8522
Engineering Offices in Baltimore, Lehigh Valley, Reading and Trenton.

APPENDIX D

FIELD DATA

AIR PROGRAMS

CLIENT: HRI
W.O. NO.:
PLANT: Lake Ahri
LOCATION: Bay Harbor Ohio
DATE: 8/14/91
RUN NO.: HRI - 2
OPERATOR: JCJ
SAMPLE BOX NO.:
METER BOX NO.: 44
METER H:
C FACTOR: .10



PITOT TUBE COEF.: .84
PITOT TUBE NO.:
AMBIENT TEMP.: 75
BP: 28.79
ASSUMED MOIS.: 25 %
PROBE LENGTH:
NOZZLE DIA.: .310
PROBE HEAT SET:
LEAK RATE: .006 @ 10"
THIMBLE NO.:
FILTER NO.:

#1 #2 #3

POINT NO.	POINT DIS.	CLOCK TIME ACTUAL	CLOCK TIME RUN MIN.	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	STACK TEMP. °F	PROBE TEMP. °F	FILTER TEMP. °F	IMP. TEMP. °F	METER TEMP. INLET °F	METER TEMP. OUTLET °F	PUMP VAC. "HG	CO2/O2
A1	1.01	0911	0	529.159	.22	1.12	190		252	60	79	78	3.0	
2	3.22		3	531.2	.52	2.70	192		256	49	80	79	5.8	
3	5.46	0917/0930	6	533.8	.42	2.18	192		256	47	81	79	5.0	
4	8.50		9	536.3	.53	2.75	194		252	53	83	80	6.0	
5	12.00		12	538.9	.49	2.52	196		255	52	85	81	6.0	
6	17.09		15	541.7	.47	2.45	198		259	52	87	82	6.0	7.32
7	30.41		18	544.4	.56	2.90	208		257	62	90	83	7.3	
8	36.00		21	547.1	.60	3.08	215		261	66	92	84	8.5	
9	39.54		24	550.0	.61	3.18	227		255	68	94	85	9.2	
10	42.54		27	553.0	.60	3.08	232		261	69	96	86	9.0	
11	44.78		30	556.0	.60	3.08	240		258	72	97	86	9.0	
12	46.49		33	559.0	.61	3.18	242		258	73	99	88	9.0	
stop		0957	36	562.028										

IMPINGERS	END	START	DIFF
1	343	150	
2	278	150	
3	6	—	
4			
5			
GEL	277	237	40

ORSAT	CO2	CO2+O2	O2
1	6.8		13.4
2	6.6		13.4
3	6.7		13.4

SSM

CLIENT: HRI
W.O. NO.:
PLANT:
LOCATION: Baytown O-14 C

DATE: 8/14/91
RUN NO.: HRI-2
OPERATOR: JCJ

POINT NO.	POINT DIS. INS.	CLOCK TIME ACTUAL	CLOCK TIME RUN	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	METER TEMP. °F INLET	METER TEMP. °F OUTLET	STACK TEMP. °F (#1)	PUMP VAC "HG	BOX TEMP °F (#2)	IMP TEMP °F (#4)	Probe	Stack/O_2
S1		1005	0	562.028	.16	0.81	95	91	187	2.9	261	66		
2			3	563.6	.32	1.68	98	92	209	4.5	255	65		
3			6	565.9	.32	1.68	99	92	222	4.5	263	60		-.18
4			9	568.0	.42	2.18	101	94	225	5.8	258	58		
5			12	570.6	.25	1.29	103	94	223	4.0	264	57		
6			15	572.8	.39	1.79	104	95	220	4.5	265	56		
7			18	574.9	.51	2.70	106	96	246	7.0	255	55		-.23
8			21	577.6	.47	2.48	107	97	211	6.8	263	55		
9			24	580.3	.65	3.30	108	98	212	8.9	257	56		
10			27	583.4	.58	2.99	109	99	209	8.0	259	58		
11			30	586.3	.60	3.11	110	100	210	8.0	259	58		
12			33	589.4	.63	3.25	111	101	209	8.5	259	57		
stop		1042	36	592.477										

COMMENTS:

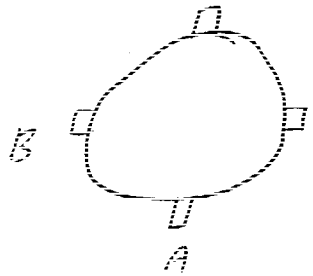
497
429
23

SSM

SOUTHWEST ENVIRONMENTAL
AIR PROGRAMS

SHEET 1 OF 2

CLIENT: HRI
W.O. NO.:
PLANT: Lake Ariel
LOCATION: Bypass Outlet
DATE: 8/19/91
RUN NO.: HRI-1
OPERATOR: JCJ
SAMPLE BOX NO.:
METER BOX NO.: 44
METER H:
C FACTOR: .76



