Wheelabrator South Broward Inc.
A Waste Management Company
4400 South State Road 7
Ft. Lauderdale, FL 33314

May 8, 2013

UPS# 1Z2AW7390197438931

Mr. Joe Lurix
Air Program Administrator
Florida Department of Environmental Protection
Southeast District
400 North Congress Ave., Suite 200
West Palm Beach, FL 33401

Re: Wheelabrator South Broward
2013 Annual Compliance Stack Test and RATA Reports

Dear Mr. Lurix:

Please find enclosed a copy of the final compliance stack test report and the continuous emissions monitoring system certification RATA report for testing conducted on March 25-27 of this year by Clean Air Engineering, Inc.

I, the undersigned, am a responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this submittal. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements and information in this document are true, accurate and complete.

If there are any questions, please contact this office at (954) 581-6606.

Sincerely,

Scott McIlvaine
Plant Manager

cc: USEPA, Region IV, Pesticides and Toxics Management Division, Air & EPCRA Enforcement Branch, Air Enforcement Section (with) UPS#1Z2AW7390196354363

FDEP, Tallahassee, Bureau of Air Regulation, New Source Review Section, (with) UPS#1Z2AW7390196615143

Broward County Department of Planning and Environmental Protection, Air Quality Division (with) UPS#1Z2AW7390195194958

Nicole Turnbull (with)
Ram Tewari – BCWRS (without)
Tim Porter (without)
Rob French – MPI (with)

CleanAir.

CleanAir Engineering
500 W. Wood Street
Palatine, IL 60067-4975
www.cleanair.com

Wheelabrator South Broward, Inc.
4400 South State Road 7
Ft. Lauderdale, FL 33314

REPORT ON COMPLIANCE TESTING

Performed for:

WHEELABRATOR SOUTH BROWARD, INC.
ASH HANDLING SYSTEM, LIME SILO VENT,
UNITS 1, 2 AND 3 SDA INLETS, FF OUTLETS AND STACKS
FT. LAUDERDALE, FL
VOLUME III OF III

Client Reference No: Service Agreement
CleanAir Project No: 12218-3
Revision 0: May 8, 2013

RPTv4_6_9.dot
12218-3 South Compliance_R0
37062013 013700 12218-3

QA/QC DATA

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I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: ML

Date: 5/6/13

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 and Method 29 (Particulate/Metals and Mercury) QA/QC Results

	Run No.	1	2	3	4	
	Date (2013)	Mar 25	Mar 26	Mar 26	Mar 26	
	Start Time (approx.)	12:26	07:51	10:25	12:59	
	Stop Time (approx.)	14:40	10:03	12:36	15:11	
	Total Duration of Test Run (min.)	134	132	131	132	
	Net Sampling Time (min.)	125	125	125	125	
	Sampling System Calibration Summary					
	Nozzle ID No:	0.276-1	0.2725-1	0.2725-1	0.2725-1	
D_n	Nozzle Diameter (in):	0.276	0.273	0.273	0.273	
	Probe ID No:	67-8-21	67-8-21	67-8-21	67-8-21	
C_p	Pitot Coefficient:	0.8130	0.8130	0.8130	0.813	
	Meter Box ID. No:	85-2	85-2	85-2	85-2	
Y_d	Meter Box Yd - Field Sheet	1.0039	1.0039	1.0039	1.0039	
	Meter Box Yd - Database	1.0039	1.0039	1.0039	1.0039	
	Meter Box ΔH@ - Field Sheet	1.7413	1.7413	1.7413	1.7413	
	Meter Box ΔH@ - Database	1.7413	1.7413	1.7413	1.7413	
	QA/QC					
	Final Leak Check					
	(a) 4% of Sampling Rate (cfm)	0.0256	0.0215	0.0214	0.0228	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0030	0.0010	0.0050	0.0010	
	Sample Volume					
	Minimum Volume Required (dscf)	30.00	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	76.916	67.795	66.117	70.456	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.1080	0.9415	0.9270	0.9868	
Y_{qa}	Alternative Meter Calibration Factor	0.9862	0.9749	0.9749	0.9728	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-1.8%	-2.9%	-2.9%	-3.1%	**-2.7%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	105.74	100.82	103.20	103.70	
	Point-by-Point Isokinetic Variation					
	Number of points <90%	0	0	0	0	
	Number of points >110%	3	0	0	0	
	Number of points <80%	0	0	0	0	
	Number of points >120%	0	0	0	0	

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 SDA Inlet

USEPA Method 26A (HCl)
QA/QC Results

Run No.		1	2	3	
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Total Duration of Test Run (min.)		60	71	60	
Net Sampling Time (min.)		60	60	60	
Sampling System Calibration Summary					
	Probe ID No:	66-4-7	66-4-7	66-4-7	
	Meter Box ID. No:	61-11	61-11	61-11	
Y_d	Meter Box Yd - Field Sheet	1.0050	1.0050	1.0050	
	Meter Box Yd - Database	1.0050	1.0050	1.0050	
	Meter Box ΔH@ - Field Sheet	1.6964	1.6964	1.6964	
	Meter Box ΔH@ - Database	1.6964	1.6964	1.6964	
QA/QC					
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0238	0.0245	0.0245	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0000	0.0030	0.0030	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	34.011	34.796	34.703	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0954	1.0954	1.0954	
Y_{qa}	Alternative Meter Calibration Factor	1.0684	1.0412	1.0418	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	6.3%	3.6%	3.7%	**4.5%**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 26A (HCl)
QA/QC Results

Run No.		1	2	3	
Date (2013)		Mar 25	Mar 25	Mar 25	
Start Time (approx.)		08:00	09:23	10:54	
Stop Time (approx.)		09:00	10:34	11:54	
Total Duration of Test Run (min.)		60	71	60	
Net Sampling Time (min.)		60	60	60	
Sampling System Calibration Summary					
	Probe ID No:	67-4-3	67-4-3	67-4-3	
	Meter Box ID. No:	66-14	66-14	66-14	
Y_d	Meter Box Yd - Field Sheet	0.9879	0.9879	0.9879	
	Meter Box Yd - Database	0.9879	0.9879	0.9879	
	Meter Box ΔH@ - Field Sheet	1.8015	1.8015	1.8015	
	Meter Box ΔH@ - Database	1.8015	1.8015	1.8015	
QA/QC					
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0273	0.0275	0.0277	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0010	0.0030	0.0010	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	39.448	39.521	39.530	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.2247	1.2247	1.2247	
Y_{qa}	Alternative Meter Calibration Factor	0.9993	0.9923	0.9888	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	1.2%	0.4%	0.1%	**0.6%**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 and Method 29 (Particulate/Metals and Mercury)
QA/QC Results

Run No.		1	2	3	4	
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27	
Start Time (approx.)		07:59	10:32	13:04	12:07	
Stop Time (approx.)		10:11	12:45	15:17	14:22	
Total Duration of Test Run (min.)		132	133	133	135	
Net Sampling Time (min.)		125	125	125	125	
Sampling System Calibration Summary						
	Nozzle ID No:	0.2725-1	0.2725-1	0.2725-1	0.2725-2	
D_n	Nozzle Diameter (in):	0.273	0.273	0.273	0.273	
	Probe ID No:	67-8-17	67-8-17	67-8-17	67-8-16	
C_p	Pitot Coefficient:	0.8240	0.8240	0.8240	0.825	
	Meter Box ID. No:	66-11	66-11	66-11	66-22	
Y_d	Meter Box Yd - Field Sheet	0.9906	0.9906	0.9906	0.9972	
	Meter Box Yd - Database	0.9906	0.9906	0.9906	0.9972	
	Meter Box ΔH@ - Field Sheet	1.8274	1.8274	1.8274	1.8840	
	Meter Box ΔH@ - Database	1.8274	1.8274	1.8274	1.8840	
QA/QC						
	Final Leak Check					
	(a) 4% of Sampling Rate (cfm)	0.0227	0.0224	0.0222	0.0223	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0020	0.0020	0.0030	0.0030	
	Sample Volume					
	Minimum Volume Required (dscf)	30.00	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	68.028	66.494	66.386	69.965	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0146	1.0038	0.9957	1.0284	
Y_{qa}	Alternative Meter Calibration Factor	0.9914	0.9982	0.9940	0.9868	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.1%	0.8%	0.3%	-1.0%	**0.0%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	101.05	98.87	99.05	100.56	
	Point-by-Point Isokinetic Variation					
	Number of points <90%	0	0	0	0	
	Number of points >110%	0	0	0	0	
	Number of points <80%	0	0	0	0	
	Number of points >120%	0	0	0	0	

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 23 (PCDD/F)
QA/QC Results

	Run No.	2	3	4	
	Date (2013)	Mar 26	Mar 26	Mar 27	
	Start Time (approx.)	08:03	13:09	07:21	
	Stop Time (approx.)	12:49	17:25	11:39	
	Total Duration of Test Run (min.)	286	256	258	
	Net Sampling Time (min.)	250	250	250	
	Sampling System Calibration Summary				
	Nozzle ID No:	2722-1	2722-1	2722-1	
D_n	Nozzle Diameter (in):	0.272	0.272	0.272	
	Probe ID No:	67-8-16	67-8-16	67-8-16	
C_p	Pitot Coefficient:	0.8250	0.8250	0.8250	
	Meter Box ID. No:	66-22	66-22	66-22	
Y_d	Meter Box Yd - Field Sheet	0.9972	0.9972	0.9972	
	Meter Box Yd - Database	0.9972	0.9972	0.9972	
	Meter Box ΔH@ - Field Sheet	1.8840	1.8840	1.8840	
	Meter Box ΔH@ - Database	1.8840	1.8840	1.8840	
	QA/QC				
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0217	0.0224	0.0224	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0030	0.0000	0.0030	
	Sample Volume				
	Minimum Volume Required (dscf)	NA	NA	NA	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0019	1.0204	1.0328	
Y_{qa}	Alternative Meter Calibration Factor	0.9873	0.9848	0.9808	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-1.0%	-1.2%	-1.6%	**-1.3%**
	Mean Isokinetic Sampling Rate Variation				
	Minimum Allowable (%)	90	90	90	
	Maximum Allowable (%)	110	110	110	
%I	Actual Variation (%)	100.90	99.73	101.43	
	Point-by-Point Isokinetic Variation				
	Number of points <90%	0	0	0	
	Number of points >110%	0	0	0	
	Number of points <80%	0	0	0	
	Number of points >120%	0	0	0	

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 SDA Inlet

USEPA Method 26A (HCl)
QA/QC Results

Run No.		1	2	
	Date (2013)	Mar 27	Mar 27	
	Start Time (approx.)	07:47	09:08	
	Stop Time (approx.)	08:47	10:08	
	Total Duration of Test Run (min.)	60	60	
	Net Sampling Time (min.)	60	60	
	Sampling System Calibration Summary			
	Probe ID No:	66-4-7	66-4-7	
	Meter Box ID. No:	61-11	61-11	
Y_d	Meter Box Yd - Field Sheet	1.0050	1.0050	
	Meter Box Yd - Database	1.0050	1.0050	
	Meter Box ΔH@ - Field Sheet	1.6964	1.6964	
	Meter Box ΔH@ - Database	1.6964	1.6964	
	QA/QC			
	Final Leak Check			
	(a) 4% of Sampling Rate (cfm)	0.0239	0.0241	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	
	Allowable Limit - *minimum of a and b (cfm)*	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0030	0.0030	
	Sample Volume			
	Minimum Volume Required (dscf)	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	36.313	35.676	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)			
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0954	1.0954	
Y_{qa}	Alternative Meter Calibration Factor	1.0316	1.0367	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	2.6%	3.2%	**2.9%**

*Run 3 impinger broke mid run which compromised the sample.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 26A (HCl)
QA/QC Results

	Run No.	**1**	**2**	**3**	
	Date (2013)	Mar 27	Mar 27	Mar 27	
	Start Time (approx.)	07:47	09:08	10:27	
	Stop Time (approx.)	08:47	10:08	11:27	
	Total Duration of Test Run (min.)	60	60	60	
	Net Sampling Time (min.)	60	60	60	
	Sampling System Calibration Summary				
	Probe ID No:	67-4-3	67-4-3	67-4-3	
	Meter Box ID. No:	66-11	66-11	66-11	
Y_d	Meter Box Yd - Field Sheet	0.9906	0.9906	0.9906	
	Meter Box Yd - Database	0.9906	0.9906	0.9906	
	Meter Box ΔH@ - Field Sheet	1.8274	1.8274	1.8274	
	Meter Box ΔH@ - Database	1.8274	1.8274	1.8274	
	QA/QC				
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0268	0.0272	0.0271	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0020	0.0020	0.0010	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	41.046	40.896	40.501	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.2247	1.2247	1.2247	
Y_{qa}	Alternative Meter Calibration Factor	0.9803	0.9762	0.9839	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-1.0%	-1.5%	-0.7%	**-1.1%**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 and Method 29 (Particulate/Metals and Mercury)
QA/QC Results

	Run No.	1	2	3	4	
	Date (2013)	Mar 26	Mar 27	Mar 27	Mar 27	
	Start Time (approx.)	12:11	07:28	09:59	12:29	
	Stop Time (approx.)	14:24	09:41	12:11	14:41	
	Total Duration of Test Run (min.)	133	133	132	132	
	Net Sampling Time (min.)	125	125	125	125	
	Sampling System Calibration Summary					
	Nozzle ID No:	0.2725-2	0.2725-2	0.2725-2	0.2725-1	
D_n	Nozzle Diameter (in):	0.273	0.273	0.273	0.273	
	Probe ID No:	67-8-17	67-8-17	67-8-17	67-8-17	
C_p	Pitot Coefficient:	0.8240	0.8240	0.8240	0.824	
	Meter Box ID. No:	66-6	66-6	66-6	66-6	
Y_d	Meter Box Yd - Field Sheet	0.9854	0.9854	0.9854	0.9854	
	Meter Box Yd - Database	0.9854	0.9854	0.9854	0.9854	
	Meter Box ΔH@ - Field Sheet	1.8280	1.8280	1.8280	1.8280	
	Meter Box ΔH@ - Database	1.8280	1.8280	1.8280	1.8280	
	QA/QC					
	Final Leak Check					
	(a) 4% of Sampling Rate (cfm)	0.0218	0.0218	0.0228	0.0241	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0020	0.0030	0.0020	0.0030	
	Sample Volume					
	Minimum Volume Required (dscf)	30.00	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	65.654	68.916	69.345	73.413	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	0.9793	0.9813	1.0060	1.0599	
Y_{qa}	Alternative Meter Calibration Factor	0.9924	0.9681	0.9702	0.9659	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.7%	-1.8%	-1.5%	-2.0%	**-1.1%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	99.10	101.00	98.52	100.88	
	Point-by-Point Isokinetic Variation					
	Number of points <90%	2	0	0	0	
	Number of points >110%	1	0	0	0	
	Number of points <80%	2	0	0	0	
	Number of points >120%	1	0	0	0	

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 SDA Inlet

USEPA Method 26A (HCl)
QA/QC Results

	Run No.	**1**	**2**	**3**	
	Date (2013)	Mar 26	Mar 26	Mar 26	
	Start Time (approx.)	08:00	09:21	10:46	
	Stop Time (approx.)	09:00	10:21	11:46	
	Total Duration of Test Run (min.)	60	60	60	
	Net Sampling Time (min.)	60	60	60	
	Sampling System Calibration Summary				
	Probe ID No:	66-4-7	66-4-7	66-4-7	
	Meter Box ID. No:	61-11	61-11	61-11	
Y_d	Meter Box Yd - Field Sheet	1.0050	1.0050	1.0050	
	Meter Box Yd - Database	1.0050	1.0050	1.0050	
	Meter Box ΔH@ - Field Sheet	1.6964	1.6964	1.6964	
	Meter Box ΔH@ - Database	1.6964	1.6964	1.6964	
	QA/QC				
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0236	0.0248	0.0241	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0030	0.0030	0.0030	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	35.380	36.205	35.211	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0954	1.0954	1.0954	
Y_{qa}	Alternative Meter Calibration Factor	1.0548	1.0180	1.0448	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	5.0%	1.3%	4.0%	**3.4%**

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 26A (HCl)
QA/QC Results

Run No.		1	2	3	
Date (2013)		Mar 26	Mar 26	Mar 26	
Start Time (approx.)		08:00	09:21	10:46	
Stop Time (approx.)		09:00	10:21	11:46	
Total Duration of Test Run (min.)		60	60	60	
Net Sampling Time (min.)		60	60	60	
Sampling System Calibration Summary					
	Probe ID No:	67-4-3	67-4-3	67-4-3	
	Meter Box ID. No:	66-18	66-18	66-18	
Y_d	Meter Box Yd - Field Sheet	1.0008	1.0008	1.0008	
	Meter Box Yd - Database	1.0008	1.0008	1.0008	
	Meter Box ΔH@ - Field Sheet	1.9165	1.9165	1.9165	
	Meter Box ΔH@ - Database	1.9165	1.9165	1.9165	
QA/QC					
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0258	0.0259	0.0260	
	(b) Allowable Rate from Method (cfm)	0.0200	0.0200	0.0200	
	Allowable Limit - minimum of a and b (cfm)	0.0200	0.0200	0.0200	
	Actual Final Leak Rate (cfm)	0.0010	0.0020	0.0020	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	38.835	38.653	38.295	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.2247	1.2247	1.2247	
Y_{qa}	Alternative Meter Calibration Factor	1.0111	1.0116	1.0137	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	1.0%	1.1%	1.3%	**1.1%**

042213 151515
JNI@

Nozzle Calibration Sheet

Client	Wheelabrator	Project Number	12218
Calibrated by	S. Brown	Unit	1-3
Date	3/ /2013	Runs	1-

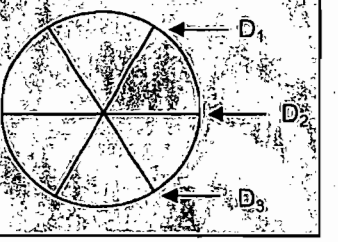
Caliper ID 12156068

Nozzle Identification	D_1 (inches)	D_2 (inches)	D_3 (inches)	ΔD (inches)	D_{ave} (inches)
0.2725-1	0.2725	0.2725	0.2725	0.0000	0.2725
0.2722-1	0.2720	0.2725	0.2720	0.0005	0.2722
0.2765-1	0.2760	0.2765	0.2770	0.0010	0.2760
0.2725-2	0.2730	0.2720	0.2725	0.0010	0.2725

D_1, D_2, D_3 = three nozzle diameter measurements

ΔD = maximum difference between any two diameters
ΔD = 0.004 inches*

D_{ave} = average of D_1, D_2, D_3



* (40 CFR 60, Appendix A, Method 5, Section 5.1)

QA/QC SB
Date 3/27

CleanAir ENGINEERING

CERTIFICATE OF INSPECTION / 検査成績書

発行No./Issue No. : 4097558680

Product name/品名	Digimatic Caliper/ﾃﾞｼﾞﾏﾁｯｸｷｬﾘﾊﾟ
Model No./符号	CD-4"CSX
Code No./ コードNo.	500-195-20
Serial No./製造No.	12156068
Measuring range/測定範囲	0-100mm / 0-4inch
Minimum indication/最小表示量	0.01mm / 0.0005inch
Standard Temperature/標準温度	20℃
QC Manager M.Sato	

Inspection standard : Mitutoyo standard
Based on : JISB7507:1993,DIN862:1988
Traceable to : NMIJ/AIST by JCSS No.0030, NIST via 821/276375-08, PTB via 4937 PTB 08

Mitutoyo Corporation

(1)Inspection result/検査結果

Measuring length 測定長		Permissible values 許容値	errors/器差 External/外側	errors/器差 Internal/内側
	φ4	0.01 -0.03	---	-0.02
	0		0.00	---
	50		-0.01	-0.01
Unit : mm	100	±0.02	-0.01	-0.01
単位 : mm	150	※	---	---
	200	※	---	---
	φ0.16	0.0005 -0.0015	---	-0.0010
	0		0.0000	---
	2		-0.0005	-0.0005
Unit : inch	4	±0.0010	-0.0005	-0.0005
単位 : inch	6		---	---
	8		---	---

(2)Judgment/判定 : Passed/合格

※DIN 862,1988 : 0.03

この検査成績書には安心してご利用いただけますよう出荷時の検査データを記載していますが、校正証明書取得用にはご利用できません。

U0048-00180(1)

Caliper Calibration Sheet

Calibrated by	D Leishman		
Calibration Date	5-14-12	Expiration Date	5-14-13

Caliper ID	12156068

Standard Caliper ID	1014600021

Inside Jaw Check		
Standard Caliper Setting (in)	Caliper Reading (in)	Deviation (ΔD)
0.150	0.1505	0.0005
0.300	0.300	0.000
0.500	0.500	0.000

Outside Jaw Check		
Standard Caliper Setting (in)	Caliper Reading (in)	Deviation (ΔD)
0.150	0.1505	0.0005
0.300	0.300	0.000
0.500	0.500	0.000

ΔD = maximum deviation between standard and caliper being calibrated
ΔD ≤ 0.001 inch for every reading

CleanAir ENGINEERING

Clean Air Engineering - Meter Box Full Test Calibration

Client: Source | **Reviewed By:** M. Vaquero | **Calibration Signature:**

ID No: 61-11 | **Calibrated By:** Jeff Ivens | **Meter Box Yd:** 1.0050

Dept No: Source | **Date of Calibration:** 07/10/12 | **Meter Box ΔH@:** 1.6964

Meter Box Serial No: n/a | **Due Date of Calibration:** 07/11/13 | **Barometer Serial No:** W12637

Manufacturer Part No: 0028 | **Meter Box Vacuum:** 1.0 in. H_2O | **Barometric Pressure:** 29.34 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.396	0.50	-1.20	1.0000	0.000	5.000	5.000	748.300	753.335	5.035	80.0	80.0	80.00	92.0	87.0	89.50	12.10	1.0062	1.6972
0.395	0.50	-1.20	1.0000	0.000	5.000	5.000	753.335	758.379	5.044	80.0	80.0	80.00	92.0	87.0	89.50	12.12	1.0044	1.7028
0.686	1.50	-1.50	1.0000	0.000	10.000	10.000	766.700	776.808	10.108	80.0	80.0	80.00	98.0	89.0	93.50	13.94	1.0067	1.6833
0.689	1.50	-1.50	1.0000	0.000	10.000	10.000	776.806	786.934	10.128	80.0	80.0	80.00	99.0	89.0	94.00	13.91	1.0054	1.6761
0.968	3.00	-1.80	1.0000	0.000	10.000	10.000	720.100	730.169	10.069	80.0	80.0	80.00	98.0	86.0	92.00	9.90	1.0031	1.7073
0.965	3.00	-1.80	1.0000	0.000	10.000	10.000	730.169	740.262	10.093	80.0	80.0	80.00	100.0	88.0	94.00	9.93	1.0043	1.7114
																Averages	1.00502	1.69635

Nomenclature

P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68 °F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

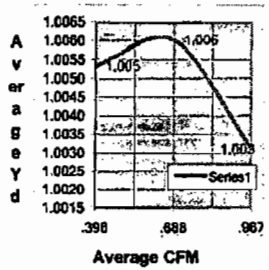
Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_d)(P_b)}{(T_d + 460)(\Theta)}$$

Average YD vs. Average CFM



Vacuum Gauge

Standard (In.Hg)	Gauge (In.Hg)
5.2	5.0
10.1	10.0
14.6	15.0
19.6	20.0
24.6	25.0

Calibration Reference Information (Standard Meter)

Reference Used: Wet Test Meter | **Serial No:** 11AH6

Calibrated By: Martin Vaquero | **Date Calibrated:** 10/26/2011

Percent Error: 0.230% | **Calibration Due Date:** 10/26/2012

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check	Pass	YD Tolerance:	Pass

CleanAir ENGINEERING

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 61-11 Office: n/a

Calibrated by: Jeff Ivens Client: Source

Date: 7/10/12 Job No: n/a

Temperature Scale Used: Fahrenheit Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux	6	7
50	51	52	52	51	51		
100	101	102	102	101	101		
150	151	152	152	151	151		
200	201	202	202	201	201		
250	251	252	252	251	251		
300	301	302	302	301	301		
350	351	352	352	351	351		
400	401	402	402	401	401		
450	451	452	452	451	451		
500	501	502	502	501	501		
550	551	552	551	551	551		
600	601	602	601	601	601		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A Serial No: T-279500

Calibrated By: JH Metrology Date Calibrated: 8/18/2011

Calibration Report No: 1000150187 Calibration Due Date: 8/18/2012

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 | Meter No. ~~618~~ 61-11 SB 4/22/13 | Orifice D-3

Location warehouse | Meter Yd 1.0050 | Orifice K' 0.5547

Test Date 04/02/13 | Meter ΔH@ 1.6964 | Orifice Cal. Date 11/26/12

Operator C.Eilering | Full Test Cal. Date 07/11/12

Barom. Press. (P_b) 29.44 in. Hg

Leak Checks

Negative Pressure — *No movement of manometer in one-minute* ☑ Pass

Positive Pressure — *No movement of manometer in one-minute* ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Ambient Temp. - T_{amb} (°F)	Orifice ΔH (In. W.C.)	Vacuum (In. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
	0.0	899.56	67	67								
	5.0	903.01	68	67	73	1.60	20	5.0	3.45	67.3	1.0366	1.7%
	10.0	906.58	68	68	73	1.60	20	5.0	3.57	67.8	1.0028	-1.6%
	15.0	910.09	67	68	74	1.60	20	5.0	3.51	67.8	1.0189	0.0%
										Average Y_i	1.0194	
										Cal. Error	1.4%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + \Delta H/13.6\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y_i}}{\overline{Y_i}} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y_i} - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

CleanAir ENGINEERING

Clean Air Engineering - Meter Box Full Test Calibration

Client: Source | **Reviewed By:** R. REDEL | **Calibration Signature:**

ID No: 66-6 | **Calibrated By:** J. Ivens | **Meter Box Yd:** 0.9854

Dept No: 66 | **Date of Calibration:** 01/21/13 | **Meter Box ΔH@:** 1.8280

Meter Box Serial No: 66-6 | **Due Date of Calibration:** 01/09/13 | **Barometer Serial No:** W12637

Manufacturer Part No: 0028 | **Meter Box Vacuum:** 1.0 in. H_2O | **Barometric Pressure:** 29.36 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.381	0.50	-1.20	1.0000	0.000	5.000	5.000	978.500	983.658	5.158	64.0	64.0	64.00	78.0	77.0	77.50	12.97	0.9901	1.8691
0.380	0.50	-1.20	1.0000	0.000	5.000	5.000	983.658	988.815	5.157	64.0	64.0	64.00	77.0	76.0	76.50	12.99	0.9885	1.8784
0.672	1.50	-1.50	1.0000	0.000	10.000	10.000	10.462	20.850	10.388	64.5	64.5	64.50	85.0	77.0	81.00	14.70	0.9855	1.8042
0.672	1.50	-1.50	1.0000	0.000	10.000	10.000	20.850	31.260	10.410	64.5	64.5	64.50	86.0	78.0	82.00	14.70	0.9852	1.8008
0.951	3.00	-1.80	1.0000	0.000	10.000	10.000	952.676	963.085	10.409	64.0	64.0	64.00	87.0	77.0	82.00	10.39	0.9819	1.7992
0.947	3.00	-1.80	1.0000	0.000	10.000	10.000	963.085	973.490	10.405	64.0	64.0	64.00	86.0	77.0	81.50	10.44	0.9813	1.8165
																Averages	0.98541	1.82803

Nomenclature

P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68 °F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

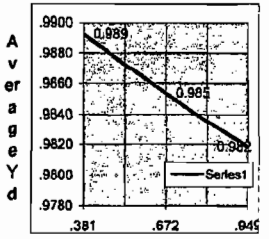
Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

Average YD vs. Average CFM



Vacuum Gauge	
Standard (in.Hg)	Gauge (in.Hg)
4.9	5.0
10.1	10.0
15.1	15.0
20.1	20.0
24.7	25.0

Calibration Reference Information (Standard Meter)

Reference Used: Wet Test Meter | **Serial No:** 11AG9

Calibrated By: Martin Vaquero | **Date Calibrated:** 7/22/2012

Percent Error: 0.245% | **Calibration Due Date:** 7/23/2013

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check:	Pass	YD Tolerance:	Pass

CleanAir ENGINEERING

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 66-6 Office: n/a

Calibrated by: J. Ivens Client: n/a

Date: 1/21/13 Job No: n/a

Temperature Scale Used: Fahrenheit Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux	6	7
50	49	50	50	50	50		
100	99	100	100	100	100		
150	149	150	150	150	150		
200	199	200	200	200	200		
250	249	250	250	250	250		
300	299	300	300	300	300		
350	349	350	350	350	350		
400	399	400	400	400	400		
450	449	450	450	450	450		
500	499	500	500	500	500		
550	549	550	550	550	550		
600	599	600	600	600	600		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A Serial No: T-279500

Calibrated By: JH Metrology Date Calibrated: 8/20/2012

Calibration Report No: 1000164078 Calibration Due Date: 8/21/2013

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 Meter No. 66-6 Orifice C-5

Location warehouse Meter Yd 0.9854 Orifice K' 0.5583

Test Date 04/04/13 Meter ΔH@ 1.8280 Orifice Cal. Date 11/21/12

Operator P. Bihun Full Test Cal. Date 01/21/13

Barom. Press. (P_b) 29.44 in. Hg

Leak Checks

Negative Pressure

No movement of manometer in one-minute ☑ Pass

Positive Pressure

No movement of manometer in one-minute ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature		Ambient Temp. - T_{amb} (°F)	Orifice ΔH (in. W.C.)	Vacuum (in. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
			Inlet (°F)	Outlet (°F)								
	0.0	672.30	66	65								
	5.0	676.05	67	65	69	1.70	20	5.0	3.75	65.8	0.9605	0.0%
	10.0	679.80	68	66	72	1.70	20	5.0	3.75	66.5	0.9592	-0.1%
	15.0	683.55	70	67	74	1.70	20	5.0	3.75	67.8	0.9610	0.1%
										Average Y_i	0.9602	
										Cal. Error	-2.6%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + \Delta H/13.6\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y_i}}{\overline{Y_i}} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y_i} - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

CleanAir ENGINEERING

Clean Air Engineering - Meter Box Full Test Calibration

Client: Source | **Reviewed By:** M. Vaquero | **Calibration Signature:**

ID No: 66-11 | **Calibrated By:** Jeff Ivens | **Meter Box Yd:** 0.9906

Dept No: Source | **Date of Calibration:** 07/11/12 | **Meter Box ΔH@:** 1.8274

Meter Box Serial No: n/a | **Due Date of Calibration:** 07/12/13 | **Barometer Serial No:** W12637

Manufacturer Part No: 0028 | **Meter Box Vacuum:** 1.0 in. H_2O | **Barometric Pressure:** 29.34 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.377	0.50	-1.20	1.0000	0.000	5.000	5.000	984.600	989.693	5.093	78.5	78.5	78.50	88.0	85.0	86.50	12.73	0.9921	1.8750
0.377	0.50	-1.20	1.0000	0.000	5.000	5.000	989.693	994.781	5.088	78.5	78.5	78.50	87.0	85.0	86.00	12.75	0.9922	1.8809
0.664	1.50	-1.50	1.0000	0.000	10.000	10.000	19.911	30.137	10.226	79.0	79.0	79.00	93.0	86.0	89.50	14.47	0.9895	1.8170
0.663	1.50	-1.50	1.0000	0.000	10.000	10.000	30.137	40.373	10.236	79.0	79.0	79.00	93.0	86.0	89.50	14.48	0.9885	1.8195
0.950	3.00	-1.80	1.0000	0.000	10.000	10.000	957.401	967.589	10.188	78.5	78.5	78.50	95.0	85.0	90.00	10.12	0.9905	1.7774
0.945	3.00	-1.80	1.0000	0.000	10.000	10.000	967.589	977.782	10.193	78.5	78.5	78.50	96.0	85.0	90.50	10.17	0.9910	1.7950
																Averages	0.99062	1.82744

Nomenclature

P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.82 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

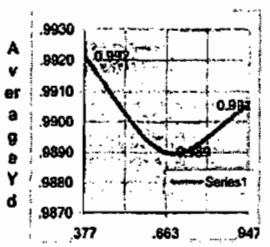
Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

Average YD vs. Average CFM



Vacuum Gauge

Standard (in.Hg)	Gauge (in.Hg)
4.7	5.0
9.8	10.0
14.9	15.0
20.3	20.0
25.6	25.0

Calibration Reference Information (Standard Meter)

Reference Used: Wet Test Meter | Serial No: 11AH6

Calibrated By: Martin Vaquero | Date Calibrated: 10/26/2011

Percent Error: 0.230% | Calibration Due Date: 10/26/2012

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check	Pass	YD Tolerance:	Pass

CleanAir ENGINEERING

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 66-11 Office: n/a

Calibrated by: Jeff Ivens Client: Source

Date: 7/11/12 Job No: n/a

Temperature Scale Used: Fahrenheit Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux	6	7
50	49	50	50	49	49		
100	99	100	100	99	99		
150	149	150	150	149	149		
200	199	200	200	199	199		
250	249	250	250	249	249		
300	299	300	300	299	299		
350	349	350	350	349	349		
400	399	400	400	399	399		
450	449	450	450	449	449		
500	499	500	500	499	499		
550	549	550	550	549	549		
600	599	600	600	599	599		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A Serial No: T-279500

Calibrated By: JH Metrology Date Calibrated: 8/18/2011

Calibration Report No: 1000150187 Calibration Due Date: 8/18/2012

Meter Box Critical Orifice Post-Test Calibration Data

Project No.	12218	Meter No.	66-11	Orifice	C-3
Location	warehouse	Meter Yd	0.9906	Orifice K'	0.4406
Test Date	04/03/13	Meter ΔH@	1.8274	Orifice Cal. Date	11/21/12
Operator	P. Bihun	Full Test Cal. Date	07/11/12		

Barom. Press. (P_b) 29.65 in. Hg

Leak Checks

Negative Pressure

No movement of manometer in one-minute ☑ Pass

Positive Pressure

No movement of manometer in one-minute ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Ambient Temp. - T_{amb} (°F)	Orifice ΔH (in. W.C.)	Vacuum (in. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
	0.0	179.00	68	67								
	5.0	181.91	69	67	70	1.10	21	5.0	2.91	67.8	0.9811	0.1%
	10.0	184.82	69	68	70	1.10	21	5.0	2.91	68.3	0.9821	0.2%
	15.0	187.74	70	68	72	1.10	21	5.0	2.92	68.8	0.9778	-0.3%
										Average Y_i	0.9803	
										Cal. Error	-1.0%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + {}^{\Delta H}/_{13.6}\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y_i}}{\overline{Y_i}} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y_i} - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

CleanAir ENGINEERING

Clean Air Engineering - Meter Box Full Test Calibration

Client: Source | **Reviewed By:** M. Vaquero | **Calibration Signature:**

ID No: 66-14 | **Calibrated By:** Jeff Ivens | **Meter Box Yd:** 0.9879

Dept No: Source | **Date of Calibration:** 09/12/12 | **Meter Box ΔH@:** 1.8015

Meter Box Serial No: n/a | **Due Date of Calibration:** 09/13/13 | **Barometer Serial No:** W12637

Manufacturer Part No: 0028 | **Meter Box Vacuum:** 1.0 in. H_2O | **Barometric Pressure:** 29.36 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.384	0.50	-1.20	1.0000	0.000	5.000	5.000	31.900	37.035	5.135	79.0	79.0	79.00	90.0	88.0	89.00	12.51	0.9876	1.8029
0.384	0.50	-1.20	1.0000	0.000	5.000	5.000	37.035	42.171	5.136	79.0	79.0	79.00	90.0	87.0	88.50	12.51	0.9865	1.8062
0.670	1.50	-1.50	1.0000	0.000	10.000	10.000	51.301	61.594	10.293	79.0	79.0	79.00	96.0	89.0	92.50	14.35	0.9884	1.7760
0.670	1.50	-1.50	1.0000	0.000	10.000	10.000	61.594	71.883	10.289	79.0	79.0	79.00	97.0	89.0	93.00	14.35	0.9897	1.7760
0.938	3.00	-1.80	1.0000	0.000	10.000	10.000	0.003	10.233	10.230	79.0	79.0	79.00	97.0	86.0	91.50	10.24	0.9883	1.8186
0.935	3.00	-1.80	1.0000	0.000	10.000	10.000	10.233	20.482	10.249	79.0	79.0	79.00	97.0	87.0	92.00	10.28	0.9873	1.8295
																Averages	0.98795	1.80153

Nomenclature

P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

Equations

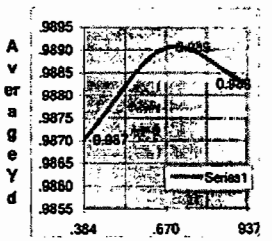
$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

12.47

Average YD vs. Average CFM



Vacuum Gauge

Standard (in.Hg)	Gauge (in.Hg)
5.0	5.0
10.5	10.0
15.6	15.0
20.6	20.0
25.5	25.0

Calibration Reference Information (Standard Meter)

Reference Used: Wet Test Meter | **Serial No:** 11AH6

Calibrated By: Martin Vaquero | **Date Calibrated:** 10/26/2011

Percent Error: 0.230% | **Calibration Due Date:** 10/26/2012

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check	Pass	YD Tolerance:	Pass

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CleanAir ENGINEERING

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 66-14 Office: n/a

Calibrated by: Jeff Ivens Client: Source

Date: 9/12/12 Job No: n/a

Temperature Scale Used: Fahrenheit Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux	6	7
50	50	51	48	49	49		
100	99	101	98	99	99		
150	149	151	149	149	149		
200	199	201	200	199	199		
250	249	251	249	249	249		
300	299	301	299	299	299		
350	349	351	349	349	349		
400	399	401	399	398	399		
450	449	451	449	449	449		
500	499	501	499	499	499		
550	549	551	549	549	549		
600	599	601	599	598	599		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A Serial No: T-279500

Calibrated By: JH Metrology Date Calibrated: 8/20/2012

Calibration Report No: 1000164078 Calibration Due Date: 8/20/2013

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 Meter No. 66-14 Orifice C-5

Location wh Meter Yd 0.9879 Orifice K' 0.5583

Test Date 04/02/13 Meter ΔH@ 1.8015 Orifice Cal. Date 11.21/12

Operator p bihun Full Test Cal. Date 09/12/12

Barom. Press. (P_b) 29.50 in. Hg

Leak Checks

Negative Pressure — *No movement of manometer in one-minute* ☑ Pass

Positive Pressure — *No movement of manometer in one-minute* ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Ambient Temp. - T_{amb} (°F)	Orifice ΔH (in. W.C.)	Vacuum (in. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
	0.0	533.20	64	63								
	5.0	536.88	67	63	67	1.60	20	5.0	3.68	64.3	0.9781	0.3%
	10.0	540.57	66	63	71	1.60	20	5.0	3.69	64.8	0.9727	-0.3%
	15.0	544.24	67	64	74	1.60	20	5.0	3.67	65.0	0.9757	0.0%
										Average Y_i	0.9755	
										Cal. Error	-1.3%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + \Delta H/13.6\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y}_i}{\overline{Y}_i} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y}_i - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

CleanAir ENGINEERING

Client:	SOURCE 66	**Reviewed By:**	R.Redel	**Calibration Signature:**	
ID No:	66-18	**Calibrated By:**	O.Lavrov	**Meter Box Yd:**	1.0008
Job No:	n/a	**Date of Calibration:**	10/31/12	**Meter Box ΔH@:**	1.9165
Meter Box Serial No:	4U-5139-63M	**Due Date of Calibration:**	11/01/13	**Barometer Serial No:**	W12637
Manufacturer Part No:	0028	**Meter Box Vacuum:**	1.0 in. H_2O	**Barometric Pressure:**	29.00 In. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.374	0.50	-1.00	1.0000	0.000	6.000	6.000	62.141	68.233	6.092	71.5	71.5	71.50	84.0	81.0	82.50	15.45	1.0015	1.9043
0.374	0.50	-1.00	1.0000	0.000	5.000	5.000	68.233	73.298	5.065	71.5	71.5	71.50	83.0	80.0	81.50	12.87	1.0019	1.9063
0.651	1.50	-1.30	1.0000	0.000	10.000	10.000	77.743	87.888	10.145	71.5	71.5	71.50	86.0	83.0	84.50	14.78	1.0027	1.8752
0.651	1.50	-1.30	1.0000	0.000	10.000	10.000	87.888	98.028	10.140	71.5	71.5	71.50	86.0	83.0	84.50	14.78	1.0032	1.8752
0.900	3.00	-1.70	1.0000	0.000	10.000	10.000	38.244	48.400	10.156	71.5	71.5	71.50	89.0	80.0	84.50	10.69	0.9968	1.9728
0.901	3.00	-1.70	1.0000	0.000	10.000	10.000	48.400	58.556	10.156	71.5	71.5	71.50	90.0	81.0	85.50	10.68	0.9986	1.9655
																Averages	1.00077	1.91653

Nomenclature

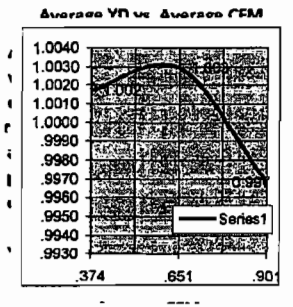
P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$



Vacuum Gauge

Standard (in.Hg)	Gauge (in.Hg)
4.6	5.0
9.7	10.0
15.1	15.0
20.1	20.0
25.1	25.0

Calibration Reference Information (Standard Meter)

Reference Used:	Wet Test Meter	Serial No:	11AG9
Calibrated By:	Martin Vaquero	Date Calibrated:	7/22/2012
Percent Error:	0.249%	Calibration Due Date:	7/22/2013

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check	Pass	YD Tolerance: ± 2% of 1.0000	Pass

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 66-18

Calibrated by: O.Lavrov

Date: 10/31/12

Temperature Scale Used: Fahrenheit

Office: Express

Client: SOURCE 66

Job No: n/a

Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux		
50	51	48	50	51	51		
100	101	98	100	101	101		
150	151	148	150	151	151		
200	201	198	200	201	201		
250	251	248	250	251	251		
300	300	298	300	300	300		
350	350	348	350	350	350		
400	400	398	400	400	400		
450	450	448	450	450	450		
500	500	498	500	500	500		
550	550	548	550	550	550		
600	600	598	600	600	600		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A

Calibrated By: JH Metrology

Calibration Report No: 1000164938

Serial No: T-225950

Date Calibrated: 10/18/2012

Calibration Due Date: 10/18/2013

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 Meter No. 66-18 Orifice C-5

Location warehouse Meter Yd 1.0008 Orifice K' 0.5583

Test Date 04/03/13 Meter ΔH@ 1.9165 Orifice Cal. Date 11/21/12

Operator P. Bihun Full Test Cal. Date 10/31/12

Barom. Press. (P_b) 29.65 in. Hg

Leak Checks

Negative Pressure

No movement of manometer in one-minute ☑ Pass

Positive Pressure

No movement of manometer in one-minute ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature		Ambient Temp. - T_{amb} (°F)	Orifice ΔH (In. W.C.)	Vacuum (In. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
			Inlet (°F)	Outlet (°F)								
	0.0	365.50	69	67								
	5.0	369.15	70	67	72	1.80	20	5.0	3.65	68.3	0.9885	0.1%
	10.0	372.79	70	68	74	1.80	20	5.0	3.64	68.8	0.9903	0.3%
	15.0	376.45	71	68	77	1.80	20	5.0	3.65	69.3	0.9844	-0.3%
										Average Y_i	0.9878	
										Cal. Error	-1.3%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + {}^{\Delta H}/_{13.6}\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y}_i}{\overline{Y}_i} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y}_i - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

CleanAir ENGINEERING

Client:	SOURCE 66	**Reviewed By:**	R.Redel	**Calibration Signature:**	
ID No:	66-22	**Calibrated By:**	O.Lavrov	**Meter Box Yd:**	0.9972
Job No:	N/A	**Date of Calibration:**	10/12/12	**Meter Box ΔH@:**	1.8840
Meter Box Serial No:	28-080307-1	**Due Date of Calibration:**	10/13/13	**Barometer Serial No:**	W12637
Manufacturer Part No:	0028	**Meter Box Vacuum:**	1.0 in. H_2O	**Barometric Pressure:**	29.61 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.380	0.50	-1.10	1.0000	0.000	5.000	5.000	958.243	963.397	5.154	72.5	72.5	72.50	91.0	88.0	89.50	12.91	0.9971	1.8582
0.379	0.50	-1.10	1.0000	0.000	5.000	5.000	963.397	968.558	5.161	72.5	72.5	72.50	91.0	88.0	89.50	12.93	0.9958	1.8640
0.656	1.50	-1.30	1.0000	0.000	10.000	10.000	2.359	12.646	10.287	72.5	72.5	72.50	95.0	88.0	91.50	14.96	0.9998	1.8714
0.657	1.50	-1.30	1.0000	0.000	10.000	10.000	12.646	22.940	10.294	72.5	72.5	72.50	95.0	88.0	91.50	14.94	0.9991	1.8684
0.913	3.00	-1.80	1.0000	0.000	10.000	10.000	932.821	943.162	10.341	72.0	72.0	72.00	99.0	90.0	94.50	10.75	0.9960	1.9220
0.913	3.00	-1.80	1.0000	0.000	10.000	10.000	943.162	953.512	10.350	72.0	72.0	72.00	99.0	90.0	94.50	10.75	0.9951	1.9220
																Averages	0.99716	1.88399

Nomenclature

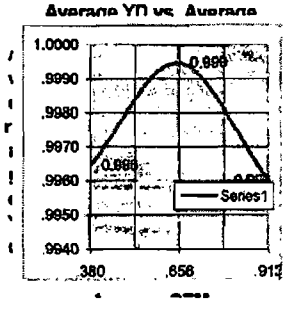
P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
Θ	Duration of Run (minutes)

Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$



Vacuum Gauge	
Standard (in.Hg)	Gauge (in.Hg)
5.5	5.0
9.9	10.0
15.1	15.0
20.2	20.0
25.1	25.0

Calibration Reference Information (Standard Meter)

Reference Used:	Wet Test Meter	Serial No:	11AG9
Calibrated By:	Martin Vaquero	Date Calibrated:	7/22/2012
Percent Error:	0.245%	Calibration Due Date:	7/23/2013

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check:	Pass
Vacuum Gauge Check:	Pass	YD Tolerance: ± 2% of 1.0000	Pass

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 66-22 | Office: Express

Calibrated by: O.Lavrov | Client: SOURCE 66

Date: 10/12/12 | Job No: n/a

Temperature Scale Used: Fahrenheit | Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux		
50	50	49	48	50	50		
100	100	99	98	100	100		
150	150	149	148	150	150		
200	200	199	198	200	200		
250	250	249	248	250	250		
300	300	299	298	300	300		
350	350	349	348	350	350		
400	400	399	399	400	400		
450	450	449	449	450	450		
500	500	499	498	500	500		
550	550	549	549	550	550		
600	600	599	598	600	600		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A | Serial No: T-279500

Calibrated By: JH Metrology | Date Calibrated: 8/20/2012

Calibration Report No: 1000164078 | Calibration Due Date: 8/20/2013

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 Meter No. 66-22 Orifice C-5

Location warehouse Meter Yd 0.9972 Orifice K' 0.5583

Test Date 04/03/13 Meter ΔH@ 1.8840 Orifice Cal. Date 11/21/12

Operator P. Bihun Full Test Cal. Date 10/12/12

Barom. Press. (P_b) 29.65 in. Hg

Leak Checks

Negative Pressure ☑ Pass

No movement of manometer in one-minute

Positive Pressure ☑ Pass

No movement of manometer in one-minute

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature		Ambient Temp. - T_{amb} (°F)	Orifice ΔH (in. W.C.)	Vacuum (in. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
			Inlet (°F)	Outlet (°F)								
	0.0	904.00	67	65								
	5.0	907.65	68	66	72	1.70	20	5.0	3.65	66.5	0.9855	0.4%
	10.0	911.32	69	67	74	1.70	20	5.0	3.67	67.5	0.9802	-0.2%
	15.0	914.99	70	67	76	1.70	20	5.0	3.67	68.3	0.9797	-0.2%
										Average Y_i	0.9818	
										Cal. Error	-1.5%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + \Delta H / 13.6\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y}_i}{\overline{Y}_i} \times 100 \qquad \text{Spec.: } \Delta Y_i \le \pm 2\%$$

$$Cal.Error = \frac{\overline{Y}_i - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \le \pm 5\%$$

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Clean Air Engineering - Meter Box Full Test Calibration

Client: Source | **Reviewed By:** R. Redel | **Calibration Signature:**

ID No: 85-2 | **Calibrated By:** Jeff Ivens | **Meter Box Yd:** 1.0039

Dept No: Source 66 | **Date of Calibration:** 12/21/12 | **Meter Box ΔH@:** 1.7413

Meter Box Serial No: n/a | **Due Date of Calibration:** 12/22/13 | **Barometer Serial No:** W12637

Manufacturer Part No: 0028 | **Meter Box Vacuum:** 1.0 in. H_2O | **Barometric Pressure:** 29.05 in. Hg

				Standard Meter Gas Volume (ft^3)			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)			Time (min.)	Calibration Results	
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	T_{is} In	T_{os} Out	T_{ds} Avg.	T_i In	T_o Out	T_d Avg.	Θ	Y_d	ΔH@
0.392	0.50	-1.20	1.0000	0.000	5.000	5.000	96.200	101.271	5.071	66.0	66.0	66.00	83.0	79.0	81.00	12.44	1.0098	1.7446
0.389	0.50	-1.20	1.0000	0.000	5.000	5.000	106.319	111.396	5.077	66.0	66.0	66.00	83.0	80.0	81.50	12.52	1.0095	1.7638
0.682	1.50	-1.50	1.0000	0.000	10.000	10.000	127.792	138.085	10.293	66.5	66.5	66.50	91.0	82.0	86.50	14.27	1.0008	1.7155
0.682	1.50	-1.50	1.0000	0.000	10.000	10.000	148.410	158.693	10.283	66.5	66.5	66.50	91.0	83.0	87.00	14.27	1.0027	1.7123
0.957	3.00	-1.80	1.0000	0.000	10.000	10.000	67.605	77.808	10.203	65.5	65.5	65.50	89.0	77.0	83.00	10.19	1.0005	1.7591
0.958	3.00	-1.80	1.0000	0.000	10.000	10.000	77.808	88.043	10.235	65.5	65.5	65.50	91.0	78.0	84.50	10.18	1.0002	1.7524
																Averages	1.00391	1.74128

Nomenclature

- P_b Barometric Pressure (in. Hg)
- Q Flow Rate (cfm)
- ΔH Orifice Pressure differential (in. H_2O)
- ΔP Inlet Pressure Differential (in. H_2O)
- V_d Gas Meter Volume - Dry (ft^3)
- V_{ds} Standard Meter Volume - Dry (ft^3)
- T_d Average Meter Box Temperature (°F)
- T_o Outlet Meter Box Temperature (°F)
- T_{ds} Average Standard Meter Temperature (°F)
- Y_d Meter Correction Factor (unitless), $Y_i \leq Y_{avg} \pm 0.02$
- Y_{ds} Standard Meter Correction Factor (unitless)
- ΔH@ Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_2O) $\Delta H@_i \leq \Delta H@_{avg} \pm 0.2$
- Θ Duration of Run (minutes)

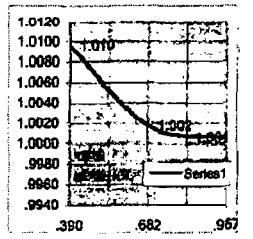
Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{(0.0319)(\Delta H)}{P_b(T_d + 460)}\left[\frac{(T_{ds} + 460)\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

Average YD vs. Average CFM



Vacuum Gauge

Standard (in.Hg)	Gauge (in.Hg)
5.3	5.0
10.2	10.0
15.4	15.0
20.4	20.0
25.4	25.0

Calibration Reference Information (Standard Meter)

Reference Used: Wet Test Meter | Serial No: 11AG9

Calibrated By: Martin Vaquero | Date Calibrated: 7/22/2012

Percent Error: 0.245% | Calibration Due Date: 7/23/2013

Meter Box Pre-Calibration Inspection

Positive Leak Check:	Pass	Electrical Check:	Pass
Negative Leak Check:	Pass	Pyrometer Check	Pass
Vacuum Gauge Check	Pass	YD Tolerance:	Pass

CleanAir ENGINEERING

Meter Box - Pyrometer Calibration Sheet

Meter Box No: 85-2 Office: n/a

Calibrated by: Jeff Ivens Client: Source

Date: 12/21/12 Job No: n/a

Temperature Scale Used: Fahrenheit Type of Calibration: Full-Test

Calibration Reference Settings (°F)	Pyrometer Reading for each Channel (°F)						
	1 Stack	2 Probe	3 Filter	4 Imp Out	5 Aux	6	7
50	51	51	51	51	50		
100	101	101	101	101	101		
150	151	152	150	151	151		
200	201	202	201	201	201		
250	252	252	250	251	251		
300	301	302	300	301	301		
350	351	352	350	351	351		
400	401	402	400	401	401		
450	452	451	450	451	451		
500	501	501	500	501	501		
550	552	552	549	551	551		
600	601	602	600	600	601		

Tolerance = ±2°F difference from reference setting.

Calibration Reference Information

Reference Used: Omega CL23A Serial No: T-279500

Calibrated By: JH Metrology Date Calibrated: 10/18/2012

Calibration Report No: 1000164938 Calibration Due Date: 10/18/2013

Meter Box Critical Orifice Post-Test Calibration Data

Project No. 12218 Meter No. 85-2 Orifice C-5

Location warehouse Meter Yd 1.0039 Orifice K' 0.5583

Test Date 04/03/13 Meter ΔH@ 1.7413 Orifice Cal. Date 11/21/12

Operator P. Bihun Full Test Cal. Date 12/21/12

Barom. Press. (P_b) 29.65 in. Hg

Leak Checks

Negative Pressure

No movement of manometer in one-minute ☑ Pass

Positive Pressure

No movement of manometer in one-minute ☑ Pass

Important: All leak checks must pass in order for calibration to be valid.

Run	Elapsed Time (minutes)	Meter Volume (dcf)	Meter Temperature		Ambient Temp. - T_{amb} (°F)	Orifice ΔH (in. W.C.)	Vacuum (in. Hg)	Net Run Time - Θ (minutes)	Net Meter Volume for Run - V_m (dcf)	Avg Meter Temp. for Run - T_m (°F)	DGM Calibration Factor - Y_i	Percent Variation - ΔY_i
			Inlet (°F)	Outlet (°F)								
	0.0	824.10	71	70								
	5.0	827.84	72	69	73	1.60	21	5.0	3.74	70.5	0.9684	0.0%
	10.0	831.57	73	70	74	1.60	20	5.0	3.73	71.0	0.9710	0.3%
	15.0	835.32	74	70	76	1.60	20	5.0	3.75	71.8	0.9654	-0.3%
										Average Y_i	0.9683	
										Cal. Error	-3.5%	

Calculations and Specifications

$$Y_i = \frac{K' \times P_b \times (T_m + 460) \times \theta}{17.64 \times V_m \times \left(P_b + \Delta H/13.6\right) \times \sqrt{T_{amb} + 460}}$$

$$\Delta Y_i = \frac{Y_i - \overline{Y}_i}{\overline{Y}_i} \times 100 \qquad \text{Spec.: } \Delta Y_i \leq \pm 2\%$$

$$Cal.Error = \frac{\overline{Y}_i - Y_d}{Y_d} \times 100 \qquad \text{Spec.: } Cal.Error \leq \pm 5\%$$

CleanAir ENGINEERING

Sample Probe Calibration

Probe Type: M5 with S-Type Pitot **I.D. Number:** 67-4-3

Project Number:

Thermocouple Calibration

Reference Type: Thermocouple Reference I.D. No: 15-078-39 Pyrometer I.D. No: 80512890 Units: °F

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ambient	73	74	-1	0.19%	
2	200°F-250°F	236	239	-3	0.43%	%Difference ≤ 1.5

* Based on Absolute Temperature (Rankine)

Does thermocouple assembly meet specifications? → **YES**

Pitot Tube Calibration (Wind Tunnel Method @ 50 ft/sec)

Reference Pitot I.D. No: Wind Tunnel Reference Pitot Cp: 0.99

Pitot Side 'A' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(A)}$**
1	0.549	0.749	0.848	0.003
2	0.544	0.749	0.844	0.002
3	0.545	0.749	0.845	0.001
		Side 'A' Average Probe $C_{p(A)}$=	0.8456	0.0017

Specification
Avg. C_p Deviations ≤ 0.01

Pitot Side 'B' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(B)}$**
1	0.535	0.747	0.838	0.001
2	0.541	0.755	0.839	0.000
3	0.540	0.753	0.839	0.000
		Side 'B' Average Probe $C_{p(B)}$=	0.8382	0.0005

Specification
Avg. C_p Deviations ≤ 0.01

'A' Average C_p		'B' Average C_p		Difference	Specification
0.846	—	0.838	=	0.008	|Difference| ≤ 0.01

Does assembly meet specifications? **YES** → **If "Yes", C_p= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.**

$$^{*}C_{P(S)} = C_{P(STD)}\sqrt{\frac{\Delta p_{(STD)}}{\Delta p_{(S)}}} \qquad ^{**}Deviation = \left|C_{P(S)} - \overline{C_{P\,(A\text{ or }B)}}\right|$$

All specifications are from EPA-600/9-76-005, section 3.7

Probe Cp= 0.842 Calibrated by: D. Luckhard Date: 10/09/2012

CleanAir ENGINEERING

Sample Probe Calibration

Probe Type: M5 with S-Type Pitot **I.D. Number:** 66-4-7

Project Number:

Thermocouple Calibration

Reference Type: Thermocouple Reference I.D. No: 15-078-39 Pyrometer I.D. No: 80512890 Units: °F

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ambient	73	72	1	0.19%	
2	200°F-250°F	245	240	5	0.71%	%Difference ≤ 1.5

* Based on Absolute Temperature (Rankine)

Does thermocouple assembly meet specifications? ⟶ **YES**

Pitot Tube Calibration (Wind Tunnel Method @ 49 ft/sec)

Reference Pitot I.D. No: Wind Tunnel Reference Pitot Cp: 0.99

Pitot Side 'A' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(A)}$**
1	0.542	0.765	0.833	0.002
2	0.545	0.767	0.835	0.001
3	0.547	0.763	0.838	0.003
		Side 'A' Average Probe $C_{p(A)}$=	0.8354	0.0017

Specification Avg. C_p Deviations ≤ 0.01

Pitot Side 'B' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(B)}$**
1	0.551	0.783	0.830	0.002
2	0.556	0.781	0.835	0.003
3	0.555	0.787	0.831	0.001
		Side 'B' Average Probe $C_{p(B)}$=	0.8320	0.0021

Specification Avg. C_p Deviations ≤ 0.01

'A' Average C_p		'B' Average C_p		Difference	Specification
0.835	—	0.832	=	0.003	|Difference| ≤ 0.01

Does assembly meet specifications? **YES** ⟶ **If "Yes", C_p= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.**

$$^{*}C_{P(S)} = C_{P(STD)}\sqrt{\frac{\Delta p_{(STD)}}{\Delta p_{(S)}}} \qquad ^{**}Deviation = \left|C_{P(S)} - \overline{C}_{P\,(\text{A or B})}\right|$$

All specifications are from EPA-600/9-76-005, section 3.0

Probe Cp= 0.834 Calibrated by: D. Luckhard Date: 11/19/2012

CleanAir ENGINEERING

Sample Probe Calibration

Probe Type: M5 with S-Type Pitot **I.D. Number:** 67-8-16

Project Number:

Thermocouple Calibration

Reference Type: Thermocouple Reference I.D. No: 15-078-39 Pyrometer I.D. No: 80512890 Units: °F

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ambient	75	75	0	0.00%	
2	200°F-250°F	298	295	3	0.40%	%Difference ≤ 1.5

* Based on Absolute Temperature (Rankine)

Does thermocouple assembly meet specifications? ⟶ **YES**

Pitot Tube Calibration (Wind Tunnel Method @ 49 ft/sec)

Reference Pitot I.D. No: Wind Tunnel Reference Pitot Cp: 0.99

Pitot Side 'A' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(A)}$**
1	0.533	0.780	0.819	0.007
2	0.544	0.771	0.832	0.006
3	0.541	0.775	0.827	0.001
		Side 'A' Average Probe $C_{p(A)}$=	0.8256	0.0047

Specification Avg. C_p Deviations ≤ 0.01

Pitot Side 'B' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(B)}$**
1	0.543	0.774	0.830	0.005
2	0.539	0.786	0.820	0.005
3	0.542	0.782	0.824	0.000
		Side 'B' Average Probe $C_{p(B)}$=	0.8246	0.0033

Specification Avg. C_p Deviations ≤ 0.01

'A' Average C_p		'B' Average C_p		Difference	Specification
0.826	—	0.825	=	0.001	|Difference| ≤ 0.01

Does assembly meet specifications? YES ⟶ **If "Yes", C_p= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.**

$$^{*}C_{P(S)} = C_{P(STD)}\sqrt{\frac{\Delta p_{(STD)}}{\Delta p_{(S)}}} \qquad ^{**}Deviation = \left|C_{P(S)} - \overline{C}_{P\,(\text{A or B})}\right|$$

All specifications are from EPA-600/9-76-005, section 3.1

Probe Cp= 0.825 Calibrated by: G. Pavlovics Date: 10/25/2012

CleanAir. ENGINEERING

Sample Probe Calibration

Probe Type: M5 with S-Type Pitot **I.D. Number:** 67-8-17

Project Number:

Thermocouple Calibration

Reference Type: Thermocouple Reference I.D. No: 15-078-39 Pyrometer I.D. No: 80512890 Units: °F

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ambient	72	72	0	0.00%	
2	200°F-250°F	242	245	-3	0.43%	%Difference ≤ 1.5

* Based on Absolute Temperature (Rankine)

Does thermocouple assembly meet specifications? ⟶ **YES**

Pitot Tube Calibration (Wind Tunnel Method @ 49 ft/sec)

Reference Pitot I.D. No: Wind Tunnel Reference Pitot Cp: 0.99

Pitot Side 'A' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(A)}$**
1	0.544	0.778	0.828	0.001
2	0.544	0.780	0.827	0.000
3	0.541	0.778	0.826	0.001
		Side 'A' Average Probe $C_{p(A)}$=	0.8270	0.0007

Specification
Avg. C_p Deviations ≤ 0.01

Pitot Side 'B' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(B)}$**
1	0.546	0.796	0.820	0.002
2	0.549	0.797	0.822	0.000
3	0.547	0.792	0.823	0.001
		Side 'B' Average Probe $C_{p(B)}$=	0.8214	0.0011

Specification
Avg. C_p Deviations ≤ 0.01

'A' Average C_p		'B' Average C_p		Difference	Specification
0.827	—	0.821	=	0.006	|Difference| ≤ 0.01

Does assembly meet specifications? **YES** ⟶ **If "Yes", C_p= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.**

$$^{*}C_{P(S)} = C_{P(STD)}\sqrt{\frac{\Delta p_{(STD)}}{\Delta p_{(S)}}} \qquad ^{**}Deviation = \left|C_{P(S)} - \overline{C_{P\,(\text{A or B})}}\right|$$

All specifications are from EPA-600/9-76-005, section 3.1

Probe Cp= 0.824 Calibrated by: B ARNOLD Date: 04/20/2012

CleanAir ENGINEERING

Sample Probe Calibration

Probe Type: M5 with S-Type Pitot **I.D. Number:** 67-8-21

Project Number:

Thermocouple Calibration

Reference Type: Thermocouple Reference I.D. No: 15-078-39 Pyrometer I.D. No: 80512890 Units: °F

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ambient	77	76	1	0.19%	
2	200°F-250°F	286	286	0	0.00%	%Difference ≤ 1.5

* Based on Absolute Temperature (Rankine)

Does thermocouple assembly meet specifications? ⟶ YES

Pitot Tube Calibration (Wind Tunnel Method @ 60 ft/sec)

Reference Pitot I.D. No: Wind Tunnel Reference Pitot Cp: 0.99

Pitot Side 'A' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(A)}$**
1	0.537	0.801	0.811	0.002
2	0.537	0.799	0.811	0.001
3	0.544	0.800	0.816	0.003
		Side 'A' Average Probe $C_{p(A)}$=	0.8128	0.0022

Specification: Avg. C_p Deviations ≤ 0.01

Pitot Side 'B' :

Trial No.	Reference ΔP	Probe ΔP	Probe $C_{p(S)}$*	Abs. Deviation from Avg. $C_{p(B)}$**
1	0.542	0.808	0.811	0.003
2	0.538	0.808	0.808	0.006
3	0.540	0.785	0.822	0.008
		Side 'B' Average Probe $C_{p(B)}$=	0.8133	0.0055

Specification: Avg. C_p Deviations ≤ 0.01

'A' Average C_p		'B' Average C_p		Difference	Specification
0.813	—	0.813	=	0.000	|Difference| ≤ 0.01

Does assembly meet specifications? YES ⟶ **If "Yes", C_p= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.**

$$^{*}C_{P(S)} = C_{P(STD)}\sqrt{\frac{\Delta p_{(STD)}}{\Delta p_{(S)}}} \qquad ^{**}Deviation = \left|C_{P(S)} - \overline{C_{P\,(A\,or\,B)}}\right|$$

All specifications are from EPA-600/9-76-005, section 3.1

Probe Cp= 0.813 Calibrated by: G. Pavlovivs Date: 10/25/2012

CleanAir ENGINEERING

METROLOGY

Certificate of Calibration

2033001737

ACCREDITED
Certificate #1618.01

Customer Information

On Site Calibration
CleanAir Engineering, Inc.
500 W. Wood Street
Palatine, IL 60067

PO #: 04380-64-65800
Reference #: 1232582dd
Account #: 09352MT
SO #: 32582

Instrument Identification

Instrument Id: **8028301135**
Location:
Noun: Scale, 4100/0.1 Gram Digital
Model: AV4101C
Mfr: Ohaus
Serial #: 8028301135
Accuracy: ±0.1 Gram repeatability, ±0.3 Linearity

Certification Information

Reason For Service: Calibration with Data
Type Of Calibration: Normal
As Found Condition: In Tolerance
As Left Condition: Left As Found
Procedure: 33K6-4-41-1 : Scales

Technician: Eric Uphouse
Cal Date: 16 AUG 12
Cal Due: 16 AUG 13
Temperature: 21.0 °C
Humidity: 35.0 %

Calibration Data

✓ In Tolerance x Out of Tolerance

Range	Nominal	As Found		As Left		Min	Max
Plate Repeatability							
Center	5.0	5.0	✓	As Found		4.9	5.1
Left Rear	5.0	5.0	✓	As Found		4.9	5.1
Right Rear	5.0	5.0	✓	As Found		4.9	5.1

No sampling plan or other procedure was used for this calibration. Measurements and information on this certificate are valid at time of calibration only and any number of factors may cause calibration to drift out of tolerance prior to calibration due date.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, from ratio measurements, or compared to consensus standards.

