July 26, 2007

Ron Myers
US Environmental Protection Agency
Office of Air Quality Planning & Standards
Monitoring Policy Group D243-05
Research Triangle Park, North Carolina 27711

Delivered via email: myers.ron@epamail.epa.gov

Subject: USEPA Condensible Particulate Matter Study Phase II Field Testing Reference Method 202 and Improved Method 202 Condensible Particulates Comparison

Dear Mr. Myers:

The Alliance of Automobile Manufacturers is pleased to have been able to assist EPA in gathering real-world emissions information for Phase II of EPA's project to improve USEPA Reference Method 202 (RM 202) for condensible particulate matter measurement.

Phase I—Side-by-side bench testing of RM 202 and the improved CPM method;
Phase II—field testing the improved method;
Phase III—emission factor development.

Attached to this letter please find the final report on the data collected. Please feel free to post the report on your website.

If you should have any questions, please call me at (248) 357-4796.

Sincerely,

Giedrius Ambrozaitis
Manager, Mobile Sources

cc: William Prokopy, DaimlerChrysler
Valerie Ughetta, Alliance

BMW Group · DaimlerChrysler · Ford Motor Company · General Motors · Mazda
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USEPA Condensible Particulate Matter Study

Phase II Field Testing

Reference Method 202 and Improved Method 202 Condensible Particulates Comparison

Prepared for

The Alliance of Automobile Manufacturers
Washington, D.C.

Bureau Veritas Project No. 11007-107007

July 3, 2007

For the benefit of business and people

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Executive Summary

The United States Environmental Protection Agency (USEPA) initiated a project with various stakeholders for a condensible particulate matter (CPM) test method study to improve USEPA Reference Method 202 (RM 202) for CPM. The project is an outgrowth of the "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards," proposed on November 1, 2005 (70FR65984).

USEPA's project is a comprehensive test program consisting of three distinct phases as follows: Phase I—Side-by-side bench testing of RM 202 and the improved CPM method, Phase II—field-testing the improved method, and Phase III—emission factor development.

The Alliance of Automotive Manufacturers (Alliance), a stakeholder for this study, is providing this report to contribute to Phase II—comparing RM 202 to the improved method through field testing. The stationary source chosen for this application is a wet machining operation associated with an oil mist collector control device that serves an automotive machining process for transmission components. The source's flue gas temperature was less than or equal to 85 ^{o}F.

The Alliance retained Bureau Veritas North America, Inc. (Bureau Veritas) to conduct Phase II field testing for the Particulate Matter RM 202 study. The study consisted of simultaneous testing of condensible particulates with RM 202 and the improved method defined in Phase I.

On March 29th and 30th, 2007, side-by-side simultaneous stack testing studies comparing RM 202 to the improved method were conducted. In this application, the data revealed the improved method does not indicate a significant statistical difference from the traditional RM 202 based on precision and accuracy and, therefore, is an acceptable methodology for the determination of CPM. The improved method data also indicated that sample train temperatures equal to or less then the flue gas temperature (i.e., 85 ^{o}F for this application) reduced the organic fraction of the condensed phase by approximately 50%. The remaining organic fraction was located on the primary filter. By comparison, in the traditional RM 202, approximately100% of the organic fraction is found when extracted from the wet impingers.

1.0 Introduction

The improved measurement approach for condensible particulate matter (CPM) was developed by John Richards, Tom Holder and David Goshas of Air Control Techniques, P.C. They presented their findings at the Air & Waste Management Association Conference held November 2nd and 3rd, 2005. Their approach adds a distillation apparatus to cool condensible gases indirectly by capturing condensed gases in dry impingers, thereby significantly reducing the matrix effect, which is primarily responsible for artifact formation. An additional filter is added downstream, after cooling, to collect the transformed gaseous particulates in the solid form.

In this application, the front half of the improved method is identical to 40 CFR 60, Appendix A, RM 5 with the following exception: the sample probe and filter temperature are to be maintained at a temperature of less than 85 ^{o}F (that of the flue gas). The back half of the improved method includes the addition of a Method 23-type indirect condenser followed by a dropout impinger between the filter box assembly and the first of two Method 202 impingers. A secondary 47-millimeter (mm) filter is located immediately after the three dry impingers. See Figure 3 for a detailed configuration of the improved method train. The improved method sampling train has been designed to achieve adequate flue gas temperature reduction with no contact between the gas stream and the condenser's cooling water. After collection of the sample, the improved method impingers are rinsed using distilled water and methylene chloride to collect any condensed particulate matter on glassware surfaces, just as it is recovered in the current RM 202.

The Phase II study was an actual stack test consisting of the simultaneous testing of condensible particulate matter using Reference Method RM 5/202, referred to as the *"traditional method"* and the improved method 5/202 referred to as the *"improved method."* 40 CFR 60, Appendix A, Reference Method RM 5 and 40 CFR 51, Appendix M, RM 202 were used for the wet method testing. In the condensible portion RM 202, there were no adjustments of the sample (i.e., nitrogen purge or pH adjustment).

An independent testing firm, Bureau Veritas, was retained by the Alliance to perform the field study. Bill Prokopy of DaimlerChrysler, LLC was the Project Technical Advisor to the Alliance. Mike Hartman, Principal Scientist of Air-Tech Environmental, LLC was retained by Bureau Veritas to oversee the sample collection portion of this study. Thomas Schmelter (Project Manager), Brian Young, and Gordon Barba, all representing Bureau Veritas, collected the samples. The samples were delivered to Bureau Veritas' Analytical Laboratory for analysis.

1.1 Identification, Location, and Dates of Test

The testing was performed on a wet machining operation associated with an oil mist collector control device (Source #244202) at an automotive facility in Indiana on March 29th and 30th, 2007. Sampling equipment was set up and two simultaneous runs, Runs 1 through 5, were performed on March 29th, 2007. Runs 6 through 8 were performed on March 30th, 2007.

1.2 Purpose of Study

The primary purpose of this study was to evaluate whether there were significant statistical differences between the traditional and improved CPM methodologies. Two metrics were used to evaluate the differences: the f-test and the t-test, both at the 95% confidence interval. Additionally, the field testing provided an opportunity to demonstrate the feasibility and examine issues resulting from the performance of the improved method.

1.3 Description of Source

The control device was an oil mist collector used to control emissions from the machining of transmission components, which may include cutting, grinding, broaching, and drilling operations. A cutting oil added to the surface of the metal during these operations to provide cooling and lubrication produces a fine mist of oil droplets typically controlled by filtration units referred to as mist collectors. The oil mist collector is a three-stage filtration system that removes oil droplets from the flue gas. A series of filtration bags collect the metal particulates and oil mist. The flue gas from the common inlet flow is directed to the mist collector and passes through a throat that increases gas velocity. The flue gas then flows to a large separator, which decreases flue gas velocity before entering a filtration system. The resulting pressure drop provides mist elimination and collection of the oils at the bottom of the collector. The filtered air is vented through a duct to the atmosphere. The source exhausts through a rectangular duct on the roof of the facility that measures 28.5 inches wide by 22 inches deep.

The oil mist collector controls emissions from 20 hobbing machines. At the time of the testing, 16 of the 20 hobbing machines were running. The emissions from each of the hobbing units are collected via a negative-pressure duct system that connects to a common duct and the oil mist collector.

2.0 Summary of Results

2.1 Operating Data

The operating data recorded during the emissions testing was compiled by a Process Engineer from the host testing facility. The data consisted of a parts count through the duration of the 1-hour test runs. The average eight-run part count per hour was 2,052. During Run 3, on March 29, 2007, the highest part count was 2,296. The minimum number of parts counted (1,889) occurred during Run 8 on March 30, 2007. The operating data is included as Appendix A.

The process was monitored through the duration of the testing program. No process shut-downs or disruptions were encountered that would have prompted a stop in testing.

2.2 Comparison of Results

Table 1A shows the results of eight samples collected simultaneously using RM 202 and the improved method. A value of 0 mg was used for results that were reported as less than the detection limit. Tables 1B and 1C present the statistical data for the f-test and t-test, respectively, at a 95% confidence interval (C.I.).

In Table 2A two data points were removed from the traditional method as outliers (see acetone rinse results) and the data are corrected. The removal of these two data points result in an f-test that passes (Table 2B) and a t-test that does not show significant statistical difference in the two CPM methods.

USEPA CPM Comparison Study – Oil Mist Collectors

Table 1A
Comparison of Individual Results (as Received)

Improved 202 Train							Traditional 202 Train					
Run No.	**1st Filter (mg)**	**Acetone (mg)**	**Inorganic (mg)**	**Organic (mg)**	**2nd Filter (mg)**	**Total (mg)**	**Run No.**	**Filter (mg)**	**Acetone (mg)**	**Inorganic (mg)**	**Organic (mg)**	**Total**
1	0.7	1.6	2.5	2.3	0	7.1	1	0	2.4	0.8	6.8	10.0
2	2.9	1.5	0	3.0	0	7.4	2	0	1.2	0.6	5.8	7.6
3	3.1	5.0	0.8	2.2	0	11.1	3	0	**9.1**	1.7	7.6	18.4
4	2.6	2.0	0	3.4	0	8.0	4	0	3.1	2.3	6.2	11.6
5	3.5	2.3	0	1.3	0	7.1	5	0	**9.9**	0.6	3.7	14.2
6	2.5	1.7	0	4.1	0	8.3	6	0	2.1	1.1	4.2	7.4
7	2.6	2.2	0	1.4	0	6.2	7	0	3.0	0.8	2.9	6.7
8	2.3	1.7	0.7	1.4	0	6.1	8	0	3.0	0.7	3.5	7.2
Ave.	2.53	2.25	0.50	2.39	0	7.66	Ave.	0	4.23	1.08	5.09	10.39
Std Dev.	0.83	1.15	0.88	1.04	0	1.59	Std. Dev.	0	3.32	0.61	1.73	4.15
RSD (%)						20.6	RSD (%)					39.9

Table 1B
f-test Results at 95% C.I. (as Received)

Fraction	**$f_{calculated}$**	**$f_{tabulated}$**
Acetone	8.35	3.79
Inorganic	2.08	
Organic	2.77	
Total	6.81	

Table 1C
t-test Results at 95% C.I. (as Received)

Mean of individual differences, D_{ave}	2.73
Standard deviation of individual differences, s_d	3.12
Number of samples, n	8
$t_{tabulated}$	2.365
$t_{calculated}$	2.470
Results	**FAILED t-test**
Action	Remove Run 3 and 5 outliers

USEPA CPM Comparison Study – Oil Mist Collectors

Table 2A
Comparison of Individual Results (Corrected)

Improved 202 Train							Traditional 202 Train					
Run No.	**1st Filter (mg)**	**Acetone (mg)**	**Inorganic (mg)**	**Organic (mg)**	**2nd Filter (mg)**	**Total (mg)**	**Run No.**	**Filter (mg)**	**Acetone (mg)**	**Inorganic (mg)**	**Organic (mg)**	**Total**
1	0.7	1.6	2.5	2.3	0	7.1	1	0	2.4	0.8	6.8	10.0
2	2.9	1.5	0	3.0	0	7.4	2	0	1.2	0.6	5.8	7.6
3	3.1	5.0	0.8	2.2	0	11.1	**3***	**(0)**	**(9.1)**	**(1.7)**	**(7.6)**	**NA**
4	2.6	2.0	0	3.4	0	8.0	4	0	3.1	2.3	6.2	11.6
5	3.5	2.3	0	1.3	0	7.1	**5***	**(0)**	**(9.9)**	**(0.6)**	**(3.7)**	**NA**
6	2.5	1.7	0	4.1	0	8.3	6	0	2.1	1.1	4.2	7.4
7	2.6	2.2	0	1.4	0	6.2	7	0	3.0	0.8	2.9	6.7
8	2.3	1.7	0.7	1.4	0	6.1	8	0	3.0	0.7	3.5	7.2
Ave.	2.53	2.25	0.50	2.39	0	7.66	Ave.	0	2.47	1.05	4.90	8.42
Std Dev.	0.83	1.15	0.88	1.04	0	1.59	Std. Dev.	0	0.74	0.63	1.58	1.94
RSD (%)						20.6	RSD (%)					23.0

*** Bold results for Runs 3 and 5 for traditional Method 202 were excluded.**

Table 2B
f-test Results at 95% C.I. (Corrected)

Fraction	$f_{calculated}$	$f_{tabulated}$
Acetone	2.40	4.88
Inorganic	1.93	
Organic	2.31	
Total	1.49	

Table 2C
t-test Results at 95% C.I. for Unpaired Samples (Corrected)

Standard deviation of individual differences, s_d	0.94
Number of samples, n	n1 = 8, n2 = 6
$t_{tabulated}$	2.131
$t_{calculated}$	0.80
Results	**PASSED t-test**

Table 3
Filterable (Front-Half) Particulate Matter Emissions

		Emission Rate			Concentration		
Method	Run	Filter (lb/hr)	Acetone (lb/hr)	Total (lb/hr)	Filter (gr/DSCF)	Acetone (gr/DSCF)	Total (gr/DSCF)
T202	1	0.01	0.07	0.08	0.0002	0.0009	0.0011
JR202	1	0.02	0.04	0.06	0.0003	0.0006	0.0009
T202	2	0.01	0.03	0.04	0.0002	0.0004	0.0006
JR202	2	0.08	0.04	0.12	0.0010	0.0005	0.0015
T202	3	0.01	0.25	0.26	0.0002	0.0033	0.0035
JR202	3	0.09	0.14	0.23	0.0012	0.0019	0.0031
T202	4	0.01	0.09	0.10	0.0002	0.0012	0.0014
JR202	4	0.07	0.06	0.13	0.0010	0.0008	0.0018
T202	5	0.01	0.27	0.28	0.0002	0.0036	0.0038
JR202	5	0.10	0.06	0.16	0.0013	0.0008	0.0021
T202	6	0.01	0.06	0.07	0.0002	0.0008	0.0010
JR202	6	0.07	0.05	0.12	0.0009	0.0006	0.0015
T202	7	0.01	0.08	0.09	0.0002	0.0011	0.0013
JR202	7	0.07	0.06	0.13	0.0010	0.0008	0.0018
T202	8	0.01	0.08	0.09	0.0002	0.0011	0.0013
JR202	8	0.07	0.04	0.11	0.0009	0.0006	0.0015
Average							
T202		0.01	0.12	0.13	0.0002	0.0016	0.0018
JR202		0.07	0.06	0.13	0.0009	0.0008	0.0017

Table 4
Condensible (Back-Half) Particulate Matter Emissions

		Emission Rate				Concentration			
Method	Run	Inorganic (lb/hr)	Organic (lb/hr)	2nd Filter (lb/hr)	Total (lb/hr)	Inorganic (gr/DSCF)	Organic (gr/DSCF)	2nd Filter (gr/DSCF)	Total (gr/DSCF)
T202	1	0.02	0.19	—	0.21	0.0003	0.0024	—	0.0027
JR202	1	0.07	0.06	<dl	0.13	0.0009	0.0008	<dl	0.0017
T202	2	0.02	0.16	—	0.18	0.0002	0.0021	—	0.0023
JR202	2	0.01	0.08	<dl	0.09	0.0002	0.0011	<dl	0.0013
T202	3	0.05	0.21	—	0.26	0.0006	0.0028	—	0.0034
JR202	3	0.02	0.06	<dl	0.08	0.0003	0.0008	<dl	0.0011
T202	4	0.06	0.17	—	0.23	0.0009	0.0024	—	0.0033
JR202	4	0.01	0.09	<dl	0.10	0.0002	0.0013	<dl	0.0015
T202	5	0.02	0.10	—	0.12	0.0002	0.0014	—	0.0016
JR202	5	0.01	0.04	<dl	0.05	0.0002	0.0005	<dl	0.0007
T202	6	0.03	0.12	—	0.15	0.0004	0.0016	—	0.0020
JR202	6	0.01	0.11	<dl	0.12	0.0002	0.0015	<dl	0.0017
T202	7	0.02	0.08	—	0.10	0.0003	0.0011	—	0.0014
JR202	7	0.01	0.04	<dl	0.05	0.0002	0.0005	<dl	0.0007
T202	8	0.02	0.10	—	0.12	0.0003	0.0013	—	0.0016
JR202	8	0.02	0.04	<dl	0.06	0.0003	0.0005	<dl	0.0008
Average									
T202		0.03	0.14	—	0.17	0.0004	0.0019	—	0.0023
JR202		0.02	0.07	<dl	0.09	0.0003	0.0009	<dl	0.0012

dl = detection limit

3.0 Sampling Procedures

Bureau Veritas obtained filterable particulate matter and traditional Method 202 condensible particulate matter emissions measurements in accordance with the procedures specified in the United States Environmental Protection Agency (USEPA) *Standards of Performance for New Stationary Sources*. The improved Method 202 sampling procedures followed guidelines outlined in Section 3.1.3. The sampling and analytical methods used in the testing program are indicated in the following table.

Table 5
USEPA Reference Methods

Sampling Method	Parameter	Analysis
Method 1	Traverse point locations	Field measurement
Method 2	Gas stream volumetric flowrate	Field measurement, S-type pitot tube
Method 3	Molecular weight	Fyrite analysis
Method 4	Moisture content	Gravimetrical
Method 5	Filterable particulate matter	Gravimetrical
Method 202	Condensible particulate matter	Gravimetrical
John Richards Improved Method 202	Condensible particulate matter	Gravimetrical

3.1 Sampling Train and Methods

The sampling train and methods used are presented below. Glassware, including, nozzles, glass-lined probes, filter holder, impingers, and impinger connections were precleaned prior to sample train assembly. The cleaning procedure consisted of washing with hot soapy water, rinsing with hot tap water, rinsing with distilled water, and air drying. The glassware was triple-rinsed with acetone, and then triple-rinsed with methylene chloride. Glassware openings were then capped with aluminum foil prior to sample train assembly.

3.1.1 Volumetric Flowrate and Moisture Content—Methods 1 through 4

Velocity traverses were conducted in accordance with the procedures outlined in USEPA Method 1 "Sample and Velocity Traverses for Stationary Sources," and Method 2 "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)." The exhaust stack measurements were 28.5 inches wide by 22 inches deep. No insulation or port nipples were present on the source stack. Three approximate 3-inch-diameter sampling ports are located on the northwest wall of the stack. The ports were labeled from north to south as A, B, and C.

Twelve traverse points were used. The distances from the stack wall of the four traverse points for each port are presented in the following table (the same distances for each of the three ports):

Table 6
Traverse Points

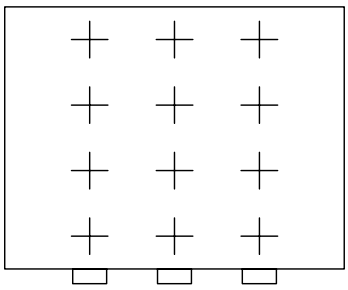
Traverse Point	Distance From Stack Wall (inches)
1	2.75
2	8.25
3	13.75
4	19.25

Traverse Point 1 was marked near the opening of the S-type pitot tube, with Traverse Point 4 marked towards the handle.

Prior to performing velocity traverses, a cyclonic flow check was performed at each point and port. The maximum Δp deflection was noted as 17° in Port C, Traverse Point 2. The minimum Δp deflection was noted as 5° at Port C, Traverse Point 1. The average cyclonic flow angle was 11.75°, which is less than the 20°-criterion that indicates cyclonic flow conditions.

Molecular weight was evaluated using USEPA Method 3, "Gas Analysis for the Determination of Dry Molecular Weight." The percents by volume of oxygen and carbon dioxide in the exhaust gas were determined by the Fyrite method. The source conditions reflected ambient amounts of oxygen, 21%, and carbon dioxide, 0%.

USEPA Method 4, "Determination of Moisture Content in Stack Gases," was used in conjunction with RM 202 and improved 202 measurements. Figure 1 depicts the oil mist collector exhaust stack's Sampling Ports and Traverse Point Locations.



Outlet = 22 inch x 28.5 inch

Traverse Point	Distance from Stack Wall (inches)
A	
1	2.75
2	8.25
3	13.75
4	19.25
B	
1	2.75
2	8.25
3	13.75
4	19.25
C	
1	2.75
2	8.25
3	13.75
4	19.25

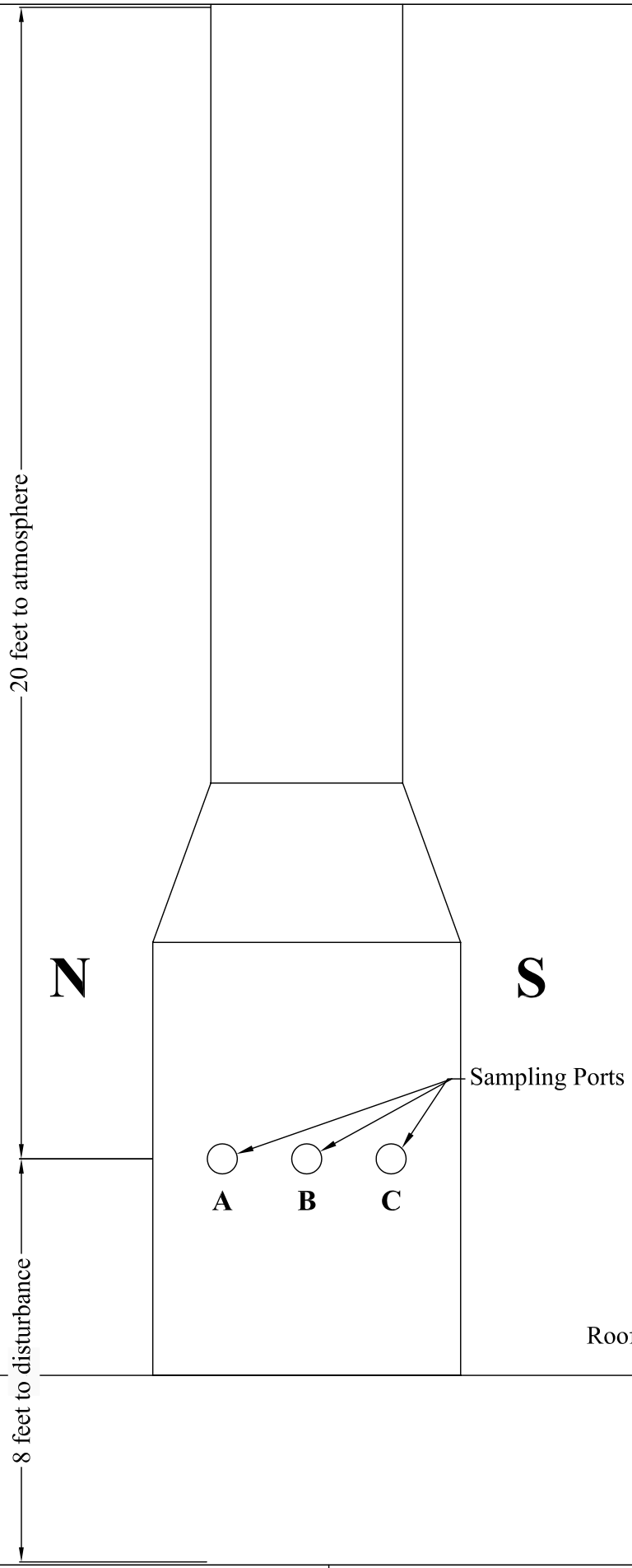


Figure 1
Outlet sampling location and traverse points

Alliance of Automobile Manufacturers

SITE: Automotive Facility
Indiana

Project No. 11007-107007

Last Revision
June 28, 2007

3.1.2 Total Particulate Matter Emissions—Traditional Method 5/202

USEPA Method 5, "Determination of Particulate Emissions from Stationary Sources" was used to measure the filterable particulate matter (FPM). USEPA Method 202, "Determination of Condensible Particulate Emissions from Stationary Sources," was used to measure the back-half condensible particulate mass.