PITOT TUBE COEF.: .84
PITOT TUBE NO.:
AMBIENT TEMP.: 69°F
BP: 28.57
ASSUMED MOIS.: 25%
PROBE LENGTH:
NOZZLE DIA.: .31
PROBE HEAT SET:
LEAK RATE: Dried @ 10"
THIMBLE NO.:
FILTER NO.:

#1 #2 #4

POINT NO.	POINT DIS.	CLOCK TIME ACTUAL	CLOCK TIME RUN MIN.	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	STACK TEMP. °F	PROBE TEMP. °F	FILTER TEMP. °F	IMP. TEMP. °F	METER TEMP. INLET °F	METER TEMP. OUTLET °F	PUMP VAC. "HG	O_2
#1	1.01	0611	6	960.000	.29	1.90	241		262	45	64	63	2.5	
2	3.22		3	962.2	.45	2.18	235		264	47	66	69	3.7	
3	5.66		6	964.3	.50	2.40	237		259	48	70	65	4.2	
4	8.50		9	967.0	.56	2.73	235		269	50	74	66	5.0	
5	12.00	0624/0632	12	969.7	.71	3.46	233		258	54	76	67	6.0	
6	17.09		15	972.6	.75	3.65	240		259	47	75	67	6.8	
7	30.91		18	975.8	.73	3.52	240		265	49	76	67	6.7	
8	36.00		21	979.1	.73	3.52	240		253	52	79	69	6.7	13.2
9	37.50		24	982.0	.75	3.65	237		260	52	80	69	7.0	13.7
10	42.34		27	985.4	.77	3.78	237		264	54	82	70	7.0	13.4/13.40
11	44.78		30	988.5	.75	3.65	235		267	54	83	70	7.0	13.3
12	46.97		33	991.9	.61	3.20	230		253	56	85	72	6.0	13.9
STOP		0656	36	994.101										

IMPINGERS	END	START	DIFF
1	330	150	180
2	330	150	180
3	132	-	132
4			
5			
GEL	275	[illegible]	38

ORSAT	CO2	CO2+O2	O2
1	5.6	18.9	13.3
2	5.5	18.9	13.4
3	5.6	18.7	13.1

SSM

CLIENT: HRE
W.O. NO.:
PLANT:
LOCATION: Rapidan Outlet

DATE: 8/14/91
RUN NO.: HRE-1
OPERATOR: JCJ

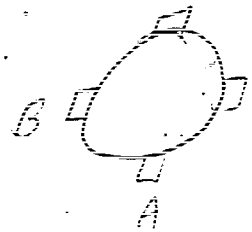
POINT NO.	POINT DIS. INS.	CLOCK TIME ACTUAL	CLOCK TIME RUN	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	METER TEMP. °F INLET	METER TEMP. °F OUTLET	STACK TEMP. °F (#1)	PUMP VAC "HG	BOX TEMP °F (#2)	IMP TEMP °F (#4)	Probe	H2O/O2
R1		0705	0	494.707	.22	1.03	75	72	213	2.5	255	56		18.8
2			3	496.4	.35	1.70	79	73	215	3.8	257	47		14.0
3			6	498.6	.42	2.01	79	73	218	4.0	277	50		14.3
4			9	500.9	.46	2.22	81	74	219	4.9	265	52		13.5
5			12	503.4	.55	2.67	82	74	226	5.5	252	53		12.8
6			15	506.1	.57	2.82	83	75	229	5.8	265	57		13.0
7			18	508.9	.71	3.45	84	75	231	7.0	257	57		13.2
8			21	512.2	.78	3.79	86	76	231	7.2	259	57		13.1
9			24	515.3	.81	3.99	86	75	230	7.8	268	58		13.5
10			27	518.4	.82	4.01	87	76	228	8.0	267	60		13.6
11			30	522.0	.83	4.05	88	76	226	8.0	253	60		13.8
12			33	525.4	.92	4.42	89	78	226	8.8	253	61		13.4
STOP		0742	36	528.903										

COMMENTS:

SSM

AIR PROGRAMS

CLIENT:	HKI
W.O. NO.:	
PLANT:	Lake Ariel
LOCATION:	Bethlehem Outlet
DATE:	8/15/91
RUN NO.:	HKI-3
OPERATOR:	JCJ
SAMPLE BOX NO.:	
METER BOX NO.:	44
METER H:	
C FACTOR:	.70



PITOT TUBE COEF.:	.84
PITOT TUBE NO.:	
AMBIENT TEMP.:	67
BP:	28.63
ASSUMED MOIS.:	25%
PROBE LENGTH:	
NOZZLE DIA.:	.310
PROBE HEAT SET:	
LEAK RATE:	.005 @ 12"
THIMBLE NO.:	
FILTER NO.:	