The expanded uncertainty of the measurement process has not exceeded 25% of the tolerance allowed for the individual characteristics measured, unless otherwise stated. The uncertainties are based on a 95% confidence level, K=2.

J.H. Metrology Co., Inc's Calibration Control System complies with applicable requirements of ANSI Z540-1-1994, ISO 9001, and ISO/IEC 17025-2005.

The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without the written approval of J.H. Metrology Co., Inc.

Approved by: Vice President

Printed: 8/23/2012 13:08:38

Date: Aug 19, 2012

Certificate of Calibration

2033001737

METROLOGY

ACCREDITED
Certificate #1618.01

✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Plate Repeatability							
Left Front	5.0	5.0	✓	As Found		4.9	5.1
Right Front	5.0	5.0	✓	As Found		4.9	5.1
Center	5.0	5.0	✓	As Found		4.9	5.1
Linearity							
4100 Grams	100.0	100.0	✓	As Found		99.7	100.3
	2000.0	2000.0	✓	As Found		1999.7	2000.3
	4000.0	4000.0	✓	As Found		3999.7	4000.3

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000150842	00941	Metric Weight Set, 12 Piece, Class 2	Unknown	03 NOV 2010	30 NOV 2012
1000152014	01088	Weight Set, 1mg - 200g, Class 1	Unknown	01 DEC 2010	31 DEC 2012

No sampling plan or other procedure was used for this calibration. Measurements and information on this certificate are valid at time of calibration only and any number of factors may cause calibration to drift out of tolerance prior to calibration due date.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, from ratio measurements, or compared to consensus standards.

The expanded uncertainty of the measurement process has not exceeded 25% of the tolerance allowed for the individual characteristics measured, unless otherwise stated. The uncertainties are based on a 95% confidence level, K=2.

J.H. Metrology Co., Inc's Calibration Control System complies with applicable requirements of ANSI Z540-1-1994, ISO 9001, and ISO/IEC 17025-2005.

The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without the written approval of J.H. Metrology Co., Inc.

Approved by: Vice President

Printed: 8/23/2012 13:08:38

Date: Aug 19, 2012

JH Metrology Co, Inc. • 1801 Hicks Road, Unit E • Rolling Meadows, Illinois 60008 • Phone: (847) 991-0290 • Fax: (847) 991-0348

METROLOGY

Certificate of Calibration

2033001736

ACCREDITED
Certificate #1618.01

Customer Information

On Site Calibration
CleanAir Engineering, Inc.
500 W. Wood Street
Palatine, IL 60067

PO #: 04380-64-65800
Reference #: 1232582dd
Account #: 09352MT
SO #: 32582

Instrument Identification

Instrument Id: **8028301068**
Location:
Noun: Scale, 4100/0.1 Gram Digital
Model: AV4101C
Mfr: Ohaus
Serial #: 8028301068
Accuracy: ±0.1 Gram repeatability, ±0.3 Linearity

Certification Information

Reason For Service: Calibration with Data
Type Of Calibration: Normal
As Found Condition: In Tolerance
As Left Condition: Left As Found
Procedure: 33K6-4-41-1 : Scales

Technician: Eric Uphouse
Cal Date: 16 AUG 12
Cal Due: 16 AUG 13
Temperature: 21.0 °C
Humidity: 35.0 %

Calibration Data

✓In Tolerance ✗Out of Tolerance

Range	Nominal	As Found		As Left		Min	Max
Plate Repeatability							
Center	5.0	5.0	✓	As Found		4.9	5.1
Left Rear	5.0	5.0	✓	As Found		4.9	5.1
Right Rear	5.0	5.0	✓	As Found		4.9	5.1

No sampling plan or other procedure was used for this calibration. Measurements and information on this certificate are valid at time of calibration only and any number of factors may cause calibration to drift out of tolerance prior to calibration due date.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, from ratio measurements, or compared to consensus standards.

The expanded uncertainty of the measurement process has not exceeded 25% of the tolerance allowed for the individual characteristics measured, unless otherwise stated. The uncertainties are based on a 95% confidence level, K=2.

J.H. Metrology Co., Inc's Calibration Control System complies with applicable requirements of ANSI Z540-1-1994, ISO 9001, and ISO/IEC 17025-2005.

The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without the written approval of J.H. Metrology Co., Inc.

Approved by: Vice President

Date: Aug 19, 2012

Printed: 8/23/2012 13:08:36

METROLOGY

Certificate of Calibration

2033001736

ACCREDITED
Certificate #1618.01

✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Plate Repeatability							
Left Front	5.0	5.0	✓	As Found		4.9	5.1
Right Front	5.0	5.0	✓	As Found		4.9	5.1
Center	5.0	5.0	✓	As Found		4.9	5.1
Linearity							
4100 Grams	100.0	100.0	✓	As Found		99.7	100.3
	2000.0	1999.9	✓	As Found		1999.7	2000.3
	4000.0	3999.8	✓	As Found		3999.7	4000.3

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000150842	00941	Metric Weight Set, 12 Piece, Class 2	Unknown	03 NOV 2010	30 NOV 2012
1000152014	01088	Weight Set, 1mg - 200g, Class 1	Unknown	01 DEC 2010	31 DEC 2012

No sampling plan or other procedure was used for this calibration. Measurements and information on this certificate are valid at time of calibration only and any number of factors may cause calibration to drift out of tolerance prior to calibration due date.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, from ratio measurements, or compared to consensus standards.

The expanded uncertainty of the measurement process has not exceeded 25% of the tolerance allowed for the individual characteristics measured, unless otherwise stated. The uncertainties are based on a 95% confidence level, K=2.

J.H. Metrology Co., Inc's Calibration Control System complies with applicable requirements of ANSI Z540-1-1994, ISO 9001, and ISO/IEC 17025-2005.

The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without the written approval of J.H. Metrology Co., Inc.

Approved by: Vice President

Date: Aug 19, 2012

Printed: 8/23/2012 13:08:36

AIR LIQUIDE Air Liquide America Specialty Gases LLC

Scott™

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 - PGVP Vendor ID: A22012

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

P.O. No.: 60126-71-65000
Document # : 48472837-001

Customer
CLEAN AIR ENGINEERING

500 WEST WOOD STREET
PALATINE IL 60067
US

ANALYTICAL INFORMATION Gas Type : OC2

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

Cylinder Number: CC196768 **Certification Date:** 27Nov2012 **Exp. Date:** 28Nov2020
Cylinder Pressure*:** 2000 PSIG **Batch No:** TRO0070277

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
OXYGEN	9.52 %	+/- 1%	Direct NIST and VSL
CARBON DIOXIDE	9.53 %	+/- 1%	Direct NIST and VSL
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 2350 23	04Jan2018	K024582	23.20 %	OXYGEN
NTRM 2300	17Aug2016	1D002807	23.04 %	CARBON DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
CAI/110P/V03018	26Nov2012	PARAMAGNETIC
PIR/2000/609015	12Nov2012	NDIR

ANALYZER READINGS

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

OXYGEN

First Triad Analysis
Date: 27Nov2012 Response Unit: %
Z1 = 0.00000 R1 = 23.20000 T1 = 9.53000
R2 = 23.20000 Z2 = 0.00000 T2 = 9.53000
Z3 = 0.00000 T3 = 9.53000 R3 = 23.20000
Avg. Concentration: 9.520 %

Second Triad Analysis

Calibration Curve
Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999999
Constants: A = -0.01175669
B = 1.000226328 C = 0
D = 0 E = 0

CARBON DIOXIDE

First Triad Analysis
Date: 27Nov2012 Response Unit: MV
Z1 = 0.00000 R1 = 97.90000 T1 = 57.50000
R2 = 97.90000 Z2 = 0.00000 T2 = 57.50000
Z3 = 0.00000 T3 = 57.50000 R3 = 97.90000
Avg. Concentration: 9.527 %

Second Triad Analysis

Calibration Curve
Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999987
Constants: A = -0.00466369
B = 0.134173465 C = -7.139E-05
D = 1.21594-05 E = 0

Special Notes: DELIVERY DOC# IS 48472675

APPROVED BY: _____
JEFF CROTEAU

AIR LIQUIDE Air Liquide America Specialty Gases LLC | Scott™

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 - PGVP Vendor ID: A22011

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

P.O. No.: 59343-71-65000
Document # : 44063920-002

Customer
CLEAN AIR

DON ALLEN
500 WEST WOOD STREET
PALATINE IL 60067
US

ANALYTICAL INFORMATION Gas Type : OC2

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

Cylinder Number: ALM040668 Certification Date: 28Nov2011 Exp. Date: 27Nov2014
Cylinder Pressure***: 2000 PSIG Batch No: TRO0047087

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
CARBON DIOXIDE	17.9	%	+/- 1%	Direct NIST and VSL
OXYGEN	18.1	%	+/- 1%	Direct NIST and VSL
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	17Aug2018	K026052	23.04 %	CARBON DIOXIDE
NTRM 2350	01Dec2011	K016398	23.20 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
PIR/2000/609015	10Nov2011	NDIR
CAI/110P/V03018	17Nov2011	PARAMAGNETIC

ANALYZER READINGS

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

CARBON DIOXIDE

First Triad Analysis
Date: 29Nov2011 Response Unit: MV
Z1=0.00000 R1=98.20000 T1=86.20000
R2=98.20000 Z2=0.00000 T2=86.20000
Z3=0.00000 T3=86.20000 R3=98.20000
Avg. Concentration: 17.90 %

Second Triad Analysis

Calibration Curve
Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.999986
Constants: A=-0.00224432
B=0.138734928 C=-0.0004578
D=1.39269E-05 E=0

OXYGEN

First Triad Analysis
Date: 29Nov2011 Response Unit: %
Z1=0.00000 R1=23.20000 T1=18.15000
R2=23.20000 Z2=0.00000 T2=18.15000
Z3=0.00000 T3=18.15000 R3=23.20000
Avg. Concentration: 18.14 %

Second Triad Analysis

Calibration Curve
Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.999999
Constants: A=-0.00577277
B=0.999884783 C=0
D=0 E=0

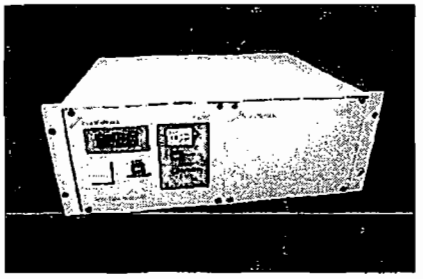
Special Notes: DELIVER ON DOC# 44063869

APPROVED BY: _____
JEFF CROTEAU

CleanAir.

CleanAir Instrument Rental
500 W. Wood Street
Palatine, IL 60067-4975
800-553-5511
www.cleanair.com

Servomex 1420C Oxygen Analyzer



The 1420C Includes:

- Analyzer
- Power cord
- Signal cable
- Manual
- Calibration sheet
- Instrument Rental Shipping Container

Specifications:

- Weight: 12 lbs.
- Dimensions: 9" x 5" x 7" (single unit)
- Range: 0-25 & 100% O2.
- Accuracy: +/- 0.1%
- Linearity: +/- 0.1% O2
- Repeatability: +/- 0.1% O2
- Response time (T90): 2.5 seconds at 200 ml/min; 2.0 seconds at 250 ml/min
- Zero Drift: <+/- .002% O2/hour
- Span Drift: <+/- .002% O2/hour
- Warm up time: typically 1 hour
- Electrical output: 0-1V non-isolated (min load 1K) or 4-20mA isolated (max load 600?).
- Display: 3.5 digit green LED display
- Display resolution: 0.1%
- AC Supply: 88-264VAC, 47-63 Hz
- Power required: 45 VA
- Operating ambient temperature: 32oF to 113oF (0oC to 45oC) as standard. 32oF to 104oF (0oC to
- 40oC) when fitted in bench top case.
- Storage temperature: -4oF to 158oF (-20oC to 70oC).
- Relative humidity: 0-90% non-condensing.

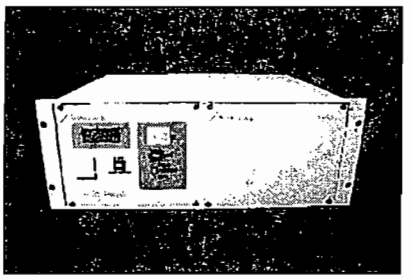
Rental/Application Notes:

- Effect of ambient temperature: <+/- 0.03% O2/C zero; <+/- 0.10% O2/C span
- Effect of barometric pressure: The analyzer measures the partial pressure of oxygen in the sample gas. Therefore, any change in sample pressure at the measuring cell will have an effect, which is proportional to the change in absolute pressure from time of calibration. An analyzer for oxygen purity (with pressure compensation) reduces error by a factor of approximately 5.
- Inlet pressure: 1-10 psig (7-70 kPag)
- Vent pressure: 11.6 to 15.9 psia (80-110 kPag)
- Flow rate: 1-6 lpm
- The Servomex 1420C/1415C can be plumbed together in a 19" rack mount (Model 1440C). The combined weight is 44 lbs. These units are compatible with the older 1400B series.
- When renting, equipment must be returned in its original packaging.

CleanAir.

CleanAir Instrument Rental
500 W. Wood Street
Palatine, IL 60067-4975
800-553-5511
www.cleanair.com

Servomex 1415C CO2 Analyzer



The 1415C Includes:

- Analyzer
- Power cord
- Signal cable
- Manual
- Calibration sheet
- Instrument Rental Shipping Container

Specifications:

- Weight: 12 lbs.
- Dimensions: 9" x 5" x 7" (single unit)
- Range: 0-20 & 25% CO_2.
- Accuracy: 1% of selected range
- Linearity: 1% of selected range
- Repeatability: 1% of selected range
- Response time (T90): <10 seconds
- Zero Drift: 2% of full scale/week
- Span Drift: 1% of reading/day
- Warm up time: typically 1 hour
- Electrical output: 0-1V non-isolated (min load 1K) or 4-20mA isolated (max load 600?).
- Display: 3.5 digit green LED display reading.
- Display resolution: 0.1%
- AC Supply: 88-264VAC, 47-63 Hz
- Power required: 45 VA
- Operating ambient temperature: 32°F to 113°F (0°C to 45°C) as standard. 32°F to 104°F (0°C to
- 40°C) when fitted in bench top case.
- Storage temperature: -4°F to 158°F (-20°C to 70°C)
- Relative humidity: 0-90% non-condensing.

Rental/Application Notes:

- Effect of ambient temperature: 1% of full scale per 10°C change.
- Effect of barometric pressure: 0.15% of reading per mbar within specified range.
- Inlet pressure: 1-10 psig (7-70 kPag)
- Vent pressure: 11.6 to 15.9 psia (80-110 kPag)
- Flow rate: 1-6 lpm
- The Servomex 1420C/1415C can be plumbed together in a 19" rack mount (Model 1440C). The combined weight is 44 lbs. These units are compatible with the older 1400B series.
- Equipment must be returned in its original packaging.

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FIELD DATA

G

I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: NK

Date: 3/6/13

CleanAir.

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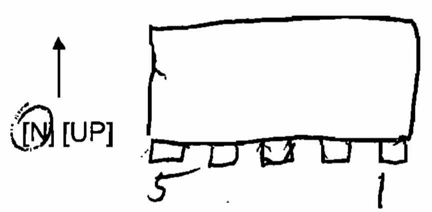
TEST LOCATION: FF OUTLET Particulate METALS **TESTING** **METHOD:** 5-29 **PAGE** 1 **OF** 2

UNIT: 1 **RUN:** 1

FIELD DATA SHEET

Client WHEELABRATOR	Project No. 12218		
Plant SOUTH BROWARD	Date 3/25/13		
Meter Operator	SHAWN JOINT		
Probe Operator	WAYNE BERRY		
Meter Box 85-2	Sample Box No. M3		
Meter Y_d 1.0039	Meter $\Delta H_@$ 1.7413		
K-Factor 2.74	Pitot C_p 0.813		
Leak Rate Before 0.003 [cfm] [Lpm]	@ 15 (in. Hg)		
Leak Rate After 0.003 [cfm] [Lpm]	@ 15 (in. Hg)		
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐		

Cross-Section of Test Location



Duct Dimensions (in)	96 x 96		
Static Pres (in H_2O)	Port Len (in)	Gas Flow [In] [Out]	First point all the way [In] [Out] of page
-8.4	10	[In]	[In]

Amb Temp (°F) 86	Bar. Press. 29.70 [in. Hg] [mbar]		
Probe I.D. No.	67-8-21		
Liner Material	GLASS		
Filter No.	e54-40		
Thimble No.	NA		
Nozzle Diameter	0.276	Nozzle I.D.	0.276-1
Start Time	12:26	Stop Time	1:40

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 533.300	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
1-1	5	0.24	0.66	535.60	307	251	252	52	85	84	2	8.4	NA	
2	10	0.22	0.60	537.78	307	252	250	52	86	85	2	8.3	↓	
3	15	0.33	0.90	540.47	305	251	252	53	88	84	3	8.5		
4	20	0.35	0.96	543.31	308	250	251	53	88	84	3	8.6		
5	25	0.54	1.50	546.90	308	252	250	53	89	85	3	8.4		ΔV=-.32
2-1	30	0.56	1.50	550.64	321	251	252	54	91	86	4	8.6		
2	35	0.40	1.10	553.78	320	252	254	55	92	86	4	8.8		
3	40	0.37	1.00	556.70	309	251	252	50	92	87	3	8.8		
4	45	0.47	1.30	560.03	312	252	251	49	92	87	4	8.6		
5	50	0.58	1.60	563.67	310	252	252	51	93	87	4	8.5		ΔV=-.22
3-1	55	0.53	1.50	567.38	311	251	252	51	93	87	4	8.8		
2	60	0.40	1.10	570.45	311	254	253	52	93	87	4	8.6		
	Total	7.6565	13.720		3729				1082	1029				
	Average	0.6696	1.2447		311.3600				~~[illegible]~~ 89.3400					

~~Sum of~~ square roots. ~~Circle correct~~ bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC [initials]
Date 3-25-13

G-3

TEST LOCATION: FF INLET **METALS TESTING** **METHOD:** 5-29 **PAGE** 2 **OF** 2

UNIT: 1 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12278
Plant	S. BROWARD	Date	3-25-13
Meter Operator		SJ	
Probe Operator		WB	

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm]	@	(in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐	Bad ☐	

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Duct Dimensions (in.)				
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page		First point all the way [In] [Out]

Start Time:		Stop Time:	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 570.45 [ft^3] [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
P3-3	65	0.47	1.20	573.65	311	252	254	53	94	88	4	8.3		
4	70	0.50	1.40	577.68	311	252	255	56	94	88	4	8.0		
5	75	0.52	1.40	580.53	310	251	252	56	94	88	4	7.8		ΔV = -.30
P4-1	80	0.44	1.20	583.96	309	255	253	58	93	88	4	7.9		
2	85	0.40	1.10	587.24	309	255	254	58	92	88	4	8.0		
3	90	0.52	1.40	590.51	312	253	255	59	92	88	4	8.2		
4	95	0.56	1.50	594.06	312	252	254	59	93	88	4	8.5		
5	100	0.57	1.60	598.03	310	254	252	60	94	88	4	8.4		ΔV = -.19
P5-1	105	0.41	1.10	600.88	311	253	254	60	93	89	4	8.2		
2	110	0.42	1.20	604.07	310	254	252	60	93	89	4	8.4		
3	115	0.44	1.20	607.28	312	255	254	60	92	89	4	8.4		
4	120	0.55	1.50	610.78	322	256	255	61	93	88	4	8.6		
5	125	0.58	1.60	614.42	316	252	254	62	93	89	4	8.5		
	Total	9.0890	17.4000		4055				1210	1146				
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC [signature] Date 3-25-13

CleanAir ENGINEERING

TEST LOCATION: FF Outlet Particulate/Metals **TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/26/13
Meter Operator	R. Behun		
Probe Operator	R. Behun		

Meter Box	85-2	Sample Box No.	M1
Meter Y_d	1.0039	Meter $\Delta H_@$	1.7413
K Factor	2.33	Pitot C_p	0.813
Leak Rate Before	0.002 [cfm] [Lpm]	@ 15	(in. Hg)
Leak Rate After	.001 [cfm] [Lpm]	@ 10	(in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐		

Cross-Section of Test Location

Duct Dimensions (in.)	96 x 96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-7.8	10.0		

Amb. Temp. (°F)	60	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.	67-8-21		
Liner Material	Glass		

Filter No. 3/26/13	PB E54 E45-38	
Thimble No.	N/A	
Nozzle Diameter	0.2225	Nozzle I.D. 2225-1

Start Time:	7:51	Stop Time:	10:03

Traverse Point Number	Min/pt / Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
				614.900		250	250							
5-1	5	0.36	0.84	617.49	302	250	249	54	62	61	2.5	8.1	N/A	
2	10	0.38	0.89	620.17	302	247	247	51	63	61	2.5	8.6		
3	15	0.40	0.93	622.90	302	245	248	50	64	62	3.0	7.7		
4	20	0.43	1.0	625.74	303	246	248	50	66	62	3.0	8.1		
5	25	0.42	0.98	628.545	302	248	248	52	67	62	3.0	7.8		628.630
4-1	30	0.38	0.89	631.30	302	247	252	55	66	63	3.0	9.5		-0.085
2	35	0.40	0.93	634.05	303	246	249	55	67	63	3.0	9.7		
3	40	0.40	0.93	636.80	303	248	249	57	68	63	3.0	8.7		
4	45	0.49	1.1	639.81	303	248	250	58	68	64	3.5	8.4		
5	50	0.53	1.2	642.955	302	248	248	59	69	64	3.5	8.3		643.025
3-1	55	0.37	0.86	645.64	302	247	249	60	68	65	3.0	8.2		-0.07
2	60	0.38	0.82	648.21	302	248	249	62	68	65	3.0	8.1		
	Total	*		67.210										
	Average	0.6190	0.8956		301.9208				66.0600					

* Sum of square roots.

Circle correct bracketed units on data sheet.

53 4/18 0.6147 11.37

3628

1517

QA/QC PB

Date 3/26/13

G - 5

CleanAir ENGINEERING

TEST LOCATION: PF Outlet Particulate/Metals **TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client: Wheelabrator		Project No. 12218	
Plant: S. Broward		Date 3/26/13	
Meter Operator: P. Bihun			
Probe Operator: P. Bihun			
Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @		(in. Hg)
Leak Rate After	[cfm] [Lpm] @		(in. Hg)
Pitot Leak Check Before: ☐		After: Good ☐ Bad ☐	

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.)			
Static Pres. (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			
Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	
Start Time:		Stop Time:	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx. (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
3	65	0.37	0.86	650.89	304	249	250	63	68	65	3.0	8.1	N/A	
4	70	0.43	1.0	653.77	303	249	248	63	68	64	3.5	7.9		
5	75	0.46	1.1	656.810	302	250	248	63	68	65	3.5	8.2		656.875
2-1	80	0.40	0.93	659.103	301	248	255	64	68	65	3.5	9.1		-0.065
2	85	0.35	0.82	662.23	302	249	250	65	69	65	3.0	8.6		
3	90	0.30	0.70	664.63	301	250	250	65	69	65	3.0	8.2		
4	95	0.38	0.89	667.30	303	250	250	65	69	65	3.5	8.7		
5	100	0.52	1.3	670.590	304	250	249	62	71	66	4.0	8.3		K=2.40
1-1	105	0.23	0.55	672.79	298	248	253	61	70	66	2.5	9.1		672.675
2	110	0.23	0.55	674.90	298	250	251	62	70	67	2.5	8.0		-0.085
3	115	0.29	0.70	677.29	302	250	246	63	69	67	3.0	8.0		
4	120	0.26	0.62	679.54	301	251	247	63	69	67	3.0	8.0		
5	125	0.42	1.0	682.415	301	250	249	63	70	67	3.5	8.2		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/26/13

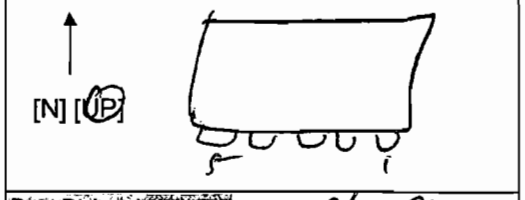
TEST LOCATION: FF Outlet **Particulate / Metals TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 1 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/26/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Cross Section of Test Location



Amb. Temp. (°F)	63	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.			67-F-21
Liner Material			Quartz

Meter Box	85-2	Sample Box No.	M3
Meter Y_d	1.0039	Meter $\Delta H_@$	1.7413
K Factor	2.45	Pitot C_p	0.813
Leak Rate Before	0.002 [cfm] [Lpm] @	15	(in. Hg)
Leak Rate After	0.005 [cfm] [Lpm] @	10	(in. Hg)
Pitot Leak Check Before ☑	After: Good ☒	Bad ☐	

Filter No.	C54-37		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1

Duct Dimensions (in.)	96 x 96			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow		First point all the way
-7.5	10.10	(In) [Out]	of page	(In) [Out]

Start Time:	10:25	Stop Time:	12:36

Traverse Point Number	Min/pt. Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (% dv)	Amb. Filter / Dioxin Trap	Notes
			3/4/13	682.925		280	250							
5-1	5	0.39	0.49	685.76	302	245	246	65	71	69	3.0	8.2	N/A	
2	10	0.36	0.88	688.43	302	244	249	62	72	70	2.5	7.8		
3	15	0.41	1.0	691.29	302	245	249	58	74	70	3.0	7.4		
4	20	0.42	1.0	694.14	302	246	249	57	74	70	3.0	7.4		
5	25	0.43	1.1	697.180	302	246	247	59	76	71	3.0	8.2		697.770
4-1	30	0.36	0.88	699.94	303	246	250	62	75	72	3.0	8.8		-0.09
2	35	0.34	0.83	702.56	303	247	250	62	75	72	2.5	8.4		
3	40	0.36	0.88	705.26	302	247	249	62	76	72	3.0	8.3		
4	45	0.42	1.0	708.14	302	248	248	63	76	73	3.0	8.3		
5	50	0.45	1.1	711.180	301	248	249	63	77	73	3.0	7.8		711.280
3-1	55	0.39	0.96	714.05	303	249	250	63	76	73	3.0	8.2		-0.07
2	60	0.32	0.78	~~716.585~~ 716.58	303	245	249	64	76	73	2.5	8.0		
	Total			716.720										
	Average	0.5922	0.8684		30,560				75,460					

Sum of square roots: 11.37

Circle correct bracketed units on data sheet: 3627

1756

CleanAir. ENGINEERING

QA/QC PB

Date 3/26/13

TEST LOCATION: FF Outlet **Particulate/Metals TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: _____ **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	17218
Plant	E. Brunswick	Date	3/26/13
Meter Operator			E. Bilyeu
Probe Operator			E. Bilyeu

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot $C_{p(std)}$	
Leak Rate Before	[cfm] [Lpm]	@	(in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐	Bad ☐	

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.):			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Start Time:		Stop Time:	

Traverse Point Number	Min/pt. 5 — Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (%dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
						250	270							
7	105	0.33	0.81	719.33	302	250	250	64	78	74	2.5	7.3	N/A	
4	70	0.41	1.0	722.19	302	246	249	64	78	74	3.0	7.9		
5	75	0.45	1.1	725.25	304	247	249	64	78	74	3.0	7.3		725.304
2-1	80	0.38	0.93	728.07	302	245	253	65	77	75	3.0	7.3		-0.045
2	85	0.30	0.74	730.53	302	247	249	65	79	75	3.0	7.2		
3	90	0.28	0.69	732.92	302	244	249	64	79	76	3.0	7.7		
4	95	0.31	0.76	735.43	302	248	249	60	80	76	3.0	6.9		
5	100	0.44	1.1	738.470	302	249	252	58	80	77	3.5	8.6		738.545
1-1	105	0.22	0.54	740.65	299	247	257	57	80	77	2.5	8.9		-0.075
2	110	0.20	0.49	742.63	298	248	248	57	79	78	2.5	7.5		
3	115	0.29	0.71	745.01	299	249	250	59	79	78	3.0	8.2		
4	120	0.25	0.61	747.27	301	249	250	60	80	78	2.5	7.6		
5	125	0.35	0.86	749.928	300	250	251	60	80	78	3.0	8.1		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/26/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 1 FF Outlet
Plant South Broward	Job No. 12218	Method 5/29

Balance Calibration Check			
Balance ID	TL07-4	Reference Weight Mass	500.0g
Reference Weight ID	60150 802830133	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job 802830106.8 Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Quartz		Sample Box No. M3
Date 3.25.13		Lot No. e54-40		pH NA
Analyst HN		Filter No. ~~e45~~ e54-40		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	787.8	465.4	322.4	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	674.0	545.3	128.7	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	575.2	550.7	24.5	Date 3/26
Impinger 4	Empty	429.5	424.5	5.0	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	645.7	643.7	2.0	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	545.9	546.3	-0.4	482.2
Impinger 7	≈ 250 g Silica Gel	747.3	729.4	17.9	500.1

Run No. 2	2	Filter Type Quartz		Sample Box No. M1
Date 3.26.13		Lot No.		pH NA
Analyst HN		Filter No. e54-38		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	664.4	443.3	221.1	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	646.9	530.6	116.3	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	572.1	538.5	33.6	Date 3/26
Impinger 4	Empty	451.0	443.9	7.1	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	545.4	541.0	4.4	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	530.3	529.7	0.6	383.1
Impinger 7	≈ 250 g Silica Gel	850.4	837.9	12.5	395.6

Run No. 3	3	Filter Type Quartz		Sample Box No. M3
Date 3.26.13		Lot No.		pH NA
Analyst HN / DL		Filter No. e54-37		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	729.8	464.4	~~265.4~~	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	648.3	545.1	~~103.6~~ 103.2	QA/QC JB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	572.8	550.3	22.5	Date 3/26
Impinger 4	Empty	427.9	424.2	3.7	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	646.6	644.6	2.0	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	543.8	543.8	0	396.6 396.8
Impinger 7	≈ 250 g Silica Gel	760.2	746.9	13.3	~~409.9~~ 410.1

QA/QC SB
Date 3/26

CleanAir. ENGINEERING

TEST LOCATION: FF Outlet **Metals** **TESTING** **METHOD:** 29 **PAGE** 1 **OF** 2

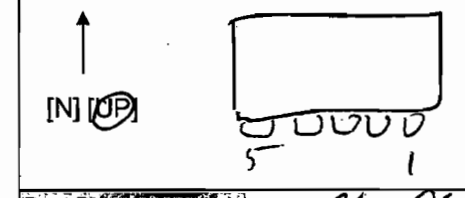
UNIT: 1 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	7/26/13
Meter Operator	R. Bilyeu		
Probe Operator	R. Bilyeu		

Meter Box	BF-2	Sample Box No.	M1
Meter Y_d	1.0039	Meter $\Delta H_@$	1.7413
K-Factor	2.45	Pitot C_p	0.843
Leak Rate Before	0.002 [cfm] [Lpm] @	15	(in. Hg)
Leak Rate After	0.001 [cfm] [Lpm] @	10	(in. Hg)
Pitot Leak Check Before ☒	After Good ☒	Bad ☐	

Cross-Section of Test Location



Duct Dimensions (in.)	96 x 96		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-8.3	10.0	In	

Amb. Temp. (°F)	66	Bar. Press.	29.90 (in. Hg) [mbar]
Probe I.D. No.	67-S-21		
Liner Material	Glass		

Filter No.	N1A		
Thimble No.	N1R		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1

Start Time:	12:59	Stop Time:	15:11

Traverse Point Number	Min/pt Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%,dv)	Ambi-Filter / Dioxin Trap	Notes
	5			750.465		250	250							
5-1	5	0.32	0.78	752.97	302	243	247	61	76	76	2.5	8.8	N/A	
2	10	0.34	0.83	755.59	304	245	247	53	77	77	2.5	8.9		
3	15	0.42	1.0	758.49	300	246	248	50	79	77	2.5	8.6		
4	20	0.48	1.2	761.71	302	248	248	49	82	78	3.0	8.3		764.730
5	25	0.46	1.1	764.730	304	247	249	49	83	79	3.0	8.4		-0.06
4-1	30	0.38	0.93	767.55	304	246	250	53	82	79	2.5	8.9		
2	35	0.35	0.86	770.22	304	247	251	53	82	79	2.5	8.8		
3	40	0.42	1.0	773.09	304	248	250	54	81	79	3.0	9.3		
4	45	0.51	1.4	776.51	308	248	248	55	80	78	3.5	9.2		
5	50	0.52	1.3	779.878	311	249	250	55	79	77	3.5	8.7		779.940
3-1	55	0.32	0.78	782.46	300	247	249	58	78	76	3.0	9.0		-0.065
2	60	0.35	0.86	785.14	304	248	249	62	78	76	3.0	8.9		
	Total	* 24.740		71.380					3087					
	Average	1.6494	0.9891		305.04	00			77.7100					

* Sum of square roots. 89 11 19 0.62835 12.04

Circle correct bracketed units on data sheet. 3647 1888

CleanAir. ENGINEERING

QA/QC RB

Date 7/26/13

TEST LOCATION: FF Outlet **TESTING** Metals **METHOD:** 29 **PAGE** 2 **OF** 2

UNIT: 1 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/26/13
Meter Operator		P. Bihun	
Probe Operator		P. Bihun	

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @		(in. Hg)
Leak Rate After	[cfm] [Lpm] @		(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐	Bad ☐	

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Duct Dimensions (in.)			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Start Time		Stop Time	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 280	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3	65	0.40	0.98	788.00	301	249	251	63	78	75	3.0	9.1	N/A	
4	70	0.57	1.3	791.35	307	249	248	63	78	74	3.5	9.4		
5	75	0.56	1.4	794.820	308	249	249	63	78	75	3.5	9.0		794.900
2-1	80	0.45	1.1	797.90	307	248	250	64	78	74	3.0	9.2		-0.075
2	85	0.38	0.93	800.67	308	249	250	65	80	74	3.0	9.4		
3	90	0.33	0.81	803.26	308	250	250	65	80	75	3.0	9.7		
4	95	0.43	1.1	806.32	308	250	250	60	80	75	3.5	9.0		
5	100	0.56	1.4	809.765	308	250	254	58	81	75	3.5	8.7		809.820
1-1	105	0.21	0.52	811.88	303	249	253	61	78	75	2.5	9.7		-0.055
2	110	0.22	0.54	814.00	304	250	250	62	79	75	2.5	8.8		
3	115	0.32	0.78	816.52	305	251	249	63	79	75	3.0	8.6		
4	120	0.30	0.74	818.98	306	250	249	64	79	75	3.0	8.7		
5	125	0.44	1.1	822.050	306	250	251	64	79	75	3.5	8.0		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC CB
Date 3/26/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 1 FF Outlet
Plant South Broward	Job No. 12218	Method 29

802830168 Balance Calibration Check			
Balance ID	TL07-4 802830135	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job — Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 4	4	Filter Type Quartz		Sample Box No. M1
Date 3.26.13		Lot No.		pH NA
Analyst HN/DL		Filter No. E54.35		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	733.4	441.8	291.6	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	631.8	532.2	99.6	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	553.3	537.0	16.3	Date 3/28
Impinger 4	Empty	445.3	443.3	2.0	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	559.7	558.3	1.4	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	539.6	536.7	2.9	413.8
Impinger 7	≈ 250 g Silica Gel	762.1	743.8	18.3	432.1

Run No. 5		Filter Type Quartz		Sample Box No.
Date		Lot No.		pH NA
Analyst		Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈ 250 g Silica Gel				

Run No. 6		Filter Type Quartz		Sample Box No.
Date		Lot No.		pH NA
Analyst		Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈ 250 g Silica Gel				

QA/QC SB
Date 9/18

CleanAir ENGINEERING

TEST LOCATION: INLET HCL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 1 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12219
Plant	S. BROWARD	Date	3-25-13
Meter Operator	SJ		
Probe Operator	SJ		

Meter Box	61-11	Sample Box No.	B-6
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6964
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@ 15	(in. Hg)
Leak Rate After	0.00 [cfm] [Lpm]	@ 15	(in. Hg)
Pitot Leak Check Before: ☑		After: Good ☑ Bad ☐	

Cross-Section of Test Location

Duct Dimensions (in.)	105		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.70	10		

Amb Temp (°F)	68	Bar Press	29.70	[in. Hg] [mbar]
Probe I.D. No.	66-4-7			
Liner Material	GLASS			

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Start Time	8:00	Stop Time	9:00

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F)	Filter T_f (°F)	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
						Set Points 355	355							
				579.200										
1-1	5	NA	1.20	582.24	498	353	354	52	88	88	2	8.2		
	10			585.25	500	352	355	52	89	88	2	8.3		
	15			588.21	501	355	356	54	94	90	2	8.4		
	20			591.16	503	354	355	54	97	90	2	8.5		
	25			594.09	501	355	354	55	95	91	4	8.2		
	30			597.01	502	356	355	52	94	92	5	8.0		
	35			599.00	501	356	356	52	98	93	6	8.1		
	40			602.85	501	355	355	54	100	93	7	8.2		
	45			605.79	501	354	354	54	102	93	9	8.4		
	50			608.79	505	356	355	55	102	93	10	8.6		
	55			611.79	508	354	352	56	102	93	11	8.8		
	60			614.89	508	355	353	58	102	93	12	8.8		
	Total	*		35.690	6029				1163	1097				
	Average		1.2000		502.4167				94.1667					

* Sum of square roots.

Circle correct bracketed units on data sheet.

G - 13

QA/QC SJ
Date 3-25-13

CleanAir ENGINEERING

TEST LOCATION: INLET **HCL TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

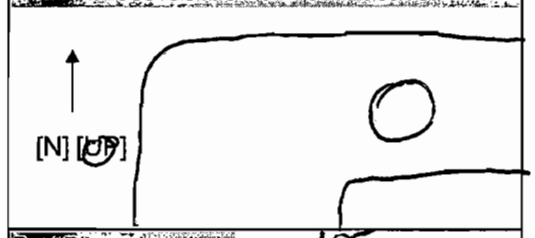
UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	S. BROWARD FS	Date	3-25-13
Meter Operator		ST	
Probe Operator		ST	

Meter Box	G-11	Sample Box No.	B-14
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6964
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	8 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	6 (in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑	Bad ☐	

Cross-Section of Test Location



Duct Dimensions (in.): 105

Static Pres (in. H_2O)	Port Len (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.6	10		

Amb. Temp. (°F)	70	Bar. Press.	29.78 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Start Time:	9:23	Stop Time:	10:34 ~~10:23~~ 8P

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume Init. Vol. [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
				615.300		355	355							
P-1	5	NA	1.20	618.53	488	352	354	52	97	96	3	7.0		
	10			621.67	498	354	355	52	96	95	4	7.1		PLANT STOP
	15			624.84	488	353	355	45	98	95	5	7.0		11 MIN DELAY
	20			628.01	496	354	354	49	99	96	6	7.0		
	25			630.90	489	354	355	49	100	96	6	7.2		
	30			633.89	491	355	355	49	100	96	7	7.4		
	35			636.89	488	355	356	53	101	97	9	7.2		
	40			640.00	490	354	355	54	100	96	10	7.0		
	45			642.97	490	355	354	56	99	96	11	7.0		
	50			645.95	496	353	353	59	94	96	12	7.6		
	55			649.92	491	355	354	59	98	95	13	7.5		
↓	60	↓	↓	652.02	494	353	353	60	99	95	14	7.6		
	Total	*		36.720	5887				1186	1149				
	Average		1.2000		490.583				97.2917					

* Sum of square roots.

Circle ~~correct~~ bracketed units on data sheet.

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QA/QC 84
Date 3-25-13

CleanAir ENGINEERING

TEST LOCATION: Inlet HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 1 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	0298
Plant	S. BROWARD	Date	3-25-13
Meter Operator		SJ	
Probe Operator		SJ	

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.): 105

Amb. Temp. (°F)	70	Bar. Press.	29.70 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Meter Box	GT-1	Sample Box No.	
Meter Y_d	1.0050	Meter $\Delta H@$	1.6964
K-Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	16 (in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑	Bad ☐	

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow	First point all the way
~1.5	10	[In] [Out]	[In] [Out]
		off page	

Start Time: 10:54 Stop Time: 11:54

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol: 652.500 [ft^3] [L]	Stack Temp. Ts (°F)	Probe Tp (°F) Set Points 355	Filter T_f (°F) Set Points 355	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (%dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
1-1	5	NA	1.20	655.63	488	356	354	60	98	96	2	6.7	NA	
	10			659.79	489	356	355	54	98	96	2	6.8		
	15			664.25	489	356	356	54	103	97	2	6.9		
	20			664.86	489	354	355	56	104	98	2	7.2		
	25			667.88	491	355	356	56	103	98	3	7.4		
	30			670.90	494	356	355	58	102	98	4	7.6		
	35			673.97	495	355	356	52	103	98	5	7.7		
	40			677.03	497	356	356	50	103	98	8	7.8		
	45			680.10	497	355	355	54	103	99	11	7.6		
	50			683.26	497	354	355	54	103	99	12	7.8		
	55			686.38	497	352	354	55	103	99	13	7.7		
↓	60	↓	↓	689.300	497	356	355	56	103	99	14	7.6	↓	
	Total	*		36.900	5919				226	1174				
	Average		1.2000		493.250				100.0000					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SJ
Date 3/28

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 1 SDA Inlet
Plant South Broward	Job No. 12218	Method Modified 26A

Balance Calibration Check			
Balance ID	8002810135	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Quartz		Sample Box No. B6
Date 3-25-13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	469.8	444.8	25.0	
Impinger 2	100 mL 01.N H2SO4	643.5	547.2	96.3	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	565.2	536.2	29.0	Date 3/25
Impinger 4	Empty	489.2	483.2	6.0	
Impinger 5	Silica Gel	697.5	682.5	15.0	Total Weight (gm)
Impinger 6					156.3
Impinger 7					171.3

Run No. 2	2	Filter Type Quartz		Sample Box No. B14
Date 3-25-13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	496.8	444.2	52.6	
Impinger 2	100 mL 01.N H2SO4	646.6	542.2	104.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	587	562.3	24.7	Date 3/25
Impinger 4	Empty	426.5	421.0	5.5	
Impinger 5	Silica Gel	706.5	694.7	11.8	Total Weight (gm)
Impinger 6					187.2
Impinger 7					199.0

Run No. 3	3	Filter Type Quartz		Sample Box No. B6
Date 3-25-13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4 HN 12:15	492.4 471.8	437.9	33.9	
Impinger 2	100 mL 01.N H2SO4	705.7 651.1	540.2	110.9	QA/QC SB
Impinger 3	100 mL 01.N H2SO4 3.25.13	592.9 561.8	534.0	27.8	Date 3/25
Impinger 4	Empty	485.2 487.3	483.2	4.1	
Impinger 5	Silica Gel	705.5 707.7	697.0	10.7	Total Weight (gm)
Impinger 6					176.7
Impinger 7					187.4

QA/QC SB
Date 3/25

CleanAir. ENGINEERING

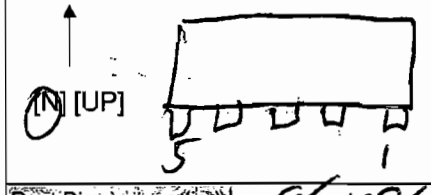
TEST LOCATION: FE OUTLET HCl **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 1 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	SOUTH BROWARD	Date	3/25/13
Meter Operator	WAYNE BERRY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	75	Bar. Press.	29.70 (in. Hg) [mbar]
Probe I.D. No.		67-4-3	
Liner Material		GLASS	

Meter Box	66-14	Sample Box No.	B-01
Meter Y_d	0.9879	Meter $\Delta H_@$	1.8015
K-Factor	—	Pitot C_p	—
Leak Rate Before	0.004 [cfm] [Lpm]	@	5 (in. Hg)
Leak Rate After	0.00 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before: ☐	After: ☐	Good ☐	Bad ☐

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—

Duct Dimensions (in.)	96 X 96			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow: (In) [Out] of page	First point all the way	(In) [Out]
-10.0	10			

Start Time: 0800 Stop Time: 0900

Traverse Point Number	Min/pt. 60 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. 406.400 [ft^3] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 300	Filter T_f (°F) Set Points 300	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx. (%, dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
B-1	5	NA	1.5	409.59	298	291	303	63	75	73	5	8.7		
	10		1.5	412.97	299	293	302	62	75	73	5	9.0		
	15		1.5	416.35	299	295	298	61	78	74	5.5	8.7		
	20		1.5	419.77	303	297	306	62	80	75	6	8.3		
	25		1.5	423.22	301	297	302	63	81	75	6	9.0		
	30		1.5	426.63	303	298	305	64	83	76	6	8.8		
	35		1.5	430.07	303	299	308	64	83	76	6	8.8		
	40		1.5	433.55	302	298	299	64	84	77	6	9.0		
	45		1.5	436.98	304	299	303	64	85	77	6	8.2		
	50		1.5	440.45	304	294	307	64	85	77	6	9.1		
	55		1.5	443.86	304	300	306	65	86	78	6	9.7		
	60		1.5	447.310	305	299	295	63	86	78	6	9.7		
	Total	*		40.9100	3625.0				981.0	909.0				
	Average		1.5		302.083				78.7500					

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC W/B

Date 3/25/13

CleanAir ENGINEERING

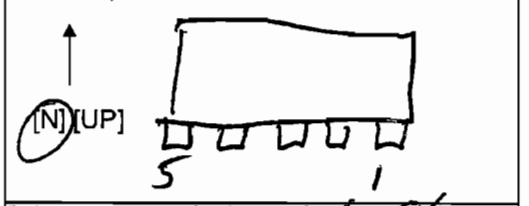
TEST LOCATION: FF OUTLET ACL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12248
Plant	SOUTH BOWARD	Date	2/25/13
Meter Operator	WAYNE BERRY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	74	Bar. Press.	29.70 [in. Hg] [mbar]
Probe I.D. No.		67-4-3	
Liner Material		GLASS	

Meter Box	66-14	Sample Box No.	B-24
Meter Y_d	0.9879	Meter $\Delta H_@$	1.8015
K Factor	—	Pitot C_p	—
Leak Rate Before	0.003 [cfm]	@ 15	(in. Hg)
Leak Rate After	0.003 [cfm]	@ 10	(in. Hg)
Pitot Leak Check Before:	N/A	After: Good ☐ Bad ☐	N/A

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—

Duct Dimensions (in.)	96X96		
Static Pres (in. H_2O)	-8.3	Port Len. (in.)	10
Gas Flow	[In] [Out] of page	First point all the way	[In] [Out]

Start Time:	0923	Stop Time:	1034

Traverse Point Number	Min/pt 60 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx (%,dv)	Amb Filter / Dioxin Trap	Notes
				447.730		300	300							
3-1	5	N/A	1.5	451.23	306	291	308	59	78	77	5.5	10.9		PROBE 0928
	10		1.5	454.59	302	292	296	54	79	78	5.5	8.8		0939 RESTART
	15		1.5	457.95	303	298	302	53	81	77	5.5	7.3		
	20		1.5	461.35	302	299	295	53	83	77	6	7.5		
	25		1.5	464.79	301	301	307	56	85	78	6	7.4		
	30		1.5	468.23	303	301	308	60	85	78	6	7.3		
	35		1.5	471.63	304	301	304	64	86	78	6	7.7		
	40		1.5	475.08	303	300	296	64	86	79	6	7.7		
	45		1.5	478.53	304	299	301	64	87	79	6	8.2		
	50		1.5	482.00	302	300	306	64	87	79	6	8.2		
	55		1.5	485.47	304	300	296	65	87	80	6	8.2		
	60		1.5	488.910	304	300	305	61	87	80	6	8.0		
	Total	*		41.1800	3638.0				1911.0	940.0				
	Average		1.5		303.166				81.2917					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB
Date 3/25/13

TEST LOCATION: FF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

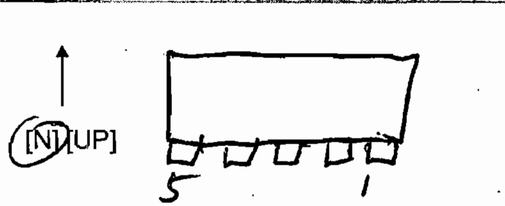
UNIT: 1 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR
Project No.	12218
Plant	SOUTH BROWARD
Date	3/25/13
Meter Operator	WAYNE BERRY
Probe Operator	—

Meter Box	66-14	Sample Box No.	B-01
Meter Y_d	0.9879	Meter $\Delta H_@$	1.8015
K Factor	—	Pitot C_p	—
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.001 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before ☐		After: Good ☐ Bad ☐	

Cross-Section of Test Location



Duct Dimensions (in.)	96 x 96		
Static Pres. (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-8.4	10	[In]	[In]

Amb. Temp. (°F)	74	Bar. Press.	29.70 [in. Hg] [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		
Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—
Start Time:	1054	Stop Time:	1154

Traverse Point Number	Min/pt 60 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 489.570	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 300	Filter T_f (°F) Set Points 300	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3-1	5	N/A	1.5	493.35	308	293	307	63	83	80	6	7.8		
	10		1.5	496.75	308	295	305	53	85	81	5.5	8.0		
	15		1.5	500.16	311	297	296	52	87	81	5.5	7.4		
	20		1.5	503.59	303	298	295	54	89	82	5.5	8.4		
	25		1.5	507.01	307	299	307	58	89	83	5.5	8.6		
	30		1.5	510.47	305	299	300	63	90	83	5.5	9.0		
	35		1.5	513.94	304	299	297	63	91	84	5.5	8.2		
	40		1.5	517.38	305	298	304	60	90	84	5.5	9.1		
	45		1.5	520.82	306	301	307	56	90	84	5.5	8.7		
	50		1.5	524.25	303	300	304	54	91	84	5.5	8.1		
	55		1.5	527.71	304	300	299	53	92	85	5.5	8.5		
	60		1.5	531.130	305	300	301	54	94	86	5.5	8.6		
	Total	*		41.5600	3669.0				1071.0	997.0				
	Average		1.5		305.750				86.167					

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC WB
Date 3/25/13

CleanAir ENGINEERING

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 1 FF Outlet
Plant South Broward	Job No. 12218	Method Modified M26A

Balance Calibration Check			
Balance ID	TL07-4 8023010 68	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	Filter Type Teflon Mat		Sample Box No. B1
Date 3/25/13	Lot No.		pH
Analyst DL	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	485.7	458.9	26.8	
Impinger 2	100 mL 01.N H2SO4	678.3	548.8	129.5	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	592.0	530.9	61.1	Date 3/25
Impinger 4	Empty	486.1	468.3	17.8	
Impinger 5	Silica Gel	724.4	704.9	19.5	Total Weight (gm)
Impinger 6					273.5
Impinger 7					254.7

Run No. 2 2	Filter Type Teflon Mat		Sample Box No. B24
Date 3.25.13	Lot No.		pH
Analyst HN	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	488.1	450.8	37.3	
Impinger 2	100 mL 01.N H2SO4	722.9	566.8	156.1	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	599.0	543.2	55.8	Date 3/25
Impinger 4	Empty	454.6	442.1	12.5	
Impinger 5	Silica Gel	724.2	706.5	17.7	Total Weight (gm)
Impinger 6					261.7
Impinger 7					279.4

Run No. 3	Filter Type Teflon Mat		Sample Box No. B1
Date	Lot No.		pH
Analyst	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	492.4	457.9	34.5	
Impinger 2	100 mL 01.N H2SO4	703.7	547.5	156.5	QA/QC
Impinger 3	100 mL 01.N H2SO4	592.9	539.4	53.5	Date
Impinger 4	Empty	468.9	468.6	0.3	
Impinger 5	Silica Gel	735.5	724.4	11.1	Total Weight (gm)
Impinger 6					244.5
Impinger 7					255.6

QA/QC SB
Date 3/25

CleanAir ENGINEERING

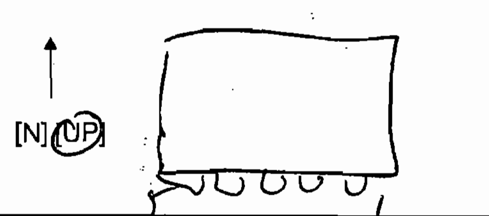
TEST LOCATION: FF Outlet Particulate/Metals **TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 1

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator	P. Bihary		
Probe Operator	P. Bihary		
Meter Box	M3 ~~M~~ 22	Sample Box No.	M9
Meter Y	~~1.0013~~ 0.9972	Meter ΔH@	~~1.840~~
K Factor	~~32.78~~ 2.1651	Pitot C_p	0.824
Leak Rate Before	0.007 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.002 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before	☒	After: Good ☒ Bad ☐	

Cross Section of Test Location



Duct Dimensions (in.)	96x96		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow (In) [Out] of page	First point all the way (In) [Out]
-12.2	10.0		

Amb. Temp (°F)	75	Bar. Press.	29.70 (in. Hg) [mbar]
Probe I.D. No.	67-8-47		
Liner Material	Glass		
Filter No.	e45-11		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1
Start Time	7:59	Stop Time	10:11

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m in}$ (°F)	DGM Outlet $T_{m out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
				842.000		250	250							Nickel
1	5	0.33	0.88	844.62	298	255	249	65	77	76	4.0	7.6	N/A	66-11
2	10	0.31	0.82	847.11	299	253	253	65	79	76	3.5	7.2		Yd = 0.9906
3	15	0.32	0.85	849.62	298	251	256	63	80	77	3.5	7.9		ΔH = 1.8274
4	20	0.33	0.88	852.19	298	250	256	62	82	77	4.0	7.9		
5	25	0.35	0.93	854.875	298	250	248	63	84	78	4.0	7.8		854.950
1	30	0.32	0.85	857.50	298	248	247	65	83	79	4.0	8.1		-0.075
2	35	0.33	0.88	860.08	299	244	249	65	81	78	4.0	8.3		
3	40	0.37	0.98	862.82	299	250	252	65	81	78	4.0	8.5		
4	45	0.42	1.1	865.75	300	250	254	62	82	78	4.5	9.0		
5	50	0.38	1.0	868.540	300	250	250	60	84	78	4.5	8.2		868.625
1	55	0.27	0.72	870.97	303	249	247	61	82	78	3.5	9.2		-0.085
2	60	0.40	1.1	873.90	300	249	248	61	83	79	4.5	9.5		
	Total	*		70.880										
	Average	0.6220	1.0368		298.960				81.8600					

* Sum of square roots. 10.99 70.845 3590 SB 4/17 1910

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC MB
Date 3/25/13

TEST LOCATION: FF Outlet — Portable Lab / Method 5 **TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 1

FIELD DATA SHEET

Client	Waste Laboratory	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K' Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @		(in. Hg)
Leak Rate After	[cfm] [Lpm] @		(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐		

Duct Dimensions (in.)

Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page N/A	First point all the way [In] [Out]

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	
Start Time:		Stop Time:	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_p (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%, dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3	65	0.44	1.2	877.01	297	251	251	59	85	79	5.0	8.3		
4	70	0.52	1.4	880.38	302	251	252	58	87	80	5.5	8.9		
5	75	0.50	1.3	883.60	300	250	247	59	88	80	5.0	9.3		883.60
1	80	0.45	1.2	886.76	300	249	246	62	86	81	5.0	9.0		-0.09
2	85	0.43	1.1	889.74	300	250	255	63	87	81	5.0	8.9		
3	90	0.48	1.3	892.98	298	251	254	63	87	81	5.5	10.1		
4	95	0.46	1.2	896.12	299	250	256	63	88	81	5.0	9.2		896.40
5	100	0.48	1.3	899.325	299	250	246	64	88	82	5.5	7.4		-0.08
1	105	0.36	0.95	902.12	296	249	255	65	86	81	4.5	7.7		
2	110	0.36	0.95	904.80	298	250	248	64	86	82	4.5	7.8		
3	115	0.37	0.98	907.55	298	250	252	62	87	82	4.5	7.8		
4	120	0.36	0.95	910.23	298	251	250	63	87	82	4.1	8.2		
5	124	0.40	1.1	913.180	299	250	251	63	87	82	5.0	8.3		
	Total													
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/25/13

TEST LOCATION: FF Outlet Partisol/Metals **TESTING** **METHOD:** 5725 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator			
Probe Operator			

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)	77	Bar. Press.	29.70 [in. Hg] [mbar]
Probe I.D. No.		67-F-17	
Liner Material		Glass	

Meter Box	Wb-4	Sample Box No.	M1
Meter Y_d	0.9906	Meter $\Delta H@$	1.8274
K Factor	2.65	Pitot C_p	0.824
Leak Rate Before	0.002 [cfm]	[Lpm] @	15 (in. Hg)
Leak Rate After	0.002 [cfm]	[Lpm] @	10 (in. Hg)
Pitot Leak Check Before ☐	After: Good ☐	Bad ☐	

Filter No.	41F-10		
Thimble No.	N/A		
Nozzle Diameter	0.272 F	Nozzle I.D.	2725-1

Duct Dimensions (in.)	96x96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-11.6	10.0		

Start Time	10:32	Stop Time	12:45

Traverse Point Number	Min/pt / Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
				913.465		250	250							
3-1	5	0.30	0.80	916.02	300	251	250	65	82	81	4.0	9.1	pitot	
2	10	0.34	0.90	918.61	306	256	254	65	85	82	4.0	8.5		
3	15	0.38	1.0	921.36	305	253	251	64	87	83	4.5	8.5		
4	20	0.46	1.2	924.44	298	250	253	63	88	83	5.0	8.4		927.165
5	25	0.46	1.2	927.52	300	250	252	63	90	84	5.0	8.5		-0.09
2-1	30	0.42	1.1	930.52	299	249	249	65	89	85	4.5	8.2		
2	35	0.40	1.1	933.46	301	250	251	65	91	85	4.5	8.1		
3	40	0.42	1.1	936.38	298	251	249	62	92	86	4.5	8.3		
4	45	0.41	1.1	939.29	300	250	253	56	92	86	4.5	8.6		
5	50	0.48	1.3	942.570	299	250	250	55	91	86	5.0	8.6		942.595
1-1	55	0.30	0.80	945.06	299	249	255	57	88	85	4.0	9.2		-0.085
2	60	0.38	1.0	947.64	300	250	252	57	86	84	4.5	7.8		
	Total	*	25.300	169.850										
	Average	0.6161	1.0120		299.120				86.5400					

Sum of square roots: 126

Circle correct bracketed units on data sheet: 3401

2071

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CleanAir ENGINEERING

QA/QC PB

Date 3/25/13

TEST LOCATION: FF Outlet Particulate/Metals TESTING METHOD: 5/29

UNIT: 2 RUN: 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		
Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @ (in. Hg)		
Leak Rate After	[cfm] [Lpm] @ (in. Hg)		
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐		

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.)			
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe ID No.			
Liner Material			
Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	
Start Time:		Stop Time:	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3	65	0.39	1.0	950.61	298	250	251	56	89	84	4.5	7.3	N/A	
4	70	0.40	1.1	953.55	300	251	249	56	90	84	5.0	7.8		
5	75	0.45	1.2	956.630	296	250	253	57	91	85	5.0	7.4	↓	956.755
5-1	80	0.30	0.80	959.23	296	249	253	59	87	85	4.0	9.0		~~0.013~~ (0.125)
2	85	0.32	0.85	961.77	298	249	252	63	89	85	4.0	8.4		
3	90	0.38	1.0	964.57	300	251	252	63	89	85	4.5	8.2		
4	95	0.33	0.88	967.15	299	251	252	60	91	86	4.5	7.8		
5	100	0.38	1.0	969.940	299	250	247	58	91	86	4.5	8.6		970.030
4-1	105	0.41	1.1	972.92	300	248	250	60	90	86	5.0	8.8		(0.09)
2	110	0.35	0.93	975.60	297	249	252	61	88	86	4.5	8.6		
3	115	0.35	0.93	978.30	298	251	251	62	86	85	4.5	8.0		
4	120	0.35	0.93	980.93	298	250	251	63	85	84	4.5	9.1		
5	125	0.37	0.98	983.705	298	250	251	63	85	84	4.5	8.9		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

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CleanAir ENGINEERING

QA/QC PB
Date 4/25/13

TEST LOCATION: FF Outlet Particulate/Metals **TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 3 **FIELD DATA SHEET**

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		
Meter Box	4-11	Sample Box No.	M9
Meter Y_d	0.9906	Meter $\Delta H_@$	1.8274
K Factor	2.65	Pitot C_p	0.824
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before: ☒	After: Good ☒ Bad ☐		

Cross-Section of Test Location

[N] [UP]

5 1

Duct Dimensions (in.)	96 x 96		
Static Pres. ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-11.7	10.0		

Amb. Temp. (°F)	78	Bar. Press.	29.70 (in. Hg) [mbar]
Probe I.D. No.	67-5-17		
Liner Material	Glass		
Filter No.	e54-39		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1
Start Time	13:04	Stop Time	15:17

Traverse Point Number	Min/pt: 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 984.155	Stack Temp. Ts (°F)	Probe T_p (°F) Set Point 250	Filter T_f (°F) Set Point 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m in}$ (°F)	DGM Outlet $T_{m out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
5-1	5	0.30	0.80	986.72	298	256	253	66	80	80	4.0	9.3	N/A	
2	10	0.33	0.88	989.30	299	257	254	63	83	80	4.0	9.0		
3	15	0.32	0.85	991.80	299	254	253	61	84	81	4.0	8.3		
4	20	0.35	0.93	994.47	299	251	251	61	88	82	4.0	8.1		
5	25	0.35	0.93	997.140	305	249	248	62	88	83	4.0	8.5		997.245
4-1	30	0.37	0.98	1000.00	312	250	247	64	89	84	4.5	8.5		-0.105
2	35	0.37	0.98	1002.76	307	249	253	64	89	85	4.5	8.5		
3	40	0.35	0.93	1005.42	299	251	248	62	90	85	4.5	8.2		
4	45	0.38	1.0	1008.20	303	250	250	62	89	88	4.5	7.9		
5	50	0.35	0.93	1010.890	300	250	253	61	89	85	4.5	8.3		1010.990
3-1	55	0.38	1.0	1013.77	298	249	248	62	86	85	4.5	8.5		-0.10
2	60	0.35	0.93	1016.44	302	249	253	63	88	85	4.5	8.4		
	Total	*53.4110		64.435										
	Average	0.6110	0.9948		300.6400				84.1600					

*Sum of square roots. 0.6118 0.6014

Circle correct bracketed units on data sheet.

3021 2043

QA/QC PB

Date 3/25/13

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CleanAir ENGINEERING

TEST LOCATION: FF Outlet **Particulate/Metals TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/25/13
Meter Operator		R. Bihun	
Probe Operator		R. Bihun	

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm]	@	(in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before ☐	After Good ☐	Bad ☐	

Duct Dimensions (in.)