Figure 2 depicts the sampling train.

The front half refers to the particulate mass collected within the nozzle, probe, and filter. The back half refers to the particulate matter collected after the filter and includes the back-half filter holder and impingers. The front-half particulate mass was added to the back-half condensible particulate matter mass to determine the exhaust particulate concentration defined as total particulate matter less than 10 microns (PM_{10}).

Bureau Veritas' isokinetic stack sampling system consisted of the following:

1. A borosilicate glass, button-hook nozzle
2. A heated borosilicate glass probe (maintained at 248 ± 25 °F)
3. A heated filter box (maintained at 248 ± 25 °F)
4. A preweighed Whatman® 934 AH glass fiber filter
5. A set of four Greenburg-Smith (GS) impingers used to collect the condensible particulate matter for each run
   - The first and second impingers of the standard GS design with 100 milliliters (mL) of deionized water
   - A third modified GS impinger containing 100 mL of deionized water. A GS impinger was modified by replacing the tip with a 1.3-cm-inner-diameter glass tube extending to about 1.3 cm from the bottom of the flask.
   - A fourth modified GS impinger containing a known amount of silica gel desiccant.
6. Sample line
7. A Nutech® control case equipped with a pump, dry-gas meter, and calibrated orifice

Prior to testing, a preliminary velocity traverse was performed and a nozzle size was calculated that would allow isokinetic sampling at an average rate of 0.75 cubic feet per minute. A pre-cleaned borosilicate glass nozzle was then selected that had an inside diameter that approximated the ideal calculated value. The nozzle was measured with calipers across three diameters to verify the inside diameter and then connected to the borosilicate glass-lined sample probe.

The impact and static pressure openings of the pitot tube were leak checked at or above 3.0 inches of velocity head for a period exceeding 15 seconds. The sampling train was then leak checked by capping the nozzle tip and drawing a vacuum of 15 inches of water. The dry-gas meter was then monitored for one minute. The sampling train was then inserted into the stack. Ice was then placed around the impingers. The probe and filter temperatures were allowed to stabilize at 248 ± 25 °F before the sample run. After production was verified by the facility Process Engineer and the sampling train was prepared, testing was initiated.

Velocity head readings and orifice calculations were performed to ensure that isokinetic sampling existed within ±10 % for the duration of the test. Each of the 12 traverse points were sampled at 5-minute intervals for the 60-minute test run. The sampling train was inspected for each traverse point and monitored continuously at the dry-gas meter. At the direction of the Alliance's Technical Director, nitrogen purges were not performed following the completion of each test run.

After completion of the post-test leak check for each test run, the nozzle and probe were triple-brushed and rinsed with acetone on location. The acetone rinses were collected in pre-cleaned 500-milliliter (mL), glass sample containers. The sample containers, filter, and impinger train were then transported to a recovery trailer. There, the filter was recovered and the front-half of the filter holder assembly was triple-rinsed with acetone and the rinsate was collected in the acetone sample container. A recovery trailer was used to provide a controlled environment and limit the potential for sample contamination.

The impinger train was also carefully disassembled in the recovery trailer. Each impinger was weighed and compared to the pre-test initial weights to determine the mass gain or loss. The impinger solution was collected in a pre-cleaned 500-mL glass sample container. Impingers 1 through 3 and all connecting glassware were then triple-rinsed with deionized water. This rinse was placed directly into the polyethylene sample container containing the collected impinger solutions. Impingers 1 through 3 and all connecting glassware were then triple-rinsed with methylene chloride, which was collected in a 500-mL glass sample container. All connecting glassware and Impingers 1 through 3 were then triple-rinsed with acetone, which was collected and combined with the methylene chloride rinsate.

The silica gel within the fourth impinger was then replaced with fresh silica gel. The sampling train was then re-assembled and capped with aluminum foil in preparation for the next sampling run.

Traditional Method

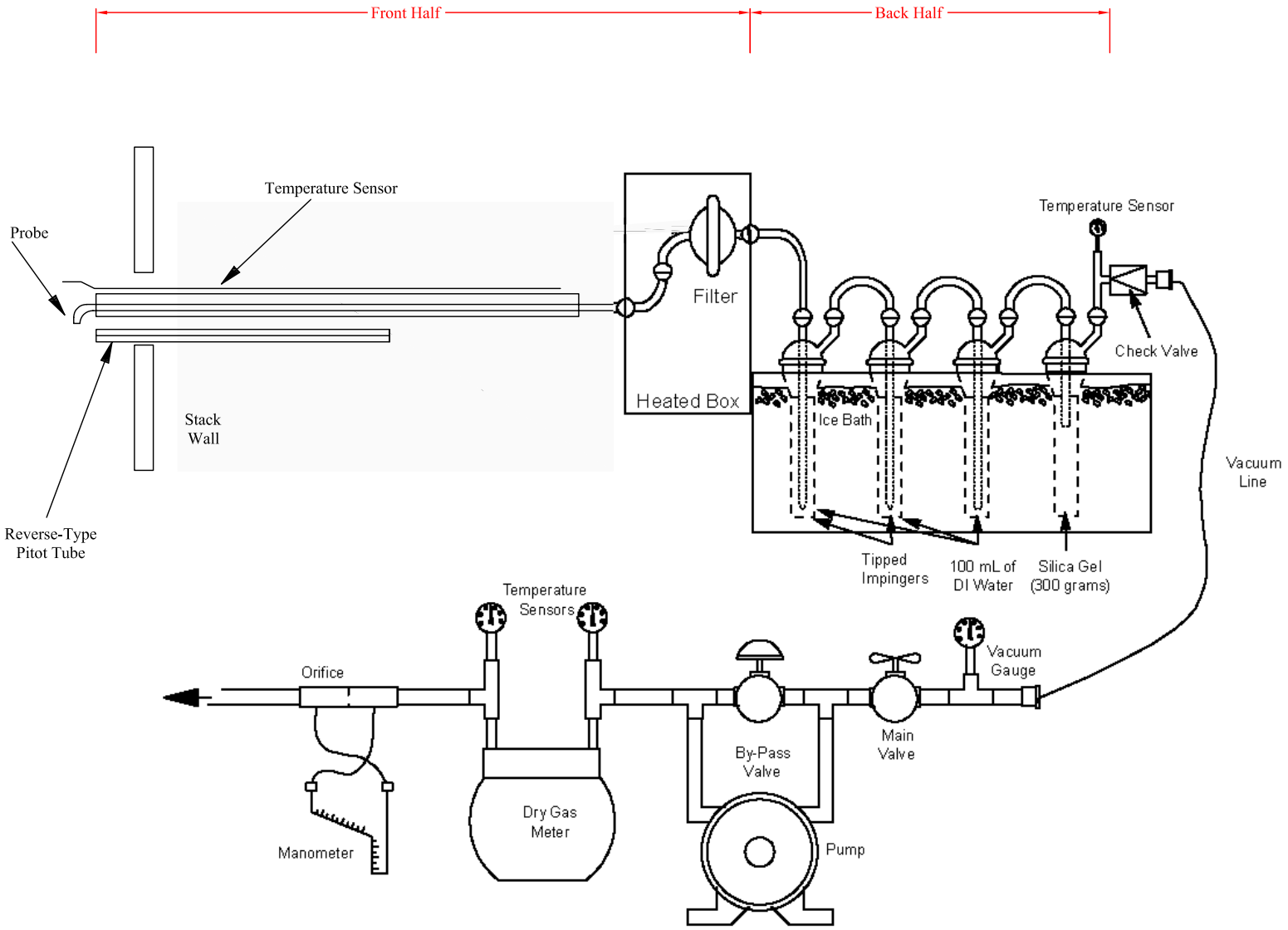


Figure 2
USEPA Reference Method 5/202 Sampling Train (Wet Method)

Alliance of Automobile Manufacturers

SITE: Automotive Facility
Indiana

Project No. 11007-107007

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Eight test runs were conducted. Bureau Veritas labeled each container with the test number and identification for the traditional method (T202), test location, and test date, and marked the level of liquid on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage. Bureau Veritas personnel transported all samples (including field blanks) to Bureau Veritas' laboratory in Novi, Michigan, for analysis.

3.1.3 Total Particulate Matter Emissions—Improved Method 5/202

For the improved method testing, particulate matter was measured using USEPA Methods 5 and 202, as described above, with exceptions. Figure 3 depicts the sampling train.

The procedure for Method 5 was modified. The sample was collected isokinetically but with the following exceptions:

- The probe temperature was maintained at ±15 ^{o}F of the stack flue gas temperature, but not exceeding 85 ^{o}F
- The filter temperature was maintained at ±15 ^{o}F of the stack flue gas temperature, but not exceeding 85 ^{o}F

The procedure for Method 202 was modified as depicted in Figure 3. The modifications were:

- A modified GS impinger (broken neck) inserted between the heated filter box and the first (traditional method) impinger
- A Method 23-type stack gas condenser placed between the first and second impingers
- A second (back-half) filter holder inserted between the second and third traditional method impingers

At the start of the sampling runs, pre-cleaned impingers in the improved train contained no water or reagent.

The improved Method 5/202 train was recovered in the same manner as the traditional Method 5/202 train. Eight test runs were conducted simultaneously. Bureau Veritas labeled each container with the test number and identification for the improved method (JR202), test location, and test date, and marked the level of liquid on the outside of the container. Immediately after recovery, the sample containers were placed in a cooler for storage. Bureau Veritas personnel transported all of these samples to Bureau Veritas' laboratory for analysis.

3.2 Calibration Sheets

Calibration sheets are presented in Appendix B.

3.3 Sample Calculations

Sample calculations are presented in Appendix C.

3.4 Data Sheets

Field data sheets are presented in Appendix D. Computer-generated data sheets are presented in Appendix E.

3.5 Analytical Results

Refer to Appendix F for laboratory analytical results.

Improved Method

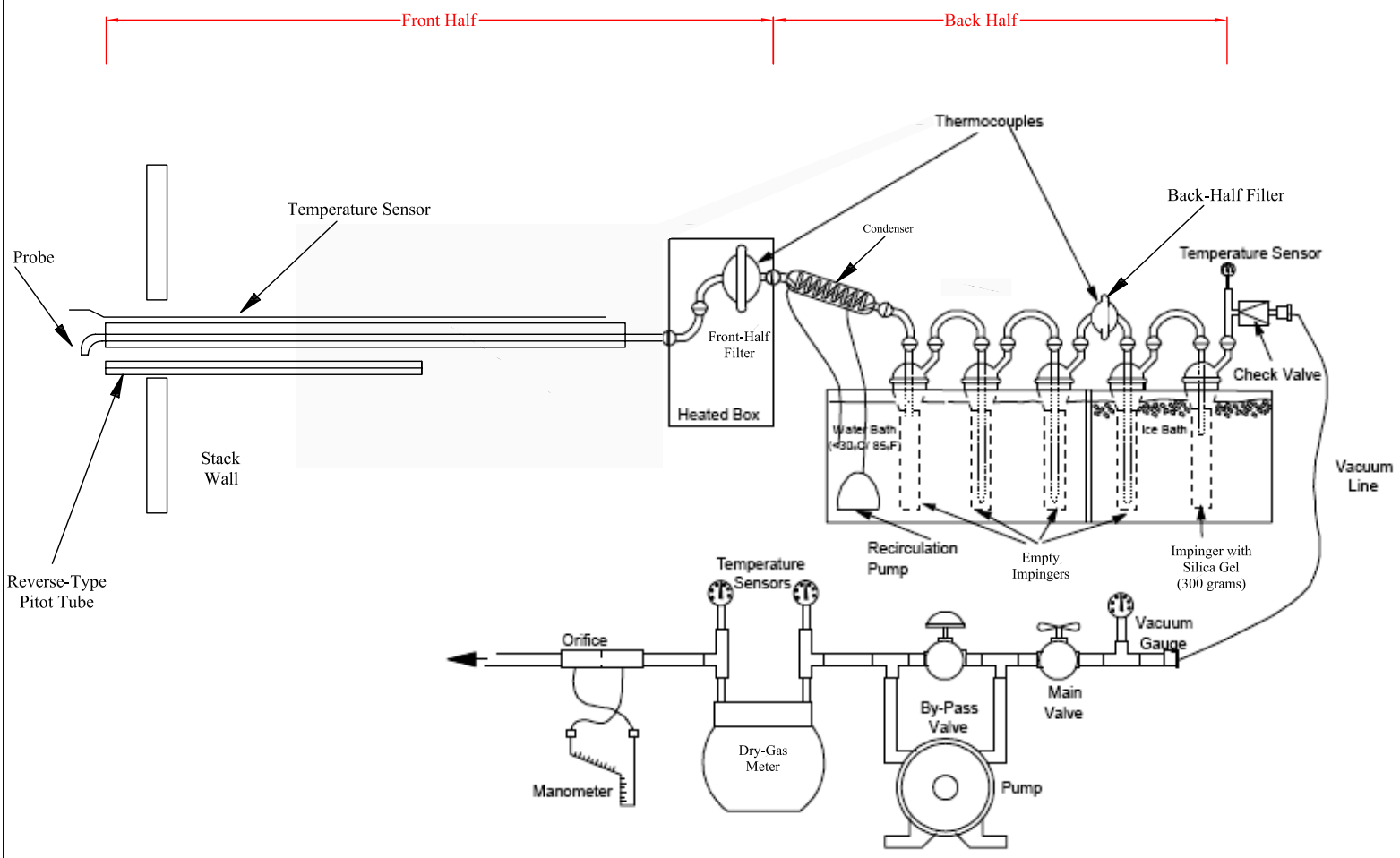

Figure 3
Improved Method 202 Sampling Train
(Dry Method - John Richards)

Alliance of Automobile Manufacturers

SITE: Automotive Facility
Indiana

Project No. 11007-107007

Last Revision
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Limitations

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July 3, 2007

Tables

Table A - T202 Runs 1 through 4

Company	**Alliance of Automobile Manufacturers**				
Source Designation	**Mist Eliminator #244202**				
Test Date	**3/29/2007**	**3/29/2007**	**3/29/2007**	**3/29/2007**	
Meter/Nozzle Information	T202-Run 1	T202-Run 2	T202-Run 3	T202-Run 4	Average
Meter Temperature Tm (F)	49.63	57.50	59.50	68.54	58.79
Meter Pressure - Pm (in. Hg)	29.52	29.52	29.52	29.51	29.52
Measured Sample Volume (Vm)	42.18	41.43	41.88	41.06	41.64
Sample Volume (Vm-Std ft^3)	43.21	41.78	42.08	40.55	41.90
Sample Volume (Vm-Std m^3)	1.22	1.18	1.19	1.15	1.19
Condensate Volume (Vw-std ft^3)	0.00	0.23	0.00	0.41	0.16
Gas Density (ρs (std) lbs/ft^3)	0.0745	0.0744	0.0745	0.0743	0.0744
Total weight of sampled gas (lbs)	3.221	3.125	3.137	3.042	3.131
Nozzle Size - An (sq. ft.)	0.0003464	0.0003464	0.0003464	0.0003464	0.0003464
Isokinetic Variation - I	98.4	98.8	98.3	98.8	98.6
Stack Data					
Average Stack Temperature - Ts (F)	83.9	84.3	85.0	85.8	84.8
Molecular Weight Stack Gas- dry (Md)	28.84	28.84	28.84	28.84	28.84
Molecular Weight Stack Gas-wet (Ms)	28.84	28.78	28.84	28.84	28.83
Stack Gas Specific Gravity (Gs)	1.00	0.99	1.00	1.00	1.00
Percent Moisture (Bws)	0.00	0.54	0.00	1.01	0.39
Water Vapor Volume (fraction)	0.000	0.005	0.000	0.010	0.004
Pressure - Ps (in. Hg)	29.41	29.41	29.41	29.41	29.41
Average Stack Velocity -Vs (ft/sec)	36.57	35.71	35.78	34.88	35.74
Area of Stack (ft^2)	4.26	4.26	4.26	4.26	4.26
Exhaust Gas Flowrate					
Flowrate ft^3/min (Actual)	9,337	9,117	9,136	8,906	9,124
Flowrate ft^3/min (Standard Wet)	8,909	8,692	8,700	8,469	8,693
Flowrate ft^3/min (Standard Dry)	8,909	8,645	8,700	8,383	8,659
Flowrate m^3/min (standard dry)	252.3	244.8	246.4	237.4	245.2
Total Particulate Weights (mg)					
Filter	0.5	0.5	0.5	0.5	0.5
Front Half Acetone Wash	2.4	1.2	9.1	3.1	4.0
Front Half USEPA Method 5 total	2.9	1.7	9.6	3.6	4.5
Inorganic Condensible Particulate Matter	0.8	0.6	1.7	2.3	1.4
Organic Condensible Particulate Matter	6.8	5.8	7.6	6.2	6.6
Back Half USEPA Method 202 total	7.6	6.4	9.3	8.5	8.0
Total Particulate Matter Weight	10.5	8.1	18.9	12.1	12.4
Total Particulate Concentration					
mg/dscf	0.243	0.194	0.449	0.298	0.296
grains/dscf	0.0037	0.0030	0.0069	0.0046	0.0046
lb/1000 lb (dry)	0.0072	0.0057	0.0133	0.0088	0.0088
Total Particulate Emission Rate					
lb/hr	0.3	0.2	0.5	0.3	0.3
lb/hr					
Filter	0.01364	0.01369	0.01367	0.01367	
Front Half Acetone Wash	0.06546	0.03284	0.24887	0.08478	
Total	0.07909	0.04653	0.26255	0.09845	
Inorganic Condensible Particulate Matter	0.02182	0.01642	0.04649	0.06290	
Organic Condensible Particulate Matter	0.18546	0.15875	0.20785	0.16956	
Total	0.20728	0.17517	0.25434	0.23246	
grains/dscf					
Filter	0.0001786	0.0001847	0.0001834	0.0001903	
Front Half Acetone Wash	0.0008572	0.0004432	0.0033374	0.0011798	
Total	0.0010357	0.0006279	0.0035208	0.0013701	
Inorganic Condensible Particulate Matter	0.0002857	0.0002216	0.0006235	0.0008753	
Organic Condensible Particulate Matter	0.0024286	0.0021423	0.0027873	0.0023596	
Total	0.0027143	0.0023639	0.0034107	0.0032350	

Table B - T202 Runs 5 through 8

Company	**Alliance of Automobile Manufacturers**				
Source Designation	**Mist Eliminator #244202**				
Test Date	**3/29/2007**	**3/30/2007**	**3/30/2007**	**3/30/2007**	
Meter/Nozzle Information	T202-Run 5	T202-Run 6	T202-Run 7	T202-Run 8	Average
Meter Temperature Tm (F)	73.04	46.63	54.33	67.83	60.46
Meter Pressure - Pm (in. Hg)	29.52	29.56	29.56	29.56	29.55
Measured Sample Volume (Vm)	42.75	40.03	40.64	41.09	41.13
Sample Volume (Vm-Std ft^3)	41.86	41.30	41.31	40.70	41.29
Sample Volume (Vm-Std m^3)	1.19	1.17	1.17	1.15	1.17
Condensate Volume (Vw-std ft^3)	0.27	0.03	0.00	0.31	0.15
Gas Density (Ps(std) lbs/ft^3)	0.0744	0.0745	0.0745	0.0743	0.0744
Total weight of sampled gas (lbs)	3.133	3.080	3.079	3.048	3.085
Nozzle Size - An (sq. ft.)	0.0003464	0.0003436	0.0003436	0.0003436	0.0003443
Isokinetic Variation - I	99.9	98.8	97.9	99.5	99.0
Stack Data					
Average Stack Temperature - Ts (F)	86.0	80.7	81.3	83.3	82.8
Molecular Weight Stack Gas- dry (Md)	28.84	28.84	28.84	28.84	28.84
Molecular Weight Stack Gas-wet (Ms)	28.77	28.83	28.84	28.84	28.82
Stack Gas Specific Gravity (Gs)	0.99	1.00	1.00	1.00	1.00
Percent Moisture (Bws)	0.65	0.08	0.00	0.76	0.37
Water Vapor Volume (fraction)	0.006	0.001	0.000	0.008	0.004
Pressure - Ps (in. Hg)	29.41	29.46	29.46	29.46	29.45
Average Stack Velocity -Vs (ft/sec)	35.51	35.12	35.12	34.77	35.13
Area of Stack (ft^2)	4.26	4.26	4.26	4.26	4.26
Exhaust Gas Flowrate					
Flowrate ft^3/min (Actual)	9,067	8,967	8,966	8,877	8,969
Flowrate ft^3/min (Standard Wet)	8,618	8,622	8,610	8,493	8,586
Flowrate ft^3/min (Standard Dry)	8,563	8,615	8,610	8,429	8,554
Flowrate m^3/min (standard dry)	242.5	243.9	243.8	238.7	242.2
Total Particulate Weights (mg)					
Filter	0.5	0.5	0.5	0.5	0.5
Front Half Acetone Wash	9.9	2.1	3.0	3.0	4.5
Front Half USEPA Method 5 total	10.4	2.6	3.5	3.5	5.0
Inorganic Condensible Particulate Matter	0.6	1.1	0.8	0.7	0.8
Organic Condensible Particulate Matter	3.7	4.2	2.9	3.5	3.6
Back Half USEPA Method 202 total	4.3	5.3	3.7	4.2	4.4
Total Particulate Matter Weight	14.7	7.9	7.2	7.7	9.4
Total Particulate Concentration					
mg/dscf	0.351	0.191	0.174	0.189	0.226
grains/dscf	0.0054	0.0030	0.0027	0.0029	0.0035
lb/1000 lb (dry)	0.0104	0.0057	0.0052	0.0056	0.0067
Total Particulate Emission Rate					
lb/hr	0.4	0.2	0.2	0.2	0.3
lb/hr					
Filter	0.01353	0.01380	0.01379	0.01370	
Front Half Acetone Wash	0.26784	0.05794	0.08272	0.08219	
Total	0.28136	0.07173	0.09650	0.09589	
Inorganic Condensible Particulate Matter	0.01623	0.03035	0.02206	0.01918	
Organic Condensible Particulate Matter	0.10010	0.11588	0.07996	0.09589	
Total	0.11633	0.14623	0.10202	0.11507	
grains/dscf					
Filter	0.0001843	0.0001868	0.0001868	0.0001896	
Front Half Acetone Wash	0.0036493	0.0007846	0.0011208	0.0011376	
Total	0.0038336	0.0009715	0.0013076	0.0013272	
Inorganic Condensible Particulate Matter	0.0002212	0.0004110	0.0002989	0.0002654	
Organic Condensible Particulate Matter	0.0013639	0.0015693	0.0010834	0.0013272	
Total	0.0015851	0.0019803	0.0013823	0.0015926	

