DAQC-1579-16
Site ID 10981(B4)

MEMORANDUM

To: **STACK TEST FILE – GENEVA ROCK PRODUCTS – MORGAN PIT**

Through: Jay Morris, Minor Source Compliance Section Manager

From: Anthony DeArcos, Environmental Scientist

Date: November 2, 2016

Subject:

SOURCE:	**CMI HOT MIX ASPHALT PLANT**
CONTACT:	**SAM BERNARD, 801-802-6954**
LOCATION:	**3175 WEST OLD HIGHWAY ROAD, MORGAN, MORGAN COUNTY, UT**
TEST CONTRACTOR:	**AMERICAN ENVIRONMENTAL TESTING COMPANY, INC.**
PERMIT/AO#:	**DAQE-089-00, DATED DECEMBER 22, 2000**
ACTION CODE:	**TR = TEST REVIEW**
SUBJECT:	**REVIEW OF STACK TEST REPORT DATED OCTOBER 25, 2016**

On October 27, 2016, DAQ received a test report for the Geneva Rock Products – Morgan Pit. Testing was performed on October 5 & 6, 2016, to demonstrate compliance with the emission limits found in Condition 5. The DAQ-calculated test results are:

Source	Test Date	Test Method	Pollutant	Result	Limit
CMI Hot Mix Asphalt Plant	10/5&6/2016	201 A & 202	PM10	0.7069 lb/hr 0.003 gr/dscf	13.99 lb/hr 0.024 gr/dscf

DEVIATIONS: **None noted.**

CONCLUSION: **The Geneva Rock Products – Morgan Pit stack test report appears to be acceptable.**

RECOMMENDATION: The Geneva Rock Products – Morgan Pit's CMI Hot Mix Asphalt Plant should be considered in compliance at time of the stack tests.

HPV: **Not Applicable**

ATTACHMENTS: **Geneva Rock Products – Morgan Pit stack test report dated October 25, 2016 and DAQ-generated stack test audit sheets.**

Division of Air Quality
Compliance Demonstration

Source Information

Company Name	**Geneva Rock Products - Morgan Pit**
Company Contact:	**Sam Bernard**
Contact Phone No.	**801-802-6954**
Source Designation:	**CMI Hot Mix Asphalt Plant**

Test & Review Dates

Test Date:	10/5&6/2016
Review Date:	11/2/2016
Observer:	**Name Here**
Reviewer:	**Anthony DeArcos**

Tabs Are Shown

Particulate Emission Limits

lbs/MMBtu	lbs/hr	gr/dscf		
	13.990	0.024		

Emission Rates - "Front Half"

lbs/MMBtu	**lbs/hr**	**gr/dscf**		
	0.1500	**0.0006**		

Test Information

Stack_I.D._inches	**As ft^2**	Y	Dl H @	Cp	Pbar	Pq (static)	**Dn**
61.91	20.90	1.0310	1.666	0.855	25.17	-0.32	0.182

Contractor Information

Contracting Company:	American Environmental
Contact:	Brent Benson
Phone No.:	801-266-7111
Project No.:	

F factors for Coal, Oil, and Gas

	Fd scf/MMBtu	Fw scf/MMBtu	Fc scf/MMBtu
COAl			
Anthrocite 2	○ 10100	○ 10540	○ 1970
Bituminous 2	○ 9780	○ 10640	○ 1800
Lignite	○ 9860	○ 11950	○ 1910
OIL	○ 9190	○ 320	○ 1420
GAS			
Natural	○ 8710	○ 10610	○ 1040
Propane	○ 8710	○ 10200	○ 1190
Butane	○ 8710	○ 10390	○ 1250

☐ F factor used

lbs/MMBtu
○ O2
○ CO2

Summary

Division of Air Quality

Reference Methods 5 - TSP

Compliance Demonstration of

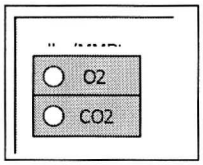
Geneva Rock Products - Morgan Pit

Testing Results				
Test Date	10/5&6/2016	10/5&6/2016	10/5&6/2016	10/5&6/2016
	Run 1	Run 2	Run 3	Run 4
As ft^2	20.90	20.90	20.90	
Pbar	25.10	25.10	25.33	
Pq (static)	-0.34	-0.33	-0.30	
Ps	25.08	25.08	25.31	
Avg. Ts F	228.67	224.42	226.50	
CO2 - F_{CO2}	4.00	3.50	3.50	
O2	14.00	14.50	13.50	
N2+C	82.00	82.00	83.00	
Md	29.20	29.14	29.10	
Ms	26.16	25.96	26.02	
Y	1.03	1.03	1.03	
Cp	0.86	0.86	0.86	
Vm cf	18.94	17.73	16.94	
Vlc	128.30	128.80	118.90	
$A_{VG.}$ Tm F	74.42	73.75	75.50	
Vm std	16.19	15.17	14.58	
Vw std	6.04	6.06	5.60	
Bws	0.27	0.29	0.28	
S Bws	1.00	1.00	1.00	
Avg. Sqrt Dlp	0.66	0.65	0.65	
Vs	49.14	48.92	48.74	
scfm wet	39595.10	39666.64	39759.30	
acfm	61622.06	61350.63	61115.18	
Qsd dscfh	1730316.63	1700525.28	1723906.62	
# Sample Points	12.00	12.00	12.00	
Dn	0.182	0.182	0.182	
An	1.81E-04	1.81E-04	1.81E-04	
Start Time	11:38	14:18	13:29	
End Time	12:56	15:31	14:41	
Total Test time	60.00	60.00	60.00	
Time @ point	5.00	5.00	5.00	

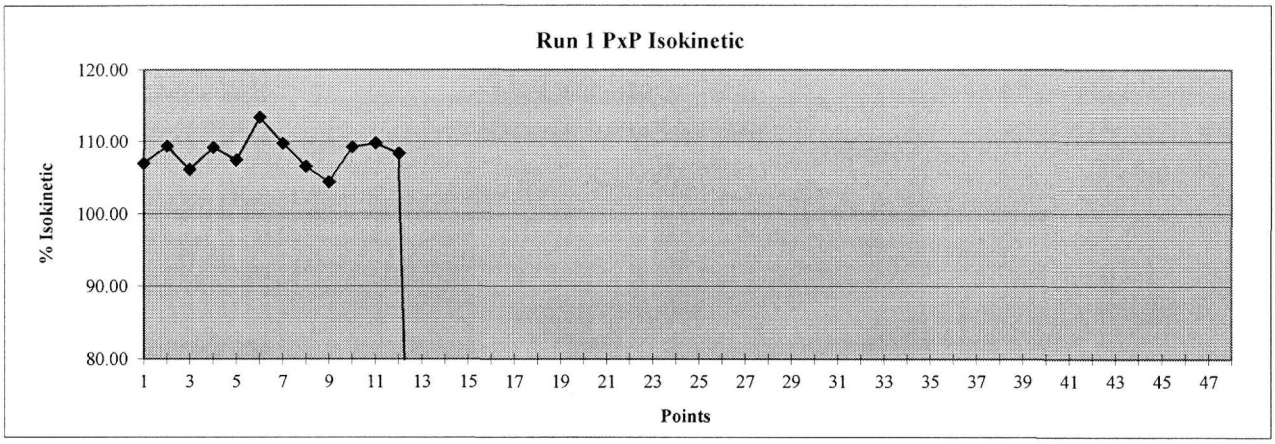
	Lab Data - grams collected		
Lab Data	Probe	Filter	Back
Run 1	0.0002	0.0004	0.0024
Run 2	0.0001	0.0002	0.002
Run 3	0.0004	0.0005	0.0026
Run 4			

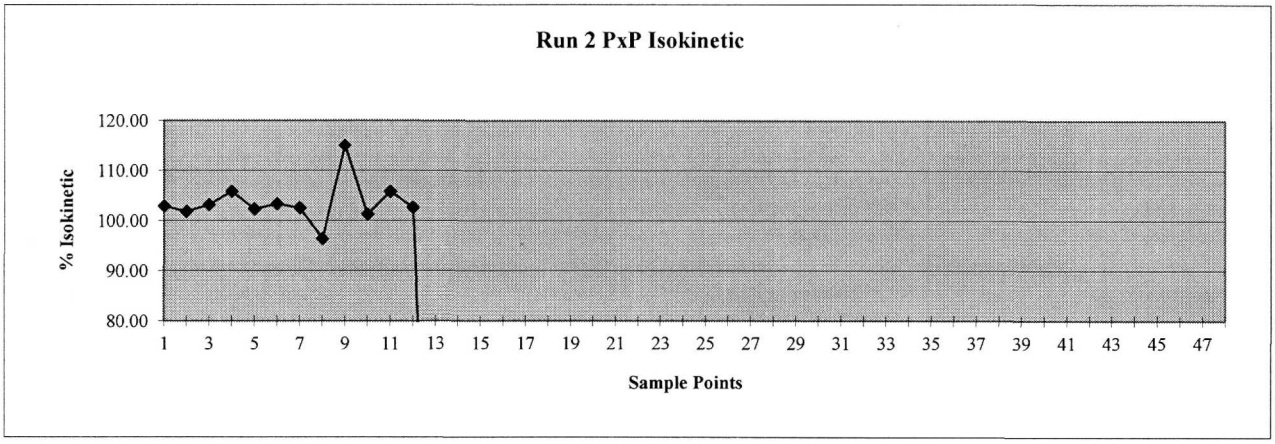
Front Half Emissions Summary					
	Run 1	Run 2	Run 3	Run 4	Avg.
gr./dscf	0.0006	0.0003	0.0010		0.0006
lbs/hr	0.1414	0.0741	0.2346		0.1500
lbs/MMBtu					

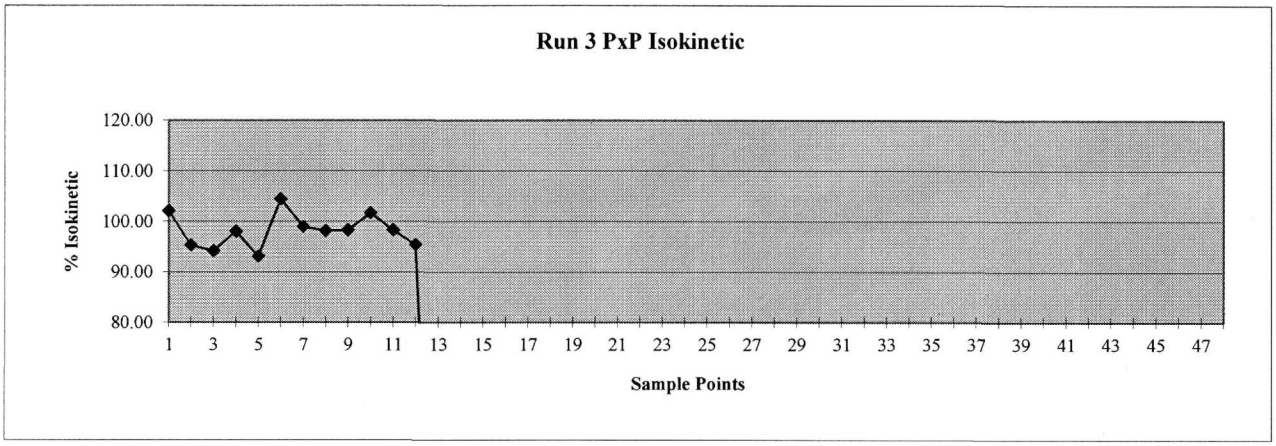
Total Emissions Summary w/back half condensable					
	Run 1	Run 2	Run 3	Run 4	Avg.
gr./dscf	0.0029	0.0023	0.0037		0.0030
lbs/hr	0.7069	0.5684	0.9124		0.7292
lbs/MMBtu					

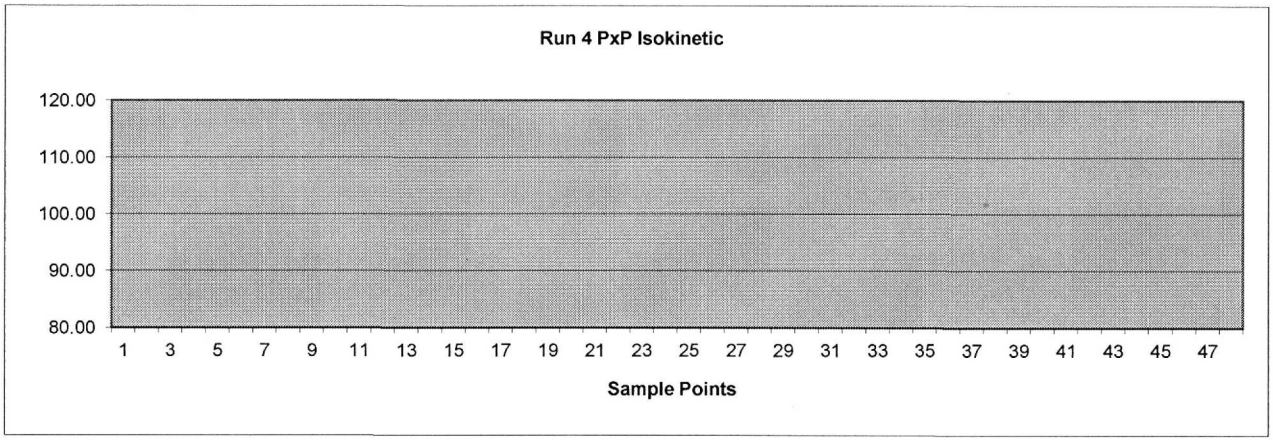


F factor used


Run 1 PxP Isokinetic
120.00
110.00
100.00
90.00
80.00
% Isokinetic
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Points


Run 2 PxP Isokinetic
120.00
110.00
100.00
90.00
80.00
% Isokinetic
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Sample Points

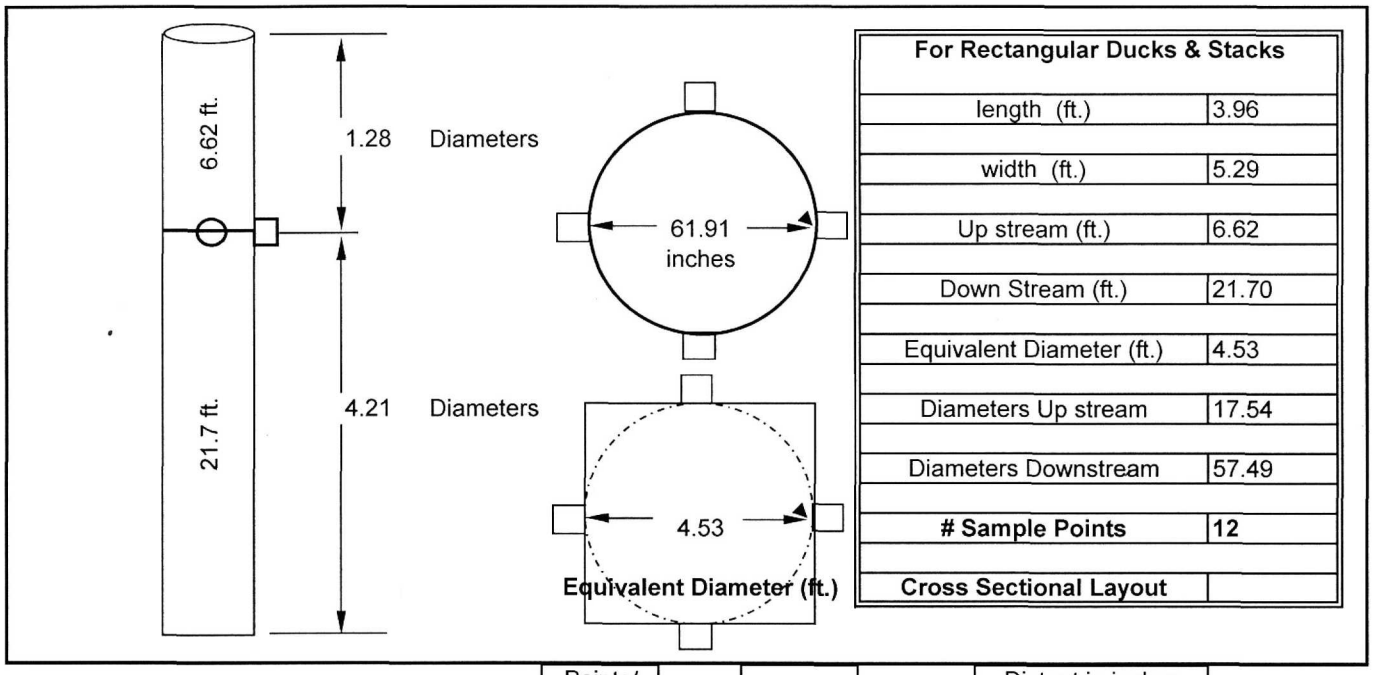

Run 3 PxP Isokinetic
120.00
110.00
100.00
90.00
80.00
% Isokinetic
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Sample Points


Run 4 PxP Isokinetic
120.00
110.00
100.00
90.00
80.00
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Sample Points

Method 1 Data For Minimum number of traverse points for particulate traverses

Company Name Geneva Rock Products - Morgan Pit Date 10/5&6/2016

Sample Location:



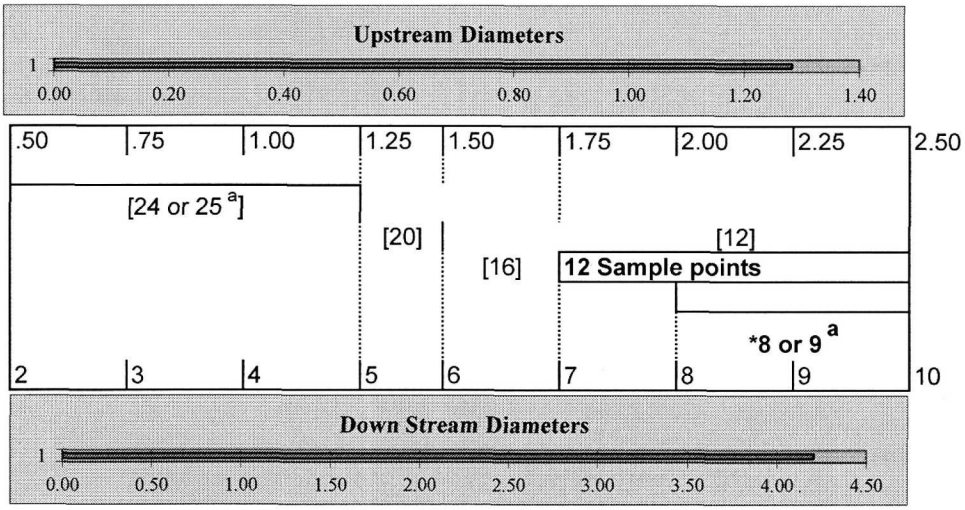
For Rectangular Ducks & Stacks	
length (ft.)	3.96
width (ft.)	5.29
Up stream (ft.)	6.62
Down Stream (ft.)	21.70
Equivalent Diameter (ft.)	4.53
Diameters Up stream	17.54
Diameters Downstream	57.49
# Sample Points	**12**
Cross Sectional Layout	

Type Stack or Duct

Diameter (in.)	61.91
Upstream (ft.)	6.62
Down Stream (ft.)	21.70
Coupling (in.)	12.00
Stack Area (ft^2)	20.90
# Sample Points	12

8, 12, 16, 20, &24

Points/ Diameter	% Dia	Distant in inches Wall	Coupling
1	4.40%	2.72	14.72
2	14.60%	9.04	21.04
3	29.60%	18.33	30.33
4	70.40%	43.58	55.58
5	85.40%	52.87	64.87
6	95.60%	59.19	71.19



*** For Stack Diameters between 12 - 24 inches**

Geneva Rock Products - Mo			Flow & Moisture				Test Date	10/5&6/2016	
As ft^2	Pbar	Pq (static)	Ps	Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms
20.90	25.10	-0.34	25.08	229	4.00	14.00	82.00	29.20	26.16
Y	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws	1.6526
1.0310	0.86	18.940	128.30	74.42	16.191	6.039	0.2717	0.9990	0.999
Avg. Sqrt Dlp	Vs	scfm wet	acfm	Qsd dscfh	# Sample Points	Dn	Total Test time (minutes)	Time @ point (minutes)	Avg. Dlh
0.656	49.14	39,595	61,622	1.73E+06	12	0.182	60	5.00	0.270250
					TRUE				