Static Pres ($in. H_2O$)	Port Len (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	
Start Time		Stop Time	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft^3) [L]	Stack Temp T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (% dv)	☐ Amb Filter ☐ Dioxin Trap	Notes
3	65	0.37	0.98	1019.19	299	251	255	62	89	84	4.5	8.7	N/A	
4	70	0.42	1.1	1022.16	303	250	254	63	89	85	5.0	8.8		
5	75	0.47	1.1	1025.140	301	250	251	63	92	85	5.0	9.1		1025.215
2-1	80	0.38	1.0	1027.99	304	249	249	65	88	85	4.5	9.1		-0.075
2	85	0.46	1.2	1031.11	299	249	252	65	88	85	5.0	8.2		
3	90	0.40	1.1	1034.03	299	250	250	62	84	83	5.0	8.3		
4	95	0.446	1.2	1037.11	297	250	252	63	81	81	5.0	8.7		
5	100	0.43	1.1	1040.100	300	250	247	62	83	81	5.0	8.6		1040.175
1-1	105	0.34	0.90	1042.82	301	249	255	63	81	80	4.5	8.9		-0.075
2	110	0.36	0.95	1045.50	297	250	254	64	81	80	4.5	8.4		
3	115	0.36	0.95	1048.21	298	250	251	60	80	79	4.5	9.1		
4	120	0.32	0.85	1050.76	298	250	253	61	81	79	4.5	9.2		
5	125	0.47	1.3	1053.945	299	251	253	61	81	79	5.5	8.8		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/25/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 2 FF Outlet
Plant South Broward	Job No. 12218	Method 5/29

Balance Calibration Check			
Balance ID	TL 07-4 8028301068	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Quartz		Sample Box No. M9
Date 3-25-13		Lot No.		pH NA
Analyst DL		Filter No. C45-11		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	703.8	456.6	247.2	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	682.6	558.2	124.4	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	586.1	554.6	31.5	Date 3/25
Impinger 4	Empty	445.5	437.6	7.9	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	549.7	545.2	4.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	538 9.2	537.5	1.7	417.2
Impinger 7	≈250 g Silica Gel	735.3	715.8	19.5	436.7

Run No. 2	2	Filter Type Quartz		Sample Box No. M1
Date 3-25-13		Lot No.		pH NA
Analyst DL		Filter No. C45-10		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	688.1	444.3	243.8	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	639.9	531.7	108.2	QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	566.9	538.8	28.1	Date
Impinger 4	Empty	451.3	444.7	6.6	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	547.9	542.6	5.3	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	540.7	538.5	2.2	394.2
Impinger 7	≈250 g Silica Gel	837.9	824.5	13.4	407.6

Run No. 3		Filter Type Quartz		Sample Box No. M9
Date 3/25/13		Lot No.		pH NA
Analyst DL		Filter No. C54-39		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	716.5	456.5	260.0	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	652.5	556.6	95.9	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	564.0	544.8	19.2	Date 3/25
Impinger 4	Empty	441.6	436.9	4.7	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	548.7	546.0	2.7	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	540.8	540.6	0.2	382.7
Impinger 7	≈250 g Silica Gel	749.5	735.3	14.2	396.9

QA/QC SB
Date 3/25

CleanAir. ENGINEERING

TEST LOCATION: FF OUTLET METALS **TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

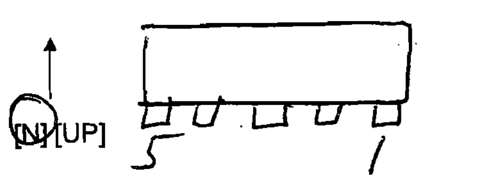
UNIT: 2 **RUN:** 4

FIELD DATA SHEET

Client WHEELABRATOR	Project No. 12218
Plant SOUTH BROWARD	Date 3/27/13
Meter Operator SHAWN JOINT	
Probe Operator WAYNE BERRY	

Meter Box 66-22	Sample Box No. M-1
Meter Y_d 0.9972	Meter $\Delta H_@$ 1.8840
K Factor 2.90	Pitot C_p 0.825
Leak Rate Before 0.003 [cfm] [Lpm] @ 15 (in. Hg)	
Leak Rate After 0.003 [cfm] [Lpm] @ 16 (in. Hg)	
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐

Cross-Section of Test Location



Duct Dimensions (in.) 96 x 96			
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-12.1	10		

Amb. Temp. (°F)	Bar. Press. 30.10	[in. Hg] [mbar]
Probe I.D. No.	67-8-16	
Liner Material	GLASS	

Filter No.	NA	
Thimble No.	NA	
Nozzle Diameter	0.2725	Nozzle I.D. 0.2725-2

Start Time:	12:07	Stop Time:	14:22

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 832.300	Stack Temp T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp T_c (°F)	DGM Inlet $T_{m(in)}$ (°F)	DGM Outlet $T_{m(out)}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐ ____	Notes
1-1	5	0.42	1.20	835.33	297	252	251	54	63	62	5	9.6	NA	
2	10	0.38	1.10	838.09	296	251	252	54	65	62	5	9.6	↓	*K=2.77
3	15	0.39	1.10	840.85	295	252	254	53	65	62	5	9.6		
4	20	0.43	1.20	843.74	300	254	252	54	66	62	5	9.7		
5	25	0.45	1.20	846.69	299	252	251	56	68	63	5	9.3		ΔV=-.19
2-1	30	0.44	1.20	849.90	297	251	252	58	69	65	5	9.4		
2	35	0.45	1.20	852.92	297	250	252	59	70	65	5	9.5		
3	40	0.38	1.10	855.74	303	251	250	60	71	64	5	9.6		
4	45	0.45	1.20	858.74	300	252	251	62	71	65	5	9.4		
5	50	0.50	1.40	861.89	297	250	252	58	71	65	5	9.3		ΔV=-.11
3-1	55	0.36	1.00	864.72	299	251	250	41	72	66	5	9.0		
2	60	0.33	0.91	867.31	300	252	252	41	73	67	5	8.7		
	Total	7.7185	13.8100	34.790	3580				824	793				
	Average	0.6179	1.0624		297.9600				68.2800					

* Sum of square roots. Circle correct bracketed units on data sheet.

SB 69.520 4/23/13

QA/QC SA
Date 3-27-13

CleanAir ENGINEERING

TEST LOCATION: FF OUTLET | METALS **TESTING** | **METHOD:** 5-29 | **PAGE** 2 **OF** 2

UNIT: 2 | **RUN:** 4

FIELD DATA SHEET

Client	WHEELABRATOR	Project No	12217
Plant	S. Blowers	Date	3-27-17
Meter Operator	SJ		
Probe Operator	WB		

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.		[in. Hg] [mbar]
Probe I.D. No.				
Liner Material				

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm]	@	(in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐	Bad ☐	

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Duct Dimensions (in.)			
Static Pres. (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Start Time:		Stop Time:	

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol: 861.310 (ft³)[L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx. (%,dv.)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
				861.310		250	250							
3-3	65	0.37	1.00	870.14	301	251	252	42	76	69	5	8.2	NA	
4	70	0.40	1.10	873.00	300	252	252	43	76	70	5	8.4		
5	75	0.41	1.10	875.74	300	250	251	43	76	70	5	8.8		ΔV=.01
4-1	80	0.36	1.00	878.74	299	252	251	43	74	70	5	9.0		
2	85	0.33	0.91	881.30	301	251	250	44	74	70	5	9.1		
3	90	0.35	0.97	883.99	295	253	254	46	74	70	5	9.4		
4	95	0.35	0.97	886.73	301	252	250	50	74	70	5	9.6		
5	100	0.36	1.00	889.41	300	252	251	50	76	71	5	9.5		ΔV=.13
5-1	105	0.32	0.89	892.10	300	251	250	52	75	70	5	9.6		
2	110	0.28	0.77	894.52	300	252	252	53	74	70	5	9.8		
3	115	0.30	0.83	896.99	299	251	252	54	75	70	5	9.6		
4	120	0.42	1.20	900.10	299	252	251	55	75	70	5	9.3		
5	125	0.36	1.00	902.80	299	252	252	55	75	70	5	9.2		
	Total	7.1793	12.7500		3894				974	910.0000				
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC [signature]
Date 3-27-17

CleanAir ENGINEERING

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 2 FF Outlet
Plant South Broward	Job No. 12218	Method 29

Balance Calibration Check			
Balance ID	TL0M-4 8028301068	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 4	Filter Type Quartz		Sample Box No. M1
Date 3/27/17	Lot No.		pH NA
Analyst DL	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	682.8	443.1	239.7	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	631.2	530.0	101.2	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	551.6	530.1	21.5	Date 3/27
Impinger 4	Empty	446.9	443.9	3.0	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	542.8	541.3	1.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	534.9	536.2	-1.3	365.8
Impinger 7	≈250 g Silica Gel	774.4	762.0	12.4	378.0

Run No. 5	Filter Type Quartz		Sample Box No.
Date	Lot No.		pH NA
Analyst	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈250 g Silica Gel				

Run No. 6	Filter Type Quartz		Sample Box No.
Date	Lot No.		pH NA
Analyst	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈250 g Silica Gel				

QA/QC SB
Date 3/27

CleanAir. ENGINEERING

TEST LOCATION: FF outlet Dioxin **TESTING** **METHOD:** 23 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3-26-13
Meter Operator	A. Obuchowski		
Probe Operator	"		

Meter Box	66-22	Sample Box No.	D3
Meter Y_d	0.9972	Meter $\Delta H_@$	1.8840
K Factor	2.68 → 2.75	Pitot C_p	0.825
Leak Rate Before 0.005 [cfm] [Lpm]	@ 15 (in. Hg)		
Leak Rate After 0.003 [cfm] [Lpm]	@ 12 (in. Hg)		
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐		

Cross-Section of Test Location

Duct Dimensions (in.)	96 x 96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-10.4	10	[In] circled	[In] circled

Amb. Temp. (°F)	65	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.	67-8-16		
Liner Material	glass		

Filter No.	—	
Thimble No.	—	
Nozzle Diameter	0.2722	Nozzle I.D. 2722-1

Start Time: 0803	Stop Time: 1249

Traverse Point Number	Min/pt 10 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 412.515	Stack Temp. Ts (°F)	Probe T_p (°F) Set Point 250	Filter T_f (°F) Set Point 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	~~Amb Filter~~ / Dioxin Trap ☑	Notes IGS 0806 pause
1-1	10	0.35	0.94	417.65	292	251	249	47	59	58	5	7.9	46	200 cc/min @ 8.34 rester
-2	20	0.38	1.0	423.62	292	252	251	46	60	58	8	8.5	45	↓
-3	30	0.43	1.2	428.83	297	250	250	49	61	59	9	8.2	50	
-4	40	0.37	0.99	434.28	301	250	250	52	62	59	8	8.1	52	
-5	50	0.47	1.3	440.42	295	250	249	56	62	59	10	7.8	55	440.47
2-1	60	0.34	0.91	446.00	294	250	250	60	62	59	8	9.0	60	-0.35
-2	70	0.38	1.0	451.48	295	251	250	64	62	60	9	8.5	63	
-3	80	0.40	1.1	457.17	294	250	248	66	64	61	9	8.6	65	
-4	90	0.43	1.2	463.16	299	250	249	52	64	61	9	9.6	48	
-5	100	0.51	1.4	469.49	297	250	250	50	65	62	10	9.0	47	469.60
3-1	110	0.34	0.94	474.92	291	250	249	47	65	64	8	9.5	46	-0.11
-2	120	0.34	0.94	480.24	293	250	250	48	68	66	8	8.7	47	
-3	130	0.33	0.91	485.47	294	250	249	55	69	68	8	7.7	56	↓
	Total	15.377	25.22	135.705	7393				1656	1578				
	Average	6.6055	1.0088		295.72				64.68					

Sum of square roots. Circle correct bracketed units on data sheet.

13.83 3834 823 64.66 (64.74)

QA/QC [initials]
Date 3-26-13

CleanAir ENGINEERING

G-31

TEST LOCATION: EF outlet **DIOXIN TESTING** **METHOD:** 23 **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client: Wheelabrator	Project No.: 1221E
Plant: S. Broward	Date: 3-26-13
Meter Operator: A. Obuchowski	
Probe Operator: "	

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)	Bar. Press. [in. Hg] [mbar]
Probe I.D. No.	
Liner Material	

Meter Box	Sample Box No.
Meter Y_d	Meter $\Delta H_@$
K Factor	Pitot C_p
Leak Rate Before [cfm] [Lpm] @ (in. Hg)	
Leak Rate After [cfm] [Lpm] @ (in. Hg)	
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐

Duct Dimensions (in.)

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Filter No.		
Thimble No.		
Nozzle Diameter	Nozzle I.D.	

Start Time:	Stop Time:

Traverse Point Number	Min/pt / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 490.62 [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☒ Dioxin Trap ☐ ____	Notes
						250	250							IGS
3-4	140	0.35	0.96	~~465.47~~	296	250	250	64	70	67	8	8.7	63	200 cc/min
-5	150	0.39	1.1	@ 3:26 ~~496.62~~ 496.18	296	250	250	62	70	66	9	9.0	65	496.36
4-1	160	0.37	1.0	501.77	299	249	249	54	67	65	8	9.3	56	-0.18
-2	170	0.33	0.91	506.97	298	250	251	49	67	65	8	9.2	55	
-3	180	0.33	0.91	512.20	295	251	251	49	69	64	8	8.1	59	
-4	190	0.35	0.96	517.54	296	249	250	52	69	64	8	9.2	63	
-5	200	0.44	1.2	523.44	295	249	250	56	66	64	10	8.6	54	523.62
5-1	210	0.26	0.77	528.40	292	249	246	59	70	65	7	9.2	59	-0.18
-2	220	0.33	0.91	533.60	296	251	250	61	71	66	8	9.6	61	
-3	230	0.33	0.91	538.64	299	250	249	64	70	65	8	9.8	64	
-4	240	0.33	0.91	544.02	305	250	248	63	72	66	8	8.7	57	
-5	250	0.31	0.85	549.040	292	250	253	64	70	66	8	8.7	54	↓
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC SL

Date 4/[illegible]/13

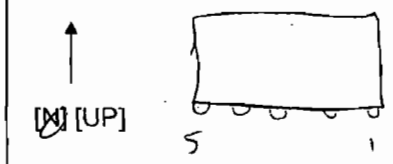
TEST LOCATION: FF outlet Dioxin **TESTING** **METHOD:** 23 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 3

FIELD DATA SHEET

Client	wheelabrator	Project No.	12218
Plant	S. Broward	Date	3-26-13
Meter Operator	A. Obuchowski		
Probe Operator	"		

Cross-Section of Test Location



Amb. Temp. (°F)	65	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.		67-E-16	
Liner Material		glass	

Meter Box	66-22	Sample Box No.	
Meter Y_d	0.9972	Meter $\Delta H_@$	1.8840
K Factor	2.70→2.77	Pitot C_p	0.825
Leak Rate Before	0.004 [cfm] [Lpm]	@ 15	(in. Hg)
Leak Rate After	0.000 [cfm] [Lpm]	@ 12	(in. Hg)
Pitot Leak Check Before: ☒	After: Good ☒ Bad ☐		

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	0.2722	Nozzle I.D.	2722-1

Duct Dimensions (in.)	96×96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-11.0	10		

Start Time:	1309	Stop Time:	17:25

Traverse Point Number	Min/pt 10 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. 549.725 [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☒ Dioxin Trap ☐ ____	Notes
5-1	10	0.29	0.78	554.56	297	250	250	61	72	68	5	8.6	56	IGS 200 L/min
-2	20	0.29	0.78	559.32	296	255	254	50	76	71	5	8.5	44	
-3	30	0.32	0.89	564.51	297	250	250	47	77	72	7	8.7	47	
-4	40	0.34	0.94	569.81	301	249	252	47	74	71	7	9.5	49	
-5	60	0.36	1.0	575.70	291	250	251	52	73	70	8	9.7	57	575.50
4-1	60	0.32	0.89	580.64	292	249	249	59	72	70	7	9.5	59	-0.20
-2	70	0.32	0.89	585.65	293	250	253	63	72	69	7	9.4	62	
-3	80	0.30	0.83	590.64	300	251	250	64	76	70	7	9.7	59	
-4	90	0.31	0.86	595.93	295	250	252	66	78	72	7	9.5	65	
-5	100	0.31	0.86	601.16	293	250	251	54	79	74	7	9.4	46	601.28
3-1	110	0.35	0.97	606.61	298	250	250	50	80	74	8	9.8	46	-0.18
-2	120	0.35	0.97	612.03	295	250	251	49	78	74	8	9.9	49	
-3	130	0.35	0.97	617.47	296	250	250	54	78	73	8	8.9	53	
	Total	*15.325²	26.27	139.9550	7456				1424	1802				
	Average	0.6130	1.0508		298.24				74.52					

Sum of square roots. Circle correct bracketed units on data sheet.

11.63 3844 985 928

G-33

CleanAir. ENGINEERING

QA/QC SB
Date 4/18/13

TEST LOCATION: FF outlet **DIOXIN TESTING** **METHOD:** 23 **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 3

FIELD DATA SHEET

Client: Wheelabrator	Project No.: 12218
Plant: S. Broward	Date: 3-26-13
Meter Operator: A. Obuchowski	
Probe Operator: "	

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)	Bar. Press. [in. Hg] [mbar]
Probe I.D. No.	
Liner Material	

Meter Box	Sample Box No.
Meter Y_d	Meter $\Delta H_@$
K Factor	Pitot C_p
Leak Rate Before [cfm] [Lpm] @ (in. Hg)	
Leak Rate After [cfm] [Lpm] @ (in. Hg)	
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐

Duct Dimensions (in.)

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Filter No.	
Thimble No.	
Nozzle Diameter	Nozzle I.D.

Start Time:	Stop Time:

Traverse Point Number	Min/pt ~10 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐ ____	Notes
						250	250							IGS
3-4	140	0.42	1.2	623.47	297	250	251	58	76	73	9	9.5	53	200 L/min
3-5	150	0.42	1.2	629.48	296	250	254	63	75	72	9	9.9	55	629.61
2-1	160	0.43	1.2	635.62	296	250	250	61	76	72	9	9.9	53	-0.13
-2	170	0.41	1.1	641.33	299	250	251	55	77	72	8	9.9	49	
-3	180	0.43	1.2	647.27	299	251	249	52	79	72	9	9.8	50	
-4	190	0.44	1.2	653.25	297	250	251	55	77	71	9	10.0	53	
-5	200	0.51	1.4	659.76	299	250	250	60	79	72	10	9.9	58	659.90
1-1	210	0.35	0.97	665.38	312	250	250	62	79	74	8	10.0	59	-0.14
-2	220	0.35	0.97	670.86	305	250	253	64	81	74	8	9.9	52	
-3	230	0.42	1.2	676.87	302	250	250	59	80	74	9	10.0	49	
-4	240	0.50	1.4	683.37	304	250	247	61	80	74	10	10.1	56	
-5	250	0.59	1.6	690.33 C	306	250	250	65	80	74	12	10.4	63	
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC 2

Date 4/25/13

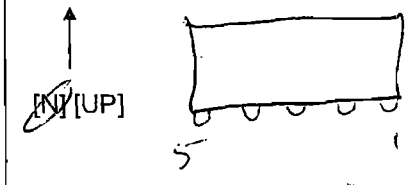
TEST LOCATION: EF outlet **DIOXIN TESTING** **METHOD:** 23 **PAGE** 1 **OF** 2

UNIT: 2 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	1221E
Plant	S. Broward	Date	3-27-13
Meter Operator	A. Chuchvara/		
Probe Operator	"		

Cross-Section of Test Location



Amb. Temp. (°F)	55	Bar. Press.	30.10 [in. Hg] [mbar]
Probe I.D. No.	67-E-16		
Liner Material	glass		

Meter Box	66-22	Sample Box No.	D3
Meter Y_d	0.9972	Meter $\Delta H_@$	1.8E40
K Factor	2.74	Pitot C_p	0.825
Leak Rate Before	0.005 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Pitot Leak Check Before: ☐	After: Good ☑ Bad ☐		

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	0.2722	Nozzle I.D.	2722-1

Duct Dimensions (in.)	96 x 96		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-11.2	16		

Start Time:	721	Stop Time:	1139

Traverse Point Number	Min/pt ic Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 690.916 [ft^3] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☑ Dioxin Trap ☐ ———	Notes
						250	250							IGS
2-1	10	0.34	0.93	696.09	295	260	258	43	49	47	5	9.2	39	200 c/min
-2	20	0.36	0.99	701.37	298	252	252	36	51	48	7	9.0	40	
-3	30	0.44	1.2	707.13	299	250	252	37	54	49	8	8.8	45	
-4	40	0.40	1.1	712.70	299	250	253	46	58	52	8	9.0	53	
-5	50	0.45	1.2	718.55	304	249	249	43	59	54	8	8.7	57	718.73
1-1	60	0.33	0.90	723.86	296	249	251	47	58	57	7	9.9	49	-0.18
-2	70	0.38	1.0	729.25	292	250	250	48	57	57	8	8.1	47	
-3	80	0.30	0.82	734.24	300	250	250	50	59	58	7	8.8	53	
-4	90	0.38	1.0	739.76	288	249	250	51	61	60	8	8.9	51	
-5	100	0.42	1.2	745.62	290	250	249	53	60	61	9	8.8	54	745.91
3-1	110	0.22	0.60	750.15	291	249	250	54	61	62	6	9.9	57	-0.29
-2	120	0.28	0.77	755.03	293	250	250	56	62	63	7	8.8	58	
-3	130	0.33	0.90	760.27	292	250	252	49	62	63	8	8.3	49	
	Total	15.5945*	26.926	139.420	7393				1548	1519				
	Average	0.6238	1.0768		295.720				61.340					

* Sum of square roots.

Circle correct bracketed units on data sheet.

12.61 3877 751 731

QA/QC ✓
Date 3-27-13

CleanAir. ENGINEERING

TEST LOCATION: FF outlet **DIOXIN TESTING** **METHOD:** 22 **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator
Plant	S. Broward
Meter Operator	A. Obuchowski
Probe Operator	"
Project No.	12216
Date	3-27-13

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)	Bar. Press. [in. Hg] [mbar]
Probe I.D. No.	
Liner Material	

Meter Box	Sample Box No.
Meter Y_d	Meter $\Delta H_@$
K Factor	Pitot C_p
Leak Rate Before [cfm] [Lpm] @ (in. Hg)	
Leak Rate After [cfm] [Lpm] @ (in. Hg)	
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐

Duct Dimensions (in.)

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Filter No.	
Thimble No.	
Nozzle Diameter	Nozzle I.D.

Start Time:	Stop Time:

Traverse Point Number	Min/pt 10 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft^3] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☑ Dioxin Trap ☐ ____	Notes
														165
5-4	140	0.35	0.96	765.64	291	250	250	46	63	64	8	8.5	42	200 cc/min
-5	150	0.39	1.1	771.36	292	250	249	47	63	64	8	8.5	44	771.50
4-1	160	0.35	0.96	776.82	289	250	251	51	64	64	8	9.2	49	-0.14
-2	170	0.36	0.99	782.30	291	250	250	56	67	66	8	9.5	54	
-3	180	0.39	1.1	788.06	293	250	249	61	67	67	9	10.5	56	
-4	190	0.48	1.3	794.31	294	250	250	58	68	68	10	10.9	47	
-5	200	0.51	1.4	800.73	295	249	252	52	70	70	10	9.9	46	800.90
3-1	210	0.42	1.2	806.85	300	250	248	55	67	68	9	10.5	50	-0.17
-2	220	0.43	1.2	812.72	302	250	251	58	67	66	9	9.8	53	
-3	230	0.44	1.2	818.70	300	250	248	62	66	64	9	10.6	59	
-4	240	0.55	1.5	825.14	304	250	250	61	67	64	11	10.4	54	
-5	250	0.52	1.4	831.610	305	250	250	61	68	63	11	9.9	54	
	Total	*												
	Average													

* Sum of squares.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SL

Date 4/2/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 2 FF Outlet
Plant South Broward	Job No. 12218	Method 23

Balance Calibration Check

Balance ID	TL07-4 8025970113S	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	Filter Type Rinsed Glass Fiber		Sample Box No. D1
Date 3-25-13	Lot No.		pH NA
Analyst HN	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	1363.0	632.8	730.2	
Impinger 2	100 ml HPLC Water	541.3	538.1	3.2	QA/QC SB
Impinger 3	100 ml HPLC Water	560.9	560.1	0.8	Date 3/26
Impinger 4	Empty	420.5	420.3	0.2	
Impinger 5	Trap # T1640-003	355.9	335.0	20.9	Total Weight (gm)
Impinger 6	Silica Gel	780.5	728.7	51.8	755.3
Impinger 7					807.1

Run No. 2	Filter Type Rinsed Glass Fiber		Sample Box No. D3
Date 3/26/13	Lot No.		pH NA
Analyst DL	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	1332.7	642.0	690.7	
Impinger 2	100 ml HPLC Water	508.9	510.1	-1.2	QA/QC SB
Impinger 3	100 ml HPLC Water	517.3	517.6	-0.3	Date 3/26
Impinger 4	Empty	426.0	420.9	5.1	
Impinger 5	Trap # T1640-009	379.8	358.4	21.4	Total Weight (gm)
Impinger 6	Silica Gel	793.7	741	52.7	715.7
Impinger 7					768.4

Run No. 3	Filter Type Rinsed Glass Fiber		Sample Box No. D4
Date 3/26/13	Lot No.		pH NA
Analyst DL	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	1283.7	633.5	650.2	
Impinger 2	100 ml HPLC Water	545.6	548.2	-2.6	QA/QC SB
Impinger 3	100 ml HPLC Water	553.3	553.5	-0.2	Date 3/27
Impinger 4	Empty	420.1	420.1	0.0	
Impinger 5	Trap # T1640-001	425.2	404.8	20.4	Total Weight (gm)
Impinger 6	Silica Gel	755.9	705.1	50.8	662.8
Impinger 7					718.6

QA/QC SB
Date 3/27

CleanAir ENGINEERING

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 2 FF Outlet
Plant South Broward	Job No. 12218	Method 23

Balance Calibration Check			
Balance ID	8028101135	Reference Weight Mass	500g
Reference Weight ID	60150	Reference Weight Reading	499.9

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 4	4	Filter Type Rinsed Glass Fiber		Sample Box No.
Date 3.27.13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	1334.0	640.7	693.3	
Impinger 2	100 ml HPLC Water	523.7	523.2	0.5	QA/QC SB
Impinger 3	100 ml HPLC Water	531.0	529.7	1.3	Date 4/18/13
Impinger 4	Empty	430.2	430.2	0.0	
Impinger 5	Trap # 1640-002	343.1	321.4	21.7	Total Weight (gm)
Impinger 6	Silica Gel	791.8	734.2	57.6	716.8
Impinger 7					774.4

Run No. 5		Filter Type Rinsed Glass Fiber		Sample Box No.
Date		Lot No.		pH NA
Analyst		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml HPLC Water				QA/QC
Impinger 3	100 ml HPLC Water				Date
Impinger 4	Empty				
Impinger 5	Trap #				Total Weight (gm)
Impinger 6	Silica Gel				
Impinger 7					

Run No. 6		Filter Type Rinsed Glass Fiber		Sample Box No.
Date		Lot No.		pH NA
Analyst		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml HPLC Water				QA/QC
Impinger 3	100 ml HPLC Water				Date
Impinger 4	Empty				
Impinger 5	Trap #				Total Weight (gm)
Impinger 6	Silica Gel				
Impinger 7					

QA/QC SB
Date 4/18/13

CleanAir ENGINEERING

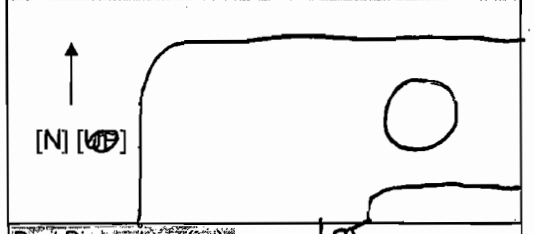
TEST LOCATION: INLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	S. BROWARD'S	Date	3-27-13
Meter Operator	SS		
Probe Operator	SS		

Cross-Section of Test Location



Amb. Temp. (°F)	61	Bar. Press.	30.10 [in. Hg] [mbar]
Probe I.D. No.	66-4-1		
Liner Material	GLASS		

Meter Box	61-11	Sample Box No.	B6
Meter Y_d	1.0050	Meter ΔH@	1.6164
K-Factor	NA	Pitot C_p	.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before	☑	After: Good ☑	Bad ☐

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Duct Dimensions (in.) 105

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.5	14		

Start Time 7:47 Stop Time 8:47

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 801.920 [ft^3] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 355	Filter T_f (°F) Set Points 355	Cond. Temp. T_c (°F)	DGM Inlet $T_{m,In}$ (°F)	DGM Outlet $T_{m,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (% dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
1-1	5	NA	1.200	804.99	494	354	355	46	70	69	3	6.7	NA	
	10			807.05	494	355	354	46	70	69	3	6.8		
	15			811.02	494	354	353	46	69	68	4	6.7		
	20			813.99	492	355	356	47	69	67	5	6.8		
	25			816.97	492	354	355	48	69	67	6	6.7		
	30			819.98	490	355	354	48	69	66	7	6.8		
	35			823.00	490	354	355	50	70	66	10	6.9		
	40			825.99	489	355	356	52	71	65	11	6.9		
	45			828.95	489	355	354	53	72	65	12	7.2		
	50			831.82	489	354	355	54	72	65	13	7.3		
	55			834.80	490	355	356	55	72	66	14	7.3		
↓	60	↓	↓	837.78	491	355	354	56	72	66	15	7.2	↓	
	Total	*		35.860	5896				845	799				
	Average		1.200		~~490.5000~~ 491.3333				70.4167	68.5000				

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC SS
Date 3-27-13

CleanAir ENGINEERING

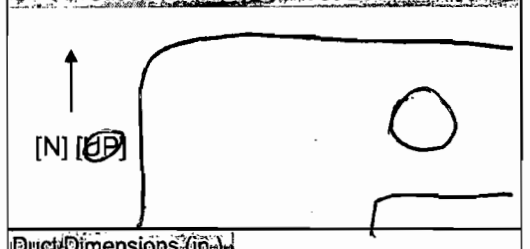
TEST LOCATION: INLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12118
Plant	S. BROWARD	Date	3-27-13
Meter Operator	SS		
Probe Operator	SS		

Cross-Section of Test Location



Duct Dimensions (in.)

Amb. Temp. (°F)	62	Bar. Press.	30.10 [in Hg] [mbar]
Probe I.D. No.	66-4-1		
Liner Material	GLASS		

Meter Box	61-11	Sample Box No.	B14
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6964
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Pitot Leak-Check Before: ☑	After: Good ☑	Bad ☐	

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.4	14		

Start Time: 9:08 Stop Time: 10:08

Traverse Point Number	Min/pt. 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 838.000 [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 355	Filter T_f (°F) Set Points 355	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%, dv)	Amb. Filter / Ploxin Trap	Notes
1-1	5	NA	1.20	841.01	496	352	355	45	80	78	4	7.8	NA	
	10			844.02	495	354	354	45	81	79	5	7.8		
	15			847.03	495	355	355	46	82	79	6	7.9		
	20			850.04	497	356	354	46	83	80	7	7.9		
	25			853.05	497	354	354	46	83	80	8	7.9		
	30			856.32	496	354	355	47	83	80	8	7.8		
	35			859.22	495	354	354	48	85	80	9	8.0		
	40			862.17	494	355	355	50	85	81	10	8.2		
	45			865.16	495	354	356	51	86	81	11	7.4		
	50			869.18	497	355	356	52	87	82	11	8.3		
	55			871.19	499	356	355	53	87	82	12	7.8		
↓	60	↓	↓	874.15	497	354	354	54	88	83	13	8.2	↓	
	Total			36.150	5953				1010	965				
	Average		1.2000		496.08333				84.2917					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SS Date 3-27-13

TEST LOCATION: INLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12219
Plant	S. EDWARDS	Date	3-27-13
Meter Operator		SS	
Probe Operator		SS	

Meter Box	61-11	Sample Box No.	B
Meter Y_d	1.0050	Meter $\Delta H@$	1.6901
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑	Bad ☐	

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.): 15

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow	First point all the way
-1.4	14	[In] [Out] of page	[In] [Out]

Amb. Temp. (°F)	64	Bar. Press.	30.10 [in.Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Start Time: 10:27 Stop Time:

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol: 874.500 [cf] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 355	Filter T_f (°F) Set Points 355	Cond. Temp. T_c (°F)	DGM Inlet T_{min} (°F)	DGM Outlet T_{mout} (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
1-1	5	NA	1.20	877.55	511	354	355	49	89	86	3	8.2	NA	
	10			880.50	510	355	354	49	89	86	4	8.1		
	15			883.42	511	356	355	50	90	87	5	7.7		
	20			886.34	511	356	355	52	92	87	7	7.5		
	25			889.26	510	354	354	52	93	87	8	7.3		
	30			892.18	514	355	354	52	91	88	9	7.2		
	35			895.03	512	356	354	52	91	88	10	7.5		
	40			897.88	511	356	355	50	98	88	15	7.8		
	45	NA		899.06	511	355	356	49	103	88	20	8.7		
	50													
	55													
	60													
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SA
Date 3-27-13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 2 SDA Inlet
Plant South Broward	Job No. 12218	Method Modified 26A

Balance Calibration Check

Balance ID	TL 07-4 8028301068	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job — Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1		Filter Type Quartz		Sample Box No. B6
Date 3-27-13		Lot No.		pH NA
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	475.5	455.0	20.5	
Impinger 2	100 mL 01.N H2SO4	644.2	544.2	100.0	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	561.7	535.7	26.0	Date 3/27
Impinger 4	Empty	487.7	482.3	5.4	
Impinger 5	Silica Gel	740.3	726.7	13.6	Total Weight (gm)
Impinger 6					151.9
Impinger 7					165.5

Run No. 2		Filter Type Quartz		Sample Box No. B14
Date 3-27-13		Lot No.		pH NA
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	502.0	464.3	38.7	
Impinger 2	100 mL 01.N H2SO4	631.2	545.9	85.3	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	582.8	567.6	15.2	Date 3/27
Impinger 4	Empty	423.7	422.3	1.4	
Impinger 5	Silica Gel	739.0	731.2	7.8	Total Weight (gm)
Impinger 6					140.6
Impinger 7					148.4

Run No. 3		Filter Type Quartz		Sample Box No. B6
Date 3-27-13		Lot No.		pH NA
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4		456.6		
Impinger 2	100 mL 01.N H2SO4		552.0		QA/QC
Impinger 3	100 mL 01.N H2SO4		532.8		Date
Impinger 4	Empty		482.8		
Impinger 5	Silica Gel		740.3		Total Weight (gm)
Impinger 6					
Impinger 7					

QA/QC SB
Date 3/27

CleanAir. ENGINEERING

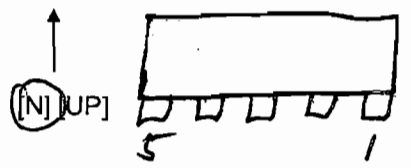
TEST LOCATION: FF OUTLET | HCL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 2 **RUN:** 1

FIELD DATA SHEET

Client: WHEELABRATOR	Project No.: 12218
Plant: SOUTH BRUNO	Date: 3/27/13
Meter Operator: WAYNE BERRY	
Probe Operator: —	

Cross-Section of Test Location



Amb. Temp. (°F): 50	Bar. Press.: 30.10	(in. Hg) [mbar]	
Probe I.D. No.:	67-4-3		
Liner Material:	GLASS		

Meter Box: 66-11	Sample Box No.: B-1		
Meter Y_d: 0.9906	Meter $\Delta H_@$: 1.8274		
K Factor: —	Pitot C_p: —		
Leak Rate Before: 0.003 [cfm] [Lpm]	@ 15	(in. Hg)	
Leak Rate After: 0.002 [cfm] [Lpm]	@ 10	(in. Hg)	
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐		

Filter No.: —			
Thimble No.: —			
Nozzle Diameter: —	Nozzle I.D.: —		

Duct Dimensions (in.):	96 X 96			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow: (in) [Out] of page	First point all the way (in) [Out]	
-11.2	10			

Start Time: 0747 Stop Time: 0847

Traverse Point Number	Min/pt / Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m (ft³) Init. Vol. / ILL	Stack Temp. Ts (°F)	Probe T. (°F) Set Points 300	Filter T. (°F) 300	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx (% dv)	Amb. Filter / Dioxin Trap	Notes
3-1	5	N/A	1.5	057.80	294	283	302	43	51	50	5.5	9.0		
	10		1.5	061.10	292	289	301	40	54	57	5.5	8.1		
	15		1.5	064.42	296	291	300	40	56	53	5.5	8.0		
	20		1.5	067.74	302	292	300	43	58	54	6	8.1		
	25		1.5	071.10	296	292	301	46	59	52	6	9.1		
	30		1.5	074.47	298	284	299	51	58	58	6	8.8		
	35		1.5	077.85	299	280	300	54	59	59	6	8.5		
	40		1.5	081.24	293	280	299	58	59	60	6	8.1		
	45		1.5	084.58	295	283	300	59	61	61	6.5	8.1		
	50		1.5	088.06	300	279	301	61	60	62	6.5	8.3		
	55		1.5	091.34	298	280	300	62	62	63	6.5	7.8		
	60		1.5	094.745	290	283	300	63	62	64	6.5	8.0		
	Total	*		40.2700	3553.0				689.00	691.0				
	Average		(1.5)		(296.083)				57.500	58				

* Sum of square roots.

Circle correct bracketed units on data sheet

52.916

CleanAir ENGINEERING

QA/QC WB

Date 3/27/13

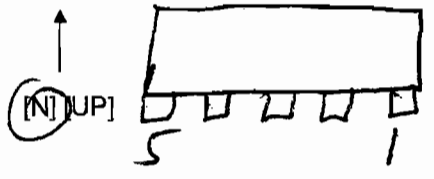
TEST LOCATION: FF OUT LOT HCL **TESTING METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	SOUTH BRUNSWICK	Date	3/27/13
Meter Operator	WAYNE BERRY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp: (°F)	50	Bar. Press.	30.10 [in. Hg] [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		

Meter Box	66-11	Sample Box No.	B-24
Meter Y_d	0.9906	Meter $\Delta H_@$	1.8274
K Factor	—	Pitot C_p	—
Leak Rate Before	0.004 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.002 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before	Good ☐ Bad ☐	After:	Good ☐ Bad ☐

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—

Duct Dimensions (in.)	96 x 96		
Static Pres (in. H_2O)	-11.1	Port Len. (in.)	10
Gas Flow	[In] [Out] of page	First point all the way	[In] [Out]

Start Time:	0908	Stop Time:	1008

Traverse Point Number	Min/pt Elapsed Time (60)	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points (300)	Filter T_f (°F) Set Points (300)	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap	Notes
				095.380										
3-1	5	N/A	1.5	098.74	294	277	307	54	61	67	6	9.2		
	10		1.5	102.11	294	275	303	52	62	68	6.5	9.2		
	15		1.5	105.48	293	276	301	51	63	68	6.5	8.9		
	20		1.5	108.88	294	269	301	53	62	67	7	8.7		
	25		1.5	112.27	294	274	301	53	64	67	7	8.9		
	30		1.5	115.67	296	271	300	53	65	68	7	8.4		
	35		1.5	119.09	292	277	301	55	65	68	7	8.8		
	40		1.5	122.50	295	278	301	58	64	68	7	8.4		
	45		1.5	125.91	293	272	298	61	65	68	7	7.9		
	50		1.5	129.31	295	272	300	63	65	68	7	8.2		
	55		1.5	132.80	292	275	302	64	67	69	7	8.9		
	60		1.5	136.135	297	281	301	64	68	69	7	7.7		
	Total	11.5*		40,7550	3529.0				771.0	815.0				
	Average				294.083				66.0833					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB
Date 4/7/13

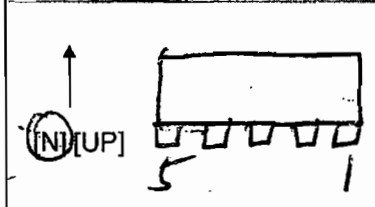
TEST LOCATION: FF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	SOUTH BROWARD	Date	3/27/13
Meter Operator	SHAWN JOINT		
Probe Operator	WAYNE BERRY		

Cross-Section of Test Location



Amb. Temp. (°F)	53	Bar. Press	30.10 (in Hg) [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		

Meter Box	66-11	Sample Box No.	B-01
Meter Y_d	0.9906	Meter $\Delta H_@$	1.8274
K Factor	—	Pitot C_p	—
Leak Rate Before	0.002 (cfm) [Lpm]	@	15 (in. Hg)
Leak Rate After	0.00 (cfm) [Lpm]	@	16 (in. Hg)
Pitot Leak Check Before	—	After: Good ☐ Bad ☐	

Duct Dimensions (in.)	96 x 96		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow (In) [Out]	First point all the way (In) [Out]
-12.1	10	of page	

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—

Start Time: 1027 Stop Time: 1127

Traverse Point Number	Min/pt. / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (%dv)	Amb. Filter / Dioxin Trap	Notes
	60			136.570		300	300							
2-1	5	N/A	1.5	~~140.~~ 139.990	299	284	305	49	69	72	5.5	8.7		
	10		1.5	143.38	295	292	304	45	72	73	5.5	9.0		
	15		1.5	146.78	296	287	301	44	72	74	5.5	9.1		
	20		1.5	150.15	296	286	299	45	72	74	5.5	9.4		
	25		1.5	153.54	298	279	301	49	70	72	5.5	9.5		
	30		1.5	156.94	298	281	300	53	70	72	5.5	9.2		
	35		1.5	160.35	298	286	301	56	72	73	5.5	9.3		
	40		1.5	163.74	296	287	301	55	70	72	6	9.7		
	45		1.5	167.12	298	279	301	57	65	68	6	9.7		
	50		1.5	170.48	295	281	300	57	65	66	6	8.8		
	55		1.5	173.83	297	290	301	58	66	65	6	9.8		
	60		1.5	177.210	298	283	300	54	65	64	6	9.7		
	Total	*		40.6400	3564.0				828.0	845.0				
	Average		1.5		297.00				69.7083					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC W.B
Date 3/27/13

Impinger Weight Sheet

Client Wheelabrator			Unit Name / Location Unit 2 FF Outlet
Plant South Broward	Job No. 12218		Method Modified M26A

Balance Calibration Check			
Balance ID	8D2810135	Reference Weight Mass	500g
Reference Weight ID	60150	Reference Weight Reading	499.9

Check must be performed at least Once per Method per Job — Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No.	1	1	Filter Type Teflon Mat	Sample Box No.	B1
Date	3.27.13		Lot No.	pH	
Analyst	HW		Filter No. NA	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	493.5	458.5	35.0	
Impinger 2	100 mL 01.N H2SO4	654.8	548.0	106.8	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	590.5	539.7	50.8	Date 3/27
Impinger 4	Empty	481.5	468.3	13.2	
Impinger 5	Silica Gel	702.8	687.9	14.9	Total Weight (gm)
Impinger 6					205.8
Impinger 7					220.7

Run No.	2	2	Filter Type Teflon Mat	Sample Box No.	B24
Date	3.27.13		Lot No.	pH	
Analyst	HW		Filter No. NA	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	481.2	437.5	43.7	
Impinger 2	100 mL 01.N H2SO4	660.0	547.6	112.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	573.0	527.9	45.9	Date 3/27
Impinger 4	Empty	450.2	440.8	9.4	
Impinger 5	Silica Gel	730.1	716.8	13.3	Total Weight (gm)
Impinger 6					211.4
Impinger 7					224.7

Run No.	3	3	Filter Type Teflon Mat	Sample Box No.	B1
Date	3.27.13		Lot No.	pH	
Analyst	HW		Filter No. NA	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	494.4	452.0	42.4	
Impinger 2	100 mL 01.N H2SO4	661.3	545.8	115.5	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	595.6	550.0	3/27 SB 8.9 45.6	Date 3/27
Impinger 4	Empty	476.9	468.0	3/27 SB 15.5 8.9	
Impinger 5	Silica Gel	717.9	702.4	15.5	Total Weight (gm)
Impinger 6					212.4
Impinger 7					227.9

QA/QC SB
Date 3/27

CleanAir ENGINEERING

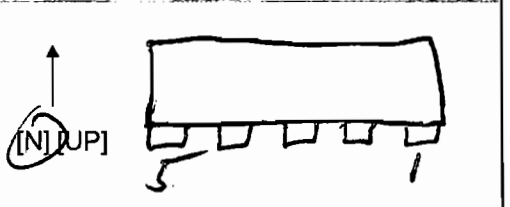
TEST LOCATION: FF OUTLET **METALS TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 3 **RUN:** 1

FIELD DATA SHEET

Client: WHEELABRATOR	Project No. 12218	Plant: SOUTH BROWARD	Date: 3/26/13
Meter Operator: SHAWN JOINT		Probe Operator: WAYNE BENNY	

Cross-Section of Test Location



Amb. Temp. (°F): 76	Bar. Press.: 29.90	[in. Hg] [mbar]	
Probe I.D. No.: 67-8-17			
Liner Material: GLASS			

Meter Box: 66-6	Sample Box No.: M-9		
Meter Y_d: 0.9854	Meter $\Delta H_@$: 1.8280		
K Factor: 2.73	Pitot C_p: 0.824		
Leak Rate Before: 0.002 [cfm] [Lpm] @ 15 (in. Hg)			
Leak Rate After: 0.002 [cfm] [Lpm] @ 15 (in. Hg)			
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐		

Filter No.: E54-36			
Thimble No.: NA			
Nozzle Diameter: 0.2725	Nozzle I.D.: 02725-2		

Duct Dimensions (in.): 96x96			
Static Pres ($in. H_2O$): -.9	Port Len (in.): 10	Gas Flow: [In] [Out] of page	First point all the way: [In] [Out]

Start Time: 12:11 Stop Time: 14:24

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. 384.820 (ft^3) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (%,dv)	☐ Amb. Filter ☐ Dioxin Trap	Notes
1-1	5	0.32	0.87	387.45	292	252	252	56	74	71	4	9.2	NA	
2	10	0.22	0.60	389.67	290	251	250	55	77	71	3	9.5		
3	15	0.25	0.70	391.88	293	252	252	54	78	72	3	9.1		*K=2.80
4	20	0.31	0.87	394.48	293	251	250	55	80	73	4	9.2		ΔV=-.19
5	25	0.33	0.92	397.24	292	252	250	56	81	73	4	9.3		
2-1	30	0.44	1.20	400.43	294	252	251	50	81	73	5	9.0		
2	35	0.47	1.30	403.60	294	250	251	49	82	73	5	9.2		
3	40	0.40	1.10	406.50	294	250	250	46	84	74	5	8.9		
4	45	0.33	0.92	409.20	294	251	252	46	84	74	5	9.1		
5	50	0.35	0.98	411.96	296	250	251	45	84	75	5	9.2		ΔV=-22
3-1	55	0.32	0.90	414.85	295	252	252	45	85	77	5	9.1		
2	60	0.38	1.10	417.91	295	251	250	4	86	77	5	9.3	↓	
	Total	6.995	11.460	89.090	3522				976	883				
	Average	0.5960	0.9652		293.9600				80.3000					

Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC BG
Date 3-26-13

CleanAir ENGINEERING

TEST LOCATION: FF OUTLET **METALS TESTING** **METHOD:** 5-29 **PAGE** 2 **OF** 2

UNIT: 3 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12217
Plant	S. BROWARD	Date	3-26-13
Meter Operator			SS
Probe Operator			WB

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)	76	Bar. Press.	29.90 [in.Hg] [mbar]
Probe I.D. No.	67-8-17		
Liner Material	GLASS		

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K-Factor		Pitot C_{pi}	
Leak Rate Before	[cfm] [Lpm] @		(in.Hg)
Leak Rate After	[cfm] [Lpm] @		(in.Hg)
Pitot Leak Check Before ☐	After: Good ☐ Bad ☐		

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Duct Dimensions (in.)			
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out]
		of page	

Start Time: Stop Time:

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 417.810 [ft^3] [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3-3	65	0.36	1.00	420.50	294	252	252	45	88	78	4	9.4	NA	
4	70	0.30	0.90	423.19	294	254	253	46	88	78	4	9.3		
5	75	0.29	0.81	425.65	293	252	252	46	88	79	4	9.5		ΔV=-.11
4-1	80	0.33	0.92	428.47	294	251	252	48	86	79	4	9.3		
2	85	0.32	0.90	431.11	294	250	250	50	86	79	4	9.4		
3	90	0.36	1.00	433.87	295	251	250	51	86	79	4	9.2		
4	95	0.39	1.10	436.86	295	252	251	51	88	79	4	9.0		
5	100	0.36	1.00	439.73	295	252	250	51	88	79	4	9.1		ΔV=-.14
5-1	105	0.30	0.84	442.87	294	250	251	53	85	79	4	9.5		
2	110	0.32	0.90	447.50	294	250	252	56	85	78	4	9.0		
3	115	0.43	1.20	450.72	295	251	250	56	88	79	4	9.2		
4	120	0.39	1.10	452.15	295	252	252	56	88	79	4	9.3		
5	125	0.36	1.00	453.57	295	250	252	56	88	79	4	9.1		
	Total	7.6544	12.6700		3927				1132	1024				
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SS

Date 3-26-13

TEST LOCATION: FF Outlet / Particulate/Metals **TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/27/03
Meter Operator		P. Bilmes	
Probe Operator		P. Bilmes	

Cross-Section of Test Location

Amb. Temp. (°F)	50	Bar. Press.	30.18 (in. Hg) [mbar]
Probe I.D. No.		47-S-17	
Liner Material		Glass	

Meter Box	106-6	Sample Box No.	M3
Meter Y_d	0.9854	Meter $\Delta H_@$	1.828
K Factor	2.68	Pitot $C_{p(std)}$	0.824
Leak Rate Before	0.003 [cfm] [Lpm]	@	4 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before ☒	After Good ☒	Bad ☐	

Filter No.	S4-34		
Thimble No.	N/A		
Nozzle Diameter	0.272	Nozzle I.D.	2725-1

Duct Dimensions (in.)	96x96		
Static Pres ($in. H_2O$)	Port Len (in.)	Gas Flow (In) [Out] of page	First point all the way (In) [Out]
-2.8	10.0		

Start Time:	7:28	Stop Time:	9:41

Traverse Point Number	Min/pt 5 — Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$) 0.99	Gas Sample Volume V_m Init. Vol (ft³) [L] 454.160	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 200	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%, dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes 7:28 3/27/03
5-1	5	0.38	1.01	456.94	328	257	253	50	53	52	4.0	8.6	N/A	K = 2.680
2	10	0.36	0.94	459.61	326	256	255	45	56	52	4.0	8.3		
3	15	0.35	0.91	462.21	328	253	256	44	59	53	4.0	7.9		
4	20	0.43	1.1	465.15	329	251	249	44	60	53	4.5	8.2		
5	25	0.44	1.1	468.05	330	250	257	45	62	54	4.5	8.5		465 LIT
4-1	30	0.41	1.1	471.11	329	248	247	46	61	55	4.5	8.6		-0.02
2	35	0.38	0.99	473.87	326	249	257	47	64	56	4.5	7.7		
3	40	0.36	0.94	476.52	327	243	248	49	65	56	4.0	8.3		
4	45	0.38	0.99	479.34	328	244	253	50	64	57	4.5	8.2		
5	50	0.33	0.86	481.925	327	245	249	51	65	57	4.0	8.6		481.925
3-1	55	0.26	0.68	484.24	324	249	252	52	62	58	3.5	8.0		-0.06
2	60	0.37	0.96	486.97	328	250	254	52	63	58	4.5	8.3		
	Total	11.56	29.70	168.255										
	Average	0.6602	0.9702		326.160				60.8	0.9				

Sum of square roots. 1395

Circle correct bracketed units on data sheet. 3932

QA/QC MB

Date 3/27/03

CleanAir ENGINEERING

TEST LOCATION: FF Outlet Portsmouth / Models **TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12214
Plant	S. Brunswick	Date	3/22/13
Meter Operator	P. Bilyeu		
Probe Operator	P. Bilyeu		

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K-Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @		(in. Hg)
Leak Rate After	[cfm] [Lpm] @		(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐	Bad ☐	

Filter No.		
Thimble No.		
Nozzle Diameter	Nozzle I.D.	

Duct Dimensions (in.)				
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]	

Start Time: Stop Time:

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3	65	0.40	1.0	489.76	329	250	250	53	65	58	4.5	8.6	N/A	
4	70	0.35	0.91	492.42	330	250	250	54	65	59	4.0	7.8		495.000
5	75	0.34	0.88	495.00	324	250	252	55	66	59	4.0	8.5		-0.009
2-1	80	0.55	1.4	498.41	330	249	250	57	64	59	5.5	8.6		
2	85	0.41	1.1	501.35	332	250	251	56	67	60	5.0	8.2		
3	90	0.44	1.1	504.19	325	246	251	57	67	60	5.0	8.2		
4	95	0.38	0.99	506.97	321	252	251	57	67	60	4.5	9.0		
5	100	0.35	0.91	509.630	324	251	252	59	67	61	4.5	8.6		509.705
1-1	105	0.22	0.57	511.71	309	249	249	59	64	61	3.5	9.2		-0.075
2	110	0.28	0.73	514.12	309	250	252	59	65	61	4.0	8.9		
3	115	0.35	0.91	516.76	329	242	256	59	67	62	4.5	8.6		
4	120	0.38	0.99	519.56	332	245	254	60	68	62	4.5	8.1		
5	125	0.45	1.2	522.710	328	246	252	60	69	62	5.0	8.5		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/27/13

TEST LOCATION: FF Outlet **Particulate/Metals TESTING** **METHOD:** 5/29 **PAGE** 1 **OF** 2

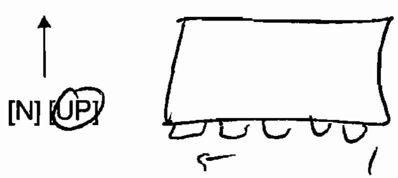
UNIT: 3 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/27/13
Meter Operator	P. Bihuns		
Probe Operator	P. Bihuns		

Meter Box	606-6	Sample Box No.	M9
Meter Y_d	0.9854	Meter $\Delta H_@$	1.8220
K Factor	2.60	Pitot C_p	0.824
Leak Rate Before	0.002 (cfm) [Lpm] @	15 (in. Hg)	
Leak Rate After	0.002 (cfm) [Lpm] @	10 (in. Hg)	
Pitot Leak Check Before: ☑	After: Good ☒ Bad ☐		

Cross-Section of Test Location



Duct Dimensions (in)	96 x 96		
Static Pres (in. H_2O)	Port Len (in)	Gas Flow (In) [Out] of page	First point all the way (In) [Out]
-10.7	10.0		

Amb Temp (°F)	62	Bar. Press	30.10 (in. Hg) [mbar]
Probe I.D. No.	67-5-17		
Liner Material	Glass		

Filter No.	254-33		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1

Start Time	9:59	Stop Time	12:11

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init Vol (ft³) [L] 523.105	Stack Temp Ts (°F)	Probe (°F) Set Points 250	Filter T (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator, approx (%dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
5-1	5	0.33	0.86	525.74	330	245	247	65	66	66	4.5	8.5	N/A	
2	10	0.33	0.86	528.34	332	260	254	54	71	67	4.0	8.6		
3	15	0.35	0.91	530.98	331	256	255	53	75	68	4.0	8.7		
4	20	0.36	0.94	533.73	332	251	252	53	77	70	4.0	9.1		536.335
5	25	0.32	0.83	536.260	330	249	251	53	78	71	4.0	9.1		-0.075
4-1	30	0.41	1.1	539.23	331	249	248	54	77	73	4.5	9.1		
2	35	0.48	1.3	542.57	333	250	254	53	80	74	5.5	8.9		
3	40	0.34	0.88	545.14	334	251	252	55	83	76	4.0	8.3		
4	45	0.35	0.91	547.81	337	250	247	57	82	77	4.0	8.7		550.540
5	50	0.35	0.91	550.485	326	250	249	58	81	77	4.0	9.3		-0.055
3-1	55	0.47	1.2	553.64	329	248	250	58	80	78	5.0	9.5		
2	60	0.47	1.2	556.73	333	250	250	58	83	78	5.0	8.4		
	Total			71.120					3887					
	Average	0.6247	1.0180		329.920				77.940					

Sum of square roots. 11.9 3978 1808

Circle correct bracketed units on data sheet

QA/QC PB
Date 3/27/13

G-51

CleanAir ENGINEERING

new general datasheet, December 2006

TEST LOCATION: FF Outlet **Particulate/Metals TESTING** **METHOD:** 5/29 **PAGE** 2 **OF** 2

UNIT: 3 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/27/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Cross-Section of Test Location

[N] [UP]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm] @		(in. Hg)
Leak Rate After	[cfm] [Lpm] @		(in. Hg)
Pitot Leak Check Before: ☐	After: Good ☐ Bad ☐		

Filter No.			
Thimble No.			
Nozzle Diameter		Nozzle I.D.	

Duct Dimensions (in.)			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Start Time:		Stop Time:	

Traverse Point Number	Min/pt Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 210	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
3	65	0.44	1.1	559.85	332	243	251	58	84	79	4.8	8.6	N/A	
4	70	0.40	1.0	562.68	332	248	253	59	81	79	4.8	9.2		
5	75	0.38	0.99	565.485	331	250	253	59	81	79	4.1	9.1		565.530
2-1	80	0.46	1.2	568.65	332	249	248	59	80	79	5.0	9.0		-0.045
2	85	0.48	1.3	571.88	331	250	249	59	82	79	5.5	9.3		
3	90	0.50	1.3	575.12	333	251	251	59	82	79	5.5	8.7		
4	95	0.38	0.99	577.95	333	251	252	59	84	79	4.8	9.1		
5	100	0.37	0.96	580.695	335	250	248	60	82	79	4.5	8.8		580.740
1-1	105	0.34	0.88	583.37	314	250	246	60	82	79	4.5	9.3		-0.045
2	110	0.28	0.73	585.73	317	250	255	61	81	79	4.0	9.3		
3	115	0.42	1.1	588.28	326	250	254	61	81	79	5.0	9.9		
4	120	0.40	1.0	591.06	327	250	253	62	82	78	4.5	8.6		
5	125	0.40	1.0	594.445	327	251	251	62	82	78	4.5	8.4		
	Total	*								1024				
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC CB

Date 3/27/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 3 FF Outlet
Plant South Broward	Job No. 12218	Method 5/29

Balance Calibration Check			
Balance ID	TL07-4 8028301068	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job — Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Quartz		Sample Box No. M9
Date 3.26.13		Lot No.		pH NA
Analyst HN		Filter No. e54-36		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	684.4	457.4	227.0	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	645.4	556.0	89.4	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	565.7	545.1	20.6	Date 3/26
Impinger 4	Empty	440.1	437.0	3.1	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	549.5	547.7	1.8	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	541.2	541.5	-0.3	341.6
Impinger 7	≈250 g Silica Gel	760.4	749.5	10.9	352.5

Run No. 2	2	Filter Type Quartz		Sample Box No. M3
Date 3-27-13		Lot No.		pH NA
Analyst HN / DL		Filter No. e54-34		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	649.8	465.1	~~184.4~~ 184.7	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	655.2	545.4	109.8	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	582.5	550.1	32.4	Date 3/27
Impinger 4	Empty	431.5	424.5	7.0	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	646.5 ~~643.6~~	~~556.5~~	2.9	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	544.5 544.4	~~545.~~	0.1	SB ~~336.6~~ 336.9
Impinger 7	≈250 g Silica Gel	774.8	760.0	14.8	4/19 ~~351.4~~ 351.7

Run No. 3	3	Filter Type Quartz		Sample Box No. M9
Date 3-27-13		Lot No.		pH NA
Analyst HN		Filter No. e54-33		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	626.4	457.2	SB ~~169.2~~ 169.2	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	661.7	556.5	105.2	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	575.5	545.6	29.9	Date 3/27
Impinger 4	Empty	444.6	436.9	7.7	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	550.3	546.7	3.6	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	538.8	538.8	0.0	SB ~~345.6~~ 345.6
Impinger 7	≈250 g Silica Gel	766.5	750.4	16.1	4/19 ~~361.7~~ 331.7

QA/QC SB
Date 3/27

CleanAir ENGINEERING

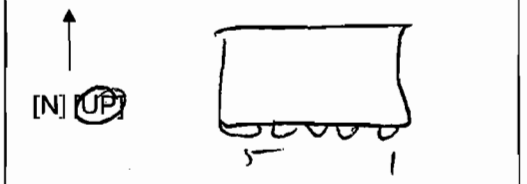
TEST LOCATION: FF Outlet **TESTING** Metals **METHOD:** 29 **PAGE** 1 **OF** 2

UNIT: 3 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/27/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Cross-Section of Test Location



Amb. Temp. (°F)	68	Bar. Press.	30.10 (in. Hg) [mbar]
Probe I.D. No.		67-F-47	
Liner Material		Glass	

Meter Box	606-6	Sample Box No.	M3
Meter Y_d	0.9854	Meter $\Delta H_@$	1.8280
K Factor	2.70	Pitot C_p	0.824
Leak Rate Before	0.004 (cfm) [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 (cfm) [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before: ☒	After: Good ☒ Bad ☐		

Filter No.	N/A		
Thimble No.	N/A		
Nozzle Diameter	0.2220	Nozzle I.D.	2220-1

Duct Dimensions (in.)	96x96		
Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out]
-10.7	10.0	of page	

Start Time:	12:29	Stop Time:	14:41

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp T_c (°F)	DGM Inlet $T_{m,in}$ (°F)	DGM Outlet T_{mout} (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
				594.720		250	250							
5-1	5	0.33	0.89	597.37	328	248	256	62	74	76	4.0	9.1	N/A	
2	10	0.33	0.89	600.01	327	257	255	59	76	76	4.0	9.2		
3	15	0.34	0.92	602.72	328	256	257	56	79	75	4.0	8.7		
4	20	0.35	0.95	605.46	327	250	252	55	80	75	4.0	9.4		608.240
5	25	0.34	0.92	608.140	326	250	249	55	80	75	4.0	9.5		-0.07
4-1	30	0.37	1.0	610.99	326	249	248	56	79	75	4.0	8.9		
2	35	0.35	0.95	613.73	327	250	254	56	80	75	4.0	9.0		
3	40	0.35	0.95	616.46	327	251	253	56	81	75	4.0	9.1		
4	45	0.36	0.97	619.22	326	251	251	56	81	76	4.0	9.1		622.065
5	50	0.36	0.97	621.970	325	250	252	57	82	76	4.0	9.4		-0.045
3-1	55	0.37	1.0	624.84	325	249	252	58	80	76	4.0	9.4		
2	60	0.45	1.2	627.96	326	249	254	60	80	76	5.0	9.6		
	Total			75.305										
	Average	0.6446	1.1324		324.040				78.180					

Sum of square roots: 11.41

Circle correct bracketed units on data sheet. 3918 1858

CleanAir ENGINEERING

QA/QC PB

Date 3/27/13

TEST LOCATION: PF Outlet **Metals TESTING** **METHOD:** 29 **PAGE** 2 **OF** 2

UNIT: 3 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	S. Broward	Date	3/22/13
Meter Operator		R. Bihun	
Probe Operator		R. Bihun	

Meter Box		Sample Box No.	
Meter Y_d		Meter $\Delta H_@$	
K Factor		Pitot C_p	
Leak Rate Before	[cfm] [Lpm]	@	(in. Hg)
Leak Rate After	[cfm] [Lpm]	@	(in. Hg)
Pitot Leak Check Before ☐	After Good ☐	Bad ☐	

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.)

Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]

Amb. Temp. (°F)		Bar. Press.	[in. Hg] [mbar]
Probe I.D. No.			
Liner Material			

Filter No.		
Thimble No.		
Nozzle Diameter	Nozzle I.D.	

