AP42 Section: 11.1

Reference Number: 68

Title: Results Of The May 26, 1993 Particulate Emission Compliance Test On The No. 7 Portable Asphalt Plant Stationed Near Appleton, Minnesota,

Interpoll Laboratories, Inc., Circle Pines, MN,

July 7, 1993.

79C

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Circle Pines, Minnesota 55014-1819

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RESULTS OF THE MAY 26, 1993 NSPS PARTICULATE EMISSION COMPLIANCE TEST ON THE NO. 7 PORTABLE ASPHALT PLANT STATIONED NEAR APPLETON, MINNESOTA

Submitted to:

DUININCK COMPANIES
P.O. Box 208
Prinsburg, Minnesota

Attention:

Chris Duininck

Approved by:

Daniel Despen
Manager
Field Testing Support Group

Report Number 3-8919
July 7, 1993
SP/slp

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APPENDICES:

ABBREVIATIONS

ACFM	actual cubic feet per minute
cc (ml)	cubic centimeter (milliliter)
DSCFM	dry standard cubic foot of dry gas per minute
DSML	dry standard milliliter
DEG-F (°F)	degrees Fahrenheit
DIA.	diameter
FP	finished product for plant
FT/SEC	feet per second
g	gram
GPM	gallons per minute
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g/dscm	grams per dry standard cubic meter
HP	horsepower
HRS	hours
IN.	inches
IN.HG.	inches of mercury
IN.WC.	inches of water
LB	pound
LB/DSCF	pounds per dry standard cubic foot
LB/HR	pounds per hour
LB/10^6BTU	pounds per million British Thermal Units heat input
LB/MMBTU	pounds per million British Thermal Units heat input
LTPD	long tons per day
MW	megawatt
mg/Nm^3	milligrams per dry standard cubic meter
ug/Nm^3	micrograms per dry standard cubic meter
microns (um)	micrometer
MIN.	minutes
ng	nanograms
ohm-cm	ohm-centimeter
PM	particulate matter
PPH	pounds per hour
PPM	parts per million
ppmC	parts per million carbon
ppm,d	parts per million, dry
ppm,w	parts per million, wet
ppt	parts per trillion
PSI	pounds per square inch
SQ.FT.	square feet
TPD	tons per day
ug	micrograms
v/v	percent by volume
w/w	percent by weight
<	≤ (when following a number)

Standard contitions are defined as 68°F (20°C) and 29.92 IN. of mercury pressure.

g:\stack\wp\misc\abbrev.frm

1 INTRODUCTION

On May 26, 1993 Interpoll Laboratories Personnel conducted a State Particulate and Visible Emission Compliance Test on the Duininck Companies No. 7 Portable Asphalt Plant stationed near Appleton, Minnesota. Ron Rosenthal and Bob Aschenbach performed the on-site portion of the test. Coordination between testing activities and plant operation was provided by Chris Duininck of Duininck Companies. A member of the Minnesota Pollution Control Agency did not witness the test.

The asphalt plant tested is a Barber Greene Model DM-75 asphalt plant which has a rated capacity of 500 TPH. The plant is normally operated at 480 TPH with an aggregate moisture content of 7%. Emissions from the plánt are controlled by a Custom Welding Dust-Eater baghouse. The process equipment burned waste oil and operated under normal conditions.

Particulate evaluations were performed in accordance with EPA Methods 1 - 5, and 9, CFR Title 40, Part 60, Appendix A (revised July 1, 1992). A preliminary determination of the gas linear velocity profile was made before the first particulate determination to allow selection of the appropriate nozzle diameter required for isokinetic sample withdrawal. An Interpoll Labs sampling train which meets or exceeds specifications in the above-cited reference was used to extract particulate samples by means of a heated glass-lined probe. Wet catch samples were collected in the back half of the Method 5 sampling train and analyzed as per Minnesota Rules part 7005.0500.

An integrated flue gas sample was extracted simultaneously with each particulate sample using a specially designed gas sampling system. Integrated flue gas samples were collected in 44-liter Tedlar bags housed in a protective aluminum container. After sampling was complete, the bags were returned to the laboratory for Orsat analysis. Prior to sampling,

the Tedlar bags are leak checked at 15 IN.HG. vacuum with an in-line rotameter. Bags with any detectable inleakage are discarded.

Testing was conducted from 5 test ports oriented horizontally on the stack. The test ports are located 2.7 diameters downstream and 3.3 diameters upstream of the nearest flow disturbances. A 25-point traverse was used to collect representative particulate samples. Each traverse point was sampled 2.5 minutes to give a total sampling time of 62.5 minutes per run. Visible emissions were read by Randy Madison, an EPA-certified observer.

The important results of the test are summarized in Section 2. Detailed results are presented in Section 3. Field data and all other supporting information are presented in the appendices.

2 SUMMARY AND DISCUSSION

The results of the particulate emission test are summarized in Tables 1 and 2. The particulate concentration averaged 0.094 GR/DSCF (Dry + Organic Wet Catch) and 0.00574 (Dry Catch Only). The corresponding particulate emission rates averaged 22.2 and 1.36 LB/HR. Opacity averaged 7.6 percent.

No difficulties were encountered in the field or in the laboratory evaluation of the samples. On the basis of these facts and a complete review of the data and results, it is our opinion that the results reported herein are accurate and closely reflect the actual values which existed at the time the test was performed.

Table 1. Summary of the Results of the May 26, 1993 Particulate Emission Compliance Test on the Duininck Brothers No. 7 Portable Asphalt Plant Stationed near Appleton, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		05-26-93	05-26-93	05-26-93
Time runs were done	(HRS)	830/ 945	1010/1126	1155/1312
Process rate	(TON/HR)			
recycle		232.0	242.0	242.0
aggregate		248.0	259.0	268.0
asphalt		14.5	15.1	15.5
total		494.5	516.1	525.5
Volumetric flow				
actual	(ACFM)	60708	60032	59910
standard	(DSCFM)	28266	27315	26997
Gas temperature	(DEG-F)	270	266	269
Moisture content	(%V/V)	33.74	35.53	35.89
Gas composition	(%V/V,dry)			
carbon dioxide		7.60	7.40	7.90
oxygen		10.60	10.70	10.00
nitrogen		81.80	81.90	82.10
Isokinetic variation	(%)	103.7	103.0	102.1
Part. emission rate	(LB/HR)	25.16	21.45	20.04
Particulate concentration				
actual	(GR/ACF)	.0483	.0417	.0390
standard	(GR/DSCF)	0.104	.0916	.0866

Note: Dry + Organic Wet Catch

* Federal regulations restrict particulate emissions from portable asphalt plants to .04 GR/DSCF, CFR Title 40, Part 60, Subpart I.

Table 2. Summary of the Results of the May 26, 1993 Particulate Emission Compliance Test on the Duininck Brothers No. 7 Portable Asphalt Plant Stationed near Appleton, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		05-26-93	05-26-93	05-26-93
Time runs were done	(HRS)	830/ 945	1010/1126	1155/1312
Process rate	(TON/HR)			
recycle		232.0	242.0	242.0
aggregate		248.0	259.0	268.0
asphalt		14.5	15.1	15.5
total		494.5	516.1	525.5
Volumetric flow				
actual	(ACFM)	60708	60032	59910
standard	(DSCFM)	28266	27315	26997
Gas temperature	(DEG-F)	270	266	269
Moisture content	(%V/V)	33.74	35.53	35.89
Gas composition	(%V/V,dry)			
carbon dioxide		7.60	7.40	7.90
oxygen		10.60	10.70	10.00
nitrogen		81.80	81.90	82.10
Isokinetic variation	(%)	103.7	103.0	102.1
Part. emission rate	(LB/HR)	1.52	1.34	1.21
Particulate concentration				
actual	(GR/ACF)	.00292	.00260	.00235
standard	(GR/DSCF)	.00628	.00571	.00522

Note: Dry Catch Only

* Federal regulations restrict particulate emissions from portable asphalt plants to .04 GR/DSCF, CFR Title 40, Part 60, Subpart I.

3 RESULTS

The results of all field and laboratory evaluations are presented in this section. Gas composition (Orsat and moisture) are presented first followed by the computer printout of the particulate and opacity results. Preliminary measurements including test port locations are given in the appendices.

The results have been calculated on a personal computer using programs written in Extended BASIC specifically for source testing calculations. EPA-published equations have been used as the basis of the calculation techniques in these programs. The particulate emission rate has been calculated using the product of the concentration times flow method.

3.1 Results of Orsat & Moisture Analyses

Test No. 1
No. 7 Portable Asphalt Plant

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	05-26-93	05-26-93	05-26-93
Dry basis (orsat)			
carbon dioxide.....	7.60	7.40	7.90
oxygen.....	10.60	10.70	10.00
nitrogen.....	81.80	81.90	82.10
Wet basis (orsat)			
carbon dioxide.....	5.04	4.77	5.06
oxygen.....	7.02	6.90	6.41
nitrogen.....	54.20	52.80	52.63
water vapor.....	33.74	35.53	35.89
Dry molecular weight.....	29.64	29.61	29.66
Wet molecular weight.....	25.71	25.49	25.48
Specific gravity.....	0.888	0.880	0.880
Water mass flow.....(LB/HR)	40378	42227	42403
FO	1.355	1.378	1.380

3.2 Results of Particulate Loading Determinations

Test No. 1
No. 7 Portable Asphalt Plant

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	05-26-93	05-26-93	05-26-93
Time run start/end.....(HRS)	830/ 945	1010/1126	1155/1312
Static pressure.....(IN.WC)	-1.70	-1.70	-1.70
Cross sectional area (SQ.FT)	14.38	14.38	14.38
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	404.0	365.0	424.0
desiccant.....(GRAMS)	34.0	90.0	29.0
total.....(GRAMS)	438.0	455.0	453.0
Total particulate material..			
.....collected(grams)	0.2729	0.2311	0.2141
Gas meter coefficient.....	1.0039	1.0039	1.0039
Barometric pressure..(IN.HG)	29.18	29.18	29.18
Avg. orif.pres.drop..(IN.WC)	0.89	0.85	0.80
Avg. gas meter temp..(DEF-F)	71.8	86.5	83.5
Volume through gas meter....			
at meter conditions...(CF)	41.64	41.08	40.04
standard conditions.(DSCF)	40.55	38.93	38.15
Total sampling time....(MIN)	100.00	100.00	100.00
Nozzle diameter.....(IN)	.191	.191	.191
Avg.stack gas temp ..(DEG-F)	270	266	269
Volumetric flow rate.....			
actual.....(ACFM)	60708	60032	59910
dry standard.....(DSCFM)	28266	27315	26997
Isokinetic variation.....(%)	103.7	103.0	102.1
Particulate concentration...			
actual.....(GR/ACF)	0.04833	0.04167	0.03901
dry standard.....(GR/DSCF)	0.10384	0.09161	0.08660
Particle mass rate...(LB/HR)	25.158	21.448	20.041

3.3 Results of Opacity Observations

Test No. 1
No. 7 Asphalt Plant Stack

Results of Opacity Observations ---------- EPA Method 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0.0000	0.00
5	0.0223	45.00
10	0.0458	53.33
15	0.0706	1.67
20	0.0969	0.00
25	0.1249	0.00
30	0.1549	0.00
35	0.1871	0.00
40	0.2219	0.00
45	0.2596	0.00
50	0.3010	0.00
55	0.3468	0.00
60	0.3979	0.00
65	0.4559	0.00
70	0.5229	0.00
75	0.6021	0.00
80	0.6690	0.00
85	0.8239	0.00
90	1.0000	0.00
95	1.3010	0.00
99	2.0000	0.00
Avg Opac 7.83	Avg OD 0.0356	Time average

Observer: Randy Madison
Cert. Date: 04-06-93
Date of Observation: 05-26-93
Time of Observation: 0830-0930

Test No. 2
No. 7 Asphalt Plant Stack

Results of Opacity Observations ---------- EPA Method 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0.0000	0.00
5	0.0223	47.92
10	0.0458	51.25
15	0.0706	0.83
20	0.0969	0.00
25	0.1249	0.00
30	0.1549	0.00
35	0.1871	0.00
40	0.2219	0.00
45	0.2596	0.00
50	0.3010	0.00
55	0.3468	0.00
60	0.3979	0.00
65	0.4559	0.00
70	0.5229	0.00
75	0.6021	0.00
80	0.6690	0.00
85	0.8239	0.00
90	1.0000	0.00
95	1.3010	0.00
99	2.0000	0.00
Avg Opac 7.65	Avg OD 0.0347	Time average