Table C - JR202 Runs 1 through 4

Company	**Alliance of Automobile Manufacturers**				
Source Designation	**Mist Eliminator #244202**				
Test Date	**3/29/2007**	**3/29/2007**	**3/29/2007**	**3/29/2007**	
Meter/Nozzle Information	JR202-Run 1	JR202-Run 2	JR202-Run 3	JR202-Run 4	Average
Meter Temperature Tm (F)	56.50	61.67	63.38	72.00	63.39
Meter Pressure - Pm (in. Hg)	29.52	29.52	29.51	29.51	29.52
Measured Sample Volume (Vm)	41.84	42.88	40.68	41.43	41.71
Sample Volume (Vm-Std ft^3)	42.66	43.30	40.92	41.00	41.97
Sample Volume (Vm-Std m^3)	1.21	1.23	1.16	1.16	1.19
Condensate Volume (Vw-std ft^3)	0.25	0.74	0.32	0.41	0.43
Gas Density (Ps(std) lbs/ft^3)	0.0744	0.0741	0.0743	0.0743	0.0743
Total weight of sampled gas (lbs)	3.192	3.262	3.065	3.075	3.148
Nozzle Size - An (sq. ft.)	0.0003631	0.0003631	0.0003436	0.0003436	0.0003533
Isokinetic Variation - I	94.9	96.8	97.1	98.5	96.8
Stack Data					
Average Stack Temperature - Ts (F)	83.9	84.3	85.0	85.7	84.7
Molecular Weight Stack Gas- dry (Md)	28.84	28.84	28.84	28.84	28.84
Molecular Weight Stack Gas-wet (Ms)	28.78	28.66	28.76	28.84	28.76
Stack Gas Specific Gravity (Gs)	0.99	0.99	0.99	1.00	0.99
Percent Moisture (Bws)	0.57	1.67	0.77	0.99	1.00
Water Vapor Volume (fraction)	0.006	0.017	0.008	0.010	0.010
Pressure - Ps (in. Hg)	29.41	29.41	29.41	29.41	29.41
Average Stack Velocity -Vs (ft/sec)	35.88	36.13	35.65	35.36	35.75
Area of Stack (ft^2)	4.26	4.26	4.26	4.26	4.26
Exhaust Gas Flowrate					
Flowrate ft^3/min (Actual)	9,160	9,224	9,103	9,028	9,129
Flowrate ft^3/min (Standard Wet)	8,740	8,794	8,668	8,586	8,697
Flowrate ft^3/min (Standard Dry)	8,690	8,647	8,602	8,501	8,610
Flowrate m^3/min (standard dry)	246.1	244.9	243.6	240.7	243.8
Total Particulate Weights (mg)					
Filter	0.7	2.9	3.1	2.6	2.3
Front Half Acetone Wash	1.6	1.5	5.0	2.0	2.5
Front Half USEPA Method 5 total	2.3	4.4	8.1	4.6	4.9
Filterable Condensible Particulate Matter	0.5	0.5	0.5	0.5	0.5
Inorganic Condensible Particulate Matter	2.5	0.5	0.8	0.5	1.1
Organic Condensible Particulate Matter	2.3	3.0	2.2	3.4	2.7
Back Half total	5.3	4.0	3.5	4.4	4.3
Total Particulate Matter Weight	7.6	8.4	11.6	9.0	9.2
Total Particulate Concentration					
mg/dscf	0.178	0.194	0.284	0.220	0.219
grains/dscf	0.0027	0.0030	0.0044	0.0034	0.0034
lb/1000 lb (dry)	0.0053	0.0057	0.0084	0.0065	0.0065
Total Particulate Emission Rate					
lb/hr	0.2	0.2	0.3	0.2	0.2
lb/hr					
Filter	0.01886	0.07661	0.08621	0.07131	
Front Half Acetone Wash	0.04311	0.03963	0.13904	0.05486	
Total	0.06197	0.11624	0.22525	0.12617	
Filterable Condensible Particulate Matter	0.01347	0.01321	0.01390	0.01371	
Inorganic Condensible Particulate Matter	0.06736	0.01321	0.02225	0.01371	
Organic Condensible Particulate Matter	0.06197	0.07925	0.06118	0.09325	
Total	0.14280	0.10567	0.09733	0.12068	
grains/dscf					
Filter	0.0002532	0.0010336	0.0011692	0.0009786	
Front Half Acetone Wash	0.0005787	0.0005346	0.0018858	0.0007528	
Total	0.0008319	0.0015682	0.0030551	0.0017314	
Filterable Condensible Particulate Matter	0.0001809	0.0001782	0.0001886	0.0001882	
Inorganic Condensible Particulate Matter	0.0009043	0.0001782	0.0003017	0.0001882	
Organic Condensible Particulate Matter	0.0008319	0.0010693	0.0008298	0.0012798	
Total	0.0019171	0.0014257	0.0013201	0.0016562	

Table D - JR202 Runs 5 through 8

Company	**Alliance of Automobile Manufacturers**				
Source Designation	**Mist Eliminator #244202**				
Test Date	**3/29/2007**	**3/30/2007**	**3/30/2007**	**3/30/2007**	
Meter/Nozzle Information	JR202-Run 5	JR202-Run 6	JR202-Run 7	JR202-Run 8	Average
Meter Temperature Tm (F)	78.21	51.96	59.96	71.29	65.35
Meter Pressure - Pm (in. Hg)	29.52	29.56	29.56	29.56	29.55
Measured Sample Volume (Vm)	43.19	41.26	40.50	41.20	41.54
Sample Volume (Vm-Std ft^3)	42.25	42.51	41.07	40.85	41.67
Sample Volume (Vm-Std m^3)	1.20	1.20	1.16	1.16	1.18
Condensate Volume (Vw-std ft^3)	0.53	0.00	0.15	0.08	0.19
Gas Density (Ps(std) lbs/ft^3)	0.0742	0.0745	0.0744	0.0745	0.0744
Total weight of sampled gas (lbs)	3.174	3.168	3.068	3.049	3.115
Nozzle Size - An (sq. ft.)	0.0003436	0.0003436	0.0003328	0.0003328	0.0003382
Isokinetic Variation - I	99.5	97.3	98.2	98.3	98.3
Stack Data					
Average Stack Temperature - Ts (F)	86.0	80.7	81.3	83.3	82.8
Molecular Weight Stack Gas- dry (Md)	28.84	28.84	28.84	28.84	28.84
Molecular Weight Stack Gas-wet (Ms)	28.71	28.84	28.80	28.84	28.80
Stack Gas Specific Gravity (Gs)	0.99	1.00	0.99	1.00	0.99
Percent Moisture (Bws)	1.23	0.00	0.35	0.20	0.45
Water Vapor Volume (fraction)	0.012	0.000	0.004	0.002	0.004
Pressure - Ps (in. Hg)	29.41	29.46	29.46	29.46	29.45
Average Stack Velocity -Vs (ft/sec)	36.18	36.25	36.10	35.98	36.13
Area of Stack (ft^2)	4.26	4.26	4.26	4.26	4.26
Exhaust Gas Flowrate					
Flowrate ft^3/min (Actual)	9,237	9,255	9,216	9,187	9,224
Flowrate ft^3/min (Standard Wet)	8,780	8,899	8,850	8,791	8,830
Flowrate ft^3/min (Standard Dry)	8,672	8,899	8,819	8,773	8,791
Flowrate m^3/min (standard dry)	245.6	252.0	249.7	248.4	248.9
Total Particulate Weights (mg)					
Filter	3.5	2.5	2.6	2.3	2.7
Front Half Acetone Wash	2.3	1.7	2.2	1.7	2.0
Front Half USEPA Method 5 total	5.8	4.2	4.8	4.0	4.7
Filterable Condensible Particulate Matter	0.5	0.5	0.5	0.5	0.5
Inorganic Condensible Particulate Matter	0.5	0.5	0.5	0.7	0.6
Organic Condensible Particulate Matter	1.3	4.1	1.4	1.4	2.1
Back Half total	2.3	5.1	2.4	2.6	3.1
Total Particulate Matter Weight	8.1	9.3	7.2	6.6	7.8
Total Particulate Concentration					
mg/dscf	0.192	0.219	0.175	0.162	0.187
grains/dscf	0.0030	0.0034	0.0027	0.0025	0.0029
lb/1000 lb (dry)	0.0057	0.0065	0.0052	0.0048	0.0055
Total Particulate Emission Rate					
lb/hr	0.2	0.3	0.2	0.2	0.2
lb/hr					
Filter	0.09501	0.06923	0.07384	0.06534	
Front Half Acetone Wash	0.06244	0.04708	0.06248	0.04830	
Total	0.15745	0.11631	0.13633	0.11364	
Filterable Condensible Particulate Matter	0.01357	0.01385	0.01420	0.01420	
Inorganic Condensible Particulate Matter	0.01357	0.01385	0.01420	0.01989	
Organic Condensible Particulate Matter	0.03529	0.11354	0.03976	0.03977	
Total	0.06244	0.14124	0.06816	0.07387	
grains/dscf					
Filter	0.0012783	0.0009077	0.0009769	0.0008689	
Front Half Acetone Wash	0.0008400	0.0006172	0.0008266	0.0006422	
Total	0.00212	0.00152	0.00180	0.00151	
Filterable Condensible Particulate Matter	0.0001826	0.0001815	0.0001879	0.0001889	
Inorganic Condensible Particulate Matter	0.0001826	0.0001815	0.0001879	0.0002645	
Organic Condensible Particulate Matter	0.0004748	0.0014886	0.0005260	0.0005289	
Total	0.00084	0.00185	0.00090	0.00098	

Appendix A

Facility Operating Data

Stack 244202 March 29-30,2007

BT	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8
286263	115	76	107	98	57	61	143	99
252999	78	117	123	101	48	114	118	111
AAA063000	145	146	155	154	142	145	141	139
252991	0	0	72	159	242	0	82	123
286262	74	112	108	68	67	136	100	119
293392	NR	NR	NR	NR	NR	NR	NR	NR
293393	180	190	190	170	240	180	120	180
293394	NR	NR	NR	NR	NR	NR	NR	NR
293395	170	180	200	170	200	170	150	170
AAA012201	NR	NR	NR	NR	NR	NR	NR	NR
AAA012200	187	215	187	107	124	183	193	130
AAA012199	222	230	229	212	212	208	214	146
AAA012298	NR	NR	NR	NR	NR	NR	NR	NR
AAA012297	225	237	235	217	218	213	219	227
AAA012296	214	131	226	153	78	204	161	0
AAA006304	214	232	228	209	212	207	213	219
AAA006307	NR	NR	NR	NR	NR	NR	NR	NR
AAA006302	218	217	236	200	219	148	212	226
317521	NR	NR	NR	NR	NR	NR	NR	NR
263214	NR	NR	NR	NR	NR	NR	NR	NR
Total	2042	2083	2296	2018	2059	1969	2066	1889

NR = Not Running

Appendix B

Calibration Sheets

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: C:\Documents and Settings\tschmelter.AME\Desktop\Air Quality\Cals, Equations, Boilers\Meter 6\[2007-03-08.xls]5
Revised: 7/25/95 Version: 2.2

Model #: Meter 6
Serial #:

Date: ——————> 03.08.07
Barometric Pressure: ——> 30.20 (in. Hg)
Theoretical Critical Vacuum:—> 14.25 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

——— DRY GAS METER READINGS ——— -CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
0.50	12.00	219.295	224.350	5.055	83.0	84.0	83.0	83.0	AS47	0.323	15.0	73.0	73.0	73.0
1.00	12.00	224.350	231.295	6.945	83.0	83.0	83.0	83.0	AS55	0.440	15.0	73.0	74.0	73.5
1.70	12.00	231.295	240.195	8.900	84.0	84.0	87.0	83.0	AS63	0.566	15.0	73.0	73.0	73.0
3.10	12.00	240.195	252.270	12.075	86.0	83.0	88.0	84.0	AS73	0.756	14.5	73.0	74.0	73.5
4.70	12.00	252.270	266.860	14.590	88.0	84.0	90.0	85.0	AS81	0.923	12.0	74.0	73.0	73.5

********** RESULTS **********

— DRY GAS METER — VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	——— ORIFICE ——— VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	– DRY GAS METER – CALIBRATION FACTOR Y Value (number)	Variation (number)	——— ORIFICE ——— CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
4.963	140.6	5.077	143.8	5.079	1.023	0.012	1.541	39.14	-0.148
6.830	193.4	6.907	195.6	6.917	1.011	0.000	1.667	42.33	-0.023
8.744	247.6	8.882	251.5	8.886	1.016	0.005	1.712	43.48	0.023
11.887	336.6	11.863	336.0	11.880	0.998	-0.013	1.750	44.44	0.060
14.378	407.2	14.480	410.1	14.501	1.007	-0.004	1.777	45.14	0.088
		Average Y ——>			1.011		1.689	42.90	<——— Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: _____ Date: 3/8/07

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: S:\ES\Air Quality Group\Calibrations\Meter 6\[April 10, 2007.xls]522ORPR5
Revised: 7/25/95 Version: 2.2

Model #: Meter #6
Serial #:

Date: ————> 4.10.07
Barometric Pressure: ————> 30.09 (in. Hg)
Theoretical Critical Vacuum:—> 14.19 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

—— DRY GAS METER READINGS —— / -CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
0.50	12.00	97.600	102.659	5.059	83.0	83.0	83.0	83.0	AS47	0.323	15.0	70.0	70.0	70.0
0.99	12.00	102.659	109.600	6.941	82.0	82.0	82.0	82.0	AS55	0.440	15.0	71.0	72.0	71.5
1.70	12.00	109.600	118.477	8.877	82.0	82.0	84.0	82.0	AS63	0.566	15.0	72.0	72.0	72.0
3.10	12.00	118.477	130.550	12.073	84.0	82.0	85.0	82.0	AS73	0.756	15.0	73.0	73.0	73.0
4.70	12.00	130.550	145.230	14.680	85.0	82.0	89.0	83.0	AS81	0.923	14.0	73.0	73.0	73.0

** RESULTS **

DRY GAS METER VOLUME CORRECTED Vm(std) (cu ft)	DRY GAS METER VOLUME CORRECTED Vm(std) (liters)	ORIFICE VOLUME CORRECTED Vcr(std) (cu ft)	ORIFICE VOLUME CORRECTED Vcr(std) (liters)	ORIFICE VOLUME NOMINAL Vcr (cu ft)	DRY GAS METER CALIBRATION FACTOR Y Value (number)	DRY GAS METER CALIBRATION FACTOR Y Variation (number)	ORIFICE CALIBRATION FACTOR dH@ Value (in H2O)	ORIFICE CALIBRATION FACTOR dH@ Value (mm H2O)	ORIFICE CALIBRATION FACTOR dH@ Variation (in H2O)
4.951	140.2	5.072	143.6	5.065	1.024	0.016	1.539	39.10	-0.153
6.814	193.0	6.894	195.3	6.904	1.012	0.003	1.653	41.98	-0.039
8.721	247.0	8.857	250.8	8.878	1.016	0.007	1.719	43.68	0.028
11.885	336.6	11.825	334.9	11.875	0.995	-0.014	1.759	44.68	0.067
14.468	409.7	14.434	408.8	14.494	0.998	-0.011	1.788	45.43	0.097
			Average Y ——>		1.009		1.692	42.97	<—— Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: [signature]

Date: 4/10/07

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: C:\Documents and Settings\tschmelter.AME\Desktop\Air Quality\Cals, Equations, Boilers\Meter 7\[2007-03-08.xls]5:
Revised: 7/25/95 Version: 2.2

Model #: Meter 7
Serial #:

Date: ——————> 03.08.07
Barometric Pressure: ———> 30.20 (in. Hg)
Theoretical Critical Vacuum:—> 14.25 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

———— DRY GAS METER READINGS ———— -CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
0.54	12.00	87.765	92.850	5.085	77.0	78.0	77.0	77.0	AS47	0.323	15.0	74.0	72.0	73.0
1.10	12.00	92.850	99.795	6.945	77.0	78.0	77.0	77.0	AS55	0.440	15.0	73.0	73.0	73.0
1.80	12.00	99.795	108.640	8.845	78.0	77.0	80.0	77.0	AS63	0.566	15.0	74.0	74.0	74.0
3.20	12.00	108.640	120.600	11.960	80.0	77.0	81.0	78.0	AS73	0.756	15.0	74.0	73.0	73.5
4.90	12.00	120.600	135.110	14.510	81.0	78.0	83.0	78.0	AS81	0.923	14.0	73.0	74.0	73.5

** RESULTS **

— DRY GAS METER — VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	— ORIFICE — VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	— DRY GAS METER — CALIBRATION FACTOR Y Value (number)	Variation (number)	— ORIFICE — CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
5.049	143.0	5.077	143.8	5.079	1.005	0.003	1.683	42.74	-0.132
6.905	195.5	6.910	195.7	6.913	1.001	-0.001	1.850	47.00	0.036
8.797	249.1	8.873	251.3	8.894	1.009	0.007	1.838	46.68	0.023
11.913	337.4	11.863	336.0	11.880	0.996	-0.006	1.826	46.38	0.012
14.485	410.2	14.480	410.1	14.501	1.000	-0.002	1.875	47.63	0.061
				Average Y ———>	1.002		1.814	46.09	<—— Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: [signature] Date: 3/8/07

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: S:\ES\Air Quality Group\Calibrations\Meter 7\[April 10, 2007.xls]522ORPR5
Revised: 7/25/95 Version: 2.2

Model #: Meter #7
Serial #:

Date: ——————> 4.10.07
Barometric Pressure: ———> 30.09 (in. Hg)
Theoretical Critical Vacuum:—> 14.19 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

——— DRY GAS METER READINGS ——— -CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)
0.53	12.00	894.350	899.424	5.074	77.0	75.0	75.0	74.0	AS47	0.323	15.0	70.0	70.0	70.0
1.10	12.00	899.424	906.350	6.926	75.0	74.0	76.0	74.0	AS55	0.440	15.0	70.0	70.0	70.0
1.80	12.00	906.350	915.170	8.820	76.0	74.0	78.0	75.0	AS63	0.566	15.0	71.0	71.0	71.0
3.30	12.00	915.170	927.061	11.891	78.0	75.0	79.0	75.0	AS73	0.756	15.0	72.0	72.0	72.0
4.90	12.00	927.061	941.501	14.440	79.0	75.0	79.0	75.0	AS81	0.923	14.0	73.0	73.0	73.0

** RESULTS **

DRY GAS METER: VOLUME CORRECTED Vm(std) (cu ft)	DRY GAS METER: VOLUME CORRECTED Vm(std) (liters)	ORIFICE: VOLUME CORRECTED Vcr(std) (cu ft)	ORIFICE: VOLUME CORRECTED Vcr(std) (liters)	ORIFICE: VOLUME NOMINAL Vcr (cu ft)	DRY GAS METER CALIBRATION FACTOR Y: Value (number)	Variation (number)	ORIFICE CALIBRATION FACTOR dH@: Value (in H2O)	Value (mm H2O)	Variation (in H2O)
5.038	142.7	5.072	143.6	5.065	1.007	0.003	1.658	42.10	-0.171
6.893	195.2	6.904	195.5	6.894	1.002	-0.002	1.859	47.21	0.030
8.777	248.6	8.866	251.1	8.869	1.010	0.007	1.843	46.81	0.014
11.854	335.7	11.837	335.2	11.864	0.999	-0.005	1.894	48.10	0.065
14.444	409.0	14.434	408.8	14.494	0.999	-0.004	1.891	48.02	0.062

Average Y ———> 1.003

1.829 46.45 <——— Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: [signature] Date: 4/10/07

Nozzle Verification

Facility	Alliance	Consultant	BY
Source	#244202	Date	March 29, 2007

Nozzle ID	D_1 (inch)	D_2 (inch)	D_3 (inch)	ΔD (inch)	$D_{average}$ (inch)
#52	0.253	0.251	0.251	0.002	0.252
#58	0.259	0.257	0.257	0.002	0.258
#51A	0.252	0.252	0.249	0.003	0.251
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-

Nozzle diameter measured on a different diameter (inches)
Tolerance: measure within 0.001 inches.

ΔD = Maximum difference in any two measurements (inches)
Tolerance = 0.004 inches.

$D_{average}$ = Average of D_1, D_2, D_3.

Nozzle Verification

Facility	Alliance		Consultant	BY
Source	#244202		Date	March 30, 2007

Nozzle ID	D_1 (inch)	D_2 (inch)	D_3 (inch)	ΔD (inch)	$D_{average}$ (inch)
# 51B	0.252	0.252	0.250	0.002	0.251
# 47	0.247	0.245	0.248	0.003	0.247
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-
				-	-

Nozzle diameter measured on a different diameter (inches)
Tolerance: measure within 0.001 inches.

ΔD = Maximum difference in any two measurements (inches)
Tolerance = 0.004 inches.

$D_{average}$ = Average of D_1, D_2, D_3.

BUREAU VERITAS NORTH AMERICA, INC.
PITOT TUBE INSPECTION

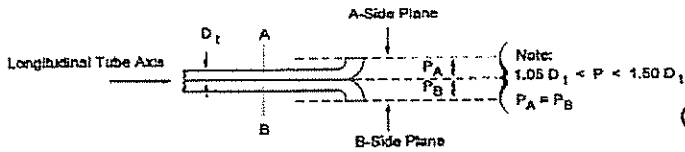
PITOT TUBE NO. 4'

DATE 3/29/07

Pitot Tube not on Probe

Operator: BH/TS

$3/16 \leq Dt \leq 3/8$
0.48 cm 0.95 cm
$P_A = P_B$



YES NO

YES NO

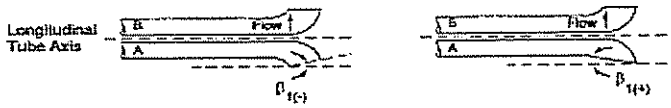
$1.05\ Dt \leq P_{A,B} \leq 1.5\ Dt$

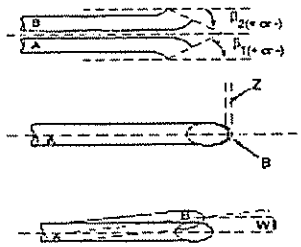
YES NO

α_1 and $\alpha_2 < 10°$

YES NO

β_1 and $\beta_2 < 5°$





β YES NO

$z < 0.32$ cm (1/8 in)

z YES NO

$w < 0.08$ cm (1/32 in)

w YES NO

Pitot on Probe
Component Spacing OK

Pitot Tube Correction Factor: 0.84

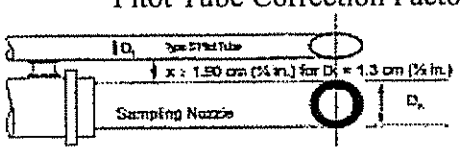


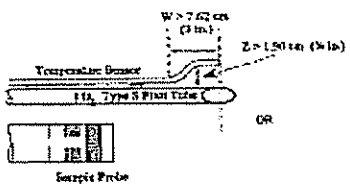
Fig. A

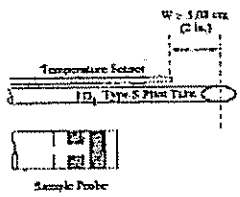
Fig.

