



March 24, 2010

Perry M. Thomas
Chief Compliance Officer
Ypsilanti Community Utilities Authority
2777 State Street
Ypsilanti, Michigan

Bureau Veritas Project No. 11010-000036.00

Subject: Sewage Sludge Incinerator Emission Testing
Ypsilanti Community Utilities Authority
2777 State Street
Ypsilanti, Michigan

Dear Mr. Thomas:

Bureau Veritas North America, Inc. is pleased to submit this report for the emission testing at the Ypsilanti Community Utilities Authority's wastewater treatment plant fluidized-bed sewage sludge incinerator in Ypsilanti, Michigan. The enclosed report was generated from the ERT and summarizes the results of the testing performed February 17 – 18, 2010.

The following table summarizes the results of the testing. An average emission factor was calculated using the process data obtained during the emission testing and compared the results to permitted emission limits, as applicable.

Summary of EU-FBSSI Exhaust Emissions		
Parameter	Emission Factor	Permitted Limit
Total PM10 † (lb/ton dry sewage sludge)	0.19	0.35
Filterable PM10 (lb/ton dry sewage sludge)	0.027	Not regulated
Filterable PM2.5 (lb/ton dry sewage sludge)	8.2×10^{-4}	Not regulated
Filterable PM2.5 – PM10 (lb/ton dry sewage sludge)	5.7×10^{-3}	Not regulated

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Summary of EU-FBSSI Exhaust Emissions		
Parameter	Emission Factor	Permitted Limit
Total Particulate (lb/ton dry sewage sludge)	0.094	Not regulated
Inorganic Condensable Particulate (lb/ton dry sewage sludge)	0.055	Not regulated
Organic Condensable Particulate (lb/ton dry sewage sludge)	0.040	Not regulated
Mercury (lb/ton dry sewage sludge)	2.1×10^{-5}	6.9×10^{-4}
Mercury (gram/24-hour period)	0.56	3,200
Carbon monoxide (ppmvd at 7% oxygen)	2.1	100
Antimony (lb/ton dry sewage sludge)	1.2×10^{-5}	Not regulated
Arsenic (lb/ton dry sewage sludge)	2.2×10^{-5}	1.3×10^{-3}
Beryllium (lb/ton dry sewage sludge)	1.5×10^{-7}	2.5×10^{-5}
Beryllium (gram/24-hour period)	0.0039	10
Cadmium (lb/ton dry sewage sludge)	1.0×10^{-6}	8.5×10^{-3}
Chromium (lb/ton dry sewage sludge)	3.9×10^{-5}	4.5×10^{-2}
Cobalt (lb/ton dry sewage sludge)	6.8×10^{-6}	Not regulated
Lead (lb/ton dry sewage sludge)	8.4×10^{-6}	Not regulated
Manganese (lb/ton dry sewage sludge)	9.9×10^{-4}	Not regulated
Nickel (lb/ton dry sewage sludge)	5.4×10^{-5}	Not regulated
Phosphorous (lb/ton dry sewage sludge)	2.6×10^{-3}	Not regulated
Selenium (lb/ton dry sewage sludge)	9.2×10^{-5}	Not regulated

† Includes total particulate mass from OTM 27/OTM 28 sampling trains



The following table provides emission rates (lb/hr) assuming the maximum rated capacity of 3.47 dry ton/hour:

Emission Rate at Maximum Rated Capacity (3.47 dry ton/hour)	
Parameter	Emission Rate (lb/hour)
Total PM10	0.66
Filterable PM10	0.094
Filterable PM2.5	0.0028
Filterable PM2.5 – PM10	0.020
Total Particulate	0.033
Inorganic Condensable Particulate	0.019
Organic Condensable Particulate	0.14
Mercury	7.3×10^{-5}
Mercury (gram/24-hour period)	0.79
Carbon monoxide (ppmvd at 7% oxygen)	2.1
Antimony	4.1×10^{-5}
Arsenic	7.6×10^{-5}
Beryllium	5.2×10^{-7}
Beryllium (gram/24-hour period)	0.0057
Cadmium	3.5×10^{-6}
Chromium	1.4×10^{-4}
Cobalt	2.4×10^{-5}
Lead	2.9×10^{-5}
Manganese	0.0034
Nickel	1.9×10^{-4}
Phosphorous	0.0090
Selenium	3.2×10^{-4}



If you have any questions regarding this report, please contact us.

Sincerely,

Thomas R. Schmelter, QSTI
Project Manager
Health, Safety, and Environmental Services

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Director
Health, Safety, and Environmental Services

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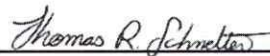
Final Test Report
for

Ypsilanti Community Utilities Authority - FBSSI

 / March 23, 2010

Permitted Facility Representative / Date

Name: Perry Thomas
Title: Chief Compliance Officer
Company: Ypsilanti Community Utilities Authorit
Sign Date: 3/23/2010

 / March 23, 2010

Testing Company Representative / Date

Name: Thomas Schmelter
Title: Project Manager
Company: Bureau Veritas North America Inc.
Sign Date: 3/23/2010

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Facility Information:

Ypsilanti Community Utilities Authority - F		
2777 State Road		
Ypsilanti	MI	48198

Contact: Perry Thomas

Phone: (734) 484-4600 Ext. 121

Fax: (734) 544-7149

Email: PThomas@ycua.org

Testing Company:

Bureau Veritas North America, Inc.		
45525 Grand River Avenue #200		
Ypsilanti	MI	48374

Contact: Thomas Schmelter

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Industry/SCC/NAIS 221320

AFS #:

FRS #: 110000540861

Air Permit Number:

68-02A

Permitted Source ID/Name:

EU-FBSSI

Fluidized Bed Sewage Sludge Incinerator

Permitted Maximum Process Rate:

3.465 dry tons sludge per hour in 24 hrs

Max. Normal Operation Process Rate:

1.9 to 2.6 dry tons per hour

Target Process Test Rate:

2.5 dry tons per hour

SCC / Description 50100799

Waste Disposal - Solid Waste Disposal - Government - Sewage Treatment - Other
Not Classified

The following state and federal regulations that apply to the proposed testing:

Regulation Description	Compound	Limit	Unit
Michigan Administrative Rule R336.1201(3)	CO	100	ppmvd corrected to 7% O2
R336.1331, 40CFR 60.152(a)(1)	Total PM10	0.35	lb/ton dry sewage sludge
R336.1224 (1), R336.1225	Arsenic	0.0013	lb/ton dry sewage sludge
R336.1224 (1)	Beryllium	0.000025	lb/ton dry sewage sludge
40 CFR 61.32(a) R336.1225- in lb/ton dry sewage sludge	Beryllium	10	g/24-hour period
R336.1224 (1), R336.1225	Cadmium	0.0085	lb/ton dry sewage sludge
R336.1224 (1), R336.1225	Chromium	0.045	lb/ton dry sewage sludge
R336.1224 (1)	Mercury	0.00069	lb/ton dry sewage sludge
40 CFR 61.52(b)	Mercury	3200	g/24-hour period

Description of the source (including control equipment). Please see the attachments for source or process flow diagram:

Ypsilanti Community Utilities Authority operates a wastewater treatment facility that processes over 22 million gallons of residential and industrial wastewater per day. As part of the wastewater treatment, biosolids are accumulated and collected prior to discharge of treated water into the Lower Rouge River and/or Huron River. Biosolids (sludge) are typically brown to black in color, malodorous, and consists of residual organic matter and microbes containing bacteria and pathogens. Ypsilanti Community Utilities Authority accumulates over 6,000 dry

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tons of biosolids each year. The biosolid sludge accumulated at the Ypsilanti Community Utilities Authority wastewater treatment plant is incinerated in a fluidized-bed sewage sludge incinerator. The fluidized-bed sewage sludge incinerator air emissions are controlled by four pollution control devices: a scrubber, impingement tray, electrostatic precipitator, and carbon bed.

Sampling Location Information:

Location	Round Duct Diam.	Rect. Duct Length /Width		Equiv. Diam	Distance from upstream dist.	Distance from downstream dist.	Number of Traverse Ports	Min.Travers Points
Stack exit	42	0	0	0	672	216	2	12

Test Parameter Information:

Location	Target Parameter	Test Method	Number of Test Runs	Test Run Duration	Sample Points	Comments
Stack exit	Antimony	Method 29	3	240	0	
Stack exit	Arsenic	Method 29	3	240	0	
Stack exit	Beryllium	Method 29	3	240	0	
Stack exit	Cadmium	Method 29	3	240	0	
Stack exit	Chromium	Method 29	3	240	0	
Stack exit	Cobalt	Method 29	3	240	0	
Stack exit	Lead	Method 29	3	240	0	
Stack exit	Manganese	Method 29	3	240	0	
Stack exit	Phosphorus (yellow or white)	Method 29	3	240	0	
Stack exit	Selenium	Method 29	3	240	0	
Stack exit	Carbon Monoxide	Method 10	3	240	0	The 8.883 ppm CO calibration gas was divided using Method 205 Gas Divider at 50% to get the 4.44 ppmv CO
Stack exit	Inorganic (Aqueous) Condensible Part.	OTM - 28	3	240	0	
Stack exit	Organic Condensible Particulate	OTM - 28	3	240	0	
Stack exit	Co2	Method 3A CO2	3	240	0	
Stack exit	O2	Method 3A O2	3	240	0	
Stack exit	Total Particulate	OTM - 27	3	240	0	
Stack exit	Filterable PM10	OTM - 27	3	240	0	
Stack exit	Filterable PM2.5	OTM - 27	3	240	0	
Stack exit	Filterable PM2.5 - PM10	OTM - 27	3	240	0	
Stack exit	Nickel	Method 29	3	240	0	
Stack exit	Mercury	Method 29	3	240	0	

The following describes any modifications and/or deviations to the applicable test methods. If alternative methods were requested, see the attachments for documentation of request AND approval, including dates.

1. Method 29
Method 29 in Appendix A-8 to Part 60 of this chapter will be used to measure Hg. The procedures for preparation of Hg standards and sample analysis in Sections 13.4.1.1 through 13.4.1.3 of ASTM D6784-02 will be used instead of the procedures in Sections 7.5.33 and 11.1.3 of Method 29, and the QA/QC procedures in Section 13.4.2 of ASTM D6784-02 will be used instead of the procedures in Section 9.2.3 of Method 29.

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2. Analytical Method for Metals

Graphite furnace/atomic absorption spectrophotometry (GFAAS) analytical methods are proposed as potential alternatives to inductively-coupled plasma with mass spectrophotometry (ICP/MS). GFAAS can achieve the detection limits equal to ICP/MS.

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Sampling / Stack Data Results Summary

Location Stack exit - Method 10

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

Location Stack exit - Method 29

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:10:00 PM	6:45:00 PM	12:46:00 PM	
Net Run Time, minutes	240	240	240	
Dry Gas Meter Volume Sampled, dscf	166.550	158.255	156.639	160.481
Moisture Content of Stack Gas, %	4.35	4.17	4.15	4.223
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Average Stack Gas Temperature, °F	141.17	141.17	140.00	140.780
Dry Volumetric Flow Rate, dry scfm	16,097.8	15,305.8	15,054.3	15,485.967
Actual Wet Volumetric Flue Gas Flow Rate, acfm	19,245.8	18,264.5	17,877.7	18,462.667
Percent Isokinetic of Sampling Rate, %	99.8	99.8	100.4	100.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

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Location Stack exit - Method 3A CO2

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

Location Stack exit - Method 3A O2

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:25:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

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Location Stack exit - OTM - 27

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:03:45 PM	6:41:15 PM	12:47:15 PM	
Net Run Time, minutes	225.25	234.5	243.75	
Dry Gas Meter Volume Sampled, dscf	82.504	89.142	92.790	88.145
Moisture Content of Stack Gas, %	4.10	4.18	4.24	4.173
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Average Stack Gas Temperature, °F	141.67	141.33	139.58	140.860
Dry Volumetric Flow Rate, dry scfm	14,249.8	14,864.9	15,512.4	14,875.700
Actual Wet Volumetric Flue Gas Flow Rate, acfm	17,006.1	17,745.0	18,426.1	17,725.733
Percent Isokinetic of Sampling Rate, %	118.0	117.4	112.7	116.033
F-Factor, dscfm/MMBtu @ %O ₂	8710	8710	8710	8,710.000
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

Location Stack exit - OTM - 28

				<u>Average</u>
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:03:45 PM	6:41:15 PM	12:47:15 PM	
Net Run Time, minutes	225.25	234.5	243.75	
Dry Gas Meter Volume Sampled, dscf	82.504	89.142	92.781	88.142
Moisture Content of Stack Gas, %	4.16	4.18	4.24	4.193
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Average Stack Gas Temperature, °F	141.67	141.33	139.58	140.860
Dry Volumetric Flow Rate, dry scfm	14,245.7	14,864.9	15,512.4	14,874.333
Actual Wet Volumetric Flue Gas Flow Rate, acfm	17,011.9	17,745.0	18,426.1	17,727.667
Percent Isokinetic of Sampling Rate, %	118.1	117.4	112.7	116.067
F-Factor, dscfm/MMBtu @ %O ₂	8710	8710	8710	8,710.000
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

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Emissions Summary

Location: Stack exit - Method 10

Compound: Carbon Monoxide

	Average		
Run	1	2	3
ppm	3.84E+00	4.09E+00	3.73E+00
ppm@7%O2	4.07E+00	4.55E+00	4.63E+00

Location: Stack exit - Method 29

Compound: Antimony

	Average		
RunNumber	2	3	1
Mass_mg	0.0023	0.0023	0.0023
ppm	1.01E-04	1.02E-04	9.63E-05

Compound: Arsenic

	Average		
RunNumber	2	3	1
Mass_mg	0.0045	0.0039	0.0042
ppm	3.22E-04	2.82E-04	2.86E-04

Compound: Beryllium

	Average		
RunNumber	2	3	1
Mass_mg	0.000027	0.000025	0.000032
ppm	1.61E-05	1.50E-05	1.81E-05

Compound: Cadmium

	Average		
RunNumber	2	3	1
Mass_mg	0.00015	0.0001	0.00034
ppm	7.16E-06	4.82E-06	1.54E-05

Compound: Chromium

	Average		
RunNumber	2	3	1
Mass_mg	0.0075	0.0094	0.0055
ppm	7.74E-04	9.80E-04	5.39E-04

Compound: Cobalt

	Average		
RunNumber	2	3	1
Mass_mg	0.00117	0.00106	0.00166
ppm	1.07E-04	9.75E-05	1.44E-04

Compound: Lead

	Average		
RunNumber	2	3	1
Mass_mg	0.0023	0.00014	0.0024
ppm	5.96E-05	3.66E-06	5.91E-05

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Compound: Manganese

	Average		
RunNumber	2	3	1
Mass_mg	0.1416	0.143	0.2843
ppm	1.38E-02	1.41E-02	2.64E-02

Compound: Mercury

	Average		
RunNumber	1	2	3
Mass_mg	0.00419	0.00383	0.00361
ppm	1.07E-04	1.02E-04	9.76E-05

Compound: Nickel

	Average		
RunNumber	1	2	3
Mass_mg	0.0096	0.0159	0.0053
ppm	8.34E-04	1.45E-03	4.90E-04

Compound: Phosphorus (yellow or white)

	Average		
RunNumber	2	3	1
Mass_mg	0.4891	0.5136	0.4979
ppm	8.48E-02	8.99E-02	8.20E-02

Compound: Selenium

	Average		
RunNumber	2	3	1
Mass_mg	0.0139	0.0189	0.0197
ppm	9.45E-04	1.30E-03	1.27E-03

Location: Stack exit - OTM - 27

Compound: Filterable PM10

	Average		
RunNumber	1	2	3
Mass_mg	8	1	-0.3
Elb/hr	1.83E-01	2.21E-02	-6.63E-03

Compound: Filterable PM2.5

	Average		
RunNumber	1	2	3
Mass_mg	0.7	-0.1	-0.3
Elb/hr	1.60E-02	-2.21E-03	-6.63E-03

Compound: Filterable PM2.5 - PM10

	Average		
RunNumber	1	2	3
Mass_mg	2.5	-0.4	-0.3
Elb/hr	5.71E-02	-8.82E-03	-6.63E-03

Compound: Total Particulate

	Average		
RunNumber	1	2	3
Mass_mg	15	8	7.6
			10.200

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Elb/hr	3.43E-01	1.76E-01	1.68E-01	0.229
Location: Stack exit - OTM - 28				
Compound: Inorganic (Aqueous) Condensible Pa				
				Average
RunNumber	1	2	3	
Mass_mg	7.2	6.7	4.2	6.033
Elb/hr	1.64E-01	1.48E-01	9.29E-02	0.135
Compound: Organic Condensible Particulate				
				Average
RunNumber	1	2	3	
Mass_mg	5.4	4.2	3.5	4.367
Elb/hr	1.23E-01	9.26E-02	7.74E-02	0.098

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Process Run Data

Run	Name	Value	UOM	Target Value	Comments
1	Heat input (gas guns)	1550.6	bic feet/unit ti	0	Average value
1	Sewage sludge feed rate (belt press solids)	2.44	dry tons/hr	2.5	Converted from gpm using % solids
1	Composition	21		0	Sewage solids and moisture
1	Flue gas flowrate	16847	scfm	13061	at blower
1	Sorbent type and sorbent injection rate	0		0	Not applicable
1	Scrubber liquor flowrate - venturi	330.5	gpm	300	
1	Scrubber liquor flowrate - impingement	493.1	gpm	350	
1	Scrubber liquor pH	3.92		7	Manual readings. No meter.
1	Pressure drop - venturi	32.07	inches water	20	20 to 40 range
1	Pressure drop - impingement	9.93	inches water	-15	-15 to 5 range
1	Pressure drop - GAC	4.87	inches water	1	1 to 10 range
1	Material and composition	20.7	%	25	Feed to incinerator
2	Heat input (gas guns)	1666.7	bic feet/unit ti	0	Average value
2	Sewage sludge feed rate (belt press solids)	2.44	dry tons/hr	2.5	Converted from gpm using % solids
2	Composition	21		0	Sewage solids and moisture
2	Flue gas flowrate	15927	scfm	13061	at blower
2	Sorbent type and sorbent injection rate	0		0	Not applicable
2	Scrubber liquor flowrate - venturi	330.21	gpm	300	
2	Scrubber liquor flowrate - impingement	490.45	gpm	350	
2	Scrubber liquor pH	3.62		7	Manual readings. No meter.
2	Pressure drop - venturi	32.21	inches water	20	20 to 40 range
2	Pressure drop - impingement	10.05	inches water	-15	-15 to 5 range
2	Pressure drop - GAC	4.95	inches water	1	1 to 10 range
2	Material and composition	19.56	%	25	Feed to incinerator
3	Heat input (gas guns)	1014.4	bic feet/unit ti	0	Average value
3	Sewage sludge feed rate (belt press solids)	2.44	dry tons/hr	2.5	Converted from gpm using % solids
3	Composition	23		0	Sewage solids and moisture
3	Flue gas flowrate	15673	scfm	13061	at blower
3	Sorbent type and sorbent injection rate	0		0	Not applicable

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3	Scrubber liquor flowrate - venturi	329.27	gpm	300	
3	Scrubber liquor flowrate - impingement	471.18	gpm	350	
3	Scrubber liquor pH	3.7		7	Manual readings. No meter.
3	Pressure drop - venturi	32.32	inches water	20	20 to 40 range
3	Pressure drop - impingement	9.66	inches water	-15	-15 to 5 range
3	Pressure drop - GAC	4.9	inches water	1	1 to 10 range
3	Material and composition	21.86	%	25	Feed to incinerator

APCD Run Data

Run	Name	Value	UOM	Target Value	Comments
1	WET ELECTROSTATIC PRECIPITATOR	0		0	
2	WET ELECTROSTATIC PRECIPITATOR	0		0	
3	WET ELECTROSTATIC PRECIPITATOR	0		0	
1	Granular Activated Carbon Absorber	0	N/A	0	In operation during testing.
2	Granular Activated Carbon Absorber	0	N/A	0	In operation during testing.
3	Granular Activated Carbon Absorber	0	N/A	0	In operation during testing.
1	Venturi scrubber	0		0	
2	Venturi scrubber	0		0	
3	Venturi scrubber	0		0	
1	Impingement type wet scrubber	0		0	
2	Impingement type wet scrubber	0		0	
3	Impingement type wet scrubber	0		0	
1	LOW NOX BURNERS	0		0	

Process Lab Run Data

Run	Name	Value	UOM	Comments
1	Sludge moisture content	0	%	
1	Sludge mercury content	510	µg/kg	µg/kg dry sludge
1	Sludge antimony content	1500	µg/kg	µg/kg dry sludge
1	Sludge arsenic content	5400	µg/kg	µg/kg dry sludge
1	Sludge beryllium content	110	µg/kg	µg/kg dry sludge
1	Sludge cadmium content	3000	µg/kg	µg/kg dry sludge
1	Sludge chromium content	24000	µg/kg	µg/kg dry sludge
1	Sludge cobalt content	23000	µg/kg	µg/kg dry sludge
1	Sludge lead content	14000	µg/kg	µg/kg dry sludge

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1	Sludge manganese content	6E+05	µg/kg	µg/kg dry sludge
1	Sludge phosphorus content	2E+07	µg/kg	µg/kg dry sludge
1	Sludge selenium content	8500	µg/kg	µg/kg dry sludge
1	Ultimate/proximate analysis	38.85		ASTM D-3172, D-5373
2	Sludge moisture content	0	%	
2	Sludge mercury content	580	µg/kg	µg/kg dry sludge
2	Sludge antimony content	12000	µg/kg	µg/kg dry sludge
2	Sludge arsenic content	4800	µg/kg	µg/kg dry sludge
2	Sludge beryllium content	110	µg/kg	µg/kg dry sludge
2	Sludge cadmium content	2800	µg/kg	µg/kg dry sludge
2	Sludge chromium content	22000	µg/kg	µg/kg dry sludge
2	Sludge cobalt content	21000	µg/kg	µg/kg dry sludge
2	Sludge lead content	13000	µg/kg	µg/kg dry sludge
2	Sludge manganese content	5E+05	µg/kg	µg/kg dry sludge
2	Sludge phosphorus content	2E+07	µg/kg	µg/kg dry sludge
2	Sludge selenium content	7600	µg/kg	µg/kg dry sludge
2	Ultimate/proximate analysis	38.85		ASTM D-3172, D-5373
3	Sludge moisture content	0	%	
3	Sludge mercury content	630	µg/kg	µg/kg dry sludge
3	Sludge antimony content	10000	µg/kg	µg/kg dry sludge
3	Sludge arsenic content	4200	µg/kg	µg/kg dry sludge
3	Sludge beryllium content	110	µg/kg	µg/kg dry sludge
3	Sludge cadmium content	2900	µg/kg	µg/kg dry sludge
3	Sludge chromium content	23000	µg/kg	µg/kg dry sludge
3	Sludge cobalt content	20000	µg/kg	µg/kg dry sludge
3	Sludge lead content	14000	µg/kg	µg/kg dry sludge
3	Sludge manganese content	5E+05	µg/kg	µg/kg dry sludge
3	Sludge phosphorus content	2E+07	µg/kg	µg/kg dry sludge
3	Sludge selenium content	7500	µg/kg	µg/kg dry sludge
3	Ultimate/proximate analysis	43.05		ASTM D-3172, D-5373

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Sampling / Stack Data Results Detail

Location Stack exit - Method 10				
				Average
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Fuel Factor	1.24	1.26	1.22	
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Analyzer Make	Teledyne	Teledyne	Teledyne	#Error
Analyzer Model	300EM CO	300EM CO	300EM CO	#Error
Analyzer Serial Number	312	312	312	312.000
Operating Range	10	10	10	10.000
Operating Units	ppm	ppm	ppm	
No. Readings/Avg.	1	1	1	1.000
Calibration Set	0	0	1	0.333
Calibration Pre Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Pre Zero Cylinder Instrument Response	0.1	-0.1	0.2	0.067
Calibration Pre Zero Cylinder Bias	1	-1	2	0.667
Calibration Pre Zero Cylinder Drift	0	0	0	0.000
Calibration Pre High Cylinder ID	XC0182219B	XC0182219B	XC0182219B	
		B		
Calibration Pre High Cylinder Instrument Response	4.5	4.3	4.6	4.467
Calibration Pre High Cylinder Bias	-44	-46	-43	-44.333
Calibration Pre High Cylinder Drift	0	0	0	0.000
Calibration Post Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Post Zero Cylinder Instrument Response	-0.1	0	0.1	0.000
Calibration Post Zero Cylinder Bias	-1	0	1	0.000
Calibration Post Zero Cylinder Drift	2	1	1	1.333
Calibration Post High Cylinder ID	XC0182219B	XC0182219B	XC0182219B	
		B		
Calibration Post High Cylinder Instrument Response	4.3	4.5	4.5	4.433
Calibration Post High Cylinder Bias	-46	-44	-44	-44.667
Calibration Post High Cylinder Drift	2	2	1	1.667
Cavg	1.9	2	2	1.967
Cavg Units	ppmvd	ppmvd	ppmvd	
Cgas	3.8358	4.0922	3.7349	3.888
Cgas Units	ppmvd	ppmvd	ppmvd	
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000
Cgasw	0	0	0	0.000
Cgasw Units				

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Location Stack exit - Method 29

				Average
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:10:00 PM	6:45:00 PM	12:46:00 PM	
Net Traversing Points	12	12	12	
Net Run Time, minutes	240	240	240	
Nozzle Diameter, inches	0.276	0.276	0.276	0.276
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	1.0153	1.0153	1.0153	1.015
Barometric Pressure, inches of Mercury	29.77	29.77	29.85	29.797
Average Orifice Meter Differential, inches H2O	0.32	1.73	1.67	1.240
Dry Gas Meter Volume Sampled, cubic feet	173.407	164.595	162.830	166.944
Average Dry Gas Meter Temperature, °F	95.79	97.13	98.25	97.057
Dry Gas Meter Volume Sampled, dscf	166.550	158.255	156.639	160.481
Total Moisture Liquid collected, g	161.1	146.1	144.1	150.433
Volume of Water Vapor, standard cubic feet	7.58	6.88	6.78	7.080
Moisture Content of Stack Gas, %	4.35	4.17	4.15	4.223
Moisture Saturation at Stack Gas Temperature, %	20.30	20.30	19.65	20.083
Dry Mole Fraction	0.9565	0.9583	0.9585	0.958
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Carbon Monoxide & Nitrogen, %	81.6	81.7	81.1	81.467
Fuel Factor	1.24	1.26	1.22	
Dry Molecular Weight, lb/lb-Mole	30.01	29.92	29.86	29.930
Wet Molecular weight, lb/lb-Mole	29.49	29.42	29.37	29.427
Flue Gas Static Pressure, inches of H2O	0.25	0.25	0.25	0.250
Absolute Flue Gas Pressure, inches of Mercury	29.79	29.79	29.87	29.817
Average Stack Gas Temperature, °F	141.17	141.17	140.00	140.780
Average Velocity Head, inches of H2O	0.315	0.283	0.272	0.290
Average Stack Gas Velocity, feet/second	33.34	31.64	30.97	31.983
Stack Cross-Sectional Area, square feet	9.621	9.621	9.621	9.621
Dry Volumetric Flow Rate, dry scfm	16,097.8	15,305.8	15,054.3	15,485.967
Actual Wet Volumetric Flue Gas Flow Rate, acfm	19,245.8	18,264.5	17,877.7	18,462.667
Percent Isokinetic of Sampling Rate, %	99.8	99.8	100.4	100.000
Percent Excess Air, %	46.1	51.2	66.5	54.600
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Round Duct Diameter, inches	42	42	42	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

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Location Stack exit - Method 3A CO2				
				Average
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Fuel Factor	1.22	1.26	1.22	
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Analyzer Make	Servomex	Servomex	Servomex	#Error
Analyzer Model	1400 CO2	1400 CO2	1400 CO2	#Error
Analyzer Serial Number	1420/705 531	1420/705 531	1420/705 531	#Error
Operating Range	25	25	25	25.000
Operating Units	ppmv	ppm	ppm	
No. Readings/Avg.	1	1	1	1.000
Calibration Set	2	2	3	2.333
Calibration Pre Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Pre Zero Cylinder Instrument Response	0	0	0	0.000
Calibration Pre Zero Cylinder Bias	0	0	0	0.000
Calibration Pre Zero Cylinder Drift	0	0	0	0.000
Calibration Pre High Cylinder ID	ALM048996	ALM048996	ALM048996	
	CO2	CO2	CO2	
Calibration Pre High Cylinder Instrument Response	11	11	11	11.000
Calibration Pre High Cylinder Bias	-0.4	-0.4	-0.4	-0.400
Calibration Pre High Cylinder Drift	0	0	0	0.000
Calibration Post Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Post Zero Cylinder Instrument Response	0	0.1	0	0.033
Calibration Post Zero Cylinder Bias	0	0.4	0	0.133
Calibration Post Zero Cylinder Drift	0	0.4	0	0.133
Calibration Post High Cylinder ID	ALM048996	ALM048996	ALM048996	
	CO2	CO2	CO2	
Calibration Post High Cylinder Instrument Response	11	11.2	11	11.067
Calibration Post High Cylinder Bias	-0.4	0.4	-0.4	-0.133
Calibration Post High Cylinder Drift	0	0.8	0	0.267
Cavg	10.6	9.9	9.2	9.900
Cavg Units	ppmvd	ppmvd	ppmvd	
Cgas	10.6964	9.8946	9.2836	9.958
Cgas Units	ppmvd	ppmvd	ppmvd	
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000
Cgasw	0	0	0	0.000
Cgasw Units				

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Location Stack exit - Method 3A O2				
				Average
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:25:00 PM	8:15:00 AM	
Run Finish Time	1:00:00 PM	6:48:00 PM	12:45:00 PM	
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Fuel Factor	1.22	1.3	1.4	
Dry Volumetric Flow Rate, dry scfm	16847	15927	15673	16,149.000
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Moisture, %	4.1	4.2	4.2	4.167
Analyzer Make	Teledyne	Teledyne	Teledyne	#Error
Analyzer Model	300EM O2	300EM O2	300EM O2	#Error
Analyzer Serial Number	312	312	312	312.000
Operating Range	25	25	25	25.000
Operating Units	ppm	ppm	ppm	
No. Readings/Avg.	1	1	1	1.000
Calibration Set	4	4	5	4.333
Calibration Pre Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Pre Zero Cylinder Instrument Response	0.1	0.2	0.2	0.167
Calibration Pre Zero Cylinder Bias	0	0.4	0.8	0.400
Calibration Pre Zero Cylinder Drift	0	0	0	0.000
Calibration Pre High Cylinder ID	ALM048996	ALM048996	ALM048996	
	O2	O2	O2	
Calibration Pre High Cylinder Instrument Response	11.5	11.3	11.4	11.400
Calibration Pre High Cylinder Bias	1.6	0.8	1.2	1.200
Calibration Pre High Cylinder Drift	0	0	0	0.000
Calibration Post Zero Cylinder ID	ALM013377	ALM013377	ALM013377	
Calibration Post Zero Cylinder Instrument Response	0.2	0.1	0.2	0.167
Calibration Post Zero Cylinder Bias	0.4	0	0.8	0.400
Calibration Post Zero Cylinder Drift	0.4	0.4	0	0.267
Calibration Post High Cylinder ID	ALM048996	ALM048996	ALM048996	
	O2	O2	O2	
Calibration Post High Cylinder Instrument Response	11.3	11.2	11.4	11.300
Calibration Post High Cylinder Bias	0.8	0.4	1.2	0.800
Calibration Post High Cylinder Drift	0.8	0.4	0	0.400
Cavg	7.8	8.4	9.7	8.633
Cavg Units	ppmvd	ppmvd	ppmvd	
Cgas	7.48	8.1757	9.3304	8.329
Cgas Units	ppmvd	ppmvd	ppmvd	
Fuel Type	Gas - Natural	Gas - Natural	Gas - Natural	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000
Cgasw	0	0	0	0.000
Cgasw Units				

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Location Stack exit - OTM - 27