Observer: Randy Madison
Cert. Date: 04-06-93
Date of Observation: 05-26-93
Time of Observation: 1010-1110

Test No. 3
No. 7 Asphalt Plant Stack

Results of Opacity Observations ---------- EPA Method 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0.0000	0.00
5	0.0223	50.83
10	0.0458	49.17
15	0.0706	0.00
20	0.0969	0.00
25	0.1249	0.00
30	0.1549	0.00
35	0.1871	0.00
40	0.2219	0.00
45	0.2596	0.00
50	0.3010	0.00
55	0.3468	0.00
60	0.3979	0.00
65	0.4559	0.00
70	0.5229	0.00
75	0.6021	0.00
80	0.6690	0.00
85	0.8239	0.00
90	1.0000	0.00
95	1.3010	0.00
99	2.0000	0.00
Avg Opac 7.46	Avg OD 0.0339	Time average

Observer: Randy Madison
Cert. Date: 04-06-93
Date of Observation: 05-26-93
Time of Observation: 1200-1300

4 RESULTS OF WASTE OIL AND AGGREGATE ANALYSES

INTERPOLL LABORATORIES, INC.
(612)786-6020

Duininck Company
Sample Log No. 8919-35

Results of Waste Oil Profile

Test: 1
Sample Description: Composite
Sample Type: Waste Oil

Parameter	Units	Method	As Received
Gross heating value	BTU/LB	ASTM D240	141656
Sulfur	%	ASTM D3177	0.57
Ash	%	ASTM D482	0.85
Density	LB/GAL	ASTM D1298	7.4088
Total fluorine	% w/w	EPA SW-846, 9056	0.006
Total chlorine	% w/w	EPA SW-846, 9056	0.03
Total bromine	% w/w	EPA SW-846, 9056	< 0.003
Total lead	% w/w	EPA SW-846, 6010	0.005
Total PCB	mg/Kg	EPA SW-846, 8080	< 1.1

Respectfully submitted,

Jeannie F. O'Neil, Manager
Inorganic Chemistry Group

for Wayne A. Olson, Manager
Organic Chemistry Group

JFO/WAO/sk

INTERPOLL LABORATORIES, INC.
(612)786-6020

Duininck Company
Laboratory Log No. 8919

Results of Moisture Analysis[1]

Log No.	Test/Run	Sample Type	% Moisture
8919-29	Test 1 Run 1	Virgin Aggregate	5.84
8919-30	Test 1 Run 1	Recycle	3.56
8919-31	Test 1 Run 2	Virgin Aggregate	4.03
8919-32	Test 1 Run 2	Recycle	5.77
8919-33	Test 1 Run 3	Virgin Aggregate	6.10
8919-34	Test 1 Run 3	Recycle	4.37

Respectfully submitted,

Jeannie F. O'Neil, Manager
Inorganic Chemistry Group

JFO/sk

[1]Analysis by ASTM Method D3173

APPENDIX A

VOLUMETRIC FLOW RATE DETERMINATION

Test No. 1
No. 7 Portable Asphalt Plant

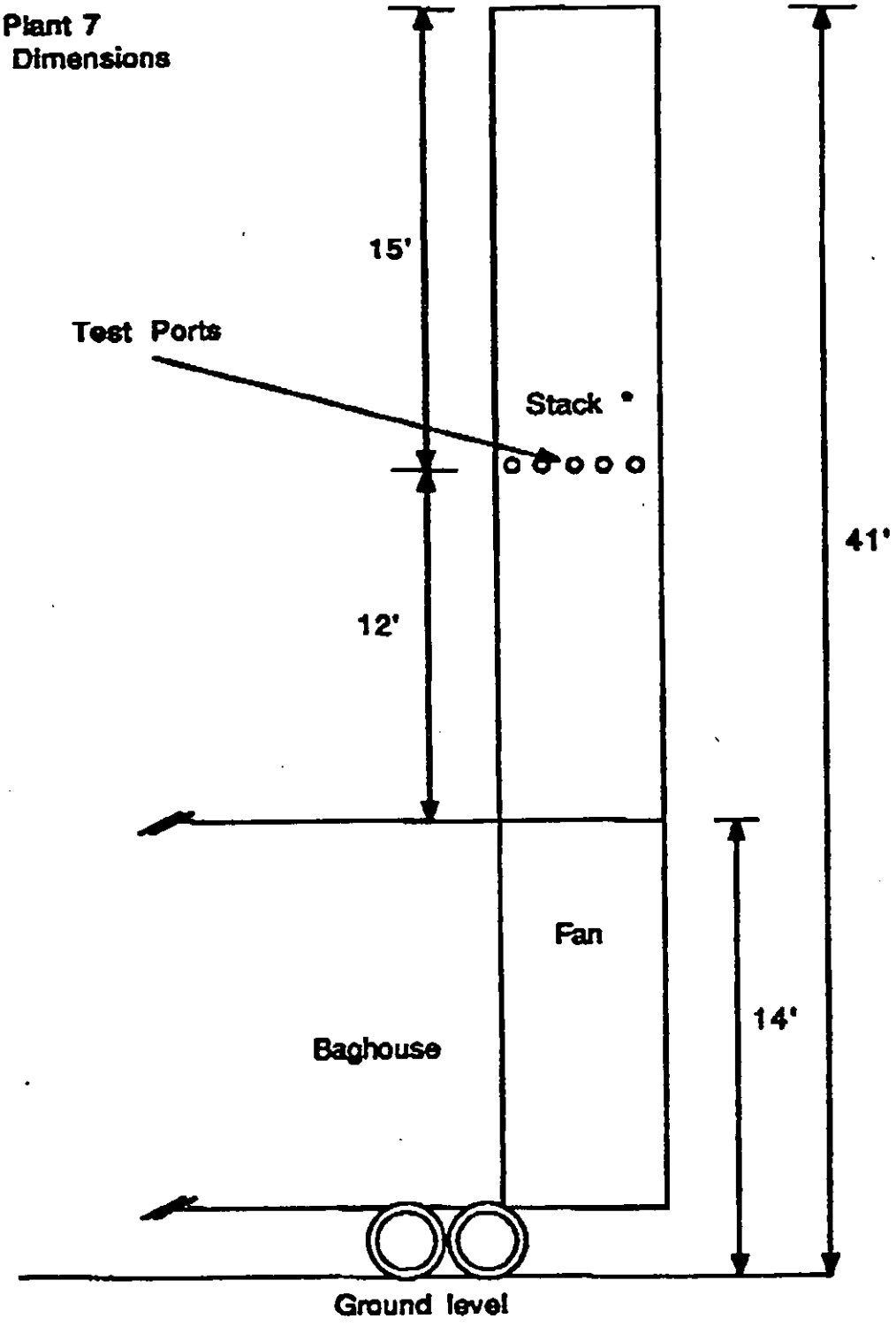
Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	05-26-93
Time of Determination.....(HRS)	745
Barometric pressure.....(IN.HG)	29.18
Pitot tube coefficient.....	.84
Number of sampling ports.....	5
Total number of points.....	25
Shape of duct.....	Rectangular
Duct width.....(IN)	45
Duct length.....(IN)	46
Duct area.....(SQ.FT)	14.38
Direction of flow.....	UP
Static pressure.....(IN.WC)	-1.7
Avg. gas temp.....(DEG-F)	270
Moisture content.....(% V/V)	33.74
Avg. linear velocity.....(FT/SEC)	56.5
Gas density.....(LB/ACF)	.04690
Molecular weight.....(LB/LBMOLE)	29.64
Mass flow of gas.....(LB/HR)	137060
Volumetric flow rate.....	
actual.....(ACFM)	48707
dry standard.....(DSCFM)	22667

APPENDIX B

LOCATION OF TEST PORTS

DBI - Plant 7
Stack Dimensions



*Note: Test ports face toward the front of the BH. ←

APPENDIX E

ASPHALT PLANT OPERATING DATA

APPENDIX F

PROCEDURES

Particulate Loadings and Emission Rates

The particulate emission rates were determined per EPA Methods 1-5, CFR title 40, Part 60, Appendix A (revised July 1, 1987). In this procedure, a preliminary velocity profile of the gases in the flue is obtained by means of a temperature and velocity traverse. On the basis of these values, sampling nozzles of appropriate diameter are selected to allow isokinetic sampling, a necessary prerequisite for obtaining a representative sample.

The sampling train consists of a heated glass-lined sampling probe equipped with a Type S pitot and a thermocouple. The probe is attached to a sampling module which houses the all-glass in line filter holder in a temperature controlled oven. In addition, the sampling module also houses the impinger case and a Drierite drying column. The sampling module is connected by means of an umbilical cord to the control module which houses the dry test gasmeter, the calibrated orifice, a leakless pump, two inclined manometers, and all controls required for operating the sampling train.

Particulate samples were collected as follows: The sample gas was drawn in through the sampling probe isokinetically and passed through a 4-inch diameter Gelman Type A/E glass fiber filter. The particulates were removed at this point and collected on the filter. The gases then passed through an ice-cooled impinger train and a desiccant-packed drying column which quantitatively absorb all moisture from the sample gas stream after which the sample gas passes through the pump and the dry test gasmeter which integrates the sample gas flow throughout the course of the test. A calibrated orifice attached to the outlet of the gasmeter provides instantaneous flow rate data.

A representative particulate sample was acquired by sampling for equal periods of time at the centroid of a number of equal area regions in the duct. The sampling rate is adjusted at each site such that an isokinetic sampling condition prevails. Nomographs are used to aid in the rapid determination of the sampling rate.

After sampling is complete, the filter is removed and placed in a clean container. The nozzle and inlet side of the filter holder are quantitatively washed with acetone and the washings are stored in a second container. A brush is often used in the cleaning step to help dislodge deposits. The samples are returned to the laboratory where they are logged in and analyzed. The volume of the acetone rinse ("probe wash") is noted and then the rinse is quantitatively transferred to a tared 120 cc porcelain evaporating dish and the acetone evaporated off at 97-105 °F. This temperature is used to prevent condensation of atmospheric moisture due to the cooling effect induced by the evaporation of acetone. The acetone-free sample is then transferred to an oven and dried at 105 °C for 30 minutes, cooled in a desiccator over Drierite, and then weighed to the nearest .01 mg. The filter sample is quantitatively transferred to a 6-inch watch glass and dried in an oven at 105 °C for two hours. The filter and watch glass are then cooled in a desiccator and the filter weighed to the nearest .01 mg. All weighings are performed in a balance room where the relative humidity is hydrostatted to less than 50% relative humidity. Microscopic examination of the samples is performed if any unusual characteristics are observed. The weight of the acetone rinse is corrected for the acetone blank. The Drierite column is weighed on-site and the water collected by Drierite is added to the condensate so that the total amount of absorbed water may be ascertained.

Integrated flue gas samples for Orsat analysis were collected simultaneously from the stack and from the breeching at the inlet to the wet scrubber. The samples were collected in 15-liter gas sampling bags at a constant flow rate throughout each particulate run. The bags were then returned to the laboratory and analyzed by Orsat analysis. Standard commercially prepared solutions were used in the Orsat analyzer (sat. KOH for carbon dioxide and reduced methylene blue for oxygen).

Interpoll Laboratories
(612)786-6020

Condensible Organic Compounds Analysis

(State of Minnesota - MPCA Exhibit C)

Method II-8672-MN

Equipment: Separatory funnel - 500 cc with Teflon stopcock

Powder funnel - 75 mm ID with a 17 mm stem

Evaporating dish(es) - 200 cc or 250 cc beaker

Reagents: Diethyl ether - reagent grade

Chloroform - reagent grade

Sodium sulfate - (ACS) granular anhydrous

Toluene - (if 3% hydrogen peroxide is used to collect the samples)

Glass wool (Pyrex microfiber)

PREPARATION

1. Place 1 kg of granular anhydrous sodium sulfate in a shallow tray and heat to 200 ^{o}C for at least four hours. Store in a tightly sealed glass container.

2. Place a plug of clean glass wool in the stem of the powder funnel. The plug must be of sufficient size so that it is held snuggly in place by its own pressure. Add a one-inch layer of dry sodium sulfate.