Start Time	Stop Time

Traverse Point Number	Min/pt Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. (ft³) [L]	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%,dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
7	65	0.50	1.4	631.31	326	250	253	62	82	76	5.5	9.3	N/A	
4	70	0.43	1.2	634.52	325	250	254	62	82	75	5.0	9.6		
5	75	0.39	1.1	637.571	323	249	250	64	82	71	4.5	9.0		637.571
2-1	80	0.57	1.5	641.10	323	248	251	65	79	75	5.5	9.2		-0.035
2	85	0.52	1.4	644.48	324	250	253	60	82	71	5.5	8.8		
3	90	0.46	1.2	647.61	324	252	250	53	83	76	5.0	9.1		
4	95	0.42	1.1	650.58	325	250	248	52	83	76	4.5	9.4		653.89
5	100	0.47	1.3	653.850	324	250	252	51	83	76	5.5	9.3		-0.045
1-1	101	0.38	1.0	656.73	301	251	251	53	80	76	4.5	9.6		
2	110	0.48	1.2	659.90	325	250	253	54	81	76	5.0	9.0		
3	115	0.60	1.6	663.56	320	250	256	54	82	76	6.0	9.1		
4	120	0.48	1.3	666.83	322	251	248	54	84	76	5.5	9.5		
8	125	0.50	1.4	670.220	321	250	249	54	84	76	5.5	8.6		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

QA/QC PB

Date 3/22/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 3 FF Outlet
Plant South Broward	Job No. 12218	Method 29

Balance Calibration Check			
Balance ID	TL07-4 8023088	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 4	Filter Type Quartz		Sample Box No.
Date 3/27/13	Lot No.		pH NA
Analyst DL	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	707.2	465.7	241.5	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	644.4	559.9	84.5	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	566.4	551.6	14.8	Date 4/19/13
Impinger 4	Empty	437.9	434.9	3.0	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	653.9	654.4	-0.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	536.5	537.8	-1.3	342.0
Impinger 7	≈250 g Silica Gel	722.6	708.4	14.2	356.2

Run No. 5	Filter Type Quartz		Sample Box No.
Date	Lot No.		pH NA
Analyst	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈250 g Silica Gel				

Run No. 6	Filter Type Quartz		Sample Box No.
Date	Lot No.		pH NA
Analyst	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty				
Impinger 2	100 ml 5%HNO_3/10%H_2O_2				QA/QC
Impinger 3	100 ml 5%HNO_3/10%H_2O_2				Date
Impinger 4	Empty				
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4				Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4				
Impinger 7	≈250 g Silica Gel				

QA/QC SB
Date 4/19/13

CleanAir. ENGINEERING

TEST LOCATION: INLET HCL TESTING METHOD: 26A PAGE 1 OF 1

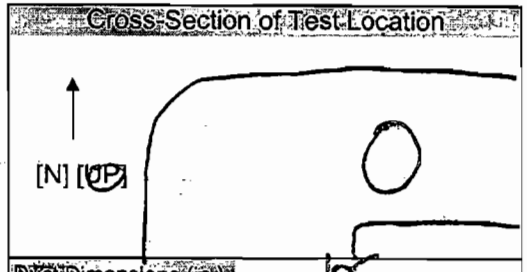
UNIT: 3 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	S. BROWARD	Date	3-26-13
Meter Operator		SJ	
Probe Operator		SJ	

Meter Box	61-11	Sample Box No.	B-14
Meter Y_d	1.0050	Meter $\Delta H@$	1.8164
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm] @	15	(in. Hg)
Leak Rate After	0.003 [cfm] [Lpm] @	18	(in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑	Bad ☐	

Cross Section of Test Location



Duct Dimensions (in.)			
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out]
-1.1	14	of page	

Amb. Temp. (°F)	64	Bar. Press.	29.98 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Start Time	9:00	Stop Time	9:00

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. 692.200 [ft^3] [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 355	Filter T_f (°F) Set Points 355	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (%dv)	☐ Amb. Filter ☐ Dioxin Trap	Notes
P1-1	5	NA	1.20	695.25	480	352	356	47	70	70	4	8.8	NA	
	10			698.30	481	354	355	47	72	70	4	9.7		
	15			701.35	480	355	354	49	74	70	5	8.6		
	20			704.11	481	354	352	53	74	70	6	8.5		
	25			707.02	482	355	355	54	75	70	8	8.8		
	30			709.92	484	354	356	58	75	70	10	9.0		
	35			712.74	480	355	355	60	75	71	11	8.6		
	40			715.66	480	354	356	54	75	71	12	8.8		
	45			718.60	481	355	356	54	75	71	13	8.7		
	50			721.54	481	354	355	55	75	71	14	8.5		
	55			724.58	484	355	354	56	76	72	15	8.6		
↓	60	↓	↓	727.64	484	356	354	56	77	72	15	8.7	↓	
	Total	*		35.440	5783				893	848				
	Average		1.2000		481.917				74.5417					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC Date 3-26-13

TEST LOCATION: INLET HCL **TESTING METHOD:** 26A **PAGE** 1 **OF** 1

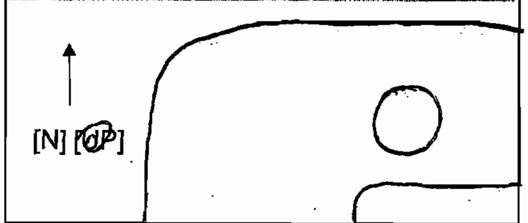
UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client: WHEELABRATOR	Project No.: 12218
Plant: S. BROWARD	Date: 3-26-13
Meter Operator: SJ	
Probe Operator: SJ	

Meter Box: 61-11	Sample Box No.: 136
Meter Y_d: 1.0050	Meter $\Delta H_@$: 1.6964
K-Factor: NA	Pitot C_p: 0.834
Leak Rate Before: 0.003 [cfm] [Lpm] @ 15 (in. Hg)	
Leak Rate After: 0.003 [cfm] [Lpm] @ 16 (in. Hg)	
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐

Cross-Section of Test Location



Duct Dimensions (in.)	105		
Static Pres (in. H_2O)	Port Len (in)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.0	14	Out	In

Amb. Temp. (°F): 66	Bar. Press.: 29.90	[in. Hg] [mbar]	
Probe I.D. No.: 66-4-7			
Liner Material: GLASS			
Filter No.: NA			
Thimble No.: NA			
Nozzle Diameter: NA	Nozzle ID: NA		
Start Time: 9:21	Stop Time: 10:21		

Traverse Point Number	Min/pt 5 / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [ft³] [L] 728.000	Stack Temp. Ts (°F)	Probe T_p (°F) Set Point 355	Filter T_f (°F) Set Point 355	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indicator approx (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
11-1	5	NA	1.20	731.14	493	355	354	50	83	79	3	7.7	NA	
↓	10	↓	↓	734.31	493	356	355	50	84	79	3	7.8	↓	
	15			737.47	490	355	352	51	85	80	4	7.6		
	20			740.58	489	354	354	52	88	82	5	7.5		
	25			743.646	488	355	354	53	89	85	8	8.2		
	30			746.71	488	356	352	54	89	86	9	8.3		
	35			749.77	488	355	356	55	89	86	10	8.4		
	40			752.86	483	354	354	56	90	88	11	8.5		
	45			755.96	483	356	355	58	91	89	12	8.5		
	50			759.06	483	355	356	58	91	89	13	8.6		
	55			762.08	481	354	355	59	92	89	14	8.5		
↓	60	↓	↓	765.24	481	355	356	60	92	89	15	8.5	↓	
	Total	*		37.240	5840				1063	1021				
	Average		1.2000		486.6667				86.8333					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SW
Date 3-26-13

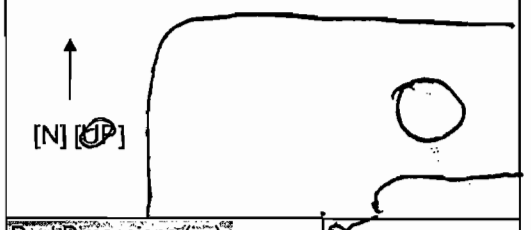
TEST LOCATION: Inlet HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 3 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	S. BROWARD	Date	3-26-13
Meter Operator	SJ		
Probe Operator	SJ		

Cross Section of Test Location



Amb. Temp. (°F)	75	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Meter Box	GF-11	Sample Box No.	
Meter Y_d	1.0080	Meter $\Delta H_@$	1.6964
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	5 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	5 (in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑	Bad ☐	

Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	NA	Nozzle I.D.	NA

Duct Dimensions (in.): 105

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow	First point all the way
-1.1	14	[In] [Out] of page	[In] [Out]

Start Time:	10:46	Stop Time:	11:46

Traverse Point Number	Min/pt. / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 765.500 @ [L]	Stack Temp. TS (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx. (%, dv)	☐ Amb. Filter ☐ Dioxin Trap	Notes
1-1	5	NA	1.20	768.58	478	356	352	49	89	85	4	8.8	NA	
	10			771.66	478	355	354	48	89	85	5	8.7		
	15			774.75	480	354	355	48	89	85	5	8.6		
	20			777.72	480	356	356	49	88	84	6	9.0		
	25			780.69	480	355	355	50	88	84	7	8.9		
	30			783.66	479	354	355	52	87	84	8	8.8		
	35			786.64	479	355	354	54	87	84	9	8.7		
	40			789.63	479	356	355	54	87	84	10	8.6		
	45			792.62	478	355	356	55	87	84	11	8.5		
	50			795.61	479	356	355	56	87	84	12	8.4		
	55			798.60	479	356	356	58	87	84	13	8.5		
↓	60	↓	↓	801.66	480	355	355	59	87	84	14	8.6	↓	
	Total	*		36.160	5747				1050	1011				
	Average		1.2000		478.967				85.9583					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SA
Date 3-26-13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 3 SDA Inlet
Plant South Broward	Job No. 12218	Method Modified 26A

Balance Calibration Check			
Balance ID	TL07-4 8028301135	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job — Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Quartz		Sample Box No. B14
Date 3.26.13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	471.1	454.0	17.1	
Impinger 2	100 mL 01.N H2SO4	600.7	529.5	71.2	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	565.2	540.5	24.7	Date 3/26
Impinger 4	Empty	429.9	422.0	7.9	
Impinger 5	Silica Gel	718.8	706.1	12.7	Total Weight (gm)
Impinger 6					120.9
Impinger 7					133.6

Run No. 2	2	Filter Type Quartz		Sample Box No. B6
Date 3.26.13		Lot No.		pH NA
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	498.8	457.1	41.7	
Impinger 2	100 mL 01.N H2SO4	630.4	552.8	77.6	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	548.9	535.2	13.7	Date 3/26
Impinger 4	Empty	485.0	482.7	2.3	
Impinger 5	Silica Gel	717.2	707.6	9.6	Total Weight (gm)
Impinger 6					135.3
Impinger 7					144.9

Run No. 3	3	Filter Type Quartz		Sample Box No. B14
Date 3.26.13		Lot No.		pH NA
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	524.6	461.2	63.4	
Impinger 2	100 mL 01.N H2SO4	601.7	545.8	55.9	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	570.3	560.2	10.1	Date 3/26
Impinger 4	Empty	423.3	421.2	2.1	
Impinger 5	Silica Gel	731.3	720.1	11.2	Total Weight (gm)
Impinger 6					131.5
Impinger 7					142.7

QA/QC SB
Date 3/26

CleanAir ENGINEERING

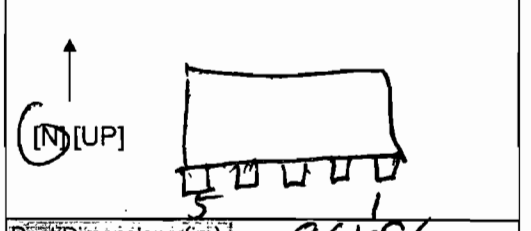
TEST LOCATION: FF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 3 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	SOUTH BROWARD	Date	3/26/13
Meter Operator	WAYNE BENOIT		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	53	Bar. Press.	29.90 (in. Hg) [mbar]
Probe I.D. No.	67-4.3		
Liner Material	GLASS		

Meter Box	6-18	Sample Box No.	B-24
Meter Y_d	1.0008	Meter $\Delta H_@$	1.9165
K Factor	—	Pitot C_p	—
Leak Rate Before	0.003 (cfm) [Lpm]	@	15 (in. Hg)
Leak Rate After	0.001 [cfm] [Lpm]	@	16 (in. Hg)
Pitot Leak Check Before: ☐	After: ☐	Good ☐	Bad ☐

Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—

Duct Dimensions (in.)	96 X 96		
Static Pres ($in. H_2O$)	-9.9	Port Len. (in.)	10
Gas Flow	(In) [Out] of page	First point all the way	(In) [Out]

Start Time:	0800	Stop Time:	0900

Traverse Point Number	Min/pt. 60 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. 246.660 (ft^3) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 300	Filter T (°F) Set Points 300	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator, approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
3 1	5	N/A	1.5	249.98	296	281	305	59	64	63	6	9.5		
	10		1.5	253.06	296	283	304	61	66	64	6	9.5		
	15		1.5	256.24	295	282	298	51	70	63	6	9.4		
	20		1.5	259.43	296	281	300	52	72	63	6	8.9		
	25		1.5	262.65	295	281	300	56	73	63	6	9.4		
	30		1.5	265.88	296	283	301	61	74	64	6	8.7		
	35		1.5	269.13	294	282	300	62	73	64	6	9.2		
	40		1.5	272.40	297	282	300	63	74	64	6	9.5		
	45		1.5	275.62	290	279	299	63	74	65	6	9.4		
	50		1.5	278.85	293	277	300	63	73	65	6	9.6		
	55		1.5	282.19	294	272	300	62	74	65	6	9.6		
	60		1.5	285.36	293	276	300	60	75	66	6.5	9.5		
	Total	*		38.7000	3535.0				862.0	769.0				
	Average		(1.5)		(294.583)				(67.958)					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB
Date 3/26/10

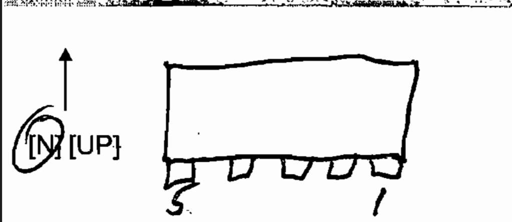
TEST LOCATION: FF OUTLET HCL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client WHEELABRATOR	Project No. 12218
Plant SOUTH BROWARD	Date 3/26/13
Meter Operator WAYNE BERRY	
Probe Operator —	
Meter Box C6-18	Sample Box No.
Meter Y_d 1.0008	Meter $\Delta H_@$ 1.9165
K Factor —	Pitot C_p —
Leak Rate Before 0.004 [(cfm)] [Lpm] @ 15 (in. Hg)	
Leak Rate After 0.002 [(cfm)] [Lpm] @ 10 (in. Hg)	
Pitot Leak Check Before ☐	After: Good ☐ Bad ☐

Cross-Section of Test Location



Duct Dimensions (in.)	96x96		
Static Pres (in. H_2O)	Port Len (in.)	Gas Flow [(In)] [Out] of page	First point all the way [(In)] [Out]
-10.1	10		

Amb. Temp. (°F) 55	Bar. Press. 29.80	[(in. Hg)] [mbar]	
Probe I.D. No.	67-4-3		
Liner Material	GLASS		
Filter No.	—		
Thimble No.	—		
Nozzle Diameter	—	Nozzle I.D.	—
Start Time:	0921	Stop Time:	1021

Traverse Point Number	Min/pt 60 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. [(ft³)] [L] 285.740	Stack Temp. Ts (°F)	Probe T (°F) Set Points 300	Filter T (°F) Set Points 300	Cond. Temp. T_c (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
3-1	5	N/A	1.5	288.92	298	296	308	55	69	66	5.5	9.6		
	10		1.5	292.15	300	299	304	53	71	66	5.5	9.6		
	15		1.5	295.37	296	300	301	51	74	66	6	9.8		
	20		1.5	298.58	299	299	299	52	75	67	6	9.2		
	25		1.5	301.80	296	298	300	58	75	67	6	9.5		
	30		1.5	305.09	298	295	300	59	76	68	6.5	9.0		
	35		1.5	308.35	295	295	301	62	77	68	6.5	9.2		
	40		1.5	311.59	296	300	300	64	77	68	6.5	8.0		
	45		1.5	314.82	297	299	299	64	77	69	6.5	9.4		
	50		1.5	318.04	293	300	301	61	78	69	8.5	9.1		
	55		1.5	321.29	295	299	300	61	79	70	6.5	8.9		
	60		1.5	324.535	295	299	300	61	80	70	7.0	9.9		
	Total	*		38.7950	3558.0				908.0	814.0				
	Average		1.5		296.5000				71.7500					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB
Date [illegible]/13

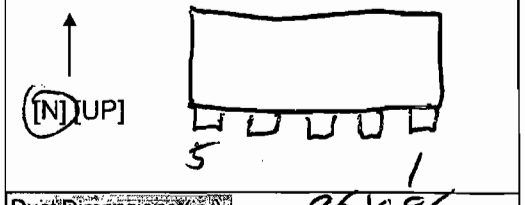
TEST LOCATION: FF OUTLET ACL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 3 RUN: 3

FIELD DATA SHEET

Client: WHEELABRATOR	Project No.: 12718		
Plant: SOUTH BROWARD	Date: 3/26/13		
Meter Operator: WAYNE BOLEY			
Probe Operator: —			
Meter Box: 66-18	Sample Box No.: B-24		
Meter Y_d: 1.0008	Meter $\Delta H@$: 1.9165		
K Factor: —	Pitot C_p: —		
Leak Rate Before: 0.005 [cfm] [Lpm]	@ 15 (in. Hg)		
Leak Rate After: 0.002 [cfm] [Lpm]	@ 10 (in. Hg)		
Pitot Leak Check Before: ☐	After: Good ☑ Bad ☐		

Cross Section of Test Location



Duct Dimensions (in.)	Static Pres $-H$ (in. H_2O)	Port Len. (in.)	Gas Flow [In]	Gas Flow [Out]	First point all the way [In]	First point all the way [Out]
96 X 96	-9.1	10	of page			

Amb. Temp. (°F): 56	Bar. Press.: 29.90 (in. Hg) [mbar]		
Probe I.D. No.: 67-4-3			
Liner Material: GLASS			
Filter No.: —			
Thimble No.: —			
Nozzle Diameter: —	Nozzle I.D.: —		

Start Time: 1046 Stop Time: 1146

Traverse Point Number	Min/pt 60 Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. 325.220 (ft³) [L]	Stack Temp. Ts (°F)	Probe Tp (°F) Set Points 300	Filter T. (°F) Set Points 300	Cond. Temp. Tc (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator, approx (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
3-1	5	N/A	1.5	328.48	300	297	304	55	76	72	6	9.8		
	10		1.5	331.72	292	298	301	53	78	73	6	9.8		
	15		1.5	334.92	293	302	300	51	81	73	6	9.2		
	20		1.5	338.16	294	300	301	51	83	74	6	9.0		
	25		1.5	341.39	292	298	300	53	83	74	6.5	8.4		
	30		1.5	344.64	292	299	301	58	83	75	6.5	9.8		
	35		1.5	347.91	292	299	301	57	84	76	6.5	9.2		
	40		1.5	351.17	293	299	301	61	84	76	6.5	9.5		
	45		1.5	354.42	292	302	300	62	85	77	6.5	9.7		
	50		1.5	357.78	294	300	299	63	87	78	6.5	9.7		
	55		1.5	360.95	297	300	300	63	88	79	6.5	8.5		
	60		1.5	364.210	290	298	300	63	87	80	6.5	9.7		
	Total	*		38.9900	3521.0				999.0	907.0				
	Average		1.5		293.417				79.417					

* Sum of ~~square~~ roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB
Date 3/26/13

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location Unit 3 FF Outlet
Plant South Broward	Job No. 12218	Method Modified M26A

Balance Calibration Check			
Balance ID	TL07-4 802830 1068	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.3g

Check must be performed at least Once per Method per Job

Reference Weight Mass must agree with Reference Weight Reading to within ±0.5 g.

Run No. 1	1	Filter Type Teflon Mat		Sample Box No. B24
Date 3-26-13		Lot No.		pH
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	484.1	449.5	34.6	
Impinger 2	100 mL 01.N H2SO4	666.4	565.7	100.7	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	584.7	542.7	42.0	Date 3/26
Impinger 4	Empty	451.1	441.7	9.4	
Impinger 5	Silica Gel	737.0	724.1	12.9	Total Weight (gm)
Impinger 6					186.7
Impinger 7					199.6

Run No. 2	2	Filter Type Teflon Mat		Sample Box No. B1
Date 3.26.13		Lot No.		pH
Analyst DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	478.1	446.5	31.6	
Impinger 2	100 mL 01.N H2SO4	639.0	534.6	104.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	566.8	519.8	47.0	Date 3/26
Impinger 4	Empty	481.0	466.3	14.7	
Impinger 5	Silica Gel	688.5	671.1	17.4	Total Weight (gm)
Impinger 6					197.7
Impinger 7					215.1

Run No. 3	3	Filter Type Teflon Mat		Sample Box No. B24
Date 3.26.13		Lot No.		pH
Analyst HN		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	474.5	440.8	33.7	
Impinger 2	100 mL 01.N H2SO4	662.8	557.1	105.7	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	576.8	539.0	37.8	Date 3/26
Impinger 4	Empty	451.1	441.4	9.7	
Impinger 5	Silica Gel	717.1	701.4	15.7	Total Weight (gm)
Impinger 6					186.9
Impinger 7					202.6

QA/QC SB
Date 3/26

CleanAir ENGINEERING

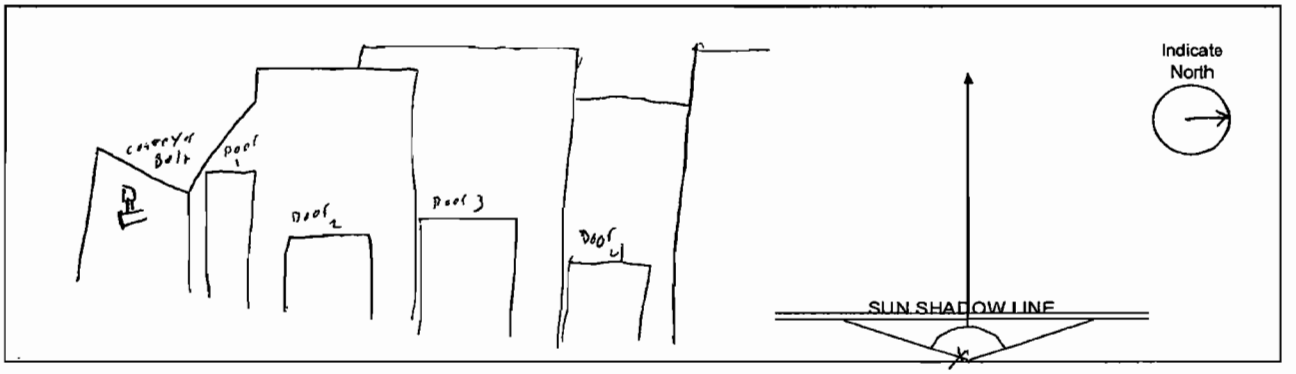
EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No.	12218	**Date**	3/27/15
Client	Wheelabrator	**Observer**	D. Luckhurst
Plant	South Broward	**Affiliation**	Clean Air Engineering

Industry	Municipal	**Process Unit**	Ash unloading

Precipitation	0	**Wind Direction**	N
Sky Conditions	clear	**Wind Speed**	0-5 MPH

Sketch process unit: Indicate observer position relative to source and sun. Indicate potential emission points and/or actual emission points.



OBSERVATIONS

Comments	Clock Time	Observation Period Duration (min : sec)	Accumulated Emission Duration (min : sec)
Pools 1, 2 and 4 closed at start 3 closed at 8:01, 2 opened at 8:08	Start 7:55	20:00	
	Stop 8:15	~~00:12.74~~ DL 3/27/15	00:12.74
all doors closed at start Door 3 opened at 8:23 and closed at 8:26 and opened at 8:32	Start 8:20	20:00	00:00
	Stop 8:40		
all doors closed for full 20 minutes	Start 8:45	20:00	00:00
	Stop 9:05		
	Start		
	Stop		
	Start		
	Stop		
	Start		
	Stop		

Note: Rest breaks must be taken every 15 to 20 minutes for 5 to 10 minutes.

CleanAir. ENGINEERING

QA/QC DL
Date 3/27/15

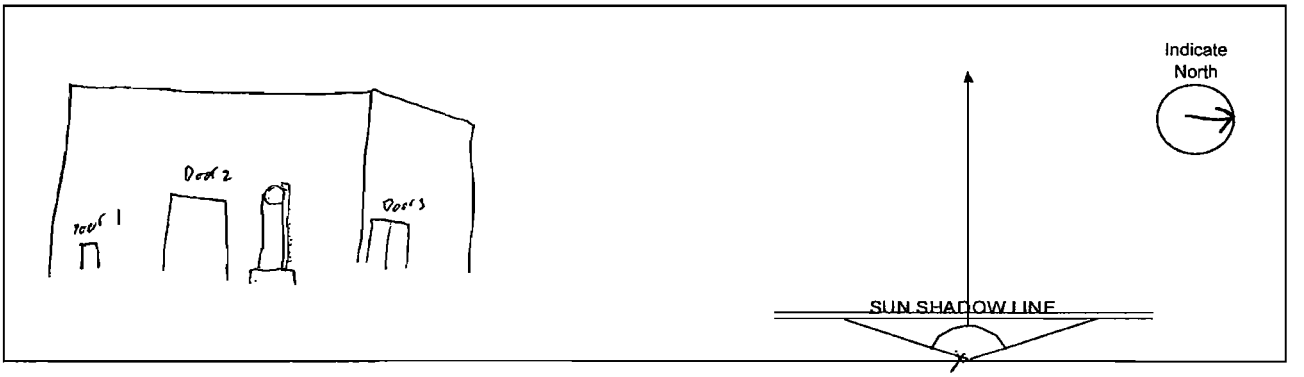
EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No.	12218	**Date**	3/27/13
Client	Wheelabrator	**Observer**	D. Luckhurst
Plant	South Broward	**Affiliation**	Clean Air Engineering

Industry	municipal	**Process Unit**	Ash conveyer / Doghouse enclosure

Precipitation	0	**Wind Direction**	N
Sky Conditions	clear	**Wind Speed**	0-5 MPH

Sketch process unit: Indicate observer position relative to source and sun. Indicate potential emission points and/or actual emission points.



OBSERVATIONS

Comments	Clock Time	Observation Period Duration (min : sec)	Accumulated Emission Duration (min : sec)
all doors closed	Start 10:20	20:00	00.00
door 2 opened at 11:03	Stop 10:40		
all doors closed	Start 10:45	20:00	00:00
	Stop 11:05		
	Start 11:10	20:00	00:00
	Stop 11:30		
	Start		
	Stop		
	Start		
	Stop		
	Start		
	Stop		

Note: Rest breaks must be taken every 15 to 20 minutes for 5 to 10 minutes.

CleanAir ENGINEERING

QA/QC DL
Date 3/27/13

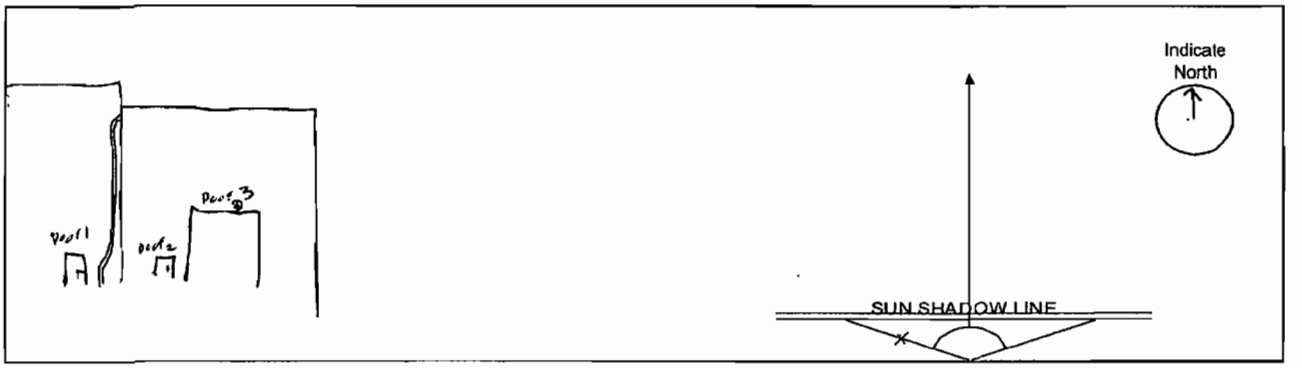
EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No.	12218	**Date**	3/27/13
Client	wheelabrator	**Observer**	D. Lockhard
Plant	Broward's-South	**Affiliation**	Clean Air Engineering

Industry	Municipal	**Process Unit**	Bag house Enclosure

Precipitation	0	**Wind Direction**	N
Sky Conditions	clear	**Wind Speed**	0-5 MPH

Sketch process unit: Indicate observer position relative to source and sun. Indicate potential emission points and/or actual emission points.



OBSERVATIONS

Comments	Clock Time	Observation Period Duration (min : sec)	Accumulated Emission Duration (min : sec)
all doors closed	Start 12:30	20:00	60:00
	Stop 12:50		
	Start 12:55	20:00	00:00
	Stop 13:15		
	Start 13:20	20:00	00:00
	Stop 13:40		
	Start		
	Stop		
	Start		
	Stop		
	Start		
	Stop		

Note: Rest breaks must be taken every 15 to 20 minutes for 5 to 10 minutes.

CleanAir. ENGINEERING

QA/QC DL
Date 3/27/13

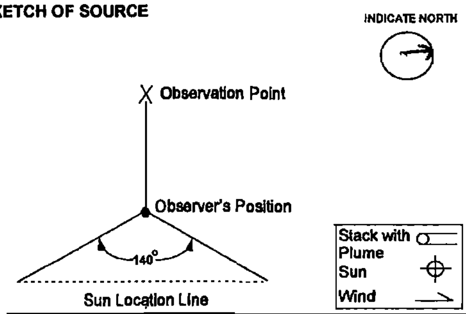
1/

Visible Emissions Observation Form

Field	Value
CLIENT/OWNER	Wheelabrator
PROJECT NUMBER	12218
OBSERVATION DATE	3/26/13
START TIME	8:55
END TIME	10:46
PLANT	South Broward
UNIT	Lime Silo
RUN	1
PROCESS EQUIPMENT	Lime Silo
OPERATING MODE	Continuous
CONTROL EQUIPMENT	Baghouse
OPERATING MODE	continuous
DESCRIBE EMISSION POINT	vent exit
HEIGHT ABOVE GROUND LEVEL	75 ft.
DISTANCE FROM OBSERVER	300 ft.
HEIGHT RELATIVE TO OBSERVER	70 ft.
DIRECTION FROM OBSERVER	W
DESCRIBE EMISSIONS	no plume
EMISSION COLOR	NA
PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: YES ☐ NO ☒	
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	NA
POINT IN PLUME AT WHICH EMISSIONS WERE DETERMINED	~~overcast sky~~ visible no plume (DL 3/26/13)
DESCRIBE BACKGROUND	overcast sky / Blue sky; 1st 40 min / rest of the run
WIND SPEED	5-10 MPH
WIND DIRECTION	N
AMBIENT TEMPERATURE	55 °F
RELATIVE HUMIDITY	

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

LAYOUT SKETCH OF SOURCE



Field	Value
RANGE OF OPACITY READINGS — MINIMUM	0
MAXIMUM	0
OBSERVER'S NAME (PRINT)	Daniel Lockhard
OBSERVER'S SIGNATURE	[signature]
DATE	3/26/13
CERTIFIED BY	Aeromet
DATE	3/2013

COMMENTS

QA/QC SB
Date 3/26

CleanAir ENGINEERING

Visible Emissions Observation Form

CLIENT/OWNER	PROJECT NUMBER	OBSERVATION DATE	START TIME	END TIME
Wheelabrator	12218	3/26/13	8:55	10:46

PLANT	UNIT	RUN
South Broward	Line 5:1	1

PROCESS EQUIPMENT | **OPERATING MODE**

CONTROL EQUIPMENT | **OPERATING MODE**

DESCRIBE EMISSION POINT

HEIGHT ABOVE GROUND LEVEL | **DISTANCE FROM OBSERVER**

HEIGHT RELATIVE TO OBSERVER | **DIRECTION FROM OBSERVER**

DESCRIBE EMISSIONS

EMISSION COLOR | **PLUME TYPE:** CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT YES ☐ NO ☐ | **IF WATER DROPLET PLUME** ATTACHED ☐ DETACHED ☐

POINT IN PLUME AT WHICH EMISSIONS WERE DETERMINED

DESCRIBE BACKGROUND

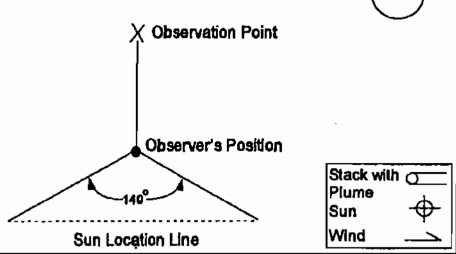
WIND SPEED | **WIND DIRECTION**

AMBIENT TEMPERATURE | **RELATIVE HUMIDITY**

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

LAYOUT SKETCH OF SOURCE

INDICATE NORTH



RANGE OF OPACITY READINGS

MINIMUM	MAXIMUM
0	0

OBSERVER'S NAME (PRINT) Daniel Luckhard

OBSERVER'S SIGNATURE	DATE
[signature]	3/26/13

CERTIFIED BY	DATE
Aeromet	3/2013

COMMENTS

FO-EPA9.xls, August 2004

QA/QC SG
Date 3/26

CleanAir ENGINEERING

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FIELD DATA PRINTOUTS

H

I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: MK

Date: 5/6/13

CleanAir.

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Field Data Printout

Location:	Unit 1 FF Outlet	**Test Method:**	**USEPA Method 5/29**
Test Run:	1	**Analyte:**	**Particulate/Metals**
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.70
Project No:	12218	Static P:	-8.4
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.25
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	10.93
Probe Operator:	W. Berry 456	N_2+CO (dry volume %):	80.82
Test Date:	3/25/13		
Start Time:	12:26		
Stop Time:	14:40	H_2O (condensate, ml or gm):	482.2
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	17.9
Leak Rate After:	0.003 cfm @ 16 "Hg	Actual Moisture (%):	23.43

Nozzle ID No:	0.276-1
Nozzle Diameter (D_n):	0.276
Probe ID No:	67-8-21
Pitot C_p:	0.813
Pitot Leak Check:	☑Pass ☐Fail
Meter Box ID. No:	85-2
Meter ΔH@:	1.74130
Meter Y_d:	1.00390

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			533.300						
1-01	5.0	0.24	0.66	535.600	307	85	84	0.49	2.30	104.1
1-02	10.0	0.22	0.60	537.780	307	86	85	0.47	2.18	102.8
1-03	15.0	0.33	0.90	540.470	305	88	84	0.57	2.69	103.5
1-04	20.0	0.35	0.96	543.310	308	88	84	0.59	2.84	106.3
1-05	25.0	0.54	1.50	546.800	308	89	85	0.73	3.49	105.1
LEAK CHECK	25.0			547.120						
2-01	30.0	0.56	1.50	550.640	321	91	86	0.75	3.52	104.7
2-02	35.0	0.40	1.10	553.780	320	92	86	0.63	3.14	110.2*
2-03	40.0	0.37	1.00	556.700	309	92	87	0.61	2.92	105.7
2-04	45.0	0.47	1.30	560.030	312	92	87	0.69	3.33	107.2
2-05	50.0	0.58	1.60	563.670	310	93	87	0.76	3.64	105.4
LEAK CHECK	50.0			563.890						
3-01	55.0	0.53	1.50	567.380	311	93	87	0.73	3.49	105.7
3-02	60.0	0.40	1.10	570.450	311	93	87	0.63	3.07	106.9
3-03	65.0	0.42	1.20	573.650	311	94	88	0.65	3.20	108.6
3-04	70.0	0.50	1.40	577.080	311	94	88	0.71	3.43	106.7
3-05	75.0	0.52	1.40	580.530	310	94	88	0.72	3.45	105.2
LEAK CHECK	75.0			580.830						
4-01	80.0	0.44	1.20	583.960	309	93	88	0.66	3.13	103.7
4-02	85.0	0.40	1.10	587.240	309	92	88	0.63	3.28	114.1*
4-03	90.0	0.52	1.40	590.510	312	92	88	0.72	3.27	100.0
4-04	95.0	0.56	1.50	594.060	312	93	88	0.75	3.55	104.6
4-05	100.0	0.58	1.60	598.030	310	94	88	0.76	3.97	114.7*
LEAK CHECK	100.0			598.220						
5-01	105.0	0.41	1.10	600.880	311	93	89	0.64	2.66	91.3
5-02	110.0	0.42	1.20	604.070	310	93	89	0.65	3.19	108.2
5-03	115.0	0.44	1.20	607.280	312	92	88	0.66	3.21	106.7
5-04	120.0	0.55	1.50	610.780	322	93	88	0.74	3.50	104.7
5-05	125.0	0.58	1.60	614.420	316	93	88	0.76	3.64	105.7
Final	125.0		1.24480	80.09000	311.36000	89.34000		0.66858	80.09000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6686	1.2448	80.0900	311.3600	89.3400				
		☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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Field Data Printout

Location:	Unit 1 FF Outlet	Test Method:	USEPA Method 5/29
Test Run:	2	Analyte:	Particulate/Metals
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.90
Project No:	12218	Static P:	-7.8
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.32
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	10.73
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.95
Test Date:	3/26/13		
Start Time:	07:51		
Stop Time:	10:03	H_2O (condensate, ml or gm):	383.1
Leak Rate Before:	0.002 cfm @ 15 "Hg	H_2O (silica, g):	12.5
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	21.54

Nozzle ID No:	0.2725-1		
Nozzle Diameter (D_n):	0.273		
Probe ID No:	67-8-21		
Pitot C_p:	0.813		
Pitot Leak Check:	☑Pass ☐Fail		
Meter Box ID. No:	85-2		
Meter ΔH@:	1.74130		
Meter Y_d:	1.00390		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			614.900						
5-01	5.0	0.36	0.84	617.490	302	62	61	0.60	2.59	100.4
5-02	10.0	0.38	0.89	620.170	302	63	61	0.62	2.68	101.0
5-03	15.0	0.40	0.93	622.900	302	64	62	0.63	2.73	100.1
5-04	20.0	0.43	1.00	625.740	303	66	62	0.66	2.84	100.3
5-05	25.0	0.42	0.98	628.545	302	67	62	0.65	2.80	100.1
LEAK CHECK	25.0			628.630						
4-01	30.0	0.38	0.89	631.300	302	66	63	0.62	2.67	100.2
4-02	35.0	0.40	0.93	634.050	303	67	63	0.63	2.75	100.5
4-03	40.0	0.40	0.93	636.800	303	68	63	0.63	2.75	100.4
4-04	45.0	0.49	1.10	639.810	303	68	64	0.70	3.01	99.3
4-05	50.0	0.53	1.20	642.955	302	69	64	0.73	3.15	99.6
LEAK CHECK	50.0			643.028						
3-01	55.0	0.37	0.86	645.660	302	68	65	0.61	2.63	99.7
3-02	60.0	0.35	0.82	648.210	302	68	65	0.59	2.55	99.3
3-03	65.0	0.37	0.86	650.890	304	68	65	0.61	2.68	101.6
3-04	70.0	0.43	1.00	653.770	303	68	64	0.66	2.88	101.4
3-05	75.0	0.46	1.10	656.810	302	68	65	0.68	3.04	103.3
LEAK CHECK	75.0			656.875						
2-01	80.0	0.40	0.93	659.630	301	68	65	0.63	2.76	100.3
2-02	85.0	0.35	0.82	662.230	302	69	65	0.59	2.60	101.1
2-03	90.0	0.30	0.70	664.630	301	69	65	0.55	2.40	100.7
2-04	95.0	0.38	0.89	667.300	303	69	65	0.62	2.67	99.8
2-05	100.0	0.52	1.30	670.590	304	71	66	0.72	3.29	105.0
LEAK CHECK	100.0			670.675						
1-01	105.0	0.23	0.55	672.790	298	70	66	0.48	2.12	101.0
1-02	110.0	0.23	0.55	674.900	298	70	67	0.48	2.11	100.6
1-03	115.0	0.29	0.70	677.290	302	69	67	0.54	2.39	101.9
1-04	120.0	0.26	0.62	679.540	301	69	67	0.51	2.25	101.2
1-05	125.0	0.42	1.00	682.415	301	70	67	0.65	2.88	101.8
Final	125.0		0.89560	67.20700	301.92000	66.06000		0.61477	67.20700	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6147	0.8956	67.2100	301.9200	66.0600				
		☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 5/29**
Analyte: **Particulate/Metals**

Location: Unit 1 FF Outlet
Test Run: 3
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: P. Bihun 505
Probe Operator: P. Bihun 505
Test Date: 3/26/13
Start Time: 10:25
Stop Time: 12:36
Leak Rate Before: 0.002 cfm @ 15 "Hg
Leak Rate After: 0.005 cfm @ 10 "Hg

Bar. Press. (in. Hg): 29.90
Static P: -7.5
O_2 (dry volume %): 7.73
CO_2 (dry volume %): 11.13
N_2+CO (dry volume %): 81.14
H_2O (condensate, ml or gm): 396.8
H_2O (silica, g): 13.3
Actual Moisture (%): 22.59

Nozzle ID No: 0.2725-1
Nozzle Diameter (D_n): 0.273
Probe ID No: 67-8-21
Pitot C_p: 0.813
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 85-2
Meter ΔH@: 1.74130
Meter Y_d: 1.00390

Traverse Point	Run Time 5.0 min/read	Pilot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			682.925						
5-01	5.0	0.39	0.96	685.760	302	71	69	0.62	2.84	105.1
5-02	10.0	0.36	0.88	688.430	302	72	70	0.60	2.67	102.8
5-03	15.0	0.41	1.00	691.290	302	74	70	0.64	2.86	103.0
5-04	20.0	0.42	1.00	694.140	302	74	70	0.65	2.85	101.4
5-05	25.0	0.43	1.10	697.180	302	76	71	0.66	3.04	106.7
LEAK CHECK	25.0			697.270						
4-01	30.0	0.36	0.88	699.940	303	75	72	0.60	2.67	102.4
4-02	35.0	0.34	0.83	702.560	303	75	72	0.58	2.62	103.4
4-03	40.0	0.36	0.88	705.260	302	76	72	0.60	2.70	103.4
4-04	45.0	0.42	1.00	708.140	302	76	73	0.65	2.88	102.0
4-05	50.0	0.45	1.10	711.180	301	77	73	0.67	3.04	103.9
LEAK CHECK	50.0			711.250						
3-01	55.0	0.39	0.96	714.050	303	76	73	0.62	2.80	103.0
3-02	60.0	0.32	0.78	716.580	303	76	73	0.57	2.53	102.7
3-03	65.0	0.33	0.81	719.330	302	78	74	0.57	2.75	109.5
3-04	70.0	0.41	1.00	722.190	302	78	74	0.64	2.86	102.3
3-05	75.0	0.45	1.10	725.255	304	78	74	0.67	3.06	104.8
LEAK CHECK	75.0			725.300						
2-01	80.0	0.38	0.93	728.070	302	77	75	0.62	2.77	102.9
2-02	85.0	0.30	0.74	730.530	302	79	75	0.55	2.46	102.6
2-03	90.0	0.28	0.69	732.920	302	79	76	0.53	2.39	103.0
2-04	95.0	0.31	0.76	735.430	302	80	76	0.56	2.51	102.8
2-05	100.0	0.44	1.10	738.470	302	80	77	0.66	3.04	104.5
LEAK CHECK	100.0			738.545						
1-01	105.0	0.22	0.54	740.650	299	80	77	0.47	2.11	101.9
1-02	110.0	0.20	0.49	742.630	295	79	78	0.45	1.98	100.3
1-03	115.0	0.29	0.71	745.050	299	79	78	0.54	2.42	102.1
1-04	120.0	0.25	0.61	747.270	301	80	78	0.50	2.22	100.9
1-05	125.0	0.35	0.86	749.925	300	80	78	0.59	2.65	102.0
Final	125.0		0.86840	66.72000	301.56000	75.46000		0.59225	66.72000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5922	0.8684	66.7200	301.5600	75.4600				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 1 FF Outlet	Test Method:	USEPA Method 29
Test Run:	4	Analyte:	Mercury
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.90
Project No:	12218	Static P:	-8.3
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.61
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	10.59
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.80
Test Date:	3/26/13		
Start Time:	12:59		
Stop Time:	15:11	H_2O (condensate, ml or gm):	413.8
Leak Rate Before:	0.002 cfm @ 15 "Hg	H_2O (silica, g):	18.3
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	22.40

Nozzle ID No:	0.2725-1		
Nozzle Diameter (D_n):	0.273		
Probe ID No:	67-8-21		
Pitot C_p:	0.813		
Pitot Leak Check:	☑ Pass ☐ Fail		
Meter Box ID. No:	85-2		
Meter ΔH@:	1.74130		
Meter Y_d:	1.00390		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s	Sample ΔH	Metered	Stack T_s	Dry Gas Meter $T_{m\text{-}in}$	Dry Gas Meter $T_{m\text{-}out}$	$\sqrt{\Delta P_s}$ (calculated)	Volume (calculated)	Isokinetics (calculated)
	0.0	(in. H_2O)	(in. H_2O)	(dcf) 750.415	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
5-01	5.0	0.32	0.78	752.970	302	76	76	0.57	2.56	103.2
5-02	10.0	0.34	0.83	755.590	304	77	77	0.58	2.62	102.6
5-03	15.0	0.42	1.00	758.490	300	79	77	0.65	2.90	101.7
5-04	20.0	0.48	1.20	761.710	302	82	78	0.69	3.22	105.5
5-05	25.0	0.46	1.10	764.730	304	83	79	0.68	3.02	101.0
LEAK CHECK	25.0			764.790						
4-01	30.0	0.38	0.93	767.550	304	82	79	0.62	2.76	101.6
4-02	35.0	0.35	0.86	770.220	304	82	79	0.59	2.67	102.4
4-03	40.0	0.42	1.00	773.090	304	81	79	0.65	2.87	100.6
4-04	45.0	0.55	1.40	776.550	308	80	78	0.74	3.46	106.5
4-05	50.0	0.52	1.30	779.875	311	79	77	0.72	3.33	105.7
LEAK CHECK	50.0			779.940						
3-01	55.0	0.32	0.78	782.460	300	78	76	0.57	2.52	101.4
3-02	60.0	0.35	0.86	785.140	304	78	76	0.59	2.68	103.4
3-03	65.0	0.40	0.98	788.000	301	78	75	0.63	2.86	103.2
3-04	70.0	0.51	1.30	791.365	307	78	74	0.71	3.37	108.1
3-05	75.0	0.56	1.40	794.825	308	78	75	0.75	3.46	106.1
LEAK CHECK	75.0			794.900						
2-01	80.0	0.45	1.10	797.900	307	78	74	0.67	3.00	102.6
2-02	85.0	0.38	0.93	800.670	308	80	74	0.62	2.77	102.9
2-03	90.0	0.33	0.81	803.260	308	80	75	0.57	2.59	103.1
2-04	95.0	0.43	1.10	806.320	308	80	75	0.66	3.06	106.8
2-05	100.0	0.56	1.40	809.765	308	81	75	0.75	3.44	105.3
LEAK CHECK	100.0			809.820						
1-01	105.0	0.21	0.52	811.880	303	78	75	0.46	2.06	102.6
1-02	110.0	0.22	0.54	814.000	304	79	75	0.47	2.12	103.1
1-03	115.0	0.32	0.78	816.500	305	79	75	0.57	2.50	100.9
1-04	120.0	0.30	0.74	818.980	306	79	75	0.55	2.48	103.5
1-05	125.0	0.44	1.10	822.050	306	79	75	0.66	3.07	105.9
Final	125.0		0.98960	71.38000	305.04000	77.74000		0.62835	71.38000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6284	0.9896	71.3800	305.0400	77.7400				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 5/29 and 29
Analyte: Particulate Metals and Mercury

Location: Unit 1 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.93000		8.25000	80.82000	30.07880	1.15737	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.73000		8.32000	80.95000	30.04960	1.17241	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.13000		7.73000	81.14000	30.09000	1.18329	☑ Fo value within expected range.
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.59000		8.61000	80.80000	30.03880	1.16053	☑ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 1 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 29
Analyte: Mercury
Analyst: H. Nguyen
Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	787.8	465.4	322.4
Impinger 2	5%HNO3/10%H2O2	674.0	545.3	128.7
Impinger 3	5%HNO3/10%H2O2	575.2	550.7	24.5
Impinger 4	Empty	429.5	424.5	5.0
Impinger 5	4%KMnO4/10%H2SO4	645.7	643.7	2.0
Impinger 6	4%KMnO4/10%H2SO4	545.9	546.3	-0.4
Impinger 7	Silica Gel	747.3	729.4	17.9
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
482.2	Liquid (gm)		
0.0	less rinse (gm)		
482.2	Net Liquid (gm)	482.2	☑ QA/QC OK
+ 17.9	Silica Gel (gm)	17.9	☑ QA/QC OK
500.1	Total Vlc (gm)	500.1	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	664.4	443.3	221.1
Impinger 2	5%HNO3/10%H2O2	646.9	530.6	116.3
Impinger 3	5%HNO3/10%H2O2	572.1	538.5	33.6
Impinger 4	Empty	451.0	443.9	7.1
Impinger 5	4%KMnO4/10%H2SO4	545.4	541.0	4.4
Impinger 6	4%KMnO4/10%H2SO4	530.3	529.7	0.6
Impinger 7	Silica Gel	850.4	837.9	12.5
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
383.1	Liquid (gm)		
0.0	less rinse (gm)		
383.1	Net Liquid (gm)	383.1	☑ QA/QC OK
+ 12.5	Silica Gel (gm)	12.5	☑ QA/QC OK
395.6	Total Vlc (gm)	395.6	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	729.8	464.4	265.4
Impinger 2	5%HNO3/10%H2O2	648.3	545.1	103.2
Impinger 3	5%HNO3/10%H2O2	572.8	550.3	22.5
Impinger 4	Empty	427.9	424.2	3.7
Impinger 5	4%KMnO4/10%H2SO4	646.6	644.6	2.0
Impinger 6	4%KMnO4/10%H2SO4	543.8	543.8	0.0
Impinger 7	Silica Gel	760.2	746.9	13.3
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
396.8	Liquid (gm)		
0.0	less rinse (gm)		
396.8	Net Liquid (gm)	396.8	☑ QA/QC OK
+ 13.3	Silica Gel (gm)	13.3	☑ QA/QC OK
410.1	Total Vlc (gm)	410.1	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	733.4	441.8	291.6
Impinger 2	5%HNO3/10%H2O2	631.8	532.2	99.6
Impinger 3	5%HNO3/10%H2O2	553.3	537.0	16.3
Impinger 4	Empty	445.3	443.3	2.0
Impinger 5	4%KMnO4/10%H2SO4	559.7	558.3	1.4
Impinger 6	4%KMnO4/10%H2SO4	539.6	536.7	2.9
Impinger 7	Silica Gel	762.1	743.8	18.3
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
413.8	Liquid (gm)		
0.0	less rinse (gm)		
413.8	Net Liquid (gm)	413.8	☑ QA/QC OK
+ 18.3	Silica Gel (gm)	18.3	☑ QA/QC OK
432.1	Total Vlc (gm)	432.1	☑ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 1 SDA Inlet		**Analyte:**		**HCl**
Test Run:	1				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.70	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.7	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	7.88	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.15	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.98	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/25/13				
Start Time:	08:00				
Stop Time:	09:00		H_2O (condensate, ml or gm):	156.3	Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	15.0	Meter ΔH@: 1.69640
Leak Rate After:	0.000 cfm	@ 15 "Hg	Actual Moisture (%):	19.16	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			579.200						
1-01	5.0		1.20	582.240	498	88	88		3.04	
1-01	10.0		1.20	585.250	500	89	88		3.01	
1-01	15.0		1.20	588.210	501	94	90		2.96	
1-01	20.0		1.20	591.160	503	97	90		2.95	
1-01	25.0		1.20	594.090	501	95	91		2.93	
1-01	30.0		1.20	597.010	502	94	92		2.92	
1-01	35.0		1.20	599.000	501	98	93		1.99	
1-01	40.0		1.20	602.850	501	100	93		3.85	
1-01	45.0		1.20	605.790	501	102	93		2.94	
1-01	50.0		1.20	608.790	505	102	93		3.00	
1-01	55.0		1.20	611.790	508	102	93		3.00	
1-01	60.0		1.20	614.890	508	102	93		3.10	
Final	60.0		1.20000	35.69000	502.41667	94.16667			35.69000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	35.6900	502.4167	94.1667				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 1 SDA Inlet	Test Method:	USEPA Method 26A
Test Run:	2	Analyte:	HCl
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.70
Project No:	12218	Static P:	-1.6
Source Area (ft^2):	60.13205	O_2 (dry volume %):	7.68
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	11.25
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	81.07
Test Date:	3/25/13		
Start Time:	09:23		
Stop Time:	10:34	H_2O (condensate, ml or gm):	187.2
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	11.8
Leak Rate After:	0.003 cfm @ 16 "Hg	Actual Moisture (%):	21.21

Nozzle ID No:	N/A	Pitot Leak Check:	☑ Pass ☐ Fail
Nozzle Diameter (D_n):	N/A		
Probe ID No:	66-4-7		
Pitot C_p:	0.834		
Meter Box ID. No:	61-11		
Meter ΔH@:	1.69640		
Meter Y_d:	1.00500		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			615.300						
1-01	5.0		1.20	618.530	488	97	96		3.23	
1-01	10.0		1.20	621.670	498	96	95		3.14	
1-01	15.0		1.20	624.840	488	98	95		3.17	
1-01	20.0		1.20	628.010	490	99	96		3.17	
1-01	25.0		1.20	630.900	489	100	96		2.89	
1-01	30.0		1.20	633.890	491	100	96		2.99	
1-01	35.0		1.20	636.890	488	101	97		3.00	
1-01	40.0		1.20	640.000	490	100	96		3.11	
1-01	45.0		1.20	642.970	490	99	96		2.97	
1-01	50.0		1.20	645.950	490	99	96		2.98	
1-01	55.0		1.20	648.920	491	98	95		2.97	
1-01	60.0		1.20	652.020	494	99	95		3.10	
Final	60.0		1.20000	36.72000	490.58333	97.29167			36.72000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	36.7200	490.5833	97.2917				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 1 SDA Inlet		**Analyte:**		**HCl**
Test Run:	3				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.70	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.5	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	8.07	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.04	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.89	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/25/13				
Start Time:	10:54				
Stop Time:	11:54		H_2O (condensate, ml or gm):	176.7	Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	10.7	Meter ΔH@: 1.69640
Leak Rate After:	0.003 cfm	@ 16 "Hg	Actual Moisture (%):	20.26	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			652.500						
1-01	5.0		1.20	655.630	488	98	96		3.13	
1-01	10.0		1.20	658.710	489	98	96		3.08	
1-01	15.0		1.20	661.750	489	103	97		3.04	
1-01	20.0		1.20	664.860	488	104	98		3.11	
1-01	25.0		1.20	667.880	491	103	98		3.02	
1-01	30.0		1.20	670.900	494	102	98		3.02	
1-01	35.0		1.20	673.970	495	103	98		3.07	
1-01	40.0		1.20	677.030	497	103	98		3.06	
1-01	45.0		1.20	680.100	497	103	98		3.07	
1-01	50.0		1.20	683.260	497	103	99		3.16	
1-01	55.0		1.20	686.280	497	103	99		3.02	
1-01	60.0		1.20	689.300	497	103	99		3.02	
Final	60.0		1.20000	36.80000	493.25000	100.00000			36.80000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	36.8000	493.2500	100.0000				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 1 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.14500		7.87500	80.98000	30.09820	1.16869	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.25000		7.68000	81.07000	30.10720	1.17511	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.04000		8.07000	80.89000	30.08920	1.16214	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis:
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

The Run 1 IGS bag did not have enough volume to analyze. An average of Runs 2 and 3 are used for the Run 1 O_2/CO_2.

USEPA Method 4 Laboratory Data

Location: Unit 1 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 26A
Analyte: HCl
Analyst: H. Nguyen
Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	469.8	444.8	25.0
Impinger 2	100 ml 0.1N H2SO4	643.5	547.2	96.3
Impinger 3	100 ml 0.1N H2SO4	565.2	536.2	29.0
Impinger 4	Empty	489.2	483.2	6.0
Impinger 5	Silica Gel	697.5	682.5	15.0
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
156.3	Liquid (gm)		
0.0	less rinse (gm)		
156.3	Net Liquid (gm)	156.3	☑ QA/QC OK
+ 15.0	Silica Gel (gm)	15.0	☑ QA/QC OK
171.3	Total Vlc (gm)	171.3	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	496.8	444.2	52.6
Impinger 2	100 ml 0.1N H2SO4	646.6	542.2	104.4
Impinger 3	100 ml 0.1N H2SO4	587.0	562.3	24.7
Impinger 4	Empty	426.5	421.0	5.5
Impinger 5	Silica Gel	706.5	694.7	11.8
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
187.2	Liquid (gm)		
0.0	less rinse (gm)		
187.2	Net Liquid (gm)	187.2	☑ QA/QC OK
+ 11.8	Silica Gel (gm)	11.8	☑ QA/QC OK
199.0	Total Vlc (gm)	199.0	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	471.8	437.9	33.9
Impinger 2	100 ml 0.1N H2SO4	651.1	540.2	110.9
Impinger 3	100 ml 0.1N H2SO4	561.8	534.0	27.8
Impinger 4	Empty	487.3	483.2	4.1
Impinger 5	Silica Gel	707.7	697.0	10.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
176.7	Liquid (gm)		
0.0	less rinse (gm)		
176.7	Net Liquid (gm)	176.7	☑ QA/QC OK
+ 10.7	Silica Gel (gm)	10.7	☑ QA/QC OK
187.4	Total Vlc (gm)	187.4	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 1 FF Outlet		**Analyte:**		**HCl**
Test Run:	1				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.70	Nozzle ID No: N/A
Project No:	12218		Static P:	-10.0	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	9.21	Probe ID No: 67-4-3
Meter Operator:	W. Berry	456	CO_2 (dry volume %):	9.86	Pitot C_p: N/A
Probe Operator:			N_2+CO (dry volume %):	80.93	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/25/13				
Start Time:	08:00				
Stop Time:	09:00		H_2O (condensate, ml or gm):	235.2	Meter Box ID. No: 66-14
Leak Rate Before:	0.004 cfm	@ 15 "Hg	H_2O (silica, g):	19.5	Meter ΔH@: 1.80150
Leak Rate After:	0.001 cfm	@ 10 "Hg	Actual Moisture (%):	23.30	Meter Y_d: 0.98790

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			406.400						
3-01	5.0		1.50	409.590	298	75	73		3.19	
3-01	10.0		1.50	412.970	299	75	73		3.38	
3-01	15.0		1.50	416.350	299	78	74		3.38	
3-01	20.0		1.50	419.270	303	80	75		2.92	
3-01	25.0		1.50	423.220	301	81	75		3.95	
3-01	30.0		1.50	426.630	303	83	76		3.41	
3-01	35.0		1.50	430.070	303	83	76		3.44	
3-01	40.0		1.50	433.550	302	84	77		3.48	
3-01	45.0		1.50	436.980	304	85	77		3.43	
3-01	50.0		1.50	440.450	304	85	77		3.47	
3-01	55.0		1.50	443.860	304	86	78		3.41	
3-01	60.0		1.50	447.310	305	86	78		3.45	
Final	60.0		1.50000	40.91000	302.08333	78.75000			40.91000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.9100	302.0833	78.7500				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 1 FF Outlet		**Analyte:**		**HCl**
Test Run:	2				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.70	Nozzle ID No: N/A
Project No:	12218		Static P:	-8.3	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	7.76	Probe ID No: 67-4-3
Meter Operator:	W. Berry	456	CO_2 (dry volume %):	11.25	Pitot C_p: N/A
Probe Operator:			N_2+CO (dry volume %):	80.99	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/25/13				
Start Time:	09:23				
Stop Time:	10:34		H_2O (condensate, ml or gm):	261.7	Meter Box ID. No: 66-14
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	17.7	Meter ΔH@: 1.80150
Leak Rate After:	0.003 cfm	@ 10 "Hg	Actual Moisture (%):	24.96	Meter Y_d: 0.98790

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			447.730						
3-01	5.0		1.50	451.230	306	78	77		3.50	
3-01	10.0		1.50	454.590	302	79	78		3.36	
3-01	15.0		1.50	457.950	303	81	77		3.36	
3-01	20.0		1.50	461.350	302	83	77		3.40	
3-01	25.0		1.50	464.790	301	85	78		3.44	
3-01	30.0		1.50	468.230	303	85	78		3.44	
3-01	35.0		1.50	471.630	304	86	78		3.40	
3-01	40.0		1.50	475.080	303	86	79		3.45	
3-01	45.0		1.50	478.530	304	87	79		3.45	
3-01	50.0		1.50	482.000	302	87	79		3.47	
3-01	55.0		1.50	485.470	304	87	80		3.47	
3-01	60.0		1.50	488.910	304	87	80		3.44	
Final	60.0		1.50000	41.18000	303.16667	81.29167			41.18000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.1800	303.1667	81.2917				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 26A**
Analyte: **HCl**

Location: Unit 1 FF Outlet
Test Run: 3
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: W. Berry 456
Probe Operator:
Test Date: 3/25/13
Start Time: 10:54
Stop Time: 11:54
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.001 cfm @ 10 "Hg

Bar. Press. (in. Hg): 29.70
Static P: -8.4
O_2 (dry volume %): 8.53
CO_2 (dry volume %): 10.64
N_2+CO (dry volume %): 80.83
H_2O (condensate, ml or gm): 244.5
H_2O (silica, g): 11.1
Actual Moisture (%): 23.33

Nozzle ID No: N/A
Nozzle Diameter (D_n): N/A
Probe ID No: 67-4-3
Pitot C_p: N/A
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 66-14
Meter ΔH@: 1.80150
Meter Y_d: 0.98790

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			489.570						
3-01	5.0		1.50	493.350	308	83	80		3.78	
3-01	10.0		1.50	496.750	308	85	81		3.40	
3-01	15.0		1.50	500.160	311	87	81		3.41	
3-01	20.0		1.50	503.590	303	89	82		3.43	
3-01	25.0		1.50	507.010	307	89	83		3.42	
3-01	30.0		1.50	510.470	305	90	83		3.46	
3-01	35.0		1.50	513.940	304	91	84		3.47	
3-01	40.0		1.50	517.380	305	90	84		3.44	
3-01	45.0		1.50	520.820	306	90	84		3.44	
3-01	50.0		1.50	524.250	303	91	84		3.43	
3-01	55.0		1.50	527.710	304	92	85		3.46	
3-01	60.0		1.50	531.130	305	94	86		3.42	
Final	60.0		1.50000	41.56000	305.75000	86.16667			41.56000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.5600	305.7500	86.1667				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 1 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.86000		9.21000	80.93000	29.94600	1.18560	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.25000		7.76000	80.99000	30.11040	1.16800	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.64000		8.53000	80.83000	30.04360	1.16259	☑ Fo value within expected range.
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 1 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 26A
Analyte: HCl
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	485.7	458.9	26.8
Impinger 2	100 ml 0.1N H2SO4	678.3	548.8	129.5
Impinger 3	100 ml 0.1N H2SO4	592.0	530.9	61.1
Impinger 4	Empty	486.1	468.3	17.8
Impinger 5	Silica Gel	724.4	704.9	19.5
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
235.2	Liquid (gm)		
0.0	less rinse (gm)		
235.2	Net Liquid (gm)	235.2	☑ QA/QC OK
+ 19.5	Silica Gel (gm)	19.5	☑ QA/QC OK
254.7	Total Vlc (gm)	254.7	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	488.1	450.8	37.3
Impinger 2	100 ml 0.1N H2SO4	722.9	566.8	156.1
Impinger 3	100 ml 0.1N H2SO4	599.0	543.2	55.8
Impinger 4	Empty	454.6	442.1	12.5
Impinger 5	Silica Gel	724.2	706.5	17.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
261.7	Liquid (gm)		
0.0	less rinse (gm)		
261.7	Net Liquid (gm)	261.7	☑ QA/QC OK
+ 17.7	Silica Gel (gm)	17.7	☑ QA/QC OK
279.4	Total Vlc (gm)	279.4	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	492.4	457.9	34.5
Impinger 2	100 ml 0.1N H2SO4	703.7	547.5	156.2
Impinger 3	100 ml 0.1N H2SO4	592.9	539.4	53.5
Impinger 4	Empty	468.9	468.6	0.3
Impinger 5	Silica Gel	735.5	724.4	11.1
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
244.5	Liquid (gm)		
0.0	less rinse (gm)		
244.5	Net Liquid (gm)	244.5	☑ QA/QC OK
+ 11.1	Silica Gel (gm)	11.1	☑ QA/QC OK
255.6	Total Vlc (gm)	255.6	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

Location:	Unit 2 FF Outlet			Test Method:	USEPA Method 5/29
Test Run:	1			Analyte:	Particulate/Metals
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.70	Nozzle ID No: 0.2725-1
Project No:	12218		Static P:	-12.2	Nozzle Diameter (D_n): 0.273
Source Area (ft^2):	64.00000		O_2 (dry volume %):	8.56	Probe ID No: 67-8-17
Meter Operator:	P. Bihun	505	CO_2 (dry volume %):	10.35	Pitot C_p: 0.824
Probe Operator:	P. Bihun	505	N_2+CO (dry volume %):	81.09	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/25/13				
Start Time:	07:59				
Stop Time:	10:11		H_2O (condensate, ml or gm):	417.2	Meter Box ID. No: 66-11
Leak Rate Before:	0.007 cfm	@ 15 "Hg	H_2O (silica, g):	19.5	Meter ΔH@: 1.82740
Leak Rate After:	0.002 cfm	@ 10 "Hg	Actual Moisture (%):	23.20	Meter Y_d: 0.99060

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			842.000						
1-01	5.0	0.33	0.88	844.620	298	77	76	0.57	2.62	102.1
1-02	10.0	0.31	0.82	847.110	299	79	76	0.56	2.49	99.9
1-03	15.0	0.32	0.85	849.620	298	80	77	0.57	2.51	98.9
1-04	20.0	0.33	0.88	852.190	298	82	77	0.57	2.57	99.6
1-05	25.0	0.35	0.93	854.875	298	84	78	0.59	2.68	100.7
LEAK CHECK	25.0			854.950						
2-01	30.0	0.32	0.85	857.500	298	83	79	0.57	2.55	100.0
2-02	35.0	0.33	0.88	860.080	299	81	78	0.57	2.58	100.0
2-03	40.0	0.37	0.98	862.820	299	81	78	0.61	2.74	100.3
2-04	45.0	0.42	1.10	865.750	300	82	78	0.65	2.93	100.7
2-05	50.0	0.38	1.00	868.540	300	84	78	0.62	2.79	100.6
LEAK CHECK	50.0			868.625						
3-01	55.0	0.27	0.72	870.970	303	82	78	0.52	2.35	100.6
3-02	60.0	0.40	1.10	873.900	300	83	79	0.63	2.93	103.0
3-03	65.0	0.44	1.20	877.010	297	85	79	0.66	3.11	103.9
3-04	70.0	0.52	1.40	880.380	302	87	80	0.72	3.37	103.6
3-05	75.0	0.50	1.30	883.600	300	88	80	0.71	3.22	100.7
LEAK CHECK	75.0			883.690						
4-01	80.0	0.45	1.20	886.760	300	86	81	0.67	3.07	101.3
4-02	85.0	0.43	1.10	889.740	300	87	81	0.66	2.98	100.5
4-03	90.0	0.48	1.30	892.980	298	87	81	0.69	3.24	103.3
4-04	95.0	0.46	1.20	896.120	299	88	81	0.68	3.14	102.2
4-05	100.0	0.48	1.30	899.325	299	88	82	0.69	3.21	102.1
LEAK CHECK	100.0			899.410						
5-01	105.0	0.36	0.95	902.120	296	86	81	0.60	2.71	99.7
5-02	110.0	0.36	0.95	904.800	298	86	82	0.60	2.68	98.6
5-03	115.0	0.37	0.98	907.550	298	87	82	0.61	2.75	99.7
5-04	120.0	0.36	0.95	910.230	298	87	82	0.60	2.68	98.5
5-05	125.0	0.40	1.10	913.180	299	87	82	0.63	2.95	103.0
Final	125.0		1.03680	70.84500	298.96000	81.86000		0.62203	70.84500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6220	1.0368	70.8450	298.9600	81.8600				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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N

Field Data Printout

Location:	Unit 2 FF Outlet	Test Method:	USEPA Method 5/29
Test Run:	2	Analyte:	Particulate/Metals
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.70
Project No:	12218	Static P:	-11.6
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.36
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	10.73
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.91
Test Date:	3/25/13		
Start Time:	10:32		
Stop Time:	12:45	H_2O (condensate, ml or gm):	394.2
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	13.4
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%):	22.39