				Average
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:03:45 PM	6:41:15 PM	12:47:15 PM	
Net Traversing Points	12	12	12	
Net Run Time, minutes	225.25	234.5	243.75	
Nozzle Diameter, inches	0.196	0.196	0.196	0.196
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.98	0.98	0.98	0.980
Barometric Pressure, inches of Mercury	29.77	29.77	29.85	29.797
Average Orifice Meter Differential, inches H2O	0.48	0.49	0.49	0.487
Dry Gas Meter Volume Sampled, cubic feet	91.462	99.200	103.312	97.991
Average Dry Gas Meter Temperature, °F	111.42	113.63	115.46	113.503
Dry Gas Meter Volume Sampled, dscf	82.504	89.142	92.790	88.145
Total Moisture Liquid collected, g	75	82.7	87.3	81.667
Volume of Water Vapor, standard cubic feet	3.53	3.89	4.11	3.843
Moisture Content of Stack Gas, %	4.10	4.18	4.24	4.173
Moisture Saturation at Stack Gas Temperature, %	20.57	20.39	19.44	20.133
Dry Mole Fraction	0.959	0.9582	0.9576	0.958
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Carbon Monoxide & Nitrogen, %	81.6	81.7	81.1	81.467
Fuel Factor	1.24	1.26	1.22	
Dry Molecular Weight, lb/lb-Mole	30.01	29.92	29.86	29.930
Wet Molecular weight, lb/lb-Mole	29.52	29.42	29.36	29.433
Flue Gas Static Pressure, inches of H2O	0.25	0.25	0.25	0.250
Absolute Flue Gas Pressure, inches of Mercury	29.79	29.79	29.87	29.817
Average Stack Gas Temperature, °F	141.67	141.33	139.58	140.860
Average Velocity Head, inches of H2O	0.246	0.267	0.289	0.267
Average Stack Gas Velocity, feet/second	29.46	30.74	31.92	30.707
Stack Cross-Sectional Area, square feet	9.621	9.621	9.621	9.621
Dry Volumetric Flow Rate, dry scfm	14,249.8	14,864.9	15,512.4	14,875.700
Actual Wet Volumetric Flue Gas Flow Rate, acfm	17,006.1	17,745.0	18,426.1	17,725.733
Percent Isokinetic of Sampling Rate, %	118.0	117.4	112.7	116.033
Percent Excess Air, %	46.1	51.2	66.5	54.600
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Round Duct Diameter, inches	42	42	42	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

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Location Stack exit - OTM - 28

	Average			
Run Number	1	2	3	
Test Date	2/17/2010	2/17/2010	2/18/2010	
Run Start Time	9:00:00 AM	2:35:00 PM	8:15:00 AM	
Run Finish Time	1:03:45 PM	6:41:15 PM	12:47:15 PM	
Net Traversing Points	12	12	12	
Net Run Time, minutes	225.25	234.5	243.75	
Nozzle Diameter, inches	0.196	0.196	0.196	0.196
Pitot Tube Coefficient	0.84	0.84	0.84	0.840
Dry Gas Meter Calibration Factor	0.98	0.98	0.98	0.980
Barometric Pressure, inches of Mercury	29.77	29.77	29.85	29.797
Average Orifice Meter Differential, inches H2O	0.48	0.49	0.49	0.487
Dry Gas Meter Volume Sampled, cubic feet	91.462	99.200	103.302	97.988
Average Dry Gas Meter Temperature, °F	111.42	113.63	115.46	113.503
Dry Gas Meter Volume Sampled, dscf	82.504	89.142	92.781	88.142
Total Moisture Liquid collected, g	76	82.7	87.3	82.000
Volume of Water Vapor, standard cubic feet	3.58	3.89	4.11	3.860
Moisture Content of Stack Gas, %	4.16	4.18	4.24	4.193
Moisture Saturation at Stack Gas Temperature, %	20.57	20.39	19.44	20.133
Dry Mole Fraction	0.9584	0.9582	0.9576	0.958
Carbon Dioxide, %	10.6	9.9	9.2	9.900
Oxygen, %	7.8	8.4	9.7	8.633
Carbon Monoxide & Nitrogen, %	81.6	81.7	81.1	81.467
Fuel Factor	1.24	1.26	1.22	
Dry Molecular Weight, lb/lb-Mole	30.01	29.92	29.86	29.930
Wet Molecular weight, lb/lb-Mole	29.51	29.42	29.36	29.430
Flue Gas Static Pressure, inches of H2O	0.25	0.25	0.25	0.250
Absolute Flue Gas Pressure, inches of Mercury	29.79	29.79	29.87	29.817
Average Stack Gas Temperature, °F	141.67	141.33	139.58	140.860
Average Velocity Head, inches of H2O	0.246	0.267	0.289	0.267
Average Stack Gas Velocity, feet/second	29.47	30.74	31.92	30.710
Stack Cross-Sectional Area, square feet	9.621	9.621	9.621	9.621
Dry Volumetric Flow Rate, dry scfm	14,245.7	14,864.9	15,512.4	14,874.333
Actual Wet Volumetric Flue Gas Flow Rate, acfm	17,011.9	17,745.0	18,426.1	17,727.667
Percent Isokinetic of Sampling Rate, %	118.1	117.4	112.7	116.067
Percent Excess Air, %	46.1	51.2	66.5	54.600
F-Factor, dscfm/MMBtu @ %O2	8710	8710	8710	8,710.000
Round Duct Diameter, inches	42	42	42	
Rectangular Duct Width, inches	0	0	0	
Rectangular Duct Length, inches	0	0	0	
Fw	10610	10610	10610	10,610.000
Fc	1040	1040	1040	1,040.000

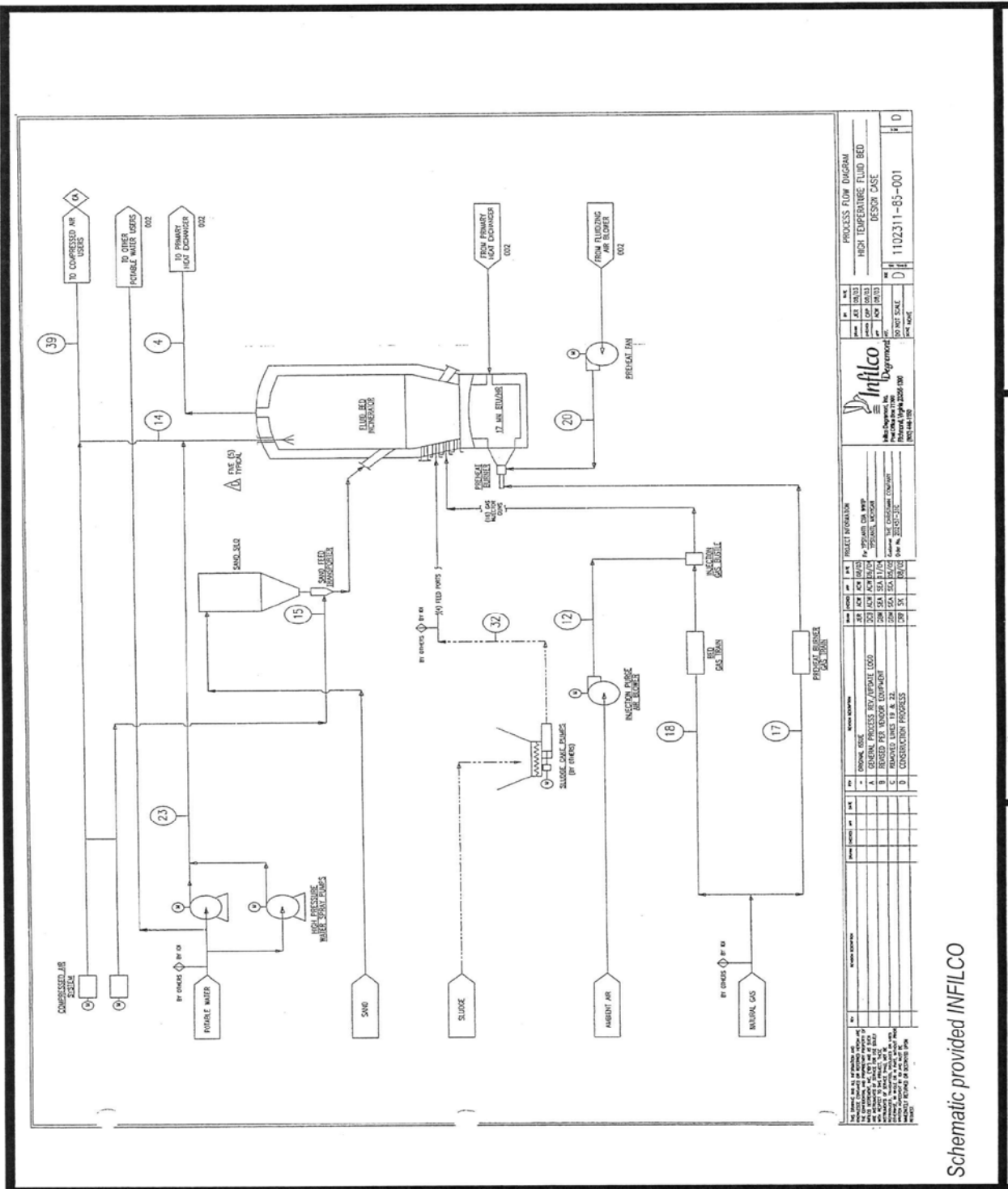
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ATTACHMENT 1

Source/Process Flow Diagram

Figure 1-1. EU-FBSSI Schematic 1



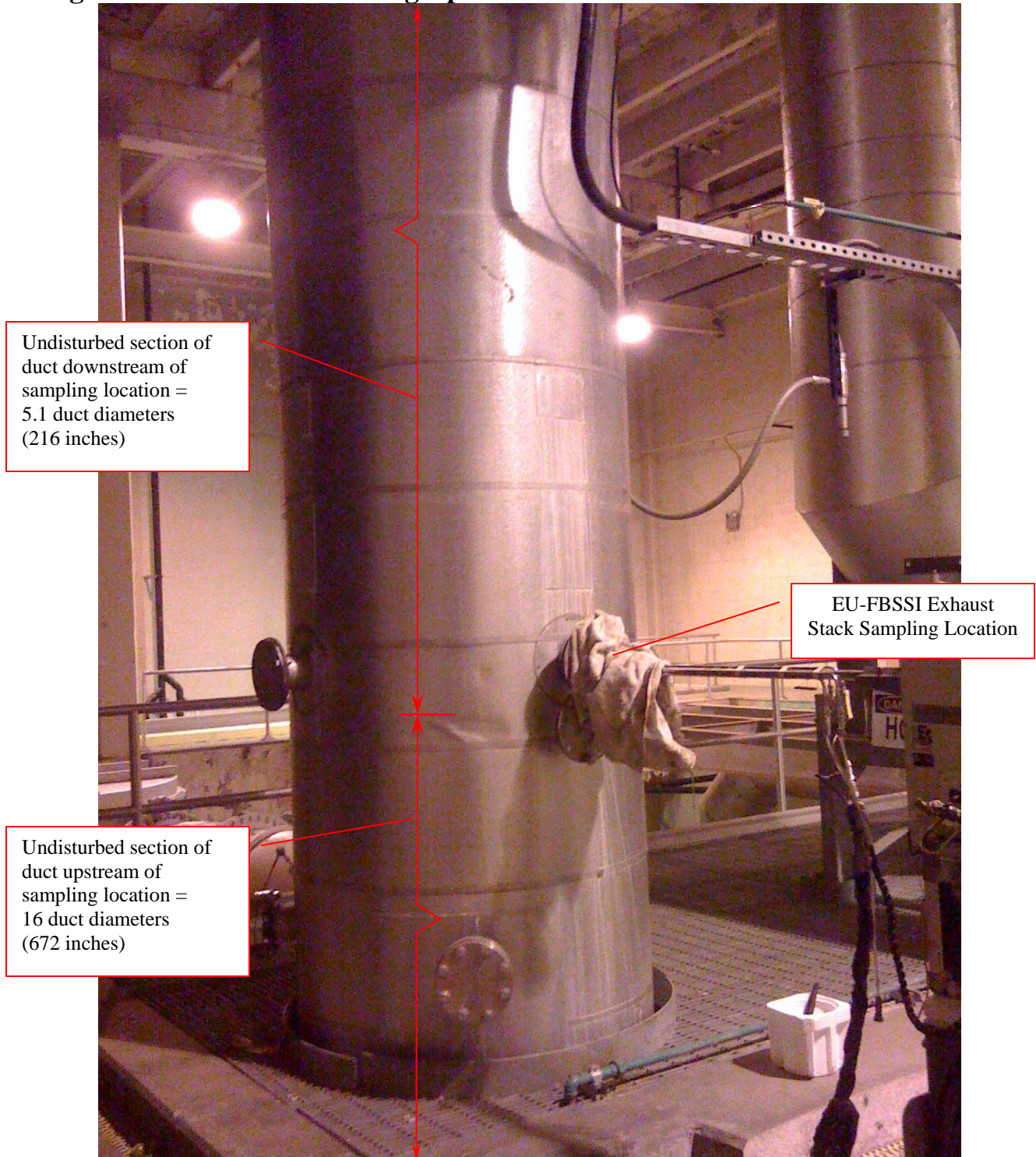
Schematic provided INFILCO

ATTACHMENT 2

EPA Method 1 Location Supporting Documentation

A photograph of the sampling location is presented below.

Figure 1-3. EU-FBSSI Photograph



ATTACHMENT 3

Cyclonic Flow Absence Supporting Documentation

[illegible]
$$P_s = P_{bar} + (P_{stat}/13.6) = \frac{M_d = 0.440(\%CO_2) + 0.320(\%O_2) + 0.280(\%N_2 + \%CO)}{M_s = (M_d)((1-(B_w/100)) + 18(B_w/100))} = \frac{\text{ft/min}}{\text{scfm}}$$

ATTACHMENT 4

Pre-Test Meter Boxes/DGM Calibrations



DRY GAS METER CALIBRATION REPORT

Customer: Bureau VeritasDate: 1/4/2010Console Serial # 80283Console Part # Nutech 2010DGM Type S-275DGM # 6842668Reference Meter S/N 15962156Barometric Pressure, P_b : 29.48 in. HgTested at: 0.00 in. Hg - Vacuum

RUN	1	2	3	Units
Orifice Manometer Setting, ΔH	2.00	0.75	6.00	in. H ₂ O
Elapsed Time	14	22	8	min.

Reference Meter

Final Volume Reading	409.640	420.356	431.498	ft ³
Initial Volume Reading	399.228	410.070	421.121	ft ³
Total Gas Volume, V_w	10.412	10.286	10.377	ft ³
Temperature, Initial	64.00	64.00	64.00	°F
Temperature, Final	64.00	64.00	65.00	°F
Avg Temperature, T_w	64.00	64.00	64.50	°F

Dry Gas Meter

Final Volume Reading	949.376	959.953	970.685	ft ³
Initial Volume Reading	939.147	949.808	960.692	ft ³
Total Gas Volume, V_m	10.229	10.145	9.993	ft ³
Average Temperature, Initial	64.00	64.00	64.50	°F
Average Temperature, Final	64.00	64.50	65.00	°F
Avg Temperature, T_m	64.00	64.25	64.75	°F

ΔH (a)	2.0544	1.9484	2.0270	Avg. ΔH (a) 2.0099
----------------	--------	--------	--------	----------------------------

 ΔH (a) Tolerance Check

OK

OK

OK

Gamma, Y	1.0118	1.0115	1.0226	Avg. Y 1.0153
----------	--------	--------	--------	---------------

Gamma Tolerance Check

OK

OK

OK

Calibration Performed By: 

$$\Delta H_{(a)} = \frac{0.0319 \Delta H}{P_b (T_m + 460)} \left[\frac{(T_w + 460) \theta}{V_w} \right]^2$$

$$Y = \frac{V_w P_b (T_m + 460)}{V_m (P_b + \Delta H / 13.6) (T_w + 460)}$$

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\Critical Orifice Worksheet.xls\522ORPR5

Revised: 7/25/95 Version: 2.2

Model #: ES #6

Serial #:

Date: -----> 2/10/10

Barometric Pressure: -----> 29.90 (in. Hg)

Theoretical Critical Vacuum: -----> 14.10 (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 -----

dH (in H2O)	Time (min)	Volume		Initial Temps.		Final Temps.		Orifice K' Orifice Serial# Coefficient (number)	Actual -- Ambient Temperature --	
		Initial (cu ft)	Final (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)		Vacuum Initial (in Hg)	Final Average (deg F)
0.51	20.00	67.394	75.845	65.0	65.0	67.0	66.0	AS47	15.0	68.0
0.95	20.00	75.845	87.516	67.0	66.0	71.0	68.0	AS55	15.0	68.0
1.70	21.00	87.516	103.158	71.0	68.0	74.0	69.0	AS63	15.0	68.0
3.20	23.00	103.158	126.551	74.0	69.0	76.0	70.0	AS73	15.0	68.0
4.80	20.00	126.551	151.361	76.0	70.0	78.0	71.0	AS81	15.0	68.0

***** RESULTS *****

--- DRY GAS METER ---				ORIFICE				--- DRY GAS METER ---				ORIFICE			
VOLUME		VOLUME		VOLUME		VOLUME		VOLUME		VOLUME		VOLUME		VOLUME	
CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED	
Vm(std)		Vm(std)		Vcr		Vcr		Vcr		Vcr		Vcr		Vcr	
(cu ft)		(liters)		(cu ft)		(liters)		(cu ft)		(liters)		(cu ft)		(liters)	
8.489	240.4	8.416	238.4	8.425	238.4	8.425	238.4	8.425	238.4	8.425	238.4	8.425	238.4	8.425	238.4
11.686	330.9	11.686	330.9	11.456	324.4	11.456	324.4	11.468	324.4	11.468	324.4	11.468	324.4	11.468	324.4
15.617	442.3	15.461	437.9	15.477	437.9	15.477	437.9	15.477	437.9	15.477	437.9	15.477	437.9	15.477	437.9
23.364	661.7	22.629	640.8	22.653	640.8	22.653	640.8	22.653	640.8	22.653	640.8	22.653	640.8	22.653	640.8
24.806	702.5	24.018	680.2	24.044	680.2	24.044	680.2	24.044	680.2	24.044	680.2	24.044	680.2	24.044	680.2
Average Y		Average Y		Average Y		Average Y		Average Y		Average Y		Average Y		Average Y	

ATTACHMENT 5

Post-Test Meter Boxes/DGM Calibrations

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 1\Feb 19, 2010.xls\522ORPR5
 Revised: 7/25/95 Version: 2.2

Date: 2/19/10
 Barometric Pressure: 30.03 (in. Hg)
 Theoretical Critical Vacuum: 14.17 (in. Hg)

Model #: NuTech #1
 Serial #:
 !!!!!!!!!
 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 Temps.		Final Temps.		Orifice K' Orifice Serial# Coefficient (number) (see above)	Actual -- Ambient Temperature --	
		Initial (cu ft)	Final (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)		Vacuum Initial (in Hg)	Final Average (deg F)
0.57	20.00	533.121	541.245	61.0	50.0	56.0	52.0	AS47	15.0	71.0
1.20	20.00	541.245	552.486	54.0	51.0	57.0	53.0	AS55	15.0	71.0
2.00	20.00	552.486	566.885	56.0	53.0	60.0	56.0	AS63	15.0	71.0
3.60	20.00	566.885	586.522	58.0	56.0	62.0	58.0	AS73	15.0	71.0
5.30	20.00	586.522	610.334	77.0	74.0	79.0	75.0	AS81	15.0	71.0

RESULTS
 DRY GAS METER
 ORIFICE
 DRY GAS METER
 ORIFICE

VOLUME		VOLUME		VOLUME		VOLUME		VOLUME		VOLUME	
CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED		CORRECTED	
Vm(std)	Vm(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)	Vcr(std)
8.372	237.1	8.429	238.7	8.449	238.7	8.449	238.7	8.449	238.7	8.449	238.7
11.625	329.2	11.473	324.9	11.501	324.9	11.501	324.9	11.501	324.9	11.501	324.9
14.847	420.5	14.747	417.6	14.782	417.6	14.782	417.6	14.782	417.6	14.782	417.6
20.239	573.2	19.707	558.1	19.754	558.1	19.754	558.1	19.754	558.1	19.754	558.1
23.828	674.8	24.054	681.2	24.112	681.2	24.112	681.2	24.112	681.2	24.112	681.2
Average Y		Average Y		Average Y		Average Y		Average Y		Average Y	
		0.994		0.994		0.994		0.994		0.994	

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 H2O 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: 2/19/10

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\[#6 February19, 2010.xls]522ORPRS
Revised: 7/25/95 Version: 2.2

Model #: ES #6
Serial #: 2/19/10
Barometric Pressure: 30.03 (in. Hg)
Theoretical Critical Vacuum: 14.17 (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 Temps.		Final Temps.		Orifice K' Orifice		Actual -- Ambient Temperature --	
		Initial (cu ft)	Final (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum Initial (in Hg)	Final (deg F)
0.50	20.00	606.920	615.500	84.0	76.0	79.0	76.0	AS47	0.323	15.0	71.0
0.99	20.00	615.500	627.251	78.0	76.0	79.0	76.0	AS55	0.440	15.0	71.0
1.70	20.00	627.251	642.257	77.0	75.0	80.0	76.0	AS63	0.566	15.0	71.0
3.30	20.00	642.257	662.731	79.0	76.0	83.0	77.0	AS73	0.756	15.0	71.0
4.80	20.00	662.731	687.532	76.0	75.0	81.0	75.0	AS81	0.923	15.0	71.0

***** RESULTS *****

--- DRY GAS METER ---				ORIFICE		--- DRY GAS METER ---		ORIFICE	
VOLUME CORRECTED		VOLUME CORRECTED		VOLUME CORRECTED		CALIBRATION FACTOR		CALIBRATION FACTOR	
Vm(std)	Vm(std)	Vcr(std)	Vcr(std)	Vcr	Vcr	Value	dh@	Value	Variation
(cu ft)	(liters)	(cu ft)	(liters)	(cu ft)	(liters)	(in H2O)	(mm H2O)	(in H2O)	(in H2O)
8.447	239.2	8.429	238.7	8.449	0.998	1.565	39.76	1.565	-0.178
11.615	328.9	11.473	324.9	11.501	0.988	1.673	42.49	1.673	-0.070
14.864	421.0	14.747	417.6	14.782	0.992	1.741	44.21	1.741	-0.003
20.294	574.7	19.707	558.1	19.754	0.971	1.888	47.97	1.888	0.145
24.764	701.3	24.054	681.2	24.112	0.971	1.849	46.96	1.849	0.106
Average Y				0.984		1.743	44.28		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 H2O 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: 2/19/10

ATTACHMENT 6

Nozzles Calibrations



Nozzle Verification

Facility	YCUA	Consultant	MK
Source	FBSSI	Date	2/17/10

Nozzle ID	D ₁ (inch)	D ₂ (inch)	D ₃ (inch)	ΔD (inch)	D _{average} (inch)
13 A	0.276	0.277	0.275	0.002	0.276
6 A	0.196	0.196	0.195	0.001	0.196

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 D₁, D₂, D₃.

ATTACHMENT 7

Pitots Calibration

11127400-27
No 220L-276

Clayton
ENVIRONMENTAL
CONSULTANTS

PITOT TUBE INSPECTION CRITERIA CHECKLIST

PITOT TUBE NUMBER

DATE

Pitot Tube not on Probe

$$3/16 \leq Dt \leq 3/8$$

$$.48\text{cm} \quad .95\text{cm}$$

$$P_A = P_B$$

$$1.05 Dt \leq P_A \leq 1.5 Dt$$

$$\alpha_1 \text{ and } \alpha_2 < 10^\circ$$

$$\beta_1 \text{ and } \beta_2 < 5^\circ$$

$$z < 0.32 \text{ cm (1/8 in)}$$

$$w < 0.08 \text{ cm (1/32 in)}$$

Pitot on Probe
Component Spacing OK

FIGURE

A. $x \geq 1.9 \text{ cm}$

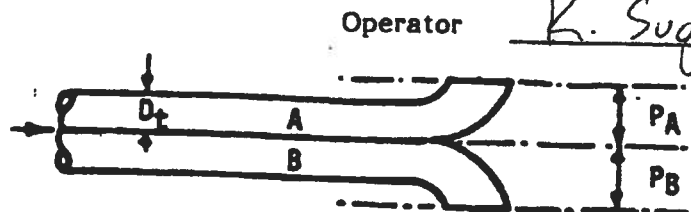
B-1. $z \geq 1.9 \text{ cm}$
 $w \geq 7.62 \text{ cm}$

or

B-2. $Z \geq 5.08 \text{ cm}$

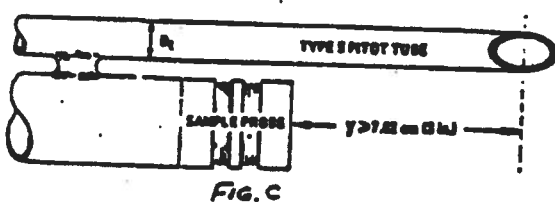
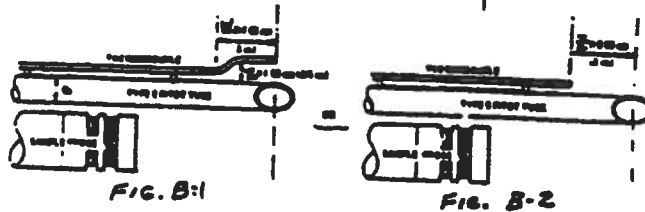
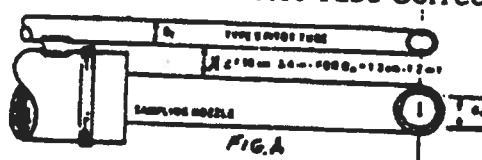
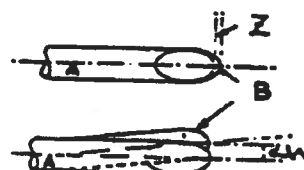
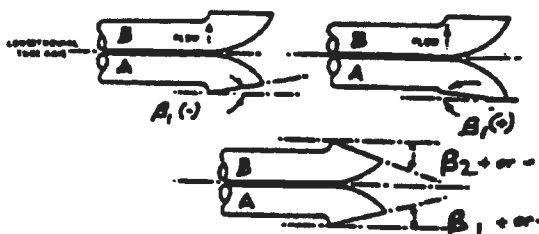
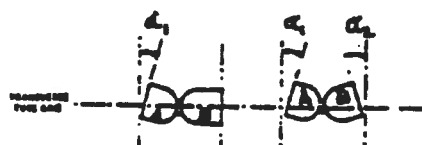
C. $Y \geq 7.62 \text{ cm}$

Pitot Tube Correction Factor:



Operator

K. Sugar



YES NO
YES NO
YES NO
YES NO

YES NO

YES NO
YES NO

Pitot Tube Correction Factor

0.84

A. YES NO

B-1 YES NO

B-2 YES NO

C YES NO

ATTACHMENT 8

Thermocouples Calibrations



Meter Box Thermocouple Calibration Sheet

Meter Box #:	1		Tech:	MPK		Date:	2/12/10	
Reference:	Pic MODEL 520 #107222							
	Reference Thermometer:		Thermocouple		Difference (%)			
Source:	°F	°R	°F	°R				
Meter In:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	401	861	0.1			
Meter Out:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	401	861	0.1			
Probe:								
Low Temp	32	492	32	492	0.0			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	402	862	0.1			
Stack:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	401	861	0.1			
Oven:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	403	863	0.1			
Exit:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	398	858	0.1			
Auxiliary:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	215	676	0.0			
High Temp	400	860	401	861	0.1			

Note: Tolerance is $\leq 1.5\%$



Meter Box Thermocouple Calibration Sheet

Meter Box #:	6		Tech:	MPI		Date:	2/12/10	
Reference:	Pie Model 520 #107222							
	Reference Thermometer:		Thermocouple		Difference (%)			
Source:	°F	°R	°F	°R				
Meter In:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	215	675	0.0			
High Temp	400	860	401	861	0.1			
Meter Out:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	398	856	0.1			
Probe:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	403	863	0.1			
Stack:								
Low Temp	32	492	33	493	0.1			
Mid Temp	215	675	217	677	0.1			
High Temp	400	860	401	861	0.1			
Oven:								
Low Temp	32	492	32	492	0.0			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	402	862	0.1			
Exit:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	401	861	0.1			
Auxiliary:								
Low Temp	32	492	31	491	0.1			
Mid Temp	215	675	216	676	0.1			
High Temp	400	860	401	861	0.1			

Note: Tolerance is $\leq 1.5\%$

[illegible]

Note: Tolerance is +/- 2%

[illegible]

Note: Tolerance is +/- 2%

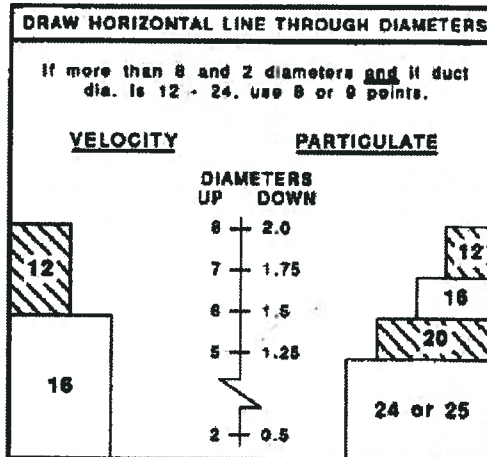
ATTACHMENT 9

Sampling Locations Dimensions and Point Locations



Sampling and Velocity Traverse Point Determination EPA Method 1

PLANT NAME <u>YCUA</u>	
CITY, STATE <u>YPSILANTI, MI</u>	
SAMPLING LOCATION <u>FBSSI</u>	
NO. OF PORTS AVAILABLE	<u>4</u>
NO. OF PORTS USED	<u>2</u>
PORT INSIDE DIAMETER	<u>4</u>
DISTANCE FROM FAR WALL TO OUTSIDE OF PORT	<u>50.25</u>
NIPPLE LENGTH AND/OR WALL THICKNESS	<u>4.25</u>
DEPTH OF STACK OR DUCT	<u>42</u>
STACK OR DUCT WIDTH (IF RECTANGULAR)	<u>NA</u>
EQUIVALENT DIAMETER: $D_e = \frac{2 \times \text{DEPTH} \times \text{WIDTH}}{\text{DEPTH} + \text{WIDTH}} = \frac{2(\quad)(\quad)}{(\quad) + (\quad)} = \quad$	
DISTANCE FROM PORTS TO FLOW DISTURBANCES	<div style="display: flex; justify-content: space-around;"> <div>UPSTREAM <u>672</u> DIAMETERS <u>16</u></div> <div>DOWNSTREAM <u>216</u> DIAMETERS <u>5.14</u></div> </div>
STACK/DUCT AREA = $\pi \cdot (21)^2 = 1384.7 \text{ IN}^2$ (must be $> 113 \text{ in}^2$)	



LOCATION OF POINTS
IN CIRCULAR
STACKS OR DUCTS

	4	8	10	12
1	6.7	4.4	3.2	2.1
2	25.0	14.6	10.6	8.2
3	78.0	20.6	19.4	14.6
4	93.3	70.4	32.3	22.6
5		85.4	67.7	34.2
6		95.8	80.8	48.8
7			85.8	77.4
8			95.8	85.4
9				91.8
10				97.4
11				99.9
12				97.9

LOCATION OF POINTS
IN RECTANGULAR
STACKS OR DUCTS

	3	4	8
1	16.7	12.6	10.0
2	50.0	37.6	30.0
3	83.3	62.5	50.0
4		87.5	70.0
5			88.0

POINT	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL	DISTANCE FROM OUTSIDE OF PORT
1	<u>4.4</u>	<u>1.8</u>	<u>10.09</u>
2	<u>14.6</u>	<u>6.1</u>	<u>14.35</u>
3	<u>27.6</u>	<u>12.4</u>	<u>20.65</u>
4	<u>70.4</u>	<u>29.6</u>	<u>37.85</u>
5	<u>85.4</u>	<u>35.9</u>	<u>44.15</u>
6	<u>95.6</u>	<u>40.2</u>	<u>48.45</u>
7			
8			
9			
10			
11			
12			

Do not place points closer to stack walls than
1.0 in. for stack dia. > 24 in.
0.5 in. for stack dia. 12 to < 24 in.