Point No.	Meter (cf)	dl "p"	dl "h"	ts F	tm F (in)	tm F (out)
1	226.811	0.31	0.27	211	70	70
2	228.140	0.42	0.27	213	71	70
3	229.720	0.57	0.27	222	74	70
4	231.500	0.78	0.27	232	77	70
5	233.632	0.30	0.27	225	77	70
6	234.940	0.35	0.27	235	76	71
7	236.420	0.41	0.27	246	76	72
8	237.960	0.66	0.27	243	81	73
9	239.872	0.26	0.27	225	78	73
10	241.060	0.28	0.27	227	79	74
11	242.350	0.39	0.27	231	82	74
12	243.880	0.60	0.27	234	84	74
13	245.752					
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Imp. Liquid Collected		
Wt. (Final)	Wt. (Initial)	lc
525.6	**405.7**	**119.9**
594.5	**594.4**	**0.1**
697.9	**695.7**	**2.2**
821.8	**815.7**	**6.1**
		0.0

Isokinetics	108.3
Test Date	10/5&6/2016
Start Time	11:38
End Time	12:56

enter

Geneva Rock Products - Mo			Flow & Moisture				Test Date	5/13/2009	
As ft^2	Pbar	Pq (static)	Ps	Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms
20.90	25.10	-0.33	25.08	224	3.50	14.50	82.00	29.14	25.96
Y	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws	1.5244
1.0310	0.86	17.728	128.80	74	15.173	6.063	0.2855	0.9990	0.999
Avg. Sqrt Dlp	Vs	scfm wet	acfm	Qsd dscfh	# Sample Points	Dn	Total Test time (minutes)	Time @ point (minutes)	Avg. Dlh
0.653	48.92	39,667	61,351	1.70E+06	12	0.182	60	5.00	0.25
					TRUE				

Point No.	Meter (cf)	dl "p"	dl "h"	ts F	tm F (in)	tm F (out)	Imp. Liquid Collected		
							Wt. (Final)	Wt. (Initial)	lc
1	246.648	0.32	0.25	221.0	71.0	71.0			
2	247.920	0.45	0.25	225.0	72.0	71.0	**515.50**	**393.30**	**122.2**
3	249.410	0.62	0.25	229.0	75.0	70.0	**594.90**	**594.40**	**0.5**
4	251.180	0.77	0.25	235.0	78.0	70.0	**698.70**	**696.50**	**2.2**
5	253.200	0.28	0.25	220.0	77.0	70.0	**834.10**	**830.20**	**3.9**
6	254.390	0.32	0.25	226.0	77.0	71.0			**0.0**
7	255.670	0.44	0.25	228.0	79.0	71.0			
8	257.160	0.66	0.25	229.0	81.0	71.0			
9	258.878	0.26	0.25	215.0	75.0	71.0			
10	260.170	0.25	0.25	212.0	76.0	72.0			
11	261.290	0.38	0.25	226.0	78.0	71.0			
12	262.720	0.54	0.25	227.0	81.0	71.0			
13	264.376								
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Isokinetics	103.3
Test Date	10/5&6/2016
Start Time	14:18
End Time	15:31

Geneva Rock Products - Mo			Flow & Moisture				Test Date	5/13/2009	
As ft^2	Pbar	Pq (static)	Ps	Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms
20.90	25.33	-0.30	25.31	227	3.50	13.50	83.00	29.10	26.02
Y	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws	1.5716
1.0310	0.86	16.939	118.90	76	14.582	5.597	0.2774	0.9990	0.999
Avg. Sqrt Dlp	Vs	scfm wet	acfm	Qsd dscfh	# Sample Points	Dn	Total Test time (minutes)	Time @ point (minutes)	Avg. Dlh
0.653	48.74	39,759	61,115	1.72E+06	12	0.182	60	5.00	0.23
					TRUE				

Point No.	Meter (cf)	dl "p"	dl "h"	ts F	tm F (in)	tm F (out)	Imp. Liquid Collected		
							Wt. (Final)	Wt. (Initial)	lc
1	264.711	0.30	0.23	210.0	71.0	71.0			
2	265.950	0.45	0.23	215.0	71.0	70.0	**517.3**	**406.0**	**111.3**
3	267.360	0.55	0.23	236.0	73.0	70.0	**597.7**	**596.6**	**1.1**
4	268.880	0.73	0.23	231.0	75.0	69.0	**707.6**	**705.7**	**1.9**
5	270.711	0.31	0.23	225.0	75.0	70.0	**838.4**	**833.8**	**4.6**
6	271.850	0.34	0.23	226.0	76.0	71.0			**0.0**
7	273.190	0.48	0.23	231.0	80.0	72.0			
8	274.700	0.59	0.23	236.0	83.0	73.0			
9	276.361	0.24	0.23	215.0	84.0	74.0			
10	277.440	0.27	0.23	230.0	82.0	75.0			
11	278.610	0.44	0.23	231.0	86.0	76.0			
12	280.060	0.56	0.23	232.0	88.0	77.0			
13	281.650								
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Isokinetics	97.9
Test Date	10/5&6/2016
Start Time	13:29
End Time	14:41

American Environmental
Testing Company Inc.

6823 South 3600 West
Spanish Fork, Utah 84660
(801) 794-2950 Fax (801) 794-2951

October 25, 2016

STATE OF UTAH
Department of Air Quality
Attn: Mr. Jay Morris,
Minor Source Compliance Manager
195 North 1950 West
Salt Lake City, Utah 84114

Dear Mr. Morris:

For and in behalf of Geneva Rock Products Mr. Sam Bernard, American Environmental Testing Company, Inc. respectfully submits the "EPA Compliance Testing Report" for Particulate/PM_{10} emissions conducted on their CMI Hot Mix Asphalt Plant located near Morgan, Utah.

Testing was conducted on October 5 & 6, 2016. There were no deviations to the reference test methods during this set of tests.

If you have any questions, or if we can be of further service, please give me a call at (801) 794-2950.

Sincerely,

Cheyney Guymon
Senior Testing Supervisor

cc: Mr. Sam Bernard, Sunroc Corporation – Environmental Specialist

"EPA COMPLIANCE TESTING REPORT FOR PARTICULATE EMISSIONS CONDUCTED ON GENEVA ROCK PRODUCTS' CMI HOT MIX ASPHALT PLANT LOCATED IN MORGAN, UTAH"

Test Date: October 5 & 6, 2016

UDEQ Approval Order No. DAQE-809-00

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

"EPA COMPLIANCE TESTING FOR PM_{10} EMISSIONS CONDUCTED ON GENEVA ROCK PRODUCTS' CMI HOT MIX ASPHALT PLANT, LOCATED IN MORGAN, UTAH"

EPA 201A Supervisor:

JD Schiller

Technicians:

Gabe Prinster

Test Date:

October 5 - 6, 2016

Submittal Date:

October 18, 2016

Prepared for: Mr. Sam Bradford, Environmental Specialist

Geneva Rock Products
1565 West 400 North
Orem, Utah 84057

Prepared by: Mr. V. Brent Benson, Technical Director

American Environmental Testing, Inc.
6823 South 3600 West
Spanish Fork, Utah 84660

CERTIFICATION OF REPORT INTEGRITY

AMERICAN ENVIRONMENTAL TESTING COMPANY, INC. (AET) certifies:

1. That every effort was made to obtain accurate and representative data within the guidelines established by:

   a. The Utah Departments of Environmental Quality.

   b. The U.S. Environmental Protection Agency Code of Federal Regulations (CFR) Title 40, Chapter I, Part 60, Appendix "A", Methods 1-4 inclusive, 9 and 201A.

   c. The U.S. Environmental Protection Agency "Quality Assurance Handbook for Air Pollution Measurement Systems".

2. All sampling and analysis performed for the compliance test reported herein were carried out by myself or under my supervision.

3. The results obtained are accurate and authentic.

I have reviewed all testing details and methods on which the results of this test are based. I find them to be accurate within the limits of the applicable methods.

JD Schiller
EPA 201A Supervisor

I have reviewed all testing details and methods on which the results of this test are based. I find them to be accurate within the limits of the applicable methods.

V. Brent Benson
Technical Director

TABLE OF CONTENTS

APPENDICES

"EPA COMPLIANCE TESTING FOR PM_{10} EMISSIONS CONDUCTED ON GENEVA ROCK PRODUCTS' CMI HOT MIX ASPHALT PLANT, LOCATED IN MORGAN, UTAH"

1.0 Introduction

1.1 Test Purpose

At the request of Geneva Rock Products' Mr. Sam Bradford, American Environmental Testing Company, Inc., (AET) conducted EPA Compliance Testing for PM_{10} Emissions on their CMI Hot Mix Asphalt (HMA) Plant, located in Morgan, Utah. These tests were conducted on October 5-6, 2016.

The UDEQ issued Granite Construction Company an Approval Order (AO) (No. DAQE-809-00) on November 16, 2009. A copy of this AO is included in Appendix "A". In the Permit, the following emissions were to be quantified from the drum dryer stack as per, Condition 13:

A. PM_{10}.
B. Opacity (3, 6 minute testing periods).

The following limitations for the CMI HMA Plant were taken from requirement in the above referenced Approval Order:

A. PM_{10} emission concentration is limited to 0.024 grains/dscf and 13.99 lb/hr in.

B. Visible emissions from the Baghouse stack are limited to 10% opacity.

To satisfy the testing requirements, Geneva Rock Products requested that AET prepare a "Pretest Protocol" to be submitted to the UDEQ outlining the appropriate testing methods. The body of that document is presented in Appendix "B".

AET performed emissions testing as set forth in the Code of Federal Regulations (CFR), Title 40, Chapter I, Part 60, Appendix "A". The following methods were used to evaluate the emissions testing:

Method 1 - "Sample and Velocity Traverses for Stationary Sources"

Method 2 - "Determination of Stack Gas Velocity and Volumetric Flow Rate (type "S" pitot tube)"

Method 3 - "Gas Analysis for Carbon Dioxide, Oxygen, Excess Air and Dry Molecular Weight"

Method 4 - "Determination of Moisture Content in Stack Gases"

Method 9 - "Determination of Visible Opacity from Stationary Sources"

Method 201A – "Determination of PM_{10} Emissions from Stationary Sources"

Method 202 – "Determination of Back-Half Condensable of PM_{10} Emissions"

2.0 Summary of Results

2.1 PM_{10} Emissions (EPA 201A)

The emissions data accumulated for PM_{10} during the October 5-6, 2016 compliance tests are summarized in Table 2.1.1 for the CMI HMA Plant.

Table 2.1.1: PM_{10} Emissions Summary for the CMI HMA Plant.

Test Run Number	DSCF Collected	Emissions Rates	
		lb/hr	grains/dscf
1	16.19	0.5625	0.0023
2	15.17	0.4943	0.0020
3	14.58	0.6778	0.0028
Average =	15.31	0.5782	0.0024

The average PM_{10} emission concentration of 0.0024 grains/dscf is 10.0% of the permitted level of 0.024 grains/dscf. The average emission rate of 0.5782 lb/hr is 4.14% of the permitted level of 13.99 lb/hr.

2.2 Visible Emission Opacity (VEO)

VEOs were taken simultaneously with each of the EPA Method 201A runs. The averages of each of these are shown in Table 2.2.1 for the CMI HMA Plant.

Table 2.2.1: VEO Summary for the CMI HMA Plant

Test Number	% VEO
1	0.00
2	0.00
3	0.00
Average =	0.00

The average VEO readings were well below the air quality permitted level of 10.0%.

3.0 Source Operation

3.1 General Plant Operations

Asphaltic concrete paving is a mixture of well graded, high quality aggregate and liquid asphaltic cement which is heated and mixed in measured quantities to produce bituminous pavement material. Aggregate constitutes 92 weight percent of the total mixture. Aside from the amount and grade of asphalt used, mix characteristics are determined by the relative amounts and types of aggregate used. A certain percentage of fine aggregate (% less that 74 micrometers in physical diameter) is required for the production of good quality asphaltic concrete.

The drum mix process simplifies the conventional process by using proportioning feed controls in place of hot aggregate storage bins, vibrating screens, and the mixer.

Aggregate is introduced at the end of the revolving drum mixer, and the asphalt is injected midway along the drum. The burner sits at the opposite end of where the aggregate enters the drum mixer. A variable flow asphalt pump is linked electronically to the aggregate belt scales to control mix specifications. The hot mix is discharged from the revolving drum mixer into surge bins or storage bins.

Geneva Rock Products gave production rates during the testing period to AET. Actual production data is attached as Appendix "C". The average production rate during the test period was as follows:

Test Run No. 1 – 302.88 TPH
Test Run No. 2 – 302.56 TPH
Test Run No. 3 – 301.33 TPH

4.0 Sampling and Analysis Procedures

4.1 Emissions Testing

A. EPA Method 1: sample and velocity traverses for stationary sources.

Figure 4.1.1 is a diagram of the CMI0 HMA Plant Stack. This reference method requires the tester, due to stack geometry, to sample for particulate and velocity at twelve (12) separate locations in the stack. The points are located at the centroid of four (4) equal area zones located along three (3) traverses located perpendicular to one another. The locations of these points relative to the stack are given in Table 4.1.2.

B. EPA Method 3; for gas analysis of carbon dioxide, oxygen, excess air, and dry molecular weight.

This reference method requires that a gas sample be extracted from the stack for analysis concurrently with each of the three (3) particulate runs. The gas sample is then analyzed via a Fyrite analyzer for carbon monoxide, carbon dioxide and oxygen. The nitrogen value is obtained by difference. Results from these determinations are included in Appendix "D" with the field and laboratory data forms.

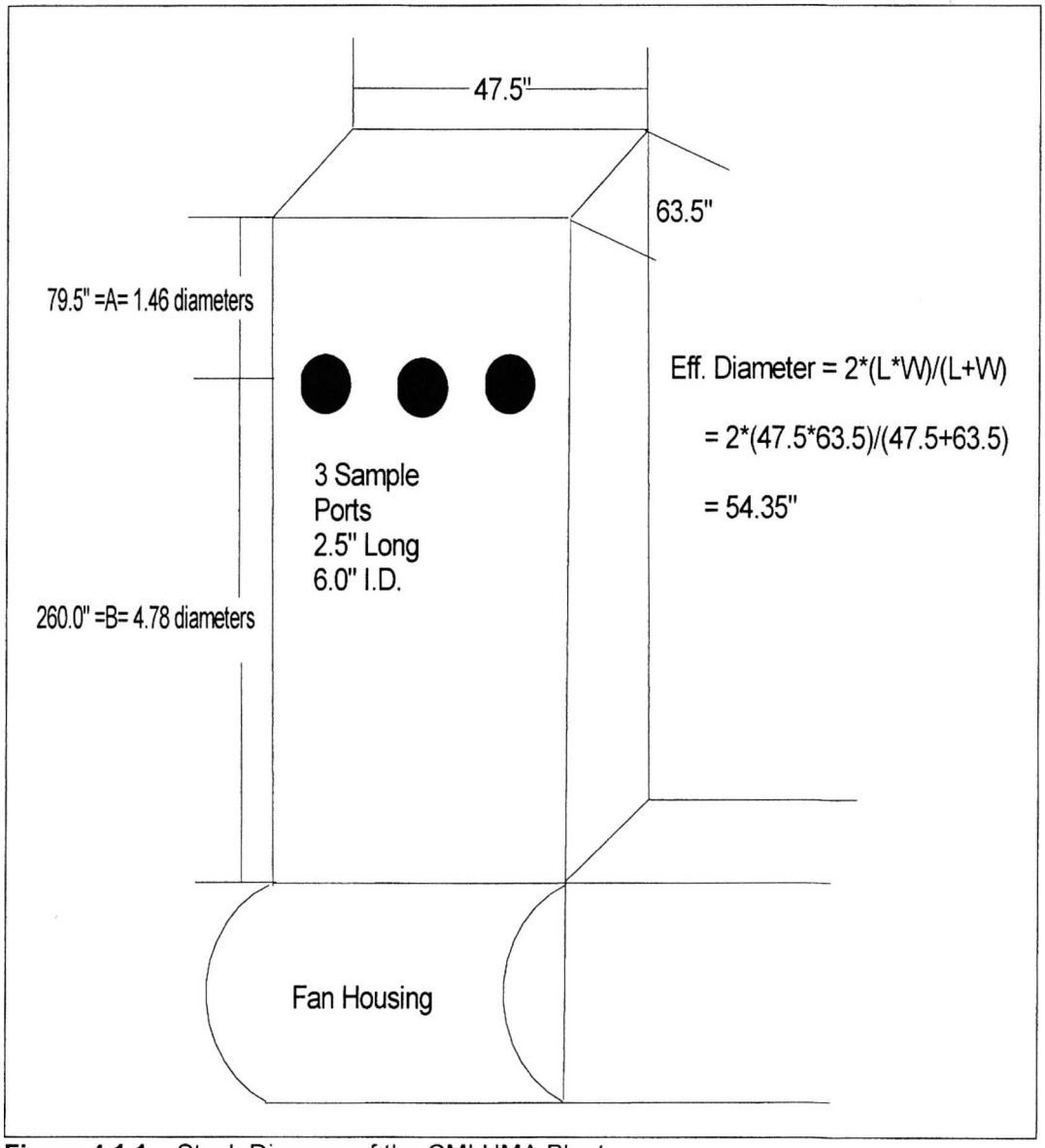
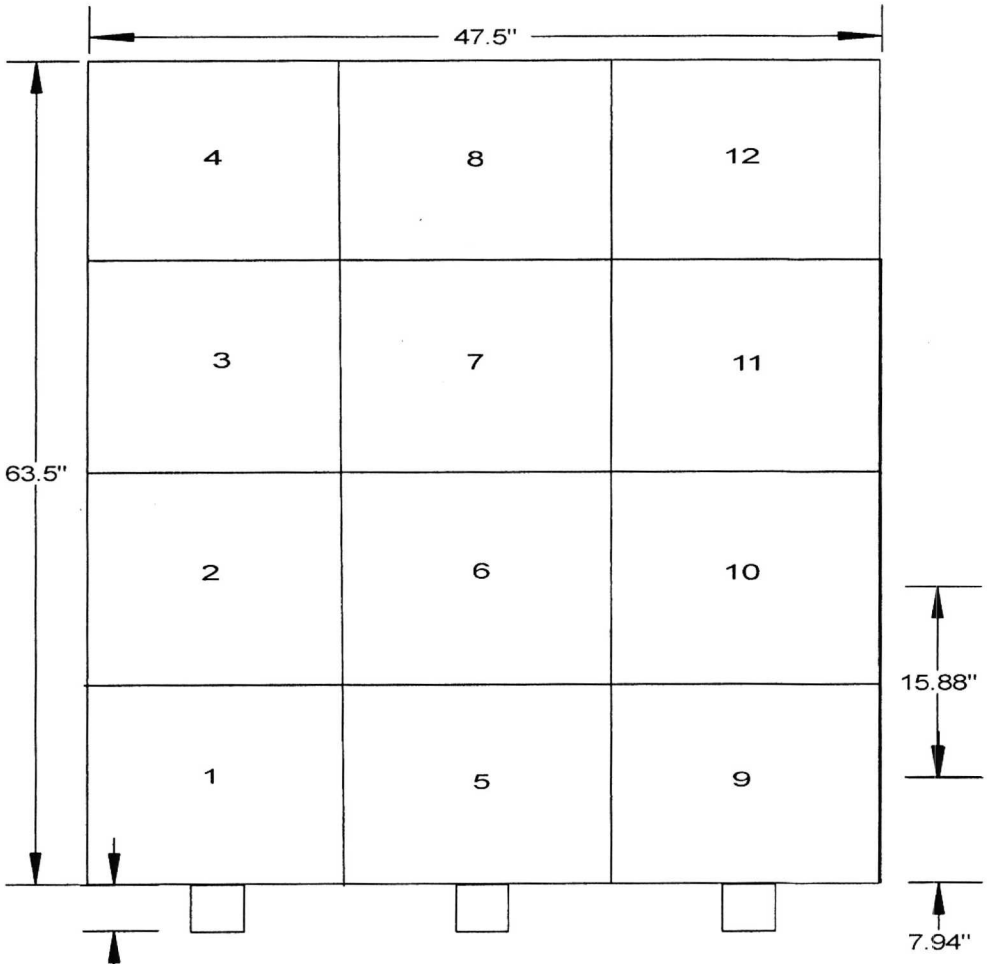


Figure 4.1.1 – Stack Diagram of the CMI HMA Plant

Table 4.1.2 – Traverse Point Locations for the CMI HMA Plant



Points	Distance from Outside to Point
1, 5, 9	10.44" = 10 1/2"
2, 6, 10	26.31" = 26 1/4"
3, 7, 11	42.19" = 42 1/4"
4, 8, 12	58.06" = 58"

C. EPA Method 2 and 201A combined; for the determination of velocity, volumetric flow rate, and particulate from stationary sources.