SAMPLING

An all-glass impinger assembly is used in the back half of the EPA Method 5 sampling train when an organic wet catch is to be collected. The impinger assembly consists of a modified impinger, a Greenburg Smith impinger followed by another modified impinger. The third impinger should have a temperature measuring device at the outlet upstream of a final impinger or desiccant column to monitor the temperature of the outlet gas stream. Prior to the start of the test, each of the first two impingers should be charged with 100 g of Class I water. The Method 5 train should be operated as provided for in EPA Method 5. Ice should be added to the impinger bath to keep the temperature of the gas at the outlet at or less than 68 ^{o}F. After the post test leak check, the impinger train is removed and impinger contents poured into a tared all-glass sample bottle and closed with a Teflon-lined cap. The sample bottle is then weighed and the total condensate calculated by subtraction of the bottle tare weight and the weight of initial water added to the impingers (200 g). A label is affixed and the sample is returned to the laboratory for analysis. The sample should be stored at 4 ^{o}C if the analysis is not conducted within 48 hours.

ANALYSIS

I. Organics

Caution! Work in vented hood!!!

A. Organic Blank Determination

1. Pour 125 mL of ethyl ether and 125 mL of chloroform into a tared beaker.
2. Evaporate solvent in hood at 70 °F or less until no solvent remains.
3. Desiccate the sample in dish for two hours.
4. Weigh the sample to nearest 0.1 mg, record and report on Form LSC-036.

B. Organic Sample Determination

1. Test for peroxide in sample ether using KI strips. (If KI strip shows positive, contact *your supervisor before* proceeding.)
2. Transfer the sample solution quantitatively to a 500 mL separatory funnel. Use the first of three 25 mL chloroform aliquots to rinse the sample container.
3. Extract with three 25 mL portions of chloroform. (Shake and vent to release pressure about 4 to 5 times each.) Allow the phases to separate. (Bottom layer is chloroform.) Draw off the bottom layer, transferring the solvent with a funnel containing a plug of sodium sulfate into a tared beaker. (Do not draw off any of the aqueous layer.)

4. After the three chloroform extractions, use two 25 mL portions of chloroform to rinse the sodium sulfate, collecting the rinses in the same tared beaker as the extracts.

5. Next extract the sample three times with 25 mL aliquots of ethyl ether. (Shake and vent to release pressure about 4 to 5 times each.) Allow the phases to separate. (Top layer is ethyl ether.) Draw off the bottom layer (aqueous) into another separatory funnel taking less than 1 mL of the ethyl ether layer with. Decant the ethyl ether, passing it through sodium sulfate and collecting the ethyl ether in the same tared dish as the chloroform.

6. After the three ethyl ether extractions, take two 25 mL portions of ethyl ether and rinse the sodium sulfate collecting the rinses in the same tared beaker as the extracts.

7. Evaporate the solvents (chloroform and ethyl ether) in the tared beaker in the hood at 70 ^{o}F or less until no solvent remains. (Use no heat and have no sources of ignition in the hood when doing this procedure.) Do not evaporate so quickly as to allow evaporative cooling to lower the temperature of the container below the dew point of water, otherwise, water will be condensed out in the container.

8. Desiccate to constant weight (two hours). Record and report the final weight to the nearest 0.1 mg on Form LSC-036.

II. Inorganics

If inorganic residue information is required, the following procedure should be conducted:

A. Inorganic Blank Determination

1. Vent the remaining aqueous phase from the organic extraction in the hood to remove residual organic solvents (usually overnight).
2. Decant the impinger catch into a tared evaporating dish.
3. Evaporate all of the water in the sample in an oven at 100 ^{o}C. Take care not to boil to prevent bumping and loss of sample.
4. Cool the dried sample in the desiccator and desiccate until a constant weight is obtained.
5. Report the results to the nearest 0.1 mg on Form LSC-036.

B. Inorganic Sample Determination

Follow steps 1-5 in Section A above.

NOTES

1. For the organics determination, in the rare event that the impinger catch resulted from a Modified Method 6 determination (SO_2), whereby the solution contains dilute hydrogen peroxide ($\geq$ 3%), do not use ether as an extraction solvent. Substitute toluene for ethyl ether in Section I. (Ether in the presence of peroxide forms explosive hydroperoxide.)

2. In the organics determination, more than three extractions may be required to extract all of the organics. Additional extractions should be performed if the aqueous phase is still cloudy.

3. Special state requirements:

   Michigan - Total sample evaporated in tared evaporating dish on steam bath.

   Iowa - Organics and inorganics separately, as required.

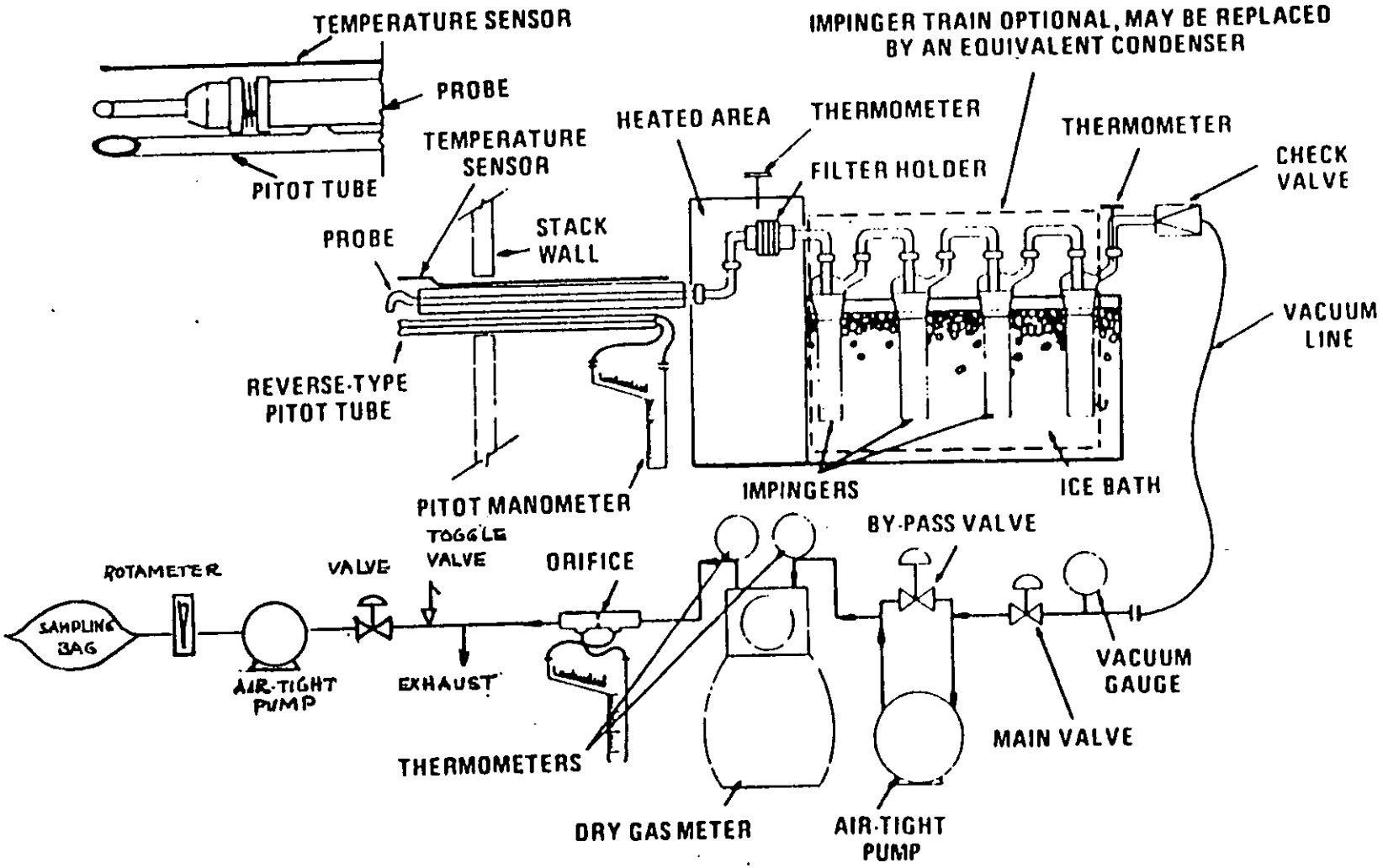
   Wisconsin - Use Method II-8672-WI.

   Rest of states - Organics only.

REFERENCES

Proposed Standards of Performance for New Stationary Sources, Federal Register 36(159) Part II, August 1, 1979.

Minnesota Pollution Control Agency, Exhibit C.



Particulate-sampling train.

Asphalt Plant Operating Conditions During Stack Testing

Rev/YH/93

Test Date(s) 5-26-93

Plant Mfr. & Model Barber Green

Type (circle one): (Drum Mix) Conventional
Other (list): _____

Pollution Control Equipment: (Baghouse) Venturi Scrubber wet scrubber cyclone multiclone
(circle one)
If wet scrubbing: _____% scrubber water recycled
List model: _____
Normal pressure drop across control equipment: 6.0 inches water
Air flow through control equipment: 85000 acfm at _____F
Was control equipment operating normally during testing? Yes
Date & procedures of last maintenance/cleaning of control equipment _____

Fuel:
Itemize all fuels and materials added to the combustion process during the test period. List fuel type used during testing (if oil, specify grade) _____. If other units of measure are used, specify and calculate appropriate heat input.

Test No.	Fuel Input (Gal/hr)	BTU/GAL (as received)	Heat Input (BTU/HR)	%Moisture (as received in aggregate) Virgin	recycle	combined
Run 1						
Run 2						
Run 3						

s the above fuel substantially the highest sulfur containing fuel normally burned? _____
Production specific fuel usage: (circle one) measured or calculated: _____cubic foot/ ton hot mix
_____gal/ton hot mix
lo. of Burners: _____ Burner(s) rating: _____ MMBTU/HR=100% setting

Operation:

time 15 min. intervals	burner setting %	aggregate tons per hour	recycle tons per hour	asphalt tons per hour	Drum Mix temp. F	dust collector pressure drop inches water	scrubber water flow rate gpm	Other (list)
8:30	75	254	227	14.7	265	6.0	—	
8:45	78	246	232	14.6	268	6.0	—	
9:00	78	246	234	14.3	268	6.3	—	
9:15	77	249	234	14.3	269	6.0	—	
930	73	246	233	14.4	261	6.0	—	
9:45	67	244	230	14.4	264	6.0	—	
10:15	69	248	230	14.3	261	6.2	—	
10:30	72	249	246	14.8	256	6.1		
10:45	68	248	244	14.5	261	6.1		
11:00	71	262	246	15.3	258	5.9		
11:15	78	272	243	15.7	260	6.1		
11:30	88	276	244	15.8	258	6.2		

Plant Operater's Certification: I certify that the information submitted herein is accurate and correct and that no information requested was withheld from the Division Manager.

By: Jon Beer, Phone: (612) 978-6011

Position: Plant operator

Note: All information required must be completed and submitted as part of the performance test. Failure to submit the required information will result in an incomplete performance test report.

Asphalt Plant Operating Conditions During Stack Testing

Rev/YH/93

Test Date(s) _____

Plant Mfr. & Model _____ Type (circle one): Drum Mix Conventional
Other (list): _____

Pollution Control Equipment: Baghouse Venturi Scrubber wet scrubber cyclone multiclone
(circle one)
If wet scrubbing: _____% scrubber water recycled
List model: _____ Normal pressure drop across control equipment: _____inches water
Air flow through control equipment: _____ acfm at _____F Was control equipment operating normally during testing? _____
Date & procedures of last maintenance/cleaning of control equipment _____

Fuel:
Itemize all fuels and materials added to the combustion process during the test period. List fuel type used during testing (if oil, specify grade) _____. If other units of measure are used, specify and calculate appropriate heat input.

Test No.___	Fuel Input (Gal/hr)	BTU/GAL (as received)	Heat Input (BTU/HR)	%Moisture (as received in aggregate) Virgin	recycle	combined
Run 1						
Run 2						
Run 3						

Is the above fuel substantially the highest sulfur containing fuel normally burned? _____
Production specific fuel usage: (circle one) measured or calculated: _____cubic foot/ ton hot mix
_____gal/ton hot mix

No. of Burners: _____ Burner(s) rating: _____ MMBTU/HR = 100% setting

Operation:

time 15 min. intervals	burner setting %	aggregate tons per hour	recycle tons per hour	asphalt tons per hour	Drum Mix temp. F	dust collector pressure drop inches water	scrubber water flow rate gpm	Other (list)
1200	83	271	237	15.9	263	5.9	———	
1215	91	268	250	15.6	257	5.9		
1230	83	259	222	14.6	272	6.0		
1245	71	271	243	15.8	248	5.8		
100	85	293	257	15.5	256	6.0		

Plant Operator's Certification: I certify that the information submitted herein is accurate and correct and that no information requested was withheld from the Division Manager.