For rectangular stacks, use only the following matrices:

No. Pts.	Matrix
9	3 x 3
12	4 x 3
16	4 x 4
25	5 x 5

Check for completeness TS

Checked by (Signature) [Signature]

ATTACHMENT 10

Run Field Data Sheets

[illegible]
$$P_s = P_{bar} + (P_{std}/13.6) = \frac{M_d}{M_s} = \frac{0.440(\%CO_2) + 0.320(\%O_2) + 0.280(\%N_2 + \%CO)}{(M_d)(1-(B_w/100)) + 18(B_w/100)} = \frac{ft/min}{scfm}$$

Run

Q401 M-29

Facility

YCUA

Source Designation

Operator

Filter No.

Barometric Pressure (P_b)Stack Static Pressure (P_s)

Stack Dimensions (Diameter)

Pilot Tube

Meter No.

HV at 0.75 cfm

THE

Assumed Moisture (B_{ass})

Needle Diameter

Leak Rate Initial

Leak Rate Final

Traverse Points

Pilot Correction Factor (C_p)

Meter Correction Factor (M)

Gas Composition

Remedies

29.73 in Hg

47.5	in H ₂ O
53.5	

2	...
...	...

[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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7000

1600.7

in	0.276	0.000
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0.000	8
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1000	1000
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12

10.84

10153

10.1%

Comment

회회

00000000

Traverse Point	Sampling Time		Sampling Train Vacuum (in Hg)	Stack Temp. T_s (°F)	Velocity Pres. ΔP_s (in H ₂ O)	Orifice Differential, ΔH (in H ₂ O)	Sample Volume V (ft ³)	Dry-Gas Meter Temp.		Probe Temperature (°F)	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Auxiliary Temperature (°F)
	(minutes)	Clock Time (24 hour)						Inlet, T_m (°F)	Outlet, T_m (°F)				
1	0	9:00	2	140	0.31	1.92	972.185	89	88	225	232	56	
2	20		2	139	0.34	2.06	986.59	94	91	230	236	58	
3	40		2	143	0.31	1.83	1001.52	94	91	232	236	58	
4	60		2	141	0.29	1.76	1015.75	94	91	244	236	54	
5	80		2	140	0.29	1.73	1029.69	101	99	246	235	54	
6	100		2	140	0.34	1.79	1043.61	101	95	244	234	56	
7	120	11:00	2	141	0.32	1.94	1057.751	96	95	238	234	62	
8	140	11:10	2	140	0.31	2.07	1072.35	98	93	242	233	63	
9	160		2	143	0.34	2.06	1087.34	101	94	242	236	55	
10	180		2	141	0.30	1.83	1102.24	100	94	242	236	56	
11	200		2	141	0.30	1.83	1116.49	101	94	244	233	60	
12	220		2	144	0.34	2.06	1130.68	101	95	246	243	63	
END	240	13:10	-				1145.592						



Moisture Recovery Form for Method 29

Plant	YCUA
Date	2/17/2010
Sampling Location	FBSSI
Run Number	RUN 1
Impinger Box Number	TZ
Recovery Person	T. Schmelter
Recovery Rinses	Filter (#1); 3x acetone (#2); 3x 0.1N HNO ₃ (100ml total) (#3); water then acetone (discard); 3x 0.1N HNO ₃ (100ml total) (#4); 3x 0.1N HNO ₃ (100 ml total) (#5a); 3x KMnO ₄ + water (100 ml total) (#5b); 8N HCl (25 ml) into 200 ml water (#5c).
Sampling Identification	FBSSI
Primary Filter Number	7

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	5% HNO ₃ / 10% H ₂ O ₂	100 mL	Mod	182 mL	100 mL	82 mL
2	5% HNO ₃ / 10% H ₂ O ₂	100 mL	GS	138 mL	100 mL	38 mL
3	Empty	0 mL	Mod	6 mL	0 mL	6 mL
4	Acidified KMnO ₄	100 mL	Mod	100 mL	100 mL	0 mL
5	Acidified KMnO ₄	100 mL	Mod	99.98 g	100 mL	-1 mL
6	Silica	~300 g	Mod	965.8 g	929.2 g	36.6 g
7						
Total Weight Gain (g)						161.6



Moisture Recovery Form for Method 29

Plant	YCUA
Date	02/17/2010
Sampling Location	FBSSI
Run Number	2
Impinger Box Number	T2
Recovery Person	T. Schmelter
Recovery Rinses	Filter (#1); 3x acetone (#2); 3x 0.1N HNO ₃ (100ml total) (#3); water then acetone (discard); 3x 0.1N HNO ₃ (100ml total) (#4); 3x 0.1N HNO ₃ (100 ml total) (#5a); 3x KMnO ₄ + water (100 ml total) (#5b); 8N HCl (25 ml) into 200 ml water (#5c).
Sampling Identification	FBSSI
Primary Filter Number	8

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	5% HNO ₃ / 10% H ₂ O ₂	100 mL	Mod	203 mL	100 mL	103 mL
2	5% HNO ₃ / 10% H ₂ O ₂	100 mL	GS	114 mL	100 mL	14 mL
3	Empty	0 mL	Mod	3 mL	0 mL	3 mL
4	Acidified KMnO ₄	100 mL	Mod	102 mL	100 mL	2 mL
5	Acidified KMnO ₄	100 mL	Mod	100 mL	100 mL	0 mL
6	Silica	~300 g	Mod	893.2 g	869.1 g	24.1 g
7						
Total Weight Gain (g)						

Quib M-29

Source Designation

Order No.

Barometric Pressure (P_b)

Stack Static Pressure (P.)

Stack Dimensions

Pilot Tube

Meter No.

ΔH at 0.75 cm

Gas Composition

2009

 ΔH at 0.75 cm

Resumed 11:23

$$\begin{array}{r} 2000 \\ 4000 \\ \hline 10000 \end{array}$$

4	in	at	at	%	%
276		0.001	0.001		
12					
0.84					
1.6153					
CO ₂				19	8
O ₂					

Traverse Point	Sampling Time		Sampling Train Vacuum (in Hg)	Stack Temp. T _s (°F)	Velocity Press. ΔP _s (in H ₂ O)	Orifice Differential, ΔH (in H ₂ O)	Sample Volume V _s (ft ³)	Gas Meter Temp.		Probe Temperature (°F)	Filter Box Temperature (°F)	Last Impinger Temperature (°F)	Auxiliary Temperature (°F)
	(minute)	Clock Time (24 hour)						Inlet, T _m (°F)	Outlet, T _m (°F)				
6	0	8:15	5	130	0.189	1.76	342.065	92	91	249	238	60	
5	20		5	138	0.189	1.77	325.70	97	93	245	240	53	
4	40		5	137	0.25	1.54	339.44	103	97	248	235	54	
3	60		5	138	0.20	1.18	355.13	102	96	247	238	59	
2	80		5	139	0.26	1.60	367.64	103	99	248	238	64	
1	100		5	141	0.26	1.59	380.45	102	97	249	238	59	
END	120	10:15					394.129						
5	140	10:25	5	141	0.30	1.83	394.129	98	97	246	245	58	
4	160		6	140	0.34	2.08	408.30	109	97	245	240	62	
3	180		5	140	0.32	1.93	423.22	97	97	242	242	53	
2	200		5	146	0.27	1.45	438.85	102	97	245	242	58	
1	220		4	142	0.21	1.28	458.23	102	97	246	240	55	
END	240	12:46	4	142	0.21	1.38	463.07	102	98	245	239	46	
	240						474.895						

325.83
339.55
263.17
86.64
580.89
394.14
68.24
113.38
37.79
37.79
51.38
63.07
74.94



Moisture Recovery Form for Method 29

Plant	YCUA
Date	02/18/2010
Sampling Location	FBSSI
Run Number	3
Impinger Box Number	ORANGE m29
Recovery Person	T. Schmelter
Recovery Rinses	Filter (#1); 3x acetone (#2); 3x 0.1N HNO ₃ (100ml total) (#3); water then acetone (discard); 3x 0.1N HNO ₃ (100ml total) (#4); 3x 0.1N HNO ₃ (100 ml total) (#5a); 3x KMnO ₄ + water (100 ml total) (#5b); 8N HCl (25 ml) into 200 ml water (#5c).
Sampling Identification	FBSSI
Primary Filter Number	020110-10 QUARTZ

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	5% HNO ₃ / 10% H ₂ O ₂	100 mL	Mod	170 mL	100 mL	70 mL
2	5% HNO ₃ / 10% H ₂ O ₂	100 mL	GS	130 mL	100 mL	30 mL
3	Empty	0 mL	Mod	4.6 mL	0 mL	4.6 mL
4	Acidified KMnO ₄	100 mL	Mod	102 mL	100 mL	2 mL
5	Acidified KMnO ₄	100 mL	Mod	102 mL	100 mL	2 mL
6	Silica	~300 g	Mod	1032.6 g	998.5 g	34.1 g
7						
Total Weight Gain (g)				144.1		



Moisture Recovery Form for Method OTM-28

Plant	YCUA
Date	02/17/2010
Sampling Location	FBSSI
Run Number	RUN 1
Impinger Box Number	T-1
Recovery Person	T. Schmelter
Recovery Rinses	2 x HPLC water (#1); 1 x acetone + 2 x MeCl2 (#2); CPM Filter (#3)
Sampling Identification	FBSSI
Primary Filter Number	11
CPM Teflon Filter Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	Empty	0	Knockout	511.9	483.8	28.1
2	Empty	0	Mod	647.2	642.0	5.2
3	HPLC Water	100	Mod	744.1	739.4	4.7
4	Silica	~300	Mod	958.4	920.4	38.0
5						
6						
7						
8						
9						
10						
Total Weight Gain (g)						76

Run OTM-28

12

Date: 2/17/10

Time: 14:35

Facility

Source Designation

Operator

Filter No.

Barometric Pressure (P_b)Stack Static Pressure (P_s)

Stack Dimensions (Diameter)

Plot Tube

Meter No.

 ΔH at 0.75 cmAssumed Moisture (B_{as})

Nozzle Diameter

Leak Rate Initial

Leak Rate Final

Traverse Points

Plot Correction Factor (C_p)

Meter Correction Factor (Y)

Gas Composition

4	in
0.196	at
0.000	at
0.015	at
12	in
0.94	in
0.980	in
10	%
8	%

CO₂O₂

Comment

Plot
P.M.
0.024"
Plot
0.024"

Traverse Point	Sampling Time (minute)	Clock Time (24 hour)	Sampling Train Vacuum (in Hg)	Stack Temp. T _s (°F)	Velocity Pres. ΔP (in H ₂ O)	Orifice Differential, ΔH (in H ₂ O)	Sample Volume V _s (ft ³)	Gas Meter Temp. Inlet, T _m (°F)	Gas Meter Temp. Outlet, T _m (°F)	Probe Temperature (°F)	Fiber Box Temperature (°F)	Last Impinger Temperature (°F)	Auxiliary Temperature (°F)
1	0	14:35	2	140	0.28	0.48	249.046	108	108	238	235	65	81
2	30	14:35	2	141	0.28	0.483	257.895	111	109	238	235	68	78
3	39:15	15:14:45	2	142	0.31	0.481	265.750	114	111	237	237	67	73
4	40:35	15:35:45	2	143	0.26	0.483	274.335	115	112	237	237	61	73
5	40:00	15:55	2	142	0.26	0.483	282.676	116	113	238	237	58	76
6	49:25	16:14:15	2	142	0.25	0.483	290.880	117	113	236	237	59	73
Perf	118:25	16:33:15					348.970						
1	118:25	16:45	2	139	0.20	0.485	298.970	114	113	238	241	67	73
2	135:25	17:03:15	2	143	0.23	0.485	306.075	116	113	234	237	61	73
3	153:50	17:20:40	2	138	0.21	0.485	313.825	117	114	238	240	64	77
4	170:25	17:37:30	2	139	0.28	0.490	321.885	117	114	236	242	63	69
5	190:25	17:57:30	2	143	0.33	0.490	329.692	117	114	237	237	63	68
6	210:25	18:15:12	2	143	0.34	0.491	338.985	117	114	235	236	66	70
END	234:50	6:41:15					348.846						

East

North



BUREAU
VERITAS

Moisture Recovery Form for Method OTM-28

Plant	YCUA
Date	2/17/2010
Sampling Location	FBSSI
Run Number	Run 2
Impinger Box Number	T-1
Recovery Person	T. Schmelter
Recovery Rinses	2 x HPLC water (#1); 1 x acetone + 2 x MeCl ₂ (#2); CPM Filter (#3)
Sampling Identification	FBSSI
Primary Filter Number	020110 - 17
CPM Teflon Filter Number	02040 - 17 NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	Empty	0	Knockout	579.2	523.9	55.3
2	Empty	0	Mod	519.2	517.5	1.7
3	HPLC Water	100	Mod	714.3	715.3	-1.0
4	Silica	~300	Mod	976.5	949.8	26.7
5						
6						
7						
8						
9						
10						
Total Weight Gain (g)						82.7



Moisture Recovery Form for Method OTM-28

Plant	YCUA
Date	02/18/2010
Sampling Location	FBSSI
Run Number	3
Impinger Box Number	Orange Bucket
Recovery Person	T. Schmelter
Recovery Rinses	2 x HPLC water (#1); 1 x acetone + 2 x MeCl2 (#2); CPM Filter (#3)
Sampling Identification	FBSSI
Primary Filter Number	020110-16
CPM Teflon Filter Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	Empty	0	Knockout	570.9 522.9	522.9	47.5
2	Empty	0	Mod	653.5	648.1	5.4
3	HPLC Water	100	Mod	725.1	723.0	2.1
4	Silica	~300	Mod	1048.3	1016.0	31.4
5						
6						
7						
8						
9						
10						
Total Weight Gain (g)						86.4

02/16/10 YCUA

DAS STARTED @ 11:57:59
114524

~~CO₂~~
~~0.0~~

CHANGES

21.4 CO₂ 21.2 O₂ ALM004838
11.1 CO₂ 11.0 O₂ ALM048996

49.75 CO LL3412A
29.7 CO ALM015483
8.883 CO LL9767

On Error

CO₂ O₂ CO
0.0 0.0 0.0
21.4 21.5 21.2 21.3 49.75 49.8
11.1 11.2 11.0 11.1 29.7 29.6
8.883 8.8

FINISH @ 1206

CO₂ THROUGH SYSTEM
#6 NH 1.747 Y=0.980

1208

CO₂ O₂ CO
0.0 0.0 0.0
21.4 21.3 21.2 22.2 49.75 49.0
11.1 11.0 11.6 24.7 28.7
FINISHED 1223 8.883 8.1

FEED

CAL CO 0.1 8.883
gas DIVIDER VERIFICATION

CO₂

0.0

8.883 49.75 49.75

57.94 0.229

49.75 #1 #2 #3 20 S
25.2 12.6 12.4 12.4 20
30.2 12.0 14.9 14.9 20
50.2 24.6 25.0 24.9 20
60.2 29.6 29.8 29.7 20
80.2 39.9 39.9 39.5 20
29.7 28.1 29.7

At the end

02/17/2010 YCUA

START DAS 72106

Direct Cal - Cal Error

CO	O ₂	CO ₂
0.70.0	0.70.1	0.70.0
8.88678.9	21.2721.3	21.4721.4
4.474.6	11.0711.1	11.1711.1

System Cal - System Bias

744

CO	O ₂	CO ₂
0.70.1	0.70.1	0.70.0
8.88678.9	21.2721.4	21.4721.2
4.474.5	11.0711.5	11.1711.0

TEST 1 STARTED @ 9:00 AM

Post Cal @ 1331

CO	O ₂	CO ₂
0.70.1	0.70.2	0.70.0
4.474.3	11.0711.3	11.1711.0

CAL complete @ 1338

TEST #2 STARTED 1435

POST TEST 2 CALIBRATION

CO	O ₂	CO ₂
0.70.0	0.70.1	0.70.1
4.474.5	11.0711.2	11.1711.2

CAL good complete @ 6:58

14-4-12

02/18/2010 YCUA 700A

CALIBRATION ERROR - DIRECT 70425

CO	O ₂	CO ₂
0 → 0.0	0 → 0.0	0 → 0.0
8.886 → 8.9	21.2 → 21.3	21.4 → 21.4
4.4 → 4.5	11.0 → 11.1	11.1 → 11.1

SYSTEM GAS 722

CO	O ₂	CO ₂
0 → 0.2	0 → 0.2	0 → 0.0
4.4 → 4.6	11.0 → 11.4	11.1 → 11.0

Run 3 START 815

POWER LOSS 1103-1123

5, 6, 9, 8, 7, 10 W 02010

1st TEST CALIBRATION 1251

CO	O ₂	CO ₂
0 → 0.1	0 → 0.2	0 → 0.0
4.4 → 4.5	11.0 → 11.4	11.1 → 11.0

At the line

EU-FBSSI Exhaust Carbon Monoxide Emissions Results
Ypsilanti Community Utilities Authority
Ypsilanti, Michigan
Bureau Veritas Project No. 11010-000036.00
Sampling Date: February 17 and 18, 2010

Parameter	Run 1	Run 2	Run 3	Average
Test Date	2/17/10	2/17/10	2/18/10	
Test Start Time	9:00	14:35	8:15	
EU-FBSSI Outlet Oxygen Content (%)	7.8	8.4	9.7	
EU-FBSSI Outlet Gas Stream Volumetric Flowrate (dscfm)	16,114	15,263	15,020	15,466
EU-FBSSI Outlet CO Concentration (ppmvd CO)	1.9	2.0	2.0	2.0
Pre-test system calibration, zero gas (Co)	0.1	0.1	0.2	0.1
Post-test system calibration, zero gas (Co)	0.1	0.0	0.1	0.1
Certified mid gas concentration (Cma)	4.4	4.4	4.4	4.4
Pre-test system calibration, mid gas (Cm)	4.5	4.3	4.6	4.5
Post-test system calibration, mid gas (Cm)	4.3	4.5	4.5	4.4
Corrected CO Concentration (ppmvd CO)	1.8	2.0	1.9	1.9
EU-FBSSI CO Mass Emission Rate (lb/hr, CO)	0.2	0.2	0.2	0.2
EU-FBSSI Outlet CO Concentration (ppmvd CO @ 7% O ₂)	2.0	2.2	2.3	2.1

CO : carbon monoxide
ppmvd : part per million, volume to volume basis, dry

EPA
VISIBLE EMISSION OBSERVATION FORM 1

Method Used (Circle One)
 Method 9 203A 203B Other: _____

Company Name: Ypsilanti Community Utilities Authority
 Facility Name: Wastewater Treatment Plant
 Street Address: 2777 State Road
 City: Ypsilanti State: Michigan Zip: 48198

Process: Incinerator Unit #: 001 Operating Mode: Operator
 Control Equipment: Venturi, Impingement, WESP, GAC Operating Mode: _____

Describe Emission Point:
Incinerator Stack 109' above ground elevation

Height of Emiss. Pt. Start: _____ End: _____ Height of Emiss. Pt. Rel. to Observer Start: _____ End: _____
 Distance to Emiss. Pt. Start: _____ End: _____ Direction to Emiss. Pt. (Degrees) Start: _____ End: _____

Vertical Angle to Obs. Pt. Start: _____ End: _____ Direction to Obs. Pt. (Degrees) Start: _____ End: _____
 Distance and Direction to Observation Point from Emission Point Start: _____ End: _____

Describe Emissions
 Start: Clear End: Clear
 Emission Color: _____ Water Droplet Plume: _____
 Start: Clear End: _____ Attached ☐ Detached ☐ None ☒

Describe Plume Background
 Start: Overcast End: Overcast
 Background Color: _____ Sky Conditions: _____
 Start: Grey End: Grey Start: Grey End: Grey
 Wind Speed: _____ Wind Direction: _____
 Start: 9 mph End: 9 mph Start: WNW End: WNW
 Ambient Temp.: _____ Wet Bulb Temp.: _____ RH Percent: _____

Source Layout Sketch

Draw North Arrow ☐ TN ☐ MN

Observer's Position

Observation Point

Sun Location Line

140°

25 FEET

75 FEET

Side View

Stack with Plume

Sun

Wind

Longitude: _____ Latitude: _____ Declination: _____

Additional Information

Form Number _____ Page _____ Of _____
 Continued on VEO Form Number _____

Observation Date: Feb. 17, 2010 Time Zone: _____ Start Time: 10:56 AM End Time: 11:02 AM

Sec	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7					
8					
9					
10					
11					
12					
13					
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17					
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23					
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25					
26					
27					
28					
29					
30					

Observer's Name (Print): ALAN C. Schack
 Observer's Signature: Alan C. Schack Date: Feb. 17, 2010
 Organization: YCA
 Certified By: _____ Date: _____

EPA VISIBLE EMISSION OBSERVATION FORM 1

Method Used (Circle One) Method 9 203A 203B Other: _____

Company Name Ypsilanti Community Utilities Authority
 Facility Name Wastewater Treatment Plant
 Street Address 2777 State Road
 City Ypsilanti State Michigan Zip 48198

Process Incinerator Unit # 001 Operating Mode Operator
 Control Equipment Venturi, Impingement, WESP, GAC Operating Mode _____

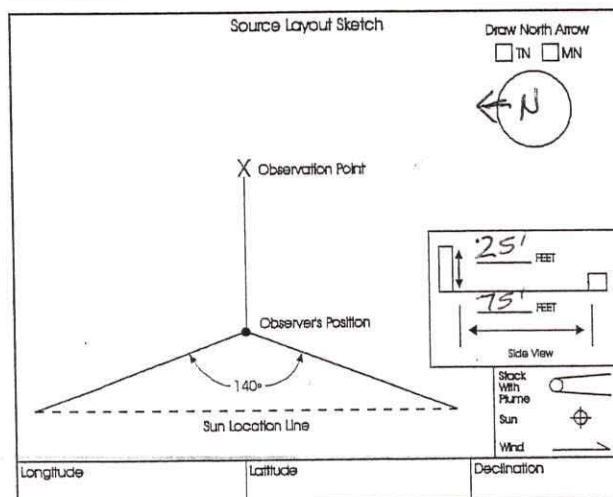
Describe Emission Point
Incinerator Stack 109' above ground elevation

Height of Emiss. Pt. _____ Height of Emiss. Pt. Rel. to Observer _____
 Start _____ End _____ Start _____ End _____
 Distance to Emiss. Pt. _____ Direction to Emiss. Pt. (Degrees) _____
 Start _____ End _____ Start _____ End _____

Vertical Angle to Obs. Pt. _____ Direction to Obs. Pt. (Degrees) _____
 Start _____ End _____ Start _____ End _____
 Distance and Direction to Observation Point from Emission Point _____
 Start _____ End _____

Describe Emissions
 Start Clear End Clear?
 Emission Color _____ Water Droplet Plume _____
 Start Clear End _____ Attached ☐ Detached ☐ None ☐

Describe Plume Background
 Start Overcast End Overcast
 Background Color _____ Sky Conditions _____
 Start Grey End _____ Start Grey End _____
 Wind Speed 10 mph End _____ Wind Direction WNW End _____
 Ambient Temp. _____ Wet Bulb Temp. _____ RH Percent _____
 Start _____ End _____



Additional Information _____

Form Number _____ Page _____ Of _____
 Continued on VEO Form Number _____

Observation Date		Time Zone				Start Time	End Time	Comments
Sec	Min	0	15	30	45			
1	0	0	0	0	0			
2	0	0	0	0	0			
3	0	0	0	0	0			
4	0	0	0	0	0			
5	0	0	0	0	0			
6	0	0	0	0	0			
7								
8								
9								
10								
11								
12								
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26								
27								
28								
29								
30								

Observer's Name (Print) Alan C. Schack
 Observer's Signature Alan C. Schack Date 2-17-2000
 Organization YCUA
 Certified By _____ Date _____

2nd run

EPA VISIBLE EMISSION OBSERVATION FORM 1

Method Used (Circle One) Method 9 203A 203B Other: _____

Company Name Ypsilanti Community Utilities Authority
 Facility Name Wastewater Treatment Plant
 Street Address 2777 State Road
 City Ypsilanti State Michigan Zip 48198

Process Incinerator Unit # 001 Operating Mode Operator
 Control Equipment Venturi, Impingement, WESP, GAC Operating Mode _____

Describe Emission Point
Incinerator Stack 109' above ground elevation
 Height of Emiss. Pt. _____
 Start _____ End _____
 Distance to Emiss. Pt. _____
 Start _____ End _____

Vertical Angle to Obs. Pt. _____
 Start _____ End _____
 Distance and Direction to Observation Point from Emission Point
 Start _____ End _____

Describe Emissions
 Start clear End _____
 Emission Color _____
 Start clear End _____
 Water Droplet Plume Attached ☐ Detached ☐ None ☒

Describe Plume Background
 Start _____ End _____
 Background Color Blue sky Sky Conditions partly cloudy
 Start 13 mph End _____
 Wind Speed _____
 Start WNW End _____
 Wind Direction _____
 Ambient Temp. _____
 Wet Bulb Temp. _____
 RH Percent _____

Source Layout Sketch

Draw North Arrow
☐ TN ☐ MN

Observer's Position

Observation Point

Sun Location Line

140°

25' FEET

75' FEET

Side View

Stack with Plume

Sun

Wind

Longitude _____ Latitude _____ Declination _____

Additional Information

Form Number _____ Page _____ Of _____
 Continued on VEO Form Number _____

Observation Date		Time Zone				Start Time	End Time
2-18-2010						9:31 AM	9:37 AM
Sec	0	15	30	45	Comments		
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			
5	0	0	0	0			
6	0	0	0	0			
7							
8							
9							
10							
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28							
29							
30							

Observer's Name (Print) ALAN C. Schork
 Observer's Signature Alan C. Schork Date 2-18-10
 Organization YCUA
 Certified By _____ Date _____

ATTACHMENT 11

Moisture Recovery

Included with Run Field Data Sheets

ATTACHMENT 12

Lab Data

First Analytical Laboratories

ANALYSIS REPORT

Method 29: Multi-metals

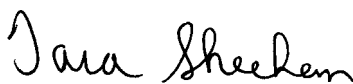
Method 5: Particulate Weight

Project # 11010.000036.00.000

Prepared for:

Bureau Veritas North America, Inc.
45525 Grand River Avenue; Suite 200
Novi, MI 48374

Reviewed and Approved by:



Tara Sheehan
Laboratory Manager

March 12, 2010

*Do not reproduce this report except in whole without permission of the laboratory.
This report meets the requirements of LAC33/NELAP.*

First Analytical Laboratories

CASE NARRATIVE

Project #: 100211

Report Date: 12-Mar-10

Client: Bureau Veritas North America, Inc.

Client Project ID: 11010.000036.00.000

Samples:

Four sets of Method 29 samples were submitted, one of which was the blank set. The target elements were antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, phosphorus, selenium, nickel, and mercury. Particulate weight was also determined. Also submitted were a multi-metals spiked audit filter and a multi-metals spiked audit solution for analysis. The samples were received in good condition with no apparent leakage or damage, and custody seals intact. All of the remaining amounts of the samples and digestates will be retained by the laboratory for six months and then discarded.

Preparation:

The samples were prepared and analyzed according to EPA Method 29, *Determination of Metals Emissions from Stationary Sources*. The front and back halves were analyzed separately. The results for determination of Particulate Matter were determined gravimetrically according to the method. The audits were prepared and analyzed according to the directions submitted.

Analysis:

Antimony, arsenic, cadmium, lead, were determined by Graphite Furnace Atomic Absorption Spectrophotometry (GFAA). Antimony, chromium, manganese, nickel and phosphorus were determined by Inductively Coupled Plasma – Optical Emission Spectrometry. Mercury was determined by Cold Vapor Atomic Absorption Spectrophotometry (CVAA). Beryllium, cobalt, and selenium were determined by Inductively Coupled Plasma – Mass Spectrometry (ICP/MS).

Results:

The metals results are presented as total micrograms of each element present in the whole analytical fraction indicated. Antimony was not detected in any of the runs. All other elements of interest were measurable in all of the runs. Mercury was measurable in two of the three runs. The highest levels found were for phosphorus at about 467 µg to 493 µg in the front halves.

The particulate weights ranged from about 0.1 mg to about 4.1 mg.

Quality Control:

A small amount of manganese was found in the blank. The level was not significant compared to the sample level. Beryllium, chromium, cobalt, nickel, and phosphorus should be blank corrected by the user, since the blank level is significant compared to the sample level. All other elements were not detected in the blank. The spike recoveries were within the normal range of 75% to 125%. All of the samples were analyzed at least in duplicate.

The passing results for the audit samples are presented on the calculation worksheets and on the forms provided by the client.



FIRST ANALYTICAL LABORATORIES

billing: PO Box 110372 - Research Triangle Park, NC 27709
shipping: 11624-C US Highway 15-501 N - Chapel Hill, NC 27517

TEL: 919 942 8607
FAX: 919 882 1603
www.firstanalyticallabs.com

ANALYSIS REPORT

Project #: 100211
Client: Bureau Veritas North America, Inc.
Client Project ID: 11010.000036.00.000

Report Date: 04-Mar-10
Date Received: 22-Feb-10

PARTICULATE MATTER WEIGHT Method 5

Container 1 (Filter)

Sample ID Client	Tare Weight g	Final Weight g	Particulate Weight mg
Blank	0.7820	0.7833	1.3
Run 1	0.7812	0.7830	1.8
Run 2	0.7808	0.7849	4.1
Run 3	0.7833	0.7862	2.9

Container 2 (Acetone Rinse)

Sample ID Client	Tare Weight g	Final Weight g	Particulate Weight mg	Sample Volume ml
Blank	10.1464	10.1465	0.1	98
Run 1	10.1277	10.1283	0.6	73
Run 2	9.8298	9.8301	0.3	86
Run 3	10.1391	10.1403	1.2	81



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www.firstanalyticallabs.com

ANALYSIS REPORT

Project #: 100211

Client: Bureau Veritas North America, Inc.

Client Project ID: 11010.000036.00.000

Report Date: 11-Mar-10

Date Received: 22-Feb-10

Total Micrograms in Sample

Sample	Sb μg	As μg	Be μg	Cd μg	Cr μg	Co μg
Blank Front	< 1.0	< 0.5	0.014	< 0.02	3.0	0.70
Blank Back	< 2.0	< 1.0	< 0.02	< 0.04	< 1.0	< 0.02
Run 1 Front	< 1.0	3.5	0.022	0.30	4.7	1.53
Run 1 Back	< 1.3	< 0.7	< 0.01	0.04	0.8	0.13
Run 2 Front	< 1.0	3.0	0.017	0.12	6.5	1.06
Run 2 Back	< 1.3	1.5	< 0.01	0.03	1.0	0.11
Run 3 Front	< 1.0	2.9	0.015	0.03	8.4	1.01
Run 3 Back	< 1.3	1.0	< 0.01	0.07	1.0	0.05

Q C SUMMARY

Spike, %Rec. Front	82%	97%	104%	86%
Spike, %Rec. Back	MSA	80%	99%	77%
Dup, %RPD Front	NA	NA	NA	3%
Dup, %RPD Back	NA	NA	NA	NA



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www.firstanalyticallabs.com

ANALYSIS REPORT

Project #: 100211

Client: Bureau Veritas North America, Inc.

Client Project ID: 11010.000036.00.000

Report Date: 11-Mar-10

Date Received: 22-Feb-10

Total Micrograms in Sample

Sample	Pb μg	Mn μg	Ni μg	P μg	Se μg
Blank Front	< 0.5	2.2	3.1	379	< 1.0
Blank Back	< 1.0	< 0.4	< 0.6	19.9	< 2.0
Run 1 Front	1.1	269	9.2	470	1.3
Run 1 Back	< 1.3	15.3	< 0.4	27.9	18.4
Run 2 Front	1.6	141	15.4	467	1.6
Run 2 Back	< 0.7	0.6	0.5	22.1	12.3
Run 3 Front	0.7	142	4.7	493	2.2
Run 3 Back	< 0.7	1.0	0.6	20.6	16.7

Q C S U M M A R Y

Spike, %Rec. Front	106%	101%	101%	80%
Spike, %Rec. Back	90%	76%	80%	75%
Dup, %RPD Front	NA	4%	3%	0.1%
Dup, %RPD Back	NA	NA	NA	NA



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TEL: 919 942 8607
FAX: 919 882 1603
www.firstanalyticallabs.com

ANALYSIS REPORT

Project #: 100211

Client: Bureau Veritas North America, Inc.