A. $x \geq 1.9$ cm

A YES NO

B-1. $z \geq 1.9$ cm
$w \geq 7.62$ cm



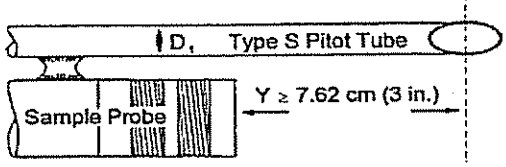


B-1 YES NO

Fig. B-1 Fig. B-2

or

B-2. $z \geq 5.08$ cm



B-2. YES NO

C. $Y \geq 7.62$ cm

C. YES NO

Fig. C

BUREAU VERITAS NORTH AMERICA, INC.
PITOT TUBE INSPECTION

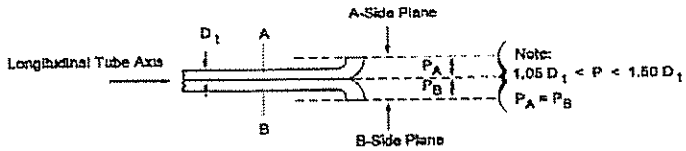
PITOT TUBE NO. 6'

DATE 3/30/07

Pitot Tube not on Probe

Operator: BY/TS

$3/16 \leq Dt \leq 3/8$
0.48 cm 0.95 cm
$P_A = P_B$



YES NO

YES NO

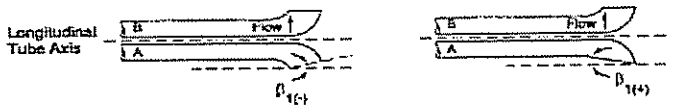
$1.05\ Dt \leq P_{A,B} \leq 1.5\ Dt$

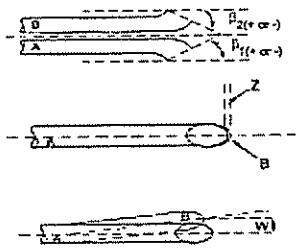
YES NO

α_1 and $\alpha_2 < 10°$

α YES NO

β_1 and $\beta_2 < 5°$





β YES NO

$z < 0.32$ cm (1/8 in)

z YES NO

$w < 0.08$ cm (1/32 in)

w YES NO

Pitot on Probe
Component Spacing OK

Pitot Tube Correction Factor: 0.84

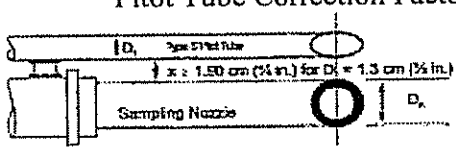


Fig. A

Fig.

A. $x \geq 1.9$ cm

A. YES NO

B-1. $z \geq 1.9$ cm
$w \geq 7.62$ cm

B-1. YES NO

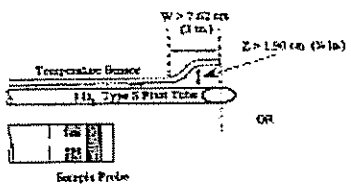


Fig. B-1

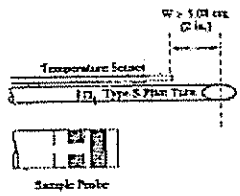


Fig. B-2

or

B-2. $z \geq 5.08$ cm

B-2. YES NO

C. $Y \geq 7.62$ cm

C. YES NO

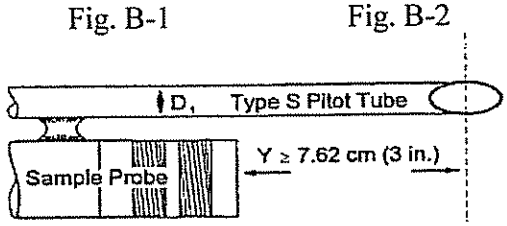


Fig. C

Appendix C

Sample Calculations

Sample Calculations

Note: Values obtained through sample calculations may deviate from that presented within the report based upon rounding differences. The calculations shown are examples.

C.1 Stack Gas Volumetric Flowrate

Moisture Content

$$V_{wc} = K_1 \cdot V_1$$

$$V_{wsg} = K_3 \cdot V_2$$

Where:

V_{wc} = volume of water vapor condensed in impingers at standard conditions (ft^3)
K_1 = $0.04706 ft^3$/g water
V_1 = volume of water collected in impingers (mL)
= mass (g) of water collected in impingers divided by 0.9982 g/mL (the density of water)
V_{wsg} = volume of water vapor collected in silica gel at standard conditions (ft^3)
K_3 = 0.04715 ft^3/g water
V_2 = mass of water collected by silica gel (g)

For example, if 5 mL of water were condensed in the impingers and 9 g of water were collected by the silica gel. The volume of water collected in each section of the sampling train, in ft^3, would be calculated as follows:

$$V_{wc} = \left(0.04706 \frac{\text{ft}^3}{\text{mL}}\right)(5\ \text{mL}) = 0.235\ \text{ft}^3$$

$$V_{wsg} = \left(0.04715 \frac{\text{ft}^3}{\text{g}}\right)(9\ \text{g}) = 0.424\ \text{ft}^3$$

The total volume of water collected would be 0.235 ft^3 + 0.424 ft^3 = 0.659 ft^3.

Gas Volume Standardization

$$V_{std} = V_m Y_m \left(\frac{T_{std}}{P_{std}} \right) \left(\frac{P_b + \frac{\Delta H}{13.6}}{T_m} \right)$$

Where:

V_{std}	=	volume of gas sampled at standard conditions (ft^3)
V_m	=	volume of gas measured by dry-gas meter (ft^3)
Y_m	=	dry-gas meter correction factor (dimensionless)
T_{std}	=	standard temperature ($^oR = 460 + {}^oF$)
P_{std}	=	standard pressure (in Hg)
P_b	=	barometric pressure (in Hg)
ΔH	=	average orifice differential pressure (in H_2O)
T_m	=	average meter temperature (^oR)

For example, if the volume of gas measured at the dry-gas meter was 44.71 ft^3, the dry-gas meter correction factor was 0.975, and the standard temperature and pressure are 528 ^oR and 29.92 in Hg, respectively, with the barometric pressure at 30.01 in Hg, the average orifice differential of 2.04, and the meter temperature of 519.9 ^oR, the volume of gas sampled corrected to standard conditions would be:

$$V_{std} = \left(44.71\,\text{ft}^3\right)\left(0.975\right)\left(\frac{528^o R}{29.92\,\text{in Hg}} \right)\left(\frac{30.01\text{in Hg} + \frac{2.04\text{in } H_2O}{13.6\frac{\text{in } H_2O}{\text{in Hg}}}}{519.9^o R} \right) = 44.09\,\text{ft}^3, \text{standard}$$

Moisture Fraction

$$B_{ws} = \frac{V_{wc} + V_{wsg}}{V_{wc} + V_{wsg} + V_{std}}$$

Where:

B_{ws}= exhaust gas moisture content

For example, using previously calculated values above, the exhaust gas moisture was calculated as follows:

$$B_{ws} = \frac{0.659\ \text{ft}^3}{0.659\ \text{ft}^3 + 44.09\ \text{ft}^3} = 0.0147$$

Absolute Stack Gas Temperature, T_s (^{o}R)

$$T_s = 460 + t_s$$

Where:

t_s = Measured stack gas temperature (^{o}F)

For example, if the average stack temperature was 374.8 ^{o}F, then the average temperature in degrees Rankine would be 374.8 + 460 = 834.8 ^{o}R.

Absolute Stack Gas Pressure, P_s (in. Hg)

$$P_s = P_{bar} + \left(\frac{P_{stat}}{13.6} \right)$$

Where:

P_{bar} = barometric pressure at test site (inches Hg)
P_{stat} = stack static pressure (inches H_2O)

For example, if the barometric and stack static pressures were 30.01 inches Hg, and -0.81 inches H_2O, respectively, the absolute stack pressure would be calculated as:

$$P_s = 30.01 + \left(\frac{-0.81}{13.6} \right) = 29.95 inHg$$

Stack Gas Molecular Weight, Dry Basis (lb/lb mole)

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

For example, if the average O_2 content of the exhaust gas stream was 20%, the CO_2 content of the gas stream was 0%, and the CO content was assumed to be negligible, the N_2 content would be assumed to make up the balance of the gas content (i.e., 100 - 20 – 0 = 80%), and the dry stack gas molecular weight would be computed as follows:

$$M_d = 0.44(0\%) + 0.32(20\%) + 0.28(80\%) = 28.80 \frac{\text{lb}}{\text{lb mol}}$$

Stack Gas Molecular Weight, Wet Basis (lb/lb mole)

$$M_s = M_d\left(1-\frac{B_{ws}}{100}\right)+18\left(\frac{B_{ws}}{100}\right)$$

If the average stack gas moisture content was 1.47%, then the wet stack gas molecular weight would be:

$$M_s = 28.80\frac{\text{lb}}{\text{lb mol}}\left(1-\frac{1.47}{100}\right)+18\left(\frac{1.47}{100}\right) = 28.64\frac{\text{lb}}{\text{lb mol}}$$

Stack Gas Velocity, V_s (ft/min)

$$V_s = \left(60\frac{\text{sec}}{\text{min}}\right)K_pC_p\Delta P\sqrt{\frac{T_s}{P_sM_s}}$$

Where:

K_p = pitot tube constant equal to $85.49\ \frac{ft}{\text{sec}}\sqrt{\frac{(lb/lb\cdot mole)(inHg)}{(^oR)(inH_2O)}}$

C_p = pitot tube coefficient, dimensionless

ΔP = average square root of the velocity head of stack gas (in H_2O)

M_s = molecular weight of the stack gas, wet basis (lb/lb mole)

For example, if the average square root of the velocity head of the stack gas was 1.0778 in H_2O, and using values already calculated, the average stack gas velocity would be calculated as follows:

$$V_s = \left(60\frac{\text{sec}}{\text{min}}\right)\left(85.49\frac{ft}{\text{sec}}\sqrt{\frac{(\text{lb/lb mol})(inHg)}{(^oR)(inH_2O)}}\right)(0.84)$$

$$\cdot 1.0778 inH_2O\sqrt{\frac{(834.8^oR)}{(29.95inHg)\left(28.64\frac{\text{lb}}{\text{lb mol}}\right)}} = 4{,}581\frac{ft}{\text{min}}$$

Average Stack Gas Volumetric Flowrate, Q_s (cfm)

$$Q_s = V_s \cdot A$$

Where:

V_s = stack gas velocity (ft/min or fpm)
A = cross-sectional area of stack (ft^2)

For example, if the circular exhaust stack has a diameter of 27 inches, then the cross-sectional area of the stack would be:

$$\frac{\pi}{4}\left(\frac{27in}{12\,in/ft}\right)^2 = 3.976\,ft^2$$

For a rectangular stack, the cross-sectional area is the width times the depth of the stack.

The stack gas volumetric flowrate would be calculated as follows:

$$Q_s = \left(4{,}581\frac{ft}{\min}\right)\cdot\left(3.976\,ft^2\right) = 18{,}214\frac{ft^3}{\min}$$

Standard Stack Gas Volumetric Flowrate, Q_{std} (scfm)

$$Q_{std} = Q_s\left(\frac{528^o R}{T_s}\right)\left(\frac{P_s}{29.92inHg}\right)$$

Where:

T_s = absolute stack gas temperature (^oR)
P_s = absolute stack gas pressure (in Hg)

For example, if we were to standardize the values calculated above, the standard stack gas volumetric flowrate would be calculated as follows:

$$Q_{std} = 18{,}214\frac{ft^3}{\min}\left(\frac{528^o R}{834.8^o R}\right)\left(\frac{29.95inHg}{29.92inHg}\right) = 11{,}532\frac{ft^3}{\min}, \text{standard}$$

Dry Standard Stack Gas Volumetric Flowrate, $Q_{std,dry}$ (dscfm)

$$Q_{std,dry} = Q_{std}\left(1 - B_{ws}\right)$$

The dry standard stack gas volumetric flowrate would be calculated as follows:

$$Q_{std,dry} = 11{,}532\frac{ft^3}{\text{min}}, \text{standard}\left(1 - 0.0147\right) = 11{,}363\frac{ft^3}{\text{min}}, \text{standard dry}$$

C.2 Particulate Concentration and Emission Rate

Particulate Concentration, C_1 (lb/ft^3, dry basis)

$$C_1 = \frac{m}{453{,}600 V_t}$$

Where: m = mass of particulate (mg).
V_t = total volume of gas sampled (ft^3).
453,600 = conversion factor, milligrams to pounds.

For example, for the traditional USEPA Reference Methods 5/202, if the total mass of particulate measured from the filter (0.6 mg), acetone rinse (7.8 mg), and the back half condensibles (inorganic 2.5 mg and organic 3.1) was (0.6 + 7.8) + (2.5 + 3.1) = 14.0 mg, and the total standardized (dry) volume of gas sampled was 44.09 ft^3, the dry particulate concentration of the gas stream is then:

$$C_1 = \frac{14.0 mg}{453{,}600 \frac{mg}{lb}(44.09\, ft^3)} = 7.00 x 10^{-7} \frac{lb}{ft^3}$$

$$7.00 x 10^{-7} \frac{lb}{ft^3} x 7000 \frac{gr}{lb} = 4.90 x 10^{-3} \frac{gr}{dscf}$$

For the modified USEPA Reference Method 5/202, the particulate mass for the second filter (filterable condensible particulate matter) is included in the total mass of particulates.

Mass Emission Rate (lb/hr)

$$\text{Emission Rate} = C_1 Q_{std,dry} \left(60 \frac{\text{min}}{hr}\right)$$

Where:
$Q_{std,dry}$ = dry standard stack gas volumetric flowrate (ft^3/min).

For example, from the previous calculation, C_1 = 7.00 x 10^{-7} lb/ft^3, and if the dry standard flowrate was 11,363 ft^3/min. The mass particulate loading in pounds per hour is then:

$$\text{Emission Rate} = 7.00 x 10^{-7} \frac{lb}{ft^3}\left(11{,}363 \frac{ft^3}{\text{min}}\right)\left(60 \frac{\text{min}}{hr}\right) = 0.48 \frac{lb}{hr}$$

Appendix D

Field Data Sheets

Company	ALLIANCE		4'	Leak Rate Initial	0.015 @15"
Source Designation	244202	Pilot Tube Number	-7	Leak Rate Final	0.000 @6
Test Date	3/29/07	Meter Number	—	Traverse points	12
Test Number	T-1	Meter Iso Factor (Kiso)	1.814	Pilot Tube Corr. Factor (Cp)	0.74
Operator	TSIBY	Delta H@	1	Meter Corr. Factor (Y)	1.002
Filter Numbers-		Assumed Moisture (Bws)		Orsat Results (%)	
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		CO2	0
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		O2	21
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	~~0.250~~ 0.252		
		#52			

Project No.

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	PROBE TEM
495.57	A 4	0	8:10	0	83	0.39	1.56	492.172	43	43	242	40	250
499.11	3	5		0	84	0.43	1.72	495.62	45	44	251	40	250
502.91	2	10		0	84	0.47	1.89	499.17	47	45	250	38	251
506.67	1	15		0	84	0.47	1.90	502.92	50	45	250	39	250
	STOP	20	8:30					506.677					
510.62	B 4	20	8:33	0	84	0.52	2.10	506.677	49	46	251	42	250
514.49	3	25		1	84	0.49	1.99	510.164	53	47	250	42	251
518.19	2	30		1	84	0.43	1.75	514.51	55	48	250	43	251
521.77	1	35		1	84	0.42	1.71	518.19	56	48	250	45	251
	STOP	40	8:53					521.6666					
525.52	C 4	40	8:56	1	84	0.49	1.99	521.6666	53	49	250	46	247
528.48	3	45		1	84	0.31	1.27	525.59	57	50	248	45	250
531.38	2	50		1	84	0.22	0.90	528.77	58	51	250	47	251
534.37	1	55		0	84	0.28	1.14	531.43	58	51	249	45	251
	END	60	9:16					534.355					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	244202	Pitot Tube Number	6'	Leak Rate Initial	0.000 @15"
Test Date	3/29/07	Meter Number	.6	Leak Rate Final	0.015 @5"
Test Number	JR-1	Meter Iso Factor (Kiso)	~~639~~	Traverse points	12
Operator	TS/BT	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-		Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	-.12	Silica Gel Wt Gain (Vlc)		CO2	.0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.258	O2	21

U-TUBE FOUND TO BE BROKEN BETWEEN 1ST & 2ND IMPINGER AT CONCLUSION OF TEST. POST TEST LEAK CHECK @ 0.015 @ 5" SHOWN; SLIGHT LEAK. ~~AS VACUUM~~

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe	2nd Filter
3 A 1	0	810	3	83	.42	1.76	671.68	57	52	79	46	80	50
2 B 2	5		3	84	.43	1.79	674.51	52	52	80	47	80	47
3 C 3	10		4	84	.48	2.00	677.86	54	58	80	45	80	48
4 D 4	15		2	84	.40	1.92	681.84	57	52	80	46	80	48
STOP	20	830	~	~	~	~	685.591	~	~	~	~	~	~
C 4	20	833	2	84	.52	2.17	685.591	56	56	80	49	81	49
3	25 ~~30~~		1	84	.32	1.34	689.63	60	53	80	49	80	49
2	30 ~~35~~		0	84	.21	.88	692.86	60	54	80	51	80	49
1	35 ~~40~~			84	.24	1.01	695.49	60	54	80	51	80	49
STOP	40 ~~45~~	853	~	~	~	~	698.318	~	~	~	~	~	~
A 1	40 ~~50~~	856	1	84	.41	1.72	698.318	59	55	80	49	80	49
2 B 2	45		1	84	.43	1.81	701.91	62	55	80	50	80	49
3 C 3	50		1	84	.42	1.78	705.63	64	56	81	50	80	49
4 D 4	55		1	84	.39	1.65	709.35	66	57	80	50	80	49
STOP	60	916	~	~	~	~	712.919	~	~	~	~	~	~

1341
1300

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	ALLIANCE			Project No.			
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.005 @15"		
Test Date	3/29/07	Meter Number	7	Leak Rate Final	0.000 @8"		
Test Number	T-2	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	TS/BY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	3	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-inches	21.5 x 28.5	Nozzle Diameter (In.)	0.252	O2	21		

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe Temp (°F)
538.30	B 4	0	9:41	0	84	0.45	1.83	534.588	53	52	249	46	250
542.4	3	5		1	84	0.48	1.97	538.25	58	54	250	47	253
545.11	2	10		1	84	0.43	1.77	542.05	61	54	251	45	250
549.10	1	15		2	84	0.43	1.77	545.73	62	55	250	45	251
	STOP	20	10:01					549.381					
553.29	C 4	20	10:05	1	84	0.49	2.02	549.381	59	56	252	47	250
556.30	3	25		2	84	0.31	1.28	553.24	61	56	250	48	250
558.98	2	30		2	84	0.21	0.87	556.41	61	56	249	47	250
561.81	1	35		0	84	0.24	0.99	559.06	61	56	250	47	250
	STOP	40	10:25					561.830					
565.31	A 4	40	10:28	1	85	0.39	1.60	561.830	58	56	250	47	250
569.01	3	45		1	85	0.43	1.77	565.35	60	56	250	47	250
572.55	2	50		1	85	0.42	1.73	568.93	61	56	251	49	249
576.05	1	55		1	85	0.40	1.65	572.51	62	56	251	49	250
	END	60	10:48					576.013					

•H = Kiso • (Cp)2 •(D)4• (1-Bw/100)2 • (MWm/MWs) • (Ps/Pm) • (Tm/Ts) • •Ps

Company	Alliance			Project No.	
Source Designation		Pitot Tube Number	244202	Leak Rate Initial	0.0 cc @ 15"
Test Date	3/29/07	Meter Number		Leak Rate Final	0.000 @ 10
Test Number	JR-2	Meter Iso Factor (Kiso)		Traverse points	12
Operator	TS/DJ	Delta H@		Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-		Assumed Moisture (Bws)	4	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+.12	Silica Gel Wt Gain (Vlc)		CO2	
Stack Dimension-Inches	21.5x22.5	Nozzle Diameter (In.)		O2	

NOZZLE SLIGHTLY CHIPPED DURING REMOVAL FROM PORT FOR LEAK CHECK. REPLACED AFTER RECOVERY

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe	Filter
A 1	0	9:41	7	84	.41	1.73	713.725	58	58	84	49	80	53
2	5		8	84	.44	1.86	717.24	63	59	84	49	80	53
3	10		9	84	.44	1.87	720.96	65	59	80	49	80	54
4	15			84	.38	1.62	724.71	66	60	80	49	80	53
4 Step	20	10:01					728.284						
B 4	20	10:05	9	84	.47	1.99	728.284	62	62	80	50	80	54
3	25		9	84	.47	1.99	732.16	64	60	80	50	80	54
2	30		9	84	.42	1.78	736.07	65	60	81	49	80	52
1	35		9	84	.41	1.74	739.85	65	60	80	49	80	53
STOP	40	10:25					743.500						
C 4	40	10:28	8	85	.50	2.11	743.500	61	60	80	50	80	55
3	45		8	85	.34	1.44	747.49	64	60	79	50	80	55
2	50		4	85	.22	.93	750.95	64	60	80	50	80	58
1	55		5	85	.26	1.10	753.68	65	60	81	51	80	57
STOP	60	10:48					756.606						

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

717.44 721.11 724.84 722.32 732.24 736.17 739.87 743.60 747.62 750.90 753.70 756.67

Company	ALLIANCE				Project No.		
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.000 @15"		
Test Date	3/29/07	Meter Number	7	Leak Rate Final	0.000 @6"		
Test Number	T-3	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	TS/BY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	5	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (in.)	0.252	O2	21		

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe Temp (°F)
579.84	A 4	0	11:25	0	85	0.41	1.67	576.288	54	54	239	49	244
583.5	3	5		0	85	0.41	1.68	579.89	56	55	251	51	251
587.08	2	10		0	85	0.42	1.72	583.47	58	55	249	50	251
590.98	1	15		0	85	0.40	1.64	586.95	60	55	254	54	250
	STOP	20	11:45					590.582					
594.44	B 4	20	11:48	0	85	0.48	1.97	590.582	59	56	247	56	248
598.21	3	25		0	85	0.48	1.98	594.43	62	57	250	59	251
601.98	2	30		0	85	0.43	1.78	598.30	64	57	251	58	250
605.56	1	35		0	85	0.42	1.74	601.93	66	58	251	57	250
	STOP	40	12:08					605.582					
609.59	C 4	40	12:11	0	85	0.31	2.11	605.582	63	59	250	55	251
612.7	3	45		0	85	0.30	1.24	609.62	66	60	251	56	248
615.23	2	50		0	85	0.20	0.83	612.70	67	60	251	54	250
618.08	1	55		0	85	0.25	1.04	615.25	67	60	250	54	250
	END	60	12:31					618.168					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	244202	Pitot Tube Number	61	Leak Rate Initial	0.0 LB @15"
Test Date	3/29/07	Meter Number	6	Leak Rate Final	0.0 LB @5"
Test Number	JR-3	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BH/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-	6	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.256	O2	21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	T avg	ΔH
C 4	0	11:25	4	85	0.52	1.960	757.475	59	59	84	54	82	59
3	5		2	85	0.31	1.17	761.34	60	59	80	57	80	59
2	10		0	87	0.20	.76	764.41	62	60	80	59	80	59
1	15	~~11:45~~	0	85	0.25	.95	766.89	64	59	80	59	80	59
STOP	20	11:45					769.668						
A 4	20	11:48	2	85	0.39	1.48	769.668	62	60	80	61	80	61
3	25		3	85	0.43	1.63	773.02	66	60	80	62	80	62
2	30		3	85	0.43	1.64	776.60	68	61	80	61	80	60
1	35		3	85	0.40	1.53	780.23	69	62	80	59	80	62
STOP	40	12:08					783.722						
B 4	40	12:11	3	85	0.47	1.79	783.722	66	62	80	58	80	62
3	45		3	85	0.47	1.80	787.40	69	63	81	59	80	63
2	50		3	85	0.40	1.53	791.21	71	64	80	59	80	64
1	55			85	0.39	1.50	794.70	72	64	80	60	80	64
STOP	60	12:31					798.150						
		12:31											