By: _____, Phone: (_____)_____

Position: _____

Note: All information required must be completed and submitted as part of the performance test. Failure to submit the required information will result in an incomplete performance test report.

APPENDIX G

CALCULATION EQUATIONS

CALCULATION EQUATIONS

METHOD 2

$$\bar{V}_s = 85.48\ C_p\ (\sqrt{\Delta p})_{avg}\ \sqrt{\frac{T_{s(avg)}}{P_s\ M_s}}$$

$$Q_{s,d} = 60(1 - B_{ws})\ \bar{V}_s\ A\ \left(\frac{528}{T_{s(avg)}}\right)\ \left(\frac{P_s}{29.92}\right)$$

$$Q_a = 60\ \bar{V}_s\ A$$

$$\dot{m}_g = \frac{4.995\ Q_{s,d}\ G_d}{1 - B_{ws}}$$

$$RH^* = 100\ (vp_{twb}\ 0.0003641\ P_s\ (T_{db} - T_{wb}))/vp_{tdb}$$

$$B^*_{ws} = RH(vp_{tdb})/P_s$$

$$= \frac{4.585 \times 10^{-2}\ P_s M_s}{T_{s\ (avg)}}$$

*Alternate equations for calculating moisture content from wet bulb and dry buld data.

SYMBOLS

A = Cross sectional area of stack, SQ. FT.

A_n = Cross sectional area of nozzle, SQ. FT.

B_{ws} = Water vapor in gas stream, proportion by volume

C_p = Pitot tube coefficient, dimensionless

C_a = Concentration of particulate matter in stack gas, wet basis, GR/ACF

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, GR/DSCF

EA = Excess air, percent by volume

γ = Dry test meter correction factor, dimensionless

G_d = Specific gravity (relative to air), dimensionless

I = Isokinetic variation, percent by volume

M_d = Molecular weight of stack gas, dry basis, g/g - mole.

$\dot{m}_g$ = Mass flow of wet flue gas, LB/HR

$\dot{m}_p$ = Particulate mass flow, LB/HR

M_s = Molecular weight of stack gas, wet basis, g/g, mole.

M_p = Total amount of particulate matter collected, g

P_{bar} = Atmospheric pressure, IN. HG. (uncompensated)

P_g = Stack static gas pressure, IN. WC.

P_s = Absolute pressure of stack gas, IN.HG.

P_{std} = Standard absolute pressure, 29.92 IN. HG.

A_a = Actual volumetric stack gas flow rate, ACFM

$Q_{s,d}$ = Dry volumetric stack gas flow rate corrected to standard conditions, DSCFM

RH = Relative humidity, %

T_{db} = Dry bulb temperature of stack gas, ^{o}F

T_{wb} = Wet bulb temperature of stack gas, ^{o}F

$T_{m(avg)}$ = Absolute average dry gas meter temperature, ^{o}R

$T_{s(avg)}$ = Absolute average stack temperature, ^{o}F

T_{std} = Standard absolute temperature, 528 ^{o}F (68 ^{o}F)

θ = Total sampling time, min.

V_{lc} = Total volume of liquid collected in impingers and silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, CF

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter corrected to standard conditions, DSCF

$V_{w(std)}$ = Volume of water vapor in the gas sample corrected to standard conditions, SCF

$\bar{V}_s$ = Average actual stack gas velocity, FT/SEC

vP_{tdb} = Vapor pressure at T_{db}, IN. HG.

vp_{twb} = Vapor pressure at T_{wb}, IN. HG

$\overline{\Delta H}$ = Average pressure differential across the orifice meter, IN. WC.

ΔP = Velocity pressure of stack gas, IN. WC.

γ = Dry test meter correction coefficient, dimensionless

ρ = Actual gas density, LB/ACF

CALCULATION EQUATIONS

METHOD 3

$$\%EA = \frac{100(\%O_2 -).5\%\ CO)}{0.264\%\ N_2 - \%O_2 + 0.5\%\ CO}$$

$$M_d = 0.44(\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

$$M_s = M_d\ (I - B_{ws}) + 0.18\ B_{ws}$$

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

CALCULATION EQUATIONS

METHOD 5

$$V_{m(std)} = 17.65\ V_m\ Y\ \left(\frac{P_{bar} + \overline{\Delta H}/13.6}{T_{m(avg)}}\right)$$

$$V_{w(std)} = 0.0472\ V_{Is}$$

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

$$I = 0.0944\ \left(\frac{T_{s(avg)}\ V_{m(std)}}{p_s\ V_s\ A_n\ \theta\ (1 - B_{ws})}\right)$$

$$C_s = \frac{15.43\ M_p}{V_{m(std)}}$$

$$C_a = \frac{272.3\ M_p\ P_s}{T_{s(avg)}\ (V_{w(std)} + V_{m(std)})}$$

$$(\dot{m}_p)_1 = 8.5714 \times 10^{-3}\ C_s\ Q_{s,d}$$

$$(\dot{m}_p)_2 = \frac{1.3228 \times 10^{-1}\ M_p\ A}{\theta\ A_n}$$

$$\dot{m}_p = \frac{(\dot{m}_p)_1 + (\dot{m}_p)_2}{2}$$

SYMBOLS

A = Cross sectional area of stack, SQ. FT.

A_n = Cross sectional area of nozzle, SQ. FT.

B_{ws} = Water vapor in gas stream, proportion by volume

C_p = Pitot tube coefficient, dimensionless

C_a = Concentration of particulate matter in stack gas, wet basis, GR/ACF

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, GR/DSCF

EA = Excess air, percent by volume

γ = Dry test meter correction factor, dimensionless

G_d = Specific gravity (relative to air), dimensionless

I = Isokinetic variation, percent by volume

M_d = Molecular weight of stack gas, dry basis, g/g - mole.

$\dot{m}_g$ = Mass flow of wet flue gas, LB/HR

$\dot{m}_p$ = Particulate mass flow, LB/HR

M_s = Molecular weight of stack gas, wet basis, g/g, mole.

M_p = Total amount of particulate matter collected, g

P_{bar} = Atmospheric pressure, IN. HG. (uncompensated)

P_g = Stack static gas pressure, IN. WC.

P_s = Absolute pressure of stack gas, IN.HG.

P_{std} = Standard absolute pressure, 29.92 IN. HG.

A_a = Actual volumetric stack gas flow rate, ACFM

$Q_{s,d}$ = Dry volumetric stack gas flow rate corrected to standard conditions, DSCFM

RH = Relative humidity, %

T_{db} = Dry bulb temperature of stack gas, ^{o}F

T_{wb} = Wet bulb temperature of stack gas, ^{o}F

$T_{m(avg)}$ = Absolute average dry gas meter temperature, ^{o}R

$T_{s}(avg)$ = Absolute average stack temperature, ^{o}F

T_{std} = Standard absolute temperature, 528 ^{o}F (68 ^{o}F)

θ = Total sampling time, min.

V_{lc} = Total volume of liquid collected in impingers and silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, CF

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter corrected to standard conditions, DSCF

$V_{w(std)}$ = Volume of water vapor in the gas sample corrected to standard conditions, SCF

$\overline{V}_s$ = Average actual stack gas velocity, FT/SEC

vP_{tdb} = Vapor pressure at T_{db}, IN. HG.

VP_{twb} = Vapor pressure at T_{wb}, IN. HG

$\overline{\Delta H}$ = Average pressure differential across the orifice meter, IN. WC.

ΔP = Velocity pressure of stack gas, IN. WC.

γ = Dry test meter correction coefficient, dimensionless

ρ = Actual gas density, LB/ACF

APPENDIX H

SAMPLING TRAIN CALIBRATION DATA

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job Dupuinck Co 8919 Date 5-25-93

Operator B Aschenbach Module No. 2

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.15 in. Hg. τ = 1.0039 ^H@ 1.74 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(446.00)	[redacted]	
2.5	447.86	54	52
5.0	449.71	56	52
7.5	451.57	59	53
10	453.425	62	53
[redacted]	V_m= 7.425	Avg(t_m)= 55.125 °F	

0733 05

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\tau\ V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(1.0039)(7.425)}\left[\frac{(55.125) + 460}{(29.15)}\right]^{0.5}$$

$$Y_{cn} = 1.0072$$

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: May 28, 1993

Meter Box No. : 2 (Rockwell Dry Test Meter Serial No. 964549)

Date of Last Calibration: May 21, 1993
Calibration Technician: E. Trowbridge
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
May 25, 1993	3-8919	446.00	660.44	214.44	214.44

* Total volume through meter since last calibration.

Date 5-21-93

Bar. Press. 29.03 in. Hg

INTERPOLL LABORATORIES, INC.
METER CALIBRATION SHEET
EPA METHOD 5

Control Module No. K
Serial No. DTM 964549
Wet Test Meter No. AL-20
Technician [signature]

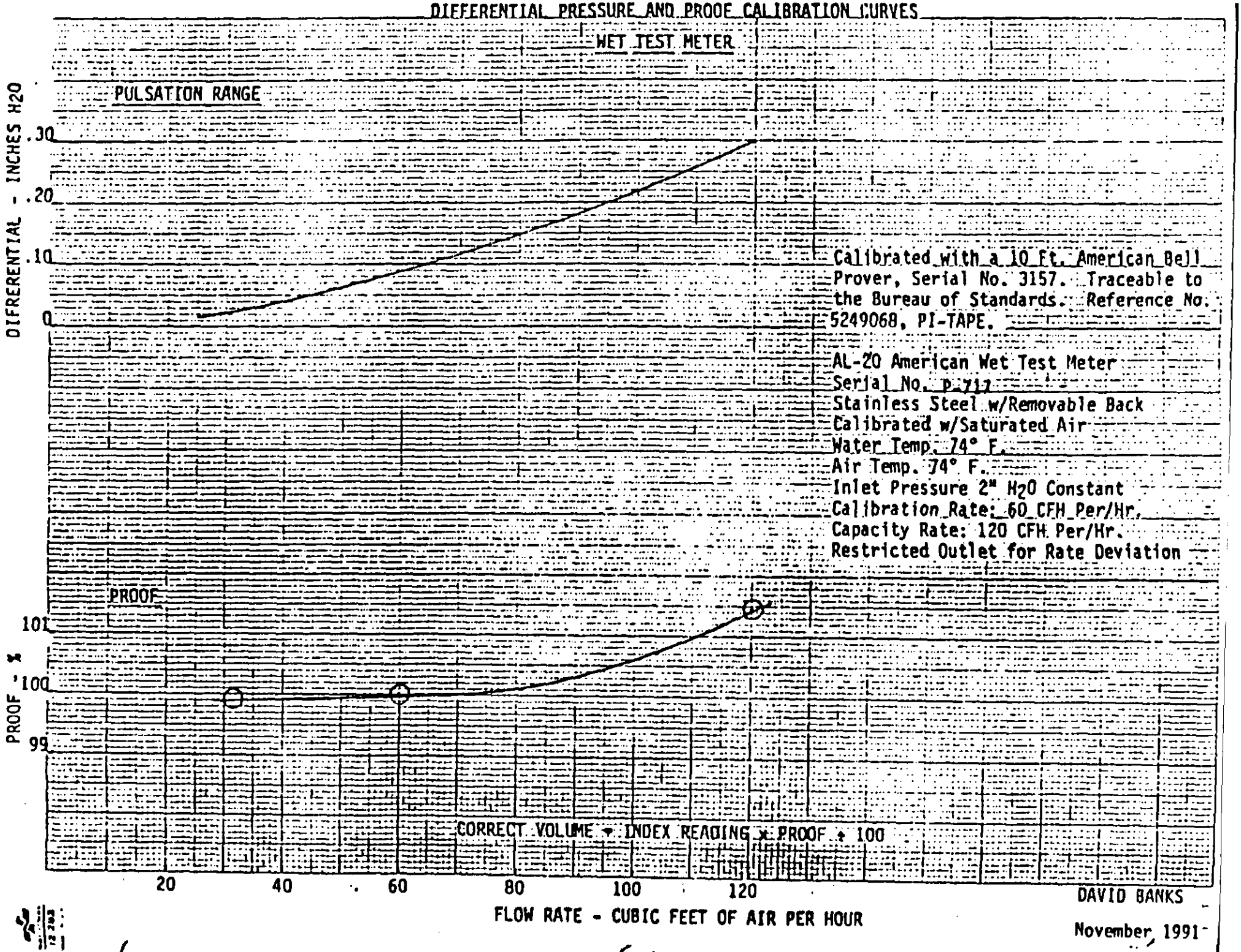
ΔH (in. WC)		Gas Volume Wet Test Meter (ft^3)	* Cal. Index ♦ (%)	* Diff. Wet Test Meter ΔP_w (in. WC)	Gas Volume Dry test meter (ft^3)		Gas temperatures			Time θ (min/sec)	Meter Coeff. Y	Orifice Const. ΔH@	C_f
							Wet Test	Dry Test					
nominal	actual				V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{do} (°F)				
0.5	.5	2	99.85	0.01	413.500	415.552	68	80	74	4/54	.9982	1.71	
1.2	1.2	3	99.91	0.025	410.000	415.030	68	78	74	4/43	1.0010	1.69	
2.0	2.0	3	99.93	0.055	416.000	419.038	68	86	75	3/45	1.0049	1.76	
3.3	3.3	5	100.00	0.09	419.500	424.588	68	90	75	4/52	1.0006	1.75	
4.7	4.7	5	100.02	0.12	425.000	430.045	68	90	76	4/08	1.0007	1.80	
											1.0039	1.74	
8	8	6	6	6	7		8	8	10	11111			