Client Project ID: 11010.000036.00.000

Report Date: 25-Feb-10

Date Received: 22-Feb-10

Total Micrograms of Mercury in Sample

Sample	Frac 1 μg	Frac2B μg	Frac3A μg	Frac3B μg	Frac3C μg	Total μg
YCVA-Blank-M29	< 0.40	< 0.82	< 0.20	< 0.09	< 1.02	< 2.53
YCVA-Run 1-M29	< 0.40	< 1.64	< 0.21	< 0.39	1.55	1.55
YCVA-Run 2-M29	< 0.40	< 1.68	< 0.20	0.52	< 1.03	0.52
YCVA-Run 3-M29	< 0.40	< 1.60	< 0.21	< 0.39	< 1.01	< 3.61

QC SUMMARY

Back Spike, %Recov. 99%

ANTIMONY
GFAA/ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 10 µg/L

Proj. #: 100211

Postdig'n spike conc. = 100 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	-0.3	-0.3	100	1		<	1.0
Run 1	100211.1-1	-0.1	-0.1	100	1		<	1.0
Run 2	100211.2-1	-0.4	-0.4	100	1		<	1.0
Run 3	100211.3-1	-0.5	-0.5	100	1		<	1.0
BACK HALVES								
Blank	100211.B-2A	-0.9	-0.9	100	1	204	104	< 2.0
Run 1	100211.1-2A	-5.5	-5.5	100	1	411	311	< 1.3
Run 2	100211.2-2A	-13.4	-13.4	100	1	419	319	< 1.3
Run 3	100211.3-2A	-8.5	-8.5	100	1	399	299	< 1.3
FRONT SPIKE	100211.1-1S	82.1				% REC =	82.1%	
BACK SPIKE	100211.1-2AS	MSA				% REC =	MSA	
Fil-6072 Blank		-0.8	-0.8	100	1		<	1.0
Fil-6072		269.4	269.4	100	1			26.9
								Total
								µg/ml
AM-1738		827.3	827.3	150	1			0.827

ARSENIC

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 5 µg/L

Proj. #: 100211

Postdig'n spike conc. = 100 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	0.0	0.0	100	1		<	0.5
Run 1	100211.1-1	35.2	35.2	100	1			3.5
Run 2	100211.2-1	30.2	30.2	100	1			3.0
Run 3	100211.3-1	29.5	29.5	100	1			2.9
BACK HALVES								
Blank	100211.B-2A	-0.2	-0.2	100	1	204	104	< 1.0
Run 1	100211.1-2A	-2.2	-2.2	100	1	411	311	< 0.7
Run 2	100211.2-2A	11.4	11.4	100	1	419	319	1.5
Run 3	100211.3-2A	7.8	7.8	100	1	399	299	1.0
FRONT SPIKE	100211.1-1S	132.2				% REC =	97.1%	
BACK SPIKE	100211.1-2AS	79.6				% REC =	79.6%	
Fil-6072 Blank		1.6	1.6	100	1		<	0.5
Fil-6072		93.3	466.5	100	5			46.7
								Total
								µg/ml
AM-1738		156.2	1562.0	150	10			1.56

B E R Y L L I U M*
ICP/MS ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 0.1 µg/L

Proj. #: 100211

Date: 11-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	0.140	0.14	100	1			0.014
Run 1	100211.1-1	0.219	0.22	100	1			0.022
Run 2	100211.2-1	0.168	0.17	100	1			0.017
Run 3	100211.3-1	0.153	0.15	100	1			0.015
BACK HALVES								
Blank	100211.B-2A	0.024	0.02	100	1	204	104	< 0.020
Run 1	100211.1-2A	0.023	0.02	100	1	411	311	< 0.013
Run 2	100211.2-2A	0.011	0.01	100	1	419	319	< 0.013
Run 3	100211.3-2A	0.022	0.02	100	1	399	299	< 0.013
* Tested by a subcontractor								
Fil-6072 Blank		0.0	0.0	100	1			< 0.01
Fil-6072		9.0	179.6	100	20			18.0
								Total
								µg/ml
AM-1738		6.6	656.7	150	100			0.657

C A D M I U M
GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 0.2 µg/L

Proj. #: 100211

Postdig'n spike conc. = 5.0 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	-0.01	-0.01	100	1		<	0.02
Run 1	100211.1-1	3.03	3.03	100	1			0.30
Run 2	100211.2-1	1.19	1.19	100	1			0.12
Run 3	100211.3-1	0.25	0.25	100	1			0.03
BACK HALVES								
Blank	100211.B-2A	0.00	0.00	100	1	204	104	< 0.04
Run 1	100211.1-2A	0.32	0.32	100	1	411	311	0.04
Run 2	100211.2-2A	0.24	0.24	100	1	419	319	0.03
Run 3	100211.3-2A	0.50	0.50	100	1	399	299	0.07
FRONT SPIKE	100211.1-1S	8.21				% REC = 103.7%		
BACK SPIKE	100211.1-2AS	5.26				% REC = 98.7%		

C H R O M I U M

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 5 µg/L

Proj. #: 100211

Postdig'n spike conc. = 1000 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	29.5	29.5	100	1			2.95
Run 1	100211.1-1	47.3	47.3	100	1			4.73
Run 2	100211.2-1	65.0	65.0	100	1			6.50
Run 3	100211.3-1	84.3	84.3	100	1			8.43
BACK HALVES								
Blank	100211.B-2A	3.1	3.1	100	1	204	104	< 0.98
Run 1	100211.1-2A	5.9	5.9	100	1	411	311	0.78
Run 2	100211.2-2A	7.8	7.8	100	1	419	319	1.02
Run 3	100211.3-2A	7.3	7.3	100	1	399	299	0.97
FRONT SPIKE	100211.1-1S	910.3				% REC =	86.3%	
BACK SPIKE	100211.1-2AS	774.0				% REC =	76.8%	
FRONT DUP	100211.2-1D	66.8				RPD =	2.7%	
BACK DUP	100211.2-2AD	7.3				RPD =	NA	
Fil-6072 Blank		29.9	29.9	100	1			3.0
Fil-6072		382.7	382.7	100	1			38.3
								Total
								µg/ml
AM-1738		1170.0	1170.0	150	1			1.17

COBALT*
ICP/MS ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 0.1 µg/L

Proj. #: 100211

Date: 10-Mar-10

Sample ID		Test	Dig'te	Dil'n		Total	Volume		
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total	
		µg/L	µg/L	ml			ml	ml	µg
FRONT HALVES									
Blank	100211.B-1	7.0	7.0	100	1				0.70
Run 1	100211.1-1	15.3	15.3	100	1				1.53
Run 2	100211.2-1	10.6	10.6	100	1				1.06
Run 3	100211.3-1	10.1	10.1	100	1				1.01
BACK HALVES									
Blank	100211.B-2A	0.1	0.1	100	1	204	104	<	0.02
Run 1	100211.1-2A	1.0	1.0	100	1	411	311		0.13
Run 2	100211.2-2A	0.8	0.8	100	1	419	319		0.11
Run 3	100211.3-2A	0.4	0.4	100	1	399	299		0.05

* Tested by a subcontractor

Fil-6072 Blank	-23.1	-23.1	100	1			<	0.0
Fil-6072	134.2	134.2	100	1				13.4

LEAD
GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 5 µg/L

Proj. #: 100211

Postdig'n spike conc. = 100 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	4.3	4.3	100	1		<	0.5
Run 1	100211.1-1	11.4	11.4	100	1			1.1
Run 2	100211.2-1	16.4	16.4	100	1			1.6
Run 3	100211.3-1	7.1	7.1	100	1			0.7
BACK HALVES								
Blank	100211.B-2A	0.1	0.1	100	1	204	104	< 1.0
Run 1	100211.1-2A	1.4	2.9	100	2	411	311	< 1.3
Run 2	100211.2-2A	2.2	2.2	100	1	419	319	< 0.7
Run 3	100211.3-2A	-0.9	-0.9	100	1	399	299	< 0.7
FRONT SPIKE	100211.1-1S	117.0				% REC = 105.6%		
BACK SPIKE	100211.1-2AS	89.9				% REC = 89.9%		

M A N G A N E S E

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 2 µg/L

Proj. #: 100211

Postdig'n spike conc. = 1000 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	21.8	21.8	100	1			2.2
Run 1	100211.1-1	538.2	2691.1	100	5			269.1
Run 2	100211.2-1	1405.5	1405.5	100	1			140.6
Run 3	100211.3-1	1424.5	1424.5	100	1			142.4
BACK HALVES								
Blank	100211.B-2A	1.4	1.4	100	1	204	104	< 0.4
Run 1	100211.1-2A	116.0	116.0	100	1	411	311	15.3
Run 2	100211.2-2A	4.5	4.5	100	1	419	319	0.6
Run 3	100211.3-2A	7.8	7.8	100	1	399	299	1.0
FRONT SPIKE	100211.1-1S	1547.1				% REC = 100.9%		
BACK SPIKE	100211.1-2AS	873.1				% REC = 75.7%		
FRONT DUP	100211.2-1D	1458.6				RPD = 3.7%		
BACK DUP	100211.2-2AD	4.7				RPD = NA		
Fil-6072 Blank		13.4	13.4	100	1			1.3
Fil-6072		286.7	286.7	100	1			28.7
								Total
								µg/ml
AM-1738		911.4	911.4	150	1			0.911

N I C K E L

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 3 µg/L

Proj. #: 100211

Postdig'n spike conc. = 1000 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	31.1	31.1	100	1			3.1
Run 1	100211.1-1	92.3	92.3	100	1			9.2
Run 2	100211.2-1	154.3	154.3	100	1			15.4
Run 3	100211.3-1	47.3	47.3	100	1			4.7
BACK HALVES								
Blank	100211.B-2A	-0.3	-0.3	100	1	204	104	< 0.59
Run 1	100211.1-2A	2.0	2.0	100	1	411	311	< 0.40
Run 2	100211.2-2A	4.0	4.0	100	1	419	319	0.52
Run 3	100211.3-2A	4.3	4.3	100	1	399	299	0.58
FRONT SPIKE	100211.1-1S	1099.1				% REC = 100.7%		
BACK SPIKE	100211.1-2AS	800.4				% REC = 80.0%		
FRONT DUP	100211.2-1D	159.4				RPD = 3.2%		
BACK DUP	100211.2-2AD	4.2				RPD = NA		
Fil-6072 Blank		14.3	14.3	100	1			1.4
Fil-6072		717.1	717.1	100	1			71.7
								Total
								µg/ml
AM-1738		1096.7	2193.4	150	2			2.19

P H O S P H O R U S

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 100 µg/L

Proj. #: 100211

Postdig'n spike conc. = 5000 µg/L

Date: 04-Mar-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume		
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd
		µg/L	µg/L	ml		ml	ml
FRONT HALVES							
Blank	100211.B-1	3786.4	3786.4	100	1		378.6
Run 1	100211.1-1	4698.8	4698.8	100	1		469.9
Run 2	100211.2-1	4673.7	4673.7	100	1		467.4
Run 3	100211.3-1	4924.6	4924.6	100	1		492.5
BACK HALVES							
Blank	100211.B-2A	101.6	101.6	100	1	204	104
Run 1	100211.1-2A	105.7	211.4	100	2	411	311
Run 2	100211.2-2A	168.2	168.2	100	1	419	319
Run 3	100211.3-2A	154.2	154.2	100	1	399	299
FRONT SPIKE	100211.1-1S	8717.2				% REC =	80.4%
BACK SPIKE	100211.1-2AS	3842.0				% REC =	74.7%
FRONT DUP	100211.2-1D	4668.2				RPD =	0.1%
BACK DUP	100211.2-2AD	182.9				RPD =	NA

SELENIUM*
ICP/MS ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 10 µg/L

Proj. #: 100211

Date: 10-Mar-10

Sample ID		Test	Dig'te	Dil'n	Total	Volume		
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	-5.7	-5.7	100	1		<	1.0
Run 1	100211.1-1	13.0	13.0	100	1			1.3
Run 2	100211.2-1	16.4	16.4	100	1			1.6
Run 3	100211.3-1	21.8	21.8	100	1			2.2
BACK HALVES								
Blank	100211.B-2A	1.8	1.8	100	1	204	104	< 2.0
Run 1	100211.1-2A	139.0	139.0	100	1	411	311	18.4
Run 2	100211.2-2A	93.5	93.5	100	1	419	319	12.3
Run 3	100211.3-2A	125.2	125.2	100	1	399	299	16.7
* Tested by a subcontractor								
Fil-6072 Blank		3.5	3.5	100	1		<	1.0
Fil-6072		59.6	298.2	100	5			29.8
								Total
								µg/ml
AM-1738		96.7	966.5	150	10			0.967

M E R C U R Y

CVAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Bureau Veritas North America, Inc.

MDL = 0.20 µg/L

Proj. #: 100211

Postdig'n spike conc. = 5.00 µg/L

Date: 25-Feb-10

Sample ID	Test	Dig'te	Dil'n	Total	Volume			
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Dig'd	Total
		µg/L	µg/L	ml		ml	ml	µg
FRONT HALVES								
Blank	100211.B-1	-0.04	-0.04	100	1	100	5	< 0.40
Run 1	100211.1-1	-0.02	-0.02	100	1	100	5	< 0.40
Run 2	100211.2-1	0.00	0.00	100	1	100	5	< 0.40
Run 3	100211.3-1	-0.04	-0.04	100	1	100	5	< 0.40
FRACTIONS 2B								
Blank	100211.B-2B	-0.04	-0.04	100	1	204	5	< 0.82
Run 1	100211.1-2B	-0.02	-0.02	100	1	411	5	< 1.64
Run 2	100211.2-2B	-0.01	-0.01	100	1	419	5	< 1.68
Run 3	100211.3-2B	0.02	0.02	100	1	399	5	< 1.60
BACK SPIKE	100211.1-2BS	4.97				% REC =	99.3%	
FRACTIONS 3A								
Blank	100211.B-3A	-0.02	-0.02	100	1	100	10	< 0.20
Run 1	100211.1-3A	-0.03	-0.03	100	1	103	10	< 0.21
Run 2	100211.2-3A	-0.02	-0.02	100	1	102	10	< 0.20
Run 3	100211.3-3A	0.01	0.01	100	1	104	10	< 0.21
FRACTIONS 3B								
Blank	100211.B-3B	-0.02	-0.02	100	1	92	20	< 0.09
Run 1	100211.1-3B	-0.01	-0.01	100	1	385	20	< 0.39
Run 2	100211.2-3B	0.28	0.28	100	1	379	20	0.52
Run 3	100211.3-3B	0.19	0.19	100	1	385	20	< 0.39
FRACTIONS 3C								
Blank	100211.B-3C	-0.03	-0.03	100	1	255	5	< 1.02
Run 1	100211.1-3C	0.30	0.30	100	1	255	5	1.55
Run 2	100211.2-3C	0.16	0.16	100	1	258	5	< 1.03
Run 3	100211.3-3C	-0.02	-0.02	100	1	252	5	< 1.01

MERCURY

QUALITY CONTROL DATA

Client: Bureau Veritas North America, Inc.

Proj. #: 100211

Date: 25-Feb-10

Calibration Data

	True conc., $\mu\text{g/L}$	Abs.
Blank	0.00	0.000
Standard 1	0.50	0.013
Standard 2	1.00	0.026
Standard 3	2.00	0.056
Standard 4	5.00	0.140
Standard 5	10.00	0.278

Calibration Verifications

ICV = 5	5.17
ICB = 0	-0.04
CCV1 = 5	4.86
CCB1 = 0	-0.03
CCV2 = 5	5.04
CCB2 = 0	-0.04
CCV3 = 5	4.93
CCB3 = 0	-0.04
CCV4 = 5	4.91
CCB4 = 0	-0.01
CCV5 = 5	4.86
CCB5 = 0	-0.03

100211

Method 29 Audit Material (Multi-Metals Spiked Filter)

REPORTING FORM: To be completed by laboratory

Request Number/Sample Number: M29-4406-01/Fil-6072 Date Issued: 02/08/10

Auditee:

Company: First Analytical Labs
 Address: 11624-C US Hwy 15-501N Chapel Hill NC 27517
 Attention of: Tara Sheehan Phone: 919-942-8607

Requestor:

Agency: Michigan DEQ-Air Quality Division
 Address: 525 W. Allegan St., 3rd Floor North, Lansing, MI 48933
 Attention of: Jon Wilford Phone: 517-335-4866

Project Name: Ypsilanti Utilities Authority

Audit Results (Results in μg)

<u>Analyte</u>	<u>Audit Sample Result</u>	<u>Blank Filter Result</u>
Antimony	<u>26.9</u>	<u>< 1.0</u>
Arsenic	<u>46.7</u>	<u>< 0.5</u>
Beryllium	<u>18.0</u>	<u>< 0.02</u>
Chromium	<u>38.3</u>	<u>3.0</u>
Cobalt	<u>13.4</u>	<u>< 1.0</u>
Manganese	<u>28.7</u>	<u>1.3</u>
Nickel	<u>71.7</u>	<u>1.4</u>
Selenium	<u>29.8</u>	<u>< 1.0</u>

INSTRUCTIONS FOR PREPARATION AND ANALYSIS OF METHOD 29 MULTI-METALS AUDIT FILTER

Note: The audit filter you received is spiked with known amounts of multiple metals. This audit sample corresponds to the sample filter referenced in Section 8.3.1 of Method 29.

To prepare and analyze each audit sample, follow the steps below.

- 1) Prepare the entire filter for digestion as described in Section 8.3.1.2 of Method 29. Be sure to digest the entire filter. Label the digested filter portion as Sample Fraction No. 1. (**Note:** Because the audit sample consists only of a filter, there is no acid-digested probe rinse as discussed in the final sentence of Section 8.3.1.2 of Method 29. Process the acid-digested filter portion by itself.)
- 2) Filter the acid digested portion (Sample Fraction No. 1) using Whatman 541 filter paper.
- 3) Dilute the filtrate with water to 100 - 300 mL volume (or to the appropriate volume for the expected metals concentrations) and label as Analytical Fraction No. 1A. (**Note:** There is no Hg Analytical Fraction 1B.)
- 4) Measure and record the diluted volume of Analytical Fraction No. 1A to within 0.1 mL. (**Note:** If an aqueous multi-metal audit sample is available, it will become impinger Analytical Fraction No. 2A.)
- 5) Analyze Analytical Fraction No. 1A as described in Section 11.1.1 or 11.1.2 of Method 29 for the target metals listed on the attached Method 29 Filter Audit **Reporting Form**.
- 6) Calculate the total μg of each target metal in the filter sample using the following equation.

$$m_{\mu\text{g}} = Ca_1 V_{\text{soln},1}$$

where

$m_{\mu\text{g}}$	=	mass of target metal (μg)
Ca_1	=	Concentration of target metal in <u>Analytical Fraction No. 1A</u> ($\mu\text{g/mL}$)
$V_{\text{soln},1}$	=	Volume of diluted sample (mL of <u>Analytical Fraction No. 1A</u>)

- 7) Record the total mass results on the Method 29 multi-metal filter **Reporting Form** in total μg for each target metal listed.
- 8) Report the Method 29 Filter Audit results recorded on the **Reporting Form** to the designated agent.

Analyst, Please Note:

In addition to the spiked multi-metals filter, you have been provided with a blank filter that has been treated identically to the audit filter (except for the metals spike). The background results from the blank filter are to be used for quality assurance documentation purposes only and **not** to adjust the spiked filter results. You are asked to report the blank filter metals results (μg) on the **Reporting Form** along with the spiked filter results.

Lab:
Call or email
Jon Wilford
wilfordj@Michigan.gov
to check results

100211

**Method 29 Audit Material
(Multi-Metals Spiked Solution)**

REPORTING FORM: To be completed by laboratory

Request Number/Sample Number: M29-4406-02/AM-1738 Date Issued: 02/08/10

Auditee:

Company: FIRST ANALYTICAL LABORATORIES
Address: 11624-C US Hwy 15-501N Chapel Hill NC 27517
Attention of: TARA Sheehan Phone: 919-942-8607

Requestor:

Agency: Michigan DEQ-Air Quality Division
Address: 525 W. Allegan St., 3rd Floor North, Lansing, MI 48933
Attention of: Jon Wilford Phone: 517-335-4866

Project Name: Ypsilanti Utilities Authority

Audit Results (Results in $\mu\text{g/mL}$)

Analyte	Result
Antimony	0.827
Arsenic	1.56
Beryllium	0.657
Chromium	1.17
Manganese	0.911
Nickel	2.19
Selenium	0.967

✓ CONTACT JON
WILFORD AT
517-335-4866
WITH RESULTS OF AUDIT
SAMPLE AS SOON AS
THEY ARE AVAILABLE
AND PRIOR TO ISSUING
FINAL REPORT. ✓
QUESTIONS? CALL THOMAS
SCHMELTER 248-388-1525

INSTRUCTIONS FOR PREPARATION AND ANALYSIS OF METHOD 29 MULTI-METALS AUDIT SOLUTION

The ampule you received contains approximately 23 mL of an aqueous solution that is 2% nitric acid by volume and has been spiked with various metals. To prepare and analyze each multi-metal audit sample solution, follow the steps below.

- 1) Wrap a paper towel around the ampule, and with the ampule in an upright position, break off the top at the pre-scored mark by exerting pressure sideways.
- 2) From the ampule, pipette exactly 20 mL of the audit sample into a 250-mL beaker. Add 100 mL of 0.1N HNO₃ to the beaker and label the sample "Sample Fraction 2A". Evaporate the sample to 20 mL on a steam bath as directed in Section 8.3.4 of Method 29.
- 3) Digest the entire Sample Fraction 2A as directed in either Section 8.3.4.1 or 8.3.4.2 of Method 29. After digesting the sample, filter the sample using Whatman 541 filter paper, and dilute the filtrate to **150 mL**. Label the diluted sample as Analytical Fraction 2A.
(**Note:** If there is a filter audit sample, it will become Analytical Fraction 1A.)
- 4) Analyze Analytical Fraction 2A as described in Section 11.1.1 or 11.1.2 of Method 29 for the target metals listed on the attached Method 29 Audit Solution **Reporting Form**.
- 5) Record the concentration results on the Method 29 multi-metals audit solution **Reporting Form** in units of µg/mL for each target metal listed for Analytical Fraction 2A.
- 6) Report the Method 29 metals audit solution results recorded on the **Reporting Form** to the designated agent.



Bureau Veritas North America, Inc.

INTERDEPARTMENTAL INTERNAL CHAIN-OF-CUSTODY

**BUREAU
VERITAS**

100211

Page 1 of 2

For Bureau Veritas Use Only
Project No.

IMPORTANT
Date Results Requested: STANDARD PM
Rush Charges Authorized? ☐ Yes ☒ No

INTERNAL DEPARTMENTAL INFORMATION
Consultant's Name: THOMAS SCHMELTZER
Consultant's Office Location: NEW, MI 48156
Internal Project No.: 110100000300000000

OUTSIDE CLIENT INFORMATION
Vision Client Code: _____
Company Name: BUREAU VERITAS
Client Name: YCUA
Mailing Address: 45525 GUY RD Telephone No.: 248-388-1525
City, State, Zip: NEW, MI 48124

Special Instructions: FORUM ANALYTICAL LABORATORIES IN EPA 114 REQUEST USING OUTDOOR HYDRO-SAMPLES
EACH RUN CONTAINS CONTAINERS #1, #2, #3, #4, #5A, #5B
#5C ANALYZE FOR SO, AS, BE, CD, CR, CO, PO, MU, P, & SE
QUESTIONS CONC. T. SCHMELTZER 248-388-1525
Soil Samples Only: Which state are these from?

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)
M29 RUN 1	02/17	9:00		
YCUA M29 RUN 2	02/17	1430		
YCUA M29 RUN 3	02/18	815		
YCUA M29 CONTAINER #7	02/18	815		
YCUA M29 CONTAINER #8A	02/18	815		
YCUA M29 CONTAINER #8B	02/18	815		
YCUA M29 CONTAINER #9	02/18	815		
YCUA M29 CONTAINER #10	02/18	815		
YCUA M29 CONTAINER #11	02/18	815		
YCUA M29 CONTAINER #12	02/18	815		

CHAIN OF CUSTODY
Collected by: THOMAS SCHMELTZER (print)
Relinquished by: in 2/18/10
Relinquished by: _____
Authorized by: Paul J. H. Jr.
(Client Signature MUST Accompany Request)

PRICING INFORMATION
☒ Fee Schedule Price
☐ Discount Price off list
☐ Special Price Attached

Send Report to:
☐ Client
☐ Internal Office

Send Via:
☒ Reg. Mail
☐ Overnight Mail
☒ Email
☐ Fax
Fax # _____

Number of Containers	7	7	7	1	-	-	-	-	-	3
ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.)										
USEPA 5										
USEPA 29										
Bz, Cd, Cr, Pb, Mn, Ni, Se										
FOR LAB USE ONLY										

Sample ID	Elem	Date	Time	Abs (Corr) Conc (Cali	RSD (Cor	Special Sc	Special Cc	Conc (Cali	Conc (Calib)2
Calib Blank	Sb	3/1/2010	10:23:27 AM	0.000		0			
20 ppb Sb	Sb	3/1/2010	10:29:29 AM	0.018		0			
50 ppb Sb	Sb	3/1/2010	10:35:31 AM	0.043		0			
100 ppb Sb	Sb	3/1/2010	10:41:34 AM	0.084		0			
200 ppb Sb	Sb	3/1/2010	10:47:36 AM	0.164		0			
ICV	Sb	3/1/2010	11:02:25 AM	0.082	97.9	6.8		102.651	93.203
ICB	Sb	3/1/2010	11:08:28 AM	0.000	-0.5	80.9		-0.197	-0.725
CCV	Sb	3/1/2010	12:39:56 PM	0.093	110.6	0.8		109.964	111.281
CCB	Sb	3/1/2010	12:45:58 PM	-0.001	-1.2	22.8		-1.342	-0.970
100211.LB	Sb	3/1/2010	1:04:22 PM	-0.001	-0.8	22.6		-0.712	-0.982
100211.LCS	Sb	3/1/2010	1:10:25 PM	0.079	93.4	6.2		97.518	89.352
100211.B-1	Sb	3/1/2010	1:16:27 PM	0.000	-0.3	151.2		0.020	-0.596
100211.1-1	Sb	3/1/2010	1:22:29 PM	0.000	-0.1	838.8		0.334	-0.469
100211.1-1	Sb	3/1/2010	1:28:35 PM	0.069	82.1	4.5	1	82.1	79.486
100211.2-1	Sb	3/1/2010	1:34:37 PM	0.000	-0.4	75.2		-0.188	-0.616
100211.3-1	Sb	3/1/2010	1:40:39 PM	-0.001	-0.5	46.2		-0.354	-0.697
100211.B-2A	Sb	3/1/2010	1:46:41 PM	-0.001	-0.9	9.0		-0.910	-0.801
CCV	Sb	3/1/2010	1:52:43 PM	0.091	108.5	1.8		109.894	107.066
CCB	Sb	3/1/2010	1:58:46 PM	-0.001	-1.5	5.7		-1.529	-1.411
100211.Aud-B	Sb	3/1/2010	2:29:06 PM	-0.001	-0.8	24.2		-0.895	-0.634
CCV	Sb	3/1/2010	2:47:21 PM	0.088	104.5	2.1		106.101	102.925
CCB	Sb	3/1/2010	2:53:24 PM	-0.001	-0.9	8.1		-0.953	-0.850

Sample ID	Elem	Date	Time	Abs (Corr)	Conc (Cali	RSD (Conc	Special	Sa	Special	Cc	Conc (Cali	Conc (Cali
Calib Blank	Sb	3/2/2010	10:42:02 AM	0.0002								
100211.1-2A	Sb	3/2/2010	11:06:23 AM	-0.0003	-5.51							
50 ppb Sb	Sb	3/2/2010	11:12:28 AM	0.0027								
100 ppb Sb	Sb	3/2/2010	11:18:33 AM	0.0055								
Calib Blank	Sb	3/2/2010	11:37:36 AM	-0.0002								
100211.2-2A	Sb	3/2/2010	12:20:14 PM	-0.0007	-13.43							
50 ppb Sb	Sb	3/2/2010	12:26:21 PM	0.0021								
100 ppb Sb	Sb	3/2/2010	12:32:25 PM	0.0044								
100211.3-2A	Sb	3/2/2010	12:38:31 PM	-0.0005	-8.49							
50 ppb Sb	Sb	3/2/2010	12:44:36 PM	0.0021								
100 ppb Sb	Sb	3/2/2010	12:50:40 PM	0.0058								

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	As	2/26/2010	11:01:37	-0.252			3.1 µg/L				
10 PPB AS	As	2/26/2010	11:08:17	0.014			80.7 µg/L				
50 PPB AS	As	2/26/2010	11:15:03	0.110			4.1 µg/L				
100 PPB AS	As	2/26/2010	11:21:50	0.209			0.3 µg/L				
200 PPB AS	As	2/26/2010	11:28:39	0.437			1.6 µg/L				
ICV	As	2/26/2010	11:47:45	0.223	103.1		2.0 µg/L			101.613	104.559
ICB	As	2/26/2010	11:54:26	-0.009	-4.0		97.0 µg/L			-6.686	-1.246
CCV	As	2/26/2010	14:04:42	0.224	103.2		4.8 µg/L			99.698	106.646
CCB	As	2/26/2010	14:11:22	0.000	-0.1	3740.0 µg/L				-2.800	2.596
100211.LB	As	2/26/2010	15:10:06	-0.015	-7.1	156.6 µg/L		1		0.764	-14.920
100211.LCS	As	2/26/2010	15:16:39	0.216	99.7	7.2 µg/L		1		104.735	94.596
100211.B-1	As	2/26/2010	15:23:14	0.000	0.0	11827.0 µg/L		1		3.052	-2.980
100211.1-1	As	2/26/2010	15:29:51	0.076	35.2	4.7 µg/L		1		33.998	36.346
100211.1-1	As	2/26/2010	15:36:37	0.286	132.2	1.8 µg/L		1	97.1	130.537	133.916
100211.2-1	As	2/26/2010	15:43:17	0.065	30.2	4.2 µg/L		1		29.281	31.069
100211.3-1	As	2/26/2010	15:50:00	0.064	29.5	9.3 µg/L		1		31.430	27.557
100211.B-2A	As	2/26/2010	15:56:46	0.000	-0.2	3697.0 µg/L		1		-5.047	4.675
100211.1-2A	As	2/26/2010	16:03:35	-0.005	-2.2	292.7 µg/L		1		2.362	-6.776
100211.1-2A	As	2/26/2010	16:10:22	0.172	79.6	1.7 µg/L		1	79.6	78.615	80.501
CCV	As	2/26/2010	16:17:10	0.233	107.5	1.6 µg/L				108.732	106.341
CCB	As	2/26/2010	16:23:48	0.000	0.1	13249.0 µg/L				-4.693	4.794

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	As	3/1/2010	10:05:28	-0.003			339.6 µg/L				
10 PPB AS	As	3/1/2010	10:12:07	0.024			4.6 µg/L				
50 PPB AS	As	3/1/2010	10:18:51	0.108			3.7 µg/L				
100 PPB AS	As	3/1/2010	10:25:40	0.214			2.3 µg/L				
200 PPB AS	As	3/1/2010	10:32:32	0.443			0.4 µg/L				
ICV	As	3/1/2010	10:42:25	0.231	105.2		4.1 µg/L			102.149	108.290
ICB	As	3/1/2010	10:49:04	0.006	2.8		76.5 µg/L			4.238	1.264
100211.2-2A	As	3/1/2010	11:24:35	0.025	11.4		36.1 µg/L		1	8.512	14.357
100211.3-2A	As	3/1/2010	11:31:31	0.017	7.8		29.8 µg/L		1	6.157	9.443
100211.Aud-B	As	3/1/2010	11:38:27	0.003	1.6		183.7 µg/L		1	3.651	-0.475
100211.Aud-6072	As	3/1/2010	11:45:17	0.205	93.3		0.4 µg/L		5	93.548	93.060
100211.Aud-AM-1738	As	3/1/2010	11:52:04	0.642	291.8		0.1 µg/L		5	292.022	291.634
100211.Aud-AM-1738	As	3/1/2010	12:00:28	0.344	156.2		4.9 µg/L		10	161.609	150.795
CCV	As	3/1/2010	12:07:16	0.226	102.9		6.8 µg/L			97.927	107.856
CCB	As	3/1/2010	12:13:56	0.022	10.0		37.7 µg/L			12.682	7.346