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

761.44 764.41 766.89 769.66

773.12 776.66 780.25 783.75

787.53 791.22 794.75 798.20

Company	ALLIANCE				Project No.		
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.015 @15"		
Test Date	3/29/07	Meter Number	7	Leak Rate Final	0.000 @5"		
Test Number	T-4	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	B/BY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	7	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Phar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	-0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-Inches	21.5 x 21.5	Nozzle Diameter (In.)	0.252	O2	21		

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe Temp (°F)
622.22	B 4	0	13:04	1	85	0.44	1.82	618.480	63	62	243	55	248
626.09	3	5		1	86	0.46	1.92	622.20	67	65	242	54	250
629.51	2	10		1	85	0.40	1.67	626.00	70	64	255	55	249
633.14	1	15		1	85	0.39	1.63	629.58	72	64	251	58	254
	STOP	20	13:24					633.075					
637.01	C 4	20	13:28	0	86	0.48	2.00	633.075	69	66	249	60	246
639.88	3	25		1	86	0.26	1.09	636.97	73	66	251	61	245
642.41	2	30		0	86	0.19	0.80	639.92	73	67	250	59	250
645.14	1	35		0	86	0.22	0.92	642.46	73	67	250	60	247
	STOP	40	13:48					645.152					
	A 4	40	13:52	0	86	0.38	1.59	645.152	70	68	251	60	238
648.07	3	45		0	86	0.42	1.76	648.57	72	68	250	60	253
652.21	2	50		0	86	0.43	1.81	652.30	74	68	250	61	254
656.05	1	55		1	86	0.41	1.73	655.92	75	69	251	61	254
659.59	END	60	14:12					659.545					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	244202	Pitot Tube Number	61	Leak Rate Initial	0.000 @15"
Test Date	3/29/07	Meter Number	.60	Leak Rate Final	0.000 @5"
Test Number	2R-4	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BR/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-	8	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Phar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (in.)	0.251	O2	21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Pitot Leak Check
A 4	0	13:04	4	85	.39	1.49	799.460	67	67	64	64	80 / 67
3	5		4	85	.43	1.65	802.85	70	66	80	65	80 / 71
2	10		4	85	.42	1.62	806.50	73	67	80	65	80 / 71
1	15		4	85	.38	1.47	810.160	75	68	85	68	80 / 71
STOP	20	13:24					813.571					
B 4	20	13:28	5	86	.47	1.81	813.571	72	69	83	67	80 / 71
3	25		5	86	.47	1.81	817.38	75	69	81	67	80 / 72
2	30		4	86	.39	1.51	821.24	77	70	80	61	80 / 72
1	35		4	86	.38	1.47	824.85	78	71	81	61	80 / 72
STOP	40	13:48					828.323					
C 4	40	13:52	5	86	.50	1.93	828.323	74	72	80	65	80 / 73
3	45		4	86	.32	1.24	832.26	77	72	81	60	80 / 71
2	50		1	86	.20	.78	835.67	77	72	81	60	80 / 71
1	55		1	86	.24	.93	838.12	78	72	80	61	80 / 73
STOP	60	14:12					840.89					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

802.45
806.32
810.14
813.64

817.42
821.24
824.77
828.34

832.29
835.47
838.21
840.90

Company	ALLIANCE				Project No.		
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.000 @15"		
Test Date	3/29/07	Meter Number	7	Leak Rate Final	0.010 @8"		
Test Number	T-5	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	TS/BH	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	9	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Pbar)	29.40	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.252	O2	21		

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	PROBE TEMP (°F)
663.41	A 4	0	15:05	0	86	0.40	1.68	659.799	70	69	252	63	250
667.25	3	5		0	86	0.45	1.89	663.42	71	70	250	65	251
671.00	2	10		0	86	0.44	1.85	667.20	73	70	256	66	259
674.89	1	15		0	86	0.38	1.60	671.00	75	70	250	66	248
	STOP	20	15:25	~	~	~	~	674.476	~	~	~	~	~
678.48	B 4	20	15:27	0	86	0.49	2.06	674.476	73	71	251	66	250
682.34	3	25		0	86	0.47	1.99	678.40	76	71	250	66	255
685.95	2	30		0	86	0.40	1.69	682.31	77	71	250	66	256
689.51	1	35		0	86	0.40	1.69	685.93	78	72	250	64	254
	STOP	40	15:47	~	~	~	~	689.548	~	~	~	~	~
693.57	C 4	40	15:50	0	86	0.49	2.07	689.548	75	72	250	63	257
697.68	3	45		0	86	0.29	1.23	693.57	78	72	249	61	249
699.75	2	50		0	86	0.19	0.80	697.33	78	72	250	61	249
702.54	1	55		0	86	0.23	0.97	699.77	77	72	248	59	250
	END	60	16:10	~	~	~	~	702.551	~	~	~	~	~

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	244202	Pitot Tube Number	6'	Leak Rate Initial	0.015 @15"
Test Date	3/25/09	Meter Number	6	Leak Rate Final	0.010 @5"
Test Number	3R-5	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BH/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-	10	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.4	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Psfat)	.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.251	O2	21

Traverse Point Number	Sampling Time (Minutes) θ	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	P	2nd F
B 4	0	15:05	4	86	.49	1.90	842.035	74	74	82	68	80	77
3	5		4	86	.49	1.91	845.99	76	76	81	61	80	77
2	10		4	86	.44	1.71	849.98	79	75	80	60	80	76
1	15		4	86	.40	1.56	853.76	81	75	80	61	80	77
STOP	20	15:25	~				857.360	~					
C 4	20	15:27	4	86	.53	2.07	857.360	78	76	80	66	80	78
3	25		3	86	.30	1.40	861.47	82	76	80	59	80	79
2	30		0	86	.20	.78	864.95	83	77	80	60	80	74
1	35		0	86	.25	.98	867.61	82	77	79	60	80	74
STOP	40	15:47	~				870.430	~					
A 4	40	15:50	3	86	.40	1.60	870.430	78	78	80	62	80	73
3	45		3	86	.44	1.72	874.07	82	77	80	57	80	70
2	50		4	86	.45	1.76	877.83	82	78	80	57	80	70
1	55		3	86	.39	1.53	881.61	83	78	80	58	80	71
STOP	60	16:10	~				885.22	~					

ΔH = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs

845.99 849.96 853.75 857.36

861.50 865.62 867.51 870.47

874.08 877.86 881.67 885.19

Company	ALLIANCE				Project No.		
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.020 @15"		
Test Date	3/30/07	Meter Number	7	Leak Rate Final	0.000 @8		
Test Number	T-6	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	JS/BY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	11	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-Inches	21.5 x 28.5"	Nozzle Diameter (In.)	0.251	O2	21		

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Probe Temp (°F)
706.30	A 4	0	7:31	0	80	0.39	1.54	702.945	40	40	251	39	250
709.88	3	5		1	80	0.42	1.666	706.39	42	41	250	39	251
713.31	2	10		1	80	0.42	1.66	709.81	44	41	250	44	252
716.69	1	15		1	80	0.40	1.59	713.26	47	42	250	45	252
	STOP	20	7:51					716.700					
720.24	B 4	20	7:55	2	81	0.43	1.70	716.700	45	43	250	44	244
724.02	3	25		2	81	0.48	1.91	720.26	49	44	250	47	250
727.60	2	30		2	81	0.44	1.76	723.99	52	44	246	47	250
731.01	1	35		2	81	0.39	1.56	727.60	53	45	249	44	250
	STOP	40	8:15					731.028					
734.85	C 4	40	8:17	2	81	0.49	1.96	731.028	51	47	250	49	253
737.69	3	45		2	81	0.28	1.13	734.79	55	47	252	52	249
740.48	2	50		0	81	0.20	0.80	737.72	55	48	252	52	252
742.91	1	55		0	81	0.24	0.97	740.21	55	49	251	50	249
	END	60	8:37					742.975					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	24420 2	Pitot Tube Number	6'	Leak Rate Initial	0.010 @15"
Test Date	3/30/07	Meter Number	.6	Leak Rate Final	0.000 @5"
Test Number	JR-6	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BY/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-	12	Assumed Moisture (Bws)	4	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Phar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.251	O2	21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	P	2nd P
C 4	0	731	4	80	0.52	1.93	885.562	46	46	77	44	80	45
3	5		2	80	0.32	1.19	889.35	47	47	80	47	80	45
2	10		0	80	0.22	0.82	892.47	49	47	80	51	80	46
1	15		1	80	0.27	1.01	895.02	51	47	80	49	80	45
STOP	20	751					897.830						
B 4	20	755	4	81	0.42	1.57	897.830	49	49	80	52	80	48
3	25		4	81	0.45	1.69	901.26	54	49	80	49	80	49
2	30		4	81	0.45	1.69	904.87	57	49	81	51	80	45
1	35		4	81	0.39	1.47	908.53	59	50	80	50	80	45
STOP	40	815					911.986						
A 4	40	817	4	81	0.49	1.84	911.986	56	51	80	49	80	46
3	45		4	81	0.49	1.85	915.75	60	52	80	51	80	46
2	50		4	81	0.43	1.63	919.59	62	53	80	51	80	46
1	55		4	81	0.42	1.59	923.22	63	54	80	52	80	46
END	60	837					926.821						

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

889.44
892.41
895.01
897.84

901.34
904.91
908.53
911.95

915.81
919.59
923.20
926.79

DAVE H.
765-454 1806

Company	ALLIANCE					Project No.	
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial		0.020 @15"	
Test Date	3/30/07	Meter Number	7	Leak Rate Final		0.000 @7	
Test Number	T-7	Meter Iso Factor (Kiso)	—	Traverse points		12	
Operator	JS/BH	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)		0.84	
Filter Numbers-		Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)		1.002	
Barometric Pressure (Phar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+ 0.12	Silica Gel Wt Gain (Vlc)		CO2		0	
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (in.)	0.251	O2		21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	PROBE TEMP (°F)
747.14 C 4	0	9:08	0	81	0.30	2.00	743.282	50	49	251	43	253
749.98 3	5		1	81	0.28	1.12	747.08	51	49	250	42	250
752.44 2	10		0	91	0.19	0.76	750.05	53	49	250	50	252
755.22 1	15		0	81	0.24	0.97	752.52	54	50	250	51	250
STOP	20	9:22	~	~	~	~	755.247	~	~	~	~	~
758.63 A 4	20	9:26	0	81	0.38	1.53	755.247	52	50	250	48	249
761.57 3	25		0	81	0.42	1.70	758.00	56	51	251	51	249
765.83 2	30		0	81	0.42	1.70	762.25	58	51	250	51	250
769.38 1	35		0	81	0.41	1.67	765.83	60	53	250	52	250
STOP	40	9:46	~	~	~	~	769.385	~	~	~	~	~
773.01 B 4	40	9:50	0	82	0.43	1.74	769.385	57	54	249	51	249
776.84 3	45		0	82	0.48	1.95	773.00	61	55	250	53	248
780.44 2	50		1	82	0.43	1.76	776.79	64	56	240	55	243
783.95 1	55		1	82	0.40	1.63	780.42	65	56	250	56	244
END	60	10:10	~	~	~	~	783.924	~	~	~	~	~

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

140 67

Company	Alliance			Project No.	
Source Designation	244202	Pitot Tube Number	.61	Leak Rate Initial	0.015 @15"
Test Date	3/30/07	Meter Number	.6	Leak Rate Final	0.015 @ "
Test Number	JR-7	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BY/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	.84
Filter Numbers-	14	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	-.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.247	O2	21

Traverse Point Number	Sampling Time (Minutes) Ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	P	Stack °F
B 4	0	902	3	81	0.48	1.70	927.725	55	55	76	49	80	49
3	5		3	81	0.49	1.74	931.36	57	55	80	50	80	50
2	10		3	81	0.41	1.46	935.10	60	55	77	55	80	50
1	15		2	81	0.41	1.46	938.58	62	56	80	56	80	51
STOP	20	922					941.951						
C 4	20	926	3	81	0.53	1.88	941.951	59	56	80	56	80	51
3	25		1	81	0.32	1.14	945.83	63	57	80	56	80	52
2	30		1	81	0.21	0.75	948.94	64	57	80	56	80	54
1	35		0	81	0.27	0.97	951.39	64	58	80	58	80	54
STOP	40	946					954.165						
A 4	40	950	3	82	0.41	1.46	954.165	62	59	80	57	80	54
3	45		3	82	0.45	1.61	957.60	66	60	80	60	81	55
2	50			82	0.45	1.62	961.19	68	60	80	64	80	56
1	55			82	0.39	1.40	964.80	70	61	80	64	80	56
END	60	1010					968.225						

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

935.00
938.51
942.00

945.83
948.86
951.40
954.18

957.59
961.21
964.81

968.18

Company	ALLIANCE			Project No.	
Source Designation	244202	Pitot Tube Number	4	Leak Rate Initial	0.005 @15"
Test Date	3/30/07	Meter Number	7	Leak Rate Final	0.000 @8"
Test Number	T-8	Meter Iso Factor (Kiso)	—	Traverse points	12
Operator	BJBY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84
Filter Numbers-	15	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.251	O2	21

	Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	PROBE TEMP (opt.)
787.70	B 4	0	10:35	0	83	0.43	1.75	784.047	61	60	243	52	251
791.56	3	5		0	83	0.47	1.93	787.72	65	61	250	51	249
795.21	2	10		0	83	0.42	1.73	791.57	68	62	251	50	254
798.68	1	15		0	83	0.38	1.57	795.20	70	63	248	51	251
	STOP	20	10:55					798.663					
803.52	C 4	20	10:57	0	83	0.47	1.94	798.663	68	64	252	52	252
805.54	3	25		0	83	0.28	1.16	802.54	72	65	250	52	251
808.08	2	30		0	83	0.20	0.83	805.54	73	66	251	52	249
810.96	1	35		0	83	0.25	1.04	808.12	73	66	250	53	250
	STOP	40	11:17					811.033					
814.90	A 4	40	11:22	0	84	0.37	1.53	811.033	70	68	260	55	247
818.12	3	45		0	84	0.40	1.66	814.53	74	68	251	55	253
821.14	2	50		0	84	0.41	1.71	818.10	75	69	250	54	245
825.15	1	55		0	84	0.38	1.59	821.63	77	70	250	55	250
	END	60	11:42					825.140					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Alliance			Project No.	
Source Designation	244202	Pilot Tube Number	6'	Leak Rate Initial	0.000 @15"
Test Date	3/30/07	Meter Number	.6	Leak Rate Final	0.005 @8"
Test Number	JR-8	Meter Iso Factor (Kiso)		Traverse points	12
Operator	BY/TS	Delta H@	1.689	Pilot Tube Corr. Factor (Cp)	.84
Filter Numbers-	16	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.011
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)	
Stack Static Pressure (Pstat)	+.12	Silica Gel Wt Gain (Vlc)		CO2	0
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.247	O2	21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	P	°F
A 4	0	1035	5	83	.41	1.47	968.545	65	64	82	59	81	60
3	5		5	83	.46	1.66	972.07	69	64	80	61	80	60
2	10		5	83	.46	1.66	975.66	71	65	80	58	80	62
1	15		5	83	.41	1.49	979.33	73	66	80	58	80	62
STOP	20	1055					982.860						
B 4	20	1057	5	83	.47	1.70	982.860	71	67	79	60	80	63
3	25		6	83	.49	1.78	986.57	75	68	80	58	80	63
2	30		5	83	.41	1.50	990.35	77	69	80	58	80	63
1	35		5	83	.41	1.50	993.90	75	69	81	58	80	
STOP	40	1117					997.413						
C 4	40	1122	6	84	.52	1.89	997.413	74	71	80	61	80	65
3	45		4	84	.30	1.10	1001.33	79	72	80	62	80	67
2	50		1	84	.20	0.73	1004.59	79	73	80	62	80	67
1	55		1	84	.25	0.92	1006.98	79	73	80	62	80	67
STOP	60	1142					1009.741						

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

1009.74

972.00
975.74
979.34
982.82

986.59
990.39
993.86
997.41

1001.35
1004.35
1007.06

Company	ALLIANCE				Project No.		
Source Designation	244202	Pitot Tube Number	4'	Leak Rate Initial	0.005 @15"		
Test Date	3/30/07	Meter Number	7	Leak Rate Final	0.000 @7"		
Test Number	T - FIELD BLANK	Meter Iso Factor (Kiso)	—	Traverse points	12		
Operator	TS/BY	Delta H@	1.814	Pitot Tube Corr. Factor (Cp)	0.84		
Filter Numbers-	17	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	1.002		
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)			
Stack Static Pressure (Pstat)	+0.12	Silica Gel Wt Gain (Vlc)		CO2	0		
Stack Dimension-Inches	21.5 x 28.5	Nozzle Diameter (In.)	0.251	O2	21		

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) ⁻H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)
				TRADITIONAL							
				FIELD		BLANK					

•H = Kiso * (Cp)2 *(D)4* (1-Bw/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * •Ps

Company	Allume				
Source Designation	244202	Pitot Tube Number	6'	Leak Rate Initial	Project No.
Test Date	3/30/07	Meter Number	6	Leak Rate Final	0.005 @15"
Test Number	JR-FIELD BLANK	Meter Iso Factor (Kiso)		Traverse points	0.000 @8"
Operator	BT/TS	Delta H@	1.689	Pitot Tube Corr. Factor (Cp)	12
Filter Numbers-	18	Assumed Moisture (Bws)	1	Meter Corr. Factor (Y)	.84
Barometric Pressure (Pbar)	29.45	Condensate Volume (Vlc)		Orsat Results (%)	1.011
Stack Static Pressure (Pstat)	-.12	Silica Gel Wt Gain (Vlc)		CO2	
Stack Dimension-inches	21.3x28.5	Nozzle Diameter (In.)	0.247	O2	0
					21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vacuum ("Hg)	Stack Temp. (°F) Ts	Velocity Pres. ("H2O) Ps	Orifice Differential ("H2O) "H	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperature Inlet (°F) Tm	Dry Gas Meter Temperature Outlet (°F) Tm	Filter Box Temperature (°F)	Last Impinger Temperature (°F)
	FIELD				BLANK						

•H = Kiso • (Cp)2 •(D)4• (1-Bw/100)2 • (MWm/MWs) • (Ps/Pm) • (Tm/Ts) • •Ps

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	KOKOMO D/C TRANSMISSION
Date	3/28/07
Sampling Location	VENT
Run Number	T202 - 1
Impinger Box Number	—
Recovery Person	MWJ
Recovery Rinses	N/A
Sampling Identification	N/A
Filter Number	GFF - 032107 - B
XAD Number	N/A

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	~100	G/S		685.5	674.7
2	H_2O	~100	G/S		723.0	714.0
3	H_2O	~100	MOD		738.0	740.8
4	SILICA Gel	~250g.	MOD		914.0	924.6
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C TRANSMISSION
Date	3/28/07
Sampling Location	VenT
Run Number	JR202-1
Impinger Box Number	—
Recovery Person	
Recovery Rinses	N/A
Sampling Identification	N/A
Filter Number	GFF-032107-2 / GFF022607-10
XAD Number	N/A

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	—		KO	559.3	560.5	
2	—		M·D	614.6	616.0	
3	H_2O	~100	M·D	725.0	727.5	725.0
4	Silica Gel	~250g	M·D	872.8	862.5	872.8
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/28/07
Sampling Location	Vent
Run Number	T202-2
Impinger Box Number	–
Recovery Person	
Recovery Rinses	N/A
Sampling Identification	N/A
Filter Number	GFF-032107-3
XAD Number	N/A

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	~100	G/S	703.4	712.5	
2	H_2O	~100	G/S	677.0	672.5	
3	H_2O	~100	M.D	720.0	718.0	
4	Silica Gel	~250g	M.D	969.4	962.0	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/28/07
Sampling Location	Vent
Run Number	JR202-2
Impinger Box Number	—
Recovery Person	
Recovery Rinses	N/A
Sampling Identification	N/A
Filter Number	GFF 032107-4 / FILTER 11
XAD Number	N/A

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	—	—	KO	572.7	574.4	
2	—	—	M.D	628.3	629.4	
3	H_2O	~100	M.D	734.5	706.8	
4	Silica Gel	~250	M.D	970.0	979.3	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kolco mo D/C TRANSMISSION
Date	3/29/07
Sampling Location	VENT
Run Number	3 TRADITIONAL
Impinger Box Number	-
Recovery Person	Mwsf.
Recovery Rinses	
Sampling Identification	
Filter Number	GFF032107-5
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	100	G/S	710.0	723.4	
2	H_2O	100	G/S	751.1	748.6	
3	H_2O	100	MOD	727.5	728.4	
4	SILICA Gel	250	MOD	937.0	930.3	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/29/07
Sampling Location	vent
Run Number	JR 202 - 3
Impinger Box Number	
Recovery Person	
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107-6 GFF 012607 - 18
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	–			564.7	564.6	
2	–			517.3	517.4	
3	H_2O	~100		710.6	712.9	
4	Silica Gel	~250g		879.6	870.6	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/29/07
Sampling Location	Vent
Run Number	T-4
Impinger Box Number	
Recovery Person	
Recovery Rinses	
Sampling Identification	
Filter Number	032107-7
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	~100	G/S	698.0	705.0	
2	H_2O	~100	G/S	737.9	738.3	
3	H_2O	~100	Mod	743.6	741.8	
4	Silica Gel	~250g	Mod	935.4	921.0	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/29/07
Sampling Location	Vent
Run Number	JR-4
Impinger Box Number	
Recovery Person	
Recovery Rinses	
Sampling Identification	19
Filter Number	GFF 022607-~~10~~ / ~~10~~032107-8
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	–	—	Mod	559.2	562.7	
2	–	—	Mod	614.5	617.7	
3	H_2O	~100	Mod	725.0	725.4	
4	Silica Gel	~250g	Mod	888.5	872.7	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo P/C Transmission
Date	3/29/07
Sampling Location	Vent
Run Number	T-5
Impinger Box Number	
Recovery Person	MWJ.
Recovery Rinses	
Sampling Identification	~~032107~~
Filter Number	032107 -10
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	100	G/S	719.9	728.9	
2	H_2O	100	G/S	731.5	730.5	
3	H_2O	100	MOD	735.6	735.9	
4	SILICA gel	250g	MOD	955.3	941.2	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	Kokomo D/C Transmission
Date	3/29/07
Sampling Location	Vent
Run Number	JR-5
Impinger Box Number	
Recovery Person	
Recovery Rinses	
Sampling Identification	
Filter Number	032107-9 / 022607-20
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	–	–		565.8	566.0	
2	–	–		518.7	519.1	
3	H_2O	~100		711.6	710.0	1.6
4	Silica Gel	~250		892.7	882.5	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	ALLIANCE, KOKOMO
Date	3/24/07
Sampling Location	Vent
Run Number	T-6
Impinger Box Number	
Recovery Person	MWH
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107-11
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	100	G/S	678.0	685.7	
2	H_2O	100	G/S	727.3	726.6	
3	H_2O	100	MOD	710.7	711.5	
4	Silica Gel	250g	MOD	978.5	970.0 ~~962.4~~	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	ALLIANCE - KOKOMO
Date	3/29/07
Sampling Location	Vent
Run Number	JR-6
Impinger Box Number	
Recovery Person	MDL.
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107-12 / GFF 022607-14
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	—	—	~~STD~~	559.0	561.6	
2	—	—	MOD	614.2	616.7	
3	H_2O	100g	MOD	763.4	766.4	
4	SILICA GEL	250g	MOD	892.1	885.8	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	ALLIANCE - Kokomo
Date	3/29/07
Sampling Location	VENT
Run Number	T - 7
Impinger Box Number	
Recovery Person	MWJ
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107 - 13
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	100	G/S	693.1	705.1	
2	H_2O	100	G/S	757.4	759.6	
3	H_2O	100	MOD	737.5	740.3	
4	Silica Gel.	250g	MOD	945.1	936.3	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	MELLINCE ICO/KO MD
Date	3/30/07
Sampling Location	ROOF VENT
Run Number	J12 - 7
Impinger Box Number	
Recovery Person	MWH.
Recovery Rinses	
Sampling Identification	
Filter Number	GFF032107-14 / GFF022607-15
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	—	—	KO	563.7	565.1	0
2	—	—	MOD	516.4	517.5	0
3	H_2O	100	MOD	707.5	710.0	
4	SILICA GEL	250	MOD	899.2	891.1	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	ALLIANCE - Kokomo
Date	3/30/07
Sampling Location	ROOF VENT
Run Number	T-8
Impinger Box Number	
Recovery Person	MWJ.
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107-15
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	H_2O	100	G/S	725.1	729.2	
2	H_2O	100	G/S	739.4	736.1	
3	H_2O	100	Mod	742.9	741.8	
4	Silica Gel	250g.	Mod	960.4	954.1	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	ALLIANCE - KOKOMO
Date	3/30/07
Sampling Location	
Run Number	JR-8
Impinger Box Number	
Recovery Person	MWJ
Recovery Rinses	
Sampling Identification	
Filter Number	GFF 032107-16 / GFF 022607-16
XAD Number	