Nozzle ID No:	0.2725-1
Nozzle Diameter (D_n):	0.273
Probe ID No:	67-8-17
Pitot C_p:	0.824
Pitot Leak Check:	☑ Pass ☐ Fail
Meter Box ID. No:	66-11
Meter ΔH@:	1.82740
Meter Y_d:	0.99060

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			913.465						
3-01	5.0	0.30	0.80	916.020	300	82	81	0.55	2.55	102.6
3-02	10.0	0.34	0.90	918.620	306	85	82	0.58	2.60	98.2
3-03	15.0	0.38	1.00	921.360	305	87	83	0.62	2.74	97.5
3-04	20.0	0.46	1.20	924.440	298	88	83	0.68	3.08	99.2
3-05	25.0	0.46	1.20	927.525	300	90	84	0.68	3.08	99.2
LEAK CHECK	25.0			927.615						
2-01	30.0	0.42	1.10	930.520	299	89	85	0.65	2.90	97.7
2-02	35.0	0.40	1.10	933.460	301	91	85	0.63	2.94	101.2
2-03	40.0	0.42	1.10	936.380	298	92	86	0.65	2.92	97.7
2-04	45.0	0.41	1.10	939.290	300	92	86	0.64	2.91	98.7
2-05	50.0	0.48	1.30	942.510	299	91	86	0.69	3.22	101.0
LEAK CHECK	50.0			942.595						
1-01	55.0	0.30	0.80	945.060	295	88	85	0.55	2.46	97.8
1-02	60.0	0.38	1.00	947.840	300	86	84	0.62	2.78	98.6
1-03	65.0	0.39	1.00	950.610	298	89	84	0.62	2.77	96.6
1-04	70.0	0.40	1.10	953.550	300	90	84	0.63	2.94	101.3
1-05	75.0	0.45	1.20	956.630	296	91	85	0.67	3.08	99.7
LEAK CHECK	75.0			956.755						
5-01	80.0	0.30	0.80	959.230	296	87	85	0.55	2.48	98.4
5-02	85.0	0.32	0.85	961.770	298	89	85	0.57	2.54	97.7
5-03	90.0	0.38	1.00	964.580	300	89	85	0.62	2.81	99.3
5-04	95.0	0.33	0.88	967.150	299	91	86	0.57	2.57	97.1
5-05	100.0	0.38	1.00	969.940	299	91	86	0.62	2.79	98.3
LEAK CHECK	100.0			970.030						
4-01	105.0	0.41	1.10	972.920	300	90	86	0.64	2.89	98.2
4-02	110.0	0.35	0.93	975.600	297	88	86	0.59	2.68	98.5
4-03	115.0	0.35	0.93	978.300	298	86	85	0.59	2.70	99.6
4-04	120.0	0.35	0.93	980.930	298	85	84	0.59	2.63	97.2
4-05	125.0	0.37	0.98	983.705	298	85	84	0.61	2.78	99.7
Final	125.0		1.01200	69.85000	299.12000	86.54000		0.61606	69.85000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6161	1.0120	69.8500	299.1200	86.5400				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 2 FF Outlet	Test Method:	USEPA Method 5/29
Test Run:	3	Analyte:	Particulate/Metals
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.70
Project No:	12218	Static P:	-11.7
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.58
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	10.66
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.76
Test Date:	3/25/13		
Start Time:	13:04		
Stop Time:	15:17	H_2O (condensate, ml or gm):	382.7
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	14.2
Leak Rate After:	0.003 cfm @ 15 "Hg	Actual Moisture (%):	21.96

Nozzle ID No:	0.2725-1		
Nozzle Diameter (D_n):	0.273		
Probe ID No:	67-8-17		
Pitot C_p:	0.824		
Pitot Leak Check:	☑Pass ☐Fail		
Meter Box ID. No:	66-11		
Meter ΔH@:	1.82740		
Meter Y_d:	0.99060		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			984.155						
5-01	5.0	0.30	0.80	986.720	298	80	80	0.55	2.57	102.7
5-02	10.0	0.33	0.88	989.300	299	83	80	0.57	2.58	98.3
5-03	15.0	0.32	0.85	991.800	299	84	81	0.57	2.50	96.6
5-04	20.0	0.35	0.93	994.470	299	88	82	0.59	2.67	98.2
5-05	25.0	0.35	0.93	997.140	305	88	83	0.59	2.67	98.5
LEAK CHECK	25.0			997.245						
4-01	30.0	0.37	0.98	1000.000	312	89	84	0.61	2.76	99.1
4-02	35.0	0.37	0.98	1002.760	307	89	85	0.61	2.76	98.9
4-03	40.0	0.35	0.93	1005.420	299	90	85	0.59	2.66	97.4
4-04	45.0	0.38	1.00	1008.200	303	89	85	0.62	2.78	98.0
4-05	50.0	0.35	0.93	1010.890	300	89	85	0.59	2.69	98.6
LEAK CHECK	50.0			1010.990						
3-01	55.0	0.38	1.00	1013.770	298	86	85	0.62	2.78	98.0
3-02	60.0	0.35	0.93	1016.440	302	88	85	0.59	2.67	98.1
3-03	65.0	0.37	0.98	1019.190	299	89	85	0.61	2.75	98.0
3-04	70.0	0.42	1.10	1022.160	303	89	85	0.65	2.97	99.6
3-05	75.0	0.42	1.10	1025.140	301	92	85	0.65	2.98	99.6
LEAK CHECK	75.0			1025.215						
2-01	80.0	0.38	1.00	1027.990	304	88	85	0.62	2.78	98.0
2-02	85.0	0.46	1.20	1031.110	299	88	85	0.68	3.12	99.9
2-03	90.0	0.40	1.10	1034.030	299	84	83	0.63	2.92	100.8
2-04	95.0	0.46	1.20	1037.110	297	81	81	0.68	3.08	99.5
2-05	100.0	0.43	1.10	1040.100	300	83	81	0.66	2.99	99.9
LEAK CHECK	100.0			1040.175						
1-01	105.0	0.34	0.90	1042.820	301	81	80	0.58	2.64	99.6
1-02	110.0	0.36	0.95	1045.500	297	81	80	0.60	2.68	97.9
1-03	115.0	0.36	0.95	1048.210	298	80	79	0.60	2.71	99.2
1-04	120.0	0.32	0.85	1050.760	298	81	79	0.57	2.55	98.9
1-05	125.0	0.47	1.30	1053.945	299	81	79	0.69	3.18	102.1
Final	125.0		0.99480	69.43500	300.64000	84.16000		0.61181	69.43500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6118	0.9948	69.4350	300.6400	84.1600				
		☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 29**
Analyte: **Mercury**

Location: Unit 2 FF Outlet
Test Run: 4
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000

Meter Operator:	S. Joint	473	
Probe Operator:	W. Berry	456	
Test Date:	3/27/13		
Start Time:	12:07		
Stop Time:	14:22		
Leak Rate Before:	0.003	cfm	@ 15 "Hg
Leak Rate After:	0.003	cfm	@ 16 "Hg

Bar. Press. (in. Hg): 30.10
Static P: -12.1
O_2 (dry volume %): 9.39
CO_2 (dry volume %): 10.02
N_2+CO (dry volume %): 80.59

H_2O (condensate, ml or grm): 365.6
H_2O (silica, g): 12.4
Actual Moisture (%): 20.27

Nozzle ID No: 0.2725-2
Nozzle Diameter (D_n): 0.273
Probe ID No: 67-8-16
Pitot C_p: 0.825
Pitot Leak Check: ☑ Pass ☐ Fail

Meter Box ID. No: 66-22
Meter ΔH@: 1.88400
Meter Y_d: 0.99720

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			832.300						
1-01	5.0	0.42	1.20	835.330	297	63	62	0.65	3.03	105.4
1-02	10.0	0.38	1.10	838.090	296	65	62	0.62	2.76	100.6
1-03	15.0	0.39	1.10	840.850	295	65	62	0.62	2.76	99.3
1-04	20.0	0.43	1.20	843.740	300	66	62	0.66	2.89	99.2
1-05	25.0	0.45	1.20	846.640	299	68	63	0.67	2.90	97.0
LEAK CHECK	25.0			846.830						
2-01	30.0	0.44	1.20	849.900	297	69	65	0.66	3.07	103.4
2-02	35.0	0.45	1.20	852.920	297	70	65	0.67	3.02	100.5
2-03	40.0	0.38	1.10	855.740	303	71	64	0.62	2.82	102.5
2-04	45.0	0.45	1.20	858.740	300	71	65	0.67	3.00	99.9
2-05	50.0	0.50	1.40	861.890	297	71	65	0.71	3.15	99.4
LEAK CHECK	50.0			862.000						
3-01	55.0	0.36	1.00	864.720	299	72	66	0.60	2.72	101.0
3-02	60.0	0.33	0.91	867.310	300	73	67	0.57	2.59	100.3
3-03	65.0	0.37	1.00	870.140	301	76	69	0.61	2.83	103.1
3-04	70.0	0.40	1.10	873.000	300	76	70	0.63	2.86	100.1
3-05	75.0	0.41	1.10	875.740	300	76	70	0.64	2.74	94.7
LEAK CHECK	75.0			876.020						
4-01	80.0	0.36	1.00	878.740	299	74	70	0.60	2.72	100.4
4-02	85.0	0.33	0.91	881.300	301	74	70	0.57	2.56	98.8
4-03	90.0	0.35	0.97	883.990	295	74	70	0.59	2.69	100.5
4-04	95.0	0.35	0.97	886.730	301	74	70	0.59	2.74	102.7
4-05	100.0	0.36	1.00	889.420	300	76	71	0.60	2.69	99.1
LEAK CHECK	100.0			889.550						
5-01	105.0	0.32	0.89	892.100	300	75	70	0.57	2.55	99.8
5-02	110.0	0.28	0.78	894.520	300	74	70	0.53	2.42	101.3
5-03	115.0	0.30	0.83	896.990	299	75	70	0.55	2.47	99.8
5-04	120.0	0.42	1.20	900.100	299	75	70	0.65	3.11	106.3
5-05	125.0	0.36	1.00	902.800	299	75	70	0.60	2.70	99.6
Final	125.0		1.06240	69.79000	298.96000	69.52000		0.61792	69.79000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6179	1.0624	69.7900	298.9600	69.5200				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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P

USEPA Method 3 Laboratory Data

Test Method: USEAP Methods 5/29 and 29
Analyte: Particulate/Metals and Mercury

Location: Unit 2 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.35000		8.56000	81.09000	29.99840	1.19227	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.73000		8.36000	80.91000	30.05120	1.16869	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.66000		8.58000	80.76000	30.04880	1.15572	☑ Fo value within expected range.
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.02000		9.39000	80.59000	29.97880	1.14870	☑ Fo value within expected range.

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RNNP

USEPA Method 4 Laboratory Data

Test Method: USEAP Methods 5/29 and 29
Location: Unit 2 FF Outlet
Analyte: Particulate/Metals and Mercury
Client: Wheelabrator South Broward, Inc.
Analyst: D. Luckhard
Project No: 12218
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	703.8	456.6	247.2
Impinger 2	5%HNO3/10%H2O2	682.6	558.2	124.4
Impinger 3	5%HNO3/10%H2O2	586.1	554.6	31.5
Impinger 4	Empty	445.5	437.6	7.9
Impinger 5	4%KMnO4/10%H2SO4	549.7	545.2	4.5
Impinger 6	4%KMnO4/10%H2SO4	539.2	537.5	1.7
Impinger 7	Silica Gel	735.3	715.8	19.5
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
417.2	Liquid (gm)		
0.0	less rinse (gm)		
417.2	Net Liquid (gm)	417.2	☑ QA/QC OK
+ 19.5	Silica Gel (gm)	19.5	☑ QA/QC OK
436.7	Total Vlc (gm)	436.7	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	688.1	444.3	243.8
Impinger 2	5%HNO3/10%H2O2	639.9	531.7	108.2
Impinger 3	5%HNO3/10%H2O2	566.9	538.8	28.1
Impinger 4	Empty	451.3	444.7	6.6
Impinger 5	4%KMnO4/10%H2SO4	547.9	542.6	5.3
Impinger 6	4%KMnO4/10%H2SO4	540.7	538.5	2.2
Impinger 7	Silica Gel	837.9	824.5	13.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
394.2	Liquid (gm)		
0.0	less rinse (gm)		
394.2	Net Liquid (gm)	394.2	☑ QA/QC OK
+ 13.4	Silica Gel (gm)	13.4	☑ QA/QC OK
407.6	Total Vlc (gm)	407.6	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	716.5	456.5	260.0
Impinger 2	5%HNO3/10%H2O2	652.5	556.6	95.9
Impinger 3	5%HNO3/10%H2O2	564.0	544.8	19.2
Impinger 4	Empty	441.6	436.9	4.7
Impinger 5	4%KMnO4/10%H2SO4	548.7	546.0	2.7
Impinger 6	4%KMnO4/10%H2SO4	540.8	540.6	0.2
Impinger 7	Silica Gel	749.5	735.3	14.2
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
382.7	Liquid (gm)		
0.0	less rinse (gm)		
382.7	Net Liquid (gm)	382.7	☑ QA/QC OK
+ 14.2	Silica Gel (gm)	14.2	☑ QA/QC OK
396.9	Total Vlc (gm)	396.9	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	682.8	443.1	239.7
Impinger 2	5%HNO3/10%H2O2	631.2	530.0	101.2
Impinger 3	5%HNO3/10%H2O2	551.6	530.1	21.5
Impinger 4	Empty	446.9	443.9	3.0
Impinger 5	4%KMnO4/10%H2SO4	542.8	541.3	1.5
Impinger 6	4%KMnO4/10%H2SO4	534.9	536.2	-1.3
Impinger 7	Silica Gel	774.4	762.0	12.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
365.6	Liquid (gm)		
0.0	less rinse (gm)		
365.6	Net Liquid (gm)	365.6	☑ QA/QC OK
+ 12.4	Silica Gel (gm)	12.4	☑ QA/QC OK
378.0	Total Vlc (gm)	378.0	☑ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 23**
Location:	Unit 2 FF Outlet		**Analyte:**		**PCDD/F**
Test Run:	2				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.90	Nozzle ID No: 2722-1
Project No:	12218		Static P:	-10.4	Nozzle Diameter (D_n): 0.272
Source Area (ft^2):	64.00000		O_2 (dry volume %):	8.63	Probe ID No: 67-8-16
Meter Operator:	A. Obuchowski	567	CO_2 (dry volume %):	10.34	Pitot C_p: 0.825
Probe Operator:	A. Obuchowski	567	N_2+CO (dry volume %):	81.03	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/26/13				
Start Time:	08:03				
Stop Time:	12:49		H_2O (condensate, ml or gm):	715.7	Meter Box ID. No: 66-22
Leak Rate Before:	0.005 cfm	@ 15 "Hg	H_2O (silica, g):	52.7	Meter ΔH@: 1.88400
Leak Rate After:	0.003 cfm	@ 12 "Hg	Actual Moisture (%):	20.96	Meter Y_d: 0.99720

Traverse Point	Run Time 10.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			412.515						
1-01	10.0	0.35	0.94	417.650	292	59	58	0.59	5.13	98.6
1-02	20.0	0.38	1.00	423.020	292	60	58	0.62	5.37	98.9
1-03	30.0	0.43	1.20	428.830	297	61	59	0.66	5.81	100.8
1-04	40.0	0.37	0.99	434.280	301	62	59	0.61	5.45	102.0
1-05	50.0	0.47	1.30	440.420	295	62	59	0.69	6.14	101.6
LEAK CHECK	50.0			440.770						
2-01	60.0	0.34	0.91	446.000	294	62	59	0.58	5.23	101.6
2-02	70.0	0.38	1.00	451.480	295	62	60	0.62	5.48	100.7
2-03	80.0	0.40	1.10	457.170	294	64	61	0.63	5.69	101.6
2-04	90.0	0.43	1.20	463.100	299	64	61	0.66	5.93	102.5
2-05	100.0	0.51	1.40	469.490	297	65	62	0.71	6.39	101.1
LEAK CHECK	100.0			469.600						
3-01	110.0	0.34	0.94	474.920	291	65	64	0.58	5.32	102.4
3-02	120.0	0.34	0.94	480.240	293	68	66	0.58	5.32	102.0
3-03	130.0	0.33	0.91	485.470	294	69	68	0.57	5.23	101.6
3-04	140.0	0.35	0.96	490.820	296	70	67	0.59	5.35	101.1
3-05	150.0	0.39	1.10	496.180	296	70	66	0.62	5.36	96.0
LEAK CHECK	150.0			496.360						
4-01	160.0	0.37	1.00	501.770	299	67	65	0.61	5.41	100.1
4-02	170.0	0.33	0.91	506.970	298	67	65	0.57	5.20	101.8
4-03	180.0	0.33	0.91	512.200	295	69	64	0.57	5.23	102.0
4-04	190.0	0.35	0.96	517.540	296	69	64	0.59	5.34	101.2
4-05	200.0	0.44	1.20	523.440	295	68	64	0.66	5.90	99.9
LEAK CHECK	200.0			523.620						
5-01	210.0	0.28	0.77	528.400	292	70	65	0.53	4.78	100.8
5-02	220.0	0.33	0.91	533.600	296	71	66	0.57	5.20	101.1
5-03	230.0	0.33	0.91	538.840	299	70	65	0.57	5.24	102.3
5-04	240.0	0.33	0.91	544.020	305	72	66	0.57	5.18	101.3
5-05	250.0	0.31	0.85	549.040	292	70	66	0.56	5.02	100.6
Final	250.0		1.00880	135.70500	295.72000	64.66000		0.60551	135.70500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6055	1.0088	135.7050	295.7200	64.6600		4.3% 2RSD		
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 23**
Analyte: **PCDD/F**

Location: Unit 2 FF Outlet
Test Run: 3
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: A. Obuchowski 567
Probe Operator: A. Obuchowski 567
Test Date: 3/26/13
Start Time: 13:09
Stop Time: 17:25
Leak Rate Before: 0.004 cfm @ 15 "Hg
Leak Rate After: 0.000 cfm @ 12 "Hg

Bar. Press. (in. Hg): 29.90
Static P: -11.0
O_2 (dry volume %): 9.48
CO_2 (dry volume %): 9.80
N_2+CO (dry volume %): 80.72
H_2O (condensate, ml or gm): 667.8
H_2O (silica, g): 50.8
Actual Moisture (%): 19.67

Nozzle ID No: 2722-1
Nozzle Diameter (D_n): 0.272
Probe ID No: 67-8-16
Pitot C_p: 0.825
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 66-22
Meter ΔH@: 1.88400
Meter Y_d: 0.99720

Traverse Point	Run Time 10.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			549.725						
5-01	10.0	0.29	0.78	554.580	297	72	68	0.54	4.86	99.2
5-02	20.0	0.29	0.78	559.320	296	76	71	0.54	4.74	96.1
5-03	30.0	0.32	0.89	564.510	297	77	72	0.57	5.19	100.1
5-04	40.0	0.34	0.94	569.810	301	74	71	0.58	5.30	99.8
5-05	50.0	0.36	1.00	575.300	291	73	70	0.60	5.49	100.0
LEAK CHECK	50.0			575.500						
4-01	60.0	0.32	0.89	580.640	292	72	70	0.57	5.14	99.4
4-02	70.0	0.32	0.89	585.850	293	72	69	0.57	5.21	101.0
4-03	80.0	0.30	0.83	590.840	300	76	70	0.55	4.99	99.8
4-04	90.0	0.31	0.86	595.930	295	78	72	0.56	5.09	99.5
4-05	100.0	0.31	0.86	601.100	293	79	74	0.56	5.17	100.6
LEAK CHECK	100.0			601.280						
3-01	110.0	0.35	0.97	606.610	298	80	74	0.59	5.33	97.9
3-02	120.0	0.35	0.97	612.030	295	78	74	0.59	5.42	99.5
3-03	130.0	0.35	0.97	617.470	296	78	73	0.59	5.44	100.1
3-04	140.0	0.42	1.20	623.470	297	76	73	0.65	6.00	101.1
3-05	150.0	0.42	1.20	629.480	296	75	72	0.65	6.01	101.4
LEAK CHECK	150.0			629.610						
2-01	160.0	0.43	1.20	635.620	296	76	72	0.66	6.01	100.1
2-02	170.0	0.41	1.10	641.330	299	77	72	0.64	5.71	97.5
2-03	180.0	0.43	1.20	647.270	299	79	72	0.66	5.94	98.8
2-04	190.0	0.44	1.20	653.250	297	77	71	0.66	5.98	98.5
2-05	200.0	0.51	1.40	659.760	299	79	72	0.71	6.51	99.5
LEAK CHECK	200.0			659.900						
1-01	210.0	0.35	0.97	665.380	312	79	74	0.59	5.48	101.7
1-02	220.0	0.35	0.97	670.860	305	81	74	0.59	5.48	101.0
1-03	230.0	0.42	1.20	676.870	302	80	74	0.65	6.01	101.1
1-04	240.0	0.50	1.40	683.370	304	80	74	0.71	6.50	100.4
1-05	250.0	0.59	1.60	690.330	306	80	74	0.77	6.96	99.1
Final	250.0		1.05080	139.95500	298.24000	74.52000		0.61301	139.95500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6130	1.0508	139.9550	298.2400	74.5200		6.0% 2RSD		
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 2 FF Outlet	Test Method:	USEPA Method 23
Test Run:	4	Analyte:	PCDD/F
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	30.10
Project No:	12218	Static P:	-11.2
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.12
Meter Operator:	A. Obuchowski 567	CO_2 (dry volume %):	10.13
Probe Operator:	A. Obuchowski 567	N_2+CO (dry volume %):	80.75
Test Date:	3/27/13		
Start Time:	07:21		
Stop Time:	11:39	H_2O (condensate, ml or gm):	716.8
Leak Rate Before:	0.005 cfm @ 15 "Hg	H_2O (silica, g):	57.6
Leak Rate After:	0.003 cfm @ 15 "Hg	Actual Moisture (%):	20.37

Nozzle ID No:	2722-1		
Nozzle Diameter (D_n):	0.272		
Probe ID No:	67-8-16		
Pitot C_p:	0.825		
Pitot Leak Check:	☑ Pass ☐ Fail		
Meter Box ID. No:	66-22		
Meter ΔH@:	1.88400		
Meter Y_d:	0.99720		

Traverse Point	Run Time 10.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			690.914						
2-01	10.0	0.34	0.93	696.090	295	49	47	0.58	5.18	102.9
2-02	20.0	0.36	0.99	701.370	298	51	48	0.60	5.28	101.9
2-03	30.0	0.44	1.20	707.130	299	54	49	0.66	5.76	100.3
2-04	40.0	0.40	1.10	712.700	299	58	52	0.63	5.57	101.0
2-05	50.0	0.45	1.20	718.550	304	59	54	0.67	5.85	100.1
LEAK CHECK	50.0			718.730						
1-01	60.0	0.33	0.90	723.860	296	58	57	0.57	5.13	101.7
1-02	70.0	0.38	1.00	729.250	292	57	57	0.62	5.39	99.4
1-03	80.0	0.30	0.82	734.240	300	59	58	0.55	4.99	103.8
1-04	90.0	0.38	1.00	739.760	288	61	60	0.62	5.52	100.9
1-05	100.0	0.42	1.20	745.620	290	60	61	0.65	5.86	102.0
LEAK CHECK	100.0			745.910						
5-01	110.0	0.22	0.60	750.150	291	61	62	0.47	4.24	101.7
5-02	120.0	0.28	0.77	755.030	293	62	63	0.53	4.88	103.8
5-03	130.0	0.33	0.90	760.270	292	62	63	0.57	5.24	102.6
5-04	140.0	0.35	0.96	765.640	291	63	64	0.59	5.37	101.8
5-05	150.0	0.39	1.10	771.360	292	63	64	0.62	5.72	102.9
LEAK CHECK	150.0			771.500						
4-01	160.0	0.35	0.96	776.820	289	64	64	0.59	5.32	100.7
4-02	170.0	0.36	0.99	782.300	291	67	66	0.60	5.48	101.9
4-03	180.0	0.39	1.10	788.060	293	67	67	0.62	5.76	103.0
4-04	190.0	0.48	1.30	794.310	294	68	68	0.69	6.25	100.6
4-05	200.0	0.51	1.40	800.730	295	70	70	0.71	6.42	100.0
LEAK CHECK	200.0			800.900						
3-01	210.0	0.42	1.20	806.850	300	67	68	0.65	5.95	102.9
3-02	220.0	0.43	1.20	812.720	302	67	66	0.66	5.87	100.7
3-03	230.0	0.44	1.20	818.700	300	66	64	0.66	5.98	101.5
3-04	240.0	0.55	1.50	825.140	304	67	64	0.74	6.44	98.0
3-05	250.0	0.52	1.40	831.610	305	68	63	0.72	6.47	101.3
Final	250.0		1.07680	139.91600	295.72000	61.34000		0.62378	139.91600	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6238	1.0768	139.9200	295.7200	61.3400				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 23
Analyte: PCDD/F

Location: Unit 2 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.34000		8.63000	81.03000	29.99960	1.18665	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.80000		9.48000	80.72000	29.94720	1.16531	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.13000		9.12000	80.75000	29.98560	1.16288	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis:
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 2 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 23
Analyte: PCDD/F
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	1332.7	642.0	690.7
Impinger 2	HPLC Water	508.9	510.1	-1.2
Impinger 3	HPLC Water	517.3	517.6	-0.3
Impinger 4	Empty	426.0	420.9	5.1
Impinger 5	XAD Trap	379.8	358.4	21.4
Impinger 6	Silica Gel	793.7	741.0	52.7
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
715.7	Liquid (gm)		
0.0	less rinse (gm)		
715.7	Net Liquid (gm)	715.7	☑ QA/QC OK
+ 52.7	Silica Gel (gm)	52.7	☑ QA/QC OK
768.4	Total Vlc (gm)	768.4	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	1283.7	633.5	650.2
Impinger 2	HPLC Water	545.6	548.2	-2.6
Impinger 3	HPLC Water	553.3	553.5	-0.2
Impinger 4	Empty	420.1	420.1	0.0
Impinger 5	XAD Trap	425.2	404.8	20.4
Impinger 6	Silica Gel	755.9	705.1	50.8
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
667.8	Liquid (gm)		
0.0	less rinse (gm)		
667.8	Net Liquid (gm)	667.8	☑ QA/QC OK
+ 50.8	Silica Gel (gm)	50.8	☑ QA/QC OK
718.6	Total Vlc (gm)	718.6	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	1334.0	640.7	693.3
Impinger 2	HPLC Water	523.7	523.2	0.5
Impinger 3	HPLC Water	531.0	529.7	1.3
Impinger 4	Empty	430.2	430.2	0.0
Impinger 5	XAD Trap	343.1	321.4	21.7
Impinger 6	Silica Gel	791.8	734.2	57.6
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
716.8	Liquid (gm)		
0.0	less rinse (gm)		
716.8	Net Liquid (gm)	716.8	☑ QA/QC OK
+ 57.6	Silica Gel (gm)	57.6	☑ QA/QC OK
774.4	Total Vlc (gm)	774.4	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty			
Impinger 2	HPLC Water			
Impinger 3	HPLC Water			
Impinger 4	Empty			
Impinger 5	XAD Trap			
Impinger 6	Silica Gel			
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 2 SDA Inlet		**Analyte:**		**HCl**
Test Run:	1				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	30.10	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.5	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	8.23	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.04	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.73	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/27/13				
Start Time:	07:47				
Stop Time:	08:47		H_2O (condensate, ml or gm):	151.9	Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	13.6	Meter ΔH@: 1.69640
Leak Rate After:	0.003 cfm	@ 10 "Hg	Actual Moisture (%):	17.66	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s	Sample ΔH	Metered	Stack	Dry Gas Meter		$\sqrt{\Delta P_s}$	Volume	Isokinetics
					T_s	$T_{m\text{-}in}$	$T_{m\text{-}out}$	(calculated)	(calculated)	(calculated)
	0.0	(in. H_2O)	(in. H_2O)	801.920	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
1-01	5.0		1.20	804.990	494	70	69		3.07	
1-01	10.0		1.20	808.050	494	70	69		3.06	
1-01	15.0		1.20	811.020	494	69	68		2.97	
1-01	20.0		1.20	813.990	492	69	67		2.97	
1-01	25.0		1.20	816.970	492	69	67		2.98	
1-01	30.0		1.20	819.980	492	69	66		3.01	
1-01	35.0		1.20	823.000	490	70	66		3.02	
1-01	40.0		1.20	825.990	489	71	65		2.99	
1-01	45.0		1.20	828.950	489	72	65		2.96	
1-01	50.0		1.20	831.320	489	72	65		2.37	
1-01	55.0		1.20	834.800	490	72	66		3.48	
1-01	60.0		1.20	837.780	491	72	66		2.98	
Final	60.0		1.20000	35.86000	491.33333	68.50000			35.86000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	35.8600	491.3333	68.5000				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 2 SDA Inlet	Test Method:	USEPA Method 26A
Test Run:	2	Analyte:	HCl
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	30.10
Project No:	12218	Static P:	-1.4
Source Area (ft^2):	60.13205	O_2 (dry volume %):	8.38
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	10.98
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	80.64
Test Date:	3/27/13		
Start Time:	09:08		
Stop Time:	10:08	H_2O (condensate, ml or gm):	140.6
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	7.8
Leak Rate After:	0.003 cfm @ 15 "Hg	Actual Moisture (%):	16.37

Nozzle ID No:	N/A		
Nozzle Diameter (D_n):	N/A		
Probe ID No:	66-4-7		
Pitot C_p:	0.834		
Pitot Leak Check:	☑ Pass ☐ Fail		
Meter Box ID. No:	61-11		
Meter ΔH@:	1.69640		
Meter Y_d:	1.00500		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			838.000						
1-01	5.0		1.20	841.010	496	80	78		3.01	
1-01	10.0		1.20	844.020	495	81	79		3.01	
1-01	15.0		1.20	847.030	495	82	79		3.01	
1-01	20.0		1.20	850.040	497	83	80		3.01	
1-01	25.0		1.20	853.050	497	83	80		3.01	
1-01	30.0		1.20	856.220	496	83	80		3.17	
1-01	35.0		1.20	859.220	495	85	80		3.00	
1-01	40.0		1.20	862.170	494	85	81		2.95	
1-01	45.0		1.20	865.160	495	86	81		2.99	
1-01	50.0		1.20	868.180	497	87	82		3.02	
1-01	55.0		1.20	871.190	499	87	82		3.01	
1-01	60.0		1.20	874.150	497	88	83		2.96	
Final	60.0		1.20000	36.15000	496.08333	82.29167			36.15000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	36.1500	496.0833	82.2917				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 2 SDA Inlet		**Analyte:**		**HCl**
Test Run:	3				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	30.10	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.4	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	9.32	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	9.94	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.74	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/27/13				
Start Time:	10:27				
Stop Time:			H_2O (condensate, ml or gm):		Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):		Meter ΔH@: 1.69640
Leak Rate After:	0.003 cfm	@ 15 "Hg	#VALUE!	#VALUE!	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s	Sample ΔH	Metered (dcf)	Stack T_s	Dry Gas Meter $T_{m\text{-}in}$	Dry Gas Meter $T_{m\text{-}out}$	$\sqrt{\Delta P_s}$ (calculated)	Volume (calculated)	Isokinetics (calculated)
	0.0	(in. H_2O)	(in. H_2O)	874.500	(°F)	(°F)	(°F)	($\sqrt{in.}$ H_2O)	(ft^3)	(%)
1-01	5.0		1.20	877.550	511	89	86		3.05	
1-01	10.0		1.20	880.500	510	89	86		2.95	
1-01	15.0		1.20	883.420	511	90	87		2.92	
1-01	20.0		1.20	886.340	511	92	87		2.92	
1-01	25.0		1.20	889.260	510	93	87		2.92	
1-01	30.0		1.20	892.180	514	92	88		2.92	
1-01	35.0		1.20	895.030	512	92	88		2.85	
1-01	40.0		1.20	897.880	511	98	88		2.85	
1-01	42.0		1.20	899.000	511	103	88		1.12	
Final	42.0		1.20000	24.50000	511.23810	89.78571			24.50000	
1 points sampled		Sq.Rt.ΔP		Voided Run						
QC-Check: Field Averages			1.2000	24.5000	511.2381	89.7857				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 2 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.04000		8.23000	80.73000	30.09560	1.14764	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.98000		8.38000	80.64000	30.09200	1.14026	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.94000		9.32000	80.74000	29.96320	1.16499	☑ Fo value within expected range.
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 2 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 26A
Analyte: HCl
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	475.5	455.0	20.5
Impinger 2	100 ml 0.1N H2SO4	644.2	544.2	100.0
Impinger 3	100 ml 0.1N H2SO4	561.7	535.7	26.0
Impinger 4	Empty	487.7	482.3	5.4
Impinger 5	Silica Gel	740.3	726.7	13.6
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
151.9	Liquid (gm)		
0.0	less rinse (gm)		
151.9	Net Liquid (gm)	151.9	☑ QA/QC OK
+ 13.6	Silica Gel (gm)	13.6	☑ QA/QC OK
165.5	Total Vlc (gm)	165.5	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	503.0	464.3	38.7
Impinger 2	100 ml 0.1N H2SO4	631.2	545.9	85.3
Impinger 3	100 ml 0.1N H2SO4	582.8	567.6	15.2
Impinger 4	Empty	423.7	422.3	1.4
Impinger 5	Silica Gel	739.0	731.2	7.8
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
140.6	Liquid (gm)		
0.0	less rinse (gm)		
140.6	Net Liquid (gm)	140.6	☑ QA/QC OK
+ 7.8	Silica Gel (gm)	7.8	☑ QA/QC OK
148.4	Total Vlc (gm)	148.4	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4		456.6	
Impinger 2	100 ml 0.1N H2SO4		552.0	
Impinger 3	100 ml 0.1N H2SO4		532.8	
Impinger 4	Empty		482.8	
Impinger 5	Silica Gel		740.3	
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 2 FF Outlet		**Analyte:**		**HCl**
Test Run:	1				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	30.10	Nozzle ID No: N/A
Project No:	12218		Static P:	-11.2	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	8.77	Probe ID No: 67-4-3
Meter Operator:	W. Berry	456	CO_2 (dry volume %):	10.51	Pitot C_p: N/A
Probe Operator:			N_2+CO (dry volume %):	80.72	Pitot Leak Check: ☑Pass ☐Fail
Test Date:	3/27/13				
Start Time:	07:47				
Stop Time:	08:47		H_2O (condensate, ml or gm):	205.8	Meter Box ID. No: 66-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	14.9	Meter ΔH@: 1.82740
Leak Rate After:	0.002 cfm	@ 10 "Hg	Actual Moisture (%):	20.19	Meter Y_d: 0.99060

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			54.475						
3-01	5.0		1.50	57.800	294	51	50		3.33	
3-01	10.0		1.50	61.100	292	54	51		3.30	
3-01	15.0		1.50	64.420	296	56	53		3.32	
3-01	20.0		1.50	67.740	302	58	54		3.32	
3-01	25.0		1.50	71.100	296	59	56		3.36	
3-01	30.0		1.50	74.470	298	58	58		3.37	
3-01	35.0		1.50	77.850	299	59	59		3.38	
3-01	40.0		1.50	81.240	293	59	60		3.39	
3-01	45.0		1.50	84.580	295	61	61		3.34	
3-01	50.0		1.50	88.060	300	60	62		3.48	
3-01	55.0		1.50	91.340	298	62	63		3.28	
3-01	60.0		1.50	94.745	290	62	64		3.41	
Final	60.0		1.50000	40.27000	296.08333	57.91667			40.27000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.2700	296.0833	57.9166				
		☐Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 26A**
Analyte: **HCl**

Location: Unit 2 FF Outlet
Test Run: 2
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: W. Berry 456
Probe Operator:
Test Date: 3/27/13
Start Time: 09:08
Stop Time: 10:08
Leak Rate Before: 0.004 cfm @ 15 "Hg
Leak Rate After: 0.002 cfm @ 10 "Hg

Bar. Press. (in. Hg): 30.10
Static P: -11.1
O_2 (dry volume %): 8.87
CO_2 (dry volume %): 10.49
N_2+CO (dry volume %): 80.64
H_2O (condensate, ml or gm): 211.4
H_2O (silica, g): 13.3
Actual Moisture (%): 20.54

Nozzle ID No: N/A
Nozzle Diameter (D_n): N/A
Probe ID No: 67-4-3
Pitot C_p: N/A
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 66-11
Meter ΔH@: 1.82740
Meter Y_d: 0.99060

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			95.380						
3-01	5.0		1.50	98.740	294	61	67		3.36	
3-01	10.0		1.50	102.110	294	62	68		3.37	
3-01	15.0		1.50	105.480	293	63	68		3.37	
3-01	20.0		1.50	108.880	294	62	67		3.40	
3-01	25.0		1.50	112.270	294	64	67		3.39	
3-01	30.0		1.50	115.670	296	65	68		3.40	
3-01	35.0		1.50	119.090	292	65	68		3.42	
3-01	40.0		1.50	122.500	295	64	68		3.41	
3-01	45.0		1.50	125.910	293	65	68		3.41	
3-01	50.0		1.50	129.310	295	65	68		3.40	
3-01	55.0		1.50	132.800	292	67	69		3.49	
3-01	60.0		1.50	136.135	297	68	69		3.33	
Final	60.0		1.50000	40.75500	294.08333	66.08333			40.75500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.7550	294.0833	66.0833				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 2 FF Outlet		**Analyte:**		**HCl**
Test Run:	3				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	30.10	Nozzle ID No: N/A
Project No:	12218		Static P:	-12.1	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	9.70	Probe ID No: 67-4-3
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	9.67	Pitot C_p: N/A
Probe Operator:	W. Berry	456	N_2+CO (dry volume %):	80.63	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/27/13				
Start Time:	10:27				
Stop Time:	11:27		H_2O (condensate, ml or gm):	212.4	Meter Box ID. No: 66-11
Leak Rate Before:	0.002 cfm	@ 15 "Hg	H_2O (silica, g):	15.5	Meter ΔH@: 1.82740
Leak Rate After:	0.001 cfm	@ 10 "Hg	Actual Moisture (%):	20.94	Meter Y_d: 0.99060

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			136.570						
2-01	5.0		1.50	139.990	299	69	72		3.42	
2-01	10.0		1.50	143.380	295	72	73		3.39	
2-01	15.0		1.50	146.780	296	72	74		3.40	
2-01	20.0		1.50	150.150	296	72	74		3.37	
2-01	25.0		1.50	153.540	298	70	72		3.39	
2-01	30.0		1.50	156.940	298	70	72		3.40	
2-01	35.0		1.50	160.350	298	72	73		3.41	
2-01	40.0		1.50	163.740	296	70	72		3.39	
2-01	45.0		1.50	167.120	298	65	68		3.38	
2-01	50.0		1.50	170.480	295	65	66		3.36	
2-01	55.0		1.50	173.830	297	66	65		3.35	
2-01	60.0		1.50	177.210	298	65	64		3.38	
Final	60.0		1.50000	40.64000	297.00000	69.70833			40.64000	
2 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.6400	297.0000	69.7083				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 2 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.51000		8.77000	80.72000	30.03240	1.15414	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.49000		8.87000	80.64000	30.03320	1.14681	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.67000		9.70000	80.63000	29.93520	1.15822	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis:
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Test Method: USEPA Method 26A
Location: Unit 2 FF Outlet — Analyte: HCl
Client: Wheelabrator South Broward, Inc. — Analyst: H. Nguyen
Project No: 12218 — Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	493.5	458.5	35.0
Impinger 2	100 ml 0.1N H2SO4	654.8	548.0	106.8
Impinger 3	100 ml 0.1N H2SO4	590.5	539.7	50.8
Impinger 4	Empty	481.5	468.3	13.2
Impinger 5	Silica Gel	702.8	687.9	14.9
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
205.8	Liquid (gm)		
0.0	less rinse (gm)		
205.8	Net Liquid (gm)	205.8	☑ QA/QC OK
+ 14.9	Silica Gel (gm)	14.9	☑ QA/QC OK
220.7	Total Vlc (gm)	220.7	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	481.2	437.5	43.7
Impinger 2	100 ml 0.1N H2SO4	660.0	547.6	112.4
Impinger 3	100 ml 0.1N H2SO4	573.8	527.9	45.9
Impinger 4	Empty	450.2	440.8	9.4
Impinger 5	Silica Gel	730.1	716.8	13.3
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
211.4	Liquid (gm)		
0.0	less rinse (gm)		
211.4	Net Liquid (gm)	211.4	☑ QA/QC OK
+ 13.3	Silica Gel (gm)	13.3	☑ QA/QC OK
224.7	Total Vlc (gm)	224.7	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	494.4	452.0	42.4
Impinger 2	100 ml 0.1N H2SO4	661.3	545.8	115.5
Impinger 3	100 ml 0.1N H2SO4	595.6	550.0	45.6
Impinger 4	Empty	476.9	468.0	8.9
Impinger 5	Silica Gel	717.9	702.4	15.5
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
212.4	Liquid (gm)		
0.0	less rinse (gm)		
212.4	Net Liquid (gm)	212.4	☑ QA/QC OK
+ 15.5	Silica Gel (gm)	15.5	☑ QA/QC OK
227.9	Total Vlc (gm)	227.9	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

Test Method: **USEPA Method 5/29**
Analyte: **Particulate/Metals**

Location: Unit 3 FF Outlet
Test Run: 1
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: S. Joint 473
Probe Operator: W. Berry 456
Test Date: 3/26/13
Start Time: 12:11
Stop Time: 14:24
Leak Rate Before: 0.002 cfm @ 15 "Hg
Leak Rate After: 0.002 cfm @ 12 "Hg

Bar. Press. (in. Hg): 29.90
Static P: -9.8
O_2 (dry volume %): 9.80
CO_2 (dry volume %): 9.42
N_2+CO (dry volume %): 80.78
H_2O (condensate, ml or gm): 341.6
H_2O (silica, g): 10.9
Actual Moisture (%): 20.17

Nozzle ID No: 0.2725-2
Nozzle Diameter (D_n): 0.273
Probe ID No: 67-8-17
Pitot C_p: 0.824
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 66-6
Meter ΔH@: 1.82800
Meter Y_d: 0.98540

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			384.820						
1-01	5.0	0.32	0.87	387.450	292	74	71	0.57	2.63	100.5
1-02	10.0	0.22	0.60	389.670	290	77	71	0.47	2.22	101.8
1-03	15.0	0.25	0.70	391.880	293	78	72	0.50	2.21	95.1
1-04	20.0	0.31	0.87	394.480	293	80	73	0.56	2.60	100.2
1-05	25.0	0.33	0.92	397.240	292	81	73	0.57	2.76	103.0
LEAK CHECK	25.0			397.430						
2-01	30.0	0.44	1.20	400.430	294	81	73	0.66	3.00	97.1
2-02	35.0	0.47	1.30	403.600	294	82	73	0.69	3.17	99.2
2-03	40.0	0.40	1.10	406.500	294	84	74	0.63	2.90	98.1
2-04	45.0	0.33	0.92	409.200	294	84	74	0.57	2.70	100.5
2-05	50.0	0.35	0.98	411.960	296	84	75	0.59	2.76	99.8
LEAK CHECK	50.0			412.180						
3-01	55.0	0.32	0.90	414.850	295	85	77	0.57	2.67	100.6
3-02	60.0	0.38	1.10	417.810	295	86	77	0.62	2.96	102.3
3-03	65.0	0.36	1.00	420.520	294	88	78	0.60	2.71	95.9
3-04	70.0	0.32	0.90	423.190	294	88	78	0.57	2.67	100.2
3-05	75.0	0.29	0.81	425.650	293	88	79	0.54	2.46	96.8
LEAK CHECK	75.0			425.760						
4-01	80.0	0.34	0.92	428.470	294	86	79	0.58	2.71	99.3
4-02	85.0	0.32	0.90	431.110	294	86	79	0.57	2.64	99.1
4-03	90.0	0.36	1.00	433.870	295	86	79	0.60	2.76	97.8
4-04	95.0	0.39	1.10	436.860	295	88	79	0.62	2.99	101.6
4-05	100.0	0.36	1.00	439.730	295	88	79	0.60	2.87	101.5
LEAK CHECK	100.0			439.870						
5-01	105.0	0.30	0.84	444.870	294	85	79	0.55	5.00	194.0*
5-02	110.0	0.32	0.90	447.500	294	85	78	0.57	2.63	98.9
5-03	115.0	0.43	1.20	450.720	295	88	79	0.66	3.22	104.2
5-04	120.0	0.38	1.10	452.150	295	88	79	0.62	1.43	49.2*
5-05	125.0	0.36	1.00	453.570	295	88	79	0.60	1.42	50.2*
Final	125.0		0.96520	68.09000	293.96000	80.30000		0.58621	68.09000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5860	0.9652	68.0900	293.9600	80.3000				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Test Method: **USEPA Method 5/29**
Analyte: **Particulate/Metals**

Location: Unit 3 FF Outlet
Test Run: 2
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: P. Bihun 505
Probe Operator: P. Bihun 505
Test Date: 3/27/13
Start Time: 07:28
Stop Time: 09:41
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 10 "Hg

Bar. Press. (in. Hg): 30.18
Static P: -9.8
O_2 (dry volume %): 9.23
CO_2 (dry volume %): 10.07
N_2+CO (dry volume %): 80.70
H_2O (condensate, ml or gm): 336.9
H_2O (silica, g): 14.8
Actual Moisture (%): 19.37

Nozzle ID No: 0.2725-2
Nozzle Diameter (D_n): 0.273
Probe ID No: 67-8-17
Pitot C_p: 0.824
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 66-6
Meter ΔH@: 1.82800
Meter Y_d: 0.98540

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			454.160						
5-01	5.0	0.38	0.99	456.940	328	53	52	0.62	2.78	103.4
5-02	10.0	0.36	0.94	459.610	326	56	52	0.60	2.67	101.6
5-03	15.0	0.35	0.91	462.210	328	59	53	0.59	2.60	100.1
5-04	20.0	0.43	1.10	465.150	329	60	53	0.66	2.94	102.1
5-05	25.0	0.44	1.10	468.085	330	62	54	0.66	2.94	100.5
LEAK CHECK	25.0			468.155						
4-01	30.0	0.41	1.10	471.110	329	61	55	0.64	2.96	104.8
4-02	35.0	0.38	0.99	473.870	326	64	56	0.62	2.76	101.1
4-03	40.0	0.36	0.94	476.560	327	65	56	0.60	2.69	101.1
4-04	45.0	0.38	0.99	479.360	328	64	57	0.62	2.80	102.6
4-05	50.0	0.33	0.86	481.925	327	65	57	0.57	2.57	100.6
LEAK CHECK	50.0			481.985						
3-01	55.0	0.26	0.68	484.260	326	62	58	0.51	2.27	100.6
3-02	60.0	0.37	0.96	486.970	328	63	58	0.61	2.71	100.6
3-03	65.0	0.40	1.00	489.760	329	65	58	0.63	2.79	99.5
3-04	70.0	0.35	0.91	492.420	330	65	59	0.59	2.66	101.3
3-05	75.0	0.34	0.88	495.000	324	66	59	0.58	2.58	99.2
LEAK CHECK	75.0			495.090						
2-01	80.0	0.55	1.40	498.410	330	64	59	0.74	3.32	101.1
2-02	85.0	0.41	1.10	501.350	332	67	60	0.64	2.94	103.4
2-03	90.0	0.44	1.10	504.190	325	67	60	0.66	2.84	96.0
2-04	95.0	0.38	0.99	506.970	321	67	60	0.62	2.78	100.8
2-05	100.0	0.35	0.91	509.630	324	67	61	0.59	2.66	100.6
LEAK CHECK	100.0			509.705						
1-01	105.0	0.22	0.57	511.750	309	64	61	0.47	2.05	96.8
1-02	110.0	0.28	0.73	514.120	309	65	61	0.53	2.37	99.4
1-03	115.0	0.35	0.91	516.760	329	67	62	0.59	2.64	100.0
1-04	120.0	0.38	0.99	519.560	332	68	62	0.62	2.80	101.9
1-05	125.0	0.45	1.20	522.710	328	69	62	0.67	3.15	105.1
Final	125.0		0.97000	68.25500	326.16000	60.80000		0.60922	68.25500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6092	0.9700	68.2550	326.1600	60.8000				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 3 FF Outlet	Test Method: / Analyte:	USEPA Method 5/29 / Particulate/Metals
Test Run:	3		
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	30.10
Project No:	12218	Static P:	-10.7
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.70
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	9.60
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.70
Test Date:	3/27/13		
Start Time:	09:59		
Stop Time:	12:11	H_2O (condensate, ml or gm):	315.6
Leak Rate Before:	0.002 cfm @ 15 "Hg	H_2O (silica, g):	16.1
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%):	18.37

Nozzle ID No:	0.2725-2		
Nozzle Diameter (D_n):	0.273		
Probe ID No:	67-8-17		
Pitot C_p:	0.824		
Pitot Leak Check:	☑ Pass ☐ Fail		
Meter Box ID. No:	66-6		
Meter ΔH@:	1.82800		
Meter Y_d:	0.98540		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			523.105						
5-01	5.0	0.33	0.86	525.740	330	66	66	0.57	2.63	101.4
5-02	10.0	0.33	0.86	528.340	332	71	67	0.57	2.60	99.7
5-03	15.0	0.35	0.91	530.980	331	75	68	0.59	2.64	97.7
5-04	20.0	0.36	0.94	533.730	332	77	70	0.60	2.75	100.1
5-05	25.0	0.32	0.83	536.260	330	78	71	0.57	2.53	97.3
LEAK CHECK	25.0			536.335						
4-01	30.0	0.41	1.10	539.230	331	77	73	0.64	2.89	98.4
4-02	35.0	0.48	1.30	542.510	333	80	74	0.69	3.28	102.9
4-03	40.0	0.34	0.88	545.140	334	83	76	0.58	2.63	97.5
4-04	45.0	0.35	0.91	547.810	337	82	77	0.59	2.67	97.8
4-05	50.0	0.35	0.91	550.485	326	81	77	0.59	2.68	97.4
LEAK CHECK	50.0			550.540						
3-01	55.0	0.47	1.20	553.640	329	80	78	0.69	3.10	97.6
3-02	60.0	0.47	1.20	556.730	333	83	78	0.69	3.09	97.3
3-03	65.0	0.44	1.10	559.850	332	84	79	0.66	3.12	101.2
3-04	70.0	0.40	1.00	562.680	332	81	79	0.63	2.83	96.6
3-05	75.0	0.38	0.99	565.485	331	81	79	0.62	2.81	98.1
LEAK CHECK	75.0			565.530						
2-01	80.0	0.46	1.20	568.650	332	80	79	0.68	3.12	99.4
2-02	85.0	0.48	1.30	571.880	331	82	79	0.69	3.23	100.5
2-03	90.0	0.50	1.30	575.120	333	82	79	0.71	3.24	98.9
2-04	95.0	0.38	0.99	577.950	333	84	79	0.62	2.83	98.8
2-05	100.0	0.37	0.96	580.695	335	82	79	0.61	2.75	97.5
LEAK CHECK	100.0			580.740						
1-01	105.0	0.34	0.88	583.370	314	82	79	0.58	2.63	96.1
1-02	110.0	0.28	0.73	585.730	317	81	79	0.53	2.36	95.3
1-03	115.0	0.42	1.10	588.780	326	81	79	0.65	3.05	101.2
1-04	120.0	0.40	1.00	591.610	327	82	78	0.63	2.83	96.2
1-05	125.0	0.40	1.00	594.445	327	82	78	0.63	2.84	96.4
Final	125.0		1.01800	71.12000	329.92000	77.94000		0.62468	71.12000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6247	1.0180	71.1200	329.9200	77.9400				
		☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 3 FF Outlet			Test Method:	USEPA Method 29
Test Run:	4			Analyte:	Mercury
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	30.10	Nozzle ID No: 0.2725-1
Project No:	12218		Static P:	-10.7	Nozzle Diameter (D_n): 0.273
Source Area (ft^2):	64.00000		O_2 (dry volume %):	10.02	Probe ID No: 67-8-17
Meter Operator:	P. Bihun	505	CO_2 (dry volume %):	9.37	Pitot C_p: 0.824
Probe Operator:	P. Bihun	505	N_2+CO (dry volume %):	80.61	Pitot Leak Check: ☑Pass ☐Fail
Test Date:	3/27/13				
Start Time:	12:29				
Stop Time:	14:41		H_2O (condensate, ml or gm):	342.0	Meter Box ID. No: 66-6
Leak Rate Before:	0.004 cfm	@ 15 "Hg	H_2O (silica, g):	14.2	Meter ΔH@: 1.82800
Leak Rate After:	0.003 cfm	@ 10 "Hg	Actual Moisture (%):	18.59	Meter Y_d: 0.98540

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			594.720						
5-01	5.0	0.33	0.89	597.370	328	74	76	0.57	2.65	100.4
5-02	10.0	0.33	0.89	600.010	327	76	76	0.57	2.64	99.7
5-03	15.0	0.34	0.92	602.720	328	79	75	0.58	2.71	100.8
5-04	20.0	0.35	0.95	605.460	327	80	75	0.59	2.74	100.3
5-05	25.0	0.34	0.92	608.140	326	80	75	0.58	2.68	99.4
LEAK CHECK	25.0			608.210						
4-01	30.0	0.37	1.00	610.990	326	79	75	0.61	2.78	99.0
4-02	35.0	0.35	0.95	613.730	327	80	75	0.59	2.74	100.3
4-03	40.0	0.35	0.95	616.460	327	81	75	0.59	2.73	99.8
4-04	45.0	0.36	0.97	619.220	326	81	76	0.60	2.76	99.3
4-05	50.0	0.36	0.97	621.970	325	82	76	0.60	2.75	98.8
LEAK CHECK	50.0			622.015						
3-01	55.0	0.37	1.00	624.840	325	80	76	0.61	2.83	100.3
3-02	60.0	0.45	1.20	627.960	326	80	76	0.67	3.12	100.6
3-03	65.0	0.50	1.40	631.350	326	82	76	0.71	3.39	103.5
3-04	70.0	0.43	1.20	634.520	325	82	75	0.66	3.17	104.4
3-05	75.0	0.39	1.10	637.515	323	82	75	0.62	3.00	103.4
LEAK CHECK	75.0			637.550						
2-01	80.0	0.57	1.50	641.100	323	79	75	0.75	3.55	101.8
2-02	85.0	0.52	1.40	644.480	324	82	75	0.72	3.38	101.2
2-03	90.0	0.46	1.20	647.610	324	83	76	0.68	3.13	99.4
2-04	95.0	0.42	1.10	650.580	325	83	76	0.65	2.97	98.7
2-05	100.0	0.47	1.30	653.850	324	83	76	0.69	3.27	102.8
LEAK CHECK	100.0			653.895						
1-01	105.0	0.38	1.00	656.730	301	80	76	0.62	2.84	97.8
1-02	110.0	0.45	1.20	659.900	325	81	76	0.67	3.17	102.0
1-03	115.0	0.60	1.60	663.560	320	82	76	0.77	3.66	101.7
1-04	120.0	0.48	1.30	666.830	322	84	76	0.69	3.27	101.5
1-05	125.0	0.50	1.40	670.220	321	84	76	0.71	3.39	103.0
Final	125.0		1.13240	75.30500	324.04000	78.18000		0.64458	75.30500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6446	1.1324	75.3050	324.0400	78.1800				
		☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 5/29 and 29
Analyte: Particulate/Metals and Mercury

Location: Unit 3 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.42000		9.80000	80.78000	29.89920	1.17834	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.07000		9.23000	80.70000	29.98040	1.15889	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.60000		9.70000	80.70000	29.92400	1.16667	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.37000		10.02000	80.61000	29.90000	1.16115	☑ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Test Method: USEPA Method 5/29 and 29
Location: Unit 3 FF Outlet — Analyte: Particulate/Metals and Mercury
Client: Wheelabrator South Broward, Inc. — Analyst: H. Nguyen
Project No: 12218 — Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	684.4	457.4	227.0
Impinger 2	5%HNO3/10%H2O2	645.4	556.0	89.4
Impinger 3	5%HNO3/10%H2O2	565.7	545.1	20.6
Impinger 4	Empty	440.1	437.0	3.1
Impinger 5	4%KMnO4/10%H2SO4	549.5	547.7	1.8
Impinger 6	4%KMnO4/10%H2SO4	541.2	541.5	-0.3
Impinger 7	Silica Gel	760.4	749.5	10.9
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
341.6	Liquid (gm)		
0.0	less rinse (gm)		
341.6	Net Liquid (gm)	341.6	☑ QA/QC OK
+ 10.9	Silica Gel (gm)	10.9	☑ QA/QC OK
352.5	Total Vlc (gm)	352.5	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	649.8	465.1	184.7
Impinger 2	5%HNO3/10%H2O2	655.2	545.4	109.8
Impinger 3	5%HNO3/10%H2O2	582.5	550.1	32.4
Impinger 4	Empty	431.5	424.5	7.0
Impinger 5	4%KMnO4/10%H2SO4	646.5	643.6	2.9
Impinger 6	4%KMnO4/10%H2SO4	544.5	544.4	0.1
Impinger 7	Silica Gel	774.8	760.0	14.8
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
336.9	Liquid (gm)		
0.0	less rinse (gm)		
336.9	Net Liquid (gm)	336.9	☑ QA/QC OK
+ 14.8	Silica Gel (gm)	14.8	☑ QA/QC OK
351.7	Total Vlc (gm)	351.7	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	626.4	457.2	169.2
Impinger 2	5%HNO3/10%H2O2	661.7	556.5	105.2
Impinger 3	5%HNO3/10%H2O2	575.5	545.6	29.9
Impinger 4	Empty	444.6	436.9	7.7
Impinger 5	4%KMnO4/10%H2SO4	550.3	546.7	3.6
Impinger 6	4%KMnO4/10%H2SO4	538.8	538.8	0.0
Impinger 7	Silica Gel	766.5	750.4	16.1
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
315.6	Liquid (gm)		
0.0	less rinse (gm)		
315.6	Net Liquid (gm)	315.6	☑ QA/QC OK
+ 16.1	Silica Gel (gm)	16.1	☑ QA/QC OK
331.7	Total Vlc (gm)	331.7	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	707.2	465.7	241.5
Impinger 2	5%HNO3/10%H2O2	644.4	559.9	84.5
Impinger 3	5%HNO3/10%H2O2	566.4	551.6	14.8
Impinger 4	Empty	437.9	434.9	3.0
Impinger 5	4%KMnO4/10%H2SO4	653.9	654.4	-0.5
Impinger 6	4%KMnO4/10%H2SO4	536.5	537.8	-1.3
Impinger 7	Silica Gel	722.6	708.4	14.2
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
342.0	Liquid (gm)		
0.0	less rinse (gm)		
342.0	Net Liquid (gm)	342.0	☑ QA/QC OK
+ 14.2	Silica Gel (gm)	14.2	☑ QA/QC OK
356.2	Total Vlc (gm)	356.2	☑ QA/QC OK

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 3 SDA Inlet		**Analyte:**		**HCl**
Test Run:	1				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.90	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.1	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	9.84	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	9.38	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.78	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/26/13				
Start Time:	08:00				
Stop Time:	09:00		H_2O (condensate, ml or gm):	120.9	Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	12.7	Meter ΔH@: 1.69640
Leak Rate After:	0.003 cfm	@ 18 "Hg	Actual Moisture (%):	15.09	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s	Sample ΔH	Metered (dcf)	Stack T_s	Dry Gas Meter $T_{m\text{-}in}$	Dry Gas Meter $T_{m\text{-}out}$	$\sqrt{\Delta P_s}$ (calculated)	Volume (calculated)	Isokinetics (calculated)
	0.0	(in. H_2O)	(in. H_2O)	692.200	(°F)	(°F)	(°F)	($\sqrt{in.}$ H_2O)	(ft^3)	(%)
1-01	5.0		1.20	695.250	480	70	70		3.05	
1-01	10.0		1.20	698.300	481	72	70		3.05	
1-01	15.0		1.20	701.250	480	74	70		2.95	
1-01	20.0		1.20	704.110	482	74	70		2.86	
1-01	25.0		1.20	707.020	482	75	70		2.91	
1-01	30.0		1.20	709.920	484	75	70		2.90	
1-01	35.0		1.20	712.790	482	75	71		2.87	
1-01	40.0		1.20	715.660	482	75	71		2.87	
1-01	45.0		1.20	718.600	481	75	71		2.94	
1-01	50.0		1.20	721.540	481	75	71		2.94	
1-01	55.0		1.20	724.580	484	76	72		3.04	
1-01	60.0		1.20	727.640	484	77	72		3.06	
Final	60.0		1.20000	35.44000	481.91667	72.54167			35.44000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	35.4400	481.9167	72.5417				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

			Test Method:		**USEPA Method 26A**
Location:	Unit 3 SDA Inlet		**Analyte:**		**HCl**
Test Run:	2				
Client:	Wheelabrator South Broward, Inc.		Bar. Press. (in. Hg):	29.90	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.0	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	10.15	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	9.03	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.82	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/26/13				
Start Time:	09:21				
Stop Time:	10:21		H_2O (condensate, ml or gm):	135.3	Meter Box ID. No: 61-11
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	9.6	Meter ΔH@: 1.69640
Leak Rate After:	0.003 cfm	@ 16 "Hg	Actual Moisture (%):	15.85	Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.\ H_2O}$)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			728.000						
1-01	5.0		1.20	731.140	493	83	79		3.14	
1-01	10.0		1.20	734.310	493	84	79		3.17	
1-01	15.0		1.20	737.470	490	85	80		3.16	
1-01	20.0		1.20	740.580	489	88	82		3.11	
1-01	25.0		1.20	743.645	488	89	85		3.06	
1-01	30.0		1.20	746.710	488	89	86		3.07	
1-01	35.0		1.20	749.770	488	89	86		3.06	
1-01	40.0		1.20	752.860	483	90	88		3.09	
1-01	45.0		1.20	755.960	483	91	89		3.10	
1-01	50.0		1.20	759.060	483	91	89		3.10	
1-01	55.0		1.20	762.080	481	92	89		3.02	
1-01	60.0		1.20	765.240	481	92	89		3.16	
Final	60.0		1.20000	37.24000	486.66667	86.83333			37.24000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	37.2400	486.6667	86.8333				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Test Method:
Analyte:

Location: Unit 3 SDA Inlet
Test Run: 3
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Source Area (ft^2): 60.13205
Meter Operator: | 473
Probe Operator: | 473
Test Date: 3/26/13
Start Time: 10:46
Stop Time: 11:46
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 16 "Hg

Bar. Press. (in. Hg): 29.90
Static P: -1.1
O_2 (dry volume %): 9.07
CO_2 (dry volume %): 10.29
N_2+CO (dry volume %): 80.64
H_2O (condensate, ml or gm): 131.5
H_2O (silica, g): 11.2
Actual Moisture (%): 16.02

Nozzle ID No: N/A
Nozzle Diameter (D_n): N/A
Probe ID No: 66-4-7
Pitot C_p: 0.834
Pitot Leak Check: ☑ Pass ☐ Fail
Meter Box ID. No: 61-11
Meter ΔH@: 1.69640
Meter Y_d: 1.00500

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s	Sample ΔH	Metered (dcf)	Stack T_s	Dry Gas Meter $T_{m\text{-}in}$	Dry Gas Meter $T_{m\text{-}out}$	$\sqrt{\Delta P_s}$ (calculated)	Volume (calculated)	Isokinetics (calculated)
	0.0	(in. H_2O)	(in. H_2O)	765.500	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
1-01	5.0		1.20	768.580	478	89	85		3.08	
1-01	10.0		1.20	771.660	478	89	85		3.08	
1-01	15.0		1.20	774.750	480	89	85		3.09	
1-01	20.0		1.20	777.720	480	88	84		2.97	
1-01	25.0		1.20	780.690	480	88	84		2.97	
1-01	30.0		1.20	783.660	479	87	84		2.97	
1-01	35.0		1.20	786.640	479	87	84		2.98	
1-01	40.0		1.20	789.630	479	87	84		2.99	
1-01	45.0		1.20	792.620	478	87	84		2.99	
1-01	50.0		1.20	795.610	478	87	84		2.99	
1-01	55.0		1.20	798.600	478	87	84		2.99	
1-01	60.0		1.20	801.660	480	87	84		3.06	
Final	60.0		1.20000	36.16000	478.91667	85.95833			36.16000	
		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	36.1600	478.9167					
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 3 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.38000		9.84000	80.78000	29.89440	1.17910	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.03000		10.15000	80.82000	29.85080	1.19048	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.29000		9.07000	80.64000	30.00920	1.14966	☑ Fo value within expected range.
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 3 SDA Inlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 26A
Analyte: HCl
Analyst: H. Nguyen
Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	471.1	454.0	17.1
Impinger 2	100 ml 0.1N H2SO4	600.7	529.5	71.2
Impinger 3	100 ml 0.1N H2SO4	565.2	540.5	24.7
Impinger 4	Empty	429.9	422.0	7.9
Impinger 5	Silica Gel	718.8	706.1	12.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
120.9	Liquid (gm)		
0.0	less rinse (gm)		
120.9	Net Liquid (gm)	120.9	☑ QA/QC OK
+ 12.7	Silica Gel (gm)	12.7	☑ QA/QC OK
133.6	Total Vlc (gm)	133.6	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	498.8	457.1	41.7
Impinger 2	100 ml 0.1N H2SO4	630.4	552.8	77.6
Impinger 3	100 ml 0.1N H2SO4	548.9	535.2	13.7
Impinger 4	Empty	485.0	482.7	2.3
Impinger 5	Silica Gel	717.2	707.6	9.6
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
135.3	Liquid (gm)		
0.0	less rinse (gm)		
135.3	Net Liquid (gm)	135.3	☑ QA/QC OK
+ 9.6	Silica Gel (gm)	9.6	☑ QA/QC OK
144.9	Total Vlc (gm)	144.9	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	524.6	461.2	63.4
Impinger 2	100 ml 0.1N H2SO4	601.7	545.8	55.9
Impinger 3	100 ml 0.1N H2SO4	570.3	560.2	10.1
Impinger 4	Empty	423.3	421.2	2.1
Impinger 5	Silica Gel	731.3	720.1	11.2
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
131.5	Liquid (gm)		
0.0	less rinse (gm)		
131.5	Net Liquid (gm)	131.5	☑ QA/QC OK
+ 11.2	Silica Gel (gm)	11.2	☑ QA/QC OK
142.7	Total Vlc (gm)	142.7	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Field Data Printout

Location:	Unit 3 FF Outlet	Test Method:	USEPA Method 26A
Test Run:	1	Analyte:	HCl
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.90
Project No:	12218	Static P:	-9.9
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.86
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	9.47
Probe Operator:		N_2+CO (dry volume %):	80.67
Test Date:	3/26/13		
Start Time:	08:00		
Stop Time:	09:00	H_2O (condensate, ml or gm):	186.7
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	12.9
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	19.48

Nozzle ID No:	N/A		
Nozzle Diameter (D_n):	N/A		
Probe ID No:	67-4-3		
Pitot C_p:	N/A		
Pitot Leak Check:	☑ Pass ☐ Fail		
Meter Box ID. No:	66-18		
Meter ΔH@:	1.91650		
Meter Y_d:	1.00080		

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			246.660						
3-01	5.0		1.50	249.980	296	64	63		3.32	
3-01	10.0		1.50	253.060	296	66	64		3.08	
3-01	15.0		1.50	256.240	295	70	63		3.18	
3-01	20.0		1.50	259.430	296	72	63		3.19	
3-01	25.0		1.50	262.650	295	73	63		3.22	
3-01	30.0		1.50	265.880	296	74	64		3.23	
3-01	35.0		1.50	269.130	294	73	64		3.25	
3-01	40.0		1.50	272.400	297	74	64		3.27	
3-01	45.0		1.50	275.620	290	74	65		3.22	
3-01	50.0		1.50	278.850	293	73	65		3.23	
3-01	55.0		1.50	282.190	294	74	65		3.34	
3-01	60.0		1.50	285.360	293	75	66		3.17	
Final	60.0		1.50000	38.70000	294.58333	67.95833			38.70000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	38.7000	294.5833	67.9583				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

		Test Method:	**USEPA Method 26A**
Location:	Unit 3 FF Outlet	**Analyte:**	**HCl**
Test Run:	2		
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg): 29.90	Nozzle ID No: N/A
Project No:	12218	Static P: -10.1	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000	O_2 (dry volume %): 9.56	Probe ID No: 67-4-3
Meter Operator:	W. Berry 456	CO_2 (dry volume %): 9.76	Pitot C_p: N/A
Probe Operator:		N_2+CO (dry volume %): 80.68	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/26/13		
Start Time:	09:21		
Stop Time:	10:21	H_2O (condensate, ml or gm): 197.7	Meter Box ID. No: 66-18
Leak Rate Before:	0.004 cfm @ 15 "Hg	H_2O (silica, g): 17.4	Meter ΔH@: 1.91650
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%): 20.75	Meter Y_d: 1.00080

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			285.740						
3-01	5.0		1.50	288.920	298	69	66		3.18	
3-01	10.0		1.50	292.150	300	71	66		3.23	
3-01	15.0		1.50	295.370	296	74	66		3.22	
3-01	20.0		1.50	298.580	299	75	67		3.21	
3-01	25.0		1.50	301.800	296	75	67		3.22	
3-01	30.0		1.50	305.090	298	76	68		3.29	
3-01	35.0		1.50	308.350	295	77	68		3.26	
3-01	40.0		1.50	311.590	296	77	68		3.24	
3-01	45.0		1.50	314.820	297	77	69		3.23	
3-01	50.0		1.50	318.040	293	78	69		3.22	
3-01	55.0		1.50	321.290	295	79	70		3.25	
3-01	60.0		1.50	324.535	295	80	70		3.25	
Final	60.0		1.50000	38.79500	296.50000	71.75000			38.79500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	38.7950	296.5000	71.7500				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 3 FF Outlet	Test Method:	USEPA Method 26A
Test Run:	3	Analyte:	HCl
Client:	Wheelabrator South Broward, Inc.	Bar. Press. (in. Hg):	29.90
Project No:	12218	Static P:	-9.1
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.58
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	9.81
Probe Operator:		N_2+CO (dry volume %):	80.61
Test Date:	3/26/13		
Start Time:	10:46		
Stop Time:	11:46	H_2O (condensate, ml or gm):	186.9
Leak Rate Before:	0.005 cfm @ 15 "Hg	H_2O (silica, g):	15.7
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%):	19.93

Nozzle ID No:	N/A
Nozzle Diameter (D_n):	N/A
Probe ID No:	67-4-3
Pitot C_p:	N/A
Pitot Leak Check:	☑ Pass ☐ Fail
Meter Box ID. No:	66-18
Meter ΔH@:	1.91650
Meter Y_d:	1.00080

Traverse Point	Run Time 5.0 min/read	Pitot ΔP_s (in. H_2O)	Sample ΔH (in. H_2O)	Metered (dcf)	Stack T_s (°F)	Dry Gas Meter $T_{m\text{-}in}$ (°F)	Dry Gas Meter $T_{m\text{-}out}$ (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{}$in. H_2O)	Volume (calculated) (ft^3)	Isokinetics (calculated) (%)
	0.0			325.220						
2-01	5.0		1.50	328.480	300	76	72		3.26	
2-01	10.0		1.50	331.720	292	78	73		3.24	
2-01	15.0		1.50	334.920	293	81	73		3.20	
2-01	20.0		1.50	338.160	294	83	74		3.24	
2-01	25.0		1.50	341.390	292	83	74		3.23	
2-01	30.0		1.50	344.640	292	83	75		3.25	
2-01	35.0		1.50	347.910	292	84	76		3.27	
2-01	40.0		1.50	351.170	293	84	76		3.26	
2-01	45.0		1.50	354.420	292	85	77		3.25	
2-01	50.0		1.50	357.780	294	87	78		3.36	
2-01	55.0		1.50	360.950	297	88	79		3.17	
2-01	60.0		1.50	364.210	290	87	80		3.26	
Final	60.0		1.50000	38.99000	293.41667	79.41667			38.99000	
2 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	38.9900	293.4167	79.4167				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Method 26A
Analyte: HCl

Location: Unit 3 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218
Method: EPA Method 3
Fuel Type: Municipal Waste
F_o for Fuel: 1.03 to 1.3

Analyst: S. Brown
Analyst Emp No: 433

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
1	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.47000		9.86000	80.67000	29.90960	1.16579	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.76000		9.56000	80.68000	29.94400	1.16189	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis: CEM
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.81000		9.58000	80.61000	29.95280	1.15392	☑ Fo value within expected range.