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	Be	3/2/2010	10:28:53	-0.001			167.1 µg/L		1		
0.5 ppb	Be	3/2/2010	10:36:18	0.017			8.3 µg/L		1		
2.0 ppb	Be	3/2/2010	10:43:52	0.045			2.1 µg/L		1		
5.0 ppb	Be	3/2/2010	10:51:27	0.090			5.5 µg/L		1		
10.0 ppb	Be	3/2/2010	10:58:58	0.158			1.3 µg/L		1		
ICV	Be	3/2/2010	11:29:32	0.088	4.84		2.6 µg/L		1	4.747	4.925
ICB	Be	3/2/2010	11:36:47	0.006	0.12		2.9 µg/L		1	0.114	0.119
CCV	Be	3/2/2010	13:27:23	0.091	5.04		5.8 µg/L		1	4.833	5.248
CCB	Be	3/2/2010	13:34:40	0.001	0.05		187.4 µg/L		1	-0.017	0.122
100211.LB	Be	3/2/2010	13:55:47	0.004	0.07		17.4 µg/L		1	0.061	0.078
100211.LCS	Be	3/2/2010	14:03:07	0.089	4.93		3.4 µg/L		1	4.814	5.050
CCV	Be	3/2/2010	15:19:01	0.099	5.68		5.9 µg/L		1	5.446	5.916
CCB	Be	3/2/2010	15:26:23	-0.002	-0.01		172.2 µg/L		1	-0.018	0.002
10211.Audit-Blank	Be	3/2/2010	15:33:43	-0.006	0.02		302.6 µg/L		1	-0.018	0.051
100211.F-6072	Be	3/2/2010	15:41:01	0.157	10.20		106.9 µg/L		1	2.486	17.914
100211.F-6072	Be	3/2/2010	15:48:18	0.282	19.53		2.4 µg/L		1	19.197	19.855
100211.AM-1738	Be	3/2/2010	16:08:04	0.275	18.96		6.0 µg/L		10	18.153	19.772
100211.AM-1738	Be	3/2/2010	16:17:09	0.112	6.57		1.8 µg/L		100	6.484	6.650
CCV	Be	3/2/2010	16:24:40	0.097	5.49		5.0 µg/L			5.296	5.685
CCB	Be	3/2/2010	16:31:57	0.006	0.11		77.6 µg/L			0.175	0.051

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	Be	3/5/2010	14:43:36	0.020			11.4 µg/L				
0.5 PPB	Be	3/5/2010	14:50:24	0.009			49.3 µg/L				
2.0 PPB	Be	3/5/2010	14:57:17	0.034			4.7 µg/L				
5.0 PPB	Be	3/5/2010	15:04:13	0.088			2.4 µg/L				
10.0 PPB	Be	3/5/2010	15:11:07	0.164			1.1 µg/L				
ICV	Be	3/5/2010	15:25:19	0.089	5.3		0.1 µg/L			5.337	5.332
ICB	Be	3/5/2010	15:31:56	0.002	0.1		113.5 µg/L			0.244	0.027
100211.Aud-6072	Be	3/5/2010	15:38:34	0.150	9.0		3.2 µg/L		20	8.776	9.188
CCV	Be	3/5/2010	15:45:25	0.095	5.7		2.0 µg/L			5.582	5.738
CCB	Be	3/5/2010	15:52:05	0.005	0.3		94.1 µg/L			0.484	0.097

Sample ID	Elem	Date	Time	Abs (Corr) Conc	(Cali RSD (Conc)	Special Sc	Special Cc	Conc (Calib	Conc (Calib)2
Calib Blank	Cd	2/26/2010	9:38:17 AM	0.000					
0.5 ppb Cd	Cd	2/26/2010	9:44:19 AM	0.012					
2.0 ppb Cd	Cd	2/26/2010	9:50:21 AM	0.049					
5.0 ppb Cd	Cd	2/26/2010	9:56:24 AM	0.119					
10.0 ppb Cd	Cd	2/26/2010	10:02:26 AM	0.220					
ICV	Cd	2/26/2010	10:17:38 AM	0.123	5.29	0.18		5.296	5.282
ICB	Cd	2/26/2010	10:23:41 AM	0.000	0.02	228.67		-0.010	0.042
CCV	Cd	2/26/2010	11:00:09 AM	0.128	5.50	1.07		5.459	5.542
CCB	Cd	2/26/2010	11:06:12 AM	0.000	-0.02	97.91		-0.034	-0.006
100211.LB	Cd	2/26/2010	11:30:42 AM	0.000	0.00	377.09		-0.006	0.014
100211.LCS	Cd	2/26/2010	1:38:12 PM	0.116	4.96	0.66		4.986	4.940
100211.B-1	Cd	2/26/2010	11:53:26 AM	0.000	-0.01	67.80		-0.007	-0.021
100211.1-1	Cd	2/26/2010	1:44:14 PM	0.072	3.03	0.34		3.032	3.018
100211.1-1	Cd	2/26/2010	1:50:20 PM	0.186	8.21	0.94	1	103.69	8.264
100211.2-1	Cd	2/26/2010	1:56:20 PM	0.029	1.19	1.20		1.204	1.184
100211.3-1	Cd	2/26/2010	2:02:23 PM	0.006	0.25	1.72		0.249	0.256
100211.B-2A	Cd	2/26/2010	2:08:25 PM	0.000	0.00	1695.01		0.009	-0.008
100211.1-2A	Cd	2/26/2010	2:14:27 PM	0.008	0.32	3.57		0.316	0.332
100211.1-2A	Cd	2/26/2010	2:20:31 PM	0.122	5.26	0.17	1	98.73	5.254
100211.2-2A	Cd	2/26/2010	2:26:34 PM	0.006	0.24	31.93		0.189	0.300
CCV	Cd	2/26/2010	2:32:36 PM	0.131	5.65	0.85		5.688	5.621
CCB	Cd	2/26/2010	2:38:38 PM	-0.002	-0.08	3.24		-0.077	-0.080
100211.3-2A	Cd	2/26/2010	2:59:01 PM	0.012	0.50	5.55		0.476	0.515
CCV	Cd	2/26/2010	3:05:04 PM	0.122	5.27	5.71		5.055	5.480
CCB	Cd	2/26/2010	3:11:06 PM	-0.001	-0.03	51.34		-0.019	-0.041

Sample ID	Date	Time	Elem	Conc	(Ca Int (Corr)	Calib Un	RSD (Corr In	Int (Corr)1	Int (Corr)2	Int (Corr)3
Calib Blank 1	2/25/2010	12:24:29 PM	Cr		230.1 ug/L	9.1276395	233.25034	207.65144	249.28541	
Standard 1	2/25/2010	12:25:30 PM	Cr		26549.3 ug/L	1.2363923	26485.879	26257.456	26904.696	
Standard 2	2/25/2010	12:26:43 PM	Cr		54134.8 ug/L	1.7110682	53089.177	54852.481	54462.841	
ICV	2/25/2010	12:29:42 PM	Cr	975.2	26293.8 ug/L	2.4007477	25739.578	26160.824	26980.896	
ICB	2/25/2010	12:31:17 PM	Cr	0.4	11.2 ug/L	118.47237	26.364069	2.4170805	4.690919	
ICS	2/25/2010	12:32:30 PM	Cr	2.9	77.6 ug/L	32.218108	101.28973	51.454586	80.17587	
100211.LB	2/25/2010	12:34:12 PM	Cr	0.2	5.4 ug/L	208.2221	17.03294	4.2045067	-5.1750046	
100211.LCS	2/25/2010	12:35:33 PM	Cr	964.0	25992.7 ug/L	0.6220635	26113.365	26055.853	25809.016	
100211.B-1	2/25/2010	12:40:17 PM	Cr	29.5	794.1 ug/L	1.8587192	805.33952	777.40766	799.64959	
100211.1-1	2/25/2010	12:43:23 PM	Cr	47.3	1275.4 ug/L	1.1382023	1272.7908	1262.3243	1291.0099	
100211.1-1 S(1)	2/25/2010	12:48:07 PM	Cr	910.3	24545.4 ug/L	1.4431304	24167.612	24598.444	24870.067	
100211.2-1	2/25/2010	12:52:38 PM	Cr	65.0	1752.7 ug/L	0.8211761	1754.5323	1737.5294	1766.1469	
100211.2-1D	2/25/2010	12:53:37 PM	Cr	66.8	1801.0 ug/L	1.433457	1810.5922	1820.5993	1771.7287	
100211.3-1	2/25/2010	12:55:02 PM	Cr	84.3	2274.1 ug/L	1.1247348	2249.413	2300.4851	2272.4229	
CCV	2/25/2010	12:57:06 PM	Cr	974.1	26264.6 ug/L	0.9257748	26214.242	26529.032	26050.626	
CCB	2/25/2010	1:01:58 PM	Cr	2.3	61.6 ug/L	83.99193	120.20921	41.808208	22.63288	
100211.B-2A	2/25/2010	1:03:04 PM	Cr	3.1	84.6 ug/L	8.2207911	83.683539	91.893751	78.073647	
100211.1-2A	2/25/2010	1:04:31 PM	Cr	5.9	159.0 ug/L	7.4068101	171.96883	156.08175	148.96512	
100211.1-2A S(1)	2/25/2010	1:10:29 PM	Cr	774.0	20870.1 ug/L	3.0225477	20201.1	20954.992	21454.111	
100211.2-2A	2/25/2010	1:12:01 PM	Cr	7.8	209.4 ug/L	9.1705288	201.15244	195.68716	231.341	
100211.2-2AD	2/25/2010	1:13:00 PM	Cr	7.3	197.4 ug/L	4.3576121	206.83481	189.96689	195.46273	
100211.3-2A	2/25/2010	1:14:18 PM	Cr	7.3	196.4 ug/L	6.5388167	196.723	209.1419	183.45678	
CCV	2/25/2010	1:16:32 PM	Cr	1042.3	28104.6 ug/L	1.4748434	28314.142	28372.496	27627.167	
CCB	2/25/2010	1:18:00 PM	Cr	0.9	25.5 ug/L	103.48582	49.548369	-2.741035	29.718083	
Audit Blank Filter	2/25/2010	1:20:24 PM	Cr	29.9	805.0 ug/L	0.8947695	808.3734	796.71144	809.86619	
Audit FIL-6072	2/25/2010	1:22:58 PM	Cr	382.7	10319.1 ug/L	0.7498767	10245.57	10311.829	10399.821	
Audit AM-1738	2/25/2010	1:24:29 PM	Cr	1170.0	31548.4 ug/L	0.6102185	31334.712	31602.193	31708.298	
CCV	2/25/2010	1:29:08 PM	Cr	1014.9	27365.0 ug/L	2.4876172	28116.924	27187.361	26790.667	
CCB	2/25/2010	1:30:22 PM	Cr	1.0	26.7 ug/L	52.925482	36.84483	32.803003	10.564907	
Calib Blank 1	2/25/2010	12:24:29 PM	Mn		650.3 ug/L	2.596994	631.9896	665.29897	653.48044	
Standard 1	2/25/2010	12:25:30 PM	Mn		339673.7 ug/L	0.8942595	338647.68	337282.05	343091.43	
Standard 2	2/25/2010	12:26:43 PM	Mn		690933.3 ug/L	1.6220416	678108.3	698842.82	695848.87	
ICV	2/25/2010	12:29:42 PM	Mn	973.8	335275.1 ug/L	3.2143468	324609.64	335055.61	346160.09	

Sample ID	Date	Time	Elem	Conc	(Ca Int (Corr)	Calib UnRSD (Corr In Int (Corr)1	Int (Corr)2	Int (Corr)3
ICB	2/25/2010	12:31:17 PM	Mn	0.1	39.2 ug/L	25.782331	50.033102	37.406478
ICS	2/25/2010	12:32:30 PM	Mn	2.6	878.5 ug/L	0.8657036	877.77422	871.22546
100211.LB	2/25/2010	12:34:12 PM	Mn	0.5	181.3 ug/L	12.547723	155.08421	196.04422
100211.LCS	2/25/2010	12:35:33 PM	Mn	955.5	328986.6 ug/L	0.6467581	330857.01	329431.14
100211.B-1	2/25/2010	12:40:17 PM	Mn	21.8	7512.7 ug/L	1.1800446	7608.6811	7495.7256
100211.1-1	2/25/2010	12:43:23 PM	Mn	2154.4	741769.6 ug/L	2.1534653	723343.02	751694.53
100211.1-1 S(1)	2/25/2010	12:48:07 PM	Mn	3014.7	1037987.8 ug/L	1.5155584	1020491.8	1042506
100211.1-1 X5 Mn	2/25/2010	12:50:08 PM	Mn	538.2	185315.7 ug/L	1.0895691	184805.25	187541.08
100211.1-1 x5 S(1) Mn	2/25/2010	12:51:14 PM	Mn	1547.1	532668.8 ug/L	0.4715048	530764.04	531727.36
100211.2-1	2/25/2010	12:52:38 PM	Mn	1405.5	483928.3 ug/L	2.064138	479759.7	476698.88
100211.2-1D	2/25/2010	12:53:37 PM	Mn	1458.6	502222.1 ug/L	0.3424005	500395.61	502460.7
100211.3-1	2/25/2010	12:55:02 PM	Mn	1424.5	490451.8 ug/L	1.0592159	484519.49	492647.52
CCV	2/25/2010	12:57:06 PM	Mn	976.0	336034.4 ug/L	0.8023852	335163.66	339058.44
CCB	2/25/2010	1:01:58 PM	Mn	0.5	177.1 ug/L	37.935325	249.45233	164.97851
100211.B-2A	2/25/2010	1:03:04 PM	Mn	1.4	478.0 ug/L	1.0417295	477.69084	483.08323
100211.1-2A	2/25/2010	1:04:31 PM	Mn	116.0	39940.0 ug/L	0.7200119	39671.97	39904.235
100211.1-2A S(1)	2/25/2010	1:10:29 PM	Mn	873.1	300624.1 ug/L	3.0721029	290111.06	304330.81
100211.2-2A	2/25/2010	1:12:01 PM	Mn	4.5	1548.3 ug/L	3.552438	1488.6777	1559.1143
100211.2-2AD	2/25/2010	1:13:00 PM	Mn	4.7	1625.7 ug/L	1.6531494	1603.5035	1655.59
100211.3-2A	2/25/2010	1:14:18 PM	Mn	7.8	2690.2 ug/L	0.4402283	2678.077	2701.7347
CCV	2/25/2010	1:16:32 PM	Mn	1050.5	361711.6 ug/L	1.7020172	364884.95	365633.78
CCB	2/25/2010	1:18:00 PM	Mn	0.2	77.8 ug/L	29.034414	53.634639	98.38527
Audit Blank Filter	2/25/2010	1:21:33 PM	Mn	13.4	4627.3 ug/L	0.4258437	4639.6869	4604.538
Audit FIL-6072	2/25/2010	1:22:58 PM	Mn	286.7	98714.5 ug/L	1.0870855	97666.702	98665.523
Audit AM-1738	2/25/2010	1:24:29 PM	Mn	911.4	313813.7 ug/L	0.833232	311224.77	313762.57
CCV	2/25/2010	1:29:08 PM	Mn	1024.0	352583.3 ug/L	2.4407428	361898.86	350920.89
CCB	2/25/2010	1:30:22 PM	Mn	0.3	98.1 ug/L	22.938752	111.02211	111.24357
Calib Blank 1	2/25/2010	12:24:29 PM	Ni		92.5 ug/L	11.387707	81.935718	102.9962
Standard 1	2/25/2010	12:25:30 PM	Ni		11456.5 ug/L	1.4310182	11434.143	11304.914
Standard 2	2/25/2010	12:26:43 PM	Ni		23582.4 ug/L	1.1203525	23332.986	23859.244
ICV	2/25/2010	12:29:42 PM	Ni	965.2	11315.8 ug/L	3.3257782	10968.758	11262.904
ICB	2/25/2010	12:31:17 PM	Ni	-2.0	-24.0 ug/L	136.21078	-60.823899	-13.06768
ICS	2/25/2010	12:32:30 PM	Ni	-0.6	-7.5 ug/L	55.12599	-10.349471	-2.7631648

Sample ID	Date	Time	Elem	Conc	(Ca Int (Corr)	Calib Un	RSD (Corr In	Int (Corr)1	Int (Corr)2	Int (Corr)3
100211.LB	2/25/2010	12:34:12 PM	Ni	-0.2	-2.2 ug/L	453.8479	9.4320026	-6.8088485	-9.3613431	
100211.LCS	2/25/2010	12:35:33 PM	Ni	971.8	11393.2 ug/L	1.5670309	11599.345	11286.11	11294.275	
100211.B-1	2/25/2010	12:40:17 PM	Ni	31.1	364.6 ug/L	5.901892	375.09373	339.85626	378.87389	
100211.1-1	2/25/2010	12:43:23 PM	Ni	92.3	1082.1 ug/L	0.8964024	1093.2081	1077.6812	1075.3724	
100211.1-1 S(1)	2/25/2010	12:48:07 PM	Ni	1099.1	12886.4 ug/L	2.2058264	12558.235	13046.76	13054.303	
100211.2-1	2/25/2010	12:52:38 PM	Ni	154.3	1808.9 ug/L	2.7809631	1751.3991	1844.8907	1830.3317	
100211.2-1D	2/25/2010	12:53:37 PM	Ni	159.4	1868.5 ug/L	2.5901276	1829.2057	1922.5259	1853.6214	
100211.3-1	2/25/2010	12:55:02 PM	Ni	47.3	554.0 ug/L	4.1672087	534.57613	547.90769	579.52581	
CCV	2/25/2010	12:57:06 PM	Ni	975.5	11437.3 ug/L	1.3578176	11468.663	11574.464	11268.668	
CCB	2/25/2010	1:01:58 PM	Ni	-2.2	-25.7 ug/L	70.216872	-19.014444	-11.902588	-46.0446	
100211.B-2A	2/25/2010	1:03:04 PM	Ni	-0.3	-3.2 ug/L	205.14458	-4.8129087	-8.6450586	3.9866798	
100211.1-2A	2/25/2010	1:04:31 PM	Ni	2.0	23.8 ug/L	18.872567	27.877016	24.40794	18.981896	
100211.1-2A S(1)	2/25/2010	1:10:29 PM	Ni	800.4	9384.3 ug/L	2.5887245	9112.177	9579.3021	9461.4838	
100211.2-2A	2/25/2010	1:12:01 PM	Ni	4.0	46.8 ug/L	95.344101	79.537853	-4.0279729	64.91096	
100211.2-2AD	2/25/2010	1:13:00 PM	Ni	4.2	49.7 ug/L	38.84419	27.987476	64.939025	56.119166	
100211.3-2A	2/25/2010	1:14:18 PM	Ni	4.3	50.8 ug/L	21.426093	59.112546	38.4848	54.834973	
CCV	2/25/2010	1:16:32 PM	Ni	1037.8	12167.4 ug/L	2.1468975	12217.211	12400.129	11884.859	
CCB	2/25/2010	1:18:00 PM	Ni	-2.0	-23.5 ug/L	68.181776	-13.634482	-14.890939	-42.00585	
Audit Blank Filter	2/25/2010	1:21:33 PM	Ni	14.3	167.6 ug/L	3.3653736	161.88597	173.16363	167.76429	
Audit FIL-6072	2/25/2010	1:22:58 PM	Ni	717.1	8408.0 ug/L	1.4697307	8305.4326	8373.4161	8545.2062	
Audit AM-1738	2/25/2010	1:24:29 PM	Ni	2071.4	24285.3 ug/L	0.9828748	24079.366	24229.655	24546.92	
Audit AM-1738 x2 Ni	2/25/2010	1:27:32 PM	Ni	1096.7	12858.2 ug/L	0.3450394	12806.947	12884.175	12883.401	
CCV	2/25/2010	1:29:08 PM	Ni	1022.7	11990.6 ug/L	3.1153253	12377.692	11961.881	11632.258	
CCB	2/25/2010	1:30:22 PM	Ni	-3.4	-39.6 ug/L	51.271835	-22.646323	-34.062701	-62.108438	
Calib Blank 1	2/25/2010	12:24:29 PM	Sb		42.1 ug/L	3.0997284	41.326497	43.646235	41.445851	
Standard 1	2/25/2010	12:25:30 PM	Sb		630.2 ug/L	3.2630688	607.7246	634.88258	648.05299	
Standard 2	2/25/2010	12:26:43 PM	Sb		1290.1 ug/L	1.4004808	1269.2515	1299.2755	1301.6757	
ICV	2/25/2010	12:29:42 PM	Sb	975.0	626.0 ug/L	3.039129	604.19352	634.84768	639.04462	
ICB	2/25/2010	12:31:17 PM	Sb	13.6	8.8 ug/L	47.382569	4.8290706	8.3555421	13.102898	
ICS	2/25/2010	12:32:30 PM	Sb	3.5	2.2 ug/L	228.13762	-1.4292771	8.0911141	0.0696908	
CCV	2/25/2010	1:16:32 PM	Sb	1088.7	699.0 ug/L	1.2026693	708.31594	696.72034	691.97421	
CCB	2/25/2010	1:18:00 PM	Sb	12.7	8.2 ug/L	12.683137	7.1639422	9.2343533	8.1149041	
Audit FIL-6072	2/25/2010	1:22:58 PM	Sb	269.4	173.0 ug/L	5.2558612	180.1217	176.07371	162.74575	

Sample ID	Date	Time	Elem	Conc (Ca	Int (Corr)	Calib Un	RSD (Corr In	Int (Corr)1	Int (Corr)2	Int (Corr)3
Audit AM-1738	2/25/2010	1:24:29 PM	Sb	827.3	531.2 ug/L	1.4751166	522.50209	533.40306	537.70342	
CCV	2/25/2010	1:29:08 PM	Sb	1056.9	678.6 ug/L	1.9665621	663.58365	689.0669	683.19938	
CCB	2/25/2010	1:30:22 PM	Sb	22.7	14.6 ug/L	2.2463753	14.871812	14.221775	14.613218	

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	Pb	2/25/2010	10:08:51	0.001			126.5 µg/L				
20 ppb	Pb	2/25/2010	10:16:23	0.019			8.2 µg/L				
50 ppb	Pb	2/25/2010	10:24:02	0.047			0.3 µg/L				
100 ppb	Pb	2/25/2010	10:31:41	0.079			3.5 µg/L				
200 ppb	Pb	2/25/2010	10:39:19	0.161			2.9 µg/L				
ICV	Pb	2/25/2010	10:56:45	0.078	89.6		1.9 µg/L			88.356	90.772
ICB	Pb	2/25/2010	11:04:07	0.004	4.2		16.0 µg/L			3.704	4.647
100211.LB	Pb	2/25/2010	11:19:05	0.001	0.6		137.1 µg/L		1	1.233	0.019
100211.LCS	Pb	2/25/2010	11:34:13	0.091	105.4		3.1 µg/L		1	103.100	107.700
100211.B-1	Pb	2/25/2010	11:41:41	0.004	4.3		16.0 µg/L		1	4.740	3.777
100211.1-1	Pb	2/25/2010	11:49:06	0.011	11.4		6.5 µg/L		1	11.889	10.837
100211.1-1	Pb	2/25/2010	11:56:44	0.099	117.0		4.8 µg/L		1	105.5	113.007
100211.2-1	Pb	2/25/2010	12:28:26	0.016	16.4		0.8 µg/L		1	16.259	16.448
100211.3-1	Pb	2/25/2010	12:35:46	0.007	7.1		13.9 µg/L		1	7.801	6.406
CCV	Pb	2/25/2010	13:35:19	0.083	95.1		9.2 µg/L		1	88.939	101.315
CCB	Pb	2/25/2010	13:42:42	0.003	3.2		66.2 µg/L		1	4.710	1.706

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	Pb	3/4/2010	14:08:17	0.001			43.1 µg/L				
20 ppb	Pb	3/4/2010	14:15:50	0.024			4.5 µg/L				
50 ppb	Pb	3/4/2010	14:23:29	0.058			0.7 µg/L				
100 ppb	Pb	3/4/2010	14:31:14	0.113			0.0 µg/L				
200 ppb	Pb	3/4/2010	14:38:52	0.199			0.9 µg/L				
ICV	Pb	3/4/2010	15:13:51	0.110	98.0		2.3 µg/L			99.603	96.385
ICB	Pb	3/4/2010	15:21:14	0.001	0.8		63.1 µg/L			0.426	1.111
100211.1-2A	Pb	3/4/2010	15:28:30	0.002	1.4		11.4 µg/L		2	1.547	1.315
100211.1-2A	Pb	3/4/2010	15:36:11	0.102	89.9		2.0 µg/L		2	89.9	88.593
CCV	Pb	3/4/2010	15:58:31	0.118	105.4		1.8 µg/L			104.065	106.701
CCB	Pb	3/4/2010	16:05:54	0.000	-0.2		705.4 µg/L			0.622	-0.933

Sample ID	Elem	Date	Time	Abs (Corr)	Conc (Cali	RSD (Conc)	Special Special (Conc (Calib)1	Conc (Calib)2
Calib Blank	Pb	2/25/2010	12:52:36 PM	0.002		0			
20 ppb Pb	Pb	2/25/2010	12:57:56 PM	0.024		0			
50 ppb Pb	Pb	2/25/2010	1:03:16 PM	0.061		0			
100 ppb Pb	Pb	2/25/2010	1:08:36 PM	0.115		0			
200 ppb Pb	Pb	2/25/2010	1:13:59 PM	0.204		0			
ICV	Pb	2/25/2010	1:36:34 PM	0.118	100.1	2.3		98.469	101.667
ICB	Pb	2/25/2010	10:42:39 AM	-0.001	-0.6	7.8		-0.593	-0.532
CCV	Pb	2/25/2010	11:15:09 AM	0.120	101.8	0.3		101.571	101.958
CCB	Pb	2/25/2010	11:20:28 AM	-0.001	-0.9	12.3		-0.849	-1.011
100211.B-2A	Pb	2/25/2010	11:32:14 AM	0.000	0.1	1703.8		0.736	-0.623
100211.1-2A	Pb	2/25/2010	11:37:34 AM	0.000	-0.2	122.2		-0.026	-0.350
100211.3-2A	Pb	2/25/2010	11:53:57 AM	-0.001	-0.9	6.7		-0.865	-0.951
CCV	Pb	2/25/2010	11:59:17 AM	0.123	104.9	0.8		104.267	105.501
CCB	Pb	2/25/2010	12:04:36 PM	-0.001	-0.6	31.1		-0.479	-0.749

Sample ID	Date	Time	Elem	Conc (Cali	Int (Corr)	Calib Unit	RSD (Corr	Int (Corr)1	Int (Corr)2	Int (Corr)3
Calib Blank 1	2/25/2010	1:33:15 PM	P		-52.2 ug/L		3.411	-54.207	-50.789	-51.630
Standard 1	2/25/2010	1:34:22 PM	P		1632.2 ug/L		1.637	1615.338	1618.319	1663.028
Standard 2	2/25/2010	1:35:17 PM	P		3215.8 ug/L		1.677	3153.803	3242.100	3251.557
ICV	2/25/2010	1:36:32 PM	P	5144.1	1659.3 ug/L		0.779	1650.430	1674.103	1653.263
ICB	2/25/2010	1:38:05 PM	P	-8.6	-2.8 ug/L		429.941	-1.140	-15.482	8.275
ICS	2/25/2010	1:38:57 PM	P	-22.0	-7.1 ug/L		166.376	-12.103	6.392	-15.596
100211.LB	2/25/2010	1:39:54 PM	P	-23.9	-7.7 ug/L		122.049	-17.603	-6.743	1.174
100211.LCS	2/25/2010	1:42:03 PM	P	5279.7	1703.0 ug/L		0.948	1685.091	1707.453	1716.425
100211.B-1	2/25/2010	1:43:34 PM	P	3786.4	1221.3 ug/L		0.955	1208.245	1225.100	1230.652
100211.1-1	2/25/2010	1:46:07 PM	P	4698.8	1515.6 ug/L		0.953	1500.941	1529.806	1516.102
100211.1-1 S(5) P	2/25/2010	1:50:30 PM	P	8717.2	2811.8 ug/L		3.412	2701.210	2861.224	2872.935
100211.2-1	2/25/2010	1:51:32 PM	P	4673.7	1507.5 ug/L		2.144	1470.317	1523.656	1528.604
100211.2-1D	2/25/2010	1:52:47 PM	P	4668.2	1505.8 ug/L		2.562	1474.747	1493.558	1548.953
100211.3-1	2/25/2010	1:53:34 PM	P	4924.6	1588.4 ug/L		2.386	1547.866	1594.545	1622.933
CCV	2/25/2010	1:54:25 PM	P	4955.3	1598.4 ug/L		3.946	1527.337	1619.901	1647.844
CCB	2/25/2010	1:55:25 PM	P	19.2	6.2 ug/L		38.190	6.083	8.599	3.877
100211.B-2A	2/25/2010	1:56:11 PM	P	101.6	32.8 ug/L		34.348	21.640	32.506	44.142
100211.1-2A	2/25/2010	1:58:34 PM	P	178.7	57.6 ug/L		16.452	65.520	60.278	47.115
100211.1-2A	2/25/2010	1:59:43 PM	P	156.7	50.6 ug/L		11.164	48.304	46.384	56.977
100211.1-2A S(5) P	2/25/2010	2:02:53 PM	P	3329.9	1074.1 ug/L		0.900	1069.442	1067.582	1085.183
100211.1-2A x2	2/25/2010	2:09:39 PM	P	105.7	34.1 ug/L		11.051	31.403	38.394	32.466
100211.1-2A x2 S(5) P	2/25/2010	2:10:38 PM	P	3842.0	1239.2 ug/L		2.331	1207.712	1245.579	1264.432
100211.2-2A	2/25/2010	2:11:51 PM	P	168.2	54.2 ug/L		25.188	38.466	62.357	61.892
100211.2-2AD	2/25/2010	2:13:22 PM	P	182.9	59.0 ug/L		4.645	56.097	59.329	61.546
100211.3-2A	2/25/2010	2:15:33 PM	P	154.2	49.7 ug/L		10.353	53.409	43.855	51.963
CCV	2/25/2010	2:16:34 PM	P	5334.0	1720.5 ug/L		1.213	1700.055	1719.667	1741.778
CCB	2/25/2010	2:17:32 PM	P	-18.9	-6.1 ug/L		274.555	10.665	-6.143	-22.810

Sample_ID	EL	Sam_Date	Sam_Time	Mean_Sig	Mean_ST	RSD	Cal_Units	Dilu	Rec	Std_U 1	Std_U 2
Calib Blank	Se	3/5/2010	12:08:37	-0.004			95.9 µg/L				
20 ppb Se	Se	3/5/2010	12:16:06	0.036			8.5 µg/L				
50 ppb Se	Se	3/5/2010	12:23:40	0.096			6.2 µg/L				
100 ppb Se	Se	3/5/2010	12:31:17	0.198			0.2 µg/L				
200 ppb Se	Se	3/5/2010	12:38:57	0.399			2.0 µg/L				
ICV	Se	3/5/2010	13:03:23	0.186	96.3		0.3 µg/L			96.484	96.086
ICB	Se	3/5/2010	13:10:52	0.011	6.1		21.3 µg/L			5.164	6.993
100211.Aud-B	Se	3/5/2010	13:18:30	0.007	3.5		17.6 µg/L		1	3.964	3.086
100211.Aud-6072	Se	3/5/2010	13:26:10	0.113	59.6		5.3 µg/L		5	61.872	57.407
100211.Aud-AM-1738	Se	3/5/2010	13:33:46	0.187	96.7		0.2 µg/L		10	96.502	96.803
CCV	Se	3/5/2010	13:41:24	0.212	109.0		12.3 µg/L			118.502	99.529
CCB	Se	3/5/2010	13:48:51	0.005	2.8		36.4 µg/L			3.510	2.074