Positive leak check performed by ET
Meter was in tolerance ☒
Meter was not in tolerance ☐; readjusted linkage
Meter was not in tolerance ☐; changed dry test meters

Approved by [signature] Date 5/27/93

* Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

S0102RR 11/91


DIFFERENTIAL PRESSURE AND PROOF CALIBRATION CURVES
WET TEST METER
PULSATION RANGE
DIFFERENTIAL - INCHES H20
.30
.20
.10
0
Calibrated with a 10 Ft. American Bell Prover, Serial No. 3157. Traceable to the Bureau of Standards. Reference No. 5249068, PI-TAPE.
AL-20 American Wet Test Meter
Serial No. P.711
Stainless Steel w/Removable Back
Calibrated w/Saturated Air
Water Temp. 74° F.
Air Temp. 74° F.
Inlet Pressure 2" H2O Constant
Calibration Rate: 60 CFH Per/Hr.
Capacity Rate: 120 CFH Per/Hr.
Restricted Outlet for Rate Deviation
PROOF
101
100
99
PROOF - %
CORRECT VOLUME = INDEX READING x PROOF ÷ 100
20
40
60
80
100
120
FLOW RATE - CUBIC FEET OF AIR PER HOUR
DAVID BANKS
November 1991

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 5-25-93 Nozzle Number 9-3
Technician: Bob Aschenbach

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.191
2	.192
3	.191
Average:	.191

Interpoll Laboratories, Inc.

Temperature Measurement Device Calibration Sheet

Unit under test: #16

Vendor FLUKE

Model 51 Serial Number 5220-20

Range -328°F to 2498°F °F Thermocouple Type K TYPE

Date of Calibration 4-3-93 Technician BOB A

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

■ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0	0	-0.6	-.6	-.13
100	100	98.6	1.4	.35
200	200	201.0	1.0	.15
300	300	299.4	.6	.07
400	400	399.0	1.0	.11
500	500	499.2	.8	.08
600	600	601.0	1.0	.09
700	700	698.8	1.2	.10
800	800	800.6	.6	.04
900	900	898.8	1.2	.08
1000	1000	1000.6	-.6	.04
1100	1100	1100	0	0
1200	1200	1202.8	2.8	.17
1300	1300	1299.4	.6	.03
1400	1400	1402.4	2.4	.13
1500	1500	1500.2	.2	.01
1600	1600	1601.2	1.2	.06
1700	1700	1700.2	.2	.009
1800	1800	1801.6	1.6	.07
1900	1900	1898.8	1.2	.05
2000	2000	2000.6	.6	.02
2100	2100	2097.8	2.2	.09
		Averages:	1.05	.069

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

■ Unit in tolerance

▱ Unit was not in tolerance: recalibrated - See new calibration sheet.

S-8??

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 31-4

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" 0
9. W <.0625" .01

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .755 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 4-8-93

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348
4-7-93 G:\STACK\WP\FORMS\S-348

INTERPOLL LABORATORIES
(612)786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 4-8-93

Technician BOB A

Mercury Column Barometer No. CAB

Aneroid Barometer No. 10723029

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
28.87	74°	.117	28.753	28.750	.003

Has this barometer shown any consistent problems with calibration? Yes (No) If yes, explain. _____

Has problem been alleviated? Yes/No. How? _____

*Note:

Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20-30 minutes before calibrating. Aneriod barometer will be calibrated to the adjusted mercury barometer readings.

S-312

APPENDIX I

MPCA TEST PLAN

Minnesota Pollution Control Agency

May 19, 1993

Mr. Chris Duininck
Duininck Brothers Inc.
P.O. Box 208
Prinsburg, Minnesota 56281

Dear Mr. Duininck:

RE: Performance Stack Testing Protocol, and Test Plan

This letter is written as the result of your notice on May 3, 1993, for the upcoming compliance test at your facility.

Enclosed are copies of the test plan, protocol, and Exhibit C, which must be included in the test report. It is the responsibility of the Permittee to submit one copy of the test report on or before the due date. Please discuss the enclosures with your consultant. A copy of Exhibit D has also been included for your reference.

At this time, the Company must submit a schematic of port locations for the proposed testing site. Dimensions must be clearly marked and labeled. Distances above and below port locations should be included.

If you have any questions or corrections regarding the contents of this letter, please contact me at (612)296-7513.

Sincerely,

Yolanda Hernandez

for Thomas G. Kosevich
Compliance Determination Unit
Compliance and Enforcement Section
Air Quality Division

TGK:mlp4201

Enclosure

cc: Steve Sommer, Marshall Regional Office
Edward Hoefs, AQD
AQD File No. 79C

520 Lafayette Rd.; St. Paul, MN 55155-4194; (612) 296-6300; Regional Offices: Duluth • Brainerd • Detroit Lakes • Marshall • Rochester

Minnesota Pollution Control Agency
Division of Air Quality
Stack Testing Protocol

The folloving is a summary of the testing requirements for the facility owned by Duininck Brothers Inc.:

I. Test Methods

A. EPA Method 1 for the location of sampling ports and points. Location of the sampling ports must be approved before the test.

Check for cyclonic flow must be done whenever there is a cyclonic type of device directly upstream of the sampling location. Correction of cyclonic flow by straightening vanes must also be verified by checking the cyclonic flow before the test.

If the location does not meet the minimum requirements in Method 1, the testing firm must conduct the flov pattern evaluation and testing according to the alternative procedures in part 2.5 of EPA Method 1 (Three-dimensional directional probe).

B. EPA Method 2 for velocity and volumetric flow rate. Three determinations: one measurement concurrently with each test run for pollutant.

C. EPA Method 3 for gas analysis. Three determinations: one measurement on an integrated sample taken concurrently with each test run for pollutant.

D. EPA Method 4 for the determination of moisture in the flue gases. Three determinations: one measurement concurrently with each test for pollutant.

E. EPA Method 5 as amended in Exhibit C and Minn. Rules 7005.0500 for the determination of particulate matter emissions. Three one-hour determinations are required. The sampling time for each run must be at least 60 minutes and the sampling rate must be at least 0.9 dscm/hr (0.53 dscf/min). Report the results as dry catch only, and wet and dry catch separately.

F. EPA Method 9 for the determination of visible emissions as amended in Minn. Rules part 7005.1860. Three hours of opacity readings are required for initial compliance.

AQD File No.: 79C

NOTE: The protocol, testplan, and information required in Exhibit C shall be submitted as part of the performance test report. Please note the new Asphalt Plant Operating Conditions During Stack Testing Sheet.

TEST PLAN FOR ASPHALT PLANTS

I. GENERAL INFORMATION

Permittee: Duininck Brothers Inc.
Permittee's Contact Person and Telephone Number: Chris Duininck (612)978-6011
Permittee's Mailing Address:

DAQ File No. 79C

MPCA Permitting Engineer: Edward Hoefs

Applicable Regulations for each Source Tested (be specific): 40 CFR Subp. I

Reason for Testing: Compliance Demonstration

Is this Test for Initial Compliance Demonstration: Yes

Dravings Showing Location of Sampling Ports Included: No

Location of the Plant at the Time of the Test:

Date When Test Plan was Discussed and Agreed Upon With the Permittee, or Pretest Meeting Needed:

II. NOTIFICATION REQUIREMENTS:

The Permittee must contact the Agency at least two weeks before the scheduled test to have a pretest meeting and obtain all necessary approvals.

It is very important to allow at least two weeks before the test to review the testing requirements in order to avoid last minute cancellations due to inadequate testing conditions.

Among the potential problems that may need to be solved before the test are:

1. Unsuitable location of sampling ports. The stack may need to be extended and/or straightening vanes be installed.
2. Permittee must schedule the test at a time when the plant can be operated at 100 percent of rated capacity, and at maximum recycle rate if applicable.
3. Permittee must be ready to burn specified fuel.
4. Permittee may have to install pressure drop taps and gauges, as well as water flow rate measuring devices.
5. Permittee may have to install sampling taps on the fuel feeding line to the burner.

III. TEST PLAN

The following is the test plan developed for

A. Emission Point(s) to be Tested: (specify plant maker and model)

B. Parameters to be Tested at Each Emission Point: PM and Opacity

C. Fuel Sampling and Analysis. (Fuel oils and used oil)

This is part of the compliance demonstration requirements. Please note that the test report will not be accepted without complete submittal of fuel analysis results of samples taken at the time of the test.

1. Sampling. One tap sample per particulate test run must be taken. The sample must be taken as close as possible to the burner,(somewhere in feeding line) to be representative of the fuel burned at the time of the test. The sample may be taken in a pint-size clean container, and according to the procedures in ASTM Method D 270-2546. Mix the three samples taken into a composite.

2. Analysis. The composite must be analyzed for: (Exhibit D)

Parameter	Method	Fuels
Gross heating value, BTU/gal	ASTM-240	All fuel oils and used oil
Sulfur, % by weight	ASTM D-1552	All fuel oils and used oil
Ash, % by weight	ASTM D-874	All fuel oils and used oil
Specific gravity	ASTM D-1298	All fuel oils and used oil
Lead, % by weight	ASTM D-2788	Used oil
PCB, ppm by weight	EPA-600/4-81-045	Used oil
Halogens, ppm by weight	ASTM D-1317 or ASTM D-808	Used oil
Acidity, pH	ASTM D-1093	Used oil
Flash point, degrees Fahrenheit	ASTM D-93	Used oil

D. Moisture Content in the Virgin and Recycle Aggregate.

1. Take two samples of each: the virgin and recycle aggregate per test run of particulates. Sample must be taken as close as possible to the feeding conveyer and during the corresponding run. Mix samples of virgin aggregate with the samples of recycle material in the same proportion as they enter the dryer, this will give one composite recycle/virgin sample per test run.

2. Perform one analysis of moisture content in each composite recycle/virgin aggregate sample as per ASTM or other recognized methodologies. A total of three analysis shall be performed, one per test run for particulates.

D. Moisture Content in the Virgin Aggregate

1. Take two samples the virgin aggregate per test run of particulates. Sample must be taken as close as possible to the feeding conveyer and during the corresponding run. Mix the two samples of virgin aggregate, this will give one composite sample per test run.

2. Perform one analysis of moisture content in each composite sample as per ASTM or other recognized methodologies. A total of three analysis shall be performed, one per test run for particulates.

E. Operating Conditions During the Test

1. Operation must be at 100 percent of design capacity at the existing aggregate moisture content - no deliberate reduction of feed rate or fan speed during testing, except for nominal damper adjustment for proper combustion. - The test report must include copies of the manufacturer's specifications that define the design capacity of the plant as a function of the moisture content of the aggregate.

2. Must burn 100 percent of the highest emitting fuel to be listed in and allowed by the permit: Used oil (vaste oil, crank oil), No. 6 fuel oil, No. 5 fuel oil, No. 4 fuel oil, No. 3 fuel oil (sometimes described as clarified or industrial fuel oil), No. 2 fuel oil, No. 1 fuel oil, LPG and natural gas.