AET tested the CMI HMA Plant using methodology consistent with EPA Methods 2 and 201A. Data from the three (3) separate runs, which constituted the compliance test, is summarized in Table 4.1.3 (Field and Laboratory Summary). The original laboratory and field data accumulated at the test site are presented in Appendix "D". Orsat and laboratory weight forms are hand written on site as the data is generated.

Table 4.1.3 – Field and Laboratory Data for the CMI HMA Plant

Symbol	Description	Units	Run #1	Run #2	Run #3
V_m	Volume of Gas Sample as	dcf	18.94	17.73	16.939
ΔH	Measured by Dry Gas Meter (DGM) Average Pressure Differential	"H_20	0.27	0.25	0.23
t_m	Across the Orifice Meter DGM Temperature	°F	74.42	73.75	75.50
T_m	Absolute Ave. DGM Temperature	°R	534.42	533.75	535.50
V_w	Total H_20 Collected,	g	128.3	128.8	118.9
CO_2	Impingers & Silica Gel Orsat Analysis	%	4.00	3.50	3.50
O_2	Orsat Analysis	%	14.00	14.50	13.50
N_2 + CO	Orsat Analysis	%	82.00	82.00	83.00
A_n	Nozzle Area	ft^2	1.8000E-04	1.8000E-04	1.8000E-04
D_n	Nozzle Diameter	inches	0.182	0.182	0.182
t_s	Stack Temperature	°F	228.67	224.42	226.50
T_s	Absolute Stack Temperature	°R	688.67	684.42	686.50
Sqrt ΔP	Velocity Head of Stack Gas	"H_20	0.6561	0.6528	0.6530
Y	DGM Calibration Factor	dimensionless	1.031	1.031	1.031
C_p	Pitot Tube Coefficient	dimensionless	0.855	0.855	0.855
P_{bar}	Barometric Pressure	"Hg	25.1	25.1	25.33
P_g	Stack Static Pressure	"H_20	-0.34	-0.33	-0.3
P_s	Absolute Stack Pressure	"Hg	24.80	25.08	25.31
A_s	Stack Area	Ft^2	20.90	20.90	20.90
ϕ	Stack diameter	inches	61.91	61.91	61.91
T_t	Total Time of Test	minute	59.15	58.45	59
M_n	Total PM-10 Matter Collected	mg	0.3	0.6	0.6

PM_{10} and velocity measurements, required in the applicable reference methods, for the CMI HMA Plant are generated in the field by computer. These forms are also included in Appendix "D" for each of the three (3) runs that comprised the compliance test. Compliance criteria is calculated using computer and hand-written field forms and is summarized in Table 4.1.4. A copy of the example calculations is attached as Appendix "H".

Table 4.1.4 – Compliance Criteria for the CMI HMA Plant

Symbol	Description	Units	Run #1	Run #2	Run #3
$V_{m\ std}$	Volume of Gas Sampled Measured	dscf	16.19	15.17	14.58
	by DGM, Corrected to Std. Conditions	dscf/min	0.3202	0.3033	0.2871
$V_{w\ std}$	Volume of Water Vapor in the Gas	scf	6.0391	6.0626	5.5966
	Sample Corrected to Std. Condtions				
B_{ws}	Water Vapor in Gas Stream		0.2717	0.2855	0.2774
	Proportion by Volume				
M_d	Molecular Weight of Stack Gas,	lb/lb mole	29.2000	29.14	29.1000
	Dry Basis				
M_s	Molecular Weight of Stack Gas,	lb/lb mole	26.1575	25.9596	26.0214
	Wet Basis				
μs	Viscosity of Stack Gas	μp	199.76	197.86	198.49
Qs	Total Cyclone Flow Rate at Wet	ft^3/min	0.59	0.56	0.53
	Cyclone Conditions				
ISO	Isokinetic Variation	%	110.8216	106.3475	99.8780
D50	Diameter of Particles Having 50%	μm	9.8215	10.0948	10.5881
	Probability of Penetration				
V_s	Average Stack Gas Velocity	ft/sec	49.41	48.92	48.74
Q_{sd}	Dry Volumetric Stack Gas Flow	dscf/h	1.7212E+06	1.7009E+06	1.7243E+06
	Rate Corrected to Std. Conditions				
Emr	PM-10 Emission Rates	lbs/hr	0.5625	0.4943	0.6778
C_s	Pm-10 Concentration in Stack	lbs/dscf	3.2678E-07	2.9060E-07	3.9309E-07
		gr/dscf	0.0023	0.0020	0.0028
		g/dscm	0.0053	0.0047	0.0064

Figure 4.1.5 is a schematic of the EPA 201A sample train used to obtain the field data. The glass fiber filters used in the train are 99.95% efficient on 0.3-micron particles and have no organic binders (Andersen P-3710). The acetone catch, filter weight and the back-half condensables were used to calculate PM_{10} emissions. The back-half condensable part of the train consisted of a condenser and water dropout followed by an empty impinger. After the empty impinger, a Teflon filter (CPM Filter) was placed prior to an impinger containing a 100 mls of water and the last impinger contained a known amount of silica gel. All impingers and the water dropout were weighed before and after each test to determine the moisture content of the gases. The condensor, knockout, empty impinger and CPM Filter were purged with nitrogen for one (1) hour at fourteen (14) liters per minute following each run. After the nitrogen purge, each of those components, along with the back of the heated filter housing and the front half of the CPM filter were rinsed twice with water and the contents placed in a sample container labeled water rinse. Following the water rinse, each of the components were then rinsed once with acetone and then twice with hexane and the contents were placed in sample container labeled organic rinse. The CPM filter was extracted with water and hexane and placed in the appropriate CPM containers. The water rinse and the organic rinse were evaporated and weighed and included to the total particulate catch. The CPM filter was maintained at a temperature between 65°F and 85°F during each sample run.

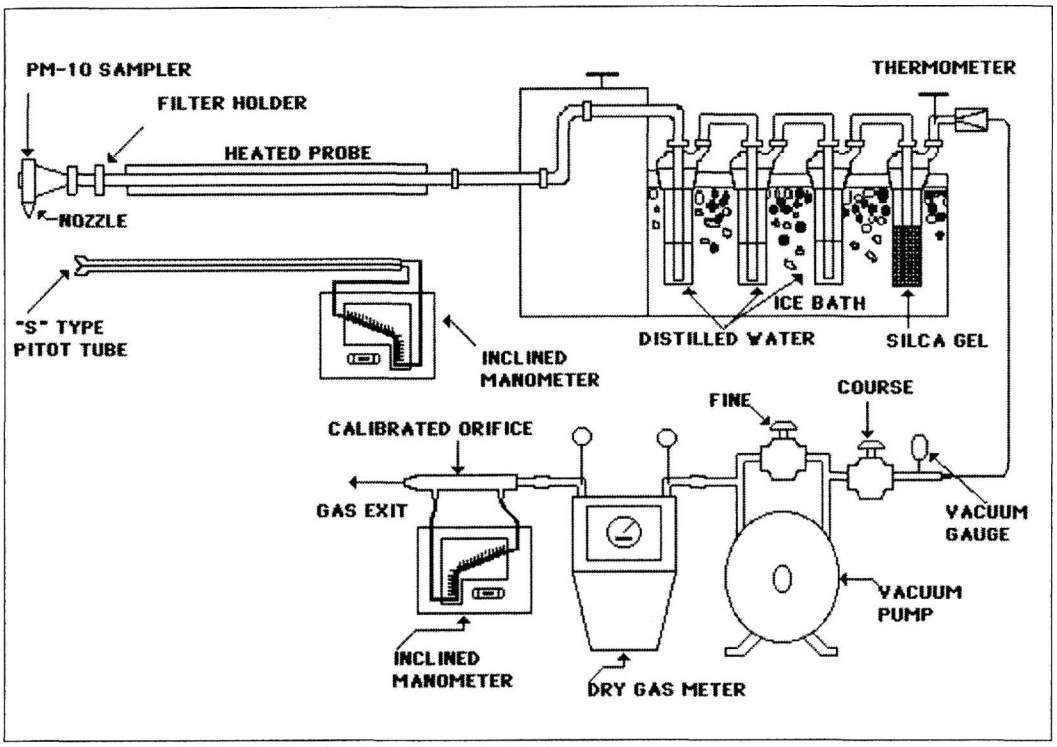


Figure 4.1.5 – EPA Method 201A Sample Train

Moisture in the stack gases was collected by keeping the impingers in the sample train below 68°F with an ice bath. The "back-half" of the moisture sampling train contained the following impingers:

Impinger Number	Contents	Amount	Parameter Collected
Knock Out	Empty	xxx	Moisture
1	Empty	xxx	Moisture
2	Deionized Water	100 ml	Moisture
3	Silica Gel	@200 g	Moisture

Prior to doing the EPA Method 201A tests, AET performed a pretest cyclonic flow determination in the exhaust stack per EPA Method 2 criteria. The stacks are testable if the average flow rate varies less than 20° from parallel to the vertical stack. The average angle was found to be 11.83° on the CMI HMA Plant. The Cyclonic Field Form is attached in Appendix "E".

On all tests for PM_{10} emissions, the sampling train was leak-checked at the nozzle at 15 inches of vacuum (Hg), and the reading recorded on the computer forms. This was done to predetermine the possibility of a diluted sample. After each test is complete AET conducts a final leak check to insure sample integrity. Those values are also included in the computer printouts. Before and after each test, the Pitot tube lines were checked for leaks under both a vacuum and pressure. The lines were also checked for clearance and the manometer was zeroed before each test. These leak checks are shown on the computer forms for each run in Appendix "D".

D. EPA Method 9; for visible emissions opacity.

During each of the EPA Method 201A runs AET had a certified VEO reader compile VEOs every fifteen (15) seconds for six (6) minutes.

Field VEO forms and the reader's current certification cards are included as Appendix "F".

5.0 Quality Control/Quality Assurance

5.1 Emissions Testing

Specific items used in the EPA approved sample trains require pretest and post-test calibrations. The frequency of the calibrations and guidelines for procedural items are delineated in the EPA's "Quality Assurance Handbook for Air Pollution Measurement Systems".

For EPA Methods 1-4 inclusive and 201A, the quality assurance guidelines are intended to insure that the PM_{10} emissions are quantified in a manner consistent with the most stringent sampling criteria possible. AET testing personnel are thoroughly trained in all aspects of the EPA required QA/QC guidelines. The crew supervisor has certified at the front of this report that the test crew adhered to those guidelines in the regulations applicable to EPA Method 201A compliance testing at Geneva Rock Products CMI HMA Plant.

Calibrations for the sample nozzle, pitot tube, thermocouples, orifice, filter balance and dry gas meter used to extract the sample are attached as Appendix "H".

The main quality criteria that AET is required to fulfill for EPA Method 201A testing are as follows:

CMI HMA Plant

1. Cut Rate = 10.0 +/- 1.0

AET Run Number	D_{50}
1	9.8215
2	10.0948
3	10.5881
Average	10.1681

All of the compliance test quality assurance criteria were achieved for this set of tests.

Appendix "A"

(Approval Order No. DAQE-809-00)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Richard W. Sprott
Director

State Of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4000 Voice
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
Web: www.deq.state.ut.us

FILE COPY

DAQE-809-00

December 22, 2000

John Wilkinson
Wilkinson Construction Co., Inc.
1200 E. 100 S.
Morgan, UT 84050

Dear Mr. Wilkinson:

Re: Approval Order For a New Asphalt Plant, Morgan County, CDS SM; ATT; NSPS, TITLE V
Project Code: N0981-001

The attached document is an Approval Order for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. M. Maung. He may be reached at (801) 536-4153.

Sincerely,

Richard W. Sprott, Acting Executive Secretary
Utah Air Quality Board

RWS:MM:re

cc: Weber-Morgan Health Department
Mike Owens, EPA Region VIII

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER FOR A NEW ASPHALT PLANT

Prepared By: M. Maung, Engineer
(801) 536-4153

APPROVAL NUMBER

DAQE-809-00

Date: December 22, 2000

Source Contact
John Wilkinson
(801) 829-6833

Wilkinson Construction

Richard W. Sprott
Acting Executive Secretary
Utah Air Quality Board

Abstract

Wilkinson Construction Company, Inc. has proposed to operate an asphalt plant and a crushing operation. This is a new site and is located near the city of Morgan in Morgan County. Morgan County is an attaintment area of the National Ambient Air Quality Standards for all pollutants.

The estimated capacity of the plant is 500,000 tons of asphalt per year and 400 tons of asphalt per hour.

The annual emissions from this plant, in tons per year, will be as follows: 8.09 tons of PM_{10}, 14.60 tons of NO_x, 1.30 tons of SO_2, 41.80 tons of CO, 6.99 tons of VOC and 2.461 tons of HAPs. The source is subject to New Source Performance Standards Subparts I (Standards of Performance for Hot Mix Asphalt Plants) and Subparts OOO (Standards of Performance for Nonmetallic Mineral Processing Plants) regulations. Title V regulations apply to this source. The source is not subject to the National Emission Standards for Hazardous Air Pollutants regulations.

The control of particulates by the baghouse and 10% opacity are recommended as Best Available Control Technology. The emissions from crushing and screening operations will be controlled by wet suppression. It has been determined that the requirements of the Utah Administrative Code R307-401-6 have been met. A 30-day public comment period was completed.

The project has been evaluated and found to be consistent with the requirements of the Utah Air Quality Rules (UAQR) and the Utah Air Conservation Act. This air quality AO authorizes the project with the following conditions, and failure to comply with any of the conditions may constitute a violation of this order.

General Conditions:

1. This Approval Order (AO) applies to the following company:

   Wilkinson Construction Company, Inc.
   1200 East 100 South
   Morgan, UT 84050
   Phone Number: (801)-829-6833
   Fax Number: (801)-829-3643

   The equipment listed below in this AO shall be operated at the following location:

   PLANT LOCATION:

   3175 West Old Highway Road, Morgan, Utah 84050
   Morgan County

   Universal Transverse Mercator Coordinate System:
   4,551.2 kilometers Northing; 436.9 kilometers Easting; Zone 12

2. Definitions of terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code Rule 307 (UAC R307), and Series 40 of the Code of Federal Regulations (40 CFR). These definitions take precedence unless specifically defined otherwise herein.

3. Wilkinson Construction Company, Inc. (Wilkinson) shall install and operate the asphalt plant drum mixer and shall conduct its operations of the asphalt plant and a crushing operation in accordance with the terms and conditions of this AO, which was written pursuant to Wilkinson's Notice of Intent submitted to the Division of Air Quality (DAQ) on April 26, 2000 and additional information submitted to the DAQ on July 17, 2000.

4. The approved installations shall consist of the following equipment or equivalent*:

A. Asphalt Plant Drum Mixer, manufacturer CMI, Model PTD-400*, rated at 400 tons per hour. Exhaust gases are vented through a baghouse, Model CMI RA3.

B. Baghouse, model CMI RA3-18PTD*, Serial Number 203

C. One triple Deck Screen: Capacity 400 tons per hour
Manufacturer: Cedar rapids
Model: El Jay CSC 45*
Year: 1996

D. One 45" Cone Crusher: Capacity 400 tons per hour
Manufacturer: Cedar rapids
Model: El Jay CSC 45*
Year: 1996

E. One 45" Roll Crusher: Capacity 400 tons per hour
Manufacturer: Cedar rapids
Model: 880*
Year: 1954

F. Conveyors

G. One diesel storage tank: capacity 5,000 gallon

H. Associated support equipment for conveying, heating, storing, classifying, drying aggregate, asphalt oil, and finished product.

* Equivalency shall be determined by the Executive Secretary.

Any future changes or modifications to the equipment and processes approved by this AO that could affect the emissions covered by this AO must be approved in accordance with R307-401-1, UAC.

Limitations and Tests Procedures

5. Emissions to the atmosphere at all times from the indicated emission point shall not exceed the following rate and concentration:

Source: Drum Mixer Vented Through the Baghouse:

Pollutant	lb/hr	grains/dscf (68 °F, 29.92 in Hg)
PM_{10} (virgin and/or RAP)	13.99	0.024

RAP denotes recycled asphalt pavement

6. Stack testing to show compliance with the emission limitations stated in Condition #9 shall be performed as specified below:

A.

Emission Point	Pollutant	Testing Status	Test Frequency
Drum exhaust passing through Baghouse	PM_{10} (virgin and RAP)	*	@

B. Testing Status (To be applied above)

* Initial compliance testing is required. The initial test date shall be performed as soon as possible and in no case later than 180 days after the issuance of this AO. Compliance testing shall not be required for both virgin and recycle materials during the same testing period. Testing shall be performed for the product being produced during the time of testing.

@ Test every five years, or sooner if directed by the Executive Secretary. Tests may be required if the source is suspected to be in violation with other conditions of this AO. Compliance testing shall not be required for both virgin and recycle materials during the same testing period. Testing shall be performed for the product being produced during the time of testing.

C. Notification

At least 30 days prior to conducting any emission testing required under any part of UAC, R307, the owner or operator shall notify the Executive Secretary of the date, time and place of such testing and, if determined necessary by the Executive Secretary, the owner or operator shall attend a pretest conference. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Executive Secretary. The source test protocol shall be approved by the Executive Secretary prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, stack to be tested, and procedures to be used. A pretest conference shall be held, if directed by the Executive Secretary. The pretest conference shall include representation from the owner/operator, the tester, and the Executive Secretary. The emission point

shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other methods as approved by the Executive Secretary. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location.

D. TSP

40 CFR 60, Appendix A, Method 5

E. PM_{10}

For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201 or 201a. The back half condensibles shall also be tested using the method specified by the Executive Secretary. All particulate captured shall be considered PM_{10}.

For stacks in which liquid drops are present, methods to eliminate the liquid drops should be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, or 5e as appropriate. The back half condensibles shall also be tested using the method specified by the Executive Secretary. The portion of the front half of the catch considered PM_{10} shall be based on information in Appendix B of the fifth addition of AP-42 or other data acceptable to the Executive Secretary.

The back half condensibles shall not be used for compliance demonstration but shall be used for inventory purposes.

F. Sample Location

40 CFR 60, Appendix A, Method 1

G. Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2

H. New Source Operation

For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production rate (rated capacity) of the plant. If the maximum AO allowable production rate has not been achieved at the time of the test, the following procedure shall be followed:

1) Testing shall be at no less than 90% of the production rate achieved to date.

2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate. This new maximum allowable production rate shall be less than 90% of the allowed maximum production rate. This new allowable maximum production rate shall remain in effect until successfully tested at a higher rate.

3) The owner/operator shall request a higher production rate when necessary. Testing at no less than 90% of the higher rate shall be conducted. A new maximum production rate (110% of the new rate) will then be allowed if the test is successful. This process may be repeated until the maximum AO production rate is achieved.

I. Existing Source Operation

For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years.

7. Visible emissions from any point or fugitive emission source associated with the facility shall not exceed the following limitations:

A.	Asphalt (baghouse)	10% opacity
B.	All crushers	15% opacity
C.	All screens	10% opacity
D.	All conveyor transfer points	10% opacity
E.	Conveyor drop points	15% opacity
F.	All other points	20% opacity

Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9.