Run Number	Trial	Percent CO_2	Percent O_2+CO_2	Percent O_2	Percent N_2	Dry Mol. Weight	F_o	Method of Analysis:
	1							
	2							
	3							
	Avg.							
CEM or Other Avg:								☐ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 3 FF Outlet
Client: Wheelabrator South Broward, Inc.
Project No: 12218

Test Method: USEPA Method 26A
Analyte: HCl
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	484.1	449.5	34.6
Impinger 2	100 ml 0.1N H2SO4	666.4	565.7	100.7
Impinger 3	100 ml 0.1N H2SO4	584.7	542.7	42.0
Impinger 4	Empty	451.1	441.7	9.4
Impinger 5	Silica Gel	737.0	724.1	12.9
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
186.7	Liquid (gm)		
0.0	less rinse (gm)		
186.7	Net Liquid (gm)	186.7	☑ QA/QC OK
+ 12.9	Silica Gel (gm)	12.9	☑ QA/QC OK
199.6	Total Vlc (gm)	199.6	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	478.1	446.5	31.6
Impinger 2	100 ml 0.1N H2SO4	639.0	534.6	104.4
Impinger 3	100 ml 0.1N H2SO4	566.8	519.8	47.0
Impinger 4	Empty	481.0	466.3	14.7
Impinger 5	Silica Gel	688.5	671.1	17.4
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
197.7	Liquid (gm)		
0.0	less rinse (gm)		
197.7	Net Liquid (gm)	197.7	☑ QA/QC OK
+ 17.4	Silica Gel (gm)	17.4	☑ QA/QC OK
215.1	Total Vlc (gm)	215.1	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	474.5	440.8	33.7
Impinger 2	100 ml 0.1N H2SO4	662.8	557.1	105.7
Impinger 3	100 ml 0.1N H2SO4	576.8	539.0	37.8
Impinger 4	Empty	451.1	441.4	9.7
Impinger 5	Silica Gel	717.1	701.4	15.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
186.9	Liquid (gm)		
0.0	less rinse (gm)		
186.9	Net Liquid (gm)	186.9	☑ QA/QC OK
+ 15.7	Silica Gel (gm)	15.7	☑ QA/QC OK
202.6	Total Vlc (gm)	202.6	☑ QA/QC OK

Test Run:

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1				
Impinger 2				
Impinger 3				
Impinger 4				
Impinger 5				
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
	Liquid (gm)		
	less rinse (gm)		
	Net Liquid (gm)		☐ QA/QC OK
	Silica Gel (gm)		☐ QA/QC OK
	Total Vlc (gm)		☐ QA/QC OK

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Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 25, 2013
Start Time 12:29
Stop time 13:03

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
Calibration Checks				
C_{oi}	Initial zero	0.048	0.030	
C_{ui}	Initial upscale	18.128	17.988	
C_{of}	Final zero	0.057	0.045	
C_{uf}	Final upscale	18.085	17.905	
C_{ma}	Actual gas value	18.100	17.900	
	U1 R1 M26A INLET			
C_{Avg}	Average conc.	10.901	8.201	Bad Bag
C_{Gas}	**Bias adjusted**	**10.88**	**8.16**	
	U1 R2 M26A INLET			
C_{Avg}	Average conc.	7.708	11.297	
C_{Gas}	**Bias adjusted**	**7.68**	**11.25**	
	U1 R3 M26A INLET			
C_{Avg}	Average conc.	8.101	11.079	
C_{Gas}	**Bias adjusted**	**8.07**	**11.04**	
	U1 R1 M26A OUTLET			
C_{Avg}	Average conc.	9.242	9.900	
C_{Gas}	**Bias adjusted**	**9.21**	**9.86**	
	U1 R2 M26A OUTLET			
C_{Avg}	Average conc.	7.798	11.297	
C_{Gas}	**Bias adjusted**	**7.76**	**11.25**	
	U1 R3 M26A OUTLET			
C_{Avg}	Average conc.	8.561	10.678	
C_{Gas}	**Bias adjusted**	**8.53**	**10.64**	
	U2 R1 5/29			
C_{Avg}	Average conc.	8.586	10.396	
C_{Gas}	**Bias adjusted**	**8.56**	**10.35**	
	U2 R2 5/29			
C_{Avg}	Average conc.	8.394	10.777	
C_{Gas}	**Bias adjusted**	**8.36**	**10.73**	

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SS CEM Version 06-2004a

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 25, 2013
Start Time 12:29
Stop time 13:03

IGS Bag Analysis

		Channel 1 O2	Channel 2 CO2	
		FF Outlet %dv	FF Outlet %dv	
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	12:30:57	0.147	-0.010	
	12:31:12	0.054	-0.054	
	12:31:27	0.049	0.031	
	12:30:57	0.147	-0.010	
	12:31:12	0.054	-0.054	
	12:31:27	0.049	0.031	
	12:31:42	**0.048**	**0.030**	**ZERO**
	12:31:57	0.045	0.025	
	12:32:12	1.376	-0.063	
	12:32:27	16.623	-0.071	
	12:32:42	20.343	-0.069	
	12:32:57	18.637	-0.069	
	12:33:12	18.034	-0.070	
	12:33:27	18.020	-0.069	
	12:33:42	15.680	2.351	
	12:33:57	-0.041	18.093	
	12:34:12	-0.045	18.102	
	12:34:27	4.800	17.969	
	12:34:42	18.123	17.967	
	12:34:57	18.126	17.979	
	12:35:12	18.127	17.984	
	12:35:27	**18.128**	**17.988**	**SPAN**
	12:35:42	18.154	17.987	
	12:35:57	19.501	8.031	
	12:36:12	12.277	6.822	
	12:36:27	9.628	9.380	
	12:36:42	9.542	9.497	
	12:36:57	9.542	9.501	
	12:37:12	**9.542**	**9.499**	**LINEARITY**
	12:37:27	9.542	9.494	
	12:37:42	13.548	7.250	
	12:37:57	20.156	0.859	
	12:38:12	20.648	0.188	
	12:38:27	16.815	2.451	
	12:38:42	10.704	8.179	
	12:38:57	10.493	8.525	
	12:39:12	**10.901**	**8.201**	**U1 R1 M26A INLET**
	12:39:27	10.923	8.090	
	12:39:42	11.216	8.245	
	12:39:57	18.475	2.719	
	12:40:12	20.559	0.240	
	12:40:27	20.634	0.158	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 25, 2013
Start Time 12:29
Stop time 13:03

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:40:42	20.641	0.151	
12:40:57	20.644	0.147	
12:41:12	20.645	0.147	
12:41:27	20.647	0.146	
12:41:42	20.647	0.140	
12:41:57	14.659	4.076	
12:42:12	8.139	10.703	
12:42:27	7.717	11.263	
12:42:42	7.706	11.288	
12:42:57	**7.708**	**11.297**	**U1 R2 M26A INLET**
12:43:12	7.708	11.298	
12:43:27	15.521	6.039	
12:43:42	20.428	0.451	
12:43:57	19.328	0.657	
12:44:12	10.043	8.669	
12:44:27	8.163	10.988	
12:44:42	**8.101**	**11.079**	**U1 R3 M26A INLET**
12:44:57	8.103	11.089	
12:45:12	8.105	11.096	
12:45:27	8.103	11.105	
12:45:42	9.014	10.946	
12:45:57	18.267	3.090	
12:46:12	20.564	0.270	
12:46:27	20.076	0.270	
12:46:42	11.682	6.994	
12:46:57	9.332	9.779	
12:47:12	9.245	9.895	
12:47:27	**9.242**	**9.900**	**U1 R1 M26A OUTLET**
12:47:42	9.243	9.903	
12:47:57	10.565	9.513	
12:48:12	18.950	2.192	
12:48:27	20.574	0.227	
12:48:42	19.037	0.808	
12:48:57	9.572	9.083	
12:49:12	7.847	11.204	
12:49:27	7.795	11.286	
12:49:42	**7.798**	**11.297**	**U1 R2 M26A OUTLET**
12:49:57	7.800	11.299	
12:50:12	8.751	11.136	
12:50:27	18.227	3.132	
12:50:42	20.562	0.270	
12:50:57	19.908	0.353	
12:51:12	11.029	7.654	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 25, 2013
Start Time 12:29
Stop time 13:03

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:51:27	8.646	10.540	
12:51:42	8.561	10.666	
12:51:57	**8.561**	**10.678**	**U1 R3 M26A OUTLET**
12:52:12	8.559	10.682	
12:52:27	8.560	10.685	
12:52:42	8.561	10.684	
12:52:57	8.562	10.681	
12:53:12	8.558	10.681	
12:53:27	8.606	10.687	
12:53:42	16.533	5.134	
12:53:57	20.497	0.376	
12:54:12	20.657	0.175	
12:54:27	19.950	0.323	
12:54:42	11.015	7.518	
12:54:57	8.672	10.289	
12:55:12	**8.586**	**10.396**	**U2 R1 5/29**
12:55:27	8.584	10.402	
12:55:42	8.582	10.407	
12:55:57	8.580	10.409	
12:56:12	13.282	7.619	
12:56:27	20.127	0.787	
12:56:42	20.599	0.192	
12:56:57	20.194	0.215	
12:57:12	10.950	7.523	
12:57:27	8.450	10.670	
12:57:42	8.394	10.766	
12:57:57	**8.394**	**10.777**	**U2 R2 5/29**
12:58:12	8.393	10.782	
12:58:27	10.988	9.595	
12:58:42	19.712	1.422	
12:58:57	20.167	0.197	
12:59:12	5.770	0.098	
12:59:27	0.182	0.052	
12:59:42	**0.057**	**0.045**	**ZERO**
12:59:57	0.054	0.043	
13:00:12	0.051	0.042	
13:00:27	0.372	0.041	
13:00:42	14.730	0.108	
13:00:57	20.390	0.149	
13:01:12	20.640	0.147	
13:01:27	19.441	6.353	
13:01:42	18.173	16.778	
13:01:57	18.079	17.851	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 25, 2013
Start Time 12:29
Stop time 13:03

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
13:02:12	**18.085**	**17.905**	**SPAN**
13:02:27	18.091	17.919	
13:02:42	18.097	17.924	
13:02:57	18.101	17.929	
13:03:12	18.485	16.635	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 15:12
Stop time 15:29

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.012	0.029
C_{ui}	Initial upscale	18.022	17.946
C_{of}	Final zero	0.040	0.076
C_{uf}	Final upscale	18.041	17.888
C_{ma}	Actual gas value	18.100	17.900
		U1 R1 5/29	
C_{Avg}	Average conc.	8.234	10.960
C_{Gas}	**Bias adjusted**	**8.25**	**10.93**
		U2 R1 M23	
C_{Avg}	Average conc.	8.443	10.687
C_{Gas}	**Bias adjusted**	**8.46**	**10.66**
		U2 R3 5/29	
C_{Avg}	Average conc.	8.566	10.667
C_{Gas}	**Bias adjusted**	**8.58**	**10.64**

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15:13:52	0.015	0.027	
15:14:07	0.012	0.029	
15:13:52	0.015	0.027	
15:14:07	**0.012**	**0.029**	**ZERO**
15:14:22	2.570	0.031	
15:14:37	16.476	5.672	
15:14:52	17.924	16.370	
15:15:07	17.946	17.516	
15:15:22	18.011	17.715	
15:15:37	18.027	17.928	
15:15:52	**18.022**	**17.946**	**SPAN**
15:16:07	17.977	17.896	
15:16:22	18.029	17.956	
15:16:37	18.039	17.961	
15:16:52	16.719	10.662	
15:17:07	10.088	9.160	
15:17:22	9.463	9.496	
15:17:37	9.447	9.497	
15:17:52	9.445	9.494	
15:18:07	9.491	9.493	
15:18:22	16.857	4.544	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 15:12
Stop time 15:29

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
15:18:37	20.497	0.307	
15:18:52	20.643	0.128	
15:19:07	20.644	0.116	
15:19:22	20.646	0.108	
15:19:37	19.726	0.375	
15:19:52	10.637	8.094	
15:20:07	8.395	10.843	
15:20:22	8.309	10.982	
15:20:37	**8.234**	**10.960**	**U1 R1 5/29**
15:20:52	8.305	10.964	
15:21:07	8.296	10.998	
15:21:22	8.310	11.003	
15:21:37	13.223	7.271	
15:21:52	9.745	9.086	
15:22:08	8.475	10.645	
15:22:22	8.443	10.684	
15:22:37	**8.443**	**10.687**	**U2 R1 M23**
15:22:52	8.556	10.691	
15:23:07	16.971	4.615	
15:23:22	20.511	0.268	
15:23:37	20.641	0.128	
15:23:52	20.642	0.116	
15:24:07	20.642	0.110	
15:24:22	20.640	0.108	
15:24:37	20.330	0.128	
15:24:52	11.812	6.759	
15:25:07	8.697	10.465	
15:25:22	**8.566**	**10.667**	**U2 R3 5/29**
15:25:37	8.565	10.685	
15:25:52	8.565	10.690	
15:26:07	8.567	10.696	
15:26:22	12.401	8.557	
15:26:37	20.000	1.014	
15:26:52	19.733	4.440	
15:27:07	18.167	16.617	
15:27:22	**18.041**	**17.888**	**SPAN**
15:27:37	18.040	17.936	
15:27:52	18.038	17.947	
15:28:07	18.031	13.051	
15:28:22	4.995	1.665	
15:28:37	0.233	0.163	
15:28:52	**0.040**	**0.076**	**ZERO**
15:29:07	0.031	0.065	

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Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 15:12
Stop time 15:29

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2
	FF Outlet %dv	**FF Outlet %dv**
15:29:22	6.221	0.068
15:29:37	19.262	0.109
15:29:52	19.970	0.137

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 11:50
Stop time 12:14

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.037	0.008
C_{ui}	Initial upscale	18.116	17.918
C_{of}	Final zero	0.044	0.027
C_{uf}	Final upscale	18.097	17.890
C_{ma}	Actual gas value	18.100	17.900
	U1 R2 5/29		
C_{Avg}	Average conc.	8.350	10.736
C_{Gas}	**Bias adjusted**	**8.32**	**10.73**
	U3 R1 M26A OUTLET		
C_{Avg}	Average conc.	9.881	9.479
C_{Gas}	**Bias adjusted**	**9.86**	**9.47**
	U3 R2 M26A OUTLET		
C_{Avg}	Average conc.	9.585	9.774
C_{Gas}	**Bias adjusted**	**9.56**	**9.76**
	U3 R3 M26A OUTLET		
C_{Avg}	Average conc.	9.601	9.818
C_{Gas}	**Bias adjusted**	**9.58**	**9.81**
	U3 R1 M26A INLET		
C_{Avg}	Average conc.	9.866	9.393
C_{Gas}	**Bias adjusted**	**9.84**	**9.38**
	U3 R2 M26A INLET		
C_{Avg}	Average conc.	10.176	9.038
C_{Gas}	**Bias adjusted**	**10.15**	**9.03**
	U3 R3 M26A INLET		
C_{Avg}	Average conc.	9.090	10.296
C_{Gas}	**Bias adjusted**	**9.07**	**10.29**

040813 123405

11:51:01	0.344	0.015
11:51:16	-0.238	0.011
11:51:01	0.344	0.015

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 11:50
Stop time 12:14

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
11:51:16	-0.238	0.011	
11:51:31	-0.202	0.008	
11:51:46	0.008	0.009	
11:52:01	**0.037**	**0.008**	**ZERO**
11:52:16	0.037	0.009	
11:52:31	4.465	0.019	
11:52:46	18.213	8.320	
11:53:01	18.552	18.175	
11:53:16	18.279	18.553	
11:53:31	18.144	17.925	
11:53:46	18.113	17.922	
11:54:01	18.114	17.922	
11:54:16	18.114	17.924	
11:54:31	**18.116**	**17.918**	**SPAN**
11:54:46	18.474	16.914	
11:55:01	15.068	6.514	
11:55:16	9.683	9.320	
11:55:31	9.517	9.522	
11:55:46	9.517	9.526	
11:56:01	9.515	9.526	
11:56:16	**9.517**	**9.526**	**LINEARITY**
11:56:31	13.330	7.515	
11:56:46	20.342	0.662	
11:57:01	20.668	0.111	
11:57:16	20.661	0.120	
11:57:31	20.651	0.118	
11:57:46	20.607	0.101	
11:58:01	20.649	0.110	
11:58:16	16.849	2.320	
11:58:31	8.930	9.926	
11:58:46	8.396	10.680	
11:59:01	**8.350**	**10.736**	**U1 R2 5/29**
11:59:16	8.340	10.753	
11:59:31	11.258	9.398	
11:59:46	19.908	1.163	
12:00:01	20.642	0.138	
12:00:16	18.065	1.487	
12:00:31	10.498	8.599	
12:00:46	9.889	9.462	
12:01:01	**9.881**	**9.479**	**U3 R1 M26A OUTLET**
12:01:16	9.882	9.486	
12:01:31	12.750	8.067	
12:01:46	20.121	0.897	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 11:50
Stop time 12:14

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
12:02:01	20.408	0.247	
12:02:16	14.608	4.249	
12:02:31	9.735	9.506	
12:02:46	9.585	9.767	
12:03:01	**9.585**	**9.774**	**U3 R2 M26A OUTLET**
12:03:16	9.585	9.780	
12:03:31	13.491	7.584	
12:03:46	20.331	0.639	
12:04:01	20.665	0.128	
12:04:16	20.637	0.115	
12:04:31	13.281	5.384	
12:04:46	9.683	9.665	
12:05:01	**9.601**	**9.818**	**U3 R3 M26A OUTLET**
12:05:16	9.603	9.828	
12:05:31	12.898	8.102	
12:05:46	20.226	0.814	
12:06:01	19.800	0.369	
12:06:16	11.363	7.430	
12:06:31	9.891	9.353	
12:06:46	**9.866**	**9.393**	**U3 R1 M26A INLET**
12:07:01	9.866	9.402	
12:07:16	11.710	8.723	
12:07:31	19.811	1.305	
12:07:46	20.638	0.140	
12:08:01	14.773	4.088	
12:08:16	10.353	8.793	
12:08:31	10.195	9.015	
12:08:46	**10.176**	**9.038**	**U3 R2 M26A INLET**
12:09:01	10.166	9.051	
12:09:16	16.403	5.020	
12:09:31	20.503	0.291	
12:09:46	19.550	0.477	
12:10:01	10.555	8.268	
12:10:16	9.110	10.246	
12:10:31	**9.090**	**10.296**	**U3 R3 M26A INLET**
12:10:46	9.090	10.303	
12:11:01	16.449	5.294	
12:11:16	20.536	0.270	
12:11:31	18.586	10.847	
12:11:47	18.053	17.616	
12:12:01	18.088	17.873	
12:12:16	**18.097**	**17.890**	**SPAN**
12:12:31	18.714	15.458	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 11:50
Stop time 12:14

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:12:46	20.480	2.041	
12:13:01	16.267	0.168	
12:13:16	0.981	0.049	
12:13:31	0.055	0.033	
12:13:46	**0.044**	**0.027**	**ZERO**
12:14:01	2.167	0.025	
12:14:16	18.247	0.091	

Prepared by Clean Air Engineering Proprietary Software
SS CEM Version 06-2004a

Wheelabrator March 26, 2013
CleanAir Project No. 12218 Start Time 17:09
South Broward Stop time 17:41
FF Outlet, SDA Inlet **IGS Bag Analysis**

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	-0.024	0.024
C_{ui}	Initial upscale	18.050	17.920
C_{of}	Final zero	-0.003	0.054
C_{uf}	Final upscale	18.027	17.863
C_{ma}	Actual gas value	18.100	17.900
		U1 R3 5/29	
C_{Avg}	Average conc.	7.692	11.142
C_{Gas}	**Bias adjusted**	7.73	**11.13**
		U1 R4 M29	
C_{Avg}	Average conc.	8.578	10.598
C_{Gas}	**Bias adjusted**	**8.61**	**10.59**
		U3 R1 5/29	
C_{Avg}	Average conc.	9.756	9.433
C_{Gas}	**Bias adjusted**	**9.80**	**9.42**
		U2 R2 M23	
C_{Avg}	Average conc.	8.591	10.349
C_{Gas}	**Bias adjusted**	**8.63**	**10.34**
		U2 R3 M23	
C_{Avg}	Average conc.	9.436	9.815
C_{Gas}	**Bias adjusted**	**9.48**	**9.80**

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17:10:33	0.441	0.028	
17:10:48	0.033	0.024	
17:10:33	0.441	0.028	
17:10:48	0.033	0.024	
17:11:03	-0.023	0.024	
17:11:18	**-0.024**	**0.024**	**ZERO**
17:11:33	1.521	0.025	
17:11:48	17.054	0.799	
17:12:03	16.665	12.732	
17:12:18	16.195	15.536	
17:12:33	16.172	15.708	
17:12:48	17.352	12.935	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 17:09
Stop time 17:41

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
17:13:03	20.080	2.083	
17:13:18	20.512	0.194	
17:13:33	20.531	0.112	
17:13:48	20.532	0.104	
17:14:03	20.533	0.100	
17:14:18	20.537	0.097	
17:14:33	17.252	1.961	
17:14:48	10.134	8.509	
17:15:03	9.380	9.457	
17:15:18	9.364	9.496	
17:15:33	9.365	9.507	
17:15:48	9.380	9.513	
17:16:03	15.508	11.632	
17:16:18	17.850	17.386	
17:16:33	17.935	17.949	
17:16:48	17.987	17.944	
17:17:03	18.047	17.923	
17:17:18	**18.050**	**17.920**	**SPAN**
17:17:33	18.063	17.919	
17:17:48	16.550	10.046	
17:18:03	9.875	9.240	
17:18:18	9.445	9.563	
17:18:33	**9.439**	**9.567**	**LINEARITY**
17:18:48	9.642	9.569	
17:19:03	18.174	3.496	
17:19:18	20.662	0.194	
17:19:33	20.472	0.126	
17:19:48	10.892	7.245	
17:20:03	7.767	11.035	
17:20:18	7.693	11.134	
17:20:33	**7.692**	**11.142**	**U1 R3 5/29**
17:20:48	9.080	10.795	
17:21:03	18.881	2.369	
17:21:18	20.616	0.179	
17:21:33	17.487	1.877	
17:21:48	9.279	9.613	
17:22:03	8.588	10.577	
17:22:18	**8.578**	**10.598**	**U1 R4 M29**
17:22:33	10.443	9.913	
17:22:48	19.305	1.866	
17:23:03	20.195	0.151	
17:23:18	11.919	6.596	
17:23:33	9.814	9.341	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 26, 2013
Start Time 17:09
Stop time 17:41

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
17:23:48	9.758	9.432	
17:24:03	**9.756**	**9.433**	**U3 R1 5/29**
17:24:18	11.363	8.879	
17:24:33	19.479	1.653	
17:24:48	20.654	0.153	
17:25:03	15.705	3.216	
17:25:18	9.011	9.768	
17:25:33	8.601	10.330	
17:25:48	**8.591**	**10.349**	**U2 R2 M23**
17:26:03	10.043	9.919	
17:26:18	18.946	2.194	<-- Paused at 17:26:26
17:36:23	20.680	0.077	
17:36:38	18.316	1.304	
17:36:53	10.650	8.293	
17:37:08	9.480	9.724	
17:37:23	9.436	9.802	
17:37:38	**9.436**	**9.815**	**U2 R3 M23**
17:37:53	10.164	9.709	
17:38:08	18.327	2.955	
17:38:23	20.536	0.252	
17:38:38	18.792	10.772	
17:38:53	18.062	17.324	
17:39:08	18.022	17.827	
17:39:23	**18.027**	**17.863**	**SPAN**
17:39:38	18.139	17.799	
17:39:53	12.015	6.121	
17:40:08	0.912	0.492	
17:40:23	0.019	0.076	
17:40:38	**-0.003**	**0.054**	**ZERO**
17:40:53	1.188	0.047	
17:41:08	16.114	0.085	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 11:14
Stop time 12:17

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	-0.012	0.000
C_{ui}	Initial upscale	18.138	17.939
C_{of}	Final zero	0.012	0.012
C_{uf}	Final upscale	18.126	17.915
C_{ma}	Actual gas value	18.100	17.900
		U2 R1 M26A OUTLET	
C_{Avg}	Average conc.	8.789	10.533
C_{Gas}	**Bias adjusted**	**8.77**	**10.51**
		U2 R2 M26A OUTLET	
C_{Avg}	Average conc.	8.883	10.513
C_{Gas}	**Bias adjusted**	**8.87**	**10.49**
		U2 R1 M26A INLET	
C_{Avg}	Average conc.	8.240	11.057
C_{Gas}	**Bias adjusted**	**8.23**	**11.04**
		U2 R2 M26A INLET	
C_{Avg}	Average conc.	8.396	10.999
C_{Gas}	**Bias adjusted**	**8.38**	**10.98**
		U3 R2 M5/29	
C_{Avg}	Average conc.	9.243	10.087
C_{Gas}	**Bias adjusted**	**9.23**	**10.07**
		U2 R3 M26A OUTLET	
C_{Avg}	Average conc.	9.718	9.683
C_{Gas}	**Bias adjusted**	**9.70**	**9.67**
		U2 R3 M26A INLET	
C_{Avg}	Average conc.	9.339	9.953
C_{Gas}	**Bias adjusted**	**9.32**	**9.94**
		U2 R4 M23	
C_{Avg}	Average conc.	9.134	10.152
C_{Gas}	**Bias adjusted**	**9.12**	**10.13**

Prepared by Clean Air Engineering Proprietary Software
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Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 11:14
Stop time 12:17

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
040813_123405			
11:15:15	1.253	0.008	
11:15:30	-0.043	0.012	
11:15:45	-0.006	0.004	
11:15:15	1.253	0.008	
11:15:30	-0.043	0.012	
11:15:45	-0.006	0.004	
11:16:00	-0.012	-0.001	
11:16:15	**-0.012**	**0.000**	**ZERO**
11:16:30	-0.013	0.000	
11:16:45	0.964	0.000	
11:17:00	15.944	0.492	
11:17:15	18.522	12.911	
11:17:30	18.245	17.691	
11:17:45	18.076	17.759	
11:18:00	18.196	18.006	
11:18:15	18.240	18.056	
11:18:30	18.242	17.969	
11:18:45	18.222	17.924	
11:19:00	18.159	17.927	
11:19:15	18.142	17.935	
11:19:30	**18.138**	**17.939**	**SPAN**
11:19:45	18.139	17.940	
11:20:00	18.138	17.946	
11:20:15	18.140	17.949	
11:20:30	18.141	17.951	
11:20:45	19.422	10.398	
11:21:00	13.395	6.155	
11:21:15	9.683	9.374	
11:21:30	9.504	9.583	
11:21:45	9.499	9.587	
11:22:00	9.499	9.587	
11:22:15	**9.499**	**9.588**	**LINEARITY**
11:22:30	9.499	9.586	
11:22:45	13.077	7.631	
11:23:00	20.146	0.922	
11:23:15	20.620	0.138	
11:23:30	13.094	5.641	
11:23:45	9.026	10.230	
11:24:00	**8.789**	**10.533**	**U2 R1 M26A OUTLET**
11:24:15	8.783	10.545	
11:24:30	8.780	10.544	
11:24:45	8.993	10.548	

Prepared by Clean Air Engineering Proprietary Software
SS CEM Version 08-2004a

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 11:14
Stop time 12:17

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
11:25:00	17.197	4.401	
11:25:15	16.988	2.425	
11:25:30	9.721	9.288	
11:25:45	8.890	10.396	
11:26:00	8.883	10.506	
11:26:15	8.883	10.509	
11:26:30	**8.883**	**10.513**	**U2 R2 M26A OUTLET**
11:26:45	8.883	10.513	
11:27:00	8.887	10.517	
11:27:15	15.720	5.836	
11:27:30	20.434	0.471	
11:27:45	20.026	0.287	
11:28:00	11.083	7.644	
11:28:15	8.369	10.889	
11:28:30	**8.240**	**11.057**	**U2 R1 M26A INLET**
11:28:45	8.234	11.070	
11:29:00	8.234	11.076	
11:29:15	8.235	11.079	
11:29:30	12.801	8.296	
11:29:45	20.015	1.001	
11:30:00	20.683	0.149	
11:30:15	19.909	0.333	
11:30:30	11.048	7.790	
11:30:45	8.520	10.822	
11:31:00	8.401	10.986	
11:31:15	**8.396**	**10.999**	**U2 R2 M26A INLET**
11:31:30	8.398	11.001	
11:31:45	8.398	11.000	
11:32:00	10.619	10.028	
11:32:15	19.207	1.949	
11:32:30	20.639	0.202	
11:32:45	20.676	0.134	
11:33:00	14.718	4.217	
11:33:15	9.598	9.599	
11:33:30	**9.243**	**10.087**	**U3 R2 M5/29**
11:33:45	9.231	10.113	
11:34:00	9.231	10.120	
11:34:15	9.231	10.124	
11:34:30	9.231	10.124	
11:34:45	9.234	10.126	
11:35:00	11.961	8.743	
11:35:15	19.635	1.429	
11:35:30	20.662	0.173	<-- Paused at 11:35:34

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 11:14
Stop time 12:17

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:05:40	20.678	0.096	
12:05:55	20.671	0.094	
12:06:10	14.784	4.171	
12:06:25	10.077	9.164	
12:06:40	9.728	9.652	
12:06:55	**9.718**	**9.683**	**U2 R3 M26A OUTLET**
12:07:10	9.719	9.689	
12:07:25	9.720	9.692	
12:07:40	10.394	9.584	
12:07:55	16.391	3.974	
12:08:10	10.837	8.224	
12:08:25	9.449	9.887	
12:08:40	**9.339**	**9.953**	**U2 R3 M26A INLET**
12:08:55	9.376	9.948	
12:09:10	9.371	9.951	
12:09:25	15.858	5.654	
12:09:40	20.518	0.321	
12:09:55	19.993	0.279	
12:10:10	11.269	7.483	
12:10:25	9.195	10.077	
12:10:40	9.138	10.173	
12:10:55	9.139	10.181	
12:11:10	**9.134**	**10.152**	**U2 R4 M23**
12:11:25	9.139	10.189	
12:11:40	11.260	9.247	
12:11:55	19.341	1.763	
12:12:10	20.644	0.191	
12:12:25	19.990	0.123	
12:12:40	4.933	0.053	
12:12:55	0.151	0.022	
12:13:10	0.020	0.018	
12:13:25	0.014	0.017	
12:13:40	**0.012**	**0.012**	**ZERO**
12:13:55	0.010	0.012	
12:14:10	0.010	0.011	
12:14:25	0.006	0.011	
12:14:40	8.264	0.055	
12:14:55	19.897	0.110	
12:15:10	20.519	0.361	
12:15:25	18.593	12.894	
12:15:40	18.130	17.569	
12:15:55	18.120	17.791	
12:16:10	18.124	17.899	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 11:14
Stop time 12:17

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:16:25	**18.126**	**17.915**	**SPAN**
12:16:40	18.126	17.922	
12:16:55	18.124	17.923	
12:17:10	19.387	11.003	
12:17:25	20.617	0.902	

Wheelabrator March 27, 2013
CleanAir Project No. 12218 Start Time 14:32
South Broward Stop time 14:48
FF Outlet, SDA Inlet

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.031	0.005
C_{ui}	Initial upscale	18.081	17.889
C_{of}	Final zero	0.040	0.039
C_{uf}	Final upscale	18.086	17.859
C_{ma}	Actual gas value	18.100	17.900
		U3 R3 5/29	
C_{Avg}	Average conc.	9.711	9.594
C_{Gas}	**Bias adjusted**	**9.70**	**9.60**
		U2 R4 M29	
C_{Avg}	Average conc.	9.397	10.017
C_{Gas}	**Bias adjusted**	**9.39**	**10.02**
		U3 R4 M29	
C_{Avg}	Average conc.	10.023	9.366
C_{Gas}	**Bias adjusted**	**10.02**	**9.37**

040813 123405

14:33:14	20.604	0.113	
14:33:14	20.604	0.113	
14:33:29	17.125	0.112	
14:33:44	1.727	0.027	
14:33:59	0.056	0.006	
14:34:14	0.035	0.005	
14:34:29	**0.031**	**0.005**	**ZERO**
14:34:44	0.031	0.004	
14:34:59	11.945	0.890	
14:35:14	18.051	14.229	
14:35:29	18.083	17.582	
14:35:44	18.080	17.885	
14:35:59	**18.081**	**17.889**	**SPAN**
14:36:14	18.116	17.888	
14:36:29	19.051	8.062	
14:36:44	11.711	7.468	
14:36:59	9.567	9.412	
14:37:14	9.482	9.510	
14:37:29	**9.481**	**9.512**	**LINEARITY**
14:37:44	10.464	9.301	
14:37:59	18.626	2.505	

Wheelabrator
CleanAir Project No. 12218
South Broward
FF Outlet, SDA Inlet

March 27, 2013
Start Time 14:32
Stop time 14:48

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
14:38:14	20.585	0.211	
14:38:29	18.946	0.901	
14:38:44	11.075	7.909	
14:38:59	9.756	9.514	
14:39:14	9.711	9.587	
14:39:29	**9.711**	**9.594**	**U3 R3 5/29**
14:39:44	10.630	9.397	
14:39:59	18.530	2.643	
14:40:14	20.558	0.225	
14:40:29	18.997	0.864	
14:40:44	10.716	7.960	
14:40:59	9.433	9.864	
14:41:14	9.396	10.007	
14:41:29	**9.397**	**10.017**	**U2 R4 M29**
14:41:44	9.399	10.024	
14:41:59	15.320	6.034	
14:42:14	20.297	0.578	
14:42:29	20.615	0.146	
14:42:44	20.616	0.129	
14:42:59	20.614	0.121	
14:43:14	20.612	0.116	
14:43:29	20.238	0.157	
14:43:44	12.733	6.181	
14:43:59	10.201	9.200	
14:44:14	10.091	9.409	
14:44:29	10.061	9.344	
14:44:44	**10.023**	**9.366**	**U3 R4 M29**
14:44:59	10.091	9.405	
14:45:14	12.540	8.179	
14:45:29	18.038	10.117	
14:45:44	18.058	17.157	
14:45:59	18.087	17.808	
14:46:14	18.086	17.837	
14:46:29	18.085	17.851	
14:46:44	**18.086**	**17.859**	**SPAN**
14:46:59	18.085	17.874	
14:47:14	18.328	13.540	
14:47:29	5.500	1.780	
14:47:44	0.255	0.146	
14:47:59	0.046	0.051	
14:48:14	**0.040**	**0.039**	**ZERO**

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SS CEM Version 06-2004a

WHEELABRATOR SOUTH BROWARD, INC.
Clean Air Project No: 12218
Location: Ash Unloading Area
Date (2013): March 27
Start Time: 7:55
End Time: 9:05

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	7:55 8:15	20	13
2	8:20 8:40	20	0
3	8:45 9:05	20	0

Total (% of observation time) = 0.36

Total (minutes) = 0.22

WHEELABRATOR SOUTH BROWARD, INC.
Clean Air Project No: 12218
Location: Door to Baghouse / Ash Unloading
Date (2013): March 27
Start Time: 10:20
End Time: 11:30

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	10:20 10:40	20	0
2	10:45 11:05	20	0
3	11:10 11:30	20	0

Total (% of observation time) = 0.0

Total (minutes) = 0.0

WHEELABRATOR SOUTH BROWARD, INC.
Clean Air Project No: 12218
Location: Rolling Door/Door to Baghouse
Date (2013): March 27
Start Time: 12:30
End Time: 13:40

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	12:30 12:50	20	0
2	12:55 13:15	20	0
3	13:20 13:40	20	0

Total (% of observation time) = 0.0

Total (minutes) = 0.0

LABORATORY DATA

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I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: MR

Date: 5/6/13

CleanAir.

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Gravimetric Laboratory Data Summary for FPM

Run No. ☐ Draft Lab Data		Blank	1	2	3
Date (2013)			Mar 25	Mar 26	Mar 26
Start Time (approx.)			12:26	07:51	10:25
Stop Time (approx.)			14:40	10:03	12:36
	Analytical Detection Limits				
MDL_f	Minimum detection limit for filter (g)	0.00010			
MDL_s	Minimum detection limit for solvent rinse (g)	0.00010			
	Filter(s)				
m_{f1}	Filter No. 1 residue mass (g)		0.00220	0.00190	0.00190
m_{f2}	Filter No. 2 residue mass (g)				
m_{f3}	Filter No. 3 residue mass (g)				
m_{f4}	Filter No. 4 residue mass (g)				
m_{filter}	*Total filter residue (g)*		0.00220	0.00190	0.00190
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		150	78	94
v_{a1}	Aliquot volume (mL)	144	150	78	94
r_{a1}	Aliquot residue mass (g)	0.00040	0.00460	0.00260	0.00190
r_{s1}	Sample residue mass (g)		0.00460	0.00260	0.00190
m_{b1}	Allowable blank correction (g)		0.00042	0.00022	0.00026
m_1	Net residue mass (g)		0.00418	0.00238	0.00164
	Second Solvent Rinse				
	N/A				
ρ_2	Density (g/mL)				
v_{s2}	Sample volume (mL)				
v_{a2}	Aliquot volume (mL)				
r_{a2}	Aliquot residue mass (g)				
r_{s2}	Sample residue mass (g)				
m_{b2}	Allowable blank correction (g)				
m_2	Net residue mass (g)		0.00000	0.00000	0.00000
m_s	*Total Solvent Residue (g)*		0.00418	0.00238	0.00164
m_T	*Total Gravimetric Result (g)*		0.00638	0.00428	0.00354
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.00638	0.00428	0.00354
n_{MDL}	*Number of Non-Detectable Fractions*		N/A	N/A	N/A
DLC	*Detection Level Classification*		ADL	ADL	ADL

Comments:

For analytical results below detection limits:

Run samples are treated as the entire value of the MDL in calculations.

Reagent blank samples are treated as zero in calculations.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Gravimetric Laboratory Data Summary for FPM

Run No. ☐ Draft Lab Data		Blank	1	2	3
Date (2013)			Mar 25	Mar 25	Mar 25
Start Time (approx.)			07:59	10:32	13:04
Stop Time (approx.)			10:11	12:45	15:17
	Analytical Detection Limits				
MDL_f	Minimum detection limit for filter (g)	0.00010			
MDL_s	Minimum detection limit for solvent rinse (g)	0.00010			
	Filter(s)				
m_{f1}	Filter No. 1 residue mass (g)		0.00480	0.00440	0.00530
m_{f2}	Filter No. 2 residue mass (g)				
m_{f3}	Filter No. 3 residue mass (g)				
m_{f4}	Filter No. 4 residue mass (g)				
m_{filter}	*Total filter residue (g)*		0.00480	0.00440	0.00530
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		74	52	82
v_{a1}	Aliquot volume (mL)	144	74	52	82
r_{a1}	Aliquot residue mass (g)	0.00040	0.00700	0.00480	0.00400
r_{s1}	Sample residue mass (g)		0.00700	0.00480	0.00400
m_{b1}	Allowable blank correction (g)		0.00021	0.00014	0.00023
m_1	Net residue mass (g)		0.00679	0.00466	0.00377
	Second Solvent Rinse				
	N/A				
ρ_2	Density (g/mL)				
v_{s2}	Sample volume (mL)				
v_{a2}	Aliquot volume (mL)				
r_{a2}	Aliquot residue mass (g)				
r_{s2}	Sample residue mass (g)				
m_{b2}	Allowable blank correction (g)				
m_2	Net residue mass (g)		0.00000	0.00000	0.00000
m_s	*Total Solvent Residue (g)*		0.00679	0.00466	0.00377
m_T	*Total Gravimetric Result (g)*		0.01159	0.00906	0.00907
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.01159	0.00906	0.00907
n_{MDL}	*Number of Non-Detectable Fractions*		N/A	N/A	N/A
DLC	*Detection Level Classification*		ADL	ADL	ADL

Comments:

For analytical results below detection limits:

Run samples are treated as the entire value of the MDL in calculations.

Reagent blank samples are treated as zero in calculations.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/202 (FPM/CPM)
Gravimetric Laboratory Data Summary for FPM

Run No. ☐ Draft Lab Data		Blank	1	2	3
Date (2013)			Mar 26	Mar 27	Mar 27
Start Time (approx.)			12:11	07:28	09:59
Stop Time (approx.)			14:24	09:41	12:11
	Analytical Detection Limits				
MDL_f	Minimum detection limit for filter (g)	0.00010			
MDL_a	Minimum detection limit for solvent rinse (g)	0.00010			
	Filter(s)				
m_{f1}	Filter No. 1 residue mass (g)		0.00940	0.01080	0.00930
m_{f2}	Filter No. 2 residue mass (g)				
m_{f3}	Filter No. 3 residue mass (g)				
m_{f4}	Filter No. 4 residue mass (g)				
m_{filter}	*Total filter residue (g)*		0.00940	0.01080	0.00930
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		130	42	146
v_{a1}	Aliquot volume (mL)	144	130	42	146
r_{a1}	Aliquot residue mass (g)	0.00040	0.00650	0.00890	0.01340
r_{s1}	Sample residue mass (g)		0.00650	0.00890	0.01340
m_{b1}	Allowable blank correction (g)		0.00036	0.00012	0.00041
m_1	Net residue mass (g)		0.00614	0.00878	0.01299
	Second Solvent Rinse				
	N/A				
ρ_2	Density (g/mL)				
v_{s2}	Sample volume (mL)				
v_{a2}	Aliquot volume (mL)				
r_{a2}	Aliquot residue mass (g)				
r_{s2}	Sample residue mass (g)				
m_{b2}	Allowable blank correction (g)				
m_2	Net residue mass (g)		0.00000	0.00000	0.00000
m_s	*Total Solvent Residue (g)*		0.00614	0.00878	0.01299
m_T	*Total Gravimetric Result (g)*		0.01554	0.01958	0.02229
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.01554	0.01958	0.02229
n_{MDL}	*Number of Non-Detectable Fractions*		N/A	N/A	N/A
DLC	*Detection Level Classification*		ADL	ADL	ADL

Comments:

For analytical results below detection limits:

Run samples are treated as the entire value of the MDL in calculations.

Reagent blank samples are treated as zero in calculations.

Detection level classifications are defined as follows:

ADL = Above Detection Level - all fractions are above detection limit

DLL = Detection Level Limited - some fractions are below detection limit

BDL = Below Detection Limit - all fractions are below detection limit

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 25	Mar 26	Mar 26
Start Time (approx.)		12:26	07:51	10:25
Stop Time (approx.)		14:40	10:03	12:36
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	0.2729	<0.2000	<0.2000
m_{FB}	Matter collected in front half blank (µg)	<0.2000	<0.2000	<0.2000
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.0000	0.0000	0.0000
m_n	Total matter corrected for allowable blanks (µg)	0.2729	<0.2000	<0.2000

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 25	Mar 26	Mar 26
Start Time (approx.)		12:26	07:51	10:25
Stop Time (approx.)		14:40	10:03	12:36
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	0.8561	0.5509	0.5243
m_{FB}	Matter collected in front half blank (µg)	0.3264	0.3264	0.3264
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.3264	0.3264	0.3264
m_n	Total matter corrected for allowable blanks (µg)	0.5297	0.2245	<0.2000

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 25	Mar 25	Mar 25
Start Time (approx.)		07:59	10:32	13:04
Stop Time (approx.)		10:11	12:45	15:17
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	2.0285	2.0936	1.7367
m_{FB}	Matter collected in front half blank (µg)	<0.2000	<0.2000	<0.2000
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.0000	0.0000	0.0000
m_n	Total matter corrected for allowable blanks (µg)	2.0285	2.0936	1.7367

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 25	Mar 25	Mar 25
Start Time (approx.)		07:59	10:32	13:04
Stop Time (approx.)		10:11	12:45	15:17
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	11.6146	16.3997	19.2155
m_{FB}	Matter collected in front half blank (µg)	0.3264	0.3264	0.3264
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.3264	0.3264	0.3264
m_n	Total matter corrected for allowable blanks (µg)	11.2882	16.0733	18.8891

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Cadmium (Cd) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 26	Mar 27	Mar 27
Start Time (approx.)		12:11	07:28	09:59
Stop Time (approx.)		14:24	09:41	12:11
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	5.2617	3.6665	4.1661
m_{FB}	Matter collected in front half blank (µg)	<0.2000	<0.2000	<0.2000
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.0000	0.0000	0.0000
m_n	Total matter corrected for allowable blanks (µg)	5.2617	3.6665	4.1661

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 5/29 (Particulate/Metals)
Lead (Pb) Laboratory Parameters

Run No.		1	2	3
Date (2013)		Mar 26	Mar 27	Mar 27
Start Time (approx.)		12:11	07:28	09:59
Stop Time (approx.)		14:24	09:41	12:11
Combined Front and Back Analyses				
$m_{F\text{-}DL}$	Front half detection limit (µg)	0.2000	0.2000	0.2000
m_{FS}	Matter collected in front half sample (µg)	40.0660	27.3831	32.2038
m_{FB}	Matter collected in front half blank (µg)	0.3264	0.3264	0.3264
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.3264	0.3264	0.3264
m_n	Total matter corrected for allowable blanks (µg)	39.7396	27.0566	31.8773

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Laboratory Parameters

Detection Limits		
m_{1b-DL}	Fraction 1B Detection Limit (µg)	0.1000
m_{2b-DL}	Fraction 2B Detection Limit (µg)	0.2000
m_{3a-DL}	Fraction 3A Detection Limit (µg)	0.2000
m_{3b-DL}	Fraction 3B Detection Limit (µg)	0.5000
m_{3c-DL}	Fraction 3C Detection Limit (µg)	0.4000
Blank Analysis		
m_{1b-B}	Fraction 1B Blank (µg)	<0.1000
m_{2b-B}	Fraction 2B Blank (µg)	<0.2000
m_{3a-B}	Fraction 3A Blank (µg)	<0.2000
m_{3b-B}	Fraction 3B Blank (µg)	<0.5000
m_{3c-B}	Fraction 3C Blank (µg)	<0.4000
$m_{total-B}$	Total Blank Amount (µg)	<1.4000

Run No.		**1**	**2**	**3**	**4**
Date (2013)		Mar 25	Mar 26	Mar 26	Mar 26
Start Time (approx.)		12:26	07:51	10:25	12:59
Stop Time (approx.)		14:40	10:03	12:36	15:11
Sample Analysis					
m_{1b-S}	Fraction 1B Sample (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{2b-S}	Fraction 2B Sample (µg)	<0.8000	<0.8000	<0.7000	<0.7000
m_{3a-S}	Fraction 3A Sample (µg)	<0.2000	<0.2000	<0.2000	<0.2000
m_{3b-S}	Fraction 3B Sample (µg)	<0.5000	<0.5000	<0.5000	<0.5000
m_{3c-S}	Fraction 3C Sample (µg)	<0.4000	<0.4000	<0.4000	<0.4000
$m_{total-S}$	Total Sample Amount (µg)	<0.8000	<0.8000	<0.7000	<0.7000
Allowable Blank					
$m_{T-B-allow}$	Total Allowable Blank (µg)	0.0000	0.0000	0.0000	0.0000
Sample Corrected for Blank					
m_n	Total Sample Amount (µg)	<0.8000	<0.8000	<0.7000	<0.7000
Sample Corrected for Blank - Prorated Fractions					
m_{n-1b}	Fraction 1B (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{n-2b}	Fraction 2B (µg)	<0.8000	<0.8000	<0.7000	<0.7000
m_{n-3a}	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000
m_{n-3b}	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000
m_{n-3c}	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Laboratory Parameters

Detection Limits		
m_{1b-DL}	Fraction 1B Detection Limit (µg)	0.1000
m_{2b-DL}	Fraction 2B Detection Limit (µg)	0.2000
m_{3a-DL}	Fraction 3A Detection Limit (µg)	0.2000
m_{3b-DL}	Fraction 3B Detection Limit (µg)	0.5000
m_{3c-DL}	Fraction 3C Detection Limit (µg)	0.4000
Blank Analysis		
m_{1b-B}	Fraction 1B Blank (µg)	<0.1000
m_{2b-B}	Fraction 2B Blank (µg)	<0.2000
m_{3a-B}	Fraction 3A Blank (µg)	<0.2000
m_{3b-B}	Fraction 3B Blank (µg)	<0.5000
m_{3c-B}	Fraction 3C Blank (µg)	<0.4000
$m_{total-B}$	Total Blank Amount (µg)	<1.4000

Run No.		**1**	**2**	**3**	**4**
Date (2013)		Mar 25	Mar 25	Mar 25	Mar 27
Start Time (approx.)		07:59	10:32	13:04	12:07
Stop Time (approx.)		10:11	12:45	15:17	14:22
Sample Analysis					
m_{1b-S}	Fraction 1B Sample (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{2b-S}	Fraction 2B Sample (µg)	0.8805	1.0329	1.0367	1.1187
m_{3a-S}	Fraction 3A Sample (µg)	<0.2000	<0.2000	<0.2000	<0.2000
m_{3b-S}	Fraction 3B Sample (µg)	<0.5000	<0.5000	<0.5000	<0.5000
m_{3c-S}	Fraction 3C Sample (µg)	<0.4000	<0.4000	<0.4000	<0.4000
$m_{total-S}$	Total Sample Amount (µg)	0.8805	1.0329	1.0367	1.1187
Allowable Blank					
$m_{T-B-allow}$	Total Allowable Blank (µg)	0.0000	0.0000	0.0000	0.0000
Sample Corrected for Blank					
m_n	Total Sample Amount (µg)	0.8805	1.0329	1.0367	1.1187
Sample Corrected for Blank - Prorated Fractions					
m_{n-1b}	Fraction 1B (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{n-2b}	Fraction 2B (µg)	0.8805	1.0329	1.0367	1.1187
m_{n-3a}	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000
m_{n-3b}	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000
m_{n-3c}	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 29 (Mercury)
Mercury (Hg) Laboratory Parameters

Detection Limits		
$m_{1b\text{-}DL}$	Fraction 1B Detection Limit (µg)	0.1000
$m_{2b\text{-}DL}$	Fraction 2B Detection Limit (µg)	0.2000
$m_{3a\text{-}DL}$	Fraction 3A Detection Limit (µg)	0.2000
$m_{3b\text{-}DL}$	Fraction 3B Detection Limit (µg)	0.5000
$m_{3c\text{-}DL}$	Fraction 3C Detection Limit (µg)	0.4000
Blank Analysis		
$m_{1b\text{-}B}$	Fraction 1B Blank (µg)	<0.1000
$m_{2b\text{-}B}$	Fraction 2B Blank (µg)	<0.2000
$m_{3a\text{-}B}$	Fraction 3A Blank (µg)	<0.2000
$m_{3b\text{-}B}$	Fraction 3B Blank (µg)	<0.5000
$m_{3c\text{-}B}$	Fraction 3C Blank (µg)	<0.4000
$m_{total\text{-}B}$	Total Blank Amount (µg)	<1.4000

Run No.		**1**	**2**	**3**	**4**
Date (2013)		Mar 26	Mar 27	Mar 27	Mar 27
Start Time (approx.)		12:11	07:28	09:59	12:29
Stop Time (approx.)		14:24	09:41	12:11	14:41
Sample Analysis					
$m_{1b\text{-}S}$	Fraction 1B Sample (µg)	<0.1000	0.1468	<0.1000	0.1548
$m_{2b\text{-}S}$	Fraction 2B Sample (µg)	1.3447	3.1709	3.2687	2.4133
$m_{3a\text{-}S}$	Fraction 3A Sample (µg)	<0.2000	<0.2000	<0.2000	<0.2000
$m_{3b\text{-}S}$	Fraction 3B Sample (µg)	<0.5000	<0.5000	<0.5000	<0.5000
$m_{3c\text{-}S}$	Fraction 3C Sample (µg)	<0.4000	<0.4000	<0.4000	<0.4000
$m_{total\text{-}S}$	Total Sample Amount (µg)	1.3447	3.3176	3.2687	2.5681
Allowable Blank					
$m_{T\text{-}B\text{-}allow}$	Total Allowable Blank (µg)	0.0000	0.0000	0.0000	0.0000
Sample Corrected for Blank					
m_n	Total Sample Amount (µg)	1.3447	3.3176	3.2687	2.5681
Sample Corrected for Blank - Prorated Fractions					
$m_{n\text{-}1b}$	Fraction 1B (µg)	<0.1000	0.1468	<0.1000	0.1548
$m_{n\text{-}2b}$	Fraction 2B (µg)	1.3447	3.1709	3.2687	2.4133
$m_{n\text{-}3a}$	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000
$m_{n\text{-}3b}$	Fraction 3B (µg)	<0.5000	<0.5000	<0.5000	<0.5000
$m_{n\text{-}3c}$	Fraction 3C (µg)	<0.4000	<0.4000	<0.4000	<0.4000

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Clean Air Engineering, Inc.

500 West Wood Street
Palatine, IL 60067

Project Number: 12218

Particulate Matter, Cadmium, Lead,
& Mercury

EPA Methods 29 & 5 Analyses

Analytical Report
20241

Element One, Inc.
6319-D Carolina Beach Rd., Wilmington, NC 28412
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 20241
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Daphne Woodman, Chemist
April 15, 2013

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
April 15, 2013

SUMMARY OF RESULTS

Summary of Analysis

Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	H_2O_2 /HNO_3 µg	Empty Impinger µg	$KMnO_4$ µg	HCl µg
U1 FF Outlet R1	#1	< 0.8	< 0.1	< 0.8	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.8	< 0.2	< 0.5	< 0.4
U1 FF Outlet R2	#1	< 0.8	< 0.1	< 0.8	< 0.2	< 0.6	< 0.4
	#2		< 0.1	< 0.8	< 0.2	< 0.6	< 0.4
U1 FF Outlet R3	#1	< 0.7	< 0.1	< 0.7	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.7	< 0.2	< 0.5	< 0.4
U1 FF Outlet R4	#1	< 0.7	< 0.1	< 0.7	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.7	< 0.2	< 0.5	< 0.4
U2 FF Outlet R1	#1	0.881	< 0.1	0.872	< 0.2	< 0.5	< 0.4
	#2		< 0.1	0.889	< 0.2	< 0.5	< 0.4
U2 FF Outlet R2	#1	1.03	< 0.1	1.04	< 0.2	< 0.5	< 0.4
	#2		< 0.1	1.02	< 0.2	< 0.5	< 0.4
U2 FF Outlet R3	#1	1.04	< 0.1	1.03	< 0.2	< 0.5	< 0.4
	#2		< 0.1	1.04	< 0.2	< 0.5	< 0.4
U2 FF Outlet R4	#1	1.12	< 0.1	1.13	< 0.2	< 0.5	< 0.4
	#2		< 0.1	1.11	< 0.2	< 0.5	< 0.4
U3 FF Outlet R1	#1	1.34	< 0.1	1.35	< 0.2	< 0.5	< 0.4
	#2		< 0.1	1.33	< 0.2	< 0.5	< 0.4
U3 FF Outlet R2	#1	3.32	0.148	3.17	< 0.2	< 0.6	< 0.4
	#2		0.146	3.17	< 0.2	< 0.6	< 0.4
U3 FF Outlet R3	#1	3.27	< 0.1	3.28	< 0.2	< 0.5	< 0.4
	#2		< 0.1	3.26	< 0.2	< 0.5	< 0.4
U3 FF Outlet R4	#1	2.57	0.157	2.43	< 0.2	< 0.5	< 0.4
	#2		0.153	2.40	< 0.2	< 0.5	< 0.4
Field Blank	#1	< 0.5	< 0.1	< 0.3	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.3	< 0.2	< 0.5	< 0.4
Reagent Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4

Summary of Analysis

Unit 1 - Summary of Method 5 Particulate Analysis

Fraction	U1-FF-Outlet-R1 e20241-1 Catch, mg	U1-FF-Outlet-R2 e20241-2 Catch, mg	U1-FF-Outlet-R3 e20241-3 Catch, mg
Filter	2.2	1.9	1.9
Rinse	4.6	2.6	1.9
Total PM	6.8	4.5	3.8

Unit 1 - Summary of Method 29 Metals Analysis

Element	U1-FF-Outlet-R1 e20241-1 Total µg	U1-FF-Outlet-R2 e20241-2 Total µg	U1-FF-Outlet-R2 e20241-2 dup Total µg	U1-FF-Outlet-R3 e20241-3 Total µg
Cadmium	0.273	< 0.2	< 0.2	< 0.2
Lead	0.856	0.562	0.540	0.524

Summary of Analysis

Unit 2 - Summary of Method 5 Particulate Analysis

Fraction	U2-FF-Outlet-R1 e20241-5 Catch, mg	U2-FF-Outlet-R2 e20241-6 Catch, mg	U2-FF-Outlet-R3 e20241-7 Catch, mg
Filter	4.8	4.4	5.3
Rinse	7.0	4.8	4.0
Total PM	11.8	9.2	9.3

Unit 2 - Summary of Method 29 Metals Analysis

Element	U2-FF-Outlet-R1 e20241-5 Total µg	U2-FF-Outlet-R2 e20241-6 Total µg	U2-FF-Outlet-R2 e20241-6 dup Total µg	U2-FF-Outlet-R3 e20241-7 Total µg
Cadmium	2.03	2.11	2.08	1.74
Lead	11.6	16.4	16.4	19.2

Summary of Analysis

Unit 3 - Summary of Method 5 Particulate Analysis

Fraction	U3-FF-Outlet-R1 e20241-9 Catch, mg	U3-FF-Outlet-R2 e20241-10 Catch, mg	U3-FF-Outlet-R3 e20241-11 Catch, mg
Filter	9.4	10.8	9.3
Rinse	6.5	8.9	13.4
Total PM	15.9	19.7	22.7

Unit 3 - Summary of Method 29 Metals Analysis

Element	U3-FF-Outlet-R1 e20241-9 Total µg	U3-FF-Outlet-R2 e20241-10 Total µg	U3-FF-Outlet-R2 e20241-10 dup Total µg	U3-FF-Outlet-R3 e20241-11 Total µg
Cadmium	5.26	3.69	3.65	4.17
Lead	40.1	27.5	27.3	32.2

Summary of Analysis

Blanks - Summary of Method 5 Particulate Analysis

Fraction	Reagent Blank e20241-14 Catch, mg
Filter	--------
Rinse	0.4
Total PM	0.4

Blanks - Summary of Method 29 Metals Analysis

Element	Field Blank e20241-13 Total µg	Reagent Blank e20241-14 Total µg
Cadmium	< 0.2	< 0.2
Lead	0.461	0.326

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Clean Air, IL	Element One #:	20241
Client ID:	12218 South Broward	Analyst:	LAL & DBW
Method:	Methods 29 & 5	Dates Received:	04/02/13
Analytes:	PM, Cd, Pb & Hg	Dates Analyzed:	04/08-15/13

Summary of Analysis

The Method 5 particulate samples were analyzed in accordance with EPA Method 5 guidelines. Particulate samples were weighed to a constant weight of ±0.5mg and reported to the nearest 0.1mg. The Method 29 samples were digested, prepared, and analyzed according to Method 29 protocol. Samples were analyzed for mercury on a PerkinElmer FIMS-100 CVAA mercury analyzer. The samples were analyzed for metals on a PerkinElmer ELAN 6100 ICP-MS.