POINT NO.	POINT DIS.	CLOCK TIME ACTUAL	CLOCK TIME RUN MIN.	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	STACK TEMP. °F	PROBE TEMP. °F	FILTER TEMP. °F	IMP. TEMP. °F	METER TEMP. INLET °F	METER TEMP. OUTLET °F	PUMP VAC. "HG	%H2O/O2
A1	1.01	0645	0	592.854	.39	2.01	176		247	95	71	70	4.0	
2	3.22		3	595.2	.48	2.50	179		253	44	72	71	5.0	
3	5.66		6	597.8	.45	2.35	183		260	43	73	71	5.0	
4	8.50		9	600.3	.62	3.22	195		247	46	76	71	7.1	
5	10.60		12	603.3	.53	2.85	205		255	47	78	71	6.9	
6	17.09		15	606.2	.53	2.76	206		260	49	80	72	6.3	
7	30.91		18	608.7	.57	2.47	207		257	51	81	73	6.0	
8	36.00		21	611.4	.62	3.12	212		248	52	82	73	7.8	-.35
9	39.50		24	614.7	.61	3.18	215		256	52	83	74	7.2	
10	42.34		27	617.7	.40	2.05	211		260	53	84	.75	5.0	
11	44.78		30	620.3	.38	1.95	210		262	53	85	75	4.8	
12	46.99		33	622.8	.35	1.83	206		254	53	86	76	4.2	
STOP		0721	36	625.030										

IMPINGERS	END	START	DIFF
1	2.15	150	
2	2.22	150	
3	8		
4			
5			
GEL	211	157	54

ORSAT	CO2	CO2+O2	O2
1	<L		13.6
2	<L		13.6
3	<L		13.7

SSM

CLIENT: HRI

W.O. NO.:

PLANT: Lake Hill

LOCATION: Bayview OHIO

DATE: 8/15/91

RUN NO.: HRI-3

OPERATOR: JCJ

POINT NO.	POINT DIS. INS.	CLOCK TIME ACTUAL	CLOCK TIME RUN	METER CU. FT.	PITOT "H2O	ORIFICE "H2O	METER TEMP. °F INLET	METER TEMP. °F OUTLET	#1 STACK TEMP. °F	PUMP VAC "HG	#2 BOX TEMP °F	#9 IMP TEMP °F	Pb	%H2O/O2
B1		0730	6	625.030	.20	1.02	78	76	185	2.8	293	61		
2			3	626.7	.41	2.10	81	76	189	4.7	265	50		
3			6	629.2	.41	2.10	81	77	207	5.0	277	48		
4			9	631.6	.35	1.83	83	77	209	4.6	254	49		
5			12	633.9	.41	2.10	83	77	217	5.0	266	49		
6			15	636.3	.43	2.23	86	78	222	5.2	260	50		
7			18	639.0	.52	2.70	87	78	222	6.0	254	51		-.28
8			21	641.6	.58	3.00	89	79	224	7.0	255	52		
9			24	644.5	.72	3.80	89	79	227	9.0	263	52		
10			27	647.7	.77	4.00	91	80	227	10.0	254	54		
11			30	651.3	.64	3.29	91	80	225	8.0	241	56		-.43
12			33	654.6	.82	4.25	91	81	227	11.0	258	56		
stop		0806	36	657.542										

COMMENTS:

657.5
191.8
19.7

SSM

APPENDIX E

COMPUTER PRINTOUT

SPOTTS, STEVENS & McCOY, INC.
NSR PROGRAMS
SAMPLING SUMMARY SHEET

Client: HRI
Plant: LAKE ARIEL
Unit Tested: ASPHALT PLANT
Pollutant: PARTICULATE & FLOW
Sampling Location: BAGHOUSE STACK
W.O.: 1037-004