Sample ID	Date	Element	Aliquot (mL)	Conc. µg (Reading 1)	Conc. µg (Reading 2)
ICV	2/24/2010	Hg	-	5.17	-
ICB	2/24/2010	Hg	-	-0.04	-
100211.B-2B	2/24/2010	Hg	5	-0.04	-0.03
100211.1-2B	2/24/2010	Hg	5	-0.04	0.01
100211.1-2BS	2/24/2010	Hg	5	4.97	4.96
100211.2-2B	2/24/2010	Hg	5	-0.01	0.00
100211.3-2B	2/24/2010	Hg	5	0.02	0.02
CCV	2/24/2010	Hg	-	4.86	-
CCB	2/24/2010	Hg	-	-0.03	-
100211.3-2B	2/24/2010	Hg	5	0.01	-
100211.B-3A	2/24/2010	Hg	10	-0.03	-0.01
100211.1-3A	2/24/2010	Hg	10	-0.04	-0.01
100211.2-3A	2/24/2010	Hg	10	-0.03	0.00
100211.3-3A	2/24/2010	Hg	10	-0.01	0.03
100211.B-3B	2/24/2010	Hg	20	0.00	-
CCV	2/24/2010	Hg	-	5.04	-
CCB	2/24/2010	Hg	-	-0.04	-
100211.1-3B	2/24/2010	Hg	20	-0.01	0.00
100211.2-3B	2/24/2010	Hg	20	0.26	0.29
100211.3-3B	2/24/2010	Hg	20	0.16	0.21
100211.B-3C	2/24/2010	Hg	5	-0.03	-0.03
CCV	2/24/2010	Hg	-	4.93	-
CCB	2/24/2010	Hg	-	-0.04	-
100211.1-3C	2/24/2010	Hg	5	0.32	0.30
100211.1-3C	2/24/2010	Hg	5	0.29	-
100211.2-3C	2/24/2010	Hg	5	0.18	0.14
100211.3-3C	2/24/2010	Hg	5	0.00	-0.04
CCV	2/24/2010	Hg	-	4.91	-
CCB	2/24/2010	Hg	-	-0.01	-
100211.B-1	2/24/2010	Hg	5	-0.04	-0.03
100211.1-1	2/24/2010	Hg	5	-0.03	-0.01
100211.1-1	2/24/2010	Hg	5	-0.01	-
100211.2-1	2/24/2010	Hg	5	0.01	-0.01
100211.3-1	2/24/2010	Hg	5	-0.04	-0.03
CCV	2/24/2010	Hg	-	4.86	-
CCB	2/24/2010	Hg	-	-0.03	-

Calibration Data

	$\mu\text{g/L}$	Abs.
Blank	0.00	0.000
Standard 1	0.50	0.013
Standard 2	1.00	0.026
Standard 3	2.00	0.056
Standard 4	5.00	0.140
Standard 5	10.00	0.278



ICP-MS Expert Worksheet Report
Report Date 11:54:01am 11/Mar/2010
Worksheet Habibi-FAL-03102010.msww
VARIAN Analyst

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Worksheet Summary

Worksheet: Habibi-FAL-03102010.msww
Created: 03:13:47pm 21/Apr/2008
Analyst:
Computer: CHEMMS001
Last Saved: 10:42:58pm 10/Mar/2010
Software Ver v2.1 b107
Firmware Ver 1.65
Samples: 43
Comment:

Chemistry

Matrix:
Acids Used:
Keywords:
CRM:

Measurement Parameters

Analysis Modes Analysis Type: Quantitative, Acquisition Mode: Steady State, Scan Mode: Peak Hopping
Spacing: Coarse, Points/Peak: 1, Scans/Replicate: 20, Replicates/Sample: 5

Plasma Plasma flow: 18.00 L/min Auxiliary flow: 1.80 L/min Sheath Gas Flow: 0.17 L/min Nebulizer flow: 0.94 L/min
Sampling depth: 7.50 mm
Power: 1.40 kW Pump rate: 2 rpm Stabilization delay 30 sec

Ion Optics (volt) VersionNumber: 7
First Extraction Lens: -2.00 Second Extraction Lens: -179.00 Third Extraction Lens: -198.00
Left Mirror Lens: 42.00 Right Mirror Lens: 27.00 Bottom Mirror Lens: 31.00
Corner Lens: -223.00 Entrance Lens: 1.00
Fringe Bias: -1.90 Entrance Plate: -31.00
Detector Focus: True Pole Bias: 0.00

CRI (mL/min) Skimmer Cone: OFF CRI Skimmer Gas Flow: 0 mL/min
Sampler Cone: OFF CRI Sampler Gas Flow: 0 mL/min

Sampling Aerosol generation: Nebulizer, Source: Manual
Fast pump during sample delay/rinse: On, Enable device control: Off
Spray Chamber Cooling: On Spray Chamber Temp: 3.00 Degrees Celcius
Sample uptake delay: 30 sec, Smart Rinse: No, Switch Delay: OFF
Scan time: 1139 msec, Replicate time: 22.78 sec

Analytes (8)

Be9, Cr53, Co59, Ni60, As75, Se78, Cd111, Pb208

SemiQuant Analytes (0)

Internal Standards (1)

In115: Be9, Cr53, Co59, Ni60, As75, Se78, Cd111, Pb208

No. of isotope ratio standards: 0

Isotope Ratios (0)

Default exclusions (7)

Ar40, Ar40Ar40, N14, N14H1, O16, O16H1, Ar40H1

User-specified exclusions (0)

Scan Segments (16)

Start (m/z)	Stop (m/z)	Dwell (µsec)	Attenuation mode	Norm-Med	Med-High
9	9	50000	Auto	55.987	93.617
53	53	50000	Auto	65.577	101.470
59	59	50000	Auto	73.412	101.770
60	60	50000	Auto	75.115	101.897
75	75	50000	Auto	73.556	103.669
76	76	50000	Auto	69.200	103.778



ICP-MS Expert Worksheet Report
 Report Date 11:54:01am 11/Mar/2010
 Worksheet Habibi-FAL-03102010.msww
VARIAN Analyst

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Start (m/z)	Stop (m/z)	Dwell (µsec)	Attenuation mode	Norm-Med	Med-High		
77	77	50000	Auto	71.350	103.694		
78	78	50000	Auto	69.919	104.287		
82	82	50000	Auto	72.852	104.400		
83	83	50000	Auto	71.285	107.321		
106	106	50000	Auto	79.850	104.525		
108	108	50000	Auto	81.208	105.169		
111	111	50000	Auto	81.154	102.986		
115	115	50000	Auto	81.747	104.000		
118	118	50000	Auto	81.516	104.000		
208	208	50000	Auto	87.878	99.679		
		Be9	NOT * Needen 3/11/10	Cr53	Co59	Ni60	As75
Sample Label		ppb	ppb	ppb	ppb	ppb	Se78
Blank		-	-	0.0000	-	-	-
Corr Conc		-	-	0.0000	-	-	-
%RSD		8.00	1.54	3.95	3.21	1.86	8.26
Mean (c/s)		27.4000	1411.600	709.2000	3915.200	23048.04	3926.229
Blank		-	-	0.0000	0.0000	0.0000	0.0000
Corr Conc		-	-	0.0000	0.0000	0.0000	0.0000
%RSD		17.76	2.11	4.62	2.24	1.85	8.54
Mean (c/s)		27.0000	1449.800	719.4000	3769.600	24051.76	3891.542
Blank		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Corr Conc		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
%RSD		45.28	6.98	1.69	1.22	1.33	6.27
Mean (c/s)		25.4000	1614.200	745.0000	3653.400	24410.02	3714.304
Standard 0.061 ppb		0.0610	-e	0.0610	-e	-e	-e
Corr Conc		0.0610	-	0.0610	-	-	-
%RSD		7.22	-	3.37	-	-	-
Mean (c/s)		126.4000	-	4708.600	-	-	-
Standard 0.122 ppb		0.1220	-e	0.1220	-e	-e	-e
Corr Conc		0.1220	-	0.1220	-	-	-
%RSD		5.52	-	2.22	-	-	-
Mean (c/s)		253.6000	-	6292.200	-	-	-
Standard 0.61 ppb		0.6100	-e	0.6100	-e	-e	-e
Corr Conc		0.6100	-	0.6100	-	-	-
%RSD		2.88	-	2.34	-	-	-
Mean (c/s)		1147.200	-	21724.60	-	-	-
Standard 1.22 ppb		1.2200	1.2200	1.2200	1.2200	-e	-e
Corr Conc		1.2200	1.2200	1.2200	1.2200	-	-
%RSD		4.40	4.15	3.64	3.42	-	-
Mean (c/s)		2367.200	6022.000	44333.20	12414.00	-	-
Standard 2.44 ppb		2.4400	2.4400	2.4400	2.4400	-e	-e
Corr Conc		2.4400	2.4400	2.4400	2.4400	-	-
%RSD		3.36	3.24	3.39	3.73	-	-
Mean (c/s)		4696.400	10511.80	87917.40	21790.60	-	-
Standard 6.25 ppb		6.2500	6.2500	6.2500	6.2500	-e	-e
Corr Conc		6.2500	6.2500	6.2500	6.2500	-	-
%RSD		4.94	4.70	4.30	4.00	-	-
Mean (c/s)		11319.60	23377.80	213465.0	49834.80	-	-
Standard 12.2 ppb		12.2000	12.2000	12.2000	12.2000	12.2000	12.2000
Corr Conc		12.2000	12.2000	12.2000	12.2000	12.2000	12.2000
%RSD		1.77	1.72	0.51	0.72	0.62	2.32
Mean (c/s)		24360.80	48042.40	455169.4	99700.00	73155.17	12790.90
Standard 24.4 ppb		24.4000	24.4000	24.4000	24.4000	24.4000	24.4000
Corr Conc		24.4000	24.4000	24.4000	24.4000	24.4000	24.4000
%RSD		0.98	0.54	0.71	0.62	0.88	1.09
Mean (c/s)		48427.00	92423.00	886733.0	192157.2	119563.1	21537.17
Standard 62.5 ppb		62.5000	62.5000	62.5000	62.5000	62.5000	62.5000
Corr Conc		62.5000	62.5000	62.5000	62.5000	62.5000	62.5000
%RSD		1.87	1.05	1.69	1.36	1.92	2.12
Mean (c/s)		120475.4	225251.0	2150587	467191.0	253809.9	46940.38
Standard 125.0 ppb		125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
Corr Conc		125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
%RSD		1.45	0.79	0.99	1.07	1.01	0.29
Mean (c/s)		250313.2	456709.4	4350429	953101.0	491863.4	92558.21



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Sample Label	Be9 ppb	Cu63 ppb	Co59 ppb	Ni60 ppb	As75 ppb	Se78 ppb
Standard 250.0 ppb	250.0000	250.0000	250.0000	250.0000	250.0000	250.0000
Corr Conc	250.0000	250.0000	250.0000	250.0000	250.0000	250.0000
%RSD	1.64	1.24	1.52	1.46	1.23	1.62
Mean (c/s)	502226.4	898285.4	8596095	1859723	939924.9	179412.2
Matrix Blank	0.1122	-0.0417	0.0064	-0.0742	0.7105	0.4628
Corr Conc	0.1122	-0.0417	0.0064	-0.0742	0.7105	0.4628
%RSD	8.30	34.32	12.89	11.04	26.49	48.29
Mean (c/s)	237.6000	1405.000	944.2000	2958.400	26073.41	3860.024
Matrix Blank	0.0622	-0.0390	0.0029	-0.0811	0.7579	0.6274
Corr Conc	0.0622	-0.0390	0.0029	-0.0811	0.7579	0.6274
%RSD	13.16	15.04	33.72	9.95	25.53	57.14
Mean (c/s)	141.4000	1404.200	813.2000	2885.200	26053.48	3931.240
Matrix Blank	0.0352	-0.0234	0.0035	-0.0623	0.8678	0.7216
Corr Conc	0.0352	-0.0234	0.0035	-0.0623	0.8678	0.7216
%RSD	9.59	50.77	20.82	14.23	25.85	74.72
Mean (c/s)	89.4000	1440.600	824.8000	2986.800	26125.12	3938.942
Matrix Blank	0.0261	-0.0192	0.0027	-0.0611	0.9900	0.9621
Corr Conc	0.0261	-0.0192	0.0027	-0.0611	0.9900	0.9621
%RSD	25.34	83.23	41.46	19.12	12.27	40.61
Mean (c/s)	71.6000	1436.800	785.6000	2958.400	26239.61	4034.469
Matrix Blank	0.0228	-0.0014	0.0033	-0.0511	1.0720	0.8683
Corr Conc	0.0228	-0.0014	0.0033	-0.0511	1.0720	0.8683
%RSD	18.57	747.8	32.18	26.20	4.59	55.89
Mean (c/s)	64.4000	1470.400	793.6000	2976.000	26057.84	3906.597
Matrix Blank	0.0194	0.0026	0.0035	-0.0408	1.2458	0.3943
Corr Conc	0.0194	0.0026	0.0035	-0.0408	1.2458	0.3943
%RSD	24.66	590.5	10.78	23.27	10.02	83.81
Mean (c/s)	57.6000	1466.200	787.8000	3013.600	26351.59	3583.935
LB	0.0125	0.0878	0.0044	0.1728	0.9578	0.4610
Corr Conc	0.0125	0.0878	0.0044	0.1728	0.9578	0.4610
%RSD	39.26	53.78	76.55	38.80	65.90	189.6
Mean (c/s)	48.6000	1850.800	866.4000	4772.200	26862.47	3830.394
LCS-100	102.4555	96.3843	91.8961	95.0675	95.6304	110.5507
Corr Conc	102.4555	96.3843	91.8961	95.0675	95.6304	110.5507
%RSD	1.54	1.53	1.56	2.30	1.56	1.83
Mean (c/s)	186605.4	326011.8	3122908	683290.8	359985.0	69350.03
LB	0.0492	0.0737	0.0076	0.1461	1.1269	0.7562
Corr Conc	0.0492	0.0737	0.0076	0.1461	1.1269	0.7562
%RSD	17.45	69.08	35.46	43.49	56.02	83.88
Mean (c/s)	119.6000	1831.600	995.4000	4653.200	27951.77	4096.667
LB	0.0233	0.0775	0.0041	0.1388	0.8201	0.5213
Corr Conc	0.0233	0.0775	0.0041	0.1388	0.8201	0.5213
%RSD	17.80	67.56	74.28	46.76	80.45	181.8
Mean (c/s)	70.0000	1854.800	875.6000	4622.800	26949.46	3953.501
B-1	0.1401	21.7171	7.0050	9.4281	3.2961	-5.7016
Corr Conc	0.1401	21.7171	7.0050	9.4281	3.2961	-5.7016
%RSD	5.72	8.18	7.04	7.52	25.32	4.78
Mean (c/s)	286.6000	76522.20	244929.8	72634.20	34993.61	20.6816
LB	0.0048	0.5337	0.0115	0.2971	1.7009	1.6730
Corr Conc	0.0048	0.5337	0.0115	0.2971	1.7009	1.6730
%RSD	98.27	11.53	40.39	30.57	44.99	51.64
Mean (c/s)	34.2000	3529.400	1149.400	5867.200	30502.62	4723.262
LB	0.0043	0.2364	0.0091	0.2064	1.3390	0.9715
Corr Conc	0.0043	0.2364	0.0091	0.2064	1.3390	0.9715
%RSD	37.69	21.66	52.35	36.11	45.70	72.61
Mean (c/s)	34.6000	2511.200	1087.400	5314.400	29929.10	4399.065
LB	0.0037	0.1659	0.0074	0.1779	1.2390	0.8602
Corr Conc	0.0037	0.1659	0.0074	0.1779	1.2390	0.8602
%RSD	43.62	28.63	53.01	41.02	47.22	91.33
Mean (c/s)	33.8000	2286.000	1043.800	5169.400	30007.77	4386.563
I-1	0.2191	45.8937	15.3096	74.0112	32.4576	12.9513
Corr Conc	0.2191	45.8937	15.3096	74.0112	32.4576	12.9513
%RSD	6.77	5.93	5.62	5.82	6.23	5.72
Mean (c/s)	416.0000	153632.2	512916.8	524577.2	134983.8	10984.22



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Sample Label	Be9 ppb	Cr53 ppb	Co59 ppb	Ni60 ppb	As75 ppb	Se78 ppb
LB	0.0031	0.3318	0.0107	0.3053	1.5331	1.3913
Corr Conc	0.0031	0.3318	0.0107	0.3053	1.5331	1.3913
%RSD	64.64	13.83	27.22	23.45	40.18	82.35
Mean (c/s)	32.4000	2898.600	1166.600	6160.800	31003.61	4707.562
2-1	0.1682	74.0581	10.6436	138.8936	34.7318	16.4048
Corr Conc	0.1682	74.0581	10.6436	138.8936	34.7318	16.4048
%RSD	8.71	5.96	6.05	6.20	6.61	8.88
Mean (c/s)	335.4000	255385.6	368867.0	1014693	147714.6	13442.45
LB	0.0009	0.3195	0.0111	0.3649	1.7067	1.7772
Corr Conc	0.0009	0.3195	0.0111	0.3649	1.7067	1.7772
%RSD	264.4	14.36	34.99	24.05	35.61	36.59
Mean (c/s)	27.6000	2823.200	1168.200	6564.200	31379.22	4940.324
3-1	0.1529	87.2552	10.1313	25.6231	30.3117	21.8409
Corr Conc	0.1529	87.2552	10.1313	25.6231	30.3117	21.8409
%RSD	17.98	10.64	9.81	10.51	10.31	9.74
Mean (c/s)	298.2000	292377.0	341610.4	184809.6	128310.8	16305.97
LB	0.0017	0.4784	0.0130	0.4996	2.1007	2.1662
Corr Conc	0.0017	0.4784	0.0130	0.4996	2.1007	2.1662
%RSD	279.5	13.35	30.74	15.78	30.73	33.77
Mean (c/s)	28.0000	3303.400	1199.400	7393.400	31872.11	5021.843
LB	0.0000	0.3085	0.0097	0.3841	1.8614	1.6438
Corr Conc	0.0000	0.3085	0.0097	0.3841	1.8614	1.6438
%RSD	5562	22.97	38.77	25.85	32.13	37.42
Mean (c/s)	25.4000	2746.200	1104.400	6636.200	31642.14	4793.323
LCS-100	127.4190	113.9346	104.5166	108.8602	105.2316	121.1599
Corr Conc	127.4190	113.9346	104.5166	108.8602	105.2316	121.1599
%RSD	1.68	2.54	3.00	1.85	1.21	2.05
Mean (c/s)	244111.0	405119.2	3736095	822583.0	414299.5	79609.22
LB	0.0319	0.2325	0.0139	0.3514	2.0925	2.0360
Corr Conc	0.0319	0.2325	0.0139	0.3514	2.0925	2.0360
%RSD	18.50	26.56	22.75	27.26	36.47	53.05
Mean (c/s)	88.4000	2431.200	1241.200	6285.600	31990.77	4950.065
LCS-100	124.6396	111.5071	103.2993	106.9692	104.4790	119.3391
Corr Conc	124.6396	111.5071	103.2993	106.9692	104.4790	119.3391
%RSD	3.84	4.26	4.05	3.46	3.17	4.28
Mean (c/s)	236171.8	392191.0	3652567	799499.8	407015.1	77581.74
LB	0.0422	0.3363	0.0115	0.2602	1.8620	2.1298
Corr Conc	0.0422	0.3363	0.0115	0.2602	1.8620	2.1298
%RSD	20.46	117.0	43.06	41.56	39.58	42.57
Mean (c/s)	111.4000	2877.800	1185.400	5752.800	32127.23	5192.140
LB	0.0268	0.1491	0.0095	0.2471	1.5983	2.0595
Corr Conc	0.0268	0.1491	0.0095	0.2471	1.5983	2.0595
%RSD	24.73	42.49	47.59	39.79	47.13	38.08
Mean (c/s)	80.0000	2212.600	1117.600	5696.800	31321.65	5177.586
B-2A	0.0238	3.0674	0.0628	1.9792	1.7248	1.7503
Corr Conc	0.0238	3.0674	0.0628	1.9792	1.7248	1.7503
%RSD	18.76	18.97	21.98	20.86	46.76	58.92
Mean (c/s)	74.2000	13044.00	3113.000	19337.80	31737.37	4944.624
LB	0.0142	0.1594	0.0083	0.1836	1.5591	1.6873
Corr Conc	0.0142	0.1594	0.0083	0.1836	1.5591	1.6873
%RSD	27.09	36.21	43.81	39.37	44.88	40.20
Mean (c/s)	54.8000	2242.400	1072.200	5179.200	31033.54	4916.098
1-2A	0.0229	8.4503	0.9786	7.9918	4.0615	139.0174
Corr Conc	0.0229	8.4503	0.9786	7.9918	4.0615	139.0174
%RSD	17.54	15.77	15.79	15.46	33.69	17.43
Mean (c/s)	65.6000	29883.60	33860.00	60443.00	36846.14	86035.83
LB	0.0040	0.3223	0.0043	-0.0389	1.0644	1.5467
Corr Conc	0.0040	0.3223	0.0043	-0.0389	1.0644	1.5467
%RSD	155.2	17.01	76.79	124.9	57.70	67.59
Mean (c/s)	31.8000	2716.000	875.6000	3252.200	27691.77	4572.180
2-2A	0.0105	10.5969	0.8480	7.7657	2.4849	93.4587
Corr Conc	0.0105	10.5969	0.8480	7.7657	2.4849	93.4587
%RSD	51.62	16.74	16.37	16.68	35.58	18.06
Mean (c/s)	42.4000	37181.20	29510.00	58943.80	31448.77	59133.87



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	Be9	Cr53	Co59	Ni60	As75	Se78
Sample Label	ppb	ppb	ppb	ppb	ppb	ppb
LB	0.0039	0.2677	0.0026	-0.0696	0.7935	1.4510
Corr Conc	0.0039	0.2677	0.0026	-0.0696	0.7935	1.4510
%RSD	139.6	21.40	123.7	72.02	68.54	57.75
Mean (c/s)	32.6000	2571.200	831.8000	3080.000	27226.58	4609.855
3-2A	0.0215	9.2115	0.3846	5.6181	2.7591	125.1666
Corr Conc	0.0215	9.2115	0.3846	5.6181	2.7591	125.1666
%RSD	34.41	25.00	25.68	26.39	55.15	27.11
Mean (c/s)	63.6000	32780.40	13864.20	43893.40	32806.94	78542.82
LB	0.0014	0.2276	0.0024	-0.0703	0.7064	1.0902
Corr Conc	0.0014	0.2276	0.0024	-0.0703	0.7064	1.0902
%RSD	210.8	29.36	128.6	73.71	85.99	44.78
Mean (c/s)	28.0000	2417.000	820.8000	3064.200	26816.06	4380.275
LCS-100	99.2746	92.2843	85.9101	88.4275	90.2095	105.6028
Corr Conc	99.2746	92.2843	85.9101	88.4275	90.2095	105.6028
%RSD	3.35	2.78	2.42	2.51	4.34	4.51
Mean (c/s)	189016.0	326355.2	3051891	664641.8	356352.8	69416.86
LCS-100	109.2168	100.0255	92.9017	96.2793	97.0296	114.1499
Corr Conc	109.2168	100.0255	92.9017	96.2793	97.0296	114.1499
%RSD	1.88	2.37	2.93	1.90	0.90	1.79
Mean (c/s)	200128.6	340320.2	3176000	696173.4	367189.0	71933.50
LCS-100	109.9952	100.8411	93.4747	96.9189	97.3787	114.4880
Corr Conc	109.9952	100.8411	93.4747	96.9189	97.3787	114.4880
%RSD	1.34	1.07	1.82	1.10	1.04	1.35
Mean (c/s)	202104.0	344037.2	3204396	702697.4	369408.8	72330.27
LCS-100	111.5405	101.7246	94.5025	97.7066	97.9378	114.3601
Corr Conc	111.5405	101.7246	94.5025	97.7066	97.9378	114.3601
%RSD	1.33	1.31	1.27	0.69	0.50	1.14
Mean (c/s)	202816.8	343436.4	3206189	701047.4	367562.6	71507.83
LB	0.0815	0.1015	0.0097	-0.0461	1.3145	1.2102
Corr Conc	0.0815	0.1015	0.0097	-0.0461	1.3145	1.2102
%RSD	4.56	44.70	41.84	115.3	48.95	64.57
Mean (c/s)	182.2000	1932.200	1070.400	3200.200	28660.58	4373.159
Matrix Blank	0.0449	-0.0089	-0.0004	-0.2862	1.2731	1.0609
Corr Conc	0.0449	-0.0089	-0.0004	-0.2862	1.2731	1.0609
%RSD	11.34	198.9	200.7	2.06	9.69	36.97
Mean (c/s)	107.6000	1491.800	688.0000	1351.400	27621.09	4148.835
Matrix Blank	0.0355	-0.0083	0.0000	-0.2809	1.3968	1.5616
Corr Conc	0.0355	-0.0083	0.0000	-0.2809	1.3968	1.5616
%RSD	11.05	244.2	569.4	2.53	9.09	17.20
Mean (c/s)	88.6000	1469.000	692.8000	1367.400	27607.21	4383.122
	Cd111	Pb208	IS: In115			
	ppb	ppb	ratio			
Blank	-	-	-			
Corr Conc	-	-	-			
%RSD	51.09	7.55	0.32			
Mean (c/s)	18.6104	210.4000	87842.96			
Blank	0.0000	0.0000	-			
Corr Conc	0.0000	0.0000	-			
%RSD	47.17	7.61	0.83			
Mean (c/s)	27.3866	207.6000	88697.14			
Blank	0.0000	0.0000	1.00			
Corr Conc	0.0000	0.0000	1.00			
%RSD	108.5	4.38	0.79			
Mean (c/s)	11.7792	210.4000	89274.03			
Standard 0.061 ppb	0.0610	0.0610	1.01			
Corr Conc	0.0610	0.0610	1.01			
%RSD	27.96	3.44	2.46			
Mean (c/s)	182.0006	703.0000	89950.43			
Standard 0.122 ppb	0.1220	0.1220	0.99			
Corr Conc	0.1220	0.1220	0.99			
%RSD	3.73	5.14	1.53			
Mean (c/s)	396.3818	1236.000	88594.16			



March 08, 2010

Thom Schmelter
BVNA, INC. ES DETROIT
45525 Grand River Avenue
Suite 200
Novi, MI 48374-

Bureau Veritas Work Order No. 10020966

Reference: 11010-000036.00.000/YCUA

Dear Thom Schmelter:

Bureau Veritas North America, Inc. received 10 samples on 2/19/2010 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:

CASE NARRATIVE

Date: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Project: 11010-000036.00.000/YCUA

Work Order No 10020966

The results of this report relate only to the samples listed in the body of this report.

Unless otherwise noted below, the following statements apply: 1) all samples were received in acceptable condition, 2) all quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results, and 3) the industrial hygiene results have not been blank corrected.

Analytical Comments for Method EPA OTM 27, solvent samples: Volumes of acetone rinses follow below.

Lab ID	Client ID	Volume (mL)
10020966-001B	YCUA OTM 27 RUN 1 CONT 2	78
10020966-001C	YCUA OTM 27 RUN 1 CONT 3	83
10020966-001D	YCUA OTM 27 RUN 1 CONT 4	20
10020966-002B	YCUA OTM 27 RUN 2 CONT 2	37
10020966-002C	YCUA OTM 27 RUN 2 CONT 3	40
10020966-002D	YCUA OTM 27 RUN 2 CONT 4	12
10020966-003B	YCUA OTM 27 RUN 3 CONT 2	40
10020966-003C	YCUA OTM 27 RUN 3 CONT 3	46
10020966-003D	YCUA OTM 27 RUN 3 CONT 4	23
10020966-004A	YCUA OTM 27 CONT H7	
	ACETONE RINSE BLANK	97

Analytical Comments for Method EPA OTM 27, solvent samples: Actual values for condensable particulate matter, less than the detection limit:

Lab ID	Client ID	Particulate (mg)
10020966-002C	YCUA OTM 27 RUN 2 CONT 3	-0.1
10020966-002D	YCUA OTM 27 RUN 2 CONT 4	-0.4
10020966-003B	YCUA OTM 27 RUN 3 CONT 2	-0.3
10020966-003C	YCUA OTM 27 RUN 3 CONT 3	-0.3
10020966-003D	YCUA OTM 27 RUN 3 CONT 4	-0.3
10020966-004A	YCUA OTM 27 CONT H7	
	ACETONE RINSE BLANK	-0.3

Analytical Comments for Method EPA OTM 28: Volumes of impinger solutions and rinses follow:

CASE NARRATIVE

Date: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Project: 11010-000036.00.000/YCUA

Work Order No 10020966

Lab ID	Client ID	Water (mL)	MeCL2/Acetone (mL)
10020966-005A	YCUA OTM 28 RUN 1	390	270
10020966-006A	YCUA OTM 28 RUN 2	420	240
10020966-007A	YCUA OTM 28 RUN 3	240	300
10020966-008A	YCUA OTM 28 FIELD BLANK	300	200
10020966-009A	YCUA OTM 28 REAGENT BLANK:		
		160 (mls Water only)	
		156 (mls acetone only)	
		162 (mls MeCl2 only)	
10020966-010A	YCUA OTM 28 CPM (rinse bottle)		
	CONT #7 WATER	166 (mls Water only)	
	CONT #6 ACETONE	152 (mls acetone only)	
	CONT #8 MECL2	154 (mls MeCl2 only)	

Analytical comments for OTM-28, reagent blanks. Please note the reagent blank results for Methylene chloride on samples 009A and 010A are reported as the organic condensible. The water reagent blank results for 009A and 010A are reported as the inorganic condensible. The acetone reagent blank results samples -009 and -010 were both non-detect at <0.5mg.