Detection Limits

The FIMS-100 CVAA instrument reporting limit for mercury was 0.004 µg per aliquot analyzed. The ICP-MS instrument reporting limit was 1.0µg/L for the metals.

Analysis QA/QC

Duplicate analyses relative percent difference (RPD), spike sample recovery and second source calibration verification data are summarized in the Quality Control Section. All QA/QC data was within the criteria of the method.

Additional Comments

The reported results have not been corrected for any blank values or spike recovery values. The Method 5 blank correction factor has not been implemented. The ICP analysis of the Field Blank and Reagent Blank samples revealed detectable concentrations of lead.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Mercury Duplicate Analysis RPD

(Method 29 QC limits: < 10% for RPD)

Run Number	Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
U1 FF Outlet R1	NA	NA	NA	NA	NA
U1 FF Outlet R2	NA	NA	NA	NA	NA
U1 FF Outlet R3	NA	NA	NA	NA	NA
U1 FF Outlet R4	NA	NA	NA	NA	NA
U2 FF Outlet R1	NA	1.9%	NA	NA	NA
U2 FF Outlet R2	NA	1.8%	NA	NA	NA
U2 FF Outlet R3	NA	0.6%	NA	NA	NA
U2 FF Outlet R4	NA	2.0%	NA	NA	NA
U3 FF Outlet R1	NA	1.5%	NA	NA	NA
U3 FF Outlet R2	1.0%	0.2%	NA	NA	NA
U3 FF Outlet R3	NA	0.6%	NA	NA	NA
U3 FF Outlet R4	2.3%	1.3%	NA	NA	NA
Field Blank	NA	NA	NA	NA	NA
Reagent Blank	NA	NA	NA	NA	NA

Mercury Spike Recoveries

(Method 29 QC limits: ± 25% for Spike Recoveries)

Run Number		Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
U1 FF Outlet R3	#1	88%	98%	93%	86%	102%
	#2	87%	97%	92%	86%	102%
U2 FF Outlet R3	#1	99%	93%	95%	85%	101%
	#2	100%	94%	95%	85%	100%
U3 FF Outlet R3	#1	103%	81%	96%	89%	103%
	#2	104%	80%	95%	88%	102%

Summary of Quality Control Data

Metals Duplicate Analysis RPD

(Method 29 QC limits: < 20% for RPD)

Element	U1-FF-Outlet-R2 RPD	U2-FF-Outlet-R2 RPD	U3-FF-Outlet-R2 RPD
Cadmium	NA	1.1%	1.1%
Lead	4.1%	0.6%	0.9%

Metals Analysis Spike Recoveries

(Method 29 QC limits: ± 25% for Spike Recoveries)

Element	U1-FF-Outlet-R3 Recovery	U2-FF-Outlet-R3 Recovery	U3-FF-Outlet-R3 Recovery
Cadmium	95%	113%	102%
Lead	95%	114%	106%

Second Source Calibration Check Recoveries

(QC limits: ±10% for Second Source Continuing Check Standard)*

Element	1 ppb	50 ppb	100 ppb*	250 ppb
Cadmium	105%	99%	99%	100%
Lead	97%	92%	99%	101%

SAMPLE CUSTODY

20241

CLIENT	Wheelabrator	PROJECT	12218SB
PLANT	South Broward	DEPT.	66
PROJECT MANAGER	S. Brown		

66-12218SB-9

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	1	QUARTZ FILTER PETRI DISH

FORWARDING LAB
Element One, Inc.
6519-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

ANALYSIS REQUESTED

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Quartz Filter No. e45-40	1		X	X	X		Metals include: Cadmium (Cd) Lead (Pb)
	3/26	Unit 1 FF Outlet	2	Quartz Filter No. e54-38	1		X	X	X		
	3/26	Unit 1 FF Outlet	3	Quartz Filter No. e54-37	1		X	X	X		
	3/26	Unit 1 FF Outlet	4	Quartz Filter	1				X		
	3/27	FF Outlet	Field Blank	Quartz Filter	1			X	X		
	3/25	Unit 2 FF Outlet	1	Quartz Filter No. e45-11	1		X	X	X		
	3/25	Unit 2 FF Outlet	2	Quartz Filter No. e45-10	1		X	X	X		
	3/25	Unit 2 FF Outlet	3	Quartz Filter No. e54-30	1		X	X	X		
	3/27	Unit 2 FF Outlet	4	Quartz Filter	1				X		
	3/26	Unit 3 FF Outlet	1	Quartz Filter No. e54-38	1		X	X	X		
	3/27	Unit 3 FF Outlet	2	Quartz Filter No. e54-34	1		X	X	X		
	3/27	Unit 3 FF Outlet	3	Quartz Filter No. e54-33	1		X	X	X		
	3/27	Unit 3 FF Outlet	4	Quartz Filter	1				X		Front and Back combined analysis.

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
[signature]	4/2/13 1042					[signature] 4/1/2013

Samples received in good condition in Fisherbrand & QEC Level 2 containers. No empty container received - [initials]

2024I

86-12218SB-10

CLIENT: Wheelabrator
PLANT: South Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218SB
DEPT.: 60

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-9033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	2	FRONT HALF ACETONE RINSE 250 mL CLEAR GLASS

ANALYSIS REQUESTED: Gravimetric; Metals; Mercury; Archive

FORWARDING LAB
Element One, Inc
6316-D Carolina Beach Road
Wilmington, NC 28412
910-790-0128 (phone)
910-799-6953 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
											Metals include: Cadmium (Cd), Lead (Pb)
	3/25	Unit 1 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/26	Unit 1 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/26	Unit 1 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/25	Unit 2 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/26	Unit 2 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/26	Unit 2 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/26	Unit 3 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/27	Unit 3 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		Front and Back combined analysis
	3/27	Unit 3 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/27	Field Blank	NA	Front Half Acetone Rinse, 250 mL Clear Glass	1			X	X		

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time
S. Brown	4/1/2013 13:00				
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**
Lisa Bratton	4/2/13 1042				

This form completed by: S. Brown
Signature: [signature] Date: 4/1/2013

20241

CLIENT	Wheelabrator
PLANT	South Broward
PROJECT MANAGER	S. Brown
PROJECT	12218SB
DEPT.	68

68-12218SB-1

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3265 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	3	FRONT HALF HNO_3 RINSE 250 mL HDLP

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/26	Unit 1 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/26	Unit 1 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			Metals include: Cadmium (Cd) Lead (Pb)
	3/26	Unit 1 FF Outlet	4	Front Half HNO_3 Rinse, 250 mL HDLP	1			X			
		FF Outlet	Field Blank	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/25	Unit 2 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/25	Unit 2 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/26	Unit 2 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/27	Unit 2 FF Outlet	4	Front Half HNO_3 Rinse, 250 mL HDLP	1			X			
	3/26	Unit 3 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/27	Unit 3 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/27	Unit 3 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/27	Unit 3 FF Outlet	4	Front Half HNO_3 Rinse, 250 mL HDLP	1			X			
											Front and Back combined analysis.

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
Lisa Breton	4/2/13 1042					4/1/2013

20241

CLIENT	Wheelabrator	PROJECT	12218SB
PLANT	South Broward	DEPT.	66
PROJECT MANAGER	S. Brown		

66-12218SB-12

CleanAir Engineering
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	4	IMPINGERS 1-3 CATCH AND RINSE 1000 mL HDLP

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

ANALYSIS REQUESTED

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/26	Unit 1 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/26	Unit 1 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		Metals include: Cadmium (Cd) Lead (Pb)
	3/26	Unit 1 FF Outlet	4	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
		FF Outlet	Field Blank	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1				X		
	3/25	Unit 2 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/25	Unit 2 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/25	Unit 2 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/27	Unit 2 FF Outlet	4	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1				X		
	3/25	Unit 3 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/27	Unit 3 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/27	Unit 3 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X	X		
	3/27	Unit 3 FF Outlet	4	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1				X		
											Front and Back combined analysis.

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:	
S. Brown	4/1/2013 11:00					S. Brown	
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature**	**Date**
Lisa Braxton	4/2/13 0942					[signature]	4/1/2013

2024/

66-12218SB-13

CLIENT: Wheelabrator
PLANT: South Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218SB
DEPT: 66

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5A	IMPINGER 4 CATCH AND RINSE 250 mL HDLP

CleanAir Engineering
500 West Wood Street
Palatine, IL 60067
800-627-0533 (phone)
847-991-3385 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSES REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/26	Unit 1 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/26	Unit 1 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/26	Unit 1 FF Outlet	4	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
		FF Outlet	Field Blank	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/25	Unit 2 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/25	Unit 2 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/26	Unit 2 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/27	Unit 2 FF Outlet	4	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/26	Unit 3 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/27	Unit 3 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/27	Unit 3 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/27	Unit 3 FF Outlet	4	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6553 (fax)

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
Lisa Brinton	4/2/13 1042					4/1/2013

20241

CLIENT	Wheelabrator
PLANT	South Broward
PROJECT MANAGER	S. Brown
PROJECT	12218SB
DEPT.	66

66-12218SB-14

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5B	IMPINGERS 5-6 CATCH AND RINSE 950 mL AMBER GLASS

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

ANALYSIS REQUESTED

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
		FF Outlet	Field Blank	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/25	Unit 2 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/25	Unit 2 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/26	Unit 2 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/27	Unit 2 FF Outlet	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/26	Unit 3 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1				X		

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
[signature]	4/2/13 1042					[signature] 4/1/2013

elementOne
20241 CAE M29-5 Report Packet
Page 20 of 46

20241

CLIENT Wheelabrator
PLANT South Broward
PROJECT MANAGER S. Brown

PROJECT 12218SB
DEPT. 86

68-12218SB-15

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5C	IMPINGERS 5-6 8N HCL RINSE 250 mL AMBER GLASS

CleanAir.
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

ANALYSIS REQUESTED

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/25	Unit 1 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/26	Unit 1 FF Outlet	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
		FF Outlet	Field Blank	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/25	Unit 2 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/25	Unit 2 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/25	Unit 2 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/27	Unit 2 FF Outlet	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/26	Unit 3 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/27	Unit 3 FF Outlet	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
Lisa Barton	4/2/13 1042					4/1/2013

2024 /

CLIENT	Wheelabrator
PLANT	South Broward
PROJECT MANAGER	S. Brown
PROJECT	12218SB
DEPT	66
	66-12218SB-16

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3285 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	SEE BELOW (IF APPLICABLE)	REAGENT BLANKS

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6853 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/28	Reagent Blank	All	Acetone (200 mL), Container 7: 250 mL Clear Glass	1		X	X	X		
	3/28	Reagent Blank	All	0.1 N HNO_3 (300 mL), Container 8A: 1000 mL HDPE	1			X	X		Metals include: Cadmium (Cd) Lead (Pb)
	3/28	Reagent Blank	All	DI Water (100 mL), Container 8B: 250 mL HDPE	1			X	X		
	3/28	Reagent Blank	All	5% HNO_3 / 10% H_2O_2 (200 mL), Container 9: 250 mL HDPE	1			X	X		
	3/28	Reagent Blank	All	4% $KMnO_4$ / 10% H_2SO_4 (100 mL), Container 10: 250 mL Amber Glass	1				X		
	3/28	Reagent Blank	All	DI Water (200 mL) / 8N HCl (25 mL), Container 11: 250 mL Amber Glass	1				X		
	3/28	Reagent Blank	All	Quartz Filters (3), Container 12: 250 mL HDPE	1			X	X		

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	4/1/2013 11:00					S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
[signature]	4/2/13 1040					[signature] 4/1/2013

ANALYTICAL DATA

Analytical Calculations

Metals-

Element Results (µg) =ICP Results (µg/L)*Dilution*Final Volume (L)

Where-

ICP Results= Raw sample concentration (ppb)--*ICP-Data Sheet*

Dilution= Diluted Volume--*ICP-MS Run Sheet*
Aliquot

Final Volume=FH=Final Volume (FV)--*Sample Submission*
BH=Received Volume (BV).*Final Volume (FV)--*Sample Submission*
Aliquot (Used)
Combined Results=FH+BH

Mercury-

$$\textbf{Mercury Results (µg)} = \frac{\textbf{CVAA Results (µg)}}{\textbf{Aliquot (ml)}} * \textbf{Final Volume (ml)}$$

Where-

CVAA Results= Raw sample reading (µg)--*Hg-Data Sheet*

Aliquot= Sample Aliquot (Alq.)--*Hg-Data Sheet*

Final Volume=Final Volume (FV)*--*Sample Submission*
* With the exception of the BH fraction where-
=Received Volume (BV)--*Sample Submission*

Analytical Calculations

Spike Recovery-

$$\text{Spike (\%)} = \frac{\text{(Spiked Result (µg/L) – Sample Result (µg/L))}}{\text{Spike Amount (µg/L)}} \quad \text{X100}$$

Where-

Spike Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Sample Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Spike Amount--*ICP-MS Spike Table*

Duplicate Analysis RPD-

$$\text{RPD (\%)} = \frac{\text{(Duplicate Result (µg/L) - Sample Result (µg/L))}}{\text{Average (µg/L)}} \quad \text{X100}$$

Where-

Sample Result =Raw sample concentration (ppb)--*ICP-Data Sheet*

Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

Average= $\frac{(\textit{Duplicate + Sample Results})}{2}$

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 20241**

FH / BH Combined

Analysis Due Date 04.10.13
QA/QC/Report Due Date 04.12.13

Client	Clean Air IL	Date Rec	04.02.13
Project No	12218 SB	Time Rec	1042

HNO_3 Lot: 111210	HF Lot: 5112070	HCl Lot: 5141 2070	**Ref. Method: 29 / 5**
Volume Marked Y / N	Volume Loss Y / N ?		

Sample Identification

1	U1 FF Outlet R1	5	U2 FF Outlet R1	9	U3 FF Outlet R1
2	U1 FF Outlet R2	6	U2 FF Outlet R2	10	U3 FF Outlet R2
	U1 FF Outlet R2 Duplicate		U2 FF Outlet R2 Duplicate		U3 FF Outlet R2 Duplicate
3	U1 FF Outlet R3	7	U2 FF Outlet R3	11	U3 FF Outlet R3
	U1 FF Outlet R3 Spike		U2 FF Outlet R3 Spike		U3 FF Outlet R3 Spike
4	U1 FF Outlet R4	8	U2 FF Outlet R4	12	U3 FF Outlet R4
				13	Field Blank
				14	Reagent Blank

Analyses Requested	Samples 1-14	Hg
	Samples 1-3, 5-7, 9-11, 13-14	Cd, Pb
	Samples 1-3, 5-7, 9-11, 14	PM

Runs / FB	Fil / Ace (FH)		HNO_3 (FH)		5% HNO_3/10% H_2O_2 (BH)			HNO_3 (A)		$KMnO_4$ (B)		HCl (C)	
	pH <2.0	Y / N	pH <2.0	Y / N	pH <2.0	Y / N		pH <2.0	Y / N	pH <2.0	Y / N	pH <2.0	Y / N
Lab ID	Fil ID	BV ml	BV ml	FV ml	BV ml	Used	FV ml	BV ml	FV ml	BV ml	FV ml	BV ml	FV ml
1	45-40	150	125	100	780	390	50	108	200	430	500	220	400
2.D	54-38	78	115		760	390		122		470	600	230	
3.S	54-37	94	135		690	345		106		410	500	200	
4			120		720	360		106		430		210	
5	45-11	74	90		720	360	50	112		370		220	
6.D	45-10	52	110		690	345		110		430		230	
7.S	54-39	82	100		680	340		108		430		230	
8			255		670	335		106		430		210	
9	54-36	130	190		640	320	50	106		390		240	
10.D	54-34	42	120		630	315		110		430 310	600	210	
11.S	54-33	146	145		575	287		104		480	500	220	
12			135		670	335		102		420		215	
13			75		300	150	50	104		390		220	

M-29 Reagent Blank

Lab ID	Fraction			BV, ml	FV, ml	Comments
14	C 7	FH	Acetone	144		
	C 8A	FH	0.1N HNO_3	310	100	Used 100 ml
	C 8A	A	0.1N HNO_3	310	-	
	C 8B	B	DI H_2O	100	100/33	Used 33 ml
	C 9	BH	5% HNO_3/10% H_2O_2	200	50	Used 100 ml
	C 10	B	4% $KMnO_4$/10%H_2SO_4	100	100/33	Used 100 ml
	C 11	C	8N HCl DI H_2O	220		
	C 12	FH	Filter			

Lab Communications (Continued on Sample Submission Page 2) CRB + Spiked w/ 100 ml Std. A @ 25ppm (FH + BH)

M29: Received C1, C2, C3, C4; C5A, C5B, C5C; RB C12, C7, C8A, C8B, C9, C10, C11—04.02.13 LLB

SS Page 1 of 2
4/3/2013 1:48:01 PM
SS by
Labeled By/Date LAL 4.3.13

FH Prep By/Date JWL 4-10-13 A Prep By/Date JWL 4-5-13
BH Prep By/Date JWL 4-5-13 B Prep By/Date JWL 4-5-13
BH/FH Prep By/Date JWL 4-10-13 C Prep By/Date JWL 4-9-13
PM Prep By / Date LAL 4-4-13 ID Verification By/Date JWL/LLS 4-4-13

elementOne **Method 5 Particulate** Lab # 20241

Client Clean Air

Balance checks Date: 04.08.13 2 g = 2.0000
Date: 04.08.13 2 g = 1.9999
Date:

Acetone Concentration 1.53E-05 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 04.08.13 Initials - LAL		Date - 04.09.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
20241-1	e45-40	T-64	0.3581	10:15	0.3603	11:00	0.3607			
20241-2	e54-38	T-42	0.3568	10:15	0.3587	11:00	0.3589			
20241-3	e54-37	T-87	0.3513	10:15	0.3532	11:00	0.3532			
20241-5	e45-11	T-86	0.3439	10:15	0.3487	11:00	0.3497			
20241-6	e45-10	T-85	0.3361	10:15	0.3406	11:00	0.3405			
20241-7	e54-39	T-82	0.3513	10:15	0.3566	11:00	0.3569			
Client Blk										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 04.08.13 Initials - LAL		Date - 04.09.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
20241-1	150	638	10.1349	10:15	10.1395	11:00	10.1395			
20241-2	78	675	10.3043	10:15	10.3070	11:00	10.3069			
20241-3	94	X58	10.4168	10:15	10.4188	11:00	10.4187			
20241-5	74	696	10.3258	10:15	10.3328	11:00	10.3331			
20241-6	52	X66	10.3162	10:15	10.3210	11:00	10.3210			
20241-7	82	554	10.2519	10:15	10.2561	11:00	10.2559			
Client Ace Blk	144	X86	10.2008	10:15	10.2012	11:00	10.2012			
E1 Acetone Blank	100	685	10.5758	10:15	10.5760	11:00	10.5759			

Total Catches

Sample ID #	Filter ID	Filter Tare, g	Final Filter + Catch, g	Filter Catch, mg		Acetone Bag ID	Bag Tare, g	Final Bag - Ace Catch, g	Acetone Catch, mg	Total Catch, mg
20241-1	e45-40	0.3581	0.3603	2.2		638	10.1349	10.1395	4.6	6.8
20241-2	e54-38	0.3568	0.3587	1.9		675	10.3043	10.3069	2.6	4.5
20241-3	e54-37	0.3513	0.3532	1.9		X58	10.4168	10.4187	1.9	3.8
20241-5	e45-11	0.3439	0.3487	4.8		696	10.3258	10.3328	7.0	11.8
20241-6	e45-10	0.3361	0.3405	4.4		X56	10.3162	10.3210	4.8	9.2
20241-7	e54-39	0.3513	0.3566	5.3		554	10.2519	10.2559	4.0	9.3
Client Blk						X86	10.2008	10.2012	0.4	0.4
E1 Blank						685	10.5758	10.5759	0.1	0.1

Element One, Inc. Form 123 - Revision 2.01.24.12

elementOne **Method 5 Particulate** Lab # 20241

Client Page 2 of 2

Balance checks Date: 04.08.13 2 g = 2.0000 Acetone Concentration

Date: 04.09.13 2 g = 1.9999 1.53E-05 mg/mg

Date:

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 04.08.13 Initials - LAL		Date - 04.09.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
20241-9	e54-36	T-81	0.3515	10:15	0.3609	11:00	0.3613			
20241-10	e54-34	T-25	0.3548	10:15	0.3656	11:00	0.3659			
20241-11	e54-33	T-04	0.3521	10:15	0.3614	11:00	0.3618			
Client Blk-14										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 04.08.13 Initials - LAL		Date - 04.09.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
20241-9	130	661	10.5023	10:15	10.5090	11:00	10.5088			
20241-10	42	X16	10.3343	10:15	10.3434	11:00	10.3432			
20241-11	146	558	10.1793	10:15	10.1927	11:00	10.1929			
Client Ace Blk	144	X86	10.2008	10:15	10.2012	11:00	10.2012			
E1 Acetone Blank	100	685	10.5758	10:15	10.5760	11:00	10.5759			

Total Catches

Sample ID #	Filter ID	Filter Tare, g	Final Filter + Catch, g	Filter Catch, mg		Acetone Bag ID	Bag Tare, g	Final Bag + Ace Catch, g	Acetone Catch, mg	Total Catch, mg
20241-9	e54-36	0.3515	0.3609	9.4		661	10.5023	10.5088	6.5	15.9
20241-10	e54-34	0.3548	0.3656	10.8		X16	10.3343	10.3432	8.9	19.7
20241-11	e54-33	0.3521	0.3614	9.3		558	10.1793	10.1927	13.4	22.7
Client Blk-14						X86	10.2008	10.2012	0.4	0.4
E1 Blank						685	10.5758	10.5759	0.1	0.1

Element One, Inc. Form 123 - Revision 2.01.24.12

elementOne **Method 29 Microwave Worksheet** **Lab ID # e** 20241

Client: Clean Air

Date Digested: 4 · 10 · 13 Initials: JWL Worksheet Prepared by: JWL

Auto Sample Loc.	Sample Lab ID 20241	Sample Weight (g)	# of filters digested	Spike	Prep Volume (ml)	Weight In Micro / Weight Out Micro	Units
1	-LRB						
2	-LRB+			100 µl Std. A			
3	-1		1				
4	-2						
5	-3						
6	-4						
7	-5						
8	-6						
9	-7						
10	-8						
11	-9						
12	-10						
13	-11						
14	-12						
15	-13						
16	-14						

LRB+ Spiked w/ 6x 100 µl of Std A @ 25 ppm

- Filter #4 : Some spilled during transfer to hot plate

-14 contained 3 filters, digested middle filter - AOS

Element One, Inc. Form 104 - Revision 1.0

HF lot #: 5112070 (2 mL)

HNO_3 Lot #: 1112110 (6 mL)

Sample/Batch Report

4/15/13

User Name: icp
Computer Name: ICP-MS
Sample File: C:\elandata_icp\Sample\x10.sam
Report Date/Time: Monday, April 15, 2013 09:29:52

A/S Loc	Batch ID	Sample ID	Description	Sample Type	Init. Quan:	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
6		QC Std 2		Sample					
303		20241-1		Sample					
304		20241-2		Sample					
305	d	20241-2		Duplicate of 3					
306		20241-3		Sample					
307	s	20241-3		Spike - 1 of 5					
308		20241-5		Sample					
309		20241-6		Sample					
310	d	20241-6		Duplicate of 8					
311		20241-7		Sample					
312	s	20241-7		Spike - 1 of 10					
313		20241-9		Sample					
314		20241-10		Sample					
315	d	20241-10		Duplicate of 13					
316		20241-11		Sample					
317	s	20241-11		Spike - 1 of 15					
318		20241-13		Sample					
319		20241-14		Sample					
1		QC Std 1		Sample					
3		QC Std 4		Sample					
5		QC Std 2		Sample					
403		20244-4		Sample					
404		20244-5		Sample					
405	d	20244-5		Duplicate of 23					
406		20244-6		Sample					
407	s	20244-6		Spike - 1 of 25					
408		20244-10		Sample					
409		20244-11		Sample					
410	d	20244-11		Duplicate of 28					
411		20244-12		Sample					
412	s	20244-12		Spike - 1 of 30					
413		20244-16		Sample					
414		20244-17		Sample					
415	d	20244-17		Duplicate of 33					
416		20244-18		Sample					
417	s	20244-18		Spike - 1 of 35					
418		20244-19		Sample					
419		20244-20		Sample					
420		20241-5		Sample					
421	d	20244-5		Duplicate of 39					
320	x5	20241-7		Sample					
321	x5s	20241-7		Spike - 1 of 41					
322		20241-13		Sample					
323		20241-14		Sample					

Dataset Report

User Name: icp
Computer Name: ICP-MS
Dataset File Path: C:\elandata_icp\DataSet\041213-4\
Report Date/Time: Monday, April 15, 2013 09:29:42

4/15/13

Autosampler Position: 4

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot. Vol.	Diluted Vol
15:03:37 Fri 12-Apr-13	Blank		Blank					
15:05:08 Fri 12-Apr-13	Standard 1		Standard #1					
15:06:35 Fri 12-Apr-13	Standard 2		Standard #2					
15:08:04 Fri 12-Apr-13	Standard 3		Standard #3					
15:09:33 Fri 12-Apr-13	QC Std 1		QC Std #1					
15:11:03 Fri 12-Apr-13	QC Std 2		QC Std #2					
15:12:31 Fri 12-Apr-13	QC Std 3		QC Std #3					
15:14:02 Fri 12-Apr-13	QC Std 4		QC Std #4					
15:15:32 Fri 12-Apr-13	QC Std 5		QC Std #5					
15:17:01 Fri 12-Apr-13	QC Std 6		QC Std #6					
15:18:30 Fri 12-Apr-13	QC Std 7		QC Std #7					
15:19:59 Fri 12-Apr-13	QC Std 8		QC Std #8					
15:21:28 Fri 12-Apr-13	QC Std 10		QC Std #10					
15:22:58 Fri 12-Apr-13	QC Std 2		Sample					
15:24:28 Fri 12-Apr-13	20241-1		Sample					
15:25:57 Fri 12-Apr-13	20241-2		Sample					
15:27:26 Fri 12-Apr-13	20241-2	d	Duplicate of 16					
15:28:55 Fri 12-Apr-13	20241-3		Sample					
15:30:24 Fri 12-Apr-13	20241-3	s	Spike - 1 of 18					
15:31:53 Fri 12-Apr-13	20241-5		Sample					
15:33:22 Fri 12-Apr-13	20241-6		Sample					
15:34:51 Fri 12-Apr-13	20241-6	d	Duplicate of 21					
15:36:20 Fri 12-Apr-13	20241-7		Sample					
15:37:49 Fri 12-Apr-13	20241-7	s	Spike - 1 of 23					
15:39:19 Fri 12-Apr-13	QC Std 1		QC Std #1					
15:40:48 Fri 12-Apr-13	QC Std 4		QC Std #4					
15:42:18 Fri 12-Apr-13	20241-9		Sample					
15:43:47 Fri 12-Apr-13	20241-10		Sample					
15:45:16 Fri 12-Apr-13	20241-10	d	Duplicate of 28					
15:46:45 Fri 12-Apr-13	20241-11		Sample					
15:48:14 Fri 12-Apr-13	20241-11	s	Spike - 1 of 30					
15:49:43 Fri 12-Apr-13	20241-13		Sample					
15:51:12 Fri 12-Apr-13	20241-14		Sample					
15:52:43 Fri 12-Apr-13	QC Std 1		Sample					
15:54:12 Fri 12-Apr-13	QC Std 4		Sample – empty tube					
15:55:42 Fri 12-Apr-13	Blank		Blank					
15:57:32 Fri 12-Apr-13	Standard 1		Standard #1					
15:59:23 Fri 12-Apr-13	Standard 2		Standard #2					
16:01:14 Fri 12-Apr-13	Standard 3		Standard #3					
16:03:05 Fri 12-Apr-13	QC Std 1		QC Std #1					
16:04:56 Fri 12-Apr-13	QC Std 2		QC Std #2					
16:06:46 Fri 12-Apr-13	QC Std 3		QC Std #3					
16:08:36 Fri 12-Apr-13	QC Std 4		QC Std #4					

16:10:30 Fri 12-Apr-13	QC Std 5		QC Std #5
16:12:21 Fri 12-Apr-13	QC Std 6		QC Std #6
16:14:11 Fri 12-Apr-13	QC Std 7		QC Std #7
16:16:02 Fri 12-Apr-13	QC Std 8		QC Std #8
16:17:54 Fri 12-Apr-13	QC Std 9		QC Std #9
16:19:45 Fri 12-Apr-13	QC Std 10		QC Std #10
16:21:38 Fri 12-Apr-13	QC Std 2		Sample
16:23:30 Fri 12-Apr-13	QC Std 1		QC Std #1
16:25:21 Fri 12-Apr-13	QC Std 4		QC Std #4
16:27:14 Fri 12-Apr-13	20244-4		Sample
16:29:04 Fri 12-Apr-13	20244-5		Sample
16:30:55 Fri 12-Apr-13	20244-5	d	Duplicate of 54
16:32:46 Fri 12-Apr-13	20244-6		Sample
16:34:36 Fri 12-Apr-13	20244-6	s	Spike - 1 of 56
16:36:27 Fri 12-Apr-13	20244-10		Sample
16:38:18 Fri 12-Apr-13	20244-11		Sample
16:40:08 Fri 12-Apr-13	20244-11	d	Duplicate of 59
16:41:59 Fri 12-Apr-13	20244-12		Sample
16:43:50 Fri 12-Apr-13	20244-12	s	Spike - 1 of 61
16:45:43 Fri 12-Apr-13	QC Std 1		QC Std #1
16:47:33 Fri 12-Apr-13	QC Std 4		QC Std #4
16:49:23 Fri 12-Apr-13	20244-16		Sample
16:51:17 Fri 12-Apr-13	20244-17		Sample
16:53:08 Fri 12-Apr-13	20244-17	d	Duplicate of 65
16:54:58 Fri 12-Apr-13	20244-18		Sample
16:56:49 Fri 12-Apr-13	20244-18	s	Spike - 1 of 68
16:58:40 Fri 12-Apr-13	20244-19		Sample
17:00:30 Fri 12-Apr-13	20244-20		Sample
17:02:24 Fri 12-Apr-13	QC Std 1		QC Std #1
17:04:15 Fri 12-Apr-13	QC Std 4		QC Std #4
09:02:25 Mon 15-Apr-13	20244-5		Sample
09:04:16 Mon 15-Apr-13	20244-5	d	Duplicate of 74
09:06:09 Mon 15-Apr-13	QC Std 1		QC Std #1
09:08:00 Mon 15-Apr-13	QC Std 4		QC Std #4
09:14:52 Mon 15-Apr-13	20241-7	x5	Sample
09:16:21 Mon 15-Apr-13	20241-7	x5s	Spike - 1 of 78
09:17:50 Mon 15-Apr-13	20241-13		Sample
09:19:19 Mon 15-Apr-13	20241-14		Sample
09:20:51 Mon 15-Apr-13	QC Std 1		QC Std #1
09:22:20 Mon 15-Apr-13	QC Std 4		QC Std #4

elementOne
Analyst:--DBW--

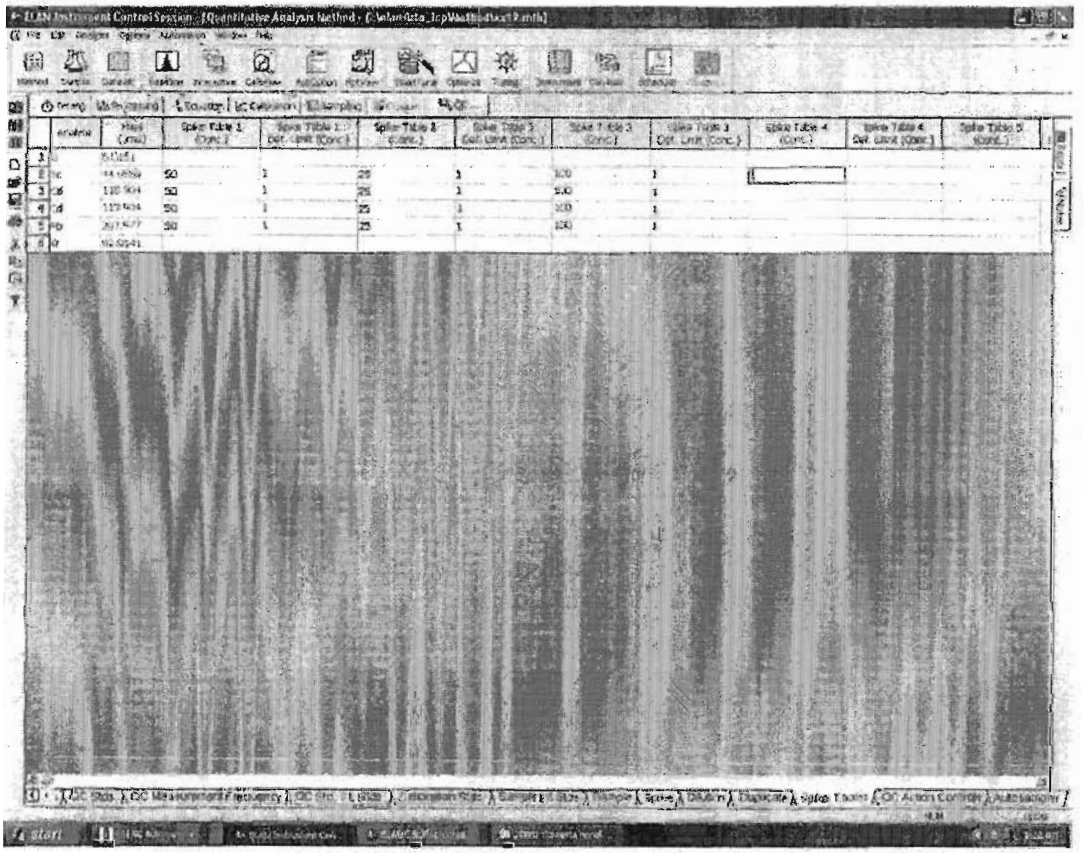
ICP-MS RUN SHEET
4/15/2013

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
303		20241-1		Sample		100x2
304		20241-2		Sample		100x2
305	d	20241-2		Duplicate of 3		100x2
306		20241-3		Sample		100x2
307	s	20241-3		Spike - 1 of 5		100x2
308		20241-5		Sample		100x2
309		20241-6		Sample		100x2
310	d	20241-6		Duplicate of 8		100x2
311		20241-7		Sample		100x2
312	s	20241-7		Spike - 1 of 10		100x2
313		20241-9		Sample		100x2
314		20241-10		Sample		100x2
315	d	20241-10		Duplicate of 13		100x2
316		20241-11		Sample		100x2
317	s	20241-11		Spike - 1 of 15		100x2
318		20241-13		Sample		100x2
319		20241-14		Sample		100x2
1		QC Std 1		Sample		
3		QC Std 4		Sample		
320	x5	20241-7		Sample		100x2
321	x5s	20241-7		Spike - 1 of 41		100x2
322		20241-13		Sample		100x2
323		20241-14		Sample		100x2

Spikes are post at 0.02mL of 25ppm spiking solution lot 021413-A in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DBW	4/15/13 9:33		DBW	4/15/13 1143	
Re-Test Required:	No: ✓	Yes:	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:



Friday, Mar 08, 2013 08:32 AM

ICP-MS QC Values Table

Element or Test	ICP Element Mass	Element symbol	Lowest Reported Value (ug)	Upper Reported Value (ug)	Reporting Unit	QC #1	QC #2	QC #3	QC #4	QC #5	QC #6 A	QC #7 AB	QC #8 .25	QC #9 LRB	QC #10 LRB+	QC #11 LRB+
Lithium	6	*Li*														
Lithium	7	Li	1	500	mg/L	0	1	250	100	50				0	50	100
Beryllium	9	Be	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Boron	10	*B*	5	500	mg/L	0	1	250	100	50				0	50	100
Boron	11	B	5	500	mg/L	0	1	250	100	50				0	50	100
Sodium	23	Na	20	5500	mg/L	0	21	2500	1100	250				0	718	
Magnesium	24	Mg	20	5500	mg/L	0	21	2500	1100	250				0	550	
Magnesium	25	*Mg*	20	5500	mg/L	0	21	2500	1100	250				0	550	
Aluminum	27	Al	1	500	mg/L	0	1	250	100	50				0	50	100
Phosphorus	31	P	20	5000	mg/L	0	20	2500	1000	250				0	200	
Potassium	39	K	20	5500	mg/L	0	20	2000	1000	200				0	500	
Calcium	44	Ca	50	5500	mg/L	0	21	2500	1100	250				0	550	
Scandium	45															
Titanium	47	Ti	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Titanium	49	Ti	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Vanadium	51	V	1	500	mg/L	0	1	250	100	50	0	20	0.25	0	50	100
Vanadium	51	V	1	500	mg/L	0	1	250	100	50	0	20	0.25	0	50	100
Chromium	52	Cr	1	500	mg/L	0	1	250	100	50		10	0.25	0	50	100
Chromium	53	*Cr*	1	500	mg/L	0	1	250	100	50		10	0.25	0	50	100
Iron	54	Fe	20	5500	mg/L	0	21	2500	1100	250	0			0		
Manganese	55	Mn	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Iron	57	Fe	20	5500	mg/L	0	21	2500	1100	250	0			0		
Cobalt	59	Co	1	500	mg/L	0	1	250	100	50	0	20	0.25	0	50	100
Nickel	60	Ni	1	500	mg/L	0	1	250	100	50	0	20	0.25	0	50	100
Copper	63	Cu	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Copper	65	Cu	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Zinc	66	Zn	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Zinc	67	*Zn*	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Zinc	68	*Zn*	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Germanium	72	Ge	1	500	mg/L	0	1	250	100	50				0	50	100
Arsenic	75	As	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Selenium	77	*Se*	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Selenium	82	Se	1	500	mg/L	0	1	250	100	50	0	10	0.25	0	50	100
Strontium	88	Sr	1	500	mg/L	0	1	250	100	50	0			0	50	100
Molybdenum	95	Mo	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Molybdenum	97	Mo	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Molybdenum	98	Mo	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Rhodium	103															
Silver	107	Ag	1	500	mg/L	0	1	250	100	50	0	10		0	50	100
Silver	109	*Ag*	1	500	mg/L	0	1	250	100	50	0	10		0	50	100
Cadmium	111	Cd	1	500	mg/L	0	1	250	100	50	0	5	0.25	0	50	100
Cadmium	114	*Cd*	1	500	mg/L	0	1	250	100	50	0	5	0.25	0	50	100
Tin	118	Sn	1	500	mg/L	0	1	250	100	50	0			0	50	100
Antimony	121	Sb	1	500	mg/L	0	1	250	100	50	0		0.25	0	50	100
Antimony	123	Sb	1	500	mg/L	0	1	250	100	50	0		0.25	0	50	100
Tellurium	128	Te	1	500	mg/L	0	1	250	100	50				0	50	100
Cesium	133															
Barium	135	*Ba*	1	500	mg/L	0	1	250	100	50	0			0	50	100
Barium	137	Ba	1	500	mg/L	0	1	250	100	50	0			0	50	100
Lanthanum	139	La	1	500	mg/L	0	1	250	100	50				0	50	100
Tantalum	159	Ta	1	500	mg/L	0	1	250	100	50				0	50	100
Platinum	195	Pt	1	500	mg/L	0	1	250	100	50				0	50	100
Gold	181	Au	1	500	mg/L	0	1	250	100	50				0	50	100
Thallium	205	Tl	1	500	mg/L	0	1	250	100	50	0			0	50	100
Lead	208	Pb	1	500	mg/L	0	1	250	100	50	0		0.25	0	50	100
Bismuth	209	Bi	1	500	mg/L	0	1	250	100	50				0	50	100
Thorium	232	Th	1	500	mg/L	0	1	250	100	50				0	50	100
Uranium	238	U	1	500	mg/L	0	1	250	100	50				0	50	100
Krypton	83															

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Block 3 92,67

Date Prepared/Digested: 4-8-13 Prep By: LAL/JWL SIF File #: 040813-1

Block #1 Temperature: 93.20 Start Time: 8:30 Machine ID: #3

Block #2 Temperature: 94.22 Stop Time: 10:45 Batch Analyst: JWL/LAL

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: ~~SRM~~ 4206419
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 040513-1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 040813-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 040813-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: LAL

Submitted for Review By: Date: Time:

Initial Review By: LAL Date: 4.8.13 Time: 3:52

Final QC Review By: YS Date: 4/10/13 Time: 1331

Comments: 20244-9BHt @ 2mL & 1mL

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
9	20212-1C				4	40C	
10	-2C						
11	-3C						
12	-4C						
13	-5C						
14	-6C						
15	-6CD						
16	-7C						
17	-7C+						
18	-8C						
19	-9C				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

Spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 52151 HNO_3 Lot # 1112110 HCl Lot #: 4112070

Persulfate Lot # 032513-8 $KMnO_4$ Lot # 012813-6 Hydrox Lot#: 032513-6

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 040813-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	20242 -9CD				4	400	
21	-10C						
22	-10C+						
23	-11C						
24	-12C						
25	-12CD						
26	-13C						
27	-13C+						
28	-14C						
29	20241-1A				4	200	
30	-2A						
31	-2AD						
32	-3A						
33	-3A+						
34	-4A						
35	-5A						
36	-6A						
37	-6AD						
38	-7A						
39	-7A+						
40	-8A						
41	-9A						
42	-10A						
43	-10AD						
44	-11A						
45	-11A+						
46	-12A						
47	-13A						
48	-14A						
49	20241-1BH				4	780	
50	-2BH					760	
51	-2BHD						
52	-3BH					690	
53	-3BH+						
54	-4BH					720	

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 040813-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
55	20241 - 5 BH				4	720	
56	- 6 BH					690	
57	- 6 BH D					↓	
58	- 7 BH					480	
59	- 7 BH ↓					↓	
60	- 8 BH					670	
61	- 9 BH					640	
62	- 10 BH					630	
63	- 10 BH D					↓	
64	- 11 BH					575	
65	- 11 BH ↓					↓	
66	- 12 BH					670	
67	- 13 BH					300	
68	- 14 BH				↓	200	
69	20244 - 1 BH				2	620	
70	- 2 BH					620	
71	- 2 BH D					↓	
72	- 3 BH					590	
73	- 3 BH ↓				↓	↓	
74	- 4 BH				4	750	
75	- 5 BH					790	
76	- 5 BH D					↓	
77	- 6 BH					720	
78	- 6 BH ↓				↓	↓	
79	- 7 BH				2	600	
80	- 8 BH					650	
81	- 8 BH D					↓	
82	- 9 BH					640	
83	- 9 BH ↓				↓	↓	
84	- 10 BH				4	760	
85	- 11 BH					740	
86	- 11 BH D					↓	
87	- 12 BH					700	
88	- 12 BH ↓				↓	↓	
89	- 13 BH				2	570	

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 4-8-13 Prep By: LAL SIF File #: 040913-1
Block #1 Temperature: 93.92 Start Time: 5:55 Machine ID: #1
Block #2 Temperature: 94.82 Stop Time: 8:10 Batch Analyst: JWL/LAL

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 42054I9
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 040813-1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 040813-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 040813-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by:

Submitted for Review By: Date: Time:
Initial Review By: LAL Date: 4-9-13 Time: ~~10~~ 11:30
Final QC Review By: KS Date: 4/10/13 Time: 1345
Comments:

A/S	LAB #	Client	Wt/FV	All Used	ml used	Sample Vol, ml	Spike µg
9	20241-1B				4	500	
10	-2B				↓	600	
11	-2BD				↓	↓	
12	-3B				↓	500	
13	-3B+				↓	↓	
14	-4B				↓	↓	
15	-5B				↓	↓	
16	-6B				↓	↓	
17	-6BD				↓	↓	
18	-7B				↓	↓	
19	-7B+				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

Spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 52151 HNO_3 Lot # 111210 HCl Lot #: 411207D

Persulfate Lot # 032513-8 $KMnO_4$ Lot # 012713-6 Hydrox Lot#: 032513-6

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 040913-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	20241-8B				4	500	
21	-9B					↓	
22	-10B					600	
23	-10BD					↓	
24	-11B					500	
25	-11B+						
26	-12B						
27	-13B						
28	-14B					↓	
29	20244-1B					500	
30	-2B						
31	-2BD						
32	-3B						
33	-3B+						
34	-4B						
35	-5B						
36	-5BD						
37	-6B						
38	-6B+						
39	-7B						
40	-8B						
41	-8BD						
42	-9B						
43	-9B+					↓	
44	-10B					600	
45	-11B					500	
46	-11BD						
47	-12B						
48	-12B+						
49	-13B						
50	-14B						
51	-14BD						
52	-15B						
53	-15B+						
54	-16B				↓	↓	

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 4-10-13 Prep By: JWL SIF File #: 041113-1
Block #1 Temperature: 92.59 Start Time: 5:55 Machine ID: #1
Block #2 Temperature: Stop Time: 8:10 Batch Analyst: JWL/LAL

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
						Standard #1 (for working std)
1	Lab BLK (3/ batch)	0		40	40	Lot #: 4205419
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 040813-1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 040813-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 040813-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: JWL

Submitted for Review By: Date: Time:
Initial Review By: JWL Date: 4-11-13 Time: 2:00
Final QC Review By: DBL Date: 4/12/13 Time: 1232
Comments: 20285-2C should be 4 not Dup
20277-3+

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
9	20285-3B				.5	1000	
10	-3BD				↓	↓	
11	-4B				1		
12	-4B+				↓	↓	
13	20244-14FH				.025	100	
14	-14FHD				↓	↓	
15	20277/79/80/81BLK				20	1	
16	-BLK+				↓	↓	
17	20277-1						
18	-2						
19	-2D				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

Spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 52151 HNO_3 Lot # 1112116 HCl Lot #: 4112030

Persulfate Lot # 040813-3 $KMnO_4$ Lot # 012913-16 Hydrox Lot#: 032513-6

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 041113-1

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	20277-3				20	1	
21	-3+						
22	-4						
23	20279						
24	20280						
25	-Dup						
26	20281						
27	-5MC						
28	20241-1C				4	400	
29	-2C						
30	-2CD						
31	-3C						
32	-3C+						
33	-4C						
34	-5C						
35	-6C						
36	-6CD						
37	-7C						
38	-7C+						
39	-8C						
40	-9C						
41	-10C						
42	-10CD						
43	-11C						
44	-11C+						
45	-12C						
46	-13C						
47	-14C						
48	20244-1C						
49	-2C						
50	-2CD						
51	-3C						
52	-3C+						
53	-4C						
54	-5C						

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 4-10-13 Prep By: JWL SIF File #: 041213-1
Block #1 Temperature: 91.76 Start Time: 5:55 Machine ID: #3
Block #2 Temperature: 91.38 Stop Time: 8:10 Batch Analyst: JWL / LAL

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 4205419
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 040813-1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 040813-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 040813-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: JWL

Submitted for Review By: Date: Time:
Initial Review By: JWL Date: 4-12-13 Time: 12:00
Final QC Review By: DBL Date: 4/15/13 Time: 8:56
Comments: PLS 20233 -3+, -12+ 20282 -3pK Acorn @ (2K)
~~2028~~

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
9	20277 - 3				10	1	
10	- 3+				↓	↓	
11	- 3				5	↓	
12	- 3+				↓	↓	
13	20241 - LRBFH				4	100	
14	- LRBFH+				1.6	↓	
15	- 1 FH				4	↓	
16	- 2 FH				↓	↓	
17	- 2 FHD				↓	↓	
18	- 3 FH				↓	↓	
19	- 3 FH +				↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

Spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml..... HNO_3 @ 1.0ml..... Persulfate @ 3.0ml..... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 52151 HNO_3 Lot # 411121IO HCl Lot #: 4112020
Persulfate Lot # 040813-8 $KMnO_4$ Lot # ~~040513-6~~ 032513-7 Hydrox Lot#: 032513-6

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: _____

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	20241-4FH				4	100	
21	-5FH						
22	-6FH						
23	-6FHD						
24	-7FH						
25	-7FHI						
26	-8FH						
27	-9FH						
28	-10FH						
29	-10FHD						
30	-11FH						
31	-11FH+						
32	-12FH						
33	-13FH						
34	-14FH				↓	↓	
35	20283-1				0.5105	1	
36	-2				0.4036		
37	-2D				0.4168		
38	-3				0.4487		
39	-3+				0.4482		
40	-4				0.4100		
41	-5				0.4117		
42	-6				0.5267		
43	-7				0.4081		
44	-8				0.4028		
45	-9				0.5272		
46	-10				0.5105		
47	-11				0.5188		
48	-11D				0.5117		
49	-12				0.5354		
50	-12+				0.5317		
51	20282				0.5304		
52	-Dup				0.5469		
53	-Spk				0.5173	↓	
54	19349-3 QC				1	10	

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PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Da Friday, April 12, 2013 15:03:37
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	64272.7		ppb
|-	Sc	45	346801		ppb
|>	Rh	103	696269.7		ppb
|	Cd	111	17.5		ppb
|-	Cd	114	27.9		ppb
|>	Ho	165	1397078.3		ppb
|-	Pb	208	2649.2		ppb
	Kr	83	127.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Da Friday, April 12, 2013 15:05:06
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	71247.7		ppb
|-	Sc	45	349742.4		ppb
|>	Rh	103	670954.8		ppb
|	Cd	111	3398.1	1.01959	ppb
|-	Cd	114	8020.8	0.91674	ppb
|>	Ho	165	1363890.9		ppb
|-	Pb	208	55656.1	0.91621	ppb
	Kr	83	-89.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample Da Friday, April 12, 2013 15:06:35
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	76471.8		ppb
|-	Sc	45	353203.8		ppb
|>	Rh	103	671967.2		ppb
|	Cd	111	327645.6	98.70146	ppb
|-	Cd	114	776459.5	88.94925	ppb
|>	Ho	165	1380306		ppb
|-	Pb	208	5643913.8	96.27389	ppb
	Kr	83	-23139.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Da Friday, April 12, 2013 15:08:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	70350.2		ppb
|-	Sc	45	330949.3		ppb
|>	Rh	103	601968		ppb
|	Cd	111	1488259.4	500.2597	ppb
|-	Cd	114	3928822.5	502.2103	ppb
|>	Ho	165	1281327.7		ppb
|-	Pb	208	27250849	500.7454	ppb
	Kr	83	-106086.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Friday, April 12, 2013 15:09:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	77964.5		ppb
|-	Sc	45	352180.5		ppb
|>	Rh	103	660694.5		ppb
|	Cd	111	122.2	0.03223	ppb
|-	Cd	114	279.6	0.02965	ppb
|>	Ho	165	1346589.6		ppb
|-	Pb	208	8590.3	0.10658	ppb
	Kr	83	134.2		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Da Friday, April 12, 2013 15:11:03
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	66048.2		ppb
|-	Sc	45	297735.9		ppb
|>	Rh	103	573012.2		ppb
|	Cd	111	2949.1	1.04696	ppb
|-	Cd	114	7121.9	0.96601	ppb
|>	Ho	165	1181590.8		ppb
|-	Pb	208	50618.7	0.972	ppb
	Kr	83	-45.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample Da Friday, April 12, 2013 15:12:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	67719.1		ppb
|-	Sc	45	298664.3		ppb
|>	Rh	103	559837.7		ppb
|	Cd	111	692940	250.3646	ppb
|-	Cd	114	1642868.6	225.814	ppb
|>	Ho	165	1209691.3		ppb
|-	Pb	208	13010794	253.3208	ppb
	Kr	83	-48966.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Friday, April 12, 2013 15:14:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	75298.2		ppb
|-	Sc	45	333993.8		ppb
|>	Rh	103	615222.8		ppb
|	Cd	111	302402.6	99.43371	ppb
|-	Cd	114	716227.4	89.56205	ppb
|>	Ho	165	1251126.7		ppb
|-	Pb	208	5264589.3	99.05111	ppb
	Kr	83	-21333.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample Da Friday, April 12, 2013 15:15:32
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	74970.8		ppb
|-	Sc	45	327643.6		ppb
|>	Rh	103	609229.9		ppb
|	Cd	111	149089.6	49.52048	ppb
|-	Cd	114	350996.5	44.33229	ppb
|>	Ho	165	1247578.2		ppb
|-	Pb	208	2443173.5	46.06817	ppb
	Kr	83	135		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample Da Friday, April 12, 2013 15:17:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	95039.8		ppb
|-	Sc	45	405588.3		ppb
|>	Rh	103	691379.8		ppb
|	Cd	111	1334.1	0.38576	ppb
|-	Cd	114	9291.9	1.03037	ppb
|>	Ho	165	1597491.6		ppb
|-	Pb	208	10594.1	0.11157	ppb
	Kr	83	123.2		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample Da Friday, April 12, 2013 15:18:30
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	100983.8		ppb
|-	Sc	45	405904.1		ppb
|>	Rh	103	676865.1		ppb
|	Cd	111	15366.7	4.58838	ppb
|-	Cd	114	44461.4	5.05174	ppb
|>	Ho	165	1569887.9		ppb
|-	Pb	208	16477.9	0.20255	ppb
	Kr	83	132.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 9
Sample Da Friday, April 12, 2013 15:19:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	60830.3		ppb
|-	Sc	45	248405		ppb
|>	Rh	103	481532.1		ppb
|	Cd	111	146.8	1.44825	ppb
|-	Cd	114	285.2	1.4075	ppb
|>	Ho	165	1021420		ppb
|-	Pb	208	34540.3	1.99453	ppb
	Kr	83	90.6		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 10
Sample Da Friday, April 12, 2013 15:21:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	81858.9		ppb
|-	Sc	45	323516.6		ppb
|>	Rh	103	611256.7		ppb
|	Cd	111	142151.3	47.06071	ppb
|-	Cd	114	338122.7	42.57172	ppb
|>	Ho	165	1273167.3		ppb
|-	Pb	208	2423539.5	44.8065	ppb
	Kr	83	53.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-1
Sample Da Friday, April 12, 2013 15:24:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	64493		ppb
|-	Sc	45	260514.8		ppb
|>	Rh	103	480480		ppb
|	Cd	111	2168.6	1.36449	ppb
|-	Cd	114	2185.7	0.82693	ppb
|>	Ho	165	1051423.1		ppb
|-	Pb	208	182138	4.28074	ppb
	Kr	83	-403.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-2
Sample Da Friday, April 12, 2013 15:25:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	78403.5		ppb
|-	Sc	45	308620.4		ppb
|>	Rh	103	570981.5		ppb
|	Cd	111	1899.5	0.67663	ppb
|-	Cd	114	1168.6	0.15692	ppb
|>	Ho	165	1195766.8		ppb
|-	Pb	208	144239.7	2.8105	ppb
	Kr	83	-446		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-2
Sample Da Friday, April 12, 2013 15:27:26
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	88853.4		ppb
|-	Sc	45	337180.6		ppb
|>	Rh	103	620827.5		ppb
|	Cd	111	1906.4	0.61617	ppb
|-	Cd	114	1130.5	0.13327	ppb
|>	Ho	165	1307295.8		ppb
|-	Pb	208	152328	2.69882	ppb
	Kr	83	-499.6		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-3
Sample Da Friday, April 12, 2013 15:28:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	79420.4		ppb
|-	Sc	45	309090.2		ppb
|>	Rh	103	554995.6		ppb
|	Cd	111	2423.7	0.87855	ppb
|-	Cd	114	2051.9	0.28154	ppb
|>	Ho	165	1208765.5		ppb
|-	Pb	208	136847.7	2.62137	ppb
	Kr	83	-354.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-3
Sample Da Friday, April 12, 2013 15:30:24
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	76716.7		ppb
|-	Sc	45	297791.3		ppb
|>	Rh	103	528364.8		ppb
|	Cd	111	124758	47.71316	ppb
|-	Cd	114	293481.8	42.73734	ppb
|>	Ho	165	1153551.5		ppb
|-	Pb	208	2410568	49.94804	ppb
	Kr	83	-264.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-5
Sample Da Friday, April 12, 2013 15:31:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	93666.4		ppb
|-	Sc	45	347485.6		ppb
|>	Rh	103	627886.9		ppb
|	Cd	111	31476.6	10.14266	ppb
|-	Cd	114	71697.6	8.77932	ppb
|>	Ho	165	1328968.9		ppb
|-	Pb	208	3280734.9	58.07316	ppb
	Kr	83	-1794		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-6
Sample Da Friday, April 12, 2013 15:33:22
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	88732.9		ppb
|-	Sc	45	332375.7		ppb
|>	Rh	103	596461.3		ppb
|	Cd	111	31045.9	10.52707	ppb
|-	Cd	114	69196.7	8.92352	ppb
|>	Ho	165	1265701.4		ppb
|-	Pb	208	4421895	82.22443	ppb
	Kr	83	-1553.8		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-6
Sample Da Friday, April 12, 2013 15:34:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	89743.1		ppb
|-	Sc	45	333751		ppb
|>	Rh	103	596190.1		ppb
|	Cd	111	30682.5	10.40872	ppb
|-	Cd	114	69400	8.95469	ppb
|>	Ho	165	1267753.8		ppb
|-	Pb	208	4404779.8	81.77269	ppb
	Kr	83	-1493.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-7
Sample Da Friday, April 12, 2013 15:36:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	88624.6		ppb
|-	Sc	45	326200.2		ppb
|>	Rh	103	592730.2		ppb
|	Cd	111	25452.8	8.68345	ppb
|-	Cd	114	58768.7	7.62559	ppb
|>	Ho	165	1249391		ppb
|-	Pb	208	5369311.5	101.156	ppb
	Kr	83	-1233.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-7
Sample Da Friday, April 12, 2013 15:37:49
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	78331.5		ppb
|-	Sc	45	285234.5		ppb
|>	Rh	103	518671.3		ppb
|	Cd	111	167340.6	65.29101	ppb
|-	Cd	114	395463.7	58.67544	ppb
|>	Ho	165	1100935.1		ppb
|-	Pb	208	8053259.1	172.1995	ppb
	Kr	83	-1231.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Friday, April 12, 2013 15:39:19
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	91705.9		ppb
|-	Sc	45	326260.9		ppb
|>	Rh	103	597838.1		ppb
|	Cd	111	163.4	0.05035	ppb
|-	Cd	114	67.5	0.00559	ppb
|>	Ho	165	1212255.6		ppb
|-	Pb	208	4428.4	0.04144	ppb
	Kr	83	84.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Friday, April 12, 2013 15:40:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	96442.7		ppb
|-	Sc	45	341027.4		ppb
|>	Rh	103	598541.3		ppb
|	Cd	111	298946.1	101.0642	ppb
|-	Cd	114	699870.1	89.98238	ppb
|>	Ho	165	1234965.1		ppb
|-	Pb	208	5224330.4	99.56473	ppb
	Kr	83	-21111.9		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-9
Sample Da Friday, April 12, 2013 15:42:18
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	86877.3		ppb
|-	Sc	45	306421.1		ppb
|>	Rh	103	560601.9		ppb
|	Cd	111	72876.2	26.30852	ppb
|-	Cd	114	170327	23.38083	ppb
|>	Ho	165	1219720.2		ppb
|-	Pb	208	10379355	200.3301	ppb
	Kr	83	-2966.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-10
Sample Da Friday, April 12, 2013 15:43:47
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	91593.5		ppb
|-	Sc	45	322384.6		ppb
|>	Rh	103	568603.1		ppb
|	Cd	111	51767.6	18.43251	ppb
|-	Cd	114	119834.2	16.22837	ppb
|>	Ho	165	1263032.9		ppb
|-	Pb	208	7379035.2	137.5317	ppb
	Kr	83	-2995.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-10
Sample Da Friday, April 12, 2013 15:45:16
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	99768.1		ppb
|-	Sc	45	336171.6		ppb
|>	Rh	103	590839.7		ppb
|	Cd	111	53250.3	18.23225	ppb
|-	Cd	114	121865.5	15.86696	ppb
|>	Ho	165	1307423.7		ppb
|-	Pb	208	7572166.9	136.299	ppb
	Kr	83	-3094		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-11
Sample Da Friday, April 12, 2013 15:46:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	102558.6		ppb
|-	Sc	45	337436.6		ppb
|>	Rh	103	607279.3		ppb
|	Cd	111	62479.3	20.83041	ppb
|-	Cd	114	144616	18.33676	ppb
|>	Ho	165	1326801.3		ppb
|-	Pb	208	9070032.1	161.0188	ppb
	Kr	83	-3368.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-11
Sample Da Friday, April 12, 2013 15:48:14
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	107623.7		ppb
|-	Sc	45	356222.4		ppb
|>	Rh	103	630102		ppb
|	Cd	111	222987.8	71.60799	ppb
|-	Cd	114	532696.9	65.03178	ppb
|>	Ho	165	1420163.8		ppb
|-	Pb	208	12879933	214.1032	ppb
	Kr	83	-3479.6		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Monday, April 15, 2013 09:06:09
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	72851.9		ppb
|-	Sc	45	269089.2		ppb
|>	Rh	103	480436.6		ppb
|	Cd	111	16.7	0.00196	ppb
|-	Cd	114	20.4	0.00018	ppb
|>	Ho	165	1012628.7		ppb
|-	Pb	208	1174	-0.01728	ppb
	Kr	83	123.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Monday, April 15, 2013 09:08:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	70031.9		ppb
|-	Sc	45	259529.2		ppb
|>	Rh	103	456731.2		ppb
|	Cd	111	225276.5	99.79515	ppb
|-	Cd	114	536333.5	90.35295	ppb
|>	Ho	165	979071.4		ppb
|-	Pb	208	4137205.8	99.45447	ppb
	Kr	83	-15666.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-7
Sample Da Monday, April 15, 2013 09:14:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	80565.7		ppb
|-	Sc	45	277205		ppb
|>	Rh	103	491080.6		ppb
|	Cd	111	4588	1.88522	ppb
|-	Cd	114	10189	1.59348	ppb
|>	Ho	165	1059103.1		ppb
|-	Pb	208	866283.4	19.21548	ppb
	Kr	83	-108.5		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-7
Sample Da Monday, April 15, 2013 09:16:21
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	74661		ppb
|-	Sc	45	250470		ppb
|>	Rh	103	432255.1		ppb
|	Cd	111	127917.5	59.88817	ppb
|-	Cd	114	305502.7	54.39773	ppb
|>	Ho	165	943382.1		ppb
|-	Pb	208	3052182.2	76.13566	ppb
	Kr	83	-71		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-13
Sample Da Monday, April 15, 2013 09:17:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	62048.2		ppb
|-	Sc	45	214695		ppb
|>	Rh	103	362420.3		ppb
|	Cd	111	1670.4	0.92746	ppb
|-	Cd	114	316.6	0.06402	ppb
|>	Ho	165	839299.6		ppb
|-	Pb	208	83740.4	2.30463	ppb
	Kr	83	-780.5		mg/L

PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20241-14
Sample Da Monday, April 15, 2013 09:19:19
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	82626.7		ppb
|-	Sc	45	271036.4		ppb
|>	Rh	103	468518		ppb
|	Cd	111	1017.8	0.43447	ppb
|-	Cd	114	384.8	0.05986	ppb
|>	Ho	165	1074068		ppb
|-	Pb	208	76485.3	1.63214	ppb
	Kr	83	-670.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Monday, April 15, 2013 09:20:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	82100.4		ppb
|-	Sc	45	257780.3		ppb
|>	Rh	103	447486		ppb
|	Cd	111	43.5	0.01458	ppb
|-	Cd	114	21.6	0.00063	ppb
|>	Ho	165	966012.2		ppb
|-	Pb	208	770	-0.02588	ppb
	Kr	83	120.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Monday, April 15, 2013 09:22:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	80542.3		ppb
|-	Sc	45	246746.8		ppb
|>	Rh	103	422437.4		ppb
|	Cd	111	214309.9	102.6443	ppb
|-	Cd	114	507519.7	92.43889	ppb
|>	Ho	165	945994.8		ppb
|-	Pb	208	3999072.3	99.4985	ppb
	Kr	83	-13847		mg/L