DATE	8/14/91	8/14/91	8/15/91
RUN NUMBER	HRI-1	HRI-2	HRI-3
DN - NOZZLE DIAMETER, IN.	0.310	0.310	0.310
PB - BAROMETRIC PRESS, IN. OF HG.	28.57	28.79	28.68
TT - NET SAMPLING TIME, MIN.	72.0	72.0	72.0
VM - VOLUME METERED, ACF	68.903	63.318	64.688
TM - AVG. METER TEMP., DEG. F	75	93	79
PM - AVG. DELTA H, IN. OF H2O	3.054	2.462	2.638
Y - GAS METER CALIB. FACTOR	1.00	1.00	1.00
VMSTD - STD. GAS VOL., SCF	65.395	58.573	61.165
VW - TOTAL WATER COLLECTED, ML.	530	367	397
%M - PERCENT MOISTURE	27.6	22.8	23.4
MD - MOLE FRACTION DRY	0.72	0.77	0.77
%CO2 - PERCENT CO2 DRY	5.6	6.7	5.2
%O2 - PERCENT O2 DRY	13.3	13.4	13.6
MWD - DRY MOLECULAR WEIGHT	29.42	29.61	29.38
MW - WET MOLECULAR WEIGHT	26.27	26.96	26.71
%EA - PERCENT EXCESS AIR	162.6	174.2	174.9
AS - STACK AREA, SQ. IN.	4,071.5	4,071.5	4,071.5
PST - STATIC PRESS., IN. OF H2O	-0.33	-0.32	-0.35
TS - STACK TEMP., DEG. F	230	212	208
CP - PITOT COEFFICIENT	0.84	0.84	0.84
VS - STACK GAS VELOCITY, FPM	3,241	2,739	2,843
QS - STACK GAS FLOW, DSCFM	48,578	45,372	46,794
QA - STACK GAS FLOW, ACFM	91,966	77,733	80,693
%I - ISOKINETIC RATIO	100.6	96.4	97.6
GR/DSCF, LEAD LOADING	0.010	0.010	0.008
LBS/HR, LEAD EMISSIONS	4.36	4.08	3.09
AVG. GR/DSCF EMISSION RATE		0.010	
ALLOWABLE GR/DSCF EMISSION RATE		0.04	

REV. 0(9/13/91)

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SACHTS, STEVENS and McCOY, INC
AIR PROGRAM
ISOKINETIC SAMPLING ANALYSIS

Client: HPI Plant: LAKE ARIEL

Unit Tested: ASPHALT PLANT Pollutant: PARTICULATE EFFLOW

Sampling Location: BAGHOUSE STACK W.O.: 1037-004

Run No: HPI-1 Date: 8/14/01 Start: 811 End: 943

DATA:

CO:	0.010	PB:	28.67	PBR:	+0.00	AS:	4021.5
O2%:	13.3	CO2%:	6.0	N2%:	81.2	VW:	630
GAS METER Y-FACTOR:			1.00	E.A.%:	182.0		

SAMPLE POINT	DISTANCE AT POINT	CLOCK TIME	TIME AT POINT	GAS METER	VELOCITY HEAD	PM ORIFICE	METER IN	TEMPERATURE OUT	STACK TEMP.	SQDE	VEL	O2	
A-1		811	3.0	400.000	0.250	1.400	64	63	231	14.16	2,220	13.3	
2			3.0	402.300	0.450	2.180	68	66	236	17.08	2,703	13.4	
3			3.0	404.300	0.600	2.400	70	66	237	18.07	2,838	13.1	
4			3.0	407.000	0.680	2.730	74	68	236	18.73	3,106		
5			3.0	409.700	0.710	3.450	76	67	239	22.18	3,401		
6			3.0	472.600	0.750	3.650	75	67	240	22.01	3,508		
7			3.0	475.500	0.750	3.520	76	67	240	22.01	3,467		
8			3.0	478.100	0.750	3.520	76	68	240	22.01	3,467		
9			3.0	482.000	0.750	3.650	80	69	239	22.00	3,503		
10			3.0	486.400	0.770	3.730	82	70	237	23.17	3,546		
11			3.0	488.900	0.750	3.650	83	70	236	22.03	3,503		
12			3.0	491.500	0.800	3.250	85	72	230	21.04	3,350		
B-1			3.0	494.707	0.220	1.030	75	72	219	12.17	1,916		
2			3.0	496.400	0.350	1.750	76	73	216	15.07	2,410		
3			3.0	498.800	0.420	2.010	78	73	218	16.07	2,650		
4			3.0	500.900	0.460	2.220	81	74	219	17.07	2,781		
5			3.0	503.400	0.550	2.670	82	74	220	19.42	3,057		
6			3.0	506.100	0.590	2.820	83	75	220	20.10	3,179		
7			3.0	508.000	0.710	3.450	84	75	221	22.15	3,480		
8			3.0	512.200	0.700	3.750	86	76	221	23.22	3,654		
9			3.0	515.000	0.810	3.900	86	76	230	23.44	3,720		
10			3.0	518.400	0.820	4.010	87	76	220	23.75	3,730		
11			3.0	522.000	0.830	4.050	88	76	220	23.86	3,756		
12			3.0	525.400	0.820	4.420	89	76	220	25.12	3,954		
				529.008									
RESULTS			TT	VM	PIT	PM		TM	TS	SQDE	VEL	O2	
			72.0	98.008	0.814	3.064		75	230	20.50	3,241	13.3	
			not	not	avg	avg		avg	avg	avg	avg	avg	

PBM= 28.79 VMSTD= 95.305 VWGAS= 34.053 %M= 27.0 RMS OF VELOCITIES = 18.3
MD= 0.72 BWMD= 39.42 BWW= 26.27 PS= 28.56

STACK GAS VELOCITY =	3,241	FPM
STACK GAS VOLUME =	46,570	DSCFM
STACK GAS VOLUME =	91,590	ACFM
STACK GAS VOLUME =	2.88E+05	LBS/HR
ISOKINETIC RATIO =	100.0	