Impinger Number	*Impinger Solution*	*Amount of Solution (g)*	*Impinger Tip Configuration*	*Impinger Weight*		
				Final (g)	*Initial (g)*	*Weight Gain (g)*
1	—	—	KO	572.1	572.3	
2	—	—	MOD	627.0	627.2	
3	H_2O	100	MOD	733.4	733.5	
4	SILICA gel	250	MOD	970.7	968.5	
5						
6						
7						
8						
9						
10						
					Total Weight Gain (g)	

Appendix E

Computer-Generated Data Sheets

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 1**		**Condensate (Vlc)**	-17	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	10.6	g
Filter Number	1		**Nozzle Diameter (in.)**	0.252	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.015 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 6"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temp. Inlet (F) Tm	Dry Gas Meter Temp. Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
A 4	0	8:10	0	83	0.39	1.56	492.172	43	43	40	242	250
3	5		0	84	0.43	1.72	495.62	45	44	40	251	250
2	10		0	84	0.47	1.89	499.17	47	45	38	250	251
1	15		0	84	0.47	1.90	502.92	50	45	39	250	250
Stop	20	8:30	-	-	-	-	506.677	-	-	-	-	-
B 4	20	8:33	0	84	0.52	2.10	506.677	49	46	42	251	250
3	25		1	84	0.49	1.99	510.64	53	47	42	250	251
2	30		1	84	0.43	1.75	514.51	55	48	43	250	251
1	35		1	84	0.42	1.71	518.19	56	48	45	250	251
Stop	40	8:53	-	-	-	-	521.666	-	-	-	-	-
C 4	40	8:56	1	84	0.49	1.99	521.666	53	49	46	250	247
3	45		1	84	0.31	1.27	525.59	57	50	45	248	250
2	50		1	84	0.22	0.90	528.77	58	51	47	250	251
1	55		0	84	0.28	1.14	531.43	58	51	45	249	251
End	60	9:16	-	-	-	-	534.355	-	-	-	-	-
Average	60		1	84	0.41	1.66	42.2	52.0	47.3	42.7	249	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	T202-Run 2		**Condensate (Vlc)**	-2.6	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	7.4	g
Filter Number	3		**Nozzle Diameter (in.)**	0.252	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.005 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 8"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
B 4	0	9:41	0	84	0.45	1.83	534.588	53	52	46	249	250
3	5		1	84	0.48	1.97	538.25	58	54	47	250	253
2	10		1	84	0.43	1.77	542.05	61	54	45	251	250
1	15		2	84	0.43	1.77	545.73	62	55	45	250	251
Stop	20	10:01	-	-	-	-	549.381	-	-	-	-	-
C 4	20	10:05	1	84	0.49	2.02	549.381	59	56	47	253	250
3	25		2	84	0.31	1.28	553.24	61	56	48	250	250
2	30		2	84	0.21	0.87	556.41	61	56	47	249	250
1	35		0	84	0.24	0.99	559.06	61	56	47	250	250
Stop	40	10:25	-	-	-	-	561.830	-	-	-	-	-
A 4	40	10:28	1	85	0.39	1.60	561.830	58	56	47	250	250
3	45		1	85	0.43	1.77	565.35	60	56	47	250	250
2	50		1	85	0.42	1.73	568.93	61	56	49	251	249
1	55		1	85	0.40	1.65	572.51	62	56	49	251	250
End	60	10:48	-	-	-	-	576.013	-	-	-	-	-
Average	60		1	84	0.39	1.60	41.43	59.8	55.3	47.0	250	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 3**		**Condensate (Vlc)**	-11.8	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	6.7	g
Filter Number	5		**Nozzle Diameter (in.)**	0.252	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.000 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 6"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
A 4	0	11:25	0	85	0.41	1.67	576.288	54	54	49	239	244
3	5		0	85	0.41	1.68	579.89	56	55	51	251	251
2	10		0	85	0.42	1.72	583.47	58	55	50	249	251
1	15		0	85	0.40	1.64	586.95	60	55	54	254	250
Stop	20	11:45	-	-	-	-	590.582	-	-	-	-	-
B 4	20	11:48	0	85	0.48	1.97	590.582	59	56	56	247	248
3	25		0	85	0.48	1.98	594.43	62	57	59	250	251
2	30		0	85	0.43	1.78	598.30	64	57	58	251	250
1	35		0	85	0.42	1.74	601.93	66	58	57	251	250
Stop	40	12:08	-	-	-	-	605.582	-	-	-	-	-
C 4	40	12:11	0	85	0.51	2.11	605.582	63	59	55	250	251
3	45		0	85	0.30	1.24	609.62	66	60	56	251	248
2	50		0	85	0.20	0.83	612.70	67	60	54	251	250
1	55		0	85	0.25	1.04	615.25	67	60	54	250	250
stop	60	12:31	-	-	-	-	618.168	-	-	-	-	-
Average	60		0	85	0.39	1.62	41.88	61.8	57.2	54.4	250	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 4**		**Condensate (Vlc)**	-5.6	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	14.4	g
Filter Number	7		**Nozzle Diameter (in.)**	0.252	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.015 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 5"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
B 4	0	13:04	1	85	0.44	1.82	618.480	63	62	55	243	248
3	5		1	86	0.46	1.92	622.20	67	65	54	242	250
2	10		1	85	0.40	1.67	626.00	70	64	55	255	249
1	15		1	85	0.39	1.63	629.58	72	64	58	251	254
Stop	20	13:24	-	-	-	-	633.075	-	-	-	-	-
C 4	20	13:28	0	86	0.48	2.00	633.075	69	66	60	249	246
3	25		1	86	0.26	1.09	636.97	73	66	61	251	245
2	30		0	86	0.19	0.80	639.92	73	67	59	250	256
1	35		0	86	0.22	0.92	642.46	73	67	60	250	247
Stop	40	13:48	-	-	-	-	645.152	-	-	-	-	-
A 4	40	13:52	0	86	0.38	1.59	645.152	70	68	60	251	238
3	45		0	86	0.42	1.76	648.57	72	68	60	250	253
2	50		0	86	0.43	1.81	652.30	74	68	61	250	254
1	55		1	86	0.41	1.73	655.92	75	69	61	251	254
stop	60	14:12	-	-	-	-	659.545	-	-	-	-	-
Average	60		1	86	0.37	1.56	41.06	70.9	66.2	58.7	249	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 5**		**Condensate (Vlc)**	-8.3	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	14.1	g
Filter Number	10		**Nozzle Diameter (in.)**	0.252	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.000 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.010 @ 8"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temp. Inlet (F) Tm	Dry Gas Meter Temp. Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
A 4	0	15:05	0	86	0.40	1.68	659.799	70	69	63	252	250
3	5		0	86	0.45	1.89	663.42	71	70	65	250	251
2	10		0	86	0.44	1.85	667.20	73	70	66	256	259
1	15		0	86	0.38	1.60	671.00	75	70	66	250	248
Stop	20	15:25	-	-	-	-	674.760	-	-	-	-	-
B 4	20	15:27	0	86	0.49	2.06	674.760	73	71	66	251	250
3	25		0	86	0.47	1.99	678.40	76	71	66	250	255
2	30		0	86	0.40	1.69	682.31	77	71	66	250	256
1	35		0	86	0.40	1.69	685.93	78	72	64	250	254
Stop	40	15:47	-	-	-	-	689.548	-	-	-	-	-
C 4	40	15:50	0	86	0.49	2.07	689.548	75	72	63	250	257
3	45		0	86	0.29	1.23	693.57	78	72	61	249	249
2	50		0	86	0.19	0.80	697.33	78	72	61	250	248
1	55		0	86	0.23	0.97	699.77	77	72	59	248	250
End	60	16:10	-	-	-	-	702.551	-	-	-	-	-
Average	60		0	86	0.39	1.63	42.8	75.1	71.0	63.8	251	252

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/30/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 6**		**Condensate (Vlc)**	-7.8	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	8.5	g
Filter Number	11		**Nozzle Diameter (in.)**	0.251	
Barometric Pressure (Pb, in. Hg)	29.45		**Leak Rate Initial**	0.000 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 8"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatı Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)
A 4	0	7:31	0	80	0.39	1.54	702.945	40	40	39	251
3	5		1	80	0.42	1.66	706.39	42	41	39	250
2	10		1	80	0.42	1.66	709.81	44	41	44	250
1	15		1	80	0.40	1.59	713.26	47	42	45	250
Stop	20	7:51	-	-	-	-	716.700	-	-	-	-
B 4	20	7:55	2	81	0.43	1.70	716.700	45	43	44	250
3	25		2	81	0.48	1.91	720.26	49	44	47	250
2	30		2	81	0.44	1.76	723.99	52	44	47	246
1	35		2	81	0.39	1.56	727.60	53	45	49	249
Stop	40	8:15	-	-	-	-	731.028	-	-	-	-
C 4	40	8:17	2	81	0.49	1.96	731.028	51	47	49	250
3	45		2	81	0.28	1.13	734.79	55	47	52	252
2	50		0	81	0.20	0.80	737.72	55	48	52	252
1	55		0	81	0.24	0.97	740.21	55	49	50	251
End	60	8:37	-	-	-	-	742.975	-	-	-	-
Average	60		1	81	0.38	1.52	40.03	49.0	44.3	46.4	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/30/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 7**		**Condensate (Vlc)**	-17	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	8.8	g
Filter Number	13		**Nozzle Diameter (in.)**	0.251	
Barometric Pressure (Pb, in. Hg)	29.45		**Leak Rate Initial**	0.000 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 7"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperati Inlet (F) Tm	Dry Gas Meter Temperati Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
C 4	0	9:02	0	81	0.50	2.00	743.282	50	49	43	251	253
3	5		1	81	0.28	1.12	747.08	51	49	42	250	250
2	10		0	81	0.19	0.76	750.05	53	49	50	250	252
1	15		0	81	0.24	0.97	752.52	54	50	51	250	250
Stop	20	9:22	-	-	-	-	755.247	-	-	-	-	-
A 4	20	9:26	0	81	0.38	1.53	755.247	52	50	48	250	249
3	25		0	81	0.42	1.70	758.00	56	51	51	251	249
2	30		0	81	0.42	1.70	762.25	58	51	51	250	250
1	35		0	81	0.41	1.67	765.83	60	53	52	250	250
Stop	40	9:46	-	-	-	-	769.385	-	-	-	-	-
B 4	40	9:50	0	82	0.43	1.74	769.385	57	54	51	249	249
3	45		0	82	0.48	1.95	773.00	61	55	53	250	248
2	50		1	82	0.43	1.76	776.79	64	56	55	240	243
1	55		1	82	0.40	1.63	780.42	65	56	56	250	244
stop	60	10:10	-	-	-	-	783.924	-	-	-	-	-
Average	60		0	81	0.38	1.54	40.64	56.8	51.9	50.3	249	249

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/30/2007		**Assumed Moisture (Bws)**	1	
Test Number	**T202-Run 8**		**Condensate (Vlc)**	0.3	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	6.3	g
Filter Number	15		**Nozzle Diameter (in.)**	0.251	
Barometric Pressure (Pb, in. Hg)	29.45		**Leak Rate Initial**	0.005 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 8"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	4Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	7		**Meter Corr. Factor (Y)**	1.002	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.814		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperati Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Probe Temperature (F)
B 4	0	10:35	0	83	0.43	1.75	784.047	61	60	52	243	251
3	5		0	83	0.47	1.93	787.72	65	61	51	250	249
2	10		0	83	0.42	1.73	791.57	68	62	50	251	254
1	15		0	83	0.38	1.57	795.20	70	63	51	248	251
Stop	20	10:55	-	-	-	-	798.663	-	-	-	-	-
C 4	20	10:57	0	83	0.47	1.94	798.663	68	64	52	252	252
3	25		0	83	0.28	1.16	802.54	72	65	52	250	251
2	30		0	83	0.20	0.83	805.54	73	66	52	251	249
1	35		0	83	0.25	1.04	808.12	73	66	53	250	250
Stop	40	11:17	-	-	-	-	811.033	-	-	-	-	-
A 4	40	11:22	0	84	0.37	1.53	811.033	70	68	55	260	247
3	45		0	84	0.40	1.66	814.53	74	68	55	251	253
2	50		0	84	0.41	1.71	818.10	75	69	54	250	245
1	55		0	84	0.38	1.59	821.63	77	70	55	250	250
stop	60	11:42	-	-	-	-	825.140	-	-	-	-	-
Average	60		0	83	0.37	1.54	41.09	70.5	65.2	52.7	251	250

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**JR202-Run 1**		**Condensate (Vlc)**	-5.1	g
Operator	TS/BY		**Silica Gel Weight Gain (Vlc)**	10.3	g
Filter Number	2	10	**Nozzle Diameter (in.)**	0.258	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.000 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.015 @ 5"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	6Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	6		**Meter Corr. Factor (Y)**	1.011	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.689		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temp. Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
B 4	0	8:10	3	83	0.42	1.76	671.080	57	52	46	79	50	80
3	5		3	84	0.43	1.79	674.51	52	52	47	80	47	80
2	10		4	84	0.48	2.00	677.86	54	58	45	80	48	80
1	15		2	84	0.46	1.92	681.84	57	52	46	80	48	80
Stop	20	8:30	-	-	-	-	685.591	-	-	-	-	-	-
C 4	20	8:33	2	84	0.52	2.17	685.591	56	51	49	80	49	81
3	25		1	84	0.32	1.34	689.63	60	53	49	80	49	80
2	30		0	84	0.21	0.88	692.86	60	54	51	80	49	80
1	35		0	84	0.24	1.01	695.49	60	54	51	80	49	80
Stop	40	8:53	-	-	-	-	698.318	-	-	-	-	-	-
A 4	40	8:56	1	84	0.41	1.72	698.318	59	55	49	80	49	80
3	45		1	84	0.43	1.81	701.91	62	55	50	80	49	80
2	50		1	84	0.42	1.78	705.63	64	56	50	81	49	80
1	55		1	84	0.39	1.65	709.35	66	57	50	80	48	80
End	60	9:16	-	-	-	-	712.918	-	-	-	-	-	-
Average	60		2	84	0.39	1.65	41.8	58.9	54.1	48.6	80	49	80

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Alliance of Automobile Manufacturers
Mist Eliminator #244202
3/29/2007

JR202-Run 2

TS/BY
4 11
29.40
0.12
21.5 28.5
6Ft
6

1.689

Assumed Moisture (Bws)	1	
Condensate (Vlc)	24.9	g
Silica Gel Weight Gain (Vlc)	-9.3	g
Nozzle Diameter (in.)	0.258	
Leak Rate Initial	0.000 @ 15"	
Leak Rate Final	0.000 @ 10"	
Traverse points	12	
Pitot Corr. Factor (Cp)	0.84	
Meter Corr. Factor (Y)	1.011	
Orsat Results (%)		
CO2	0	
O2	21	

Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatu Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
7	84	0.41	1.73	713.725	58	58	49	84	53	80
8	84	0.44	1.86	717.24	63	59	49	84	53	80
9	84	0.44	1.87	720.96	65	59	49	80	54	80
9	84	0.38	1.62	724.71	66	60	49	80	53	80
-	-	-	-	728.284	-	-	-	-	-	-
9	84	0.47	1.99	728.284	62	62	50	80	54	80
9	84	0.47	1.99	732.16	64	60	50	80	54	80
9	84	0.42	1.78	736.07	65	60	49	81	53	80
9	84	0.41	1.74	738.85	65	60	49	80	53	80
-	-	-	-	743.500	-	-	-	-	-	-
8	85	0.50	2.11	743.500	61	60	50	80	55	80
8	85	0.34	1.44	747.49	64	60	50	79	55	80
4	85	0.22	0.93	750.95	64	60	50	80	58	80
5	85	0.26	1.10	753.68	65	60	51	81	57	80
-	-	-	-	756.606	-	-	-	-	-	-
8	84	0.40	1.68	42.88	63.5	59.8	49.6	81	54	80

MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Alliance of Automobile Manufacturers
Mist Eliminator #244202
3/29/2007

JR202-Run 3

TS/BY
6 18
29.40
0.12
21.5 28.5
6Ft
6

1.689

Assumed Moisture (Bws)	1	
Condensate (Vlc)	-2.3	g
Silica Gel Weight Gain (Vlc)	9	g
Nozzle Diameter (in.)	0.251	
Leak Rate Initial	0.018 @ 15"	
Leak Rate Final	0.018 @ 5"	
Traverse points	12	
Pitot Corr. Factor (Cp)	0.84	
Meter Corr. Factor (Y)	1.011	
Orsat Results (%)		
CO2	0	
O2	21	

Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatu Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
4	85	0.52	1.96	757.475	59	59	54	84	59	82
2	85	0.31	1.17	761.34	60	59	57	80	59	80
0	85	0.20	0.76	764.41	62	60	59	80	59	80
0	85	0.25	0.95	766.89	64	59	59	80	59	80
-	-	-	-	769.668	-	-	-	-	-	-
2	85	0.39	1.48	769.668	62	60	61	80	61	80
3	85	0.43	1.63	773.02	66	60	62	80	62	80
3	85	0.43	1.64	776.60	68	61	61	80	60	80
3	85	0.40	1.53	780.23	69	62	59	80	62	80
-	-	-	-	783.722	-	-	-	-	-	-
3	85	0.47	1.79	783.722	66	62	58	80	62	80
3	85	0.47	1.80	787.40	69	63	59	81	63	81
3	85	0.40	1.53	791.21	71	64	59	80	64	80
3	85	0.39	1.50	794.70	72	64	60	80	64	80
-	-	-	-	798.150	-	-	-	-	-	-
2	85	0.39	1.48	40.68	65.7	61.1	59.0	80	61	80

MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Alliance of Automobile Manufacturers
Mist Eliminator #244202
3/29/2007

JR202-Run 4

BY/TS
8 19
29.40
0.12
21.5 28.5
6Ft
6

1.689

Assumed Moisture (Bws)	1	
Condensate (Vlc)	-7.1	g
Silica Gel Weight Gain (Vlc)	15.8	g
Nozzle Diameter (in.)	0.251	
Leak Rate Initial	0.000 @ 15"	
Leak Rate Final	0.000 @ 5"	
Traverse points	12	
Pitot Corr. Factor (Cp)	0.84	
Meter Corr. Factor (Y)	1.011	
Orsat Results (%)		
CO2	0	
O2	21	

Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatu Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
4	85	0.39	1.49	799.460	67	67	64	64	67	80
4	85	0.43	1.65	802.85	70	66	65	80	71	80
4	85	0.42	1.62	806.50	73	67	65	80	71	80
4	85	0.38	1.47	810.16	75	68	68	85	71	80
-	-	-	-	813.571	-	-	-	-	-	-
5	86	0.47	1.81	813.571	72	69	67	83	71	80
5	86	0.47	1.81	817.38	75	69	67	81	72	80
4	86	0.39	1.51	821.24	77	70	61	80	72	80
4	86	0.38	1.47	824.85	78	71	61	81	72	80
-	-	-	-	828.323	-	-	-	-	-	-
5	86	0.50	1.93	828.323	74	72	65	80	73	80
4	86	0.32	1.24	832.26	77	72	60	81	71	80
1	86	0.20	0.78	835.67	77	72	60	81	71	80
1	86	0.24	0.93	838.12	78	72	61	80	73	80
-	-	-	-	840.890	-	-	-	-	-	-
4	86	0.38	1.48	41.43	74.4	69.6	63.7	80	71	80

MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/29/2007		**Assumed Moisture (Bws)**	1	
Test Number	**JR202-Run 5**		**Condensate (Vlc)**	1	g
Operator	BY/tS		**Silica Gel Weight Gain (Vlc)**	10.2	g
Filter Number	9	20	**Nozzle Diameter (in.)**	0.251	
Barometric Pressure (Pb, in. Hg)	29.40		**Leak Rate Initial**	0.015 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.010 @ 5"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	6Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	6		**Meter Corr. Factor (Y)**	1.011	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.689		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temp. Inlet (F) Tm	Dry Gas Meter Temp. Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
B 4	0	15:05	4	86	0.49	1.90	842.035	74	74	68	82	77	80
3	5		4	86	0.49	1.91	845.99	76	76	61	81	77	80
2	10		4	86	0.44	1.71	849.98	79	75	60	80	76	80
1	15		4	86	0.40	1.56	853.76	81	75	61	80	77	80
Stop	20	15:25	-	-	-	-	857.360	-	-	-	-	-	-
C 4	20	15:27	4	86	0.53	2.07	857.360	78	76	66	80	78	80
3	25		3	86	0.30	1.40	861.47	82	76	59	80	79	80
2	30		0	86	0.20	0.78	864.95	83	77	60	80	74	80
1	35		0	86	0.25	0.98	867.61	82	77	60	79	74	80
Stop	40	15:47	-	-	-	-	870.430	-	-	-	-	-	-
A 4	40	15:50	3	86	0.41	1.60	870.430	78	78	62	80	73	80
3	45		3	86	0.44	1.72	874.07	82	77	57	80	70	80
2	50		4	86	0.45	1.76	877.83	82	78	57	80	70	80
1	55		3	86	0.39	1.53	881.61	83	78	58	80	71	80
End	60	16:10	-	-	-	-	885.220	-	-	-	-	-	-
Average	60		3	86	0.40	1.58	43.2	80.0	76.4	60.8	80	75	80