8. The following production limits shall not be exceeded without prior approval in accordance with R307-401-1, UAC:

A.	Asphalt production	500,000 tons per rolling 12-month period
B.	Total aggregate processed	475,000 tons per 12-month period

Total aggregate processed includes aggregates used in the asphalt production as well as aggregates hauled offsite. Records of asphalt production and aggregate processed shall be kept to show compliance with above. Compliance with the annual production limitations shall be determined on a rolling 12-month total. Wilkinson Construction Company, Inc. shall calculate new 12-month totals by the twentieth day of each month using data from the previous 12 months. Records of production shall be kept for all periods when the plant is in operation. These records, including rolling 12-month totals, shall be made available to the Executive Secretary or Executive Secretary's representative upon request and the records shall include the two year period prior to the date of the request. Production of asphalt shall be determined by belt scale records

or vendor receipts. Amount of aggregates hauled offsite shall be determined by scale house records or vendor receipts. Annual aggregate processed shall be determined as follows:

((asphalt production total - RAP usage) * 0.95) + aggregate hauled offsite.

9. A manometer or magnehelic pressure gage shall be installed to measure the differential pressure across the fabric filter. Static pressure differential across the fabric filter shall be between 2 to 6 inches of water column. The pressure gage shall be located such that an inspector/operator can safely read the indicator at any time. The reading shall be accurate to within plus or minus 1.0 inch of water column. The instrument shall be calibrated against a primary standard annually. Daily recording of the reading is required.

10. The following operating parameters shall be maintained within the indicated ranges:

    A. The temperature of the gases exiting the baghouse shall not be less than 160°F or more than 350°F.

    B. The asphalt mix temperature shall not exceed 350°F.

    They shall be monitored with equipment located such that an inspector/operator can safely read the output any time. The readings shall be accurate to within the following ranges:

    C. Temperature - Plus or minus 10°F.

    All instruments shall be calibrated against a primary standard at least once every year.

11. The amount of recycle asphalt used shall not exceed 40% of the total product at any time. Compliance shall be determined by the hourly amount of recycle product introduced to the kiln divided by the actual hourly production of asphalt. Monthly records maintained on site shall include:

    A. Total production of asphalt
    B. Amount of recycle asphalt used in the total production
    C. Monthly calculations of the percent recycle used in the total production

Roads and Fugitive Dust

12. All unpaved roads and other unpaved operational areas shall be water sprayed and/or chemically treated to the extent necessary to prevent, as far as practicable, the generation of fugitive dusts as dry conditions warrant or as determined necessary by the Executive Secretary. Records of treatment shall be made available to the Executive Secretary upon request and shall include a period of two years prior to the date of request. The length of paved road under the owner/operator's jurisdiction shall be periodically swept or sprayed clean as dry conditions warrant or as determined necessary by the Executive Secretary. Records of cleaning of paved road shall be made

available to the Executive Secretary upon request and shall include a period of two years prior to the date of request. All records shall include the following items:

A. Date;
B. Number of treatments made or sweep/spray cleaned;
C. Rainfall received, if any, and approximate amount;
D. Time of day treatments or sweeping/spray cleaned were made.

Also, owner/operator of this source who through his/her operations deposit materials which may create fugitive dust on a public or private road is required to clean the road such that fugitive dust as a result of his/her operations is minimized.

13. The haul road limitations shall be:

A. 0.30 mile in length round trip (paved)
B. Maximum speed: 10 miles per hour (posted)

These limitations shall not be exceeded without prior approval in accordance with R307-401, UAC. The vehicle speed on the haul road speed shall be posted, at a minimum, on site at the beginning of the haul road so that it is clearly visible from the haul road.

14. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six- minute period, however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the Executive Secretary or the Executive Secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made ½ vehicle length or greater behind the vehicle and at approximately ½ the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

Fuels

15. The sulfur content of any fuel oil or diesel burned shall not exceed 0.5 percent by weight. Sulfur content shall be decided by ASTM Method D-4294-89, or approved equivalent. The sulfur content shall be tested if directed by the Executive Secretary.

16. The owner/operator shall use only #2 fuel oil or cleaner fuel for on-site equipment. If any other fuel is to be used, an AO shall be required in accordance with R307-401-1, UAC.

Federal Limitations and Requirements

17. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subpart A, 40 CFR 60.1 to 60.18 and Subpart I, 40 CFR 60.90 to 60.93 (Standards of Performance for Hot Mix Asphalt Facilities)

apply to this installation. This facility must operate in accordance with the most current version of 40 CFR 60 applicable to this plant to be in compliance.

18. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subpart A, 40 CFR 60.1 to 60.18 and Subpart OOO, 40 CFR 60.670 to 60.676 (Standards of Performance for Nonmetallic Mineral Processing Plants) apply to this installation. This facility must operate in accordance with the most current version of 40 CFR 60 applicable to this plant to be in compliance.

Emission points that are subject to the initial observations are:

A. Cedar rapids cone crusher El Jay CSC 45
B. All screens
C. All conveyor transfer points

If the initial compliance opacity observations have been performed for these points, a repeat of the observations is not required.

Records & Miscellaneous

19. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded, and the records shall be maintained for a period of two years. Maintenance records shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request.

20. The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. This rule addresses regulated pollutant and hazardous air pollutant emission inventory reporting requirements, and emission statement inventory requirements. The full text of UAC R307-150 Series, Inventories, Testing and Monitoring is included as Appendix A. However, to be in compliance, this facility must operate in accordance with the most current version of the UAC, R307-150 series.

21. The owner/operator shall comply with R307-107, UAC. This rule addresses unavoidable breakdown reporting requirements. The full text of UAC R307-107 General Requirements, Unavoidable Breakdown, is included as Appendix B. However, to be in compliance, this facility must operate in accordance with the most current version of the UAC, R307-107.

All records referenced in this AO or in applicable NSPS, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. A summary of those records that are required as part of this Approval Order is included herein. This summary shall not be considered an additional requirement, but is included for informational purposes only. The condition that requires that these records be kept as part of the compliance with this AO is listed following the individual record. Examples of records to be kept at this source shall include the following as applicable:

Production rate	(Condition number 8)
Baghouse pressure drop	(Condition number 9)
Amount of recycled asphalt pavement use	(Condition number 11)
Fugitive dust control	(Condition number 12)
Maintenance records	(Condition number 19)
Emission inventory	(Condition number 20)
Upset, breakdown episodes	(Condition number 21)

Any future modifications to the equipment approved by this order must also be approved in accordance with R307-401-1, UAC.

The Executive Secretary shall be notified in writing if the company is sold or changes its name.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including the Utah Air Conservation Rules.

Annual emissions for this source (the entire plant) are currently calculated at the following values:

	Pollutant	Tons/yr
A.	PM_{10}	8.09
B.	SO_2	1.30
C.	NO_x	14.60
D.	CO	41.80
E.	VOC	6.99
F.	HAPs	
	formaldehyde	0.833
	benzene	1.45
	xylene	0.050
	ethyl benzene	0.060
	toluene	0.0451
	naphthalene	0.0225
	Total HAPs	2.461

These calculations are for the purposes of determining the applicability of Prevention of Significant Deterioration, nonattainment area, maintenance area, and Title V source requirements of the UAC R307.

They are not to be used for purposes of determining compliance.

Approved By:

Richard W. Sprott, Acting Executive Secretary
Utah Air Quality Board

Appendix "B"

(AET Pretest Protocol)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

AMERICAN ENVIRONMENTAL TESTING COMPANY, INC.

6823 South 3600 West
Spanish Fork, Utah 84660
(801) 794-2950

May 18, 2016

SOURCE INFORMATION

Facility Name: Geneva Rock Products
Unit to be tested: CMI Hot Mix Asphalt Plant
Mailing Address: 1565 West 400 North, Orem, Ut. 84057
Plant Address: 970 West Old Highway Road
Morgan, Utah 84050
Phone: (801) 802-6954, Cell (810) 623-7750
Plant Contact: Mr. Sam Bernard, Environmental Specialist
Test Date: July 5, 2016

CONTRACTOR OR TEST FIRM

Name: American Environmental Testing, Company, Inc.
Address: 6823 South 3600 West, Spanish Fork, Utah 84660
Phone: (801) 794-2950
Contact: V. Brent Benson, Technical Director

REASON FOR TESTING AND OPERATING PERMIT EMISSION LIMITATIONS

The Utah Department of Environmental Quality (UDEQ) issued Granite Construction Company an "Approval Order" (No. DAQE-809-00) dated November 16, 2009, for their CMI Hot Mix Asphalt (HMA) Plant, located off near Morgan, Utah. Geneva Rock Products purchased this plant and wants to perform the emissions testing to verify proper pant operation and to satisfy the permit condition. A copy of this AO is included in Appendix "A". The AO required the following limitations to be met when the plant is using recycled and virgin asphaltic materials:

A.	PM_{10}	0.024 grains/dscf
		13.99 lbs/hr

B. Opacity 10.0%

EPA TEST METHODS REQUIRED

A. Sampling and Velocity Traverse
   1. Reference Method: EPA Method 1

B. Stack Velocity and Flow Rate
   1. Reference Method: EPA Method 2

C. Gas Analysis
   1. Reference Method: EPA Method 3

D. Moisture Content
   1. Reference Method: EPA Method 4

E. Visible Opacity
   1. Reference Method: EPA Method 9

F. TSP Emissions on Stationary Sources
   1. Reference Method: EPA Method 5

G. PM_{10} Emissions
   1. Reference Method: EPA Method 201A

H. Back-half Condensable of PM_{10} Emissions
   1. Reference Method: EPA Method 202

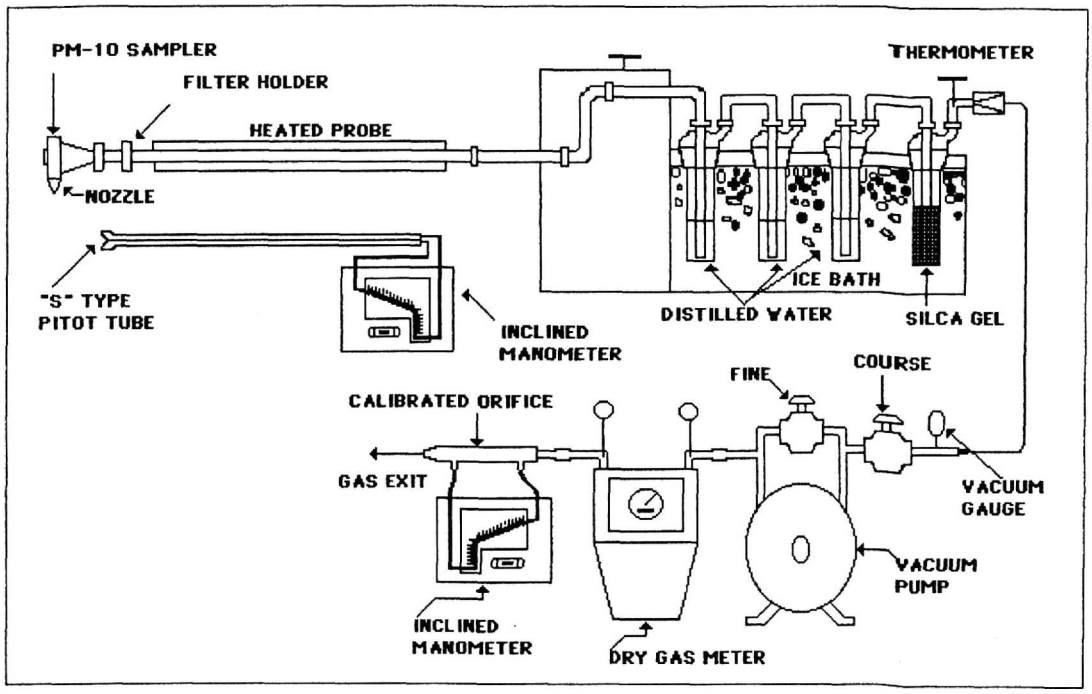
SAMPLE TRAIN INFORMATION

An EPA Method 201A or EPA Method 5/202 (depending on moisture content of the stack) sample train will be employed to perform the above referenced testing. A stainless steel probe liner will be used and maintained at a temperature of 248° ± 25°F for the duration of the test. The filter holder will also be kept at a temperature of 248° ± 25°F. The first three (3) impingers will contain 100 mls of distilled water, and the fourth will contain a known amount of silica gel. All impingers will be weighed before and after each test to determine the moisture content of the gases. The impinger bath will be maintained at a temperature lower than 68°F to condense stack moisture.

A binderless glass fiber filter will be employed in a in-stack PM_{10} cyclone as the capture media for the PM_{10} emissions. The PM_{10} cyclone will be washed with AR grade acetone. The acetone will then be evaporated and weighed. The acetone catch will be added to the filter weight and used in

the emissions calculation. Figure I is a schematic of the EPA Method 201A sample train to be used.

Figure I



CALIBRATION DATA AND SAMPLE CALCULATION

The EPA and State agencies require various calibrations for specific equipment used during testing. The current calibration data is included in Appendix "B". A sample of all field data forms will be made available at the job site.

REFERENCE METHODS

The methods that will be employed are found in 40 CFR Part 60 – Appendix A, and the EPA "Quality Assurance Handbook for Air Pollution Measurement Systems." Any deviation from these methods will first be approved by the administrator.

STACK SCHEMATIC AND TRAVERSE POINT LOCATIONS

Attached are the assumed schematics showing plan and elevation of ducting and stack arrangements including sample port positions relative to

upstream and downstream disturbances. Also included are cross-sectional sketches of the stack at the sampling locations.

1. Figure II is a stack diagram of the CMI Hot Mix Asphalt Plant Stack.
2. Table I is the traverse point locations for the CMI Hot Mix Asphalt Plant Stack

Figure II

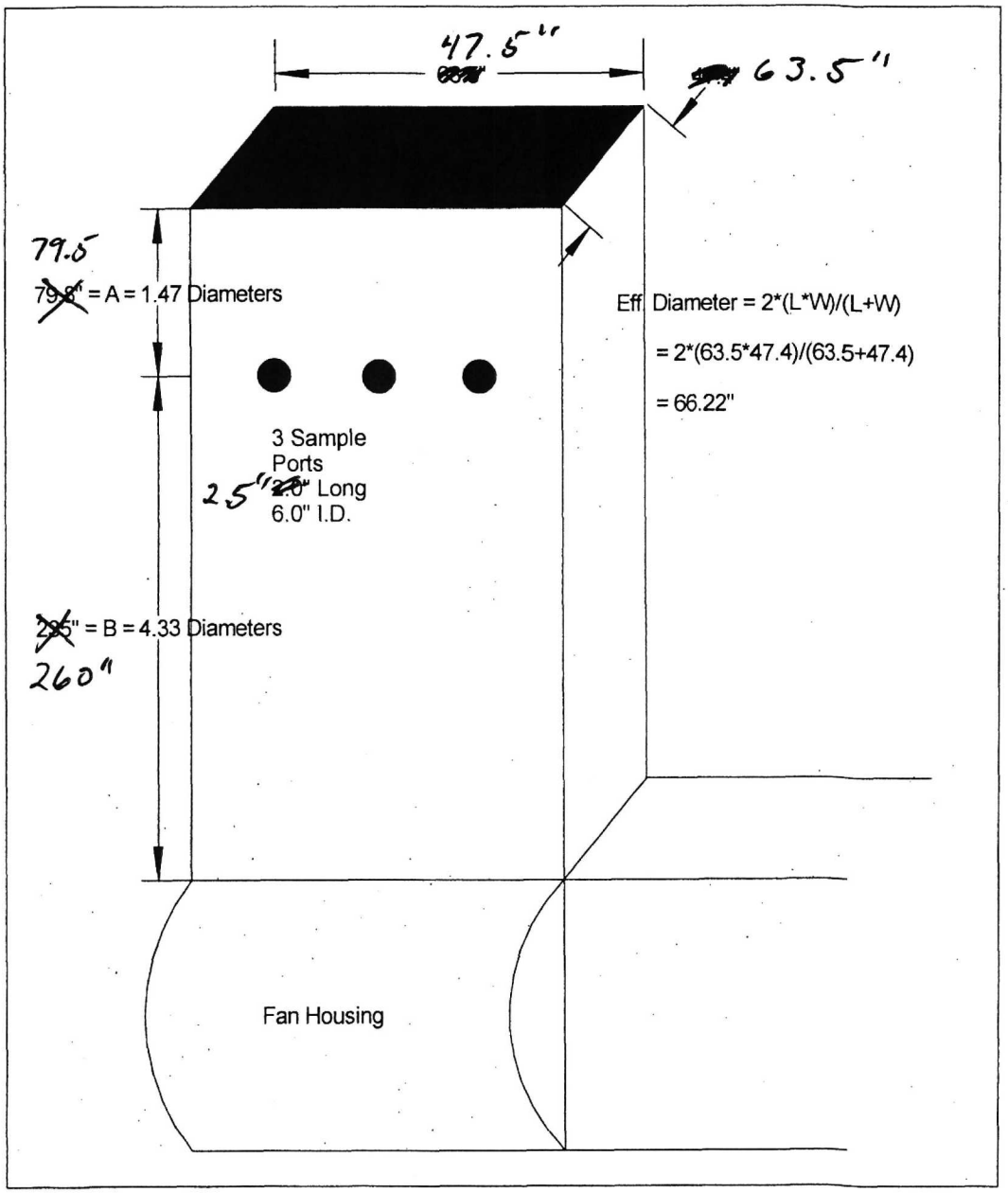
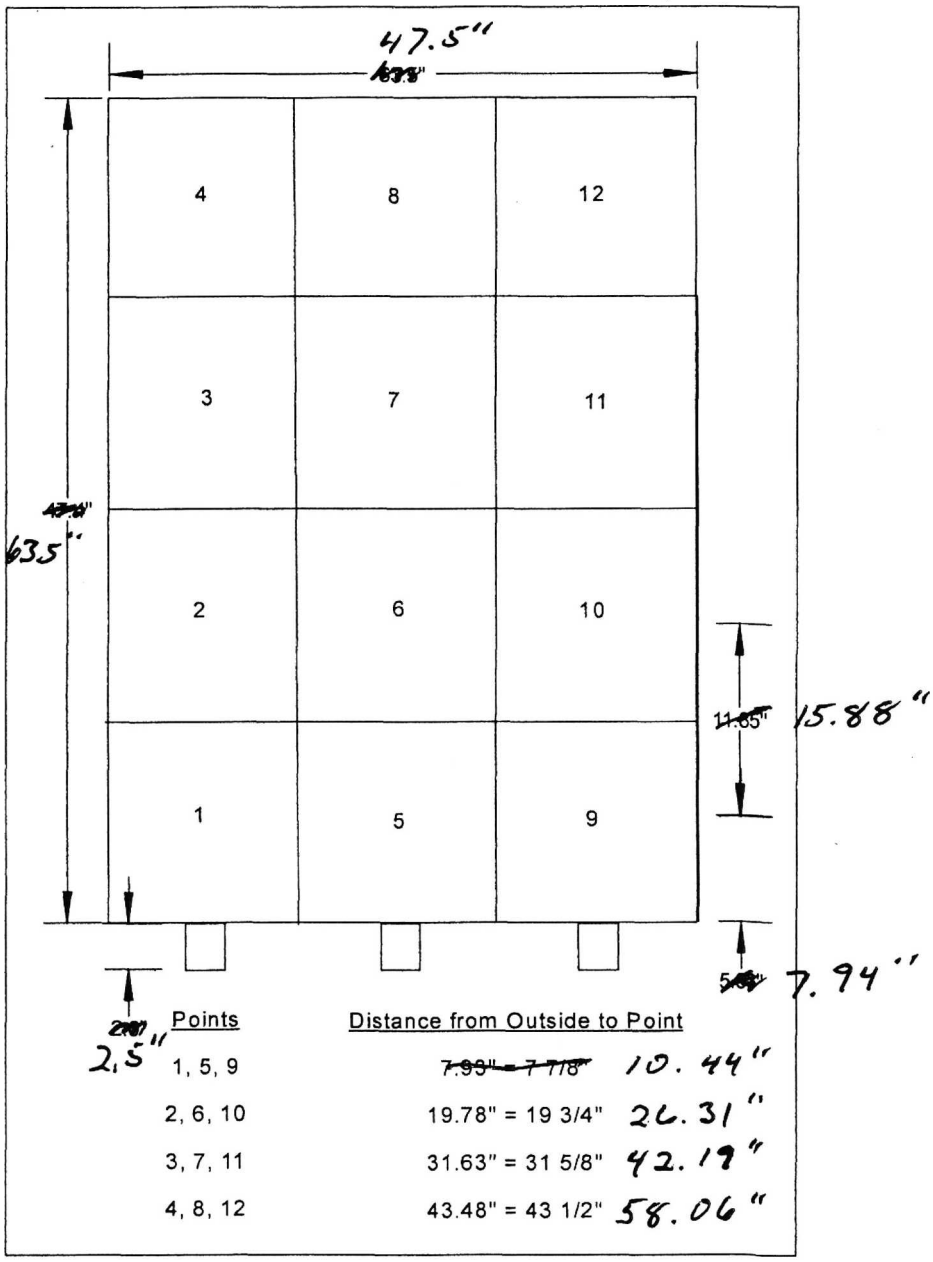


Table I



Points	Distance from Outside to Point
1, 5, 9	~~7.99" = 7 7/8"~~ 10.44"
2, 6, 10	19.78" = 19 3/4" 26.31"
3, 7, 11	31.63" = 31 5/8" 42.19"
4, 8, 12	43.48" = 43 1/2" 58.06"

PROCESS DESCRIPTION AND POLLUTION CONTROL EQUIPMENT

Asphaltic concrete paving is a mixture of well graded, high quality aggregate and liquid asphaltic cement which is heated and mixed in measured quantities to produce bituminous pavement material. Aggregate constitutes 92 weight percent of the total mixture. Aside from the amount and grade of asphalt used, mix characteristics are determined by the relative amounts and types of aggregate used. A certain

percentage of fine aggregate (% less than 74 micrometers in physical diameter) is required for the production of good quality asphaltic concrete.

The drum mix process simplifies the conventional process by using proportioning feed controls in place of hot aggregate storage bins, vibration screens, and the mixer. Aggregate is introduced near the burner end of the revolving drum mixer, and the asphalt is injected midway along the drum. A variable flow asphalt pump is linked electronically to the aggregate belt scales to control mix specifications. The hot mix is discharged from the revolving drum mixer into surge bins or storage bins. Emissions from the asphalt drum mixer are vented to a baghouse before being emitted to the atmosphere. The pressure drop across the baghouse will be maintained between 2 and 6 inches of water column. The estimated removal efficiency for the baghouse is 99+ percent for total suspended particulate material (and PM_{10}).

SAFETY CONSIDERATIONS AND OTHER REQUIREMENTS

All testing stations will be accessible from OSHA scaffolding or platforms. AET will require 1 – 480V, 30 amp, three-phase circuit to be provided by the Geneva Rock Products in order to perform the emissions testing.

OTHER COMMENTS, RECOMMENDATIONS, OR PROPOSED MODIFICATIONS

1. Each of the EPA Method 201A runs (3 runs per test) will be approximately 60 minutes in length. A cyclonic flow determination will be completed prior to the EPA Method 201A Testing (as per EPA Method 2).

2. Nozzle diameters will be selected after pretest data is collected.

3. EPA Method 3 will be used to determine the dry molecular weight of the gas stream. The gas analysis will be conducted at the job site using an Orsat or Combustion Analyzer (Cosa).

4. The moisture content of the gas stream will be measured by weighing the impingers before and after each test. This will be accomplished on site.

5. An "S" Type Pitot Tube will be used to measure the velocity of the gas stream using EPA Method 2 (if the stack is 12.0" inches or greater). An inclined manometer will be used to measure the velocity head. The first mark on the manometer is 0.01 inches of water column from the zero mark. For sources where the velocity head is less than 0.05 inches of water column, or where the stack

diameter is less than 12 inches, AET will use a Standard Pitot with an expanded manometer.

6. Barometric pressure will be measured at the sampling position via an aneroid barometer.

7. As per NSPS requirements, three (3) six minute VEO's will be conducted on the exhaust stack during each of the PM_{10} tests.

Appendix "C"

(Production Data)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

American Environmental Testing Company, Inc.
6823 South 3600 West
Spanish Fork, Utah 84660
(801)794-2950

Production Data

Owner: Geneva Rock - Morgan
Plant Desc.: CMI Hot Plant
Location: Morgan, Ut.
Control Device
Model & Serial No.: Baghouse
Date: 10/5/16

Run Number	Time 24 Hour	TPH Agg.	TPH RAP	TPH AC	% Burner Position	%Damper Positions	Stack Temp °F	Mix Temp °F	ΔP Bag/Scrubber	Bag Cycle Time
1	11:40	[illegible]42.3	76.1	11.1	65%	59%	242°	305°	5.72	30 sec
2	11:50	214.1	77.0	11.1	65%	64%	246°	305°	5.93	
3	12:00	213.6	78.4	11.2	65%	64%	251°	307°	5.84	
4	12:10	213.8	77.5	11.2	65%	64%	252°	306°	5.79	
5	12:20	213.9	80.2	11.2	65%	64%	252°	307°	5.87	
6	12:30	212.8	79.4	11.2	65%	64%	252°	307°	5.82	
7	12:40	212.9	79.3	11.1	65%	64%	249°	307°	5.84	
8	12:50	213.6	78.9	11.2	65%	64%	250°	307°	5.93	
9	2:20	212.7	78.6	11.1	64%	64%	249°	310°	5.61	
10	2:30	213.1	77.9	11.2	64%	64%	249°	312°	5.79	
11	2:40	212.6	80.1	11.1	64%	64%	251°	312°	5.84	
12	2:50	212.9	78.9	11.1	64%	64%	249°	309°	5.81	
13	3:00	212.1	79.9	11.1	64%	64%	252°	309°	5.76	
14	3:10	212.1	79.4	11.1	64%	64%	253°	309°	5.71	
15	3:20	212.6	79.9	11.1	64%	64%	253°	306°	5.89	
16	3:30	211.9	77.0	11.0	64%	64%	249°	310°	5.88	

Baghouse

No. of bags: _____
Type of Bags: _____
Temp. Range: _____

Scrubber

Water flow rate (gpm): _____
Water Pressure (psi): _____
Pond Capacity sq. ft. _____ x7.48= _____ gal.

Run 1 TPh Avg = 302.88
Run 2 TPh Avg = 302.56
Run 3 TPh Avg = 301.33

American Environmental Testing Company, Inc.
6823 South 3600 West
Spanish Fork, Utah 84660
(801)794-2950

Production Data

Owner: Geneva Rock - Morgan
Plant Desc.: CMI Hot Plant
Location: Morgan, Ut
Control Device
Model & Serial No.: Baghouse
Date: 10/6/16

Run Number	Time 24 Hour	TPH Agg.	TPH RAP	TPH AC	% Burner Position	%Damper Positions	Stack Temp °F	Mix Temp °F	ΔP Bag/Scrubber	Bag Cycle Time
3	1:30	213.6	77.9	11.1	66	64	248	306	5.87	30
	1:40	210.2	78.1	11.2	67	64	245	310	5.93	
	1:50	211.5	79.8	11.0	67	65	240	312	5.91	
	2:00	209.0	76	11	69	65	241	305	5.98	
	2:10	215	79	11	71	67	245	318	5.89	
	2:20	204	79	11	71	66	244	308	5.99	
	2:30	216	81	11.2	72	66	245	305	5.7	
	2:45	210	78	11.1	72	64	242	308	5.9	

Baghouse

No. of bags: _____
Type of Bags: _____
Temp. Range: _____

Scrubber

Water flow rate (gpm): _____
Water Pressure (psi): _____
Pond Capacity sq. ft: _____ ~~x7.48~~= _____ gal.

Appendix "D"

(Field & Laboratory Data)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

AMERICAN ENVIRONMENTAL TESTING, INC
6823 South 3600 West, Spanish Fork, Utah 84660
(801) 266-7111 Fax (801) 794-2951

PM-10 Field Data

1	Plant	Geneva Rock	
2	City	Morgan, Utah	
3	Location	CMI Hot Mix Asphalt Plant	
4	Operator	JD Schiller	
5	Date	10/5/2016	
6	Method	201A/202	
7	Run Number	1	
8	Stack Diameter - ϕ	61.91	inches
9	Stack Area - A_s	20.90	square feet
10	Sample Box Number	APEX	
11	Meter Box Number	XC-522-14	
12	Meter ΔH_δ	1.666	inches H_20
13	Meter Calibration -Y	1.031	
14	Pitot Tube Method 2 - Cp	0.855	
15	Pitot Tube Method 201A - Cp^1	0.855	
16	Probe Length	5'C	feet
17	Probe Liner Material	Glass	
18	Barometric Pressure - P_{bar}	25.1	inches Hg
19	Static Pressure - P_g	-0.34	inches H_2O
20	Stack Pressure - P_s	24.80	inches Hg
21	Ambient Temperature	57	°F

Initial PM-10 Data:

1	Initial Stack Temperature - t_s	240	°F
2	Initial Meter Temperature - t_m	69	°F
3	Assumed Moisture - B_{ws}	24	%
4	Reference ΔP	0.44	inches H_2O
5	Dry Mole. Weight of Gas - M_d	29.20	lb/lb-mole
6	Wet Mole. Weight of Gas - M_s	26.51	lb/lb-mole
7	Viscosity of Stack Gas - μ_s	205.18	µp
8	Cyclone Flow Rate - Q_s	0.58	ft3/min
9	Orifice Pressure Head - ΔH	0.27	in H_2O
10	Orifice Pressure Head - $\Delta H(-50)$	0.31	in H_2O
11	Orifice Pressure Head - $\Delta H(+50)$	0.23	in H_2O
12	Initial Gas Analysis		
	CO_2	4.00	%
	O_2	14.00	%
	N_2	82.00	%

Preliminary Data for Selecting Nozzle Size

Pretest Velocity

	Method 2 ΔP (in. H_2O)	Sqrt ΔP (in. H_2O)			Method 201A ΔP	Sqrt ΔP
1	0.29	0.54		1	0.32	0.57
2	0.4	0.63		2	0.41	0.64
3	0.52	0.72		3	0.53	0.73
4	0.65	0.81		4	0.64	0.80
5	0.21	0.46	Hot Stop	5	0.3	0.55
6	0.35	0.59	1210-1214	6	0.39	0.62
7	0.46	0.68		7	0.45	0.67
8	0.55	0.74		8	0.53	0.73
9	0.3	0.55		9	0.3	0.55
10	0.41	0.64		10	0.4	0.63
11	0.58	0.76		11	0.55	0.74
12	0.6	0.77		12	0.59	0.77
			0			
Average	0.44	0.66			0.45	0.67

nozzle #	D_n	ΔPmin	ΔPmax
1	0.47	0.0027	0.02
2	0.43	0.0039	0.03
3	0.39	0.0057	0.05
4	0.35	0.0087	0.08
5	0.32	0.0138	0.12
6	0.28	0.0236	0.19
7	0.24	0.0485	0.31
8	0.21	0.1046	0.46
9	0.20	0.1599	0.60
10	0.18	0.2407	0.80
11	0.15	0.5969	1.65
12	0.125	1.3194	3.34

Sample Point	Velocity Head of Stack Gas Method 2 ΔP (in. H_2O)	Velocity Head of Stack Gas 201A ΔP (in. H_2O)	Dwell Time (Decimal)	Actual Time (Minutes)	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)
starting						
1	0.31	0.31	4.18	4.15	70	70
2	0.42	0.42	4.86	5.00	70	71
3	0.57	0.57	5.67	5.45	70	74
4	0.78	0.78	6.63	6.45	70	77
5	0.3	0.30	4.11	4.00	70	77
6	0.35	0.35	4.44	4.30	71	76
7	0.41	0.41	4.81	4.45	72	76
8	0.66	0.66	6.10	6.00	73	81
9	0.26	0.26	3.83	3.45	73	78
10	0.28	0.28	3.97	4.00	74	79
11	0.39	0.39	4.69	4.45	74	82
12	0.6	0.60	5.81	5.45	74	84
Total			59.09	57.15		
Average	0.44	0.44			71.75	77.08
			Actual Time (T_t)	59.15		

Start Time	1138	$t_{m\,(avg)}$	74.42	°F	
Stop Time	1256	$T_{m\,(avg)}$	534.42	°R	

Initial Leak Check		Pitot Tubes
Stop	226.742	A= OK
Start	226.737	B= OK
Rate	0.005	
	Vac =	17

Stack Temperature t_s (°F)	CPM Filter Temperature t_s (°F)	Oven Temperature (°F)	Gas Volume V_m (dcf)	Vacuum (in Hg)	Orifice Pressure Head ΔH (inches H_2O)	Method 2 Sqrt DP	201A Sqrt DP
			226.811				
211	68	250	228.14	3	0.27	0.56	0.56
213	65	250	229.72	3	0.27	0.65	0.65
222	67	251	231.5	3.1	0.27	0.75	0.75
232	70	252	233.632	3.1	0.27	0.88	0.88
225	69	251	234.94	3.1	0.27	0.55	0.55
235	70	250	236.42	3.1	0.27	0.59	0.59
246	71	251	237.96	3.1	0.27	0.64	0.64
243	73	252	239.872	3.1	0.27	0.81	0.81
225	68	249	241.06	3.1	0.27	0.51	0.51
227	70	250	242.35	3.1	0.27	0.53	0.53
231	71	249	243.88	3.1	0.27	0.62	0.62
234	71	249	245.752	3.1	0.27	0.77	0.77
			18.94				
228.67	69.42	250.33		3.08	0.27	0.66	0.66

EPA Method 202

Purge

Time (minutes)	CPM Filter Temp (°F)
0	76
15	72
30	71
45	68
60	70

Final Leak Check		Pitot Tubes
Stop	245.889	A= OK
Start	245.882	B= OK
Rate	0.007	
	Vac =	6

TEST RESULTS

	Symbol	Description	Units	Value
1	V_m	Dry Gas Volume (DGM)	dcf	18.94
2	$V_{m\ std}$	Dry Gas Volume at Standard Conditions	dscf	16.19
3	Vm_{Θ}	Volume of Gas Per Minute @ Dry Condition	dscf/min	0.320
4	$V_{w\ std}$	Volume of Water Vapor in Gas Sample	scf	6.04
5	B_{ws}	Moisture Fraction of Stack, by Volume		0.27
6	M_d	Dry Molecular Weight	lb/lb-mole	29.2000
7	M_s	Wet Molecular Weight	lb/lb-mole	26.1575
8	μs	Viscosity of Stack Gas	μp	199.76
9	Q_s	Cyclone Flow Rate	ft^3/min	0.59
10	ISO	Isokinetic Variation	%	110.82
11	D_{50}	Cut Rate	μm	9.8215
12	C_O	Carbon Monoxide Concentration in Stack	%	0
13	CO_2	Carbon Dioxide Concentration in Stack	%	4.00
14	O_2	Oxygen Concentration in Stack	%	14.00
15	N_2	Nitrogen Concentration in Stack	%	82.00
16	V_w	Total Moisture Collected	g	128.3
17	V_s	Average Stack Gas Velocity	ft/sec	49.41
18	$Q_{s\ std}$	Volumetric Flow Rate @Dry Basis	dscf/hr	1.7212E+06
19	Q_a	Actual Volumetric Flow Rate	ft^3/hr	3.7186E+06
20	D_{n1}	Number 1 Nozzle Diameter	inches	0.1817
21	D_{n2}	Number 2 Nozzle Diameter	inches	0
22	A_{n1}	Number 1 Cross Sectional Area of Nozzle	square feet	1.8000E-04
23	A_{n2}	Number 2 Cross Sectional Area of Nozzle	square feet	0.0000E+00
24	Average D_n	Average Nozzle Diameter	inches	0.1817
25	Average A_n	Average Cross Sectional Area of Nozzles	square feet	1.8000E-04
26	M_n	>PM-10 Particulate Collected	mg	0.3
27	Emr	>PM-10 Emission Rate	lbs/hr	0.07
28	C_s	>Pm-10 Concentration in Stack	lbs/dscf	4.08472E-08
			grains/dscf	0.0003
			g/dscm	0.0007
29	M_n	<PM-10 Particulate Collected	mg	2.4
30	Emr	<PM-10 Emission Rate	lbs/hr	0.5625
31	C_s	<Pm-10 Concentration in Stack	lbs/dscf	3.26777E-07
			grains/dscf	0.0023
			g/dscm	0.0053
32	M_n	Condensable Particulate Collected	mg	1.8
33	Emr	Condensable Emission Rate	lbs/hr	0.42
34	C_s	Condensable Concentration in Stack	lbs/dscf	2.45083E-07
			grains/dscf	0.0017
			g/dscm	0.0046

	D_n inches	V_n ft/sec	R_{min} ft/sec	V_{min} ft/sec	R_{max} ft/sec	V_{max} ft/sec
1	0.47	7.89	#NUM!	3.95	1.994	11.84
2	0.43	9.39	#NUM!	4.69	1.852	14.08
3	0.39	11.36	#NUM!	5.68	1.721	17.04
4	0.35	14.03	#NUM!	7.01	1.604	21.04
5	0.32	17.75	#NUM!	8.87	1.500	26.62
6	0.28	23.19	#NUM!	11.59	1.411	32.72
7	0.24	31.57	0.5261	16.61	1.339	42.26
8	0.21	39.19	0.6224	24.39	1.303	51.04
9	0.20	45.43	0.6638	30.15	1.283	58.29
10	0.18	53.17	0.6958	37.00	1.266	67.33
11	0.15	78.27	0.7444	58.26	1.238	96.89
12	0.13	112.71	0.7685	86.62	1.222	137.75
13	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

ΔP_{min} in H_2O	ΔP_{max} in H_2O	A_n ft^2
0.0027	0.02	1.22E-03
0.0039	0.03	1.02E-03
0.0057	0.05	8.45E-04
0.0087	0.08	6.85E-04
0.0138	0.12	5.41E-04
0.0236	0.19	4.14E-04
0.0485	0.31	3.04E-04
0.1046	0.46	2.45E-04
0.1599	0.60	2.11E-04
0.2407	0.80	1.81E-04
0.5969	1.65	1.23E-04
1.3194	3.34	8.52E-05
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	

American Environmental Testing Company, Inc.

6823 South3600 West
Spanish Fork, Utah 84660
801-266-7111

Moisture and PM-10 & PM 2.5 Partiuclate Data
EPA Method 201A

Company: Geneva Rock Run Number: 1

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/5/2016

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	405.7	525.6	119.9 g
Impinger 2	594.4	594.5	0.1 g
Impinger 3	695.7	697.9	2.2 g
Impinger 4	815.7	821.8	6.1 g
		Total Gain (V_w) =	128.3 g

PM-2.5 Particulate Collected

Front-Half Analysis - Less Than PM-10

1 Final filter weight	0.1124	g		
2 Tare filter weight	0.112	g	GM-1	Filter ID
3 Net filter weight	0.0004	g		
4 <PM10 Acetone Wash	0.0002	g		
5 CPM Container #1 (Water)	0.0008	g		
6 CPM Container #2 (Acetone/Hexane)	0.001	g		
7 Total Condensable Catch	0.0018	g x 1000 =	1.8	mg
8 Total front-half PM-10	0.0024	g x 1000 =	2.4	mg

Front-Half Analysis - <PM-10 and >2.5 (PM-10 Cyclone)

1 >10 Acetone Wash 0.0003 g x 1000 = 0.3 mg

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6823 South 3600 West
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801-266-7111

Company: Geneva Rock Run Number: 1

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/5/2016

FYRITE Analysis

(Average of 3 analyses each)

	Volume Percent - Dry Basis			
FYRITE sample #	N_2	O_2	CO_2	CO
1	82	14	4	≤ 0.1
2	82	14	4	≤ 0.1
3	82	14	4	≤ 0.1
Average	82.00	14.00	4.00	≤ 0.01

O_2	CO_2	CO
≤ 0.3% when $O_2 \geq 4.0\%$	≤ 0.3% when $CO_2 \leq 15.0\%$	≤ 0.3%
≤ 0.2% when $O_2 \leq 4.0\%$	≤ 0.2% when $CO_2 \geq 15.0\%$	

AMERICAN ENVIRONMENTAL TESTING, INC
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PM-10 Field Data

1	Plant	Geneva Rock	
2	City	Morgan, Utah	
3	Location	CMI Hot Mix Asphalt Plant	
4	Operator	JD Schiller	
5	Date	10/5/2016	
6	Method	201A/202	
7	Run Number	2	
8	Stack Diameter - ϕ	61.91	inches
9	Stack Area - A_s	20.90	square feet
10	Sample Box Number	APEX	
11	Meter Box Number	XC-522-14	
12	Meter ΔH_δ	1.666	inches H_20
13	Meter Calibration -Y	1.031	
14	Pitot Tube Method 2 - Cp	0.855	
15	Pitot Tube Method 201A - Cp'	0.855	
16	Probe Length	5'C	feet
17	Probe Liner Material	Glass	
18	Barometric Pressure - P_{bar}	25.1	inches Hg
19	Static Pressure - P_g	-0.33	inches H_2O
20	Stack Pressure - P_s	25.08	inches Hg
21	Ambient Temperature	55	°F

Initial PM-10 Data:

1	Initial Stack Temperature - t_s	230	°F
2	Initial Meter Temperature - t_m	72	°F
3	Assumed Moisture - B_{ws}	26	%
4	Reference ΔP	0.44	inches H_2O
5	Dry Mole. Weight of Gas - M_d	29.20	lb/lb-mole
6	Wet Mole. Weight of Gas - M_s	26.29	lb/lb-mole
7	Viscosity of Stack Gas - μ_s	200.99	µp
8	Cyclone Flow Rate - Q_s	0.56	ft3/min
9	Orifice Pressure Head - ΔH	0.25	in H_2O
10	Orifice Pressure Head - ΔH(-50'	0.29	in H_2O
11	Orifice Pressure Head - ΔH(+50		in H_2O
12	Initial Gas Analysis		
	CO_2	4.00	%
	O_2	14.00	%
	N_2	82.00	%

Preliminary Data for Selecting Nozzle Size

Pretest Velocity	Method 2 ΔP (in. H_2O)	Sqrt ΔP (in. H_2O)		Method 201A ΔP	Sqrt ΔP
1	0.29	0.54	1	0.32	0.57
2	0.4	0.63	2	0.41	0.64
3	0.52	0.72	3	0.53	0.73
4	0.65	0.81	4	0.64	0.80
5	0.21	0.46	5	0.3	0.55
6	0.35	0.59	6	0.39	0.62
7	0.46	0.68	7	0.45	0.67
8	0.55	0.74	8	0.53	0.73
9	0.3	0.55	9	0.3	0.55
10	0.41	0.64	10	0.4	0.63
11	0.58	0.76	11	0.55	0.74
12	0.6	0.77	12	0.59	0.77
Average	0.44	0.66		0.45	0.67

nozzle #	D_n	ΔPmin	ΔPmax
1	0.47	0.0026	0.02
2	0.43	0.0037	0.03
3	0.39	0.0055	0.05
4	0.35	0.0083	0.07
5	0.32	0.0133	0.12
6	0.28	0.0227	0.18
7	0.24	0.0461	0.30
8	0.22	0.0877	0.41
9	0.20	0.1532	0.58
10	0.18	0.2308	0.77
11	0.15	0.5732	1.59
12	0.125	1.2678	3.21

Sample Point	Velocity Head of Stack Gas Method 2 ΔP (in. H_2O)	Velocity Head of Stack Gas 201A ΔP (in. H_2O)	Dwell Time (Decimal)	Actual Time (Minutes)	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)
starting						
1	0.32	0.32	4.25	4.15	71	71
2	0.45	0.45	5.03	5.00	71	72
3	0.62	0.62	5.91	6.00	70	75
4	0.77	0.77	6.59	6.30	70	78
5	0.28	0.28	3.97	4.00	70	77
6	0.32	0.32	4.25	4.15	71	77
7	0.44	0.44	4.98	5.00	71	79
8	0.66	0.66	6.10	6.00	71	81
9	0.26	0.26	3.83	3.45	71	75
10	0.25	0.25	3.75	3.45	72	76
11	0.38	0.38	4.63	4.45	71	78
12	0.54	0.54	5.51	5.30	71	81
Total			58.79	57.25		
Average	0.44	0.44			70.83	76.67
			Actual Time (T_t)	58.45		

Start Time	1418	$t_{m\,(avg)}$	73.75	°F
Stop Time	1531	$T_{m\,(avg)}$	533.75	°R

Initial Leak Check		Pitot Tubes
Stop	246.585	A= OK
Start	246.579	B= OK
Rate	0.006	
	Vac =	18

Stack Temperature t_s (°F)	Oven Temperature (°F)	CPM Filter Temperature t_s (°F)	Gas Volume V_m (dcf)	Vacuum (in Hg)	Orifice Pressure Head ΔH (inches H_2O)	Method 2 Sqrt DP	201A Sqrt ΔP Sqrt DP
			246.648				
221	251	67	247.92	3	0.25	0.57	0.57
225	251	68	249.41	3	0.25	0.67	0.67
229	250	69	251.18	3.1	0.25	0.79	0.79
235	250	66	253.2	3.1	0.25	0.88	0.88
220	250	68	254.39	3.2	0.25	0.53	0.53
226	253	66	255.67	3.2	0.25	0.57	0.57
228	251	67	257.16	3.2	0.25	0.66	0.66
229	250	68	258.878	3.2	0.25	0.81	0.81
215	251	68	260.17	3.2	0.25	0.51	0.51
212	251	67	261.29	3.2	0.25	0.50	0.50
226	250	67	262.72	3.2	0.25	0.62	0.62
227	251	67	264.376	3.2	0.25	0.73	0.73
			17.73				
224.42	250.75	67.33		3.15	0.25	0.65	0.65

EPA Method 202

Purge

Time (minutes)	CPM Filter Temp (°F)
0	71
15	75
30	77
45	74
60	75

Final Leak Check		Pitot Tubes
Stop	264.451	A= OK
Start	264.445	B= OK
Rate	0.006	
	Vac =	8

TEST RESULTS

	Symbol	Description	Units	Value
1	V_m	Dry Gas Volume (DGM)	dcf	17.73
2	$V_{m\ std}$	Dry Gas Volume at Standard Conditions	dscf	15.17
3	Vm_{Θ}	Volume of Gas Per Minute @ Dry Condition	dscf/min	0.303
4	$V_{w\ std}$	Volume of Water Vapor in Gas Sample	scf	6.06
5	B_{ws}	Moisture Fraction of Stack, by Volume		0.29
6	M_d	Dry Molecular Weight	lb/lb-mole	29.1400
7	M_s	Wet Molecular Weight	lb/lb-mole	25.9596
8	μs	Viscosity of Stack Gas	μp	197.86
9	Q_s	Cyclone Flow Rate	ft^3/min	0.56
10	ISO	Isokinetic Variation	%	106.35
11	D_{50}	Cut Rate	μm	10.0948
12	C_O	Carbon Monoxide Concentration in Stack	%	0
13	CO_2	Carbon Dioxide Concentration in Stack	%	3.50
14	O_2	Oxygen Concentration in Stack	%	14.50
15	N_2	Nitrogen Concentration in Stack	%	82.00
16	V_w	Total Moisture Collected	g	128.8
17	V_s	Average Stack Gas Velocity	ft/sec	48.92
18	$Q_{s\ std}$	Volumetric Flow Rate @Dry Basis	dscf/hr	1.7009E+06
19	Q_a	Actual Volumetric Flow Rate	ft^3/hr	3.6819E+06
20	D_{n1}	Number 1 Nozzle Diameter	inches	0.1817
21	D_{n2}	Number 2 Nozzle Diameter	inches	0
22	A_{n1}	Number 1 Cross Sectional Area of Nozzle	square feet	1.8000E-04
23	A_{n2}	Number 2 Cross Sectional Area of Nozzle	square feet	0.0000E+00
24	Average D_n	Average Nozzle Diameter	inches	0.1817
25	Average A_n	Average Cross Sectional Area of Nozzles	square feet	1.8000E-04
26	M_n	>PM-10 Particulate Collected	mg	0.6
27	Emr	>PM-10 Emission Rate	lbs/hr	0.15
28	C_s	>PM-10 Concentration in Stack	lbs/dscf	8.71787E-08
			grains/dscf	0.0006
			g/dscm	0.0014
29	M_n	<PM-10 Particulate Collected	mg	2
30	Emr	<PM-10 Emission Rate	lbs/hr	0.49
31	C_s	<PM-10 Concentration in Stack	lbs/dscf	2.90596E-07
			grains/dscf	0.0020
			g/dscm	0.0047
32	M_n	Condensable Particulate Collected	mg	1.7
33	Emr	Condensable Emission Rate	lbs/hr	0.42
34	C_s	Condensable Concentration in Stack	lbs/dscf	2.47006E-07
			grains/dscf	0.0017
			g/dscm	0.0044

	D_n inches	V_n ft/sec	R_{min} ft/sec	V_{min} ft/sec	R_{max} ft/sec	V_{max} ft/sec
1	0.47	7.67	#NUM!	3.84	1.999	11.51
2	0.43	9.13	#NUM!	4.56	1.856	13.69
3	0.39	11.05	#NUM!	5.52	1.725	16.57
4	0.35	13.64	#NUM!	6.82	1.606	20.46
5	0.32	17.26	#NUM!	8.63	1.502	25.89
6	0.28	22.54	#NUM!	11.27	1.413	31.84
7	0.24	30.69	0.5230	16.05	1.340	41.12
8	0.22	36.53	0.6060	22.14	1.310	47.84
9	0.20	44.17	0.6626	29.26	1.284	56.70
10	0.18	51.69	0.6950	35.92	1.267	65.49
11	0.15	76.10	0.7439	56.61	1.238	94.23
12	0.13	109.59	0.7683	84.19	1.222	133.95
13	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

ΔP_{min} in H_2O	ΔP_{max} in H_2O	A_n ft^2
0.0026	0.02	1.22E-03
0.0037	0.03	1.02E-03
0.0055	0.05	8.45E-04
0.0083	0.07	6.85E-04
0.0133	0.12	5.41E-04
0.0227	0.18	4.14E-04
0.0461	0.30	3.04E-04
0.0877	0.41	2.56E-04
0.1532	0.58	2.11E-04
0.2308	0.77	1.81E-04
0.5732	1.59	1.23E-04
1.2678	3.21	8.52E-05
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	

American Environmental Testing Company, Inc.
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Spanish Fork, Utah 84660
801-266-7111

Moisture and PM-10 & PM 2.5 Partiuclate Data

EPA Method 201A

Company: Geneva Rock Run Number: 2

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/5/2016

Moisture Collected

	Initial Weight	Final Weight	Weight Gain	
Impinger 1	393.3	515.5	122.2	g
Impinger 2	594.4	594.9	0.5	g
Impinger 3	696.5	698.7	2.2	g
Impinger 4	830.2	834.1	3.9	g

Total Gain (V_w) = 128.8 g

PM-10 Particulate Collected

Front-Half Analysis - Less Than PM-10

1	Final filter weight	0.1125	g		
2	Tare filter weight	0.1123	g	GM-2	Filter ID
3	Net filter weight	0.0002	g		
4	<PM10 Acetone Wash	0.0001	g		
5	CPM Container #1 (Water)	0.0006	g		
6	CPM Container #2 (Acetone/Hexane)	0.0011	g		
7	Total Condensable Catch	0.0017	g x 1000 =	1.7	mg
8	Total front-half PM-10	0.0020	g x 1000 =	2	mg

Front-Half Analysis - >PM-10 (PM-10 Cyclone)

1	>PM10 Acetone Wash	0.0006	g x 1000 =	0.6	mg

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Company: Geneva Rock Run Number: 2

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/5/2016

FYRITE Analysis

(Average of 3 analyses each)

	Volume Percent - Dry Basis			
FYRITE sample #	N_2	O_2	CO_2	CO
1	82	14.5	3.5	≤ 0.1
2	82	14.5	3.5	≤ 0.1
3	82	14.5	3.5	≤ 0.1
Average	82.00	14.50	3.50	≤ 0.01

O_2	CO_2	CO
≤ 0.3% when $O_2 \geq 4.0\%$	≤ 0.3% when $CO_2 \leq 15.0\%$	≤ 0.3%
≤ 0.2% when $O_2 \leq 4.0\%$	≤ 0.2% when $CO_2 \geq 15.0\%$	

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PM-10 Field Data

1	Plant	Geneva Rock	
2	City	Morgan, Utah	
3	Location	CMI Hot Mix Asphalt Plant	
4	Operator	JD Schiller	
5	Date	10/6/2016	
6	Method	201A/202	
7	Run Number	3	
8	Stack Diameter - ϕ	61.91	inches
9	Stack Area - A_s	20.90	square feet
10	Sample Box Number	APEX	
11	Meter Box Number	XC-522-14	
12	Meter ΔH_δ	1.666	inches H_20
13	Meter Calibration -Y	1.031	
14	Pitot Tube Method 2 - Cp	0.855	
15	Pitot Tube Method 201A - Cp^1	0.855	
16	Probe Length	5'C	feet
17	Probe Liner Material	Glass	
18	Barometric Pressure - P_{bar}	25.33	inches Hg
19	Static Pressure - P_g	-0.3	inches H_2O
20	Stack Pressure - P_s	25.31	inches Hg
21	Ambient Temperature	50	°F

Initial Pm-10 Data:

1	Initial Stack Temperature - t_s	210	°F
2	Initial Meter Temperature - t_m	72	°F
3	Assumed Moisture - B_{ws}	28	%
4	Reference ΔP	0.44	inches H_2O
5	Dry Mole. Weight of Gas - M_d	29.20	lb/lb-mole
6	Wet Mole. Weight of Gas - M_s	26.06	lb/lb-mole
7	Viscosity of Stack Gas - μ_s	194.12	µp
8	Cyclone Flow Rate - Q_s	0.54	ft3/min
9	Orifice Pressure Head - ΔH	0.23	in H_2O
10	Orifice Pressure Head - $\Delta H(-50)$	0.27	in H_2O
11	Orifice Pressure Head - $\Delta H(+50)$	0.20	in H_2O
12	Initial Gas Analysis		
	CO_2	4.00	%
	O_2	14.00	%
	N_2	82.00	%

Preliminary Data for Selecting Nozzle Size

Pretest Velocity

	Method 2 ΔP (in. H_2O)	Sqrt ΔP (in. H_2O)		Method 201A ΔP	Sqrt ΔP
1	0.29	0.54	1	0.32	0.57
2	0.4	0.63	2	0.41	0.64
3	0.52	0.72	3	0.53	0.73
4	0.65	0.81	4	0.64	0.80
5	0.21	0.46	5	0.3	0.55
6	0.35	0.59	6	0.39	0.62
7	0.46	0.68	7	0.45	0.67
8	0.55	0.74	8	0.53	0.73
9	0.3	0.55	9	0.3	0.55
10	0.41	0.64	10	0.4	0.63
11	0.58	0.76	11	0.55	0.74
12	0.6	0.77	12	0.59	0.77
Average	0.44	0.66		0.45	0.67

nozzle #	D_n	ΔPmin	ΔPmax
1	0.47	0.0025	0.02
2	0.43	0.0035	0.03
3	0.39	0.0051	0.05
4	0.35	0.0078	0.07
5	0.32	0.0125	0.11
6	0.28	0.0214	0.17
7	0.24	0.0425	0.28
8	0.22	0.0816	0.39
9	0.20	0.1431	0.54
10	0.18	0.2161	0.72
11	0.15	0.5376	1.49
12	0.132	0.9423	2.44

Sample Point	Velocity Head of Stack Gas Method 2 ΔP (in. H_2O)	Velocity Head of Stack Gas 201A ΔP (in. H_2O)	Dwell Time (Decimal)	Actual Time (Minutes)	Meter Temperature Outlet (°F)	Meter Temperature Inlet (°F)
starting						
1	0.3	0.30	4.11	4.00	71	71
2	0.45	0.45	5.03	5.00	70	71
3	0.55	0.55	5.57	5.30	70	73
4	0.73	0.73	6.41	6.30	69	75
5	0.31	0.31	4.18	4.15	70	75
6	0.34	0.34	4.38	4.30	71	76
7	0.48	0.48	5.20	5.15	72	80
8	0.59	0.59	5.76	5.45	73	83
9	0.24	0.24	3.68	3.45	74	84
10	0.27	0.27	3.90	4.00	75	82
11	0.44	0.44	4.98	5.00	76	86
12	0.56	0.56	5.62	5.30	77	88
Total			58.81	57.40		
Average	0.44	0.44			72.33	78.67
			Actual Time (T_t)	59		

Start Time	1329	$t_{m\,(avg)}$	75.50	°F
Stop Time	1441	$T_{m\,(avg)}$	535.50	°R

Initial Leak Check		Pitot Tubes
Stop	264.693	A= OK
Start	264.686	B= OK
Rate	0.007	
	Vac =	18

Stack Temperature t_s (°F)	Oven Temperature (°F)	CPM Filter Temperature t_s (°F)	Gas Volume V_m (dcf)	Vacuum (in Hg)	Orifice Pressure Head ΔH (inches H_2O)	Method 2 Sqrt DP	201A Sqrt DP
			264.711				
210	247	65	265.95	2.8	0.23	0.55	0.55
215	250	68	267.36	2.6	0.23	0.67	0.67
236	249	69	268.88	2.6	0.23	0.74	0.74
231	250	70	270.711	2.8	0.23	0.85	0.85
225	249	68	271.85	2.8	0.23	0.56	0.56
226	249	69	273.19	2.9	0.23	0.58	0.58
231	248	70	274.7	2.9	0.23	0.69	0.69
236	249	70	276.361	2.9	0.23	0.77	0.77
215	250	72	277.44	2.9	0.23	0.49	0.49
230	251	72	278.61	3	0.23	0.52	0.52
231	252	73	280.06	3	0.23	0.66	0.66
232	251	74	281.65	3	0.23	0.75	0.75
			16.94				
226.50	249.58	70.00		2.85	0.23	0.65	0.65

EPA Method 202

Purge

Time (minutes)	CPM Filter Temp (°F)
0	76
15	72
30	71
45	72
60	73

Final Leak Check		Pitot Tubes
Stop	281.715	A= OK
Start	281.712	B= OK
Rate	0.003	
	Vac =	9

TEST RESULTS

	Symbol	Description	Units	Value
1	V_m	Dry Gas Volume (DGM)	dcf	16.939
2	$V_{m\ std}$	Dry Gas Volume at Standard Conditions	dscf	14.58
3	Vm_{Θ}	Volume of Gas Per Minute @ Dry Condition	dscf/min	0.287
4	$V_{w\ std}$	Volume of Water Vapor in Gas Sample	scf	5.60
5	B_{ws}	Moisture Fraction of Stack, by Volume		0.28
6	M_d	Dry Molecular Weight	lb/lb-mole	29.1000
7	M_s	Wet Molecular Weight	lb/lb-mole	26.0214
8	μs	Viscosity of Stack Gas	μp	198.49
9	Q_s	Cyclone Flow Rate	ft^3/min	0.53
10	ISO	Isokinetic Variation	%	99.88
11	D_{50}	Cut Rate	μm	10.5881
12	C_O	Carbon Monoxide Concentration in Stack	%	0
13	CO_2	Carbon Dioxide Concentration in Stack	%	3.50
14	O_2	Oxygen Concentration in Stack	%	13.50
15	N_2	Nitrogen Concentration in Stack	%	83.00
16	V_w	Total Moisture Collected	g	118.9
17	V_s	Average Stack Gas Velocity	ft/sec	48.74
18	$Q_{s\ std}$	Volumetric Flow Rate @Dry Basis	dscf/hr	1.7243E+06
19	Q_a	Actual Volumetric Flow Rate	ft^3/hr	3.6678E+06
20	D_{n1}	Number 1 Nozzle Diameter	inches	0.1817
21	D_{n2}	Number 2 Nozzle Diameter	inches	0
22	A_{n1}	Number 1 Cross Sectional Area of Nozzle	square feet	1.8000E-04
23	A_{n2}	Number 2 Cross Sectional Area of Nozzle	square feet	0.0000E+00
24	Average D_n	Average Nozzle Diameter	inches	0.1817
25	Average A_n	Average Cross Sectional Area of Nozzles	square feet	1.8000E-04
26	M_n	>PM-10 Particulate Collected	mg	0.6
27	Emr	>PM-10 Emission Rate	lbs/hr	0.16
28	C_s	>PM-10 Concentration in Stack	lbs/dscf	9.0713E-08
			grains/dscf	0.0006
			g/dscm	0.0015
29	M_n	<PM-10 Particulate Collected	mg	2.6
30	Emr	<PM-10 Emission Rate	lbs/hr	0.68
31	C_s	<PM-10 Concentration in Stack	lbs/dscf	3.9309E-07
			grains/dscf	0.0028
			g/dscm	0.0064
32	M_n	Condensable Particulate Collected	mg	1.7
33	Emr	Condensable Emission Rate	lbs/hr	0.44
34	C_s	Condensable Concentration in Stack	lbs/dscf	2.5702E-07
			grains/dscf	0.0018
			g/dscm	0.0046

	D_n inches	V_n ft/sec	R_{min} ft/sec	V_{min} ft/sec	R_{max} ft/sec	V_{max} ft/sec
1	0.47	7.33	#NUM!	3.66	2.005	10.99
2	0.43	8.72	#NUM!	4.36	1.862	13.07
3	0.39	10.55	#NUM!	5.27	1.729	15.82
4	0.35	13.03	#NUM!	6.51	1.610	19.54
5	0.32	16.48	#NUM!	8.24	1.505	24.72
6	0.28	21.53	#NUM!	10.76	1.415	30.45
7	0.24	29.31	0.5182	15.19	1.341	39.31
8	0.22	34.88	0.6032	21.04	1.311	45.72
9	0.20	42.17	0.6607	27.86	1.285	54.18
10	0.18	49.36	0.6936	34.24	1.268	62.57
11	0.15	72.67	0.7432	54.01	1.239	90.01
12	0.13	93.84	0.7620	71.50	1.227	115.09
13	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

ΔP_{min} in H_2O	ΔP_{max} in H_2O	A_n ft^2
0.0025	0.02	1.22E-03
0.0035	0.03	1.02E-03
0.0051	0.05	8.45E-04
0.0078	0.07	6.85E-04
0.0125	0.11	5.41E-04
0.0214	0.17	4.14E-04
0.0425	0.28	3.04E-04
0.0816	0.39	2.56E-04
0.1431	0.54	2.11E-04
0.2161	0.72	1.81E-04
0.5376	1.49	1.23E-04
0.9423	2.44	9.50E-05
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	
#DIV/0!	#DIV/0!	

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801-266-7111

Moisture and PM-10 Partiuclate Data

EPA Method 201A

Company: Geneva Rock Run Number: 3

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/6/2016

Moisture Collected

	Initial Weight	Final Weight	Weight Gain
Impinger 1	406	517.3	111.3 g
Impinger 2	596.6	597.7	1.1 g
Impinger 3	705.7	707.6	1.9 g
Impinger 4	833.8	838.4	4.6 g

Total Gain (V_w) = 118.9 g

PM-10 Particulate Collected

Front-Half Analysis - Less Than PM-10

1	Final filter weight	0.113 g		
2	Tare filter weight	0.1125 g	GM-3	Filter ID
3	Net filter weight	0.0005 g		
4	<PM10 Acetone Wash	0.0004 g		
5	CPM Container #1 (Water)	0.0008 g		
6	CPM Container #2 (Acetone/Hexane)	0.0009 g		
7	Total Condensable Catch	0.0017 g x 1000 =	1.7	mg
8	Total front-half PM-10	0.0026 g x 1000 =	2.6	mg

Front-Half Analysis - <PM-10 and >2.5 (PM-10 Cyclone)

1 >PM10 Acetone Wash 0.0006 g x 1000 = 0.6 mg

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801-266-7111

Company: Geneva Rock Run Number: 3

Sampling Location: CMI Hot Mix Asphalt Plant Date: 10/6/2016

FYRITE Analysis

(Average of 3 analyses each)

	Volume Percent - Dry Basis			
FYRITE sample #	N_2	O_2	CO_2	CO
1	83	13.5	3.5	≤ 0.1
2	83	13.5	3.5	≤ 0.1
3	83	13.5	3.5	≤ 0.1
Average	83.00	13.50	3.50	≤ 0.01

O_2	CO_2	CO
≤ 0.3% when $O_2 \geq 4.0\%$	≤ 0.3% when $CO_2 \leq 15.0\%$	≤ 0.3%
≤ 0.2% when $O_2 \leq 4.0\%$	≤ 0.2% when $CO_2 \geq 15.0\%$	

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LABORATORY LOG FOR EPA METHOD 5 FILTER WEIGHTS

SITE Geneva Rock Products DATE Oct 5-6/2016 PROJECT CMI HMA
ADDRESS Morgan, UTAH PERFORMED BY CG/BOS/DDS

FILTER NO.	9/20 Date Initial	10/3 Date Initial	10/4 Date Initial	10/12 Date Final	10/13 Date Final	10/14 Date Final
Gm-1	0.1122	0.1120	0.1120	0.1125	0.1124	0.1124
Gm-2	0.1124	0.1123	0.1123	0.1125	0.1125	
Gm-3	0.1129	0.1126	0.1125	0.1131	0.1130	0.1130
Gm-4	0.1126	0.1124	0.1124			
Pre	0/0.4999	0/0.5000	0/0.4999	0/0.50001	0/0.5000	0/0.5000
Post	0/0.4999	0/0.4999	0/0.4998	0/0.5000	0/0.5000	0/0.50001

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EPA METHOD 202 BLANK EVAPORATION

Company: General Rock Products
Source: Moroni UT
Date: Oct 5-6 / 2016

Acetone Blank (Blk-A)
Volume of Liquid: 150 mls
Final Weight: 1.5461
Tare Weight: 1.5460
Residue: 0.0001

Water Blank (Blk-W)
Volume of Liquid: 150 mls
Final Weight: 1.4984
Tare Weight: 1.4983
Residue: 0.0001

Hexane Blank (Blk-H)
Volume of Liquid: 150 mls
Final Weight: 1.5136
Tare Weight: 1.5136
Residue: 0.0000

Field Proof Water Blank (FPWB)
Volume of Liquid: 300 mls
Final Weight: 1.5373
Tare Weight: 1.5369
Residue: 0.0004

Field Proof Acetone/Hexane Blank (FPAH)
Volume of Liquid: 400 mls
Final Weight: 1.5691
Tare Weight: 1.5688
Residue: 0.0003

Field Recovery Water Blank (FRWB)
Volume of Liquid: 400 mls
Final Weight: 1.5186
Tare Weight: 1.5181
Residue: 0.0005

Field Recovery Acetone/Hexane Blank (FRAB)
Volume of Liquid: 500 mls
Final Weight: 1.4935
Tare Weight: 1.4931
Residue: 0.0004

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Spanish Fork, Utah 84660
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LABORATORY LOG FOR EPA METHOD 5 WEIGHING TIN WEIGHTS

SITE Green Rock Products
ADDRESS Morgan, UT

DATE Oct 5-6/2016 PROJECT CMI HMA
PERFORMED BY CG/BOS/JDS

Weighing Tin ID	Date 10/7 Initial Weight#1	Date 10/10 Initial Weight#2	Date 10/11 Initial Weight#3	Date 10/14 Final Weight#1	Date 10/17 Final Weight#2	Date Final Weight#3
Blnk-A	1.5460	1.5460	1.5460	1.5461	1.5461	
Blnk-W	1.4984	1.4983	1.4983	1.4984	1.4984	
Blnk-H	1.5136	1.5136	1.5136	1.5136	1.5136	
FPWB	1.5371	1.5369	1.5369	1.5373	1.5373	
FRWB	1.5183	1.5181	1.5181	1.5186	1.5186	
FPHB	1.5688	1.5688	1.5688	1.5691	1.5691	
FRAB	1.4932	1.4932	1.4931	1.4935	1.4935	
Pre	0/2.0001	0/2.0000	0/2.0000	0/1.9999	0/1.9999	
Post	0/2.0001	0/1.9999	0/1.9999	0/1.9998	0/2.0000	

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EPA METHOD 201A PM 2.5

EVAPORATION

Company Geneva Rock
Source Morgan, UT
Date Oct 5-6/2016

Container #2

Greater Than PM 10

Run #1

Volume of Liquid 150 mls
Color Clear
Final Weight 1.5361
Tare Weight 1.5357
Residue & Blank 0.0004
- ~~Recovery~~ Blank 0.0001
Residue 0.0003

Tm 5

Run #2

Volume of Liquid 150 mls
Color Clear
Final Weight 1.5039
Tare Weight 1.5032
Residue & Blank 0.0007
- ~~Recovery~~ Blank 0.0001
Residue 0.0006

Tm 8

Run #3

Volume of Liquid 150 mls
Color Clear
Final Weight 1.5268
Tare Weight 1.5261
Residue & Blank 0.0007
- ~~Recovery~~ Blank 0.0001
Residue 0.0006

Tm 9

Container #3

Less or Equal to PM 10/Greater than PM 2.5

Run #1

Volume of Liquid 150 mls
Color Clear
Final Weight 1.4794
Tare Weight 1.4791
Residue & Blank 0.0003
- ~~Recovery~~ Blank 0.0001
Residue 0.0002

Tm 13

Run #2

Volume of Liquid 150 mls
Color Clear
Final Weight 1.5234
Tare Weight 1.5232
Residue & Blank 0.0002
- ~~Recovery~~ Blank 0.0001
Residue 0.0001

Tm 14

Run #3

Volume of Liquid 150 mls
Color Clear
Final Weight 1.5068
Tare Weight 1.5063
Residue & Blank 0.0005
- ~~Recovery~~ Blank 0.0001
Residue 0.0004

Tm 15

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(801) 794-2950 Fax (801) 794-2951

EPA METHOD 202 BACK HALF EVAPORATION

Company Geneva Rock
Source Morgan, UT
Date Oct 5-6/2016

CPM Container #1

Water

Run #1

#1-1

Volume of Liquid	400 mls
Color	Clear
Final Weight	1.5474
Tare Weight	1.5461
Residue & Blank	0.0013
-Recovery Blank	0.0005
Residue	0.0008

Run #2

#1-2

Volume of Liquid	400 mls
Color	Clear
Final Weight	1.5192
Tare Weight	1.5181
Residue & Blank	0.0011
- Recovery Blank	0.0005
Residue	0.0006

Run #3

#1-3

Volume of Liquid	400 mls
Color	Clear
Final Weight	1.4749
Tare Weight	1.4736
Residue & Blank	0.0013
- Recovery Blank	0.0005
Residue	0.0008

CPM Container #2

Acetone/Hexane

Run #1

#2-1

Volume of Liquid	500 mls
Color	Clear
Final Weight	1.5150
Tare Weight	1.5136
Residue & Blank	0.0014
- Recovery Blank	0.0004
Residue	0.0010

Run #2

#2-2

Volume of Liquid	500 mls
Color	Clear
Final Weight	1.4934
Tare Weight	1.4919
Residue & Blank	0.0015
- Recovery Blank	0.0004
Residue	0.0011

Run #3

#2-3

Volume of Liquid	500 mls
Color	Clear
Final Weight	1.5265
Tare Weight	1.5252
Residue & Blank	0.0013
- Recovery Blank	0.0004
Residue	0.0009

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6823 South 3600 West
Spanish Fork, Utah 84660
(801)-794-2950 Fax (801) 794-2951

LABORATORY LOG FOR EPA METHOD 5 WEIGHING TIN WEIGHTS

SITE Geneva Rock Prod. DATE Oct 5-6/2016 PROJECT CMI HMA
ADDRESS Mapan, UT PERFORMED BY CG/RDS/JPS

Weighing Tin ID	Date 10/7 Initial Weight#1	Date 10/10 Initial Weight#2	Date 10/11 Initial Weight#3	Date 10/14 Final Weight#1	Date 10/17 Final Weight#2	Date 10/18 Final Weight#3
Tin 5	1.5359	1.5358	1.5357	1.5362	1.5361	
Tin 8	1.5032	1.5032	1.5032	1.5039	1.5039	
Tin 9	1.5261	1.5261		1.5268	1.5268	
Tin 13	1.4792	1.4791	1.4791	1.4794	1.4794	
Tin 14	1.5232	1.5232		1.5039	1.5034	1.5234
Tin 15	1.5063	1.5063		1.5068	1.5068	
#1-1	1.5463	1.5461	1.5461	1.5474	1.5474	
#1-2	1.5181	1.5181		1.5192	1.5192	
#1-3	1.4738	1.4736	1.4736	1.4751	1.4749	1.4749
#2-1	1.5138	1.5136	1.5136	1.5150	1.5150	
#2-2	1.4919	1.4919		1.4934	1.4934	
#2-3	1.5252	1.5253	1.5252	1.5265	1.5265	
Pre	0/2.0001	0/2.0000	0/2.0000	0/1.9999	0/1.9999	0/2.0000
Post	0/2.0001	0/1.9999	0/1.9999	0/1.9998	0/2.0000	0/2.0000

Appendix "E"

(Cyclonic Flow Determination)

American Environmental Testing Company Inc.

Reno, Nevada 775-786-8553

Phoenix, Arizona 602-253-3354

Salt Lake City, Utah 801-266-7111

American Environmental Testing Company, Inc.
6823 South 3600 West
Spanish Fork, Utah 84660
(801)-794-2950 Fax (801) 794-2951

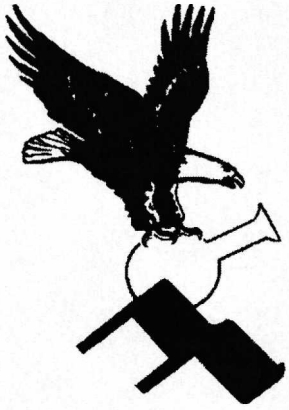
Cyclonic Flow Determination

Plant Geneva Rock | Run No. pretest
Location Morgan, Ut | Operator JDS - GP
Date 10/5/16 | Amb. Temp. °F 47° F
Bar. Press. ("Hg) 25.10" | Static Press. ("H_2O) -0.34
Pitot Tube (C_p) 5'C 0.8550 | Stack Dimensions 63½" X 47½"

Traversre#	Velocity Head ΔP	Stack Temp. °F	Cyclonic Flow	
			ΔP at 0 °	Angle at null Δ P
1	0.11		0.02	12
2	0.13		0.02	15
3	0.28		0.09	11
4	0.65		0.01	3
5	0.11		0.03	16
6	0.16		0.06	13
7	0.33		0.13	18
8	0.83		0.31	13
9	0.30		0.12	15
10	0.46		0.22	8
11	0.62		0.21	3
12	0.81		0.35	15
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

Average Angle 142/12 = 11.83°

Pitot Tubes Initial: A = ✓ B = ✓
Pitot Tubes Post: A = ✓ B = ✓



Appendix "F"

(VEOs and Certifications)

American Environmental Testing Company Inc.

Reno, Nevada 775-786-8553

Phoenix, Arizona 602-253-3354

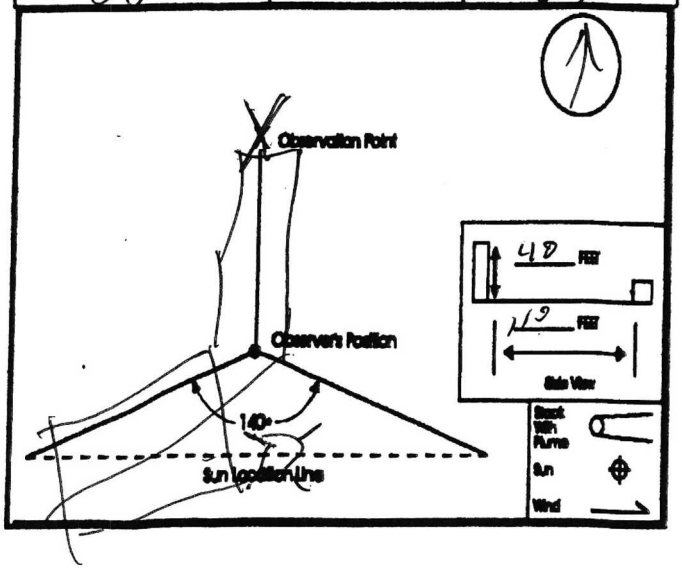
Salt Lake City, Utah 801-266-7111

American Environmental Testing Company, Inc.

6823 South 3600 West
Spanish Fork, Utah 84660
(801)-794-2950 Fax (801) 794-2951

RUN #1

Company Name	Geneva Rock
Location	Morgan Hot Plant
City	Morgan
State & Zip	Ut
Process Equipment	CMI HMA
Fuel Type	
Operating Mode	300 TPH
Control Equipment	Baghouse
Operating Mode	Full
Describe Emission Point	63.5" X 47.5" +
Height of Emission Point	40'
Height Relative to Observer	40'
Distance to Emission Point	110'
Direction to Emission Point	North
Describe Emissions	None
Emission Color	Clear
PlumeType: Continuous Fugitive Intermittent	
Water Droplets Present: No Yes	
If Water Droplet Plume: Attached Detached	
Point in the Plume at which Opacity was determined	12" above exit
Describe Plume Background (Color, etc.)	Cloudy Gray Sky
Sky Conditions & Color	Cloudy - Gray
Wind Direction	Calm
Wind Speed	Calm
Ambient Temp.	55°
Wet Bulb Temp	
RH Percent	35%



Observation Date:	Start Time:	End Time:
10/5/16	1230	1236

	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	01
3	0	0	0	0	/24 = 0%
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	/
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Observers Name (Print)	JD Schiller
Observers Signature	JDschiller
Date	10/5/16
Organization	A.E.T.
Certified By	Opacity Tek
Date	9/2016

American Environmental Testing Company, Inc.

6823 South 3600 West
Spanish Fork, Utah 84660
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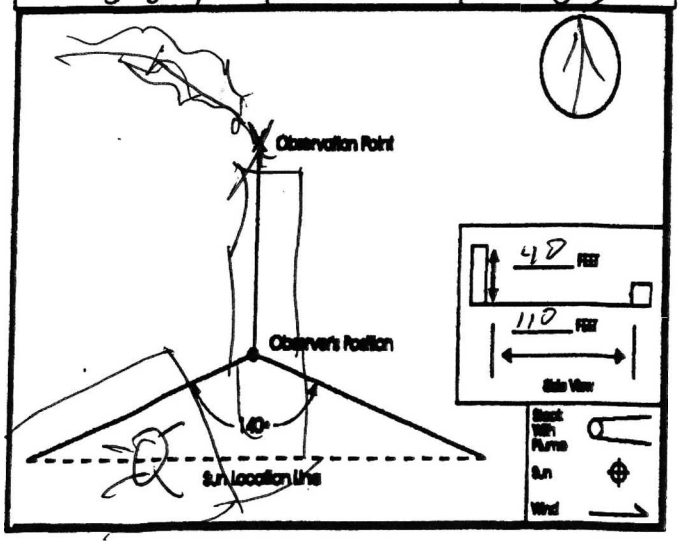
RUN 2

Company Name	Geneva Rock - Morgan
Location	Morgan Hot Plant
City	Morgan
State & Zip	Ut
Process Equipment	CMI Hot Plant
Fuel Type	
Operating Mode	300 TPH
Control Equipment	Baghouse
Operating Mode	Full
Describe Emission Point	63.5" x 42.5"
Height of Emission Point	40'
Height Relative to Observer	40'
Distance to Emission Point	110'
Direction to Emission Point	North
Describe Emissions	Clear
Emission Color	Clear
PlumeType: ~~Continuous~~ Fugitive Intermittent	
Water Droplets Present: No ~~Yes~~	
If Water Droplet Plume: Attached ~~Detached~~	
Point in the Plume at which Opacity was determined	12" above exit
Describe Plume Background (Color, etc.)	Cloudy Gray Sky
Sky Conditions & Color	Cloudy - Gray
Wind Direction	E →
Wind Speed	3-5 mph
Ambient Temp.	58° F
Wet Bulb Temp	—
RH Percent	35%



Observation Date:	Start Time:	End Time:
10/5/16	1504	1510

	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	0/
3	0	0	0	0	/24 = 0%
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

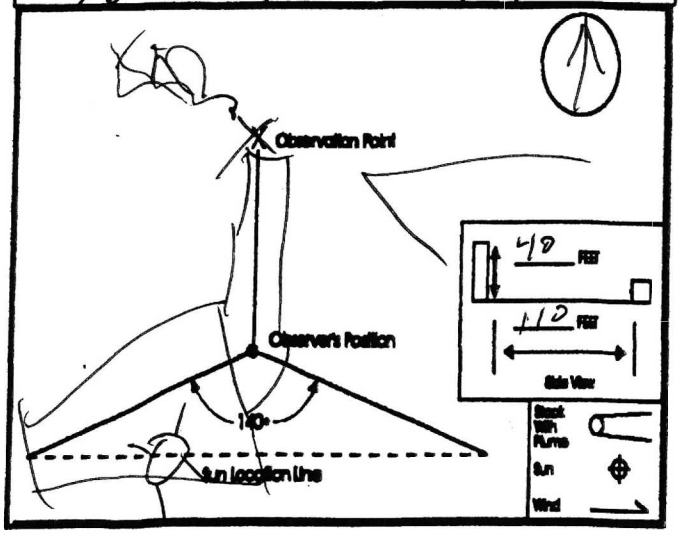
Observers Name (Print	JD Schiller
Observers Signature	
Date	
Organization	A.E.T.
Certified By	D Jaccard
Date	9/2016

American Environmental Testing Company, Inc.

6823 South 3600 West
Spanish Fork, Utah 84660
(801)-794-2950 Fax (801) 794-2951

RUN #3

Company Name	Geneva Rock
Location	Morgan Hot Plant
City	Morgan
State & Zip	Ut.
Process Equipment	CMI Hot Plant
Fuel Type	
Operating Mode	300 TPH
Control Equipment	Baghouse
Operating Mode	Full
Describe Emission Point	63.5" x 47.5"
Height of Emission Point	40'
Height Relative to Observer	40'
Distance to Emission Point	110'
Direction to Emission Point	North
Describe Emissions	None
Emission Color	Clear
PlumeType: ~~Continuous~~ Fugitive Intermittent	
Water Droplets Present: No ~~Yes~~	
If Water Droplet Plume: Attached ~~Detached~~	
Point in the Plume at which Opacity was determined	12" above exit
Describe Plume Background (Color, etc.)	Blue Sky
Sky Conditions & Color	Pt cloudy - Blue
Wind Direction	E →
Wind Speed	3-5 mph
Ambient Temp.	48°
Wet Bulb Temp	—
RH Percent	45%



Observation Date:	Start Time:	End Time:
10/6/16	1352	1358

	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	0/24 = 0%
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	/
7					
8					
9					
10					
11					
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20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Observers Name (Print	JD Schiller
Observers Signature	JDschiller
Date	10/6/16
Organization	A.E.T.
Certified By	Opacitek
Date	9/2016

12699

OPACITEK

Environmental Services

Awards this Certificate to

J D SCHILLER

For Successfully Completing the
Federal EPA Method 9
Visible Emissions Evaluation Course

Manager	SOUTH JORDAN, UT *Location*	SEPT. 12, 2016 *Date of Certification*

Appendix "G"

(Emissions Calculations)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

American Environmental Testing Company, Inc.
6823 South 3600 West
Spanish Fork, Utah 84660
(801)-794-2950 Fax (801) 794-2951

Example Calculations

(Methods 1-5)

1. A. Particulate Concentration in Stack

$$C_s = \left[\frac{M_n}{V_{mstd}}\right] \times 0.001 = g/dscf$$

B. Mass Loading C

$$C_s = (g/dscf)/453.6 = lbs/hr$$

Where:
C_s = Particulate Concentration in the Stack
M_n = mg Total Particulate
V_{mstd} = Dry Gas Volume corrected to Standard Conditions

2. Fraction of moisture in stack gas

$$Bws = \frac{V_{w\,gas}}{V_{m\,std} + V_{w\,gas}}$$

Where:
B_{ws} = Proportion by Volume of Water Vapor in Gas Stream
V_{wgas} = Volume of Water Vapor Collected at Standard
V_{mstd} = Dry Gas Volume corrected to Standard Conditions

3. Percent Isokinetic

$$\%ISO = \frac{V_{mstd} \times T_s \times P_{std} \times 100}{60 \times T_{std} \times P_s \times T_t \times V_s \times A_n \times (1 - Bws)}$$

Where:
V_{mstd} = Dry Gas Volume corrected to Standard Conditions
T_s = Absolute Stack Temperature
P_{std} = Standard Barometric Pressure
T_{std} = Standard Temperature
P_s = Stack Gas Pressure
T_t = Total Time of Test
V_s = Average Stack Gas Velocity
A_n = Cross Sectional Diameter of Nozzle
B_{ws} = Proportion by Volume of Water Vapor in Gas Stream

4. Actual stack gas volume at stack conditions

$$Q_a = \frac{V_s \times A_s}{144} \times 3600 = ft^3 / hr$$

Where:
Q_a = Stack Gas Actual Volumetric Flow Rate
V_s = Average Stack Gas Velocity
A_s = Area of the Stack

5. Dry gas volume at standard conditions

$$Q_{std} = 3600 \times (1 - Bws) \times V_s \times A_s \times \frac{T_{std} \times P_s}{T_s \times P_{std}} = dscf / hr$$

Where:
B_{ws} = Proportion by Volume of Water Vapor in Gas Stream
V_s = Average Stack Gas Velocity
A_s = Area of the Stack
T_{std} = Standard Temperature
P_s = Stack Gas Pressure
T_s = Absolute Stack Temperature
P_{std} = Standard Barometric Pressure

6. Volume of dry gas sampled at standard conditions

$$V_{mstd} = V_m \times Y \times (\frac{T_{std}}{T_m}) \times \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}} \right] = dscf$$

Where:
V_{mstd} = Dry Gas Volume corrected to Standard Conditions
V_m = Dry Gas Volume
Y = Dry Gas Meter Calibration Factor
T_{std} = Standard Temperature
T_m = Average Meter Temperature
P_{bar} = Barometric Pressure
P_{std} = Standard Barometric Pressure

7. Stack gas velocity at stack conditions

$$V_s = K_p \times C_p \times \sqrt{\Delta P} \times \sqrt{\frac{T_s}{P_s \times M_s}} = ft/\sec$$

Where:
V_s = Average Stack Gas Velocity
K_p = Pitot Tube Constant
C_p = Pitot Tube Calibration Factor
T_s = Absolute Stack Temperature
P_s = Stack Gas Pressure
M_s = Molecular Weight of Wet Gas

8. Volume of water vapor collected at standard conditions

$$V_{w\,gas} = K_1 \times V_w$$

Where:
V_{wgas} = Volume of Water Vapor Collected at Standard
K_1 = Constant in Volume Water Vapor (0.04707 ft^3/ml)
V_w = Total Water Collected in Impingers and Silica Gel

9. Molecular weight of dry gas

$$M_d = [\%CO_2 \times 0.44] + [\%O_2 \times 0.32] + [\%N_2 \times 0.28] = lb/lb - mole$$

10. Molecular weight of wet gas

$$M_s = M_d(1 - Bws) + M_w Bws$$

Where:
M_d = Molecular Weight of Dry Gas
B_{ws} = Proportion by Volume of Water Vapor in Gas Stream
M_w = Molecular Weight of Water (18lb/lb-mole)

11. Stack Pressure

$$P_s = P_{bar} + \left[\frac{P_g}{13.6}\right] = "Hgabsolute$$

Where:
P_s = Stack Gas Pressure
P_{bar} = Barometric Pressure
P_g = Static Gas Pressure

Appendix "H"

(Calibration Data)

American Environmental Testing Company Inc.

Reno, Nevada
775-786-8553

Phoenix, Arizona
602-253-3354

Salt Lake City, Utah
801-266-7111

American Environmental Testing Company, Inc.
6823 South 3600 West Spanish Fork, Utah 84660
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Meter Box Calibration Data Form
(English Units)

Date	Barometric Pressure	Meter Box Number
6/28/16	25.47	APEX XC-522-14 DGM No. 266470

Average Yi	Average ΔH	Calibrated By	Std Meter Yi
1.031	1.666	CG	0.99497

Orifice Manometer Setting ΔH	Std Test Meter (Vs) Ft3	Dry Gas Meter (Vd) Ft3	Std Test Meter (Ts) °F	ΔH/13.6	Std Test Meter Average Temp.
0.50	5	4.906	84 85	0.04	84.50
1.00	5	4.91	85 86	0.07	85.50
1.50	10	9.823	86 86	0.11	86.00
2.00	9.999	9.741	88 88	0.15	88.00
3.00	10.003	9.739	88 88	0.22	88.00
4.00	10.039	9.763	88 88	0.29	88.00

Inlet (Td i) °F	Dry Gas Meter Outlet (Td o) °F	Average (Td) °F	Time Ø Minutes	Yi	ΔH
92 97	82 84	88.75	11.35	1.020	1.733
96 105	85 87	93.25	8.05	1.025	1.735
104 111	89 92	99.00	13.33	1.033	1.769
91 105	91 92	94.75	11.09	1.028	1.658
105 113	92 95	101.25	9.04	1.038	1.632
112 117	95 98	105.50	7.49	1.044	1.472
				Average Yi 1.031	Average ΔH 1.666

American Environmental Testing Company, Inc.
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POSTTEST DRY GAS METER CALIBRATION DATA FORM
(English Units)

Date	Barometric Pressure	Meter Box Number	Plant
10/7/16	25.42	Apex-XC-522-14	Geneva Rock Prod. Morgan, Utah

Calibrated By	Pretest Yi	Average Yi	Low Span	High Span	Std Meter Yi
RS-VBB	1.031	1.014	0.979	1.083	0.99497

Manometer Setting ^H	Std Test Meter (Vs) cf	Dry Gas Meter (Vd) cf	Std Test Meter (Ts) °F	ΔH/13.6	Std Test Meter Average Temp.
0.50	5.001	4.913	77 77	0.04	77
0.50	5	4.91	77 77	0.04	77
0.50	5	4.911	78 78	0.04	78

Inlet (Td i) °F	Dry Gas Meter Outlet (Td o) °F	Average (Td) °F	Yi
77	77	77.25	1.012
77	78		
78	78	78.75	1.015
78	81		
78	82	80.25	1.016
79	82		

Average Yi

1.014

Post Test Temperature Check

Date: 10/7/16 Reference: ERTCO Hg Thermometer

Meter Box: Apex-XC-522-14 Sample Box: 1A

	Meter Box	Reference		Sample Box	Reference
Meter In:	77	77	Impinger Out:	46	46
Meter Out:	78	77	Probe:	241	246
			Oven:	244	248
			5' C Stack:	129	131

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Company: Geneva Rock Date: 10/5/2016

Sampling Location: CMI Hot Mix Asphalt Plant Calibrated By: JDS

First Nozzle Calibration

Run #	Nozzle Identication Number	D_1 (in)	D_2 (in)	D_3 (in)	ΔD	$D_{n\ Average}$
1	#10	0.181	0.182	0.182	0.001	0.182
2	#10	0.181	0.182	0.182	0.001	0.182
3	#10	0.182	0.181	0.182	0.001	0.182
4						

Second Nozzle Calibration (If Needed)

Run #	Nozzle Identication Number	D_1 (in)	D_2 (in)	D_3 (in)	ΔD	$D_{n\ Average}$
1	0	0.000	0.000	0.000	0.000	0.000
2	0	0.000	0.000	0.000	0.000	0.000
3	0	0.000	0.000	0.000	0.000	0.000
4						

where:

$D_{1,2,3}$ = Nozzle diameter measured on a different diameter. - Inches
Tolerance = ± 0.001 inches (± 0.25 mm)

ΔD = Maximum difference in any two measurements. - Inches
Tolerance = ± 0.004 inches (± 0.1 mm)

D_n = Average of $D_{1,2,3}$.

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Sample Box Temperature Sensor Calibration Form

Sample Box Number: AET Impinger Boxes (Cal)
Date: 6/28/16
Calibrated By: ROS
Barometric Pressure: 25.47
Reference: ERTCO-105-SNBS

	Reference Point Number	Source a (specify)	Reference Thermometer Temperature °F	Thermocouple Potentiometer Temperature °F	Temperature Difference b %
	1	Probe on	256	258	-0.28
Nutech	1	Probe on	251	252	-0.14
#1A	3	C Box	249	251	-0.28
	4	Oven on	70	72	-0.38
	4	Oven on	303	305	-0.26
	5	Ice water	36	38	-0.40
	1	Probe on	249	251	-0.28
APEX	1	Probe on	255	256	-0.14
#1A (XC522)	3	C Box	250	251	-0.14
	4	Oven on	73	76	-0.56
	4	Oven on	300	305	-0.66
	5	Ice water	36	36	0.00
	1	Probe on	251	251	0.00
APEX	1	Probe on	252	254	-0.28
#2A (XC522-10)	3	C Box	249	250	-0.14
	4	Oven on	72	73	-0.19
	4	Oven on	310	312	-0.26
	5	Ice water	36	37	-0.20
	1	Probe on	248	248	0.00
APEX	1	Probe on	252	252	0.00
#3A (XC522-14)	3	C Box	251	252	-0.14
	4	Oven on	69	70	-0.19
	4	Oven on	300	301	-0.13
	5	Ice water	38	38	0.00

a Type of calibration system used.

b $\frac{\text{(reference temp. °C + 460)} - \text{(test thermometer temp. °C + 460)}}{\text{reference temperature °C + 460}} * 100 < 1.5\%$

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Sample Box Temperature Sensor Calibration Form

Sample Box Number: AET Probes (Cal)
Date: 6/29/16
Calibrated By: ROS
Barometric Pressure: 25.41
Reference: ERTCO-105-SNBS

	Reference Point Number	Source a (specify)	Reference Thermometer Temperature °F	Thermocouple Potentiometer Temperature °	Temperature Difference b %
	a)	Ice Water	33	34	-0.20
5' - A	b)	Hot Water	147	150	-0.49
	c)	Boiling Water	218	220	-0.29
	d)	Warm Oil	289	291	-0.27
	e)	Hot Oil	376	376	0.00
	f)	Boiling Oil	513	515	-0.21
	a)	Ice Water	33	33	0.00
5' - B	b)	Hot Water	147	148	-0.16
	c)	Boiling Water	220	221	-0.15
	d)	Warm Oil	289	290	-0.13
	e)	Hot Oil	376	378	-0.24
	f)	Boiling Oil	512	515	-0.31
	a)	Ice Water	35	36	-0.20
5' - C	b)	Hot Water	146	148	-0.33
	c)	Boiling Water	221	221	0.00
	d)	Warm Oil	289	289	0.00
	e)	Hot Oil	377	376	0.12
	f)	Boiling Oil	513	514	-0.10

a Type of calibration system used.

b $\frac{\text{(reference temp. °C + 460) - (test thermometer temp. °C + 460)}}{\text{reference temperature °C + 460}} * 100 < 1.5\%$

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Pitot Tube Calibration Form

Pitot Tube Identification Number: 5'C
Date: 6/30/16
Calibrated By: CG-ROS

"A" Side Calibration

Run Number	P std cm H20 (inches H20)	P s cm H20 (inches H20)	Cp (S)	Deviation
1	0.45	0.6	0.8574	0.0000
2	0.45	0.6	0.8574	0.0000
3	0.45	0.6	0.8574	0.0000
		Average:	0.8574	

"B" Side Calibration

Run Number	P std cm H20 (inches H20)	P s cm H20 (inches H20)	Cp (S)	Deviation
1	0.45	0.61	0.8503	-0.0024
2	0.45	0.6	0.8574	0.0047
3	0.45	0.61	0.8503	-0.0024
		Average:	0.8527	

A & B Average = 0.8550

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: Sartarius
Model: Analytical
Serial Number: Ball0530706871
Identification: AET #1
Location: New Wells

Certificate No.: **7/5-2015#1**
Calib. Date: **7/8/2016**
Chemist: **V. B. Benson**

Next Calibration: 7/8/2016

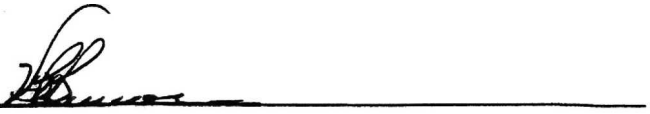
Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	1	0
20	19.9999	-1E-04	20	19.9999	-1E-04
50	50.0001	0.0001	50	50.0001	0.0001
100	100.0002	0.0002	100	100.0001	0.0001
200	200.0001	0.0001	200	200	0

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

Authorized Signature: 

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: Shimadzu
Model: Top Loader
Serial Number:)446711AET #2439
Identification: AET #2
Location: New Wells

Certificate No.: **7/5-2015 #2**
Calib. Date: **7/8/2016**
Chemist: **V. B. Benson**

Next Calibration: 7/8/2016

Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	1	0
20	19.99	-0.01	20	20	0
50	50	0	50	49.99	-0.01
100	100	0	100	100	0
200	199.99	-0.01	200	199.99	-0.01

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

Authorized Signature: _____

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer:	OHAUS	**Certificate No.:**	**7/5-2015 #3**
Model:	Analytical	**Calib. Date:**	**7/8/2016**
Serial Number:	1292	**Chemist:**	**V. B. Benson**
Identification:	AET #3		
Location:	OLD Wells		

Next Calibration: 7/8/2016

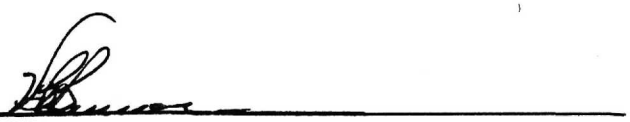
Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	0.9999	-1E-04	1	1	0
20	20	0	20	20	0
50	49.9999	-0.0001	50	49.9999	-0.0001
100	100.0001	0.0001	100	10.0002	-89.9998
200	200	0	200	200.0001	0.0001

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

Authorized Signature: 

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: OHAUS
Model: Top Loader
Serial Number: 1128451127
Identification: AET #4
Location: Old Wells

Certificate No.: 7/5-2015 #4
Calib. Date: 7/8/2016
Chemist: V. B. Benson

Next Calibration: 7/8/2016

Reference Weights Cal Id;

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	0.99	-0.01
20	20	0	20	19.99	-0.01
50	49.99	-0.01	50	50	0
100	100	0	100	100.01	0.01
200	200.01	0.01	200	200.02	0.02

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: OHAUS
Model: Top Loader
Serial Number: 8350103094
Identification: AET #5
Location: JD Wells

Certificate No.: **7/5-2015 #5**
Calib. Date: **7/8/2016**
Chemist: **V. B. Benson**

Next Calibration: 7/8/2016

Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	1	0
20	19.99	-0.01	20	19.98	-0.02
50	50	0	50	49.99	-0.01
100	100	0	100	99.99	-0.01
200	200.02	0.02	200	200.01	0.01

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

Authorized Signature: _____

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: OHAUS
Model: Analytical
Serial Number: B329582368
Identification: AET #6
Location: JD Wells

Certificate No.: **7/5-2015 #6**
Calib. Date: **7/8/2016**
Chemist: **V. B. Benson**

Next Calibration: 7/8/2016

Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	1	0
20	20	0	20	19.9999	-1E-04
50	49.9999	-0.0001	50	50	0
100	100.0001	0.0001	100	100.0002	0.0002
200	200.0001	0.0001	200	199.9999	-0.0001

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

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Certificate of Balance Calabration

Address: 6823 South 3600 West
City/State/Zip: Spanish Fork, Utah 84660

Manufacturer: Sartarius
Model: Analytical
Serial Number: A200-5/35120053
Identification: AET #7
Location: Laboratory

Certificate No.: **7/5-2015 #7**
Calib. Date: **7/8/2016**
Chemist: **V. B. Benson**

Next Calibration: 1/8/2016

Reference Weights Cal Id:

Nominal Mass	Indication	Error	Nominal Mass	Indication	Error
1	1	0	1	1	0
20	19.9999	-1E-04	20	20	0
50	50	0	50	49.9999	-0.0001
100	100	0	100	99.9999	-0.0001
200	200.0001	0.0001	200	200	0

Comments:

Pertinent Information:

The artifact described herein has been calibrated using standards traceble to NIST. This is to certify the data reported herein is true and correct as the date calibrated. The procedure used to calibrate the artifact meets the requirements to meet American Environmental standards.

Authorized Signature: _____