PARTICULATE EMISSIONS		
	PADER	TOTAL
Weight, mg =	44.50	174.20
GR/DSCF =	0.010	0.041
LBS/HR =	6.38	12.50

(REV. 06/13/01)

DSM
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ENGINEERS • PLANNERS • SCIENTISTS

SPORTS, STEVENS and McCOY, INC.
NEW PROGRAM
BOOKMETER SAMPLING SYSTEM

Client:	PIM	Plant:	LAKE ARIEL
Unit Tested:	ASPHALT PLANT	Pollutant:	PARTICULATE & FLOW
Sampling Location:	BAGHOUSE STACK	W.O.:	1037-004

Run No:	HFU-2	Date:	8/14/01	Start:	011	End:	1042

DATA

DN:	0.310	PB:	28.70	PSF:	-0.32	AS:	0.0126
O2%:	13.4	CO2%:	0.7	MPH:	70.0	VM:	987
GAS METER Y-FACTOR:			1.00	E.A.%:	176.2		

SAMPLE POINT	DISTANCE AT POINT	CLOCK TIME	TIME AT POINT	GAS METER	VELOCITY HEAD	PM ORIFICE	METER IN	TEMPERATURE OUT	STACK TEMP.	SQDE	VEL	O2	
A-1		011	3.0	628.160	0.220	1.120	79	78	100	11.08	1,062	13.4	
2			3.0	631.200	0.320	2.700	80	79	102	10.41	2,049	13.4	
3			3.0	633.800	0.420	2.100	81	79	102	10.65	2,500	13.4	
4			3.0	636.300	0.530	2.760	83	80	104	10.02	2,001		
5			3.0	638.900	0.490	2.520	85	81	106	17.03	2,774		
6			3.0	641.700	0.470	2.450	87	82	108	17.60	2,721		
7			3.0	644.400	0.580	2.900	90	83	208	18.34	2,903		
8			3.0	647.100	0.600	3.080	92	84	216	20.12	3,116		
9			3.0	650.000	0.610	3.100	94	86	227	20.47	3,107		
10			3.0	653.000	0.600	3.080	96	88	232	20.38	3,153		
11			3.0	656.000	0.600	3.080	97	88	240	20.40	3,171		
12			3.0	659.000	0.610	3.130	99	88	242	20.60	3,202		
B-1		1005	3.0	662.020	0.100	0.510	95	91	184	13.16	1,571		
2			3.0	663.030	0.320	1.640	98	92	208	14.63	2,264		
3			3.0	666.030	0.320	1.640	99	92	222	14.77	2,280		
4			3.0	669.000	0.420	2.150	101	94	226	16.90	2,634		
5			3.0	670.000	0.250	1.280	103	94	223	15.07	2,022		
6			3.0	672.000	0.340	1.790	104	96	220	15.21	2,359		
7			3.0	674.000	0.510	2.700	106	96	216	16.57	2,873		
8			3.0	677.000	0.470	2.480	107	97	211	17.70	2,748		
9			3.0	680.000	0.560	3.000	108	98	212	20.60	3,234		
10			3.0	683.000	0.580	2.990	109	99	209	19.70	3,048		
11			3.0	686.000	0.600	3.110	110	100	212	20.06	3,132		
12			3.0	689.000	0.630	3.260	111	101	209	20.58	3,177		
		1042		692.477									
RESULTS			TT	VM	PIT	PM		TM	TS	SQDE	VEL	O2	
			72.0	63.318	0.466	2.462		93	212	17.70	2,739	13.4	
			tot	tot	avg	avg		avg	avg	avg	avg	avg	

PSM= 28.07 VMSTD= 60.573 VWGAS= 17.208 SQM= 22.5 RMS OF VELOCITIES = 16.6
MD= 0.77 MWD= 28.01 MWS= 28.06 PS= 28.77

STACK GAS VELOCITY =	2,739	FPM
STACK GAS VOLUME =	46,372	DSCFM
STACK GAS VOLUME =	77,739	ACFM
STACK GAS VOLUME =	2.57E-05	LBS/HR
ISOKINETIC RATIO =	98.4	

20,165.33
34,444.41
54,609.74

PARTICULATE EMISSIONS		
	PADER	TOTAL
Weight, mg =	39.90	356.00
GR/DSCF =	0.010	0.094
LBS/HR =	.4608	3.9630

1.81 16.1

REV. 0(8/13/01)

SPORTS, STEVENS and McCOY, INC.
ENGINEERS • PLANNERS • SCIENTISTS

[illegible]