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/30/2007		**Assumed Moisture (Bws)**	1	
Test Number	**JR202-Run 6**		**Condensate (Vlc)**	-8.1	g
Operator	BY/tS		**Silica Gel Weight Gain (Vlc)**	6.3	g
Filter Number	12	14	**Nozzle Diameter (in.)**	0.251	
Barometric Pressure (Pb, in. Hg)	29.45		**Leak Rate Initial**	0.010 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.000 @ 5"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	6Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	6		**Meter Corr. Factor (Y)**	1.011	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.689		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
C 4	0	7:31	4	80	0.52	1.93	885.562	46	46	44	77	45	80
3	5		2	80	0.32	1.19	889.35	47	47	47	80	45	80
2	10		0	80	0.22	0.82	892.47	49	47	51	80	46	80
1	15		1	80	0.27	1.01	895.02	51	47	49	80	45	80
Stop	20	7:51	-	-	-	-	897.830	-	-	-	-	-	-
B 4	20	7:55	4	81	0.42	1.57	897.830	49	49	52	80	48	80
3	25		4	81	0.45	1.69	901.26	54	49	49	80	49	80
2	30		4	81	0.45	1.69	904.87	57	49	51	81	45	80
1	35		4	81	0.39	1.47	908.53	59	50	50	80	45	80
Stop	40	8:15	-	-	-	-	911.986	-	-	-	-	-	-
A 4	40	8:17	4	81	0.49	1.84	911.986	56	51	49	80	46	80
3	45		4	81	0.49	1.85	915.75	60	52	51	80	46	80
2	50		4	81	0.43	1.63	919.59	62	53	51	80	46	80
1	55		4	81	0.42	1.59	923.22	63	54	52	80	46	80
End	60	8:37	-	-	-	-	926.821	-	-	-	-	-	-
Average	60		3	81	0.41	1.52	41.26	54.4	49.5	49.7	80	46	80

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers				
Source Designation	Mist Eliminator #244202				
Test Date	3/30/2007		**Assumed Moisture (Bws)**	1	
Test Number	**JR202-Run 7**		**Condensate (Vlc)**	-5	g
Operator	BY/TS		**Silica Gel Weight Gain (Vlc)**	8.1	g
Filter Number	14	15	**Nozzle Diameter (in.)**	0.247	
Barometric Pressure (Pb, in. Hg)	29.45		**Leak Rate Initial**	0.015 @ 15"	
Stack Static Pressure (Ps, in. H_2O)	0.12		**Leak Rate Final**	0.015 @ 8"	
Stack Dimensions (in.)	21.5	28.5	**Traverse points**	12	
Pitot Tube Number	6Ft		**Pitot Corr. Factor (Cp)**	0.84	
Meter Number	6		**Meter Corr. Factor (Y)**	1.011	
Meter Isokinetic Factor (Kiso)			**Orsat Results (%)**		
ΔH@	1.689		**CO2**	0	
			O2	21	

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
B 4	0	9:02	3	81	0.48	1.70	927.725	55	55	48	76	49	80
3	5		3	81	0.49	1.74	931.36	57	55	50	80	50	80
2	10		3	81	0.41	1.46	935.10	60	55	55	77	50	80
1	15		2	81	0.41	1.46	938.58	62	56	56	80	51	80
Stop	20	9:22	-	-	-	-	941.951	-	-	-	-	-	-
C 4	20	9:26	3	81	0.53	1.88	941.951	59	56	56	80	51	80
3	25		1	81	0.32	1.14	945.83	63	57	56	80	52	80
2	30		1	81	0.21	0.75	948.94	64	57	56	80	54	80
1	35		0	81	0.27	0.97	951.39	64	58	58	80	54	80
Stop	40	9:46	-	-	-	-	954.165	-	-	-	-	-	-
A 4	40	9:50	3	82	0.41	1.46	954.165	62	59	57	80	54	80
3	45		3	82	0.45	1.61	957.60	66	60	60	80	55	81
2	50		3	82	0.45	1.62	961.19	68	60	64	80	56	80
1	55		2	82	0.39	1.40	964.80	70	61	64	80	56	80
stop	60	10:10	-	-	-	-	968.225	-	-	-	-	-	-
Average	60		2	81	0.40	1.43	40.50	62.5	57.4	56.7	79	53	80

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Company	Alliance of Automobile Manufacturers		
Source Designation	Mist Eliminator #244202		
Test Date	3/30/2007	**Assumed Moisture (Bws)**	1
Test Number	**JR202-Run 8**	**Condensate (Vlc)**	-0.5 g
Operator	BY/TS	**Silica Gel Weight Gain (Vlc)**	2.2 g
Filter Number	16 16	**Nozzle Diameter (in.)**	0.247
Barometric Pressure (Pb, in. Hg)	29.45	**Leak Rate Initial**	0.010 @ 15"
Stack Static Pressure (Ps, in. H_2O)	0.12	**Leak Rate Final**	0.005 @ 10"
Stack Dimensions (in.)	21.5 28.5	**Traverse points**	12
Pitot Tube Number	6Ft	**Pitot Corr. Factor (Cp)**	0.84
Meter Number	6	**Meter Corr. Factor (Y)**	1.010
Meter Isokinetic Factor (Kiso)		**Orsat Results (%)**	
ΔH@	1.689	**CO2**	0
		O2	21

Traverse Point Number	Sampling Time (Minutes) ø	Clock Time (24 hour)	Sampling Train Vac. ("Hg)	Stack Temp. (F) Ts	Velocity Pres. ("H2O) ΔPs	Orifice Differential ("H2O) ΔH	Sample Volume (cubic feet) Vm	Dry Gas Meter Temperatur Inlet (F) Tm	Outlet (F) Tm	Last Impinger Temperature (F)	Filter Box Temperature (F)	Second Filter Temperature (F)	Probe Temperature (F)
A 4	0	10:35	5	83	0.41	1.47	968.545	65	64	59	82	60	81
3	5		5	83	0.46	1.66	972.07	69	64	61	80	60	80
2	10		5	83	0.46	1.66	975.66	71	65	58	80	62	80
1	15		5	83	0.41	1.49	979.33	73	66	58	80	62	80
Stop	20	10:55	-	-	-	-	982.860	-	-	-	-	-	-
B 4	20	10:57	5	83	0.47	1.70	982.860	71	67	60	79	63	80
3	25		6	83	0.49	1.78	986.57	75	68	58	80	63	80
2	30		5	83	0.41	1.50	990.35	77	69	58	80	63	80
1	35		5	83	0.41	1.50	993.90	78	69	58	81	63	80
Stop	40	11:17	-	-	-	-	997.413	-	-	-	-	-	-
C 4	40	11:22	6	84	0.52	1.89	997.413	74	71	61	80	65	80
3	45		4	84	0.30	1.10	1001.33	79	72	62	80	67	80
2	50		1	84	0.20	0.73	1004.59	79	73	62	80	67	80
1	55		1	84	0.25	0.92	1006.98	79	73	62	80	67	80
stop	60	11:42	-	-	-	-	1009.741	-	-	-	-	-	-
Average	60		4	83	0.40	1.45	41.20	74.2	68.4	59.8	80	64	80

ΔH = Kiso * (Cp)2 * (1-wv/100)2 * (MWm/MWs) * (Ps/Pm) * (Tm/Ts) * ΔPs * D4

Convert weight of water to volume by divided total weight increase by density of water (0.99829 g/ml)

$$\frac{\text{Increase, g}}{\text{(l g/ml)}} = \text{Volume water, ml}$$

T202-Run 1

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	674.7	685.5	-10.8		
2	H_2O	100	G/S	714	723	-9		
3	H_2O	100	Modified	740.8	738	2.8	-17	
4	Silica Gel	250	Modified	924.6	914	10.6		10.6

T202-Run 2

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	703.4	712.5	-9.1		
2	H_2O	100	G/S	677	672.5	4.5		
3	H_2O	100	Modified	720	718	2	-2.6	
4	Silica Gel	250	Modified	969.4	962	7.4		7.4

T202-Run 3

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	710	723.4	-13.4		
2	H_2O	100	G/S	751.1	748.6	2.5		
3	H_2O	100	Modified	727.5	728.4	-0.9	-11.8	
4	Silica Gel	250	Modified	937	930.3	6.7		6.7

T202-Run 4

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	698	705	-7		
2	H_2O	100	G/S	737.9	738.3	-0.4		
3	H_2O	100	Modified	743.6	741.8	1.8	-5.6	
4	Silica Gel	250	Modified	935.4	921	14.4		14.4

T202-Run 5

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	719.9	728.9	-9		
2	H_2O	100	G/S	731.5	730.5	1		
3	H_2O	100	Modified	735.6	735.9	-0.3	-8.3	
4	Silica Gel	250	Modified	955.3	941.2	14.1		14.1

T202-Run 6

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	678	685.7	-7.7		
2	H_2O	100	G/S	727.3	726.6	0.7		
3	H_2O	100	Modified	710.7	711.5	-0.8	-7.8	
4	Silica Gel	250	Modified	978.5	970	8.5		8.5

T202-Run 7

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	693.1	705.1	-12		
2	H_2O	100	G/S	757.4	759.6	-2.2		
3	H_2O	100	Modified	737.5	740.3	-2.8	-17	
4	Silica Gel	250	Modified	945.1	936.3	8.8		8.8

T202-Run 8

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1	H_2O	100	G/S	725.1	729.2	-4.1		
2	H_2O	100	G/S	739.4	736.1	3.3		
3	H_2O	100	Modified	742.9	741.8	1.1	0.3	
4	Silica Gel	250	Modified	960.4	954.1	6.3		6.3

Convert weight of water to volume by divided total weight increase by density of water (0.99829 g/ml)

$$\frac{\text{Increase, g}}{\text{(lg/ml)}} = \text{Volume water, ml}$$

density of antifreeze = 1.04 g/ml

JR202-Run 1

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	559.3	560.5	-1.2		
2		0	0 Modified	614.6	616	-1.4		
3	H20		100 Modified	725	727.5	-2.5	-5.1	
4	Silica Gel		250 Modified	872.8	862.5	10.3		10.3

JR202-Run 2

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	572.7	574.4	-1.7		
2		0	0 Modified	628.3	629.4	-1.1		
3	H20		100 Modified	734.5	706.8	27.7	24.9	
4	Silica Gel		250 Modified	970	979.3	-9.3		-9.3

JR202-Run 3

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	564.7	564.6	0.1		
2		0	0 Modified	517.3	517.4	-0.1		
3	H20		100 Modified	710.6	712.9	-2.3	-2.3	
5	Silica Gel		250 Modified	879.6	870.6	9		9

JR202-Run 4

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	559.2	562.7	-3.5		
2		0	0 Modified	614.5	617.7	-3.2		
3	H20		100 Modified	725	725.4	-0.4	-7.1	
4	Silica Gel		250 Modified	888.5	872.7	15.8		15.8

JR202-Run 5

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	565.8	566	-0.2		
2		0	0 Modified	518.7	519.1	-0.4		
3	H20		100 Modified	711.6	710	1.6	1	
4	Silica Gel		250 Modified	892.7	882.5	10.2		10.2

JR202-Run 6

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	559	561.6	-2.6		
2		0	0 Modified	614.2	616.7	-2.5		
3	H20		100 Modified	763.4	766.4	-3	-8.1	
4	Silica Gel		250 Modified	892.1	885.8	6.3		6.3

JR202-Run 7

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	563.7	565.1	-1.4		
2		0	0 Modified	516.4	517.5	-1.1		
3	H20		100 Modified	707.5	710	-2.5	-5	
4	Silica Gel		250 Modified	899.2	891.1	8.1		8.1

JR202-Run 8

Impinger Number	Impinger Solution	Amount of Solution	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Weight Gain (g)	Total Impinger	Total Silica
1		0	0 Knockout	572.1	572.3	-0.2		
2		0	0 Modified	627	627.2	-0.2		
3	H20		100 Modified	733.4	733.5	-0.1	-0.5	
4	Silica Gel		250 Modified	970.7	968.5	2.2		2.2

Appendix F

Analytical Results

April 24, 2007

Thom Schmelter
BUREAU VERITAS - ES DETROIT
45525 Grand River Avenue
Suite 200
Novi, MI 48374-

Bureau Veritas Work Order No. 07040512

Reference: 11007-107007.00/

Dear Thom Schmelter:

Bureau Veritas North America, Inc. received 48 samples on 4/2/2007 for the analyses presented in the following report.

Enclosed is a copy of the Chain-of-Custody record, acknowledging receipt of these samples. Please note that any unused portion of the samples will be discarded 30 days after the date of this report, unless you have requested otherwise.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number provided below.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact a Client Services Representative at (800) 806-5887.

Sincerely,

Karen Coonan
Client Services Representative

cc:

Bureau Veritas North America, Inc.
22345 Roethel Drive
Novi, MI 48375

Main: (248) 344.1770
Fax: (248) 344.2655
www.us.bureauveritas.com

CASE NARRATIVE

Date: *24-Apr-07*

Client: **BUREAU VERITAS - ES DETROIT**

Project: **11007-107007.00/**

Work Order No **07040512**

The results of this report relate only to the samples listed in the body of this report and the results meet all the requirements of the NELAC standards. All quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results, unless otherwise noted below.

Analytical comments for EPA 5 Filters: The following is the actual result of the filters reported out as non-detects:

Sample -017A: Actual value of PM was -0.2mg.
Sample -021A: Actual value of PM was 0.0mg.
Sample -023A: Actual value of PM was 0.0mg.
Sample -025A: Actual value of PM was -1.1mg.
Sample -027A: Actual value of PM was 0.1mg.
Sample -029A: Actual value of PM was -0.7mg.
Sample -031A: Actual value of PM was 0.1mg.
Sample -033A: Actual value of PM was -1.5mg.
Sample -035A: Actual value of PM was 0.2mg.
Sample -037A: Actual value of PM was 0.0mg.
Sample -041A: Actual value of PM was 0.1mg.

Sample -001B: Actual value of PM was 0.0mg.
Sample -003B: Actual value of PM was 0.0mg.
Sample -005B: Actual value of PM was 0.0mg.
Sample -007B: Actual value of PM was 0.0mg.
Sample -009B: Actual value of PM was -0.1mg.
Sample -011B: Actual value of PM was 0.0mg.
Sample -013B: Actual value of PM was -0.1mg.
Sample -015B: Actual value of PM was -0.1mg.
Sample -017B: Actual value of PM was -0.1mg.

Analytical Comments for the Field Blanks: All Field Blank volumes were measured. A common mass

was extablished between the JR and T samples for each impinger type. The samples were split, the volumes and masses along with the actual value of the particulate matter of the splits are recorded below:

EPA 5 Field Blank JR
Analytical Comments for Method EPA5, sample -017C: Volume of sample taken was 23.7mL, mass was 18.3g. Actual value of the blank was 0.2 mg.
Analytical Comments for Method EPA5, sample -018A: Volume of sample taken was 23.7mL, mass was 18.3g. Actual value of the blank was 0.3 mg.

EPA 5 Filed Blank T
Analytical Comments for Method EPA5, sample -037B: Volume of sample taken was 23.3mL, mass was 18.3g. Actual value of the blank was 0 mg.
Analytical Comments for Method EPA5, sample -038A: Volume of sample taken was 23.3mL, mass was 18.3g. Actual value of the blank was -0.2 mg.

EPA 202 Field Blank MeCl2 JR
Analytical Comments for Method EPA202, sample -019A: Volume of organic sample tested was 72.0mL, mass was 80.5g. Actual value of the organic condensible particlate matter is 0.3 mg.
Analytical Comments for Method EPA202, sample -020A: Volume of organic sample was 72.5mL, mass was 80.5g. Actual value of the organic condensible particlate matter is 0 mg.

EPA 202 Field Blank MeCl2 T
Analytical Comments for Method EPA202, sample -039A: Volume of organic sample tested was 75.5mL, mass was 80.5g. Actual value of the organic condensible particlate matter is 0.4 mg.
Analytical Comments for Method EPA202, sample -040A: Volume of organic sample tested was 75.5mL, mass was 80.5g. Actual value of the organic condensible particlate matter is 0.4 mg.

EPA 202 Field Blank Water JR
Analytical Comments for Method EPA202, sample -019A: Volume of aqueous sample tested was 82.0mL, mass was 82.0g. Actual value of the inorganic condensible particlate matter is 0.2 mg.
Analytical Comments for Method EPA202, sample -020A: Volume of aqueous sample was 82.0mL, mass was 82.0g. Actual value of the inorganic condensible particlate matter is 0.3 mg.

EPA 202 Field Blank Water T
Analytical Comments for Method EPA202, sample -039A: Volume of aqueous sample tested was 82.0mL, mass was 82.0g. Actual value of the inorganic condensible particlate matter is 0 mg.

CASE NARRATIVE

Date: *24-Apr-07*

Client: **BUREAU VERITAS - ES DETROIT**

Project: **11007-107007.00/**

Work Order No **07040512**

Analytical Comments for Method EPA202, sample -040A: Volume of aqueous sample tested was 82.0mL, mass was 82.0g. Actual value of the inorganic condensible particlate matter is -0.2 mg.

Reagent Blanks: The reagent blanks follow the modified Damiler Chrysler procedure with the exception of the DCX-D Acetone Blank which had less than 100 mls for analysis. The volumes and masses are recorded below along with the actual particulate matter results:

EPA -5 Acetone (Reagent Blank)
Analytical Comments for Method EPA5, sample -041B: Volume of sample taken was 85.0mL, mass was 66.3g. Actual value of the blank was -0.5 mg.
Analytical Comments for Method EPA5, sample -045A: Volume of sample taken was 100.0mL, mass was 78.0g. Actual value of the blank was -0.4 mg.
Analytical Comments for Method EPA5, sample -046A: Volume of sample taken was 100.0mL, mass was 78.0g. Actual value of the blank was -0.4 mg.

EPA 202 MeCl2 (Reagent Blank)
Analytical Comments for Method EPA202, sample -042A: Volume of organic sample tested was 100.0mL, mass was 131.4g. Actual value of the organic condensible particlate matter is 0.4 mg.
Analytical Comments for Method EPA202, sample -043A: Volume of organic sample tested was 100.0mL, mass was 131.4g. Actual value of the organic condensible particlate matter is 0.2 mg.
Analytical Comments for Method EPA202, sample -044A: Volume of organic sample tested was 100.0mL, mass was 131.4g. Actual value of the organic condensible particlate matter is 0.2 mg.

EPA 202 Water (Reagent Blank)
Analytical Comments for Method EPA202, sample -042A: Volume of aqueous sample tested was 100.0mL, mass was 100.0g. Actual value of the inorganic condensible particlate matter is -0.4 mg.
Analytical Comments for Method EPA202, sample -047A: Volume of aqueous sample tested was 100.0mL, mass was 100.0g. Actual value of the inorganic condensible particlate matter is -0.3 mg.
Analytical Comments for Method EPA202, sample -048A: Volume of aqueous sample tested was 100.0mL, mass was 100.0g. Actual value of the inorganic condensible particlate matter is -0.4 mg.

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Project: 11007-107007.00/

Sample Type: EPA 5 Filter

Work Order No: 07040512

Method Reference Method EPA5

Date Received: 04/02/2007

RL (mg): 0.5

Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate by Method EPA5 (mg)	(mg/m³)	(ppm)	Date Analyzed
001A	JR-RUN 1 FILTER 2 03/29/07	0	0.70	--	--	04/16/2007
003A	JR-2 FILTER 4 03/29/07	0	2.9	--	--	04/16/2007
005A	JR-3 FILTER 6 03/29/07	0	3.1	--	--	04/16/2007
007A	JR-4 FILTER 8 03/29/07	0	2.6	--	--	04/16/2007
009A	JR-5 FILTER 9 03/29/07	0	3.5	--	--	04/16/2007
011A	JR-6 FILTER 12 03/30/07	0	2.5	--	--	04/16/2007
013A	JR-7 FILTER 14 03/30/07	0	2.6	--	--	04/16/2007
015A	JR-8 FILTER 16 (LARGE) 03/30/07	0	2.3	--	--	04/16/2007
017A	JR-FIELD BLANK FILTER 35 03/30/07	0	<0.5	--	--	04/16/2007
021A	T-RUN 1 FILTER 1 03/29/07	0	<0.5	--	--	04/16/2007
023A	T-2 FILTER 3 03/29/07	0	<0.5	--	--	04/16/2007
025A	T-3 FILTER 5 03/29/07	0	<0.5	--	--	04/16/2007
027A	T-4 FILTER 7 03/29/07	0	<0.5	--	--	04/16/2007
029A	T-5 FILTER 10 03/29/07	0	<0.5	--	--	04/16/2007
031A	T-6 FILTER 11 03/30/07	0	<0.5	--	--	04/16/2007
033A	T-7 FILTER 13 03/30/07	0	<0.5	--	--	04/16/2007
035A	T-8 FILTER 15 03/30/07	0	<0.5	--	--	04/16/2007
037A	T-FIELD BLANK FILTER 36 03/30/07	0	<0.5	--	--	04/16/2007
041A	FILTER BLANK 31 03/30/07	0	<0.5	--	--	04/16/2007

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client:	**BUREAU VERITAS - ES DETROIT**		
Project:	**11007-107007.00/**		
Sample Type:	**EPA 5 Filter**	**Work Order No:**	**07040512**
Method Reference	**Method EPA5**	**Date Received:**	**04/02/2007**
RL (mg):	**0.5**	**Analyst:**	**MEN**

Lab No.	Sample Identification	Air Volume (liters)	Particulate by Method EPA5			Date Analyzed
			(mg)	(mg/m^3)	(ppm)	

General Notes:
<: Less than the indicated reporting limit (RL).
--: Information not available or not applicable.
Back sections (if applicable) were checked and showed no significant breakthrough unless otherwise noted.

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Project: 11007-107007.00/

Sample Type: GF Filter, Tared

Work Order No: 07040512

Method Reference Method EPA5

Date Received: 04/02/2007

RL (mg): 0.5

Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate by Method EPA5			Date Analyzed
			(mg)	(mg/m³)	(ppm)	
001B	JR-RUN 1 FILTER 10 03/29/07	0	<0.5	--	--	04/16/2007
003B	JR-2 FILTER 11 03/29/07	0	<0.5	--	--	04/16/2007
005B	JR-3 FILTER 18 03/29/07	0	<0.5	--	--	04/16/2007
007B	JR-4 FILTER 19 03/29/07	0	<0.5	--	--	04/16/2007
009B	JR-5 FILTER 20 03/29/07	0	<0.5	--	--	04/16/2007
011B	JR-6 FILTER 14 03/30/07	0	<0.5	--	--	04/16/2007
013B	JR-7 FILTER 15 03/30/07	0	<0.5	--	--	04/16/2007
015B	JR-8 FILTER 16 (SMALL) 03/30/07	0	<0.5	--	--	04/16/2007
017B	JR-FIELD BLANK FILTER 17 03/30/07	0	<0.5	--	--	04/16/2007

General Notes:
<: Less than the indicated reporting limit (RL).
--: Information not available or not applicable.
Back sections (if applicable) were checked and showed no significant breakthrough unless otherwise noted.