3. The permit is to authorize recycling, then testing must be conducted while recycling and at the maximum ratio of recycle to virgin aggregate to be allowed by the permit:

4. Normal operation of the plant will be recycling of scrubber water, the test must be done under the same conditions:

5. Normal operation of the plant will be with recycling of collected ashes from the baghouse into the dryer, the test must be conducted under the same conditions.

F. Operating Data to Be Recorded During the Test

Operating data must be recorded during the test in its entirety i.e., particulates and visible emission observations. Operating data must be recorded every fifteen minutes. Please use the attached data sheet or equivalent.

Note: No test report will be accepted without a complete data sheet included.

1. During testing the following measurements must be made:

a) Pressure drop across the baghouse or venturi scrubber throat.

b) Scrubber water flow rate. If the measurement is done indirectly from a pump pressure gauge, the test report must include calculations, nomograms or calibration data used to compute gallons per minute of water.

c) Virgin and recycle aggregate input (ton per hour) as well as asphalt input (ton per hour). Provide the manufacturer's rating of the asphalt plant at different moisture contents in the aggregate.

d) Moisture content of the aggregate, and if applicable, the recycling material.

2. Please provide the following data:

a) Average fuel consumption rate (calculated or measured)

b) Quality of the scrubber water: recycling percent

c) Cleaning cycles of the baghouse

d) Operating data sheet enclosed

G. Testing schedules and testing firm:

H. Permitting engineer to witness the test:

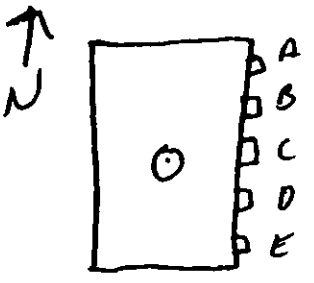
APPENDIX C

FIELD DATA SHEETS

INTERPOLL LABORATORIES - EPA METHOD 2 FIELD DATA SHEET

Job Dupont Co 8919
Source No 7 Portable Asphalt Plant
Test 1 Run 1-2 Date 5-26-93
Stack dimen. 47 x 64 IN.
Dry bulb ____ °F Wet bulb ___ °F
Manometer: ■ Reg. □ Exp. □ Elec.
Barometric pressure 29.18 in Hg
Static pressure -1.70 in WC
Operators B. Aschenbach R Rosenthal
Pitot No. 31v-4 C_p .84
Compliance Test

Cross-section View / Elevation View



Drawing of Test Site

A = 15 ft B = 12 ft

Traverse Point No.	Fraction of Diameter	Distance from Stack Wall (in)	Distance from End of Port (in)	Velocity Pressure (in WC)	Temperature of gas (°F)
		Port length: 2.0 in.		Time start: 0745 hrs	
A-1		4.7	6.7	-.47	
2		14.1	16.1	-.42	
3		23.5	25.5	-.32	
4		32.9	34.9	-.30	
5		42.3	44.3	-.35	
B-1				-.05	
2				-.25	
3				-.25	
4				.27	
5				.83	
C-1				.72	270°
2				.05	
3				.12	
4				1.20	
5				2.10	
D-1				1.80	
2				1.20	
3				1.10	
4				3.40	
5				6.10	
E-1				5.10	
2				4.10	
3				4.20	
4				5.10	
5				5.60	
Temp. meas. device & S/N:				Time end: 0755 hrs	

1.99
17
.5902

C-1 R or nothing = reg. manometer; S= expanded; E=electronic S-3921

INTERPOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job Duinick CO 8919 Date 5-26-93 Test 1 Run 1
Source No 7 Portable Asphalt Plant Stack No. of traverse points 12
Method 5 Filter holder: Glass Filter type: 4" G.F.F.

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 in. Hg. (vac) ■
Postest: ≤ .02 cfm at 20 in. Hg. (vac) ■

Particulate Catch Data:

No.s of filters used: (1) 4997

Recovery solvent(s)
■ acetone
□ other(s)

No. of probe wash bottles:
Sample recovered by: Bob A

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	745	489	256
Impinger No. 2	448	300	148
Impinger No. 3			
Condenser			
Desiccant	1414	1380	34
Total			438

Integrated Gas Sampling Data:

Bag Pump No. 31A Box No. 15 Bag No. 1

Bag Material: 5-layer Aluminized Tedlar Size: 44 L

Pretest leak check: 0.0 cc/min at 15 in. Hg.

Time start: 0830 (HRS) Time end: 0945 (HRS)

Sampling rate: 300 cc/min Operator: Bob A

S/N of O_2 Analyzer used to monitor train outlet: 5

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job Dunnage Co 8919 Operators BA PR Pitot No. 316-4 Cp .84
Source No 7 Portable Asphalt Plant Space Meter Box No. 2 ΔH 1.74 IN WC Bar. Press. 29.18 inHg H2O .30 X
Date 5-26-93 Test 1 Run 1 Gasmeter coeff. 1.0039 Nozzle No. 9-3 Nozzle Dia .191 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Gas. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (xv/v)
	0830	536.90					271	235	245	39	63	63	11.7
E - 1	4.0	540.56	5.10	2.68	0.41	12.0	271	235	246	39	65	62	10.1
2	8.0	544.03	4.20	2.22	4.00	16.0	271	235	246	39	65	62	10.1
3	12.0	547.41	4.00	2.12	7.32	15.0	271	237	248	39	67	62	10.2
4	16.0	550.53	3.60	1.91	0.47	12.0	271	239	250	39	70	63	10.3
5	20.0	553.69	3.70	1.97	3.68	11.5	270	240	249	39	74	64	10.3
D - 1	24.0	557.46	5.10	2.73	7.46	16.0	270	237	249	38	75	65	10.7
2	28.0	560.45	3.10	1.66	0.42	9.0	272	237	246	39	75	66	10.4
3	32.0	562.95	2.20	1.18	2.92	6.5	271	239	248	38	78	66	10.8
4	36.0	564.99	1.50	.81	4.99	4.5	271	239	248	38	79	68	10.7
5	40.0	567.46	2.10	1.13	7.44	7.5	271	239	245	38	81	68	10.7
C - 1	44.0	570.25	2.70	1.46	0.23	7.5	270	235	247	39	81	69	10.7
2	48.0	572.41	1.60	.87	2.38	5.0	270	236	250	38	83	70	11.0
3	52.0	573.88	.29	.15	3.30	2.0	270	236	250	38	83	71	11.0
4	56.0	574.33	.34	.18	4.30	2.0	268	240	249	38	81	71	10.7
5	60.0	575.91	.85	.46	5.87	3.0	267	240	248	38	81	72	10.7
B - 1	64.0	577.62	1.00	.54	7.58	3.5	267	239	246	38	81	23	10.7
2	68.0	578.54	.29	.15	8.51	2.0	265	237	247	38	82	72	10.7
3	72.0		-.05										
4	76.0		-.07										
5	80.0		-.06										
A - 1	84.0		-.29										
2	88.0		-.15										
3	92.0		-.09										
4	96.0		-.05										
5	100.0		-.08										
	θ = 68	Vm = 41.64		ΔH = 0.89							Avg. = 71.8		

0945

C-3

S-0037R

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job Dufferin Co 8919 Date 5-26-93 Test 1 Run 2
Source No 7 Portable Asphalt Plant Stack No. of traverse points 17
Method 5 Filter holder: Glass Filter type: 4" G.F.F.

Sample Train Leak Check:

Pretest: ☒ 0.02 cfm at 15 in. Hg. (vac) ☒
Postest: ☒ <.02 cfm at 20 in. Hg. (vac) ☒

Particulate Catch Data:

No.s of filters used: (1) 4998

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles:
Sample recovered by: BoBA

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	750	498	252
Impinger No. 2	409	296	113
Impinger No. 3			
Condenser			
Desiccant	1465	1375	90
Total			455

Integrated Gas Sampling Data:

Bag Pump No. 31A Box No. 15 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0.0 cc/min at 15 in. Hg.
Time start: 1010 (HRS) Time end: 1126 (HRS)
Sampling rate: 300 cc/min Operator: BoBA
S/N of O_2 Analyzer used to monitor train outlet: 5

CF-023

S-0046RR

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job Duininck Co. 8719 Operators BA RP Pitot No. 310-4 Cp .84
Source No 7 Portable Asphalt Plant Stack Meter Box No. 2 ΔH 1.74 IN WC Bar. Press. 29.18 inHg H2O 32 %
Date 5-26-93 Test — Run 2 Counter coeff. 1.0035 Nozzle No. 9-3 Nozzle Dia .41 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas In	Gas Out	Oxygen (v/v)
	1010	578.90											
E - 1	4	582.53	5.00	2.56	2.57	11.0	270	235	246	39	76	76	10.9
2	8	585.99	4.10	2.12	5.93	14.0	270	238	247	39	86	76	10.9
3	12	589.27	4.00	2.09	9.27	12.5	269	240	251	38	88	78	11.2
4	16	592.53	3.60	1.89	2.47	12.0	268	240	250	38	91	79	10.5
5	20	595.80	3.90	2.06	5.80	11.5	267	241	245	39	92	80	11.7
D - 1	24	599.61	5.20	2.74	9.65	16.0	268	236	247	39	91	81	10.7
2	28	602.66	3.20	1.69	2.68	9.0	268	237	245	39	92	82	10.5
3	32	605.01	1.80	.95	4.96	5.0	268	235	246	39	94	83	10.7
4	36	607.18	1.60	.85	7.12	4.5	267	236	247	38	95	84	10.6
5	40	609.61	2.20	1.17	9.65	5.0	267	237	247	38	96	84	10.5
C - 1	44	612.29	2.40	1.28	2.29	6.5	267	242	250	37	95	85	10.7
2	48	613.99	.95	.50	3.96	3.0	267	237	246	38	96	85	10.8
3	52	614.80	.22	.11	4.77	2.0	267	240	245	39	94	85	10.8
4	56	615.85	.37	.19	5.81	2.0	264	239	247	37	91	84	10.5
5	60	617.32	.76	.40	7.30	3.0	264	238	247	37	91	84	10.4
B - 1	64	619.06	1.05	.56	9.04	3.0	265	235	248	38	90	84	10.2
2	68	619.98	.28	.14	9.95	2.0	265	238	248	39	92	84	9.9
3	72.0		-.05										
4	76.0		-.13										
5	80.0		-.09										
A - 1	84.0		-.04										
2	88.0		-.05										
3	92.0		-.10										
4	96.0		-.13										
5	1000		-.23										
	θ = 68	Vm = 41.08		ΔH = 0.85							Avg. = 86.5		

1126

INTERFOLL LABORATORIES EPA METHOD 5/17 SAMPLE LOG SHEET

Job DUFFNUCK CO 8919 Date 5-26-93 Test 1 Run 3
Source No 7 Portable Asphalt Plant STACK No. of traverse points 17
Method 5 Filter holder: GLASS Filter type: 4" G.F.

Sample Train Leak Check:

Pretest: 0.02 cfm at 15 in. Hg. (vac) ■
Postest: 0.02 cfm at 20 in. Hg. (vac) ■

Particulate Catch Data:

No.s of filters used: (1)

Recovery solvent(s)
■ acetone
□ other(s)

No. of probe wash bottles:
Sample recovered by: BOB A

Condensate Data:

Item	Weight(g)		
	Final	Tare	Difference
Impinger No. 1	749	491	258
Impinger No. 2	465	299	166
Impinger No. 3			
Condenser			
Desiccant	1516	1487	29
Total			453

Integrated Gas Sampling Data:

Bag Pump No. 31A Box No. 15 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0.0 cc/min at 15 in. Hg.
Time start: 1155 (HRS) Time end: 1312 (HRS)
Sampling rate: 300 cc/min Operator: BOB A
S/N of O_2 Analyzer used to monitor train outlet: 5

CF-023

INTERPOLL LABORATORIES EPA METHOD 5 FIELD DATA SHEET

Job Dennison Co 8919
Source No 7 Portable Asphalt Plant Stack
Date 5-26-93 Test 1 Run 3

Operators BA RR
Meter Box No. 2 ΔH 1.74 IN WC
Coeafter coeff. 1.0039

Pitot No. 316-4 Cp .84
Bar. Press. 29.18 inHg H2O 34 x
Nozzle No. S-5 Nozzle Dia .191 IN.