ANALYTICAL RESULTS

Date: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Project: 11010-000036.00.000/YCUA

Sample Type: Acetone Rinse

Work Order No: 10020966

Method Reference Method EPA OTM 27

Date Received: 02/19/2010

RL (mg): 0.5

Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate Matter by EPA OTM 27			Date Analyzed
			(mg)	(mg/m ³)	(ppm)	
001B	YCUA OTM 27 RUN 1 CONT 2 02/17/10	0	8.0	--	--	03/03/2010
001C	YCUA OTM 27 RUN 1 CONT 3 02/17/10	0	2.5	--	--	03/03/2010
001D	YCUA OTM 27 RUN 1 CONT 4 02/17/10	0	0.70	--	--	03/03/2010
002B	YCUA OTM 27 RUN 2 CONT 2 02/17/10	0	1.0	--	--	03/03/2010
002C	YCUA OTM 27 RUN 2 CONT 3 02/17/10	0	<0.5	--	--	03/03/2010
002D	YCUA OTM 27 RUN 2 CONT 4 02/17/10	0	<0.5	--	--	03/03/2010
003B	YCUA OTM 27 RUN 3 CONT 2 02/18/10	0	<0.5	--	--	03/03/2010
003C	YCUA OTM 27 RUN 3 CONT 3 02/18/10	0	<0.5	--	--	03/03/2010
003D	YCUA OTM 27 RUN 3 CONT 4 02/18/10	0	<0.5	--	--	03/03/2010
004A	YCUA OTM 27 CONT H7 ACETONE RINSE BLANK 02/17/10	0	<0.5	--	--	03/03/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT
Project: 11010-000036.00.000/YCUA
Sample Type: GF Filter, Tared
Method Reference Method EPA OTM 27
RL (mg): 0.5

Work Order No: 10020966
Date Received: 02/19/2010
Analyst: MEN

Lab No.	Sample Identification	Air Volume (liters)	Particulate Matter by EPA OTM 27			Date Analyzed
			(mg)	(mg/m ³)	(ppm)	
001A	YCUA OTM 27 RUN 1 CONT 1 02/17/10	0	3.8	--	--	03/03/2010
002A	YCUA OTM 27 RUN 2 CONT 1 02/17/10	0	6.0	--	--	03/03/2010
003A	YCUA OTM 27 RUN 3 CONT 1 02/18/10	0	6.1	--	--	03/03/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28 RUN 1

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/17/2010

Lab ID: 10020966-005A

Matrix: AIR

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
EPA METHOD OTM 28						Analyst: MEN
Inorganic Condensable Particulate Matter	7.2	0.50		mg	1	3/3/2010
Organic Condensable Particulate Matter	5.4	0.50		mg	1	3/3/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28 RUN 2

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/17/2010

Lab ID: 10020966-006A

Matrix: AIR

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
EPA METHOD OTM 28						Analyst: MEN
Inorganic Condensable Particulate Matter	6.7	0.50		mg	1	3/3/2010
Organic Condensable Particulate Matter	4.2	0.50		mg	1	3/3/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28 RUN 3

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/18/2010

Lab ID: 10020966-007A

Matrix: AIR

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
EPA METHOD OTM 28						
Inorganic Condensable Particulate Matter	4.2	0.50		mg	1	3/3/2010
Organic Condensable Particulate Matter	3.5	0.50		mg	1	3/3/2010

Analyst: MEN

Qualifiers:

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

S - Spike Recovery outside accepted recovery limits

J - Analyte detected below the Reporting Limit

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

* - Value exceeds Maximum Contaminant Level

T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28 FIELD
BLANK

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/17/2010

Lab ID: 10020966-008A

Matrix: AIR

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
EPA METHOD OTM 28						Analyst: MEN
Inorganic Condensable Particulate Matter	1.5	0.50		mg	1	3/3/2010
Organic Condensable Particulate Matter	1.9	0.50		mg	1	3/3/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28
WATER/ACETONE/MECL2
REAGENT BLANK

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/17/2010

Lab ID: 10020966-009A

Matrix: AIR

Reporting

EPA METHOD OTM 28

Analyst: MEN

Inorganic Condensable Particulate Matter	0.80	0.50	mg	1	3/3/2010
Organic Condensable Particulate Matter	ND	0.50	mg	1	3/3/2010

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: 08-Mar-10

Client: BVNA, INC. ES DETROIT

Client Sample ID: YCUA OTM 28 CPM CONT
#6, #7, #8

Work Order No: 10020966

Tag Number:

Project: 11010-000036.00.000/YCUA

Collection Date: 2/17/2010

Lab ID: 10020966-010A

Matrix: AIR

Analyses	Result	Reporting Limit	Qual	Units	DF	Date Analyzed
EPA METHOD OTM 28						Analyst: MEN
Inorganic Condensable Particulate Matter	1.0	0.50		mg	1	3/3/2010
Organic Condensable Particulate Matter	ND	0.50		mg	1	3/3/2010

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)

INTERDEPARTMENTAL INTERNAL CHAIN-OF-CUSTODY

BUREAU
VERITAS

INTERNAL DEPARTMENTAL INFORMATION	Consultant's Name	THOMAS SCHWARTZ
	Consultant's Office Location	MOVI, MI HSE
	Internal Project No.	11010-000036-00-000
Mission Client Code:		
Company Name: BUREAU VERITAS		
Client Name: YCVA		
Mailing Address:		Telephone No.:
City, State, Zip:		

Special Instructions:
For OTM 27 REPORT MASS FOR EACH CONTAINER
OTM 27 RUNS CONTAIN CONTAINERS #1, #2, #3, #4
OTM 28 RUNS CONTAIN CONTAINERS #1, #2, GFM FILTER
Soil Samples Only: Which state are these from? _____

Special Instructions:
For OTM 27 REPORT MASS FOR EACH CONTAINER
OTM 27 RUNS CONTAIN CONTAINERS #1, #2, #3, #4
OTM 28 RUNS CONTAIN CONTAINERS #1, #2, CRM FILTER
Soil Samples Only: Which state are these from?

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)
YCUA OTM 27 RUN 1	02/17	9:00		
YCUA OTM 28 RUN 1	02/17	9:00		
YCUA OTM 27 RUN 2	02/17	1430		
YCUA OTM 28 RUN 2	02/17	1430		
YCUA OTM 27 RUN 3	02/18	815		
YCUA OTM 28 RUN 3	02/18	815		
YCUA OTM 28 FIELD BLANK	02/17	1430		
YCUA OTM 27	02/17	1430		

CHAIN OF CUSTODY	Collected by: <u>THOMAS SCHMEITZER</u>	(print)	Collector's Signature
	Relinquished by: <u>Matthew Kozlowski</u>		Date/Time <u>2/19/18 0735</u>
	Relinquished by:		Date/Time
	Authorized by: <u>[Signature]</u>		Date <u>02/18/2010</u>

PRICING INFORMATION	
<input checked="" type="checkbox"/> Free Schedule Price <input type="checkbox"/> Discount Price off list _____ <input type="checkbox"/> Special Price Attached	Send Report to: <input type="checkbox"/> Client <input checked="" type="checkbox"/> Internal Office Send Via: <input checked="" type="checkbox"/> Reg. Mail <input type="checkbox"/> Overnight Mail <input checked="" type="checkbox"/> Email <input type="checkbox"/> Fax Fax # _____

IMPORTANT

Date Results Requested: Standard Test

Rush Charges Authorized? ☐ Yes ☒ No

For Bureau Veritas Use Only
Project No.
10020964

Please return completed form and samples to one of the Bureau Veritas North America, Inc. locations below:

- Industrial Hygiene / Environmental / Mold
- Asbestos / Specialty Microscopy
- Pharmaceutical Actives

Distribution:
White & Yellow: Lab
Pink: Consultant

**INTERDEPARTMENTAL INTERNAL
CHAIN-OF-CUSTODY**

**BUREAU
VERITAS**

OUTSIDE CLIENT INFORMATION	
INTERNAL DEPARTMENTAL INFORMATION	Consultant's Name <u>THOMAS SCHMEUTER</u> Consultant's Office Location <u>NOVI, MI</u> <u>HSE</u> Internal Project No. <u>11010000036000000</u>
Vision Client Code:	
Company Name: <u>BUREAU VERITAS</u>	
Client Name: <u>YCUA</u>	
Mailing Address:	
City, State, Zip:	
Telephone No.:	

Special Instructions:

Soil Samples Only: Which state are these from?

[illegible]

Please return completed form and samples to one of the Bureau Veritas North America, Inc. locations below:

Detroit Lab: (800) 806-5887
Atlanta Lab: (800) 252-9919
Lake Zurich Lab: (888) 576-7522

- Industrial Hygiene / Environmental / Mold
- Asbestos / Specialty Microscopy
- Pharmaceutical Actives

IMPORTANT

Date Results Requested: Standard TA

Rush Charges Authorized? ☐ Yes ☒ No

☒ **Fee Schedule Price**

☐ **Discount Price**
off list _____

☐ **Special Price Attached**

Send Report to:

☐ **Client**

☒ **Internal Office**

Send Via:

☒ **Reg. Mail**

☐ **Overnight Mail**

☒ **Email**

☐ **Fax** ☐ **Fax #** _____

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

For Bureau Veritas Use Only
Project No.

Distribution:
White & Yellow: Lab
Pink: Consultant

February 26, 2010

Steve Wyzgoski
Ypsilanti Community Utilities Authority (YCUA)
2777 State Road
Ypsilanti, MI 48198

RE: Workorder: 173031

Dear Steve Wyzgoski:

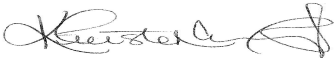
Paragon Laboratories, Inc. received the samples associated with the workorder listed above for the analyses presented in the following report. The analyses pertain only to the aliquot of sample received.

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 below.

Please note that any unused portion of the sample(s) will be discarded 60 days after sample receipt, unless requested otherwise.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact an Account Coordinator at (734) 462-3900.

Sincerely,



Kiersten S. Cummings
kierstenc@paragonlaboratories.com
Account Coordinator

ANALYTICAL RESULTS

Workorder: 173031 YCUA-021910 (3)

Lab ID: 1730310001	Date Collected: 2/17/2010 00:00	Matrix: Sludge
Sample ID: Belt Press Run #1, Composite	Date Received: 2/19/2010 11:45	
Sample Desc:	PO:	

Parameters	Qual	Result Units	DF	RL	Min	Max	Analyzed	By
Individual Parameters								
Analytical Method: SM 2540 G								
Percent Total Solids		21 %	1	0.10			2/23/2010 13:30	ELF
Analytical Method: SM 4500-P B4+E								
Phosphorus, Total		16000 mg/Kg-dry	1	480			2/22/2010 14:40	LCK
Metals								
Analytical Method: EPA 6020A								
Antimony		15 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Arsenic		5.4 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Barium		350 mg/Kg-dry	1	61			2/23/2010 10:56	LCK
Beryllium		0.11 mg/Kg-dry	1	0.097			2/23/2010 10:56	LCK
Boron		49 mg/Kg-dry	1	6.1			2/23/2010 10:56	LCK
Cadmium		3.0 mg/Kg-dry	1	0.048			2/23/2010 10:56	LCK
Chromium		24 mg/Kg-dry	1	1.2			2/23/2010 10:56	LCK
Cobalt		23 mg/Kg-dry	1	1.2			2/23/2010 10:56	LCK
Copper		330 mg/Kg-dry	1	2.4			2/23/2010 10:56	LCK
Lead		14 mg/Kg-dry	1	1.2			2/23/2010 10:56	LCK
Manganese		550 mg/Kg-dry	1	12			2/23/2010 10:56	LCK
Molybdenum		13 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Nickel		18 mg/Kg-dry	1	1.2			2/23/2010 10:56	LCK
Selenium		8.5 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Silver		5.1 mg/Kg-dry	1	0.048			2/23/2010 10:56	LCK
Thallium		0.10 mg/Kg-dry	1	0.097			2/23/2010 10:56	LCK
Tin		2.0 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Zinc		740 mg/Kg-dry	1	48			2/23/2010 10:56	LCK
Analytical Method: EPA 7471B								
Mercury		0.51 mg/Kg-dry	1	0.050			2/25/2010 13:00	ALJP

ANALYTICAL RESULTS

Workorder: 173031 YCUA-021910 (3)

Lab ID: 1730310002	Date Collected: 2/17/2010 00:00	Matrix: Sludge
Sample ID: Belt Press Run #2, Composite	Date Received: 2/19/2010 11:45	
Sample Desc:	PO:	

Parameters	Qual	Result Units	DF	RL	Min	Max	Analyzed	By
Individual Parameters								
Analytical Method: SM 2540 G								
Percent Total Solids		21 %	1	0.10			2/23/2010 13:30	ELF
Analytical Method: SM 4500-P B4+E								
Phosphorus, Total		15000 mg/Kg-dry	1	480			2/22/2010 14:40	LCK
Metals								
Analytical Method: EPA 6020A								
Antimony		12 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Arsenic		4.8 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Barium		330 mg/Kg-dry	1	60			2/23/2010 10:56	LCK
Beryllium		0.11 mg/Kg-dry	1	0.096			2/23/2010 10:56	LCK
Boron		46 mg/Kg-dry	1	6.0			2/23/2010 10:56	LCK
Cadmium		2.8 mg/Kg-dry	1	0.048			2/23/2010 10:56	LCK
Chromium		22 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Cobalt		21 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Copper		320 mg/Kg-dry	1	2.4			2/23/2010 10:56	LCK
Lead		13 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Manganese		520 mg/Kg-dry	1	12			2/23/2010 10:56	LCK
Molybdenum		12 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Nickel		16 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Selenium		7.6 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Silver		4.9 mg/Kg-dry	1	0.048			2/23/2010 10:56	LCK
Thallium		0.10 mg/Kg-dry	1	0.096			2/23/2010 10:56	LCK
Tin		1.9 mg/Kg-dry	1	0.24			2/23/2010 10:56	LCK
Zinc		690 mg/Kg-dry	1	48			2/23/2010 10:56	LCK
Analytical Method: EPA 7471B								
Mercury		0.58 mg/Kg-dry	1	0.050			2/25/2010 13:00	ALJP

ANALYTICAL RESULTS

Workorder: 173031 YCUA-021910 (3)

Lab ID: 1730310003	Date Collected: 2/18/2010 00:00	Matrix: Sludge
Sample ID: Belt Press Run #3, Composite	Date Received: 2/19/2010 11:45	
Sample Desc:	PO:	

Parameters	Qual	Result Units	DF	RL	Min	Max	Analyzed	By
Individual Parameters								
Analytical Method: SM 2540 G								
Percent Total Solids		23 %	1	0.10			2/23/2010 13:30	ELF
Analytical Method: SM 4500-P B4+E								
Phosphorus, Total		15000 mg/Kg-dry	1	430			2/22/2010 14:40	LCK
Metals								
Analytical Method: EPA 6020A								
Antimony		10 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Arsenic		4.2 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Barium		330 mg/Kg-dry	1	54			2/23/2010 10:56	LCK
Beryllium		0.11 mg/Kg-dry	1	0.086			2/23/2010 10:56	LCK
Boron		42 mg/Kg-dry	1	5.4			2/23/2010 10:56	LCK
Cadmium		2.9 mg/Kg-dry	1	0.043			2/23/2010 10:56	LCK
Chromium		23 mg/Kg-dry	1	1.1			2/23/2010 10:56	LCK
Cobalt		20 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Copper		330 mg/Kg-dry	1	2.2			2/23/2010 10:56	LCK
Lead		14 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Manganese		470 mg/Kg-dry	1	11			2/23/2010 10:56	LCK
Molybdenum		13 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Nickel		17 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Selenium		7.5 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Silver		5.4 mg/Kg-dry	1	0.043			2/23/2010 10:56	LCK
Thallium		0.10 mg/Kg-dry	1	0.086			2/23/2010 10:56	LCK
Tin		1.9 mg/Kg-dry	1	0.22			2/23/2010 10:56	LCK
Zinc		720 mg/Kg-dry	1	43			2/23/2010 10:56	LCK
Analytical Method: EPA 7471B								
Mercury		0.63 mg/Kg-dry	1	0.050			2/25/2010 13:00	ALJP

ANALYTICAL RESULTS

Workorder: 173031 YCUA-021910 (3)

Lab ID: **1730310004** Date Collected: 1/19/2010 00:00 Matrix: Sludge
Sample ID: YCUA BP Cake, Composite Date Received: 2/19/2010 11:45
Sample Desc: PO:

Parameters	Qual	Result Units	DF	RL	Min	Max	Analyzed	By
Individual Parameters								
Analytical Method: SM 2540 G								
Percent Total Solids		19 %	1	0.10			2/23/2010 13:30	ELF
Metals								
Analytical Method: EPA 6020A								
Beryllium		<0.11 mg/Kg-dry	1	0.11			2/23/2010 10:56	LCK
Analytical Method: EPA 7471B								
Mercury		0.36 mg/Kg-dry	1	0.050			2/25/2010 13:00	ALJP



31628 Glendale St.
Livonia, Michigan 48150
TEL: 734.422.8000
FAX: 734.422.5342
Website: www.rtilab.com

March 05, 2010

Steve Wyzgoski
YCUA
2777 State Rd
Ypsilanti, MI 48198-9112
TEL: (734) 544-7155
FAX (734) 544-7149

RE: 2010 Incinerator

Order No.: 1002581

Dear Steve Wyzgoski:

RTI Laboratories received 3 sample(s) on 2/19/2010 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

This report may only be reproduced in its entirety. Individual pages, reproduced without supporting documentation, do not contain related information and may be misinterpreted by other data reviewers.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Lynch", with a stylized flourish at the end.

Robert Lynch
Manager, Environmental Services
31628 Glendale St.
Livonia, Michigan 48150



31628 Glendale St.
Livonia, Michigan 48150
TEL: 734.422.8000
FAX: 734.422.5342
Website: www.rtilab.com

Case Narrative

WO#: 1002581
Date: 3/5/2010

CLIENT: YCUA
Project: 2010 Incinerator

This report in its entirety consists of the documents listed below. All documents contain the RTI Work Order Number assigned to this report.

1. Paginated Report including: Case Narrative, Analytical Results and Applicable Quality Control Summary Reports.
2. A Cover Letter that immediately precedes the Paginated Report.
3. Paginated copies of the Chain of Custody Documents supplied with this sample set.

Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated. These analytes are not routinely reviewed nor narrated below as to their potential for being laboratory artifacts.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

The elemental analysis was subcontracted to Prevalere Life Sciences for the elemental analysis. A copy of the results are included with this report.

The wet weight results from Prevelere were converted to dry weight and the results for CNHO are tabulated before the Prevalere data. Oxygen was determined with the addition of the nitrogen, hydrogen, carbon. Sulfur and ash and subtracting the value from 100.

The CNH was determined with combustion using a Exeter Analytical CE440 CHN analyzer.



31628 Glendale St.
Livonia, Michigan 48150
TEL: 734.422.8000
FAX: 734.422.5342
Website: www.rtilab.com

Analytical Report

(consolidated)

WO#: **1002581**

Date Reported: **3/5/2010**

CLIENT: YCUA **Collection Date:** 2/17/2010
Project: 2010 Incinerator
Lab ID: 1002581-001 **Matrix:** SOLID
Client Sample ID Run #1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SULFUR				ASTM-D129	SW5050	Analyst: LK
Sulfur	0.132	0.0102	%		1	2/25/2010 12:00:00 PM
HEAT CONTENT, BTU				D240	SW5050	Analyst: JS5
BTU	2,500	1.0	BTU/lb.		1	2/23/2010 2:40:34 PM
ASH CONTENT				D2974		Analyst: JS5
Ash	13	1.0	%		1	2/26/2010 2:18:37 PM
Percent Moisture	71	1.0	%		1	2/26/2010 2:18:37 PM

Qualifiers:	* / X	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits



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Analytical Report

(consolidated)

WO#: **1002581**

Date Reported: **3/5/2010**

CLIENT: YCUA **Collection Date:** 2/17/2010
Project: 2010 Incinerator
Lab ID: 1002581-002 **Matrix:** SOLID
Client Sample ID Run #2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SULFUR				ASTM-D129	SW5050	Analyst: LK
Sulfur	0.132	0.0108		%	1	2/25/2010 12:00:00 PM
HEAT CONTENT, BTU				D240	SW5050	Analyst: JS5
BTU	2,700	1.0		BTU/lb.	1	2/23/2010 2:40:34 PM
ASH CONTENT				D2974		Analyst: JS5
Ash	14	1.0		%	1	2/26/2010 2:18:37 PM
Percent Moisture	72	1.0		%	1	2/26/2010 2:18:37 PM

Qualifiers:	*X	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits



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Analytical Report

(consolidated)

WO#: **1002581**

Date Reported: **3/5/2010**

CLIENT: YCUA **Collection Date:** 2/18/2010
Project: 2010 Incinerator
Lab ID: 1002581-003 **Matrix:** SOLID
Client Sample ID Run #3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SULFUR				ASTM-D129	SW5050	Analyst: LK
Sulfur	0.150	0.0105	%		1	2/25/2010 12:00:00 PM
HEAT CONTENT, BTU				D240	SW5050	Analyst: JS5
BTU	2,700	1.0	BTU/lb.		1	2/23/2010 2:40:34 PM
ASH CONTENT				D2974		Analyst: JS5
Ash	14	1.0	%		1	2/26/2010 2:18:37 PM
Percent Moisture	70	1.0	%		1	2/26/2010 2:18:37 PM

Qualifiers:	*X	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	M	Manual Integration used to determine area response
	ND	Not Detected at the Reporting Limit	PL	Permit Limit
	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Data Tabulation with the calculation of the
% oxygen for workorder 1002581

RTI Sample	YCUA Sample	%C	%H	%N	% Ash	%S	Total	%O
								By difference
1002581-001B	Run #1	13.86	10.03	1.83	13.00	0.13	38.85	61.15
1002581-002B	Run #2	13.14	9.81	1.78	14.00	0.13	38.85	61.15
1002581-003B	Run #3	14.66	12.39	1.86	14.00	0.15	43.05	56.95



CHAIN OF CUSTODY RECORD

PAGE: OF:

MAIN LAB & HEADQUARTERS
RTI LABORATORIES, INC.
3162B Glendale Street
Livonia, MI 48150-1821
(734) 425-3411
www.rti-lab.com


RTI LABORATORIES, INC.
AZLA Cert #570 0102
NELAC Cert #000973
MIIE Cert #1150-2-424



1002581

Please Include Email Address of Report Recipient Whenever Possible !!!

SUBMITTING COMPANY: YCUA		REPORT TO: 3. WYZGOSKI		BILL TO: YCUA
PROJECT #		QUOTE #		
PROJECT NAME: 2010 INCUBATOR		COMPANY: YCUA		2777 STATE ROAD
SPECIAL INSTRUCTIONS/COMMENTS: See ATTACHMENT.		PHONE: (734) 544-7155		Ypsilanti, MI 48198
		FAX:		EMAIL: swyzgoski@comcast.net

SAMPLE'S PRINTED NAME: Steve Wyzgoski		SAMPLE'S SIGNATURE: 				ANALYTICAL PARAMETERS					COMMENTS Marked Preserved Weights NOT Sample Notation etc.
ITEM #	SAMPLE ID.	DATE SAMPLED	TIME SAMPLED	AIR	SOLID	FLUID	VOLUME	SAMPLE DESCRIPTION	NR OF CONTAINERS	HEAT TREATED ALUMINUM	
1	RUN #1	2/17/10						FWL FEED CAKE	1	X	X
2	RUN #2	2/17/10						" " "	1	X	X
3	RUN #3	2/18/10						" " "	1	X	X
4											
5											
6											
7											
8											
9											
10											

Relinquished By: [Signature]	Date: 2-19-10	Time: 11:30
Relinquished By: [Signature]	Date: 2-19-10	Time: 13:45
Relinquished By: [Signature]	Date: 2-22-10	Time: 13:30
TAT: Standard <input checked="" type="checkbox"/> RUSH <input type="checkbox"/> Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>		
Note: RUSH requests will incur surcharges!		

FOR LAB USE ONLY
Were samples preserved ☐ in field ☐ in lab ☐ N/A
Were samples filtered ☐ in field ☐ in lab ☐ N/A
Temp of samples 20.40 °C On Wed for ?
Comments: _____
See reverse side for Laboratory Terms and Conditions of service
Distribution: White and Yellow - Lab; Pink - Field

**RTI LABORATORIES, INC.**

31628 Glendale St.
Livonia, Michigan 48156
TEL: 734.422.8000
FAX: 734.422.5342
Website: www.rtilab.com

QUOTATION

Quoted#: 9105

Date: 2/10/2010

Company: YCUA
Contact: Luther Blackburn
Address: 2777 State Rd
Ypsilanti, MI 48198-9112
Phone: (734) 484-4600
Fax:

Project: Dewatered Sludge
TAT: 8 working days
QC Level: LEVEL II
Project Manager: Fred J Hoitash
Sales Rep:
Quote Expires: 6/30/2010

Item Description	Test	Matrix	Remarks	Qty	Unit Price	% Disc.	Net Price	Total
Heat Content, BTU	D240	Waste		1	50.00	16.00%	42.00	42.00
Ash Content	D2974	Solid	prox	1	25.00	16.00%	21.00	21.00
Uncategorized Testing - Industrial C			Volatile & Fixed Carbon - prox	1	60.00	16.00%	50.40	50.40
Sub-Contracted Testing Procedures			C.O.H.N - Ultimate	1	75.00	16.00%	63.00	63.00
Sulfur	ASTM-D129		Ultimate	1	70.00	16.00%	58.80	58.80

Miscellaneous Charge Summary

Item	Unit	Qty	Total
Sample Handling & Disposal	3.00	1	3.00

Sub Total: \$235.20

Misc: \$3.00

Surcharge: 0.00%

TOTAL: \$238.20

Comments: RTI Laboratories maintains accreditation through A2LA for Chemical and Mechanical testing, NELAP for environmental testing and MDEQ for potable water testing. All certifications can be viewed and/or downloaded from www.rtilab.com.

Sincerely,

Fred J Hoitash
Director, Environmental Sciences
Phone: 734.422.8000 Ext. (205)
Email: fhoitash@rtilab.com

Terms and Conditions:

Standard turnaround time is 5-7 working days. Rush turnaround is available at a surcharge on a prearranged basis. Our minimum invoice charge is \$100.00 for a standard turnaround time project and \$200.00 for a rush project. Free sample pickup is available within 30 miles of any of RTI Laboratories facilities. Sample containers and preservatives, if needed, are supplied free of charge. Invoices can be paid via Visa, Master Card, American Express, Company Check or Cash.



RTI LABORATORIES, INC.

CHAIN OF CUSTODY RECORD

COC ID: _____

PAGE: 1 OF 1

ADDRESS

31628 Glendale St.
Livonia, Michigan 48150
TEL: 734.422.8000
FAX: 734.422.5342
Website: www.rtilab.com



ATA Cert #5731.01.02



NELAC Cert #000673



SBA Cert #R-4150-2-424

ISO 15189

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRACTOR: PRE01		COMPANY: Prevalere Life Sciences, Inc.	
ADDRESS: 8282 Halscy Road			
CITY, STATE, ZIP: Whitesboro, NY 13492			
PHONE: (315) 768-2500		FAX: (315) 624-0725	
ACCOUNT # PRE01		EMAIL: _____	

ITEM	SAMPLE ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	ANALYTICAL PARAMETERS	COMMENTS
1	1002581-001B	GLASS_WM	Solid	2/17/2010	✓		COMMENTS: Methanol Preserved Weights HOT Sample Notation Additional Sample Description: etc.
2	1002581-002B	GLASS_WM	Solid	2/17/2010	✓		
3	1002581-003B	GLASS_WM	Solid	2/18/2010	✓		
4							
5							
6							
7							
8							
9							
10							

Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____

TAT: _____	Standard: <input type="checkbox"/>	RUSH	Next BD: <input type="checkbox"/>	2nd BD: <input type="checkbox"/>	3rd BD: <input type="checkbox"/>
Note: RUSH requests will incur overcharges!					

REPORT TRANSMITTAL DESIRED		
<input type="checkbox"/> HARD COPY (extra cost)	<input type="checkbox"/> FAX	<input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
FOR LAB USE ONLY		
Temp of samples: _____ °C	Attempt to Cool: _____	
Comments: _____		

Prevalere[®]

Life Sciences, Inc.

8282 Halsey Road
Whitesboro, NY 13492
Tel: (315) 736-3050
Fax: (315) 736-2460

www.prevalere.com

Attn: Physical/Chemical Analysis

Physical/Chemical Analysis Submittal Form

Submitted By: Armando Flores

Organization: KIT Labs

Address: 31679 Glendale
Glendale, MI 48150

All samples will be returned to the submitter
following completion of the analysis.

Date: 2-22-10

P.O.#: 10E-059

Phone: 734-482-8000

Fax: 734-422-5342

E-mail: aflores45@kit.lub.com

☐ Fax Results

☒ E-mail Results

PRIORITY SERVICE: For "Rush" service, please contact us for a PRIORITY Service Number before submitting samples.

PRIORITY SERVICE NUMBER: _____

Sample ID (for multiple samples attach listing of ID's):

1002581-001B

1002581-002B

1002581-003B

Expected Composition/Structure: _____

FDA cGMP Compliance Needed* ☐ Yes ☐ No

Specification Provided: ☐ No ☐ Yes: _____

FDA GLP Compliance Needed (Characterization Studies) ☐ Yes ☐ No

Client Method for Analysis: _____

Controlled Substance ☐ Yes ☐ No

If Yes:

DEA Registration # (Required): _____

Please attach copy of current license.

DEA Schedule - Check One: ☐ I ☐ II ☐ III ☐ IV ☐ V -- DEA 222 Form required for Schedule I and II items.

Safety Hazards: ☐ Volatile ☐ Flammable ☐ Explosive ☐ Toxic ☐ Other

Sample Storage: ☐ Desiccator storage (hygroscopic samples) ☐ Refrigerator (-4°C) ☐ Freezer (-20°C) ☐ Other

Special Handling: ☐ Oxygen sensitive handling (under N₂ in Dry Box) ☐ Other _____

☐ Dry sample for _____ Hrs at ☐ RT / ☐ 60°C / ☐ _____ / ☐ Vacuum

Quantitative Elemental Analysis

☒ Single ☐ Duplicate

5-10mg required for CHN; 10-20mg for other elements

Element(s):

Expected value:

☒ CHN

_____ %C _____ %H _____ %N

☐ S

_____ %S

(please indicate if sample
contains F, Hg, or Selenium)

☐ Cl

_____ %Cl

☐ F

_____ %F Combustion Aid ☐: _____

X-ray Powder Diffraction (XRD)

Sample Prep:

☐ Front Pack (0.5g)

☐ Zero Background (50mg minimum)

System Parameters:

☐ 4-40, 2-theta - organics

☐ 2-80, 2-theta - inorganics

☐ Client-specified Conditions: _____

Water Analysis By Karl Fischer

☐ Single ☐ Duplicate

10-100mg (minimum)

Method(s):

Expected value:

☐ Coulometric

_____ %

☐ Volumetric

_____ %

☐ Vaporizer Oven

_____ %

Sample melting point required: _____

Mass Spectrometry

(Structural and Molecular Weight Confirmation)
(by GC/MS and LC/MS)

☐ DEPM/CI (mol. weight confirmation)

☐ ES/MS (mol. weight confirmation)

☐ DEPM/SEI (structural confirmation)

☐ ES/MS/MS (structural confirmation)

Expected Molecular Weight: _____

Soluble in: _____

Other Quantitative Analysis

☐ Single ☐ Duplicate

☐ Heavy Metals (USP) - see USP for sample requirements

☐ Residue on Ignition (USP) (-1g sample required)

☐ Loss on Drying (-1g sample required)

☐ Melting Point (-25mg sample required)

☐ Graphite Furnace Atomic Absorption

Other Qualitative Analysis

☐ TGA (10-20mg)

Temp. Range _____ (°C)

Heating Rate _____ (°C/min)

☐ FT-IR (2-5 mg)

☐ Diffuse Reflectance ☐ KBr Pellet ☐ Nujol Mtl

Comments: Oxygen by difference on the 3 samples.

*GMP samples with established specifications require the use of validated methods. For samples with established specifications, please provide a copy (or reference) of the method and any reference to validation data. GMP regulations also require samples be identified with a distinctive code; their source; quantity; and date sample was taken.