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
Calib Blank	4/8/2013	11:07:51	0.0001209			µg			0.0001209					
STD1=.004ug	4/8/2013	11:09:06	0.0013402			µg			0.0013402					
STD2=.04ug	4/8/2013	11:10:22	0.01249			µg			0.01249					
STD3=.08ug	4/8/2013	11:11:39	0.0277711			µg			0.0277711					
STD4=.16ug	4/8/2013	11:12:57	0.0512234			µg			0.0512234					
STD5=.2ug	4/8/2013	11:14:16	0.0656804			µg			0.0656804					
Reagent Blank	4/8/2013	11:16:04	9.694E-05	0.0002965	0.0002965	µg			0.0001239	0.0003789	0.0003789	6.999E-05	0.0002141	0.0002141
0.004ug = DL	4/8/2013	11:17:18	0.0012886	0.0039409	0.0039409	µg			0.0012886	0.0039409	0.0039409			
0.080ug = STD.2	4/8/2013	11:21:15	0.0260761	0.0797467	0.0797467	µg			0.0260761	0.0797467	0.0797467			
0.080ug = QC STD 3	4/8/2013	11:23:55	0.0245971	0.0752236	0.0752236	µg			0.0245971	0.0752236	0.0752236			
REAGENT BLANK	4/8/2013	11:25:12	0.0002341	0.0007159	0.0007159	µg			0.0002341	0.0007159	0.0007159			
0.004ug = DL	4/8/2013	12:06:22	0.0012483	0.0038175	0.0038175	µg	4	400	0.0012483	0.0038175	0.0038175			
0.080ug = STD.2	4/8/2013	12:07:39	0.0263363	0.0805427	0.0805427	µg	4	400	0.0263363	0.0805427	0.0805427			
REAGENT BLANK	4/8/2013	12:08:56	-0.0000183	-0.0000562	-0.0000562	µg	4	400	-0.0000183	-0.0000562	-0.0000562			
20241-1A	4/8/2013	12:10:44	-0.000085	-0.0002602	-0.0130119	µg	4	200	-0.0000692	-0.0002118	-0.010592	-0.0001009	-0.0003086	-0.0154318
20241-2A	4/8/2013	12:12:35	-0.0000888	-0.0002716	-0.0135808	µg	4	200	-0.0000848	-0.0002595	-0.0129776	-0.0000927	-0.0002836	-0.014184
20241-2A DUP	4/8/2013	12:14:27	-0.0000798	-0.0002441	-0.0122052	µg	4	200	-0.0000872	-0.0002668	-0.0133416	-0.0000723	-0.0002213	-0.0110689
20241-3A	4/8/2013	12:16:15	-0.0000168	-0.0000514	-0.0025714	µg	4	200	-0.0000236	-0.0000722	-0.0036126	-0.00001	-0.0000306	-0.0015303
20241-3A SPK	4/8/2013	12:17:59	0.0243188	0.0743726	3.718631	µg	4	200	0.0244425	0.0747508	3.7375383	0.0241952	0.0739945	3.6997236
20241-4A	4/8/2013	12:19:44	-0.000096	-0.0002937	-0.0146896	µg	4	200	-0.000092	-0.0002813	-0.0140698	-0.0001001	-0.0003061	-0.0153093
20241-5A	4/8/2013	12:21:30	-0.0000843	-0.0002578	-0.0128921	µg	4	200	-0.0000891	-0.0002727	-0.0136365	-0.0000794	-0.0002429	-0.0121477
20241-6A	4/8/2013	12:23:16	-0.0000403	-0.0001234	-0.0061748	µg	4	200	-0.0000471	-0.000144	-0.007204	-0.0000336	-0.0001029	-0.0051457
20241-6A DUP	4/8/2013	12:25:02	-0.0000407	-0.0001246	-0.0062332	µg	4	200	-0.0000511	-0.0001565	-0.0078283	-0.0000303	-0.0000927	-0.0046381
20241-7A	4/8/2013	12:26:49	-0.0000815	-0.0002493	-0.0124689	µg	4	200	-0.0000774	-0.0002367	-0.0118369	-0.0000856	-0.000262	-0.0131009
0.004ug = DL	4/8/2013	12:28:03	0.0012647	0.0038677	0.0038677	µg	4	200	0.0012647	0.0038677	0.0038677			
0.080ug = STD.2	4/8/2013	12:29:20	0.0262659	0.0803271	0.0803271	µg	4	200	0.0262659	0.0803271	0.0803271			
REAGENT BLANK	4/8/2013	12:30:37	-0.0000121	-0.000037	-0.000037	µg	4	200	-0.0000121	-0.000037	-0.000037			
20241-7A SPK	4/8/2013	12:32:24	0.0248505	0.0759985	3.7999252	µg	4	200	0.0249101	0.0761808	3.809041	0.0247908	0.0758162	3.7908094
20241-8A	4/8/2013	12:34:12	-0.0000102	-0.0000313	-0.0015688	µg	4	200	-1.565E-05	4.786E-05	0.0023933	-0.0000361	-0.0001106	-0.005531
20241-9A	4/8/2013	12:36:00	-0.0000694	-0.0002124	-0.010622	µg	4	200	-0.0000711	-0.0002174	-0.0108735	-0.0000678	-0.0002074	-0.0103704
20241-10A	4/8/2013	12:37:49	4.165E-05	0.0001274	0.0063702	µg	4	200	4.524E-05	0.0001384	0.006919	3.807E-05	0.0001164	0.0058214
20241-10A DUP	4/8/2013	12:39:39	9.379E-05	0.0002868	0.0143416	µg	4	200	8.527E-05	0.0002608	0.013039	0.0001023	0.0003129	0.0156443
20241-11A	4/8/2013	12:41:29	5.991E-05	0.0001832	0.009162	µg	4	200	7.623E-05	0.0002331	0.0116572	4.359E-05	0.0001333	0.0066669
20241-11A SPK	4/8/2013	12:43:37	0.0249801	0.076395	3.8197477	µg	4	200	0.0251064	0.0767813	3.8390671	0.0248537	0.0760086	3.8004284
20241-12A	4/8/2013	12:45:27	1.08E-06	3.33E-06	0.0001666	µg	4	200	1.176E-05	3.596E-05	0.0017985	-0.0000095	-0.0000293	-0.0014651
20241-13A	4/8/2013	12:47:19	-0.0000512	-0.0001567	-0.0078387	µg	4	200	-0.0000551	-0.0001687	-0.0084361	-0.0000473	-0.0001448	-0.0072412
20241-14A	4/8/2013	12:49:07	-0.0000078	-0.0000241	-0.0012061	µg	4	200	-0.000011	-0.0000338	-0.0016909	-0.0000047	-0.0000144	-0.0007212
0.004ug = DL	4/8/2013	12:50:20	0.0012759	0.0039019	0.0039019	µg	4	200	0.0012759	0.0039019	0.0039019			
0.080ug = STD.2	4/8/2013	12:51:37	0.0261615	0.0800079	0.0800079	µg	4	200	0.0261615	0.0800079	0.0800079			
REAGENT BLANK	4/8/2013	12:52:54	1.751E-05	5.357E-05	5.357E-05	µg	4	200	1.751E-05	5.357E-05	5.357E-05			
20241-1 BH	4/8/2013	12:54:39	0.0008928	0.0027305	0.5324538	µg	4	780	0.0009072	0.0027744	0.5410026	0.0008785	0.0026867	0.5239051
20241-2 BH	4/8/2013	12:56:23	0.000754	0.0023058	0.4380966	µg	4	760	0.0007669	0.0023453	0.4456154	0.000741	0.0022662	0.4305777
20241-2 BH DUP	4/8/2013	12:58:08	0.0007974	0.0024387	0.4633567	µg	4	760	0.0008141	0.0024897	0.4730415	0.0007808	0.0023877	0.4536719
20241-3 BH	4/8/2013	12:59:54	0.0006506	0.0019896	0.3432085	µg	4	690	0.0006439	0.0019691	0.3396682	0.0006573	0.0020101	0.3467487
20241-3 BH SPK	4/8/2013	13:01:40	0.0254627	0.0778709	13.432732	µg	4	690	0.0255547	0.0781522	13.481258	0.0253707	0.0775896	13.384206
20241-4 BH	4/8/2013	13:03:26	0.0009709	0.0029694	0.534483	µg	4	720	0.0009997	0.0030575	0.550341	0.0009421	0.0028812	0.518625
20241-5 BH	4/8/2013	13:05:13	0.0015995	0.0048918	0.8805202	µg	4	720	0.0015842	0.0048448	0.8720683	0.0016149	0.0049387	0.888972
20241-6 BH	4/8/2013	13:07:01	0.0019579	0.0059876	1.0328658	µg	4	690	0.001975	0.0060401	1.0419142	0.0019407	0.0059352	1.0238173
20241-6 BH DUP	4/8/2013	13:08:49	0.0018696	0.0057176	0.9862935	µg	4	690	0.0018702	0.0057194	0.9866002	0.001869	0.0057159	0.9859868
20241-7 BH	4/8/2013	13:10:38	0.0019941	0.0060985	1.0367421	µg	4	680	0.0019882	0.0060803	1.0336473	0.0020001	0.0061167	1.0398369
0.004ug = DL	4/8/2013	13:11:55	0.0013193	0.0040347	0.0040347	µg	4	680	0.0013193	0.0040347	0.0040347			
0.080ug = STD.2	4/8/2013	13:13:12	0.0244458	0.0747611	0.0747611	µg	4	680	0.0244458	0.0747611	0.0747611			
REAGENT BLANK	4/8/2013	13:14:29	4.194E-05	0.0001283	0.0001283	µg	4	680	4.194E-05	0.0001283	0.0001283			
Reagent Blank	4/8/2013	14:11:24	-0.0000322	-0.0000984	-0.0000984	µg	4	680	-0.0000304	-0.0000932	-0.0000932	-0.0000339	-0.0001037	-0.0001037
0.004ug = DL	4/8/2013	14:12:38	0.001271	0.003887	0.003887	µg	4	680	0.001271	0.003887	0.003887			
0.080ug = STD.2	4/8/2013	14:13:55	0.0242375	0.0741241	0.0741241	µg	4	680	0.0242375	0.0741241	0.0741241			
0.080ug = QC STD 3	4/8/2013	14:15:15	0.0239044	0.0731051	0.0731051	µg	4	680	0.0239044	0.0731051	0.0731051			
REAGENT BLANK	4/8/2013	14:16:32	6.002E-05	0.0001836	0.0001836	µg	4	680	6.002E-05	0.0001836	0.0001836			
20241-7 BH SPK	4/8/2013	14:18:20	0.0264859	0.0810001	13.770014	µg	4	680	0.0264214	0.0808029	13.736489	0.0265504	0.0811973	13.803539
20241-8 BH	4/8/2013	14:20:10	0.0021839	0.006679	1.1187249	µg	4	670	0.0022059	0.0067461	1.1299732	0.002162	0.0066118	1.1074766
20241-9 BH	4/8/2013	14:22:00	0.0027481	0.0084044	1.3447093	µg	4	640	0.0027686	0.0084669	1.354703	0.0027277	0.008342	1.3347155
20241-10BH	4/8/2013	14:23:51	0.006583	0.0201325	3.1708648	µg	4	630	0.0065894	0.0201519	3.1739219	0.0065767	0.0201131	3.1678076
20241-10 BH DUP	4/8/2013	14:25:40	0.0067586	0.0206695	3.2554432	µg	4	630	0.0068051	0.0208116	3.2778268	0.0067122	0.0205274	3.2330596
20241-11 BH	4/8/2013	14:27:24	0.0074352	0.0227385	3.2686621	µg	4	575	0.007459	0.0228115	3.2791496	0.0074113	0.0226656	3.2581745
20241-11 BH SPK	4/8/2013	14:29:08	0.0285454	0.0872986	12.549177	µg	4	575	0.0286114	0.0875002	12.578158	0.0284795	0.087097	12.520196
20241-12 BH	4/8/2013	14:30:53	0.0047111	0.0144077	2.4132831	µg	4	670	0.0047429	0.0145048	2.4295593	0.0046793	0.0143105	2.3970069
20241-13 BH	4/8/2013	14:32:39	-0.0000681	-0.0002082	-0.0156223	µg	4	300	-0.0000633	-0.0001936	-0.0145231	-0.0000729	-0.0002229	-0.0167216
20241-14 BH	4/8/2013	14:34:25	-0.000052	-0.0001592	-0.0079641	µg	4	200	-0.000054	-0.0001653	-0.0082654	-0.0000501	-0.0001532	-0.0076628
0.004ug = DL	4/8/2013	14:35:40	0.0013467	0.0041185	0.0041185	µg	4	200	0.0013467	0.0041185	0.0041185			
0.080ug = STD.2	4/8/2013	14:36:57	0.0248532	0.0760068	0.0760068	µg	4	200	0.0248532	0.0760068	0.0760068			
REAGENT BLANK	4/8/2013	14:38:15	-0.0000058	-0.0000179	-0.0000179	µg	4	200	-0.0000058	-0.0000179	-0.0000179			
Calib Blank	4/9/2013	9:07:28	-0.0000495			µg			-0.0000495					
STD1=.004ug	4/9/2013	9:08:41	0.0009088			µg			0.0009088					
STD2=.04ug	4/9/2013	9:09:55	0.0104046			µg			0.0104046					
STD3=.08ug	4/9/2013	9:11:12	0.0200505			µg			0.0200505					
STD4=.16ug	4/9/2013	9:12:28	0.0396453			µg			0.0396453					

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
STD5=.2ug	4/9/2013	9:13:46	0.0540149			µg			0.0540149					
Reagent Blank	4/9/2013	9:15:33	1.625E-05	6.231E-05	6.231E-05	µg			4.523E-05	0.0001734	0.0001734	-0.0000127	-0.0000487	-0.0000487
0.004ug = DL	4/9/2013	9:16:45	0.0009972	0.0038229	0.0038229	µg			0.0009972	0.0038229	0.0038229			
0.080ug = STD.2	4/9/2013	9:18:01	0.0188958	0.0724402	0.0724402	µg			0.0188958	0.0724402	0.0724402			
REAGENT BLANK	4/9/2013	9:19:17	7.563E-05	0.00029	0.00029	µg			7.563E-05	0.00029	0.00029			
0.080ug = STD.2	4/9/2013	9:20:33	0.0189375	0.0725999	0.0725999	µg			0.0189375	0.0725999	0.0725999			
0.080ug = QC STD 3	4/9/2013	9:21:52	0.0195857	0.0750852	0.0750852	µg			0.0195857	0.0750852	0.0750852			
REAGENT BLANK	4/9/2013	9:28:07	0.0001149	0.0004405	0.0004405	µg			0.0001149	0.0004405	0.0004405			
20241-1B	4/9/2013	9:29:52	0.0001315	0.0005042	0.0630213	µg	4	500	0.0001198	0.0004592	0.0574019	0.0001432	0.0005491	0.0686408
20241-2B	4/9/2013	9:31:37	0.0002082	0.0007981	0.1197124	µg	4	600	0.0002248	0.0008618	0.1292724	0.0001916	0.0007343	0.1101524
20241-2B DUP	4/9/2013	9:33:21	0.0001155	0.0004426	0.0663916	µg	4	600	0.0001094	0.0004195	0.0629253	0.0001215	0.0004657	0.0898579
20241-3B	4/9/2013	9:35:07	0.0002177	0.0008347	0.1043401	µg	4	500	0.0002336	0.0008957	0.1119616	0.0002018	0.0007737	0.0967185
20241-3B SPK	4/9/2013	9:36:56	0.0179877	0.0689587	8.6198411	µg	4	500	0.0179925	0.0689771	8.6221436	0.0179829	0.0689403	8.6175387
20241-4B	4/9/2013	9:38:44	0.0001425	0.0005463	0.0682839	µg	4	500	0.000146	0.0005596	0.0699455	0.000139	0.000533	0.0666222
20241-5B	4/9/2013	9:40:34	0.0001791	0.0006865	0.0858098	µg	4	500	0.0001906	0.0007306	0.0913283	0.0001675	0.0006423	0.0802913
20241-6B	4/9/2013	9:42:23	0.0002391	0.0009167	0.1145917	µg	4	500	0.0002322	0.0008904	0.1112959	0.000246	0.0009431	0.1178874
20241-6B DUP	4/9/2013	9:44:10	0.0001877	0.0007194	0.0899242	µg	4	500	0.0001909	0.0007318	0.0914746	0.0001844	0.000707	0.0883737
20241-7B	4/9/2013	9:45:53	0.0001332	0.0005108	0.0638455	µg	4	500	0.0001189	0.0004558	0.0589744	0.0001476	0.0005657	0.0707166
0.004ug = DL	4/9/2013	9:47:06	0.0010926	0.0041886	0.0041886	µg	4	500	0.0010926	0.0041886	0.0041886			
0.080ug = STD.2	4/9/2013	9:49:42	0.0193775	0.0742869	0.0742869	µg	4	500	0.0193775	0.0742869	0.0742869			
REAGENT BLANK	4/9/2013	9:50:58	0.0001299	0.000498	0.000498	µg	4	500	0.0001299	0.000498	0.000498			
20241-7B SPK	4/9/2013	9:52:42	0.0176967	0.0678434	8.4804228	µg	4	500	0.0177378	0.0680009	8.5001161	0.0176557	0.0676858	8.4607295
20241-8B	4/9/2013	9:54:26	0.0001245	0.0004774	0.0596752	µg	4	500	0.0001504	0.0005766	0.0720784	9.864E-05	0.0003782	0.0472721
20241-9B	4/9/2013	9:56:10	0.000133	0.0005101	0.0637565	µg	4	500	9.863E-05	0.0003781	0.0472683	0.0001675	0.000642	0.0802446
20241-10B	4/9/2013	9:57:55	0.0001028	0.0003941	0.0591146	µg	4	600	0.0001271	0.0004873	0.0730933	7.849E-05	0.0003009	0.0451359
20241-10B DUP	4/9/2013	9:59:42	0.0001325	0.0005081	0.0762192	µg	4	600	0.0001217	0.0004667	0.0700059	0.0001433	0.0005496	0.0824326
20241-11B	4/9/2013	10:01:28	0.0001563	0.0005993	0.0749121	µg	4	500	0.0001404	0.0005381	0.0672623	0.0001723	0.0006605	0.0825619
20241-11B SPK	4/9/2013	10:03:14	0.0185045	0.0709401	8.8675066	µg	4	500	0.0185782	0.0712225	8.9028074	0.0184308	0.0706576	8.8322059
20241-12B	4/9/2013	10:05:02	0.0001352	0.0005183	0.0647917	µg	4	500	0.0001385	0.0005309	0.0663616	0.0001319	0.0005058	0.0632218
20241-13B	4/9/2013	10:06:54	0.0001136	0.0004354	0.0544288	µg	4	500	9.692E-05	0.0003716	0.046445	0.0001302	0.0004993	0.0624126
20241-14B	4/9/2013	10:08:42	0.0001475	0.0005654	0.0706755	µg	4	500	0.00018	0.00069	0.0862496	0.000115	0.0004408	0.0551015
0.004ug = DL	4/9/2013	10:09:58	0.0010874	0.0041689	0.0041689	µg	4	500	0.0010874	0.0041689	0.0041689			
0.080ug = STD.2	4/9/2013	10:11:12	0.0197171	0.0755887	0.0755887	µg	4	500	0.0197171	0.0755887	0.0755887			
REAGENT BLANK	4/9/2013	10:12:29	0.00018	0.0006902	0.0006902	µg	4	500	0.00018	0.0006902	0.0006902			
Calib Blank	4/11/2013	10:11:50	6.084E-05			µg	20	1	6.084E-05					
STD1=.004ug	4/11/2013	10:13:04	0.0010562			µg	20	1	0.0010562					
STD2=.04ug	4/11/2013	10:14:19	0.0108164			µg	20	1	0.0108164					
STD3=.08ug	4/11/2013	10:15:35	0.0212494			µg	20	1	0.0212494					
STD4=.16ug	4/11/2013	10:16:51	0.0413365			µg	20	1	0.0413365					
STD5=.2ug	4/11/2013	10:18:09	0.0504828			µg	20	1	0.0504828					
Reagent Blank	4/11/2013	10:19:55	4.463E-05	0.0001743	0.0001743	µg	20	1	5.044E-05	0.000197	0.000197	3.882E-05	0.0001516	0.0001516
0.004ug = DL	4/11/2013	10:21:08	0.001039	0.0040571	0.0040571	µg	20	1	0.001039	0.0040571	0.0040571			
0.080ug = STD.2	4/11/2013	10:22:23	0.0189133	0.0738497	0.0738497	µg	20	1	0.0189133	0.0738497	0.0738497			
0.080ug = QC STD 3	4/11/2013	10:23:42	0.0202673	0.0791366	0.0791366	µg	20	1	0.0202673	0.0791366	0.0791366			
REAGENT BLANK	4/11/2013	10:24:58	1.22E-06	4.78E-06	4.78E-06	µg	20	1	1.22E-06	4.78E-06	4.78E-06			
0.004ug = DL	4/11/2013	11:07:39	0.0009745	0.003805	0.003805	µg	20	1	0.0009745	0.003805	0.003805			
0.080ug = STD.2	4/11/2013	11:08:55	0.0193454	0.0755373	0.0755373	µg	20	1	0.0193454	0.0755373	0.0755373			
REAGENT BLANK	4/11/2013	11:10:11	4.216E-05	0.0001646	0.0001646	µg	20	1	4.216E-05	0.0001646	0.0001646			
20241-1C	4/11/2013	11:13:45	0.0001573	0.0006143	0.0614323	µg	4	400	0.0001437	0.0005612	0.0561155	0.0001709	0.0006675	0.066749
20241-2C	4/11/2013	11:15:33	7.067E-05	0.000276	0.027596	µg	4	400	8.011E-05	0.0003128	0.0312834	6.123E-05	0.0002391	0.0239087
20241-2C DUP	4/11/2013	11:17:23	0.0001004	0.000392	0.0391992	µg	4	400	9.688E-05	0.0003783	0.0378308	0.0001039	0.0004057	0.0405675
20241-3C	4/11/2013	11:19:13	0.0001374	0.0005364	0.0536441	µg	4	400	0.0001331	0.0005198	0.0519777	0.0001417	0.0005531	0.0553106
20241-3C SPK	4/11/2013	11:20:59	0.0208667	0.0814771	8.1477085	µg	4	400	0.0208729	0.0815016	8.1501635	0.0208604	0.0814525	8.1452535
20241-4C	4/11/2013	11:22:41	0.0001127	0.0004401	0.0440073	µg	4	400	0.000108	0.0004217	0.0421654	0.0001174	0.0004585	0.0458492
20241-5C	4/11/2013	11:24:24	0.0001676	0.0006546	0.065459	µg	4	400	0.0001781	0.0006956	0.0695553	0.0001572	0.0006136	0.0613627
20241-6C	4/11/2013	11:26:07	0.0001614	0.0006301	0.0630068	µg	4	400	0.0001555	0.0006072	0.0607156	0.0001672	0.000653	0.0652979
20241-6C DUP	4/11/2013	11:27:51	0.0001247	0.0004869	0.0486907	µg	4	400	0.0001089	0.0004251	0.042508	0.0001405	0.0005487	0.0548733
0.004ug = DL	4/11/2013	11:31:30	0.0010572	0.0041279	0.0041279	µg	4	400	0.0010572	0.0041279	0.0041279			
0.080ug = STD.2	4/11/2013	11:32:46	0.0196667	0.0767916	0.0767916	µg	4	400	0.0196667	0.0767916	0.0767916			
REAGENT BLANK	4/11/2013	11:34:02	4.272E-05	0.0001668	0.0001668	µg	4	400	4.272E-05	0.0001668	0.0001668			
20241-7C	4/11/2013	11:35:46	8.448E-05	0.0003299	0.0329896	µg	4	400	0.0001019	0.0003977	0.0397709	6.712E-05	0.0002621	0.0262082
20241-7C SPK	4/11/2013	11:37:31	0.020594	0.0804124	8.0412389	µg	4	400	0.0207555	0.0810429	8.1042877	0.0204325	0.0797819	7.9781902
20241-8C	4/11/2013	11:39:17	0.0001415	0.0005525	0.055252	µg	4	400	0.0001346	0.0005255	0.0525491	0.0001484	0.0005795	0.0579549
20241-9C	4/11/2013	11:41:03	8.819E-05	0.0003444	0.0344384	µg	4	400	8.827E-05	0.0003447	0.0344675	8.812E-05	0.0003441	0.0344092
20241-10C	4/11/2013	11:42:49	0.0001461	0.0005704	0.0570386	µg	4	400	0.0001595	0.0006227	0.062266	0.0001327	0.0005181	0.0518113
20241-10C DUP	4/11/2013	11:44:36	0.0001571	0.0006134	0.0613396	µg	4	400	0.0001514	0.0005912	0.0591172	0.0001628	0.0006356	0.063562
20241-11C	4/11/2013	11:46:23	0.000131	0.0005116	0.0511642	µg	4	400	0.0001029	0.0004019	0.0401906	0.0001591	0.0006214	0.0621378
20241-11C SPK	4/11/2013	11:48:10	0.0209662	0.0818658	8.1865794	µg	4	400	0.0210582	0.082225	8.222497	0.0208742	0.0815066	8.1506617
20241-12C	4/11/2013	11:49:58	0.0001568	0.0006121	0.0612134	µg	4	400	0.0001772	0.000692	0.0691983	0.0001363	0.0005323	0.0532285
20241-13C	4/11/2013	11:51:47	5.202E-05	0.0002031	0.0203121	µg	4	400	0.0000814	0.0003179	0.0317868	2.263E-05	8.837E-05	0.0088374
0.004ug = DL	4/11/2013	11:53:03	0.0010441	0.004077	0.004077	µg	4	400	0.0010441	0.004077	0.004077			
0.080ug = STD.2	4/11/2013	11:54:18	0.0196777	0.0768345	0.0768345	µg	4	400	0.0196777	0.0768345	0.0768345			
REAGENT BLANK	4/11/2013	11:55:34	3.496E-05	0.0001365	0.0001365	µg	4	400	3.496E-05	0.0001365	0.0001365			
20241-14C	4/11/2013	11:57:21	-0.0000029	-0.0000115	-0.0011565	µg	4	400	-0.0000007	-0.0000028	-0.0002873	-0.0000051	-0.0000202	-0.0020257
0.004ug = DL	4/11/2013	12:14:13	0.0010583	0.0041321	0.0041321	µg	4	400	0.0010583	0.0041321	0.0041321			
0.080ug = STD.2	4/11/2013	12:15:29	0.0195771	0.076442	0.076442	µg	4	400	0.0195771	0.076442	0.076442			

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
REAGENT BLANK	4/11/2013	12:16:45	4.646E-05	0.0001814	0.0001814	µg	4	400	4.646E-05	0.0001814	0.0001814			
Calib Blank	4/12/2013	9:24:46	8.975E-05			µg	4	100	8.975E-05					
STD1=.004ug	4/12/2013	9:26:02	0.0011721			µg	4	100	0.0011721					
STD2=.04ug	4/12/2013	9:27:18	0.0124241			µg	4	100	0.0124241					
STD3=.08ug	4/12/2013	9:28:35	0.0248286			µg	4	100	0.0248286					
STD4=.16ug	4/12/2013	9:29:53	0.0477428			µg	4	100	0.0477428					
STD5=.2ug	4/12/2013	9:31:12	0.0595009			µg	4	100	0.0595009					
Reagent Blank	4/12/2013	9:32:59	1.069E-05	3.572E-05	3.572E-05	µg	4	100	5.3E-07	1.78E-06	1.78E-06	2.084E-05	6.965E-05	6.965E-05
0.004ug = DL	4/12/2013	9:34:14	0.0012083	0.0040376	0.0040376	µg	4	100	0.0012083	0.0040376	0.0040376			
0.080ug = STD.2	4/12/2013	9:35:30	0.0222097	0.0742138	0.0742138	µg	4	100	0.0222097	0.0742138	0.0742138			
0.080ug = QC STD 3	4/12/2013	9:36:50	0.0252921	0.0845138	0.0845138	µg	4	100	0.0252921	0.0845138	0.0845138			
REAGENT BLANK	4/12/2013	9:38:08	3.965E-05	0.0001325	0.0001325	µg	4	100	3.965E-05	0.0001325	0.0001325			
20241-LRB FH	4/12/2013	9:47:04	5.923E-05	0.0001979	0.0049482	µg	4	100	5.748E-05	0.0001921	0.0048022	6.097E-05	0.0002038	0.0050941
20241-LRB FH SPK	4/12/2013	9:48:54	0.0188535	0.0629993	3.9374545	µg	1.6	100	0.0187875	0.0627786	3.9236598	0.0189196	0.06322	3.9512491
20241-1FH	4/12/2013	9:50:44	2.669E-05	8.921E-05	0.0022303	µg	4	100	0.000018	6.016E-05	0.0015042	3.539E-05	0.0001183	0.0029565
20241-2FH	4/12/2013	9:52:36	5.874E-05	0.0001963	0.0049071	µg	4	100	6.708E-05	0.0002242	0.0056045	5.039E-05	0.0001684	0.0042096
20241-2FH DUP	4/12/2013	9:54:24	5.475E-05	0.000183	0.0045743	µg	4	100	5.129E-05	0.0001714	0.004285	5.822E-05	0.0001945	0.0048636
20241-3FH	4/12/2013	9:56:10	7.374E-05	0.0002464	0.0061608	µg	4	100	6.707E-05	0.0002241	0.005603	8.042E-05	0.0002687	0.0067187
0.004ug = DL	4/12/2013	9:57:24	0.0011993	0.0040073	0.0040073	µg	4	100	0.0011993	0.0040073	0.0040073			
0.080ug = STD.2	4/12/2013	9:58:42	0.0219722	0.0734202	0.0734202	µg	4	100	0.0219722	0.0734202	0.0734202			
REAGENT BLANK	4/12/2013	9:59:58	7.187E-05	0.0002402	0.0002402	µg	4	100	7.187E-05	0.0002402	0.0002402			
20241-3FH SPK	4/12/2013	10:01:44	0.0209537	0.070017	1.7504245	µg	4	100	0.0210101	0.0702053	1.7551322	0.0208973	0.0698287	1.7457168
20241-4FH	4/12/2013	10:03:31	0.0001419	0.0004742	0.011854	µg	4	100	0.0001136	0.0003797	0.0094926	0.0001702	0.0005686	0.0142154
20241-5FH	4/12/2013	10:05:17	0.0006079	0.0020311	0.0507785	µg	4	100	0.000607	0.0020284	0.050711	0.0006087	0.0020338	0.0508459
20241-6FH	4/12/2013	10:07:04	0.0004856	0.0016227	0.0405683	µg	4	100	0.0004864	0.0016254	0.0406348	0.0004848	0.0016201	0.0405017
20241-6FH DUP	4/12/2013	10:08:52	0.0005126	0.0017129	0.0428218	µg	4	100	0.0005186	0.0017331	0.0433263	0.0005066	0.0016927	0.0423173
20241-7FH	4/12/2013	10:10:39	0.0005599	0.0018711	0.0467764	µg	4	100	0.0005647	0.0018869	0.0471714	0.0005552	0.0018553	0.0463814
20241-7FH SPK	4/12/2013	10:12:28	0.0238217	0.0796003	1.9900063	µg	4	100	0.0237197	0.0792596	1.9814901	0.0239236	0.0799409	1.9985225
20241-8FH	4/12/2013	10:14:18	4.027E-05	0.0001346	0.0033648	µg	4	100	3.308E-05	0.0001106	0.0027639	4.747E-05	0.0001586	0.0039658
20241-9FH	4/12/2013	10:16:08	0.0009368	0.0031304	0.0782597	µg	4	100	0.0009342	0.0031216	0.0780409	0.0009394	0.0031391	0.0784785
20241-10FH	4/12/2013	10:17:58	0.0017569	0.0058706	0.146765	µg	4	100	0.0017658	0.0059004	0.1475099	0.001748	0.0058408	0.14602
0.004ug = DL	4/12/2013	10:19:14	0.0011893	0.0039741	0.0039741	µg	4	100	0.0011893	0.0039741	0.0039741			
0.080ug = STD.2	4/12/2013	10:20:31	0.0222264	0.0742698	0.0742698	µg	4	100	0.0222264	0.0742698	0.0742698			
REAGENT BLANK	4/12/2013	10:21:48	3.631E-05	0.0001213	0.0001213	µg	4	100	3.631E-05	0.0001213	0.0001213			
20241-10FH DUP	4/12/2013	10:23:36	0.0019526	0.0065247	0.1631171	µg	4	100	0.0019592	0.0065467	0.1636686	0.001946	0.0065026	0.1625656
20241-11FH	4/12/2013	10:25:27	0.0007779	0.0025995	0.0649874	µg	4	100	0.0007743	0.0025873	0.0646828	0.0007816	0.0026117	0.0652919
20241-11FH SPK	4/12/2013	10:27:19	0.0247786	0.0827978	2.0699444	µg	4	100	0.0246278	0.0822939	2.0573472	0.0249294	0.0833017	2.0825415
20241-12FH	4/12/2013	10:29:06	0.0018533	0.0061929	0.1548229	µg	4	100	0.0018744	0.0062632	0.1565795	0.0018323	0.0061227	0.1530663
20241-13FH	4/12/2013	10:30:50	3.906E-05	0.0001305	0.0032632	µg	4	100	3.872E-05	0.0001294	0.0032351	0.0000394	0.0001317	0.0032914
20241-14FH	4/12/2013	10:32:36	8.522E-05	0.0002848	0.0071193	µg	4	100	0.0001042	0.0003481	0.0087036	6.625E-05	0.0002214	0.005535
0.004ug = DL	4/12/2013	10:40:56	0.0012544	0.0041917	0.0041917	µg	0.4	1	0.0012544	0.0041917	0.0041917			
0.080ug = STD.2	4/12/2013	10:42:12	0.0223738	0.0747623	0.0747623	µg	0.4	1	0.0223738	0.0747623	0.0747623			
REAGENT BLANK	4/12/2013	10:43:29	5.783E-05	0.0001933	0.0001933	µg	0.4	1	5.783E-05	0.0001933	0.0001933			

SGS ANALYTICAL PERSPECTIVES

18 April 2013

Scott Brown
Clean Air Engineering
500 West Wood Street
Palatine, IL 60067

Ph.: 847-991-3300
Email: scott_brown@cleanair.com

Subject: Certificate of Results

Dear Scott;

Attached to this narrative are the analytical results you requested on samples submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary	When applicable, see QC Annotations for details
Client Project No.	12218SB
AP Project #	**A5342**
Analytical Protocol	Method 23
No. Samples Submitted	6
No. Samples Analyzed	4 (Reagent Blank & Run 1 Archived)
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	28-Mar-2013
Condition Received	good
Temperature upon Receipt (C)	4 (traps and filters), 12 (solvents)
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

SGS

QC Annotations:

1. Please see Appendix A & B attached for data qualifier/attribute and lab identifier descriptions which may be contained in the project.
2. The Laboratory Method Blank and BCS3 were created at time of extraction. Method Blank does not contain CS/SS standard spikes.

Analytical Perspectives Certification IDs:

SOUTH CAROLINA	99054
ARKANSAS	88-0628
NEW JERSEY-NELAP SECONDARY	NC005
FLORIDA-NELAP PRIMARY	E87608
LOUISIANA	4024
NORTH CAROLINA	37783
WASHINGTON	C2027
NEW YORK	11988
VIRGINIA	460180
MINNESOTA	037-999-448
OREGON	pending
TEXAS	T104704484-10-1
PENNSYLVANIA-NELAP SECONDARY	68-01849

SGS Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please do not hesitate to contact us.

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Sincerely,

Donna R McCall
Project Scientist Associate

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
>	Indicates high recoveries. Shown with the numeric value at the top of the range.[1]
B	The analyte was found in the method blank, at a concentration that was at least 10% of the concentration in the sample.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned.[1]
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.[1]
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

[1]Denotes data qualifiers/attributes whose use will be phased out over time

A5342 - TEQ

Project ID: 12218SB

Sample Summary Part 1	SGS ANALYTICAL PERSPECTIVES				Method 23
Analyte	**Method Blank A5342**	**Unit 2 FF Outlet - Field Blank**	**Unit 2 FF Outlet - Run 2**	**Unit 2 FF Outlet - Run 3**	**Unit 2 FF Outlet - Run 4**
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.47)	(2.21)	[11.1]	13.8	14.7
1,2,3,7,8-PeCDD	(1.51)	(2.09)	36.8	43.7	41.8
1,2,3,4,7,8-HxCDD	(1.18)	(2.21)	56.8	63.2	64
1,2,3,6,7,8-HxCDD	(1.19)	(2.18)	177	171	200
1,2,3,7,8,9-HxCDD	(1.29)	(2.46)	77.8	72.7	85.8
1,2,3,4,6,7,8-HpCDD	7.16	9.17	987	1060	1110
OCDD	[17.5]	19.4	786	845	847
2,3,7,8-TCDF	(1.01)	(1.54)	[11.4]	12.9	13.4
1,2,3,7,8-PeCDF	(0.942)	(1.86)	21	19.2	21
2,3,4,7,8-PeCDF	(0.85)	(1.76)	44.5	42.8	45.4
1,2,3,4,7,8-HxCDF	(1.14)	(1.29)	33.1	31.3	31.6
1,2,3,6,7,8-HxCDF	(1.08)	(1.26)	38.2	38.3	36.7
2,3,4,6,7,8-HxCDF	(1.13)	(1.29)	69	71.9	70.9
1,2,3,7,8,9-HxCDF	(1.56)	(1.95)	12.1	(3.33)	(3.71)
1,2,3,4,6,7,8-HpCDF	2.28	(1.15)	97.6	96.3	94.6
1,2,3,4,7,8,9-HpCDF	(1.76)	(1.93)	19.3	24	22.7
OCDF	8.03	14.8	43	40.5	38.5
ITEF TEQ (ND=0; EMPC=0)	**0.102**	**0.126**	**100**	**117**	**123**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.12**	**0.126**	**112**	**117**	**123**
ITEF TEQ (ND=DL/2; EMPC=0)	**1.94**	**2.97**	**101**	**117**	**123**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**1.96**	**2.97**	**112**	**117**	**123**
ITEF TEQ (ND=DL; EMPC=EMPC)	**3.8**	**5.8**	**112**	**117**	**123**
Checkcode	475-588-HQH	270-937-HSF	027-340-YGQ	012-546-KXD	292-919-QVQ
Lab ID	MB1_10783_DF_TLX	A5342_10783_DF_001	A5342_10783_DF_003	A5342_10783_DF_004	A5342_10783_DF_005

( ) = DL
[ ] = EMPC

A5342 - WHO-2005-TEQ

Project ID: 12218SB

Sample Summary Part 1	SGS / ANALYTICAL PERSPECTIVES				Method 23
Analyte	**Method Blank A5342**	**Unit 2 FF Outlet - Field Blank**	**Unit 2 FF Outlet - Run 2**	**Unit 2 FF Outlet - Run 3**	**Unit 2 FF Outlet - Run 4**
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.47)	(2.21)	[11.1]	13.8	14.7
1,2,3,7,8-PeCDD	(1.51)	(2.09)	36.8	43.7	41.8
1,2,3,4,7,8-HxCDD	(1.18)	(2.21)	56.8	63.2	64
1,2,3,6,7,8-HxCDD	(1.19)	(2.18)	177	171	200
1,2,3,7,8,9-HxCDD	(1.29)	(2.46)	77.8	72.7	85.8
1,2,3,4,6,7,8-HpCDD	7.16	9.17	987	1060	1110
OCDD	[17.5]	19.4	786	845	847
2,3,7,8-TCDF	(1.01)	(1.54)	[11.4]	12.9	13.4
1,2,3,7,8-PeCDF	(0.942)	(1.86)	21	19.2	21
2,3,4,7,8-PeCDF	(0.85)	(1.76)	44.5	42.8	45.4
1,2,3,4,7,8-HxCDF	(1.14)	(1.29)	33.1	31.3	31.6
1,2,3,6,7,8-HxCDF	(1.08)	(1.26)	38.2	38.3	36.7
2,3,4,6,7,8-HxCDF	(1.13)	(1.29)	69	71.9	70.9
1,2,3,7,8,9-HxCDF	(1.56)	(1.95)	12.1	(3.33)	(3.71)
1,2,3,4,6,7,8-HpCDF	2.28	(1.15)	97.6	96.3	94.6
1,2,3,4,7,8,9-HpCDF	(1.76)	(1.93)	19.3	24	22.7
OCDF	8.03	14.8	43	40.5	38.5
WHO-2005 TEQ (ND=0; EMPC=0)	**0.0967**	**0.102**	**109**	**129**	**133**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.102**	**0.102**	**121**	**129**	**133**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**2.22**	**3.27**	**110**	**129**	**134**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**2.22**	**3.27**	**121**	**129**	**134**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**4.35**	**6.44**	**121**	**129**	**134**
Checkcode	475-588-HQH	270-937-HSF	027-340-YGQ	012-546-KXD	292-919-QVQ
Lab ID	MB1_10783_DF_TLX	A5342_10783_DF_001	A5342_10783_DF_003	A5342_10783_DF_004	A5342_10783_DF_005

( ) = DL
[ ] = EMPC

A5342 - Totals

Project ID: 12218SB

Sample Summary Part 2

SGS ANALYTICAL PERSPECTIVES

Method 23

Analyte	Method Blank A5342	Unit 2 FF Outlet - Field Blank	Unit 2 FF Outlet - Run 2	Unit 2 FF Outlet - Run 3	Unit 2 FF Outlet - Run 4
	pg	pg	pg	pg	pg
Totals					
TCDDs	0	0	2570	2660	2990
PeCDDs	0	0	2740	2760	3020
HxCDDs	0	5.02	4310	4520	4880
HpCDDs	10.8	15.5	1930	2070	2170
OCDD	0	19.4	786	845	847
TCDFs	0	0	744	743	835
PeCDFs	0	0	685	660	703
HxCDFs	0	0	562	557	568
HpCDFs	6.52	4.78	228	260	248
OCDF	8.03	14.8	43	40.5	38.5
Total PCDD/Fs (ND=0; EMPC=0)	**25.4**	**59.4**	**14600**	**15100**	**16300**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**42.9**	**64.3**	**14700**	**15100**	**16300**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**59**	**89.5**	**14700**	**15100**	**16300**
Total 2378s (ND=0; EMPC=0)	**17.5**	**43.4**	**2500**	**2640**	**2740**
Total 2378s (ND=0.5; EMPC=0)	**26.8**	**55.9**	**2500**	**2650**	**2740**
Total 2378s (ND=1; EMPC=0)	**36.1**	**68.5**	**2500**	**2650**	**2740**
Total 2378s (ND=0; EMPC=1)	**35**	**43.4**	**2520**	**2640**	**2740**
Total 2378s (ND=0.5; EMPC=1)	**43**	**55.9**	**2520**	**2650**	**2740**
Total 2378s (ND=1; EMPC=1)	**51.1**	**68.5**	**2520**	**2650**	**2740**
Checkcode	475-588-HQH	270-937-HSF	027-340-YGQ	012-546-KXD	292-919-QVQ
Lab ID	MB1_10783_DF_TLX	A5342_10783_DF_001	A5342_10783_DF_003	A5342_10783_DF_004	A5342_10783_DF_005

( ) = DL
[ ] = EMPC

A5342 - Others
Project ID: 12218SB

Sample Summary Part 3					Method 23
Analyte	**Method Blank A5342** pg	**Unit 2 FF Outlet - Field Blank** pg	**Unit 2 FF Outlet - Run 2** pg	**Unit 2 FF Outlet - Run 3** pg	**Unit 2 FF Outlet - Run 4** pg
Other PCDD/Fs (ND=0, EMPC=0)					
Other TCDD	0	0	2570	2650	2980
Other PeCDD	0	0	2710	2720	2980
Other HxCDD	0	5.02	4000	4210	4530
Other HpCDD	3.69	6.28	939	1010	1060
Other TCDF	0	0	744	730	822
Other PeCDF	0	0	619	598	636
Other HxCDF	0	0	409	415	429
Other HpCDF	4.24	4.78	111	139	131
Other PCDD/Fs (ND=0, EMPC=EMPC)					
Other TCDD	0	4.86	2590	2650	3000
Other PeCDD	0	0	2730	2720	2990
Other HxCDD	0	5.02	4020	4210	4530
Other HpCDD	3.69	6.28	939	1010	1060
Other TCDF	0	0	749	750	832
Other PeCDF	0	0	629	598	643
Other HxCDF	0	0	409	415	429
Other HpCDF	4.24	4.78	111	139	131
Checkcode	475-588-HQH	270-937-HSF	027-340-YGQ	012-546-KXD	292-919-QVQ
Lab ID	MB1_10783_DF_TLX	A5342_10783_DF_001	A5342_10783_DF_003	A5342_10783_DF_004	A5342_10783_DF_005

( ) = DL
[ ] = EMPC

A5342 - DLs

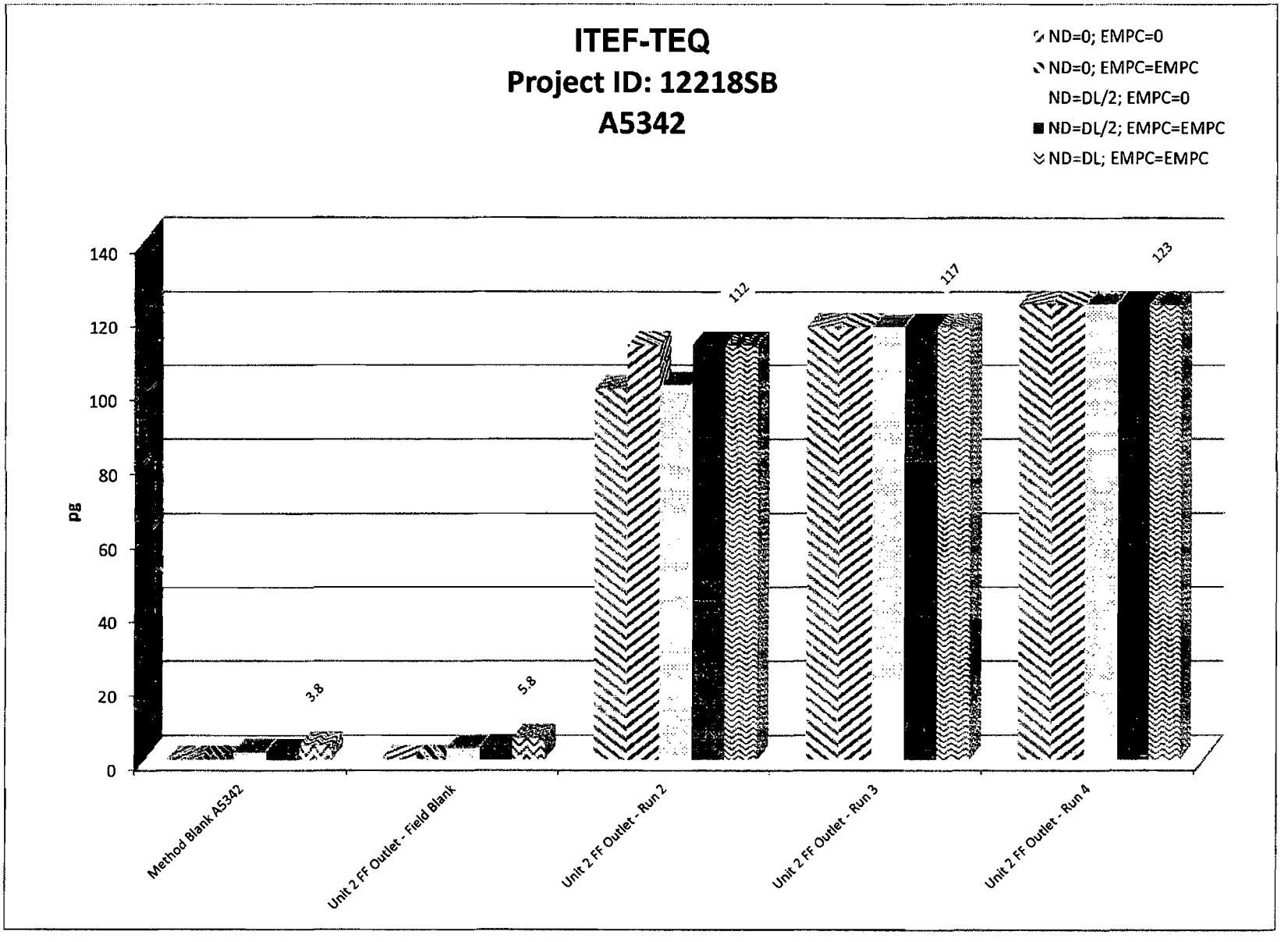
Project ID: 12218SB

Sample Summary
Part 5 (DLs)

SGS ANALYTICAL PERSPECTIVES

Method 23

Analyte	Method Blank A5342	Unit 2 FF Outlet - Field Blank	Unit 2 FF Outlet - Run 2	Unit 2 FF Outlet - Run 3	Unit 2 FF Outlet - Run 4
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	1.47	2.21	2.4	2.05	2.15
1,2,3,7,8-PeCDD	1.51	2.09	3.22	4.93	2.65
1,2,3,4,7,8-HxCDD	1.18	2.21	2.12	2.39	1.95
1,2,3,6,7,8-HxCDD	1.19	2.18	2.08	2.35	2.06
1,2,3,7,8,9-HxCDD	1.29	2.46	2.41	2.59	2.24
1,2,3,4,6,7,8-HpCDD	1.97	2.64	3.64	5.02	2.81
OCDD	2.53	4.4	3.4	4.06	4.41
2,3,7,8-TCDF	1.01	1.54	2.36	2.24	0.942
1,2,3,7,8-PeCDF	0.942	1.86	3.53	3.1	2.24
2,3,4,7,8-PeCDF	0.85	1.76	3.2	2.83	2.06
1,2,3,4,7,8-HxCDF	1.14	1.29	2.55	2.28	2.68
1,2,3,6,7,8-HxCDF	1.08	1.26	2.48	2.16	2.54
2,3,4,6,7,8-HxCDF	1.13	1.29	2.6	2.27	2.56
1,2,3,7,8,9-HxCDF	1.56	1.95	3.77	3.33	3.71
1,2,3,4,6,7,8-HpCDF	1.07	1.15	1.88	1.99	1.42
1,2,3,4,7,8,9-HpCDF	1.76	1.93	3.13	3.12	2.22
OCDF	3.46	4.73	5.02	5.61	3.06
Total TCDD	1.47	2.21	2.4	2.05	2.15
Total PeCDD	1.51	2.09	3.22	4.93	2.65
Total HxCDD	1.22	2.27	2.2	2.44	2.08
Total HpCDD	1.97	2.64	3.64	5.02	2.81
Total TCDF	1.01	1.54	2.36	2.24	0.942
Total PeCDF	0.895	1.81	3.36	2.96	2.15
Total HxCDF	1.21	1.42	2.8	2.47	2.83
Total HpCDF	1.37	1.5	2.43	2.49	1.78
Checkcode	475-588-HQH	270-937-HSF	027-340-YGQ	012-546-KXD	292-919-QVQ
Lab ID	MB1_10783_DF_TLX	A5342_10783_DF_001	A5342_10783_DF_003	A5342_10783_DF_004	A5342_10783_DF_005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Project ID: 12218SB
A5342
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ND=DL/2; EMPC=0
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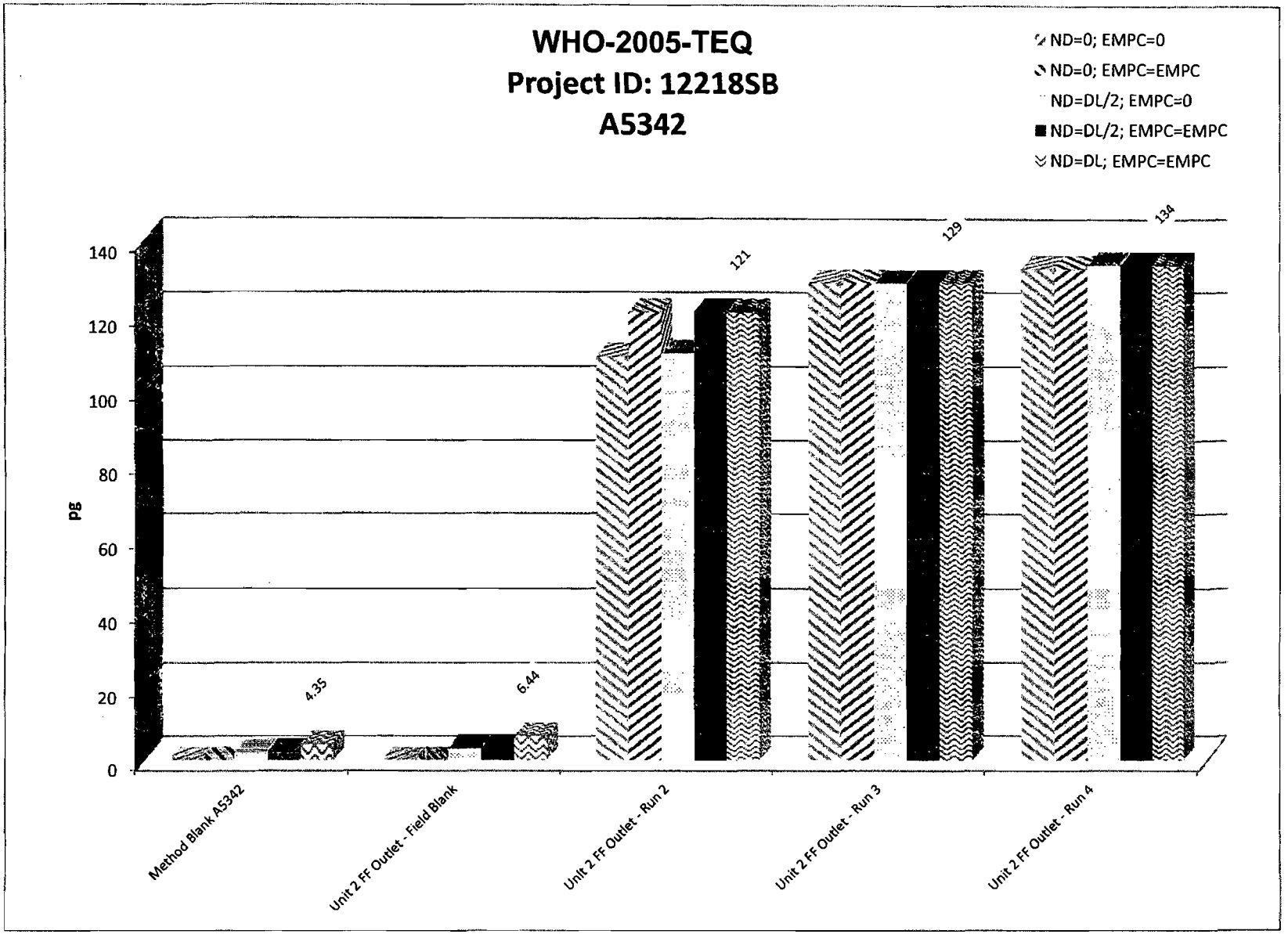
ND=DL; EMPC=EMPC
pg
140
120
100
80
60
40
20
0
3.8
5.8
112
117
123
Method Blank A5342
Unit 2 FF Outlet - Field Blank
Unit 2 FF Outlet - Run 2
Unit 2 FF Outlet - Run 3
Unit 2 FF Outlet - Run 4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ND=DL; EMPC=EMPC
pg
0
20
40
60
80
100
120
140
4.35
6.44
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129
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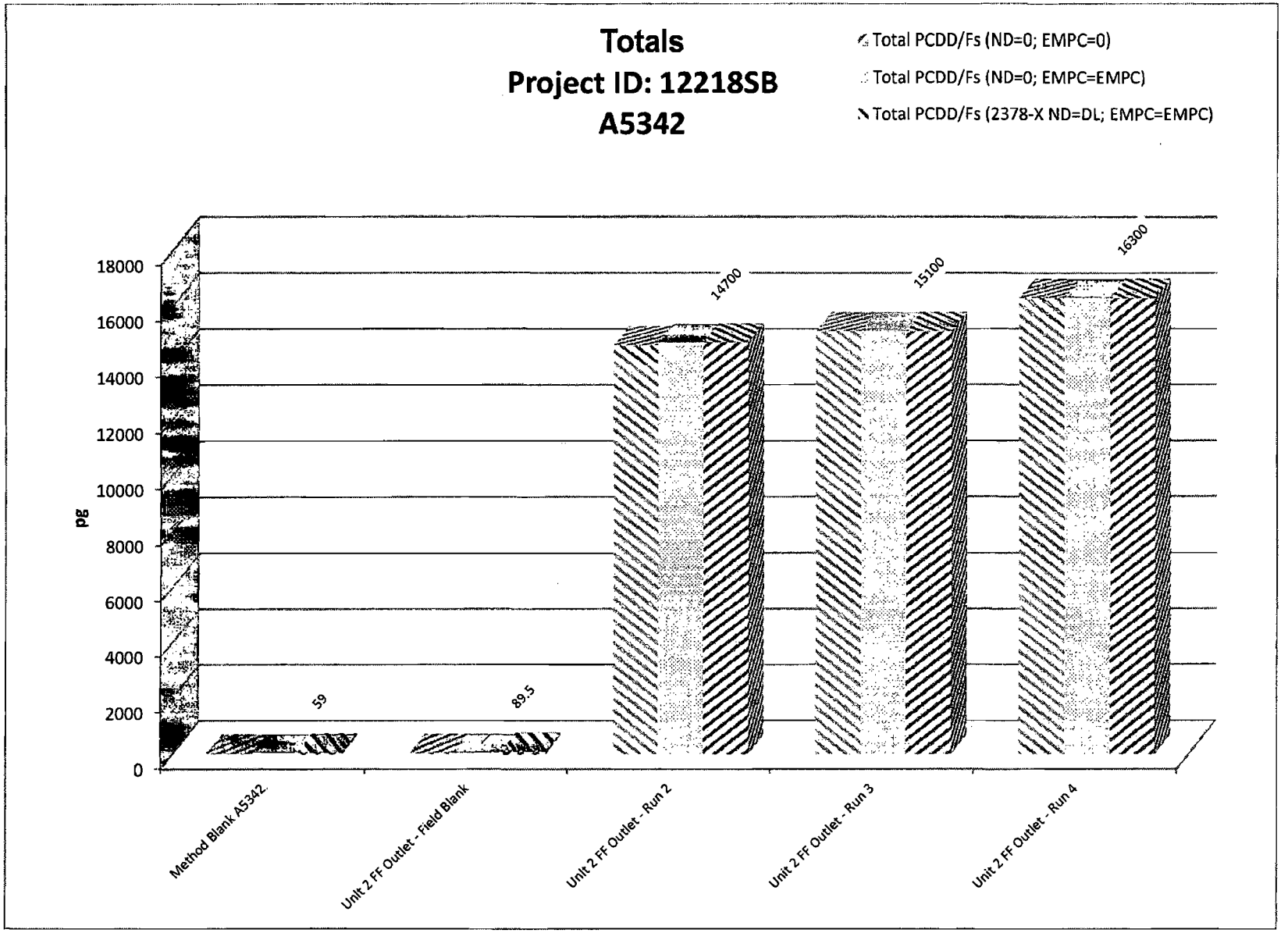
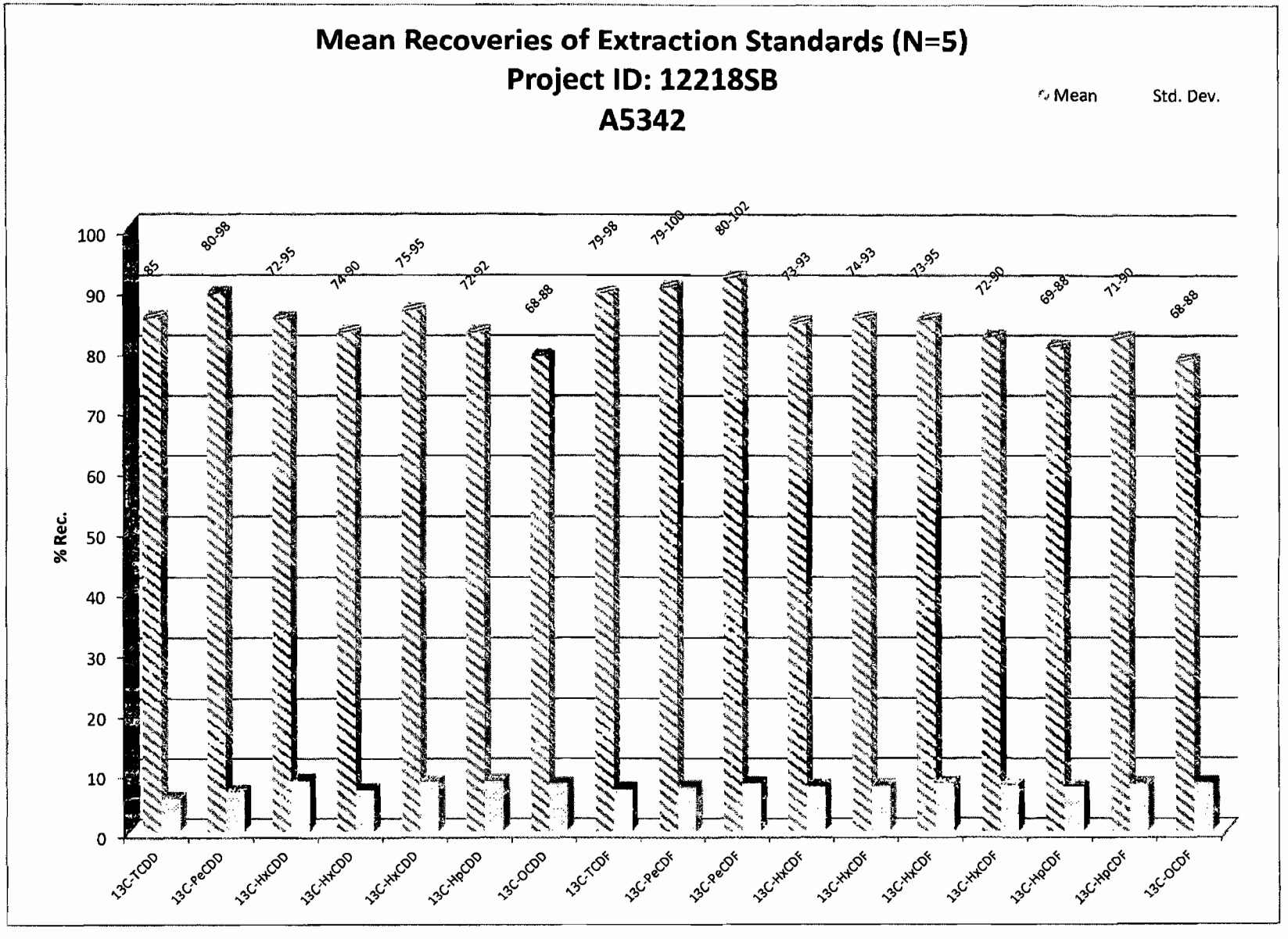
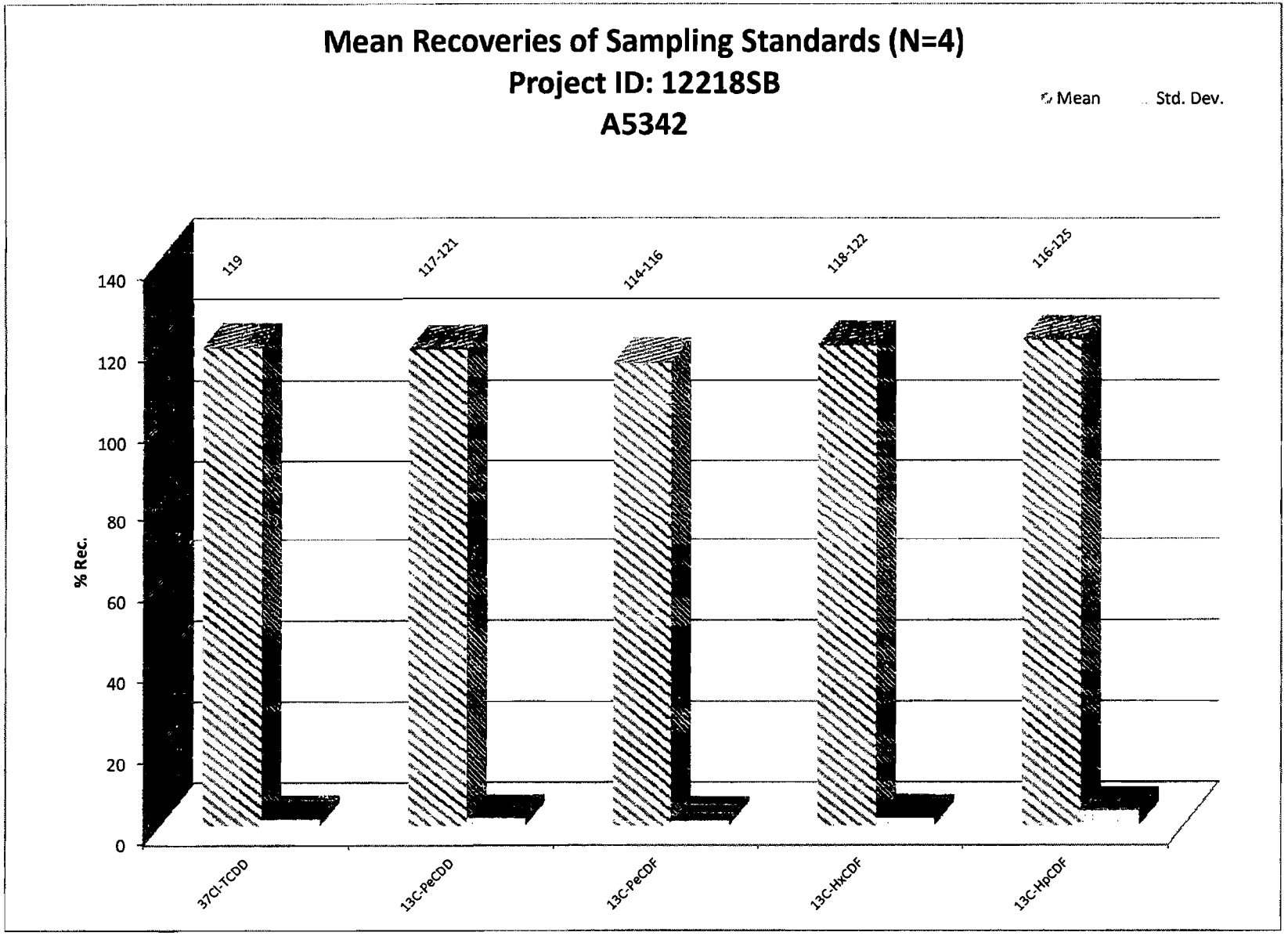
Method Blank A5342
Unit 2 FF Outlet - Field Blank
Unit 2 FF Outlet - Run 2
Unit 2 FF Outlet - Run 3
Unit 2 FF Outlet - Run 4


Totals
Project ID: 12218SB
A5342
Total PCDD/Fs (ND=0; EMPC=0)
Total PCDD/Fs (ND=0; EMPC=EMPC)
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)
pg
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
59
89.5
14700
15100
16300
Method Blank A5342
Unit 2 FF Outlet - Field Blank
Unit 2 FF Outlet - Run 2
Unit 2 FF Outlet - Run 3
Unit 2 FF Outlet - Run 4



Method Specification Limits: Tetra-Hexa ES: 40-130%, Hepta-Octa ES: 25-130% (F = fail)



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