Client:	FPM	Plant:	LAKE APPEL
Unit Tested:	ASPHALT PLANT	Pollutant:	PARTICULATE & FLOW
Sampling Location:	BAGHOUSE STACK	W.O.:	9807-006

Run No: MPM-3 Date: 07/[illegible] Start: 846 End: 908

DATA

DN:	0.310	PB:	29.90	PST:	-0.36	AH:	0.39[illegible]
CPM:	10.0	CO2%:	0.2	H2O%:	01.2	MW:	30.7
GAS METER Y-FACTOR:			1.00	E.A.%:	174.3		

SAMPLE POINT	DISTANCE AT POINT	CLOCK TIME	TIME AT POINT	GAS METER	VELOCITY HEAD	PM ORIFICE	METER IN	TEMPERATURE OUT	STACK TEMP.	SQDE	VEL.	O2	
A-1		846	3.0	862.854	0.900	2.010	71	70	176	18.74	2.461	19.8	
2			3.0	866.850	0.480	2.630	72	71	178	17.61	2.720	19.8	
3			3.0	867.000	0.460	2.350	73	71	183	17.01	2.640	19.7	
4			3.0	870.300	0.820	3.250	70	71	196	20.16	3.190		
5			3.0	873.300	0.560	2.060	70	71	204	19.12	2.970		
6			3.0	876.200	0.530	2.700	80	72	204	18.70	2.920		
7			3.0	879.000	0.570	2.070	81	73	207	19.50	3.037		
8			3.0	881.800	0.520	3.220	82	73	212	20.41	3.170		
9			3.0	884.800	0.510	3.100	83	74	215	20.20	3.160		
10			3.0	887.800	0.400	2.060	84	75	211	18.30	2.552		
11			3.0	890.800	0.380	1.960	85	75	210	16.90	2.436		
12			3.0	893.800	0.350	1.830	85	76	208	16.27	2.370		
B-1		890	3.0	895.030	0.200	1.020	78	76	196	11.30	1.750		
2			3.0	898.700	0.410	2.100	81	76	199	18.51	2.541		
3			3.0	898.300	0.410	2.100	81	77	207	18.54	2.570		
4			3.0	901.800	0.350	1.830	83	77	209	16.30	2.383		
5			3.0	903.900	0.410	2.100	83	77	217	18.60	2.595		
6			3.0	906.300	0.430	2.230	86	78	222	17.13	2.057		
7			3.0	909.000	0.520	2.700	87	78	222	18.83	2.038		
8			3.0	911.600	0.580	3.000	89	79	224	19.92	3.100		
9			3.0	914.500	0.730	3.800	89	79	227	22.24	3.484		
10			3.0	917.700	0.770	4.000	91	80	227	23.00	3.583		
11			3.0	921.300	0.840	3.290	91	80	225	20.94	3.261		
12			3.0	924.300	0.820	4.250	91	81	220	23.77	3.702		
		908		927.542									
RESULTS			TT	VM	PRT	PM		TM	TS	SQDE	VEL.	O2	
			72.0	84.880	0.498	2.830		79	200	18.28	2.643	19.6	
			min	mol	avg	avg		avg	avg	avg	avg	avg	

PSM= 28.87 VMSTD= 81.196 VMGAS= 18.880 %M= 23.6 PMS OF VELOCITIES = 16.3

MC= 0.77 MWD= 29.30 MW= 28.71 PS= 29.05

STACK GAS VELOCITY =	2.643	FPM
STACK GAS VOLUME =	46,704	DSCFM
STACK GAS VOLUME =	50,803	ACFM
STACK GAS VOLUME =	2.08E+06	LB/HR
ISOKINETIC RATIO =	97.6	

PARTICULATE EMISSIONS		
	PADDER	TOTAL
Weight, mg =	30.50	381.00
GR/DSCF =	0.000	0.200
LB/HR =	5.03	134.07

137 (1,5 2

REV. 0(03/01)

DSSM
SPOTTS, STEVENS and McCOY, INC.
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APPENDIX F

CALIBRATION DATA

SPOTTS,STEVENS & McCOY, INC.
AIR PROGRAMS
METER BOX CALIBRATION

METER BOX NUMBER: 80444 DATE: 9/5/91

CALIBRATED BY: JESSELL BAROMETRIC PRESSURE: 30.27

ORIFICE MANOMETER SETTING (delta H) IN. H2O	WET GAS METER (Vn) cu. ft.	DRY TEST METER (Vd) cu. ft.	WET TEST METER (Tw) deg. F	INLET (Tdi) deg. F	OUTLET (Tdo) deg. F	AVERAGE (Td) deg. F	TIME min.	Yi	delta H@i
0.5	5.102	5.107	73	73.5	73	73.3	12.78	1.02	1.75
1.0	5.107	5.111	72.5	76.5	74.5	75.0	9.10	1.00	1.78
1.5	10.210	10.155	73	79	75	77.0	14.82	1.01	1.81
2.0	10.155	10.178	73	82.5	76	79.3	12.97	1.00	1.85
3.0	9.968	10.148	73	84.5	76.5	80.5	10.55	0.99	1.85
4.0	9.879	10.120	73	79.5	76	77.8	9.17	0.99	1.86