Attn: Armando Flores
RTI Laboratories, Inc.
31628 Glendale Ave.
Livonia, Michigan 48150
United States

PREVAL ERF JOB NO. : 175377
P.O. NO. : 10E-059
REL NO. : Armando Flores
DATE REC. : 2/24/2010
SAMPLES : 3

[illegible]

- a. Air sensitive handling
- b. Combustion Aid Added
- c. Insufficient sample for duplicate analysis
- d. Sample did not duplicate, insufficient sample for repeat analysis
- e. Not billed
- f. Additional results forthcoming
- g. Sample was dried under vacuum for _____ hours at _____ degrees Celsius
- h. Weight below recommended 1mg

Comments:

APPROVED BY:

8282 Halsey Road Whitesboro, NY 13492 Phone: (315)736-3050 Fax: (315)736-2460

ATTACHMENT 13

Chains-of-Custody

Included with Lab Data

ATTACHMENT 14

Observer Comments

None Included

ATTACHMENT 15

Production Data

YCUA Laboratory
FBSSI Performance / Emission Testing Project

Sample ID#	Sample Date	Sample Time	Technician	% Total Solids	% Total Volatile Solids
N. PORT	02/17/10	9:00 AM	LM	20.1%	81.6%
S. PORT	02/17/10	9:30 AM	LM	20.5%	82.1%
N. PORT	02/17/10	10:00 AM	LM	20.6%	82.1%
S. PORT	02/17/10	10:30 AM	LM	20.6%	82.1%
N. PORT	02/17/10	11:00 AM	LM	20.7%	82.3%
S. PORT	02/17/10	11:30 AM	LM	20.4%	81.9%
N. PORT	02/17/10	12:00 PM	LM	20.7%	82.2%
S. PORT	02/17/10	12:30 PM	LM	20.7%	82.1%
N. PORT	02/17/10	1:00 PM	LM	20.7%	82.3%
S. PORT	02/17/10	2:30 PM	LM	20.2%	81.8%
N. PORT	02/17/10	3:00 PM	LM	19.8%	81.6%
S. PORT	02/17/10	3:30 PM	LM	19.9%	81.9%
N. PORT	02/17/10	4:00 PM	LM	19.9%	81.9%
S. PORT	02/17/10	4:30 PM	LM	19.8%	81.7%
N. PORT	02/17/10	5:00 PM	LM	20.0%	81.9%
S. PORT	02/17/10	5:30 PM	LM	20.3%	82.1%
N. PORT	02/17/10	6:00 PM	LM	18.1%	81.8%
S. PORT	02/17/10	6:30 PM	LM	18.0%	81.9%
S. PORT	02/18/10	8:15 AM	LM	21.1%	80.1%
N. PORT	02/18/10	8:45 AM	LM	23.2%	79.7%
S. PORT	02/18/10	9:15 AM	LM	21.2%	80.6%
N. PORT	02/18/10	9:45 AM	LM	22.9%	80.5%
S. PORT	02/18/10	10:15 AM	LM	21.3%	79.6%
N. PORT	02/18/10	10:45 AM	LM	22.0%	78.5%
S. PORT	02/18/10	11:15 AM	LM	21.2%	81.2%
N. PORT	02/18/10	11:45 AM	LM	21.9%	77.7%
S. PORT	02/18/10	12:15 PM	LM	22.7%	81.7%
N. PORT	02/18/10	12:45 PM	LM	21.1%	81.1%
Total Number of	28	Minimum		18.00%	77.70%
Samples:		Maximum		23.20%	82.30%
		Average		20.70%	81.29%

YPSILANTI COMMUNITY UTILITIES AUTHORITY
EMISSIONS TESTING DATA - February 2010

POINTS						TIT 3-353	TIT 3-351	TIT 3-400	AIT 3-453	PDIT 5-506	FIT 5-508	PDIT 5-522	FIT 5-539	PDIT 3-706	PDIT 3-863	TIT 3-843	TIT 3-844	HOOR	HOOR			
Date	Time	Run#	Sludge FeedTotalizer Read	Sludge Feed - Gallons	% Solids - Cake to the Incinerator	Temp in Sand bed	Temp. in Freeboard	Temp. upstream Pri, Heat Exchanger	% Oxygen before Venturi	Pressure Drop across Venturi-inches	Water Flow to Venturi	Pressure Drop - Impingement Tray -inches	Water Flow - Impingement Tray	Pressure Drop - WESP-inches	Pressure Drop - GAC-inches	Temp - GAC Bed 2 - top	Temp - GAC Bed 2 - Bottom	CEMS Corrected CO	CEMS Oxygen	Natural Gas Totalizer Read	Natural Gas Usage - Cubic Feet	Operator Initials
2/17/2010	9:00 AM	1	22537	1310	20.10%	1437	1728	1577	4.07	32.10	335.00	9.80	495.00	1.40	5.0	139	139	0.13	7.01	112630.2	6260.29	BW
	9:30 AM	1	23847	1300	20.50%	1432	1719	1589	4.18	32.70	329.00	9.90	489.00	1.50	5.0	139	139	0.13	7.01	118890.49	5992.41	BW
	10:00 AM	1	25147	1329	20.60%	1431	1724	1570	4.13	31.60	329.00	9.80	495.00	1.40	4.8	136	136	0.04	7.10	124882.9	6598.18	BW
	10:30 AM	1	26476	1312	20.60%	1432	1721	1573	3.84	31.30	330.00	10.00	492.00	1.30	4.8	135	135	0.04	7.10	131481.08	6502.97	BW
	11:00 AM	1	27788	1289	20.70%	1427	1735	1580	3.82	31.60	326.00	10.30	491.00	1.50	4.9	138	138	0.07	7.28	137984.05	7087.28	BW
	11:30 AM	1	29077	1254	20.40%	1429	1734	1572	4.23	31.70	331.00	9.60	494.00	1.40	4.7	138	138	0.07	7.28	145071.33	6004.69	BW
	12:00 PM	1	30331	1301	20.70%	1427	1728	1588	3.91	32.00	328.00	10.10	492.00	1.30	4.7	137	137	0.13	6.76	151076.02	6688.03	BW
	12:30 PM	1	31632	1326	20.70%	1433	1733	1575	4.17	32.90	334.00	10.00	496.00	1.40	4.8	136	136	0.13	6.76	157764.05	8094.79	BW
	1:00 PM	1	32958	593	20.70%	1428	1714	1566	4.65	32.50	332.00	10.00	494.00	1.60	5.0	136	136	0.14	6.99	165858.84	2593.71	BW
	1:15 PM	1	33551			1431	1716	1583	3.94	32.30	331.00	9.80	493.00	1.40	5.0	135	135	0.14	6.99	168452.55		BW
2/17/2010	2:30 PM	2	36856	1310	20.20%	1434	1725	1577	4.10	33.80	332.00	9.90	488.00	1.60	5.0	135	136	0.07	7.02	186514.2	7168.27	BW
	3:00 PM	2	38166	1334	19.80%	1430	1727	1568	4.11	32.20	329.00	10.00	491.00	1.40	4.9	137	136	0.03	7.15	193682.47	7133.66	BW
	3:30 PM	2	39500	1379	19.90%	1432	1715	1585	3.47	31.30	330.00	10.20	491.00	1.50	4.9	138	139	0.03	7.15	200816.13	7905.17	BW
	4:00 PM	2	40879	1161	19.90%	1436	1712	1580	4.71	32.10	327.20	10.10	491.30	1.50	4.8	138	139	0.14	6.93	208721.3	5967.64	DL
	4:30 PM	2	42040	1403	19.80%	1431	1722	1584	4.10	32.10	331.10	10.10	489.50	1.40	5.0	138	138	0.14	6.93	214688.94	7213.95	DL
	5:00 PM	2	43443	1202	20.00%	1427	1707	1587	4.51	31.40	329.30	9.90	491.00	1.40	4.9	138	138	0.08	7.10	221902.89	5328.94	DL
	5:30 PM	2	44645	2099	20.30%	1431	1706	1584	4.69	31.90	330.20	9.90	490.50	1.40	5.0	132	133	0.08	7.10	227231.83	11959.7	DL
	6:00 PM	2	46744	777	18.10%	1427	1722	1587	3.69	32.70	328.30	10.20	490.30	1.50	5.0	139	139	0.05	7.62	239191.53	2920.22	DL
	6:30 PM	2	47521	746	18.00%	1428	1719	1569	3.99	32.30	331.30	10.10	488.10	1.40	5.0	138	139	0.05	7.62	242111.75	4405.06	DL
	6:55 PM	2	48267			1429	1719	1573	4.04	32.30	333.70	10.10	493.80	1.40	5.0	139	139	0.05	7.62	246516.81		DL
2/18/2010	8:15 AM	3	19832	1227	21.10%	1433	1731	1588	4.97	33.10	326.00	9.80	499.00	1.40	4.8	130	131	1.82	8.73	51199.09	3782.43	BW
	8:45 AM	3	21059	1223	23.20%	1439	1714	1580	4.91	31.10	329.00	9.60	521.00	1.40	4.9	134	134	1.82	8.73	54981.52	4286.47	BW
	9:15 AM	3	22282	1229	21.20%	1427	1702	1586	5.21	31.70	328.00	9.60	466.00	1.30	4.8	135	135	1.73	8.00	59267.99	4299.17	BW
	9:45 AM	3	23511	1239	22.90%	1431	1708	1590	5.07	32.60	329.00	9.80	465.00	1.30	5.0	137	137	1.73	8.00	63567.16	4305.6	BW
	10:15 AM	3	24750	1259	21.30%	1421	1704	1585	5.05	33.10	330.00	9.40	463.00	1.50	4.8	137	137	0.85	8.38	67872.76	4644.54	BW
	10:45 AM	3	26009	1262	22.00%	1412	1717	1579	5.11	31.50	329.00	9.50	467.00	1.40	4.9	137	137	0.85	8.38	72517.3	4570.17	BW
	11:15 AM	3	27271	1247	21.20%	1426	1705	1583	5.43	32.00	329.00	9.50	462.00	1.30	4.8	136	137	0.82	8.03	77087.47	4713.9	BW
	11:45 AM	3	28518	1259	21.90%	1421	1714	1587	4.47	32.90	329.00	9.90	463.00	1.40	5.0	137	137	0.82	8.03	81801.37	4615.54	BW
	12:15 PM	3	29777	1239	22.70%	1431	1707	1573	4.79	32.50	331.00	9.60	460.00	1.30	4.9	136	137	0.8	7.99	86416.91	4510	BW
	12:45 PM	3	31016	238	21.10%	1437	1706	1579	5.14	32.80	329.00	9.90	459.00	1.40	5.0	136	136	0.8	7.99	90926.91	849.35	BW
	12:50 PM	3	31254			1429	1704	1582	5.40	32.20	333.00	9.70	458	1.30	5.0	136	136	0.80	7.99	91776.26		BW

33847

20.70%

Power problems with electrical receptacles 11:03 AM - 11:23 AM

YPSILANTI COMMUNITY UTILITIES AUTHORITY
2777 STATE ROAD, YPSILANTI, MICHIGAN 48198
SLUDGE FLOW CALCULATION DURING EMISSION TESTING - February 2010

Date	Time	Beltpress # 1		Total Flow	Beltpress # 2		Total Flow	Beltpress # 6		Total Flow	Beltpress # 8		Total Flow	% Solids	3 x day		Operator
		Totalizer Initial Flow	Totalizer End Flow		Totalizer Initial Flow	Totalizer End Flow		Totalizer Initial Flow	Totalizer End Flow		Totalizer Initial Flow	Totalizer End Flow			Blending Tank	pH of Ash Pump Water	
2/17/2010	9:00 AM	35659	37644	1985	33818	35770	1952	23499	25464	1965	33894	35890	1996	3.67			BW
	9:30 AM	37644	39629	1985	35770	37747	1977	25464	27398	1934	35890	38018	2128	3.67			BW
	10:00 AM	39629	41604	1975	37747	39719	1972	27398	29347	1949	38018	40003	1985	3.67			BW
	10:30 AM	41604	43554	1950	39719	41700	1981	29347	31306	1959	40003	42029	2026	3.67			BW
	11:00 AM	43554	45535	1981	41700	43651	1951	31306	33259	1953	42029	44315	2286	3.67	3.92		BW
	11:30 AM	45535	47486	1951	43651	45619	1968	33259	34961	1702	44315	46601	2286	4.46			BW
	12:00 PM	47486	47876	390	45619	46144	525	34961	36595	1634	46601	48922	2321	4.46			BW
	12:30 PM	47876	50192	2316	46144	47243	1099	36595	37700	1105	48922	51271	2349	4.46			BW
	1:00 PM	50192	50893	701	47243	47914	0	37700	38259	559	51271	51975	704	4.46			BW
	1:15 PM	50893			47914			38259			51975						BW
2/17/2010	2:30 PM	55957	57938	1981	52899	54849	1950	41529	42633	1104	54969	56039	1070	4.46			BW
	3:00 PM	57938	59901	1963	54849	56780	1931	42633	43760	1127	56039	58047	2008	3.95			BW
	3:30 PM	59901	62120	2219	56780	59700	2920	43760	45550	1790	58047	60319	2272	3.95			BW
	4:00 PM	62120	63787	1667	59700	60625	925	45550	46854	1304	60319	61992	1673	4.46			DL
	4:30 PM	63787	65894	2107	60625	62695	2070	46854	47702	848	61992	64089	2097	4.46	3.62		DL
	5:00 PM	65894	67639	1745	62695	64402	1707	47702	47702	0	64089	65880	1791	4.46			DL
	5:30 PM	67639	69935	2296	64402	67852	3450	47702	47702	0	65880	69385	3505	4.46			DL
	6:00 PM	69935	71567	1632	67852	68268	416	47702	47702	0	69385	69704	319	4.46			DL
	6:30 PM	71567	72857	1290	68268	69528	1260	47702	47702	0	69704	71076	1372	4.46			DL
	6:55 PM	72857			69528			47702			71076						DL
2/18/2010	8:15 AM	25744	27361	1617	25324	26913	1589	22987	24476	1489	24855	26504	1649	5.09			BW
	8:45 AM	27361	29015	1654	26913	28538	1625	24476	26000	1524	26504	28169	1665	5.09			BW
	9:15 AM	29015	30697	1682	28538	30210	1672	26000	27536	1536	28169	29883	1714	5.09			BW
	9:45 AM	30697	32309	1612	30210	31768	1558	27536	28996	1460	29883	31484	1601	5.09			BW
	10:15 AM	32309	33920	1611	31768	33349	1581	28996	30464	1468	31484	33101	1617	5.09	3.70		BW
	10:45 AM	33920	35594	1674	33349	34990	1641	30464	31984	1520	33101	34781	1680	5.09			BW
	11:15 AM	35594	37201	1607	34990	36564	1574	31984	33444	1460	34781	36408	1627	5.09			BW
	11:45 AM	37201	38839	1638	36564	38190	1626	33444	34924	1480	36408	38050	1642	5.09			BW
	12:15 AM	38839	40427	1588	38190	39833	1643	34924	36468	1544	38050	39749	1699	5.09			BW
	12:45 AM	40427	40427	0	39833	40138	305	36468	36740	272	39749	40056	307				BW
	12:50 PM	40427			40138			36740			40056						
Average %														4.49		3.75	
Total Flow				46817			44868			34686			49389				
Total Flow from All Belt Presses													175760	gallons			

YCUA SLUDGE FEED CALCULATION TO THE INCINERATOR USING BELT PRESS DATA

EMISSIONS TESTING February 2010

Date: February 17, 2010

Total Sludge Processed	175760	gallons
Average % Solids	4.49	
Total Pounds of Solids	65816	Lbs
Efficiency of Belt Press	95%	

Dry Pounds of Solids to the Incinerator during Emission Testing	62525 Lbs
---	-----------

Number of Hours	12 hours and 50 minutes
-----------------	-------------------------

Sludge Feed per Hour	4872 Lbs
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YCUA SLUDGE FEED CALCULATION TO THE INCINERATOR USING SCHWING PUMP DATA

EMISSIONS TESTING February 17, 2010

Date: February 17, 2010

Total Sludge Cake Processed	33847	gallons
Average % Solids	20.70	
Total Pounds of Solids	58433	Lbs

Dry Pounds of Solids to the Incinerator during Emission Testing	58433	Lbs
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Number of Hours	12 hours and 50 minutes
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Sludge Feed per Hour	4553 Lbs
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ATTACHMENT 16

Analyzer Calibrations and Cal Gas Certificates



Air Liquide America
Specialty Gases LLC



RATA CLASSIFIED APR 01 2009

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: ES DETROIT 293075

Project No.: 05-74876-001

Customer

BUREAU VERITAS NORTH AMERICA, INC.

45525 GRAND RIVER AVE
NOVI MI 48375

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM048996 Certification Date: 25Mar2009 Exp. Date: 24Mar2012
Cylinder Pressure***: 1950 PSIG

COMPONENT

CERTIFIED CONCENTRATION (Moles)

ANALYTICAL

ACCURACY**

TRACEABILITY

CARBON DIOXIDE	11.1	%	+/- 1%	Direct NIST and NMI
OXYGEN	11.0	%	+/- 1%	Direct NIST and NMI
NITROGEN	BALANCE			

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1800	02Oct2012	K016413	17.87 %	CARBON DIOXIDE
NTRM 2350	01Dec2011	K016398	23.20 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#

DATE LAST CALIBRATED

ANALYTICAL PRINCIPLE

PIR/2000/609015
CAI/110P/V03018

16Mar2009

NDIR

26Feb2009

PARAMAGNETIC

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

CARBON DIOXIDE

Date: 27Mar2009 Response Unit:%
Z1 = 0.00000 R1 = 93.90000 T1 = 69.40000
R2 = 94.00000 Z2 = 0.20000 T2 = 69.70000
Z3 = 0.20000 T3 = 69.70000 R3 = 94.00000
Avg. Concentration: 0.000

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999992
Constants: A = -.00654912
B = 0.111355847 C = 0.00017427
D = 0.000007164 E = 0

OXYGEN

Date: 27Mar2009 Response Unit:%
Z1 = 0.00000 R1 = 23.20000 T1 = 11.10000
R2 = 23.24000 Z2 = 0.00000 T2 = 11.10000
Z3 = 0.00000 T3 = 11.10000 R3 = 23.24000
Avg. Concentration: 11.10 %

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999998
Constants: A = -.00566786
B = 0.99983261 C = 0
D = 0 E = 0

APPROVED BY: aduc



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: ES DETROIT 293075

Project No.: 05-75528-001

Customer

BUREAU VERITAS NORTH AMERICA, INC.

45525 GRAND RIVER AVE
NOVI MI 48375

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM004858 Certification Date: 22Apr2009 Exp. Date: 21Apr2012
Cylinder Pressure***: 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	21.4	%	+/- 1%	Direct NIST and NMI
OXYGEN	21.2	%	+/- 1%	Direct NIST and NMI
NITROGEN	BALANCE			

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2300	01Nov2010	1D002807	23.04 %	CARBON DIOXIDE
NTRM 2350	01Dec2011	K016398	23.20 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#

VARIAN/3400/10693
CAI/110P/V03018

DATE LAST CALIBRATED

22Apr2009
03Apr2009

ANALYTICAL PRINCIPLE

THERMAL CONDUCTIVITY
PARAMAGNETIC

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

CARBON DIOXIDE

Date: 22Apr2009 Response Unit: AREA
Z1 = 0.00000 R1 = 1215732. T1 = 1132134.
R2 = 1216015. Z2 = 0.00000 T2 = 1132046.
Z3 = 0.00000 T3 = 1131822. R3 = 1212139.
Avg. Concentration: 21.44 %



Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.999998
Constants: A = -0.02816109
B = 0.000019317 C = 0
D = 0 E = 0

OXYGEN

Date: 22Apr2009 Response Unit: %
Z1 = 0.00000 R1 = 23.20000 T1 = 21.20000
R2 = 23.19000 Z2 = 0.02000 T2 = 21.20000
Z3 = 0.02000 T3 = 21.20000 R3 = 23.19000
Avg. Concentration: 21.19 %



Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.999998
Constants: A = -0.01097394
B = 0.999975793 C = 0
D = 0 E = 0

APPROVED BY:

JEFF CROTEAU



Air Liquide America
Specialty Gases LLC



Shipped 1290 COMBERMERE STREET
From: TROY MI 48083
Phone: 248-589-2950 Fax: 248-589-2134
C E R T I F I C A T E O F A N A L Y S I S

BUREAU VERITAS NORTH AMERICA, INC.
45525 GRAND RIVER AVE
NOVI MI 48375
PROJECT #: 05-81243-008
PO#: ES DETROIT 293075
ITEM #: 0501840 AL
DATE: 27Oct2009

CYLINDER #: ALM066137
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9
GRADE: CEM ZERO
PURITY: 99.9995%

<u>IMPURITY</u>	<u>MAXIMUM CONCENTRATIONS</u>
CO	1 PPM
CO2	1 PPM
THC	0.5 PPM
H2O	2 PPM
O2	0.5 PPM

ANALYST: 

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Great Lakes, Inc.
2009 Bellaire Ave.
Royal Oak, MI 48067
Ph: (248) 399-9150
Fax: (248) 584-2540
<http://www.airgas.com>

Customer: ANN ARBOR
Part Number: E02NI99E80A2468
Cylinder Number: LL9707
Laboratory: MIC - Royal Oak - MI
Analysis Date: Oct 18, 2007

Reference Number: 32-112599291-5
Cylinder Volume: 83 Cu.Ft.
Cylinder Pressure: 1350 PSIG
Valve Outlet: 350

Expiration Date: Oct 18, 2010

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig. i.e. 1 Mega Pascal

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	9.000 PPM	8.883 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	03060308	XC018219B	9.65PPM CARBON MONOXIDE/NITROGEN	May 01, 2011

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54, 25ppmFS CO, Nicolet 6700	Fourier Transform Infrared (FTIR)	Oct 09, 2007

Triad Data Available Upon Request

Notes: ORDER #702110

RECERT


QA Approval



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC Project No.: 05-81243-006
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: ES DETROIT 293075

Customer

BUREAU VERITAS NORTH AMERICA, INC.

45525 GRAND RIVER AVE
NOVI MI 48375

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM015483 Certification Date: 27Oct2009 Exp. Date: 26Oct2012
Cylinder Pressure***: 1999 PSIG

COMPONENT

CARBON MONOXIDE
NITROGEN

CERTIFIED CONCENTRATION (Moles)

29.7 PPM
BALANCE

ANALYTICAL

ACCURACY**

+/- 1%

TRACEABILITY

Direct NIST and VSL

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2635	02Oct2010	KAL003090	25.21 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//0928621	09Oct2009	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

CARBON MONOXIDE

Date: 20Oct2009	Response Unit: PPM
Z1 = -0.00029	R1 = 101.1769 T1 = 29.71107
R2 = 101.2323	Z2 = 0.09303 T2 = 29.72522
Z3 = 0.11207	T3 = 29.74776 R3 = 101.2492
Avg. Concentration:	29.61 PPM

Date: 27Oct2009	Response Unit: PPM
Z1 = -0.07309	R1 = 25.09699 T1 = 29.62831
R2 = 25.16737	Z2 = 0.01924 T2 = 29.71775
Z3 = 0.02399	T3 = 29.72462 R3 = 25.23868
Avg. Concentration:	29.74 PPM

Concentration = A + Bx + Cx ² + Dx ³ + Ex ⁴	
r = 9.99995E-1	
Constants:	A = 0.00000E+0
B = 8.43626E-1	C = 5.68000E-4
D = 1.00000E-6	E = 0.00000E+0

APPROVED BY:

Rob McCrandall

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Customer: BUREAU VERITAS
Part Number: E02NI99E80A0505
Cylinder Number: LL3412A
Laboratory: MIC - Royal Oak - MI
Analysis Date: Oct 27, 2008
Reference Number: 32-112760167-3
Cylinder Volume: 83 Cu.Ft.
Cylinder Pressure: 2215 PSIG
Valve Outlet: 350

Expiration Date: Oct 27, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig, i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	50.00 PPM	49.75 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

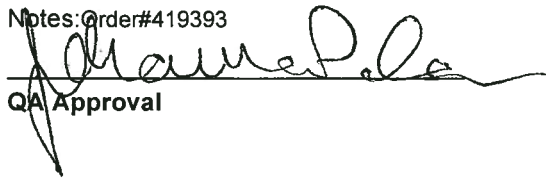
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	980602	XC012227B	49.59PPM CARBON MONOXIDE/NITROGEN	Jul 05, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54, 100ppmFS CO, Nicolet 6700	Fourier Transform Infrared (FTIR)	Oct 03, 2008

Triad Data Available Upon Request

Notes: Order#419393

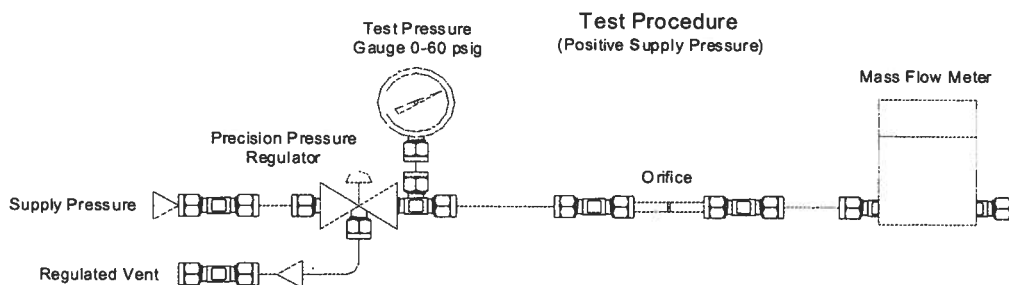

QA Approval

Millennium Instruments Inc.

Model 2002RM Cal Gas Diluter Calibration Data Sheet

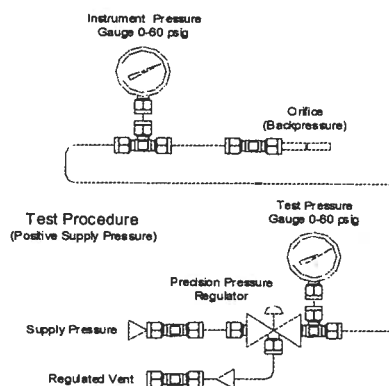
Orifice Calibration Data

Orifice Label	Pressure 15 P.S.I.G.	Pressure 20 P.S.I.G.	Pressure 25 P.S.I.G.	
K-11 (A)	1.27	1.52	1.79	L.P.M.
K-21 (B)	4.82	5.87	6.89	L.P.M.
K-19 (25%)	3.77	4.61	5.29	L.P.M.
K-17 (30%)	2.71	3.43	3.96	L.P.M.
K-21 (50%)	4.67	5.71	6.68	L.P.M.
K-17 (60%)	3.12	3.69	4.27	L.P.M.
K-10 (80%)	1.27	1.50	1.76	L.P.M.



Pressure Gauge Calibration Data

Test Gauge Pressure P.S.I.G.	Zero Gas 0-60 P.S.I.G.	Span Gas 0-60 P.S.I.G.
5.0	6.0	6.0
10.0	11.0	10.8
15.0	16.0	15.2
20.0	20.8	20.0
25.0	25.5	25.0
30.0	30.4	29.9
35.0	35.8	34.9
40.0	40.5	40.0



Barometric Press. 29.64 " Hg
Ambient Temp. 78° F
Flowmeter GFM-1111
Serial # G94699-1
Pressure Gauge WIKA
Serial # 4220048

Purchase Order Weyerhaeuser
Customer Bureau Veritas
Millennium Part # 2002RM
Serial # 200-A216
Date: 7/28/2009
Data By: J.W.

Approved By:



Practical Instrument Electronics

841 Holt Road, Webster N.Y. 14580 U.S.A.
Tel: (585) 872-9350 • Fax: (585) 872-2638

CERTIFICATE OF CALIBRATION

This is to certify that your instrument has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology (formerly NBS) within the limits of the NIST Calibration Services. Actual records pertaining to these standards are on file and are available for examination.

Certified by: Practical Instrument Electronics
Recommended Recalibration: Annually

Model Number	<u>520K</u>	Serial No.	<u>S/N 107222</u>
Calibration Date	<u>5-6-09</u>	Calibration Technician	<u>M. English</u>
In Service Date	<u> </u>	Calibration Due	<u> </u>



Analyzer Calibration Error

Source YCUA FBSSI
Operator T. Schmelter
Date February 17, 2010
Time 7:29

Analyzer calibration error data for
sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

1 and 2

Teledyne 300EM CO

10

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration response (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.0	0.0	0.0	Pass
Mid-level calibration gas	4.4	4.6	0.2	2.0	Pass
High-level calibration gas	8.883	8.9	0.0	0.2	Pass

*Calibration Error must be +/- 2%

Source YCUA FBSSI
Operator T. Schmelter
Date February 18, 2010
Time 7:16

Analyzer calibration error data for
sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

3

Teledyne 300EM CO

10

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration response (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.0	0.0	0.0	Pass
Mid-level calibration gas	4.4	4.5	0.1	1.0	Pass
High-level calibration gas	8.883	8.9	0.0	0.2	Pass

*Calibration Error must be +/- 2%



Analyzer Calibration Error

Source YCUA FBSSI
 Operator T. Schmelter
 Date February 17, 2010
 Time 7:23

Analyzer calibration error data for
 sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

1 and 2

Teledyne 300EM O2

25

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration resonse (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.1	0.1	0.4	Pass
Mid-level calibration gas	11	11.2	0.2	0.8	Pass
High-level calibration gas	21.2	21.3	0.1	0.4	Pass

*Calibration Error must be +/- 2%

Source YCUA FBSSI
 Operator T. Schmelter
 Date February 18, 2010
 Time 7:10

Analyzer calibration error data for
 sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

3

Teledyne 300EM O2

25

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration resonse (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.0	0.0	0.0	Pass
Mid-level calibration gas	11	11.1	0.1	0.4	Pass
High-level calibration gas	21.2	21.3	0.1	0.4	Pass

*Calibration Error must be +/- 2%



Analyzer Calibration Error

Source YCUA FBSSI
 Operator T. Schmelter
 Date February 17, 2010
 Time 7:38

Analyzer calibration error data for
 sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

1 and 2

Servomex 1400 CO2

25

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration resonse (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.0	0.0	0.0	Pass
Mid-level calibration gas	11.1	11.1	0.0	0.0	Pass
High-level calibration gas	21.4	21.4	0.0	0.0	Pass

*Calibration Error must be +/- 2%

Source YCUA FBSSI
 Operator T. Schmelter
 Date February 18, 2010
 Time 7:04

Analyzer calibration error data for
 sampling runs

Analyzer Model No.

Serial Number:

Calibration Span, ppmv (CS)

3

Servomex 1400 CO2

25

	Manufacturers Certified Cylinder Value (ppmv)	Analyzer calibration resonse (ppmv)	Absolute difference (ppmv)	Calibration Error (% of calibration span)	Pass/Fail*
	A	B	A-B	(A-B)/CS * 100	
Low-level (or zero) calibration gas	0.0	0.0	0.0	0.0	Pass
Mid-level calibration gas	11.1	11.1	0.0	0.0	Pass
High-level calibration gas	21.4	21.4	0.0	0.0	Pass

*Calibration Error must be +/- 2%



System Bias and Drift Data

Source Identification	YCUA FBSSI	Run Number	1, 2, 3
Operator	T. Schmelter	Calibration Span	10
Date	February 17-18, 2010	Response Time (s)	40
Analyzer Model No.	Teledyne 300EM CO	Serial Number	

Run 1

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.1	1.0	Pass	-0.1	-1.0	Pass	2.0	Pass
Upscale (high or mid)	4.4	4.6	4.5	-1.0	Pass	4.3	-3.0	Pass	2.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq .5 \text{ ppmv}$

Run 2

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	-0.1	-1.0	Pass	0.0	0.0	Pass	1.0	Pass
Upscale (high or mid)	4.4	4.6	4.3	-3.0	Pass	4.5	-1.0	Pass	2.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq .5 \text{ ppmv}$

Run 3

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.2	2.0	Pass	0.1	1.0	Pass	1.0	Pass
Upscale (high or mid)	4.4	4.5	4.6	1.0	Pass	4.5	0.0	Pass	1.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq .5 \text{ ppmv}$



System Bias and Drift Data

Source Identification YCUA FBSSI
 Operator T. Schmelter
 Date February 17-18, 2010
 Analyzer Model No. Teledyne 300EM O2

Run Number 1, 2, 3
 Calibration Span 25
 Response Time (s) 40
 Serial Number

Run 1

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.1	0.1	0.0	Pass	0.2	0.4	Pass	0.4	Pass
Upscale (high or mid)	11.0	11.1	11.5	1.6	Pass	11.3	0.8	Pass	0.8	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$

Run 2

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.1	0.2	0.4	Pass	0.1	0.0	Pass	0.4	Pass
Upscale (high or mid)	11.0	11.1	11.3	0.8	Pass	11.2	0.4	Pass	0.4	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$

Run 3

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.2	0.8	Pass	0.2	0.8	Pass	0.0	Pass
Upscale (high or mid)	11.0	11.1	11.4	1.2	Pass	11.4	1.2	Pass	0.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$



System Bias and Drift Data

Source Identification YCUA FBSSI
 Operator T. Schmelter
 Date February 17-18, 2010
 Analyzer Model No. Servomex 1400 CO2

Run Number 1, 2, 3
 Calibration Span 25
 Response Time (s) 40
 Serial Number

Run 1

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.0	0.0	Pass	0.0	0.0	Pass	0.0	Pass
Upscale (high or mid)	11.1	11.1	11.0	-0.4	Pass	11.0	-0.4	Pass	0.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$

Run 2

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.0	0.0	Pass	0.1	0.4	Pass	0.4	Pass
Upscale (high or mid)	11.1	11.1	11.0	-0.4	Pass	11.2	0.4	Pass	0.8	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$

Run 3

Initial Values						Final Values				
Calibration Gas Level	Certified Calibration gas value (ppmv)	Direct Response (ppmv)	System Response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	System response (ppmv)	System Bias (% of calibration span)	Bias: Pass/Fail	Drift (% of calibration span)	Drift: Pass/Fail
Low level gas	0.0	0.0	0.0	0.0	Pass	0.0	0.0	Pass	0.0	Pass
Upscale (high or mid)	0	11.1	11.0	-0.4	Pass	11.0	-0.4	Pass	0.0	Pass

1: System Bias must be $\leq 5\%$ of span

2: Drift must be $\leq 3\%$ of span or $|Bias_i - Bias_f| \leq 0.5 \text{ ppmv}$