Traverse Point No.	Sampling Time (min)	Sample Volume (cf)	Velocity Head (inWC)	Orifice Meter (inWC)	Dec. Vol. (cf)	VAC. inHg	Temperatures (°F) Stack	Probe	Oven	Impg.	Gas/In	Gas/Out	Oxygen (x v/v)
	1155	620.40											
E - 1	4	623.45	3.40	1.71	3.44	8.5	269	233	246	38	79	79	10.3
2	8	626.91	4.40	2.18	6.85	12.0	269	231	245	38	82	80	9.7
3	12	630.06	3.80	1.88	0.03	10.0	272	235	249	38	85	80	9.9
4	16	633.18	3.60	1.80	3.14	9.5	268	236	250	38	87	81	9.7
5	20	636.43	4.00	2.00	6.42	10.0	268	237	251	39	88	81	9.6
D - 1	24	640.14	5.10	2.54	0.13	14.0	270	237	248	38	87	81	9.7
2	28	643.19	3.50	1.75	3.20	9.5	269	239	247	39	87	79	9.4
3	32	645.30	1.60	.80	5.28	5.0	267	241	250	38	88	80	9.3
4	36	647.32	1.50	.75	7.30	4.5	268	238	245	38	89	80	9.6
5	40	649.67	2.00	1.00	9.63	5.0	268	237	246	38	89	80	10.1
C - 1	44	652.43	2.80	1.40	2.39	7.0	268	240	247	39	89	80	10.6
2	48	654.39	1.40	.70	4.34	4.0	269	237	247	39	90	81	10.6
3	52	655.22	.26	.13	5.19	2.0	268	237	250	38	90	80	10.2
4	56	656.15	.31	.15	6.11	2.0	265	238	249	38	88	81	10.1
5	60	657.62	.60	.40	7.59	3.0	267	240	246	37	87	81	9.9
B - 1	64	659.55	1.40	.70	9.54	4.0	268	240	245	37	86	80	10.1
2	68	660.44	.29	.14	0.42	2.0	268	240	246	38	87	80	9.7
3	72.0		-.10										
4	76.0		-.09										
5	80.0		-.05										
A - 1	84.0		-.06										
2	88.0		-.11										
3	92.0		-.09										
4	96.0		-.15										
5	100.0		-.21										
	θ = 108	Vm = 40.04		ΔH = 0.80							Avg.	83.5	

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C-7

S-0037R

Interpoll Laboratories
(612)786-6020

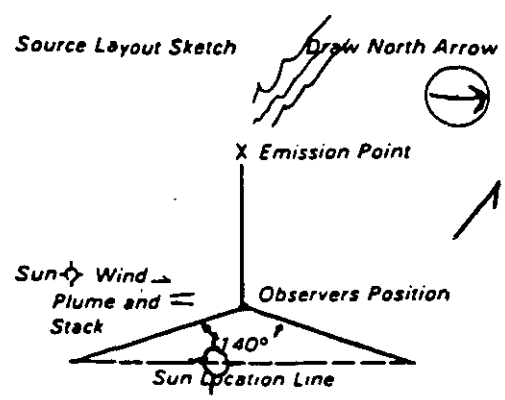
Visible Emissions Form

Test #1

SOURCE NAME: QUINCK	OBSERVATION DATE: 5-26-93
ADDRESS:	START TIME: 0830
CITY: APPLETON / STATE: MN / ZIP:	STOP TIME: 0930
PHONE:	SOURCE ID NUMBER: ASPHALT NO. 7 PORTABLE PLANT
PROCESS EQUIPMENT: ASPHALT PLANT	OPERATING MODE: FULL LOAD
CONTROL EQUIPMENT: BAGHOUSE	OPERATING MODE: FULL LOAD
DESCRIBE EMISSION POINT: START RECTANGULAR METAL STACK	STOP RECTANGULAR METAL STACK
HEIGHT ABOVE GROUND LEVEL: START 35 FT. STOP 35 FT.	HEIGHT RELATIVE TO OBSERVER: START 35 FT STOP 35 FT.
DISTANCE FROM OBSERVER: START 200 FT STOP 200 FT.	DIRECTION FROM OBSERVER: START WEST STOP WEST
DESCRIBE EMISSIONS: START LOOPING	STOP LOOPING
EMISSION COLOR: START WHITE STOP WHITE	PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT: NO ☐ YES ☒	IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☒
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START END OF STEAM PLUME	STOP END OF STEAM PLUME
DESCRIBE BACKGROUND: START PT. CLOUDY	STOP PT. CLOUDY
BACKGROUND COLOR: START BLUE STOP BLUE	SKY CONDITIONS: START PARTLY CLOUDY STOP PT. CLOUDY
WIND SPEED: START MILD 0-5 STOP MILD 0-5	WIND DIRECTION: START SE NW STOP SE NW
AMBIENT TEMP. START 60°F STOP 64°F	WET BULB TEMP. / RH.percent

SEC / MIN	0	15	30	45	MIN	0	15	30	45
1	10	10	10	10	31	5	5	5	5
2	10	10	10	10	32	5	5	10	10
3	10	10	10	10	33	5	10	5	5
4	10	10	15	10	34	10	10	5	10
5	5	5	5	5	35	10	10	10	10
6	5	5	5	5	36	10	10	10	10
7	5	5	5	5	37	10	10	10	10
8	5	5	5	5	38	10	10	10	10
9	5	5	10	5	39	10	10	5	10
10	10	10	10	10	40	5	5	10	5
11	10	10	10	10	41	5	5	5	5
12	10	10	10	10	42	5	5	5	5
13	10	10	10	10	43	5	5	5	10
14	10	15	10	10	44	10	10	5	10
15	5	5	10	10	45	10	10	10	10
16	5	5	5	5	46	10	10	10	5
17	5	5	5	5	47	10	5	5	5
18	5	5	5	5	48	5	5	5	5
19	5	5	5	5	49	10	5	10	5
20	5	5	5	5	50	10	10	10	5
21	5	10	5	10	51	10	10	10	10
22	10	10	10	10	52	10	5	10	10
23	10	10	10	10	53	10	5	5	5
24	10	10	10	10	54	5	5	5	5
25	10	10	10	10	55	5	5	5	5
26	15	15	10	10	56	5	5	5	5
27	10	10	10	10	57	10	10	10	10
28	5	5	10	5	58	10	5	10	10
29	5	5	5	5	59	10	10	10	10
30	5	5	5	5	60	10	5	5	5

Source Layout Sketch



AVERAGE OPACITY FOR HIGHEST PERIOD: 8.5%

NUMBER OF READINGS ABOVE 8.5 % WERE: 129

RANGE OF OPACITY READINGS: MINIMUM 5 MAXIMUM 15

OBSERVER'S NAME (PRINT): RANDY MADISON

COMMENTS

OBSERVER'S SIGNATURE: Randy Madison — DATE: 5-26-93

ORGANIZATION: INTERPOL LABS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE

CERTIFIED BY: JOE PEREZ WI DNR — DATE: 4-6-93

TITLE — DATE

VERIFIED BY — DATE

S-0079R

Interpoll Laboratories
(612)786-6020

Visible Emissions Form

Test #2

SOURCE NAME: DUININCK	OBSERVATION DATE: 5-26-93	START TIME: 1010
ADDRESS:		STOP TIME: 1110
CITY: APPLETON	STATE: MN	ZIP:
PHONE:	SOURCE ID NUMBER: ASPHALT NO. 7 PORTABLE PLANT	
PROCESS EQUIPMENT: ASPHALT PLANT	OPERATING MODE: FULL LOAD	
CONTROL EQUIPMENT: BAGHOUSE	OPERATING MODE: FULL LOAD	
DESCRIBE EMISSION POINT: START RECTANGULAR METAL STACK	STOP RECTANGULAR METAL STACK	
HEIGHT ABOVE GROUND LEVEL: START 35 FT STOP 35 FT	HEIGHT RELATIVE TO OBSERVER: START 35 FT. STOP 35 FT	
DISTANCE FROM OBSERVER: START 200 FT. STOP 200 FT.	DIRECTION FROM OBSERVER: START SW STOP SW	
DESCRIBE EMISSIONS: START LOOPING	STOP LOOPING	
EMISSION COLOR: START WHITE STOP WHITE	PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☒	IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☒	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START AFTER STEAM PLUME	STOP AFTER STEAM PLUME	
DESCRIBE BACKGROUND: START CLEAR SKY	STOP CLEAR SKY	
BACKGROUND COLOR: START BLUE STOP BLUE	SKY CONDITIONS: START CLEAR STOP CLEAR	
WIND SPEED: START 0-5 MILO STOP MILO	WIND DIRECTION: START NW STOP NW	
AMBIENT TEMP.: START 65° F STOP 65° F	WET BULB TEMP.	RH.percent

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	10	10	10	10	31	5	5	10	5
2	10	10	10	10	32	10	10	5	5
3	15	15	10	10	33	10	5	10	10
4	10	5	10	5	34	10	10	5	5
5	5	5	5	5	35	5	10	10	10
6	5	5	5	5	36	10	5	10	5
7	5	5	5	5	37	5	5	10	10
8	10	10	5	5	38	10	5	10	5
9	10	10	10	5	39	10	10	5	10
10	10	10	10	10	40	10	10	10	5
11	10	5	5	5	41	5	5	10	10
12	5	10	10	5	42	5	10	5	5
13	5	5	10	10	43	10	5	5	10
14	10	5	10	10	44	10	5	10	10
15	10	10	10	5	45	5	5	10	10
16	5	5	10	10	46	10	10	10	5
17	10	5	10	5	47	5	5	10	10
18	5	5	5	5	48	5	5	5	5
19	5	5	5	5	49	5	5	5	5
20	5	5	5	10	50	5	5	5	5
21	5	5	10	10	51	10	10	5	10
22	10	5	5	5	52	5	10	10	10
23	10	10	10	10	53	5	5	10	10
24	10	10	10	10	54	10	10	10	10
25	10	10	10	10	55	10	10	10	10
26	10	5	10	5	56	10	10	10	10
27	5	10	10	10	57	10	10	10	5
28	5	10	10	5	58	10	10	5	5
29	10	5	5	5	59	5	5	5	5
30	5	5	5	5	60	5	5	5	5

AVERAGE OPACITY FOR HIGHEST PERIOD: 8.3%

NUMBER OF READINGS ABOVE 8.3 % WERE: 125

RANGE OF OPACITY READINGS: MINIMUM 5% MAXIMUM 15%

OBSERVER'S NAME (PRINT): RANDY MADISON

OBSERVER'S SIGNATURE: Randy Madison

DATE: 5-26-93

ORGANIZATION: INTERPOLL LABS

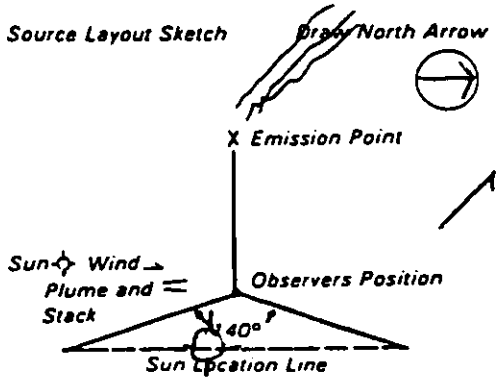
CERTIFIED BY: JOE PEREZ WI DNR

DATE: 4-6-93

VERIFIED BY:

DATE:

Source Layout Sketch



COMMENTS:

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE:

TITLE:

DATE:

S-0079R

Interpoll Laboratories
(612)786-6020

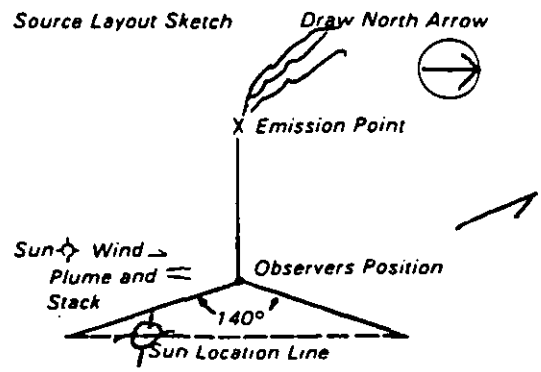
Visible Emissions Form

Test #3

SOURCE NAME: QUINICK	OBSERVATION DATE: 5-26-93	START TIME: 1200
ADDRESS:		STOP TIME: 1300
CITY: APPLETON / STATE: MN / ZIP:		
PHONE:	SOURCE ID NUMBER: ASPHALT NO. 7 PORTABLE PLANT	
PROCESS EQUIPMENT: ASPHALT PLANT	OPERATING MODE: FULL LOAD	
CONTROL EQUIPMENT: BAG HOUSE	OPERATING MODE: FULL LOAD	
DESCRIBE EMISSION POINT: START RECTANGULAR METAL STACK	STOP RECTANGULAR METAL STACK	
HEIGHT ABOVE GROUND LEVEL: START 35 FT STOP 35 FT	HEIGHT RELATIVE TO OBSERVER: START 35 FT STOP 35 FT	
DISTANCE FROM OBSERVER: START 200 FT STOP 200 FT	DIRECTION FROM OBSERVER: START SW STOP SW	
DESCRIBE EMISSIONS: START LOOPING	STOP LOOPING	
EMISSION COLOR: START WHITE STOP WHITE	PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☒	IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☒	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START AFTER STEAM PLUME	STOP AFTER STEAM PLUME	
DESCRIBE BACKGROUND: START CLEAR SKY	STOP CLEAR SKY	
BACKGROUND COLOR: START BLUE STOP BLUE	SKY CONDITIONS: START CLEAR STOP CLEAR	
WIND SPEED: START 0-5 MPH MILD STOP 0-5 MILD	WIND DIRECTION: START NW STOP NW	
AMBIENT TEMP: START 67°F STOP 70°F	WET BULB TEMP:	RH, percent:

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	5	5	10	10	31	5	5	5	5
2	10	5	10	5	32	5	5	5	5
3	10	10	10	5	33	5	10	5	10
4	5	5	10	10	34	10	10	5	10
5	10	10	5	10	35	10	10	10	10
6	10	5	5	5	36	5	10	10	10
7	10	10	5	5	37	10	10	5	5
8	10	5	10	10	38	5	10	10	10
9	10	5	5	10	39	10	5	5	5
10	10	10	5	5	40	5	5	10	10
11	5	5	5	5	41	10	5	5	5
12	10	10	5	10	42	5	10	10	10
13	10	10	10	5	43	10	10	5	5
14	10	5	10	10	44	5	10	10	5
15	5	5	10	5	45	10	5	5	5
16	10	10	5	5	46	10	10	10	5
17	5	10	5	5	47	5	10	10	5
18	10	10	5	5	48	5	5	5	10
19	5	10	10	5	49	10	10	10	5
20	10	10	5	5	50	5	10	10	10
21	5	5	5	5	51	5	5	5	5
22	5	5	10	10	52	5	5	5	5
23	10	5	10	10	53	5	5	10	10
24	5	5	10	10	54	10	10	10	10
25	10	5	5	5	55	10	10	10	10
26	5	5	10	5	56	10	5	5	10
27	10	10	10	5	57	10	10	5	5
28	5	10	10	5	58	5	10	10	10
29	5	5	10	10	59	5	5	5	5
30	10	10	5	10	60	5	5	5	5

Source Layout Sketch



AVERAGE OPACITY FOR HIGHEST PERIOD: 7.7%	NUMBER OF READINGS ABOVE 7.7%: 118
RANGE OF OPACITY READINGS: MINIMUM 5%	MAXIMUM 10%
OBSERVER'S NAME (PRINT): RANDY MADISON	
OBSERVER'S SIGNATURE: Randy Madison	DATE: 5-26-93
ORGANIZATION: INTERPOLL LABS	
CERTIFIED BY: JOE PEREZ WI DNR	DATE: 4-6-93
VERIFIED BY:	DATE:

COMMENTS:

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE:
TITLE: DATE:

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

April 19, 1993

File Code: 4500

Mr. Randy Madison
Interpoll Labs.
4500 N.E. Ball Rd.
Circle Pines, MN 55014

Dear Mr. Madison:

Please be advised that you have successfully completed our recent Visible Emissions Evaluation course.

Having participated in the smoke evaluation sessions, you met the following certification criteria:

1. The average deviation for the sets of 25 black and 25 white smoke emissions was less than 7.5%.

2. The deviation of each reading was 15% or less.

This certification is valid until October 6, 1993.

Sincerely,

Andy Seeber, Environmental Specialist
Compliance Section
Bureau of Air Management

Enclosure

APPENDIX D

INTERPOLL LABORATORIES ANALYTICAL DATA

Interpoll Laboratories
(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: Duininck
Team Leader: BA
Date Submitted: 5-27-93
Test No.: 1
Date of Analysis: 5-27-93

Source: #7 Portable Asphalt Plant
Test Site: Stack
Date of Test: 5-26-93
No. of Runs Completed: 3
Technician: C. Helgeson

Test/Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
1/1	8919-15	1	0.00	7.60	18.20	7.60	10.60	1.36
		2	0.00	7.60	18.20	7.60	10.60	1.36
	☑ B ☐ F	Avg				7.60	10.60	
1/2	-19	1	0.00	7.40	18.10	7.40	10.70	1.38
		2	0.00	7.40	18.10	7.40	10.70	1.38
	☑ B ☐ F	Avg				7.40	10.70	
1/3	-23	1	0.00	7.90	17.90	7.90	10.00	1.38
		2	0.00	7.90	17.90	7.90	10.00	1.38
	☑ B ☐ F	Avg				7.90	10.00	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☐ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Filter Gravimetrics

Job Duluth Co. Mn.
Team Leader BA
Date Submitted 5-27-93
Test No. 1
Date of Analysis 6-2-93

Source #1 Portable Asphalt Plant
Test Site Stack
Date of Test 5-26-93
No. of Runs Completed 3
Technician C. Helgeson

0	Test 1 Run 0 Field Blank Log Number 8919-10 Comments	Filter No. 5009 Filter Type 4"GF Filter Tare Wt. .8852 g Filter+Sample Wt. .8995 g Sample Wt. .0003 g
1	Test 1 Run 1 Log Number -13 Comments	Filter No. 4997 Filter Type 4"GF Filter Tare Wt. .8907 g Filter+Sample Wt. .8982 g Sample Wt. 0.0075 g
2	Test 1 Run 2 Log Number -17 Comments	Filter No. 4998 Filter Type 4"GF Filter Tare Wt. .8879 g Filter+Sample Wt. .8943 g Sample Wt. 0.0064 g
3	Test 1 Run 3 Log Number -21 Comments	Filter No. 5007 Filter Type 4"GF Filter Tare Wt. .8885 g Filter+Sample Wt. .8945 g Sample Wt. 0.0060 g
4	Test ____ Run ____ Log Number ____ Comments	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Log Number ____ Comments	Filter No. ____ Filter Type ____ Filter Tare Wt. ____ g Filter+Sample Wt. ____ g Sample Wt. ____ g

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0075	0.0064	0.0060		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.2729	0.2311	0.2141		

LSC-02PR

Interpoll Laboratories
(612) 786-6020

Sample Deposition

Job Duininck Co
Field Engineer Bob Aschenbach
Date Submitted
Test No. 1

Source No 7 Portable Asphalt Plant
Test Site Stack
Date of Test 5-26-93
No. of Runs Completed 3

No.	Sample Type	Analysis	Comments
4	Probe Wash: ☑ Acetone ☐ $MeCl_2$ ☐ DI Water ☐ _____	☑ As per EPA M-5 ☐ As per EPA M-29 ☐ As per EPA M-201A ☐ Other _____	One is Blank
4	Filter: ☑ 4" Glass ☐ SS Thimble ☐ 2.5" Glass ☐ Pallflex	☑ As per EPA M-5 ☐ As per EPA M-29 ☐ As per EPA M-201A ☐ As per EPA M-17 ☐ Other _____	One is Blank
7	Impingers: ☑ DI Water ☐ $3\%H_2O_2$ ☐ 1N NaOH ☐ KOH (Cr VI) ☐ H_2SO_4 (HCl) ☐ 2,4-DNPH ☐ _____ ☐ _____	☑ MN Protocol ☐ WI Protocol ☐ As per EPA M-202 ☐ As per EPA M-6,8 ☐ Acid Gases ☐ Formaldehyde ☐ As per EPA M-29 ☐ As per EPA M-26 ☐ Other _____	One is Blank
3	Integrated Gas Sample ☑ Tedlar Bag ☐ _____	☑ As per EPA M-3 ☐ As per EPA M-10 ☐ Other _____	
—	Oxides of Nitrogen (NO_x)	☐ As per EPA M-7A ☐ Other _____	
1	☑ Fuel Sample ☑ Aggregate	☑ Attached Form S-0163	
—	Particle Size	☐ X-Ray Sedigraph ☐ Cascade Impactor ☐ Other _____	
—	Misc Samples ☐ _____ ☐ _____	☐ As per EPA M-6 ☐ As per EPA M-7A ☐ Other _____	

Type of Source: _____

Fuel Type:

Coal: ☐Bituminous ☐Anthracite ☐Lignite
Wood: ☐Wood Waste ☐Dust ☐Bark
Oil: ☑Waste Oil ☐No. 2 ☐No. 6
☐ Natural Gas ☐ RDF ☐ Other _____

S-278

G:\STACK\WP\FORMS\S-278.LAS

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Impinger Catch/Minnesota Protocol

Job Dwinine K Co Mn. Source #7 Portable Asphalt Plant
Team Leader BA Test Site Stack
Date Submitted 5-27-93 Date of Test 5-26-93
Test No. 1 No. of Runs Completed 3
Date of Analysis 6-2-93 Technician C. Helgeson

0	Test 1 Run 0 Field Blank Log Number 5919-11 Comments	Dish No. 5A Dish Tare Wt. 44.5314 g Dish+Sample Wt. 44.5319 g Sample Wt. 0.0005 g
1	Test 1 Run 1 Log Number -14 Comments	Dish No. 7 Dish Tare Wt. 45.7584 g Dish+Sample Wt. 46.0153 g Sample Wt. 0.2569 g
2	Test 1 Run 2 Log Number -18 Comments	Dish No. 8 Dish Tare Wt. 46.9758 g Dish+Sample Wt. 47.1930 g Sample Wt. 0.2172 g
3	Test 1 Run 3 Log Number -22 Comments	Dish No. 12 Dish Tare Wt. 48.1485 g Dish+Sample Wt. 48.3502 g Sample Wt. 0.2017 g
4	Test ____ Run ____ Log Number Comments	Dish No. Dish Tare Wt. g Dish+Sample Wt. g Sample Wt. g
5	Test ____ Run ____ Log Number Comments	Dish No. Dish Tare Wt. g Dish+Sample Wt. g Sample Wt. g

Blank Solvent Wt. 0.0005 g

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	.2564	.2167 D-2	.2012		

LSC-03.GR

Interpoll Laboratories
(612) 786-6020

EPA Method 5 Data Reporting Sheet
Probe/Cyclone Wash

Job Dainock Co. Mn.
Team Leader BA
Date Submitted 5-27-93
Test No. 1
Date of Analysis 6-2-93
Transport Leakage ☒ None ☐ _____ ml

Source #7 Portable Asphalt Plant
Test Site Stack
Date of Test 5-26-93
No. of Runs Completed 3
Technician C. Hebeson
Solvent Acetone

0	Test ____ Run 0 Field Blank Log Number 8919-09 Vol. of Solvent 110 ml *Solvent Residue 1.8 ug/ml	Dish No. 66 Dish Tare Wt. 48.3093 g Dish+Sample Wt. 48.3095 g Sample Wt. 0.0002 g
1	Test ____ Run 1 Vol. of Solvent 85 ml Log Number -12 Comments	Dish No. 93 Dish Tare Wt. 53.9846 g Dish+Sample Wt. 53.9938 g Sample Wt. .0092 g
2	Test ____ Run 2 Vol. of Solvent 75 ml Log Number -16 Comments	Dish No. 110 Dish Tare Wt. 49.7370 g Dish+Sample Wt. 49.7451 g Sample Wt. .0081 g
3	Test ____ Run 3 Vol. of Solvent 70 ml Log Number -20 Comments	Dish No. 111 Dish Tare Wt. 42.7807 g Dish+Sample Wt. 42.7877 g Sample Wt. .0070 g
4	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g
5	Test ____ Run ____ Vol. of Solvent ____ ml Log Number ____ Comments	Dish No. ____ Dish Tare Wt. ____ g Dish+Sample Wt. ____ g Sample Wt. ____ g

*Solvent Residue 1.8 ug/ml = [(Sample Wt. 0.0002 g)(10⁶)]/Vol. of Sol. 110 ml
EPA-M5 Acetone Residue Blank Spec. < 7.8 ug/ml

Results:

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0090	0.0080D-3	0.0069		

LSC-01YR