FORMULAS:

$$Yi = \frac{(Vw \times BP \times (Td+460))}{(Vd \times BP+(H/13.6) \times (Tw+460))}$$

$$Qm = \frac{(Vd \times (Tdo+460))}{(Time \times (Td+460))}$$

$$Km = Qm \sqrt{\frac{(BP \times 29)}{(Tdo+460) \times (delta\ H)}}$$

$$delta\ H@i = \frac{0.921}{(Km \times Km)}$$

SPOTTS,STEVENS & McCOY, INC.
AIR PROGRAMS
METER BOX CALIBRATION

METER BOX NUMBER: 80444 DATE: 8/7/91

CALIBRATED BY: WARY BAROMETRIC PRESSURE: 30.25

ORIFICE MANOMETER SETTING (delta H) IN. H2O	WET GAS METER (Vm) cu. ft.	DRY TEST METER (Vd) cu. ft.	WET TEST METER (Tw) deg. F	INLET (Tdi) deg. F	OUTLET (Tdo) deg. F	AVERAGE (Td) deg. F	TIME min.	Yi	delta H@i
0.5	5.362	5.301	70.5	74	71	72.5	13.33	1.01	1.77
1.0	5.984	5.905	71	78	74	76.0	10.67	1.02	1.84
1.5	10.869	10.803	72	84	77	80.5	16.08	1.02	1.90
2.0	10.261	10.290	71	79	76	77.5	13.27	1.00	1.88
3.0	11.074	11.200	72	83	77	80.0	11.78	1.00	1.89
4.0	10.508	10.695	70.5	85	79	82.0	9.80	0.99	1.92

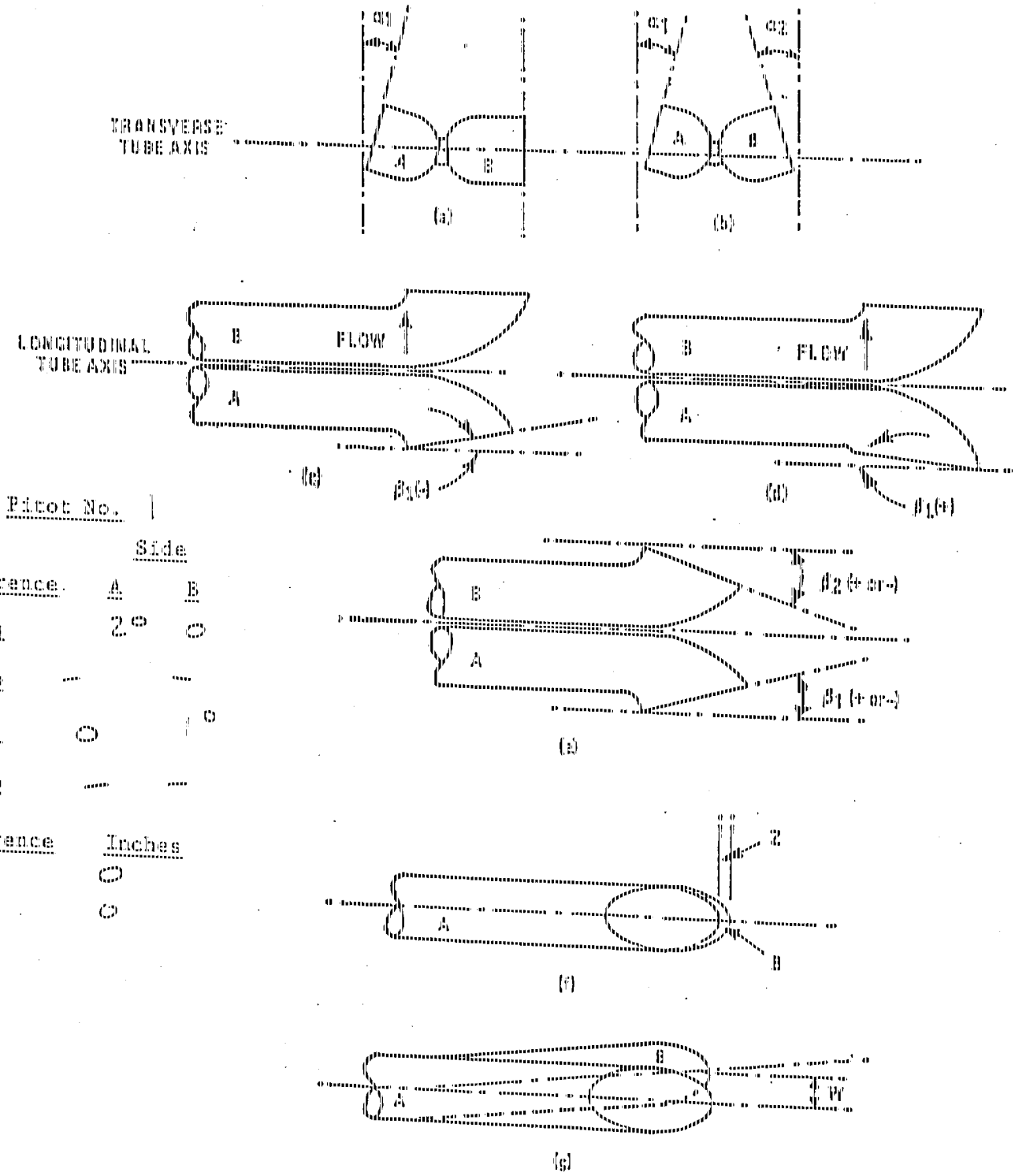
FORMULAS:

$$Yi = \frac{(Vw)(BP)(Td+460)}{(Vd)(BP+(H/13.6))(Tw+460)}$$

$$Qm = \frac{(Vd)(Tdo+460)}{(Time)(Td+460)}$$

$$Km = Qm \sqrt{\frac{(BP)(29)}{(Tdo+460)(delta\ H)}}$$

$$delta\ H@i = \frac{0.921}{(Km)(Km)}$$



Pitot No. 1

Reference	Side A	Side B
A_1	2°	0
A_2	—	—
B_1	0	0
B_2	—	—

Reference	Inches
z	0
w	0

Figure 2-3. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect the baseline value of $C_p(s)$ so long as α_1 and $\alpha_2 < 10°$, β_1 and $\beta_2 < 5°$, $z < 0.32$ cm (1/8 in.) and $w < 0.08$ cm (1/32 in.) (citation 11 in Section 8).

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POT-METER THERMOCOUPLE CALIBRATION

POT-METER NO.	Omega Box 44
THERMOCOUPLE TYPE	K
DATE	8/16/91
ICE BATH TEMPERTURE F	34
CERTIFIED MERCURY BULB F	33
AMBIENT TEMPERATURE F	72
CERTIFIED MERCURY BULB F	72
BOILING WATER F	210
CERTIFIED MERCURY BULB F	212
HOT OIL F	227
CERTIFIED MERCURY BULB F	228

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APPENDIX G

SAMPLE EQUATIONS

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ISOKINETIC SAMPLING EQUATIONS

1. Y = Meter Calibration Factor

2. BP = Barometric Pressure, Inches Hg

3. DN = Nozzle Diameter, Inches

4. TT = Net Sampling Time, Minutes

5. AS = Sampling Locaton Area, Square Inches

6. VM = Sample Gas Meter Volume, Cu.Ft.

7. PM = Average Orifice Pressure Drop, Inches H2O

8. TM = Average Dry Gas Meter Temperature, F

9. VW = Total Moisture Collected, ml

10. PST = Static Pressure, Inches H2O

PS = Stack Pressure, Inches Hg

11. PS = (PST/13.6) + BP

12. TS = Sampling Location Temperature

13. VMSTD = Volume Of Dry Gas Sampled At Standard Conditions, DSCF

$$VMSTD = \frac{17.65*VM*Y*(BP+(PM/13.6))}{(TM + 460)}$$

14. VW gas = Volume Of Water At Standard Conditions

VW gas = (0.0471 * VW)

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15. % M = Percent Moisture In Stack Gas

$$\% M = \frac{(100 * VW\ gas)}{(VMSTD + VW\ gas)}$$

16. MD = Mole Fraction Of Dry Gas

$$MD = \frac{(100 - \% M)}{100}$$

17. MWD = Molecular Weight Of Dry Gas

$$MWD = (\%CO2 * 0.44) + (\%O2 * 0.32) + [(\%CO2 + N2) * 0.28]$$

18. %EA = % Excess Air

$$\%EA = \frac{[(\%O2) - 0.5 * (\%CO)]}{0.264(\%N2) - [(\%O2) + 0.5 * (\%CO)]} * 100$$

19. MW = Molecular Weight Of Wet Stack Gas

$$MW = (MWD * MD) + (18 (1 - MD))$$

20. SDE = Average Square Root Of (Velocity Head * Absolute Stack Temp

$$SDE = [Delta\ P * (TS + 460)]^{1/2}$$

21. VS = Stack Gas Velocity At Stack Conditions

$$VS = 5130 * CP * Avg(SDE) * [1/(PS * MW)]^{1/2}$$

APPENDIX H

STANDARD TEST METHODS