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Project: 11007-107007.00/

Sample Type: Impinger

Work Order No: 07040512

Method Reference Method EPA5

Date Received: 04/02/2007

RL (mg): 0.5

Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate by Method EPA5			Date Analyzed
			(mg)	(mg/m³)	(ppm)	
001C	JR-1 ACETONE 03 03/29/07	0	1.6	--	--	04/16/2007
003C	JR-2 ACETONE 02 03/29/07	0	1.5	--	--	04/16/2007
005C	JR-3 ACETONE 26 03/29/07	0	5.0	--	--	04/16/2007
007C	JR-4 ACETONE 11 03/29/07	0	2.0	--	--	04/16/2007
009C	JR-5 ACETONE 15 03/29/07	0	2.3	--	--	04/16/2007
011C	JR-6 ACETONE 17 03/30/07	0	1.7	--	--	04/16/2007
013C	JR-7 ACETONE 13 03/30/07	0	2.2	--	--	04/16/2007
015C	JR-8 ACETONE 12 03/30/07	0	1.7	--	--	04/16/2007
017C	JR-FIELD BLANK ACETONE 36 03/30/07	0	<0.5	--	--	04/16/2007
018A	JR-FIELD BLANK ACETONE 36 DUP 03/30/07	0	<0.5	--	--	04/16/2007
021B	T-1 ACETONE 10 03/29/07	0	2.4	--	--	04/16/2007
023B	T-2 ACETONE 19 03/29/07	0	1.2	--	--	04/16/2007
025B	T-3 ACETONE 18 03/29/07	0	9.1	--	--	04/16/2007
027B	T-4 ACETONE 27 03/29/07	0	3.1	--	--	04/16/2007
029B	T-5 ACETONE 16 03/29/07	0	9.9	--	--	04/16/2007
031B	T-6 ACETONE 25 03/30/07	0	2.1	--	--	04/16/2007
033B	T-7 ACETONE 35 03/30/07	0	3.0	--	--	04/16/2007
035B	T-8 ACETONE 08 03/30/07	0	3.0	--	--	04/16/2007
037B	T-FIELD BLANK ACETONE 29 03/30/07	0	<0.5	--	--	04/16/2007
038A	T-FIELD BLANK ACETONE 29 DUP 03/30/07	0	<0.5	--	--	04/16/2007

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Project: 11007-107007.00/

Sample Type: Impinger

Work Order No: 07040512

Method Reference Method EPA5

Date Received: 04/02/2007

RL (mg): 0.5

Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate by Method EPA5 (mg)	(mg/m³)	(ppm)	Date Analyzed
041B	DCX-D ACETONE 06 03/30/07	0	<0.5	--	--	04/16/2007
045A	ACETONE BLANK 24 03/29/07	0	<0.5	--	--	04/16/2007
046A	ACETONE BLANK 32 03/29/07	0	<0.5	--	--	04/16/2007

General Notes:
<: Less than the indicated reporting limit (RL).
--: Information not available or not applicable.
Back sections (if applicable) were checked and showed no significant breakthrough unless otherwise noted.

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-002A

Client Sample ID: JR-1 MECL2 35/JR-1 WATER 28

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	2.5	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	2.3	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-004A

Client Sample ID: JR-2 MECL2 01/JR-2 WATER 31

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	3.0	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-006A

Client Sample ID: JR-3 MECL2 25/JR-3 WATER 36

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.80	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	2.2	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-008A

Client Sample ID: JR-4 MECL2 10/JR-4 WATER 29

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	3.4	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-010A

Client Sample ID: JR-5 MECL2 33/JR-5 WATER 33

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	1.3	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-012A

Client Sample ID: JR-6 MECL2 05/JR-6 WATER 15

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	4.1	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-014A

Client Sample ID: JR-7 MECL2 03/JR-7 WATER 06

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	1.4	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-016A

Client Sample ID: JR-8 MECL2 22/JR-8 WATER 02

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.70	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	1.4	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-019A

Client Sample ID: JR-FIELD BLANK MECL2 28/JR-FIELD BLANK WATER 08

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

		Reporting				
EPA METHOD 202						
Inorganic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-020A

Client Sample ID: JR-FIELD BLANK MECL2 28/JR-FIELD BLANK WATER08 DUP

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

		Reporting				
EPA METHOD 202						
Inorganic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-022A

Client Sample ID: T-1 MECL2 27/T-1 WATER 27

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.80	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	6.8	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL)

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-024A

Client Sample ID: T-2 MECL2 02/T-2 WATER 25

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.60	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	5.8	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-026A

Client Sample ID: T-3 MECL2 17/T-3 WATER 35

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	1.7	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	7.6	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL)

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-028A

Client Sample ID: T-4 MECL2 18/T-4 WATER 30

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	2.3	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	6.2	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-030A

Client Sample ID: T-5 MECL2 09/T-5 WATER 32

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.60	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	3.7	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-032A

Client Sample ID: T-6 MECL2 07/T-6 WATER 22

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	1.1	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	4.2	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-034A

Client Sample ID: T-7 MECL2 06/T-7 WATER 16

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.80	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	2.9	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-036A

Client Sample ID: T-8 MECL2 36/T-8 WATER 03

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	0.70	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	3.5	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL)

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-039A

Client Sample ID: T-FIELD BLANK MECL2 11/T-FIELD BLANK WATER 07

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

		Reporting				
EPA METHOD 202						
Inorganic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-040A

Client Sample ID: T-FIELD BLANK MECL2 11/T-FIELD BLANK WATER 07 DUP

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

		Reporting				
EPA METHOD 202						
Inorganic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	ND	0.50	mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-042A

Client Sample ID: DCX-D MECL2 23/DCX-D WATER 12

Matrix: AIR

Tag Number:

Collection Date: 3/30/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN
Organic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-043A

Client Sample ID: MECL2 BLANK 16

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Organic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-044A

Client Sample ID: MECL2 BLANK 08

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Organic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-047A

Client Sample ID: WATER BLANK 09

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *24-Apr-07*

Client: BUREAU VERITAS - ES DETROIT

Work Order No: 07040512

Project: 11007-107007.00/

Lab ID: 07040512-048A

Client Sample ID: WATER BLANK 10

Matrix: AIR

Tag Number:

Collection Date: 3/29/2007

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed	Analyst
EPA METHOD 202							
Inorganic Condensible Particulate Matter	ND	0.50		mg	1	4/16/2007	MEN

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).

J - Analyte detected below the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

T - Tentatively Identified Compound (TIC)

Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Business Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.
07040512

REPORT RESULTS TO

Name: Thomas Schneider-ES | Client Job No.: 11007-107007

Company: Alliance of Automobile Mfrs | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Purchase Order No.:

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.) For all filters:

Filters 110mm GFF-032107-X

Filters 30mm GFF-022607-XX

* Explanation of Preservative * X number is in name

Soils: Which state are these from?

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
JR-Run 1 Filter 2 - [illegible]	3/29/07		110mm		1	X		
JR-Run 1 Filter 10	3/29/07		30mm		1	X		
JR-1 $MeCl_2$-35			$MeCl_2$/Ace - glass		1		X	
JR-1 Acetone-03			Ace - glass		1	X		
JR-1 Water-28			plastic - H_2O		1		X	
JR-2 Filter 4			110mm		1	X		
JR-2 Filter 11			30mm		1	X		
JR-2 $MeCl_2$-01			glass		1		X	
JR-2 Acetone-02			glass		1	X		
JR-2 water-31			plastic		1		X	

CHAIN OF CUSTODY

Collected by: THOMAS SCHNEIDER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 1:10

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: (Client Signature **MUST** accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
22345 Roethel Drive
Novi, MI 48375
(800) 806-5887
(248) 344-1770
FAX (248) 344-2655

Atlanta Regional Lab
3380 Chastain Meadows Parkway, Suite 300
Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
(206) 763-7364
FAX (206) 763-4189

DISTRIBUTION:
White = Clayton Laboratory
Yellow = Clayton Accounting
Pink = Client Copy

10/05 20K

(*) internal (*)

Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Business Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thomas Schmelter - ES | Client Job No.: 11007-107007

Company: Alliance of Automobile MFRS | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Purchase Order No.:

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? _____

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
JR-3 Filter 6	3/29/07		110mm		1	X		
JR-3 Filter 18			30mm		1	X		
JR-3 MeCl2 -25			glass		1		X	
JR-3 Acetone -26			glass		1	X		
JR-3 Water -36			plastic		1		X	
JR-4 Filter -8			110mm		1	X		
JR-4 Filter -19			30mm		1	X		
JR-4 MeCl2 -10			glass		1		X	
JR-4 Acetone -11			glass		1	X		
JR-4 Water -29			plastic		1		X	

CHAIN OF CUSTODY

Collected by: Thomas Schmelter (print) | Collector's Signature: Thomas R Schmelter

Relinquished by: Thomas R Schmelter | Date/Time 4/2/07 | Received by: Dan Erie | Date/Time 4/2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: Dan Erie | Date/Time 4/2

Authorized by: Thomas R Schmelter (Client Signature **MUST** Accompany Request) Date 4/2/07

Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
22345 Roethel Drive
Novi, MI 48375
(800) 806-5887
(248) 344-1770
FAX (248) 344-2655

Atlanta Regional Lab
3380 Chastain Meadows Parkway, Suite 300
Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
(206) 763-7364
FAX (206) 763-4189

DISTRIBUTION:
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Yellow = Clayton Accounting
Pink = Client Copy

internal

Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested 10 Business Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address: _____

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thomas Schmelter - ES | Client Job No.: 11007-107007 | Purchase Order No.:

Company: Alliance of Automobile Mfrs | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements: (method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? _____

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
JR-5 Filter - 9	3/29/07		110mm		1	X		
JR-5 Filter - 20			30mm		1	X		
JR-5 $MeCl_2$ - 33			glass		1		X	
JR-5 Acetone - 15			glass		1	X		
JR-5 Water - 33			plastic		1		X	
JR-6 Filter - 12	3/30/07		110mm		1	X		
JR-6 Filter - 14			30mm		1	X		
JR-6 $MeCl_2$ - 05			glass		1		X	
JR-6 Acetone - 17			glass		1	X		
JR-6 Water - 15			plastic		1		X	

CHAIN OF CUSTODY

Collected by: Thomas Schmelter (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4-2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: _____ (Client Signature **MUST** Accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
22345 Roethel Drive
Novi, MI 48375
(800) 806-5887
(248) 344-1770
FAX (248) 344-2655

Atlanta Regional Lab
3380 Chastain Meadows Parkway, Suite 300
Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
(206) 763-7364
FAX (206) 763-4189

DISTRIBUTION:
White = Clayton Laboratory
Yellow = Clayton Accounting
Pink = Client Copy

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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter - ES | Client Job No.: 11007-107007 | Purchase Order No.:

Company: Alliance of Automobile M | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from?

Waters:
☐ Drinking Water
☐ Groundwater
☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
JR-7 Filter 14	3/30/07		110 mm		1	X		
JR-7 Filter 15			30 mm		1	X		
JR-7 $MeCl_2$ - 03			glass		1		X	
JR-7 Acetone - 13			glass		1	X		
JR-7 Water - 06			plastic		1		X	
JR-8 Filter - 16 (large)			110 mm		1	X		
JR-8 Filter - 16 (small)			30 mm		1	X		
JR-8 $MeCl_2$ - 22			glass		1		X	
JR-8 Acetone - 12			glass		1	X		
JR-8 water - 02			plastic		1		X	

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: (Client Signature **MUST** accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
22345 Roethel Drive
Novi, MI 48375
(800) 806-5887
(248) 344-1770
FAX (248) 344-2655

Atlanta Regional Lab
3380 Chastain Meadows Parkway, Suite 300
Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
(206) 763-7364
FAX (206) 763-4189

DISTRIBUTION:
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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address: _____

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter - ES | Client Job No.: 11007-107007

Company: Alliance of Automobile Mfrs | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Purchase Order No.:

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? _____

Waters:
☐ Drinking Water
☐ Groundwater
☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
JR - Field Blank Filter - 35	3/30/07		110mm		1	X		
JR - Field Blank Filter - 17			30mm		1	X		
JR - Field Blank $MeCl_2$ - 28			glass		1		X	
JR - Field Blank Acetone - 36			glass		1	X		
JR - Field Blank water - 08			plastic		1		X	
T - Run 1 Filter - 1	3/29/07		110mm		1	X		
T-1 $MeCl_2$ - 27			glass		1		X	
T-1 Acetone - 10			glass		1	X		
T-1 water - 27			plastic		1		X	

run in dup

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 1100

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: _____ Date 4/2/07
(Client Signature MUST Accompany Request)

Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
22345 Roethel Drive
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Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
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FAX (206) 763-4189

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10/05 20K

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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter - ES | Client Job No.: 11007-107007

Company: Alliance of Automobile Mfrs | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Purchase Order No.:

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from?

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
T-2 Filter 3	3/29/07		110mm		1	X		
T-2 $MeCl_2$ - 02			glass		1		X	
T-2 Acetone - 19			glass		1	X		
T-2 Water - 25			plastic		1		X	
T-3 Filter - 5			110mm		1	X		
T-3 $MeCl_2$ - 17			glass		1		X	
T-3 Acetone - 18			glass		1	X		
T-3 Water - 35			plastic		1		X	

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 1110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: (Client Signature **MUST** Accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

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(800) 806-5887
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Clayton Group Services, Inc.

A Bureau Veritas Company

BUREAU VERITAS 1828

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT
Date Results Requested: 10 Bus. Days
Rush Charges Authorized? ☐ Yes ☒ No
☐ Fax or ☐ E-mail Results
E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO
Name: Thomas Schmelter - ES
Company: Alliance of Automobile Mfrs
Mailing Address:
City, State, Zip: Kokomo, Indiana
Telephone No.:
FAX No.:
Client Job No.: 11007-107007
Dept.: Client Services

SEND INVOICE TO
Purchase Order No.:
Name:
Company:
Dept.:
Address:
City, State, Zip:

Special instructions and/or specific regulatory requirements: (method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from?

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
T-4 - Filter - 7	3/29/07		110mm		1	X		
T-4 - MeCl2 - 18			glass		1		X	
T-4 - Acetone - 27			glass		1	X		
T-4 Water - 30			plastic		1		X	
T-5 Filter - 10			110mm		1	X		
T-5 MeCl2 - 09			glass		1		X	
T-5 Acetone - 16			glass		1	X		
T-5 Water - 32			plastic		1		X	

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) — Collector's Signature:
Relinquished by: — Date/Time 4/2/07 — Received by: — Date/Time 4/2 1:10
Relinquished by: — Date/Time — Received by: — Date/Time
Method of Shipment: — Received at Lab by: — Date/Time 4/2
Authorized by: (Client Signature **MUST** Accompany Request) — Date 4/2/07 — Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
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FAX (248) 344-2655

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(770) 499-7500
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Seattle Regional Lab
4636 E. Marginal Way S., Suite 140
Seattle, WA 98134
(800) 568-7755
(206) 763-7364
FAX (206) 763-4189

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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. DAYS

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address: _____

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter - ES | Client Job No.: 11007-107007

Company: Alliance of Automobile Mfrs | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Purchase Order No.:

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? _____

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
T-6 Filter - 11	3/30/07		110mm		1	X		
T-6 $MeCl_2$ - 07			glass		1		X	
T-6 Acetone - 25			glass		1	X		
T-6 Water - 22			plastic		1		X	
T-7 Filter - 13			110mm		1	X		
T-7 $MeCl_2$ - 06			glass		1		X	
T-7 Acetone - 35			glass		1	X		
T-7 Water - 16			plastic		1		X	

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2 255

Authorized by: _____ Date 4/2/07
(Client Signature **MUST** Accompany Request)

Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain)

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

Detroit Regional Lab
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Novi, MI 48375
(800) 806-5887
(248) 344-1770
FAX (248) 344-2655

Atlanta Regional Lab
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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter - ES | Client Job No.: 11007-D 107007 | Purchase Order No.:

Company: Auto Alliance | Dept.: Client Services

Mailing Address:

City, State, Zip: Kokomo, Indiana

Telephone No.: | FAX No.:

SEND INVOICE TO

Name:

Company: | Dept.:

Address:

City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? ____

Waters: ☐ Drinking Water ☐ Groundwater ☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
T-8 Filter 15	3/30/07		110mm		1	X		
T-8 MeCl2 - 36			glass		1		X	
T-8 Acetone -08			glass		1	X		
T-8 Water - 03			plastic		1		X	
T - Field Blank - Filter 36			110mm		1	X		
T - Field Blank MeCl2 - 11			glass		1		X	
T - Field Blank Acetone - 29			glass		1	X		
T - Field Blank Water - 07			plastic		1		X	

run dup

CHAIN OF CUSTODY

Collected by: THOMAS SCHMELTER (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: (Client Signature **MUST** Accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

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(248) 344-1770
FAX (248) 344-2655

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Seattle Regional Lab
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Seattle, WA 98134
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Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus. Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address:

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name Thom Schmelzer - ES | Client Job No. 11007-107007

Company Alliance of Automobile Mfrs. | Dept. Client Services

Mailing Address

City, State, Zip Kokomo, IN

Telephone No. | FAX No.

SEND INVOICE TO

Name

Company | Dept.

Address

City, State, Zip

Purchase Order No.

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from?

Waters:
☐ Drinking Water
☐ Groundwater
☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
Filter Blank - 31	3/30/07		110mm		1	X		
DCX - D - MeCl2 - 23			glass		1		X	
DCX - D - MeCl2/Ace Mix - 31			glass		1		X	→ Hold
DCX - D - Acetone - 06			glass		1	X		
DCX - D - water - 12			plastic		1		X	

CHAIN OF CUSTODY

Collected by: Thomas Schmelzer (print) | Collector's Signature:

Relinquished by: | Date/Time 4/2/07 | Received by: | Date/Time 4/2 110

Relinquished by: | Date/Time | Received by: | Date/Time

Method of Shipment: | Received at Lab by: | Date/Time 4/2

Authorized by: (Client Signature **MUST** Accompany Request) Date 4/2/07 | Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain) 255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

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DISTRIBUTION:
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Pink = Client Copy

Clayton Group Services, Inc.

A Bureau Veritas Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 10 Bus Days

Rush Charges Authorized? ☐ Yes ☒ No

☐ Fax or ☒ E-mail Results

E-mail address: _____

For Clayton Use Only
Clayton Lab Project No.

REPORT RESULTS TO

Name: Thom Schmelter
Company: Alliance of Automobiles
Mailing Address:
City, State, Zip: Kokomo, IN
Telephone No.: FAX No.:
Client Job No.: 11007-10700-7
Dept.: Client Services

SEND INVOICE TO

Purchase Order No.:
Name:
Company: Dept.:
Address:
City, State, Zip:

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

* Explanation of Preservative

Soils: Which state are these from? _____

Waters:
☐ Drinking Water
☐ Groundwater
☐ Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.*)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	USEPA 5	USEPA 202	FOR LAB USE ONLY
MeCl2 Blank - 16	3/29/07		glass		1	X		
MeCl2 Blank - 08					1	X		
Acetone Blank - 24					1		X	
Acetone Blank - 32					1		X	
Acetone/MeCl2 Blank - 07					1	X		
Acetone/MeCl2 Blank - 33					1	X		
Water Blank - 09			plastic		1	X		
Water Blank - 10			plastic		1	X		

→ Hold

CHAIN OF CUSTODY

Collected by: Thomas Schmelter (print) — Collector's Signature: Thom Schmelter

Relinquished by: Thom Schmelter — Date/Time 4/2/07

Relinquished by: — Date/Time

Method of Shipment:

Authorized by: Thom Schmelter (Client Signature **MUST** Accompany Request) — Date 4/2/07

Received by: Dan Ellis — Date/Time 4/2 11:0

Received by: — Date/Time

Received at Lab by: Dan Ellis — Date/Time 4/2

Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain)

255

Please return completed form and samples to one of the Clayton Group Services, Inc. labs listed below:

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FAX (248) 344-2655

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FAX (770) 499-7511

Seattle Regional Lab
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(206) 763-7364
FAX (206) 763-4189

DISTRIBUTION:
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Spec limit for solvents

0.001% Solids by mass for 200mL solvent

Solvent	mg
CH2Cl2	2.65
Acetone	1.58
Water	2

Neat Solvent Verification

Summary: Add 200mL to beaker, run EPA5/202

Solvent	Sample	Lot #	Δwt(mg)	Report(mg)
MeCl	MNB2-26-1	EMD 46248	0.00	<0.5
MeCl	MNB2-27-1	EMD 46180	0.40	<0.5
MeCl	MNB2-27-2	EMD 46180	0.10	<0.5
MeCl	MNB2-27-3	EMD 46180	0.30	<0.5
MeCl	MNB2-27-4	EMD 46180	0.40	<0.5
MeCl	WCB9-71-4	EMD 46180	-0.60	<0.5
MeCl	WCB9-71-5	EMD 46180	-0.50	<0.5
MeCl	WCB9-71-6	EMD 46180	-0.70	<0.5
MeCl	WCB9-71-7	EMD 46180	-0.80	<0.5
Acetone	MNB2-26-3	EMD 46022	0.30	<0.5
Acetone	WCB9-71-1	EMD 46220	0.40	<0.5
Acetone	WCB9-71-2	EMD 46220	0.10	<0.5
Acetone	WCB9-71-3	EMD 46220	0.10	<0.5
Water	MNB2-26-2	Baker C31E73	0.40	<0.5
Water	MNB2-30-1	Baker E01E73	0.30	<0.5
Water	MNB2-30-2	Baker E01E73	0.20	<0.5
Water	MNB2-30-3	Baker E01E73	-0.60	<0.5
Water	MNB2-30-4	Baker E01E73	-0.20	<0.5

Rinse Bottle Verification

Summary: Condition rinse bottle by soaking w/~50mL for ~30min.
Add 200mL solvent, let sit for 5 hours, run EPA5/202

Solvent	Sample	Lot #	Δwt(mg)	Report(mg)
Acetone	Field 1, Teflon	EMD 46022	0.10	<0.5
Acetone	Field 2, Teflon	EMD 46022	0.10	<0.5
MeCl	Field 1, Teflon	EMD 46248	0.10	<0.5
MeCl	Field 2, Teflon	EMD 46248	0.10	<0.5
MeCl	Internal 1, Teflon	EMD 46248	0.00	<0.5
Water	Field 1, Teflon	Baker C31E73	0.30	<0.5
Water	Field 2, PE	Baker C31E73	0.20	<0.5
Water	Field 3, PE	Baker C31E73	0.30	<0.5

Rinse Bottle Verification

Summary: Clean sample jars w/ additional solvent rinses. Add 200mL solvent, let sit for 5 hours, run EPA5/202

Solvent	Sample	Lot #	Δwt(mg)	Report(mg)
Acetone	Glass 1	EMD 46022	0.40	<0.5
Acetone	Glass 2	EMD 46022	0.20	<0.5
MeCl	Glass 1	EMD 46248	0.40	<0.5
MeCl	Glass 2	EMD 46248	0.30	<0.5
Water	PE 1	Baker C31E73	0.40	<0.5
Water	PE 2	Baker C31E73	0.20	<0.5

Extractions Process Verification

Summary: Add 200mL water and MeCl solvent into sample jars, extract using teflon sep funnel, collect into new precleaned glass jars,

Solvent	Sample	Lot #	Δwt(mg)	Report(mg)
MeCl	MNB2-27-5	EMD 46248	0.40	<0.5
MeCl	MNB2-31-5 and 7	EMD 46248	-0.30	<0.5
MeCl	MNB2-31-6 and 8	EMD 46248	0.20	<0.5
Water	MNB2-31-5 and 7	Baker C31E73	0.20	<0.5
Water	MNB2-31-6 and 8	Baker C31E73	0.10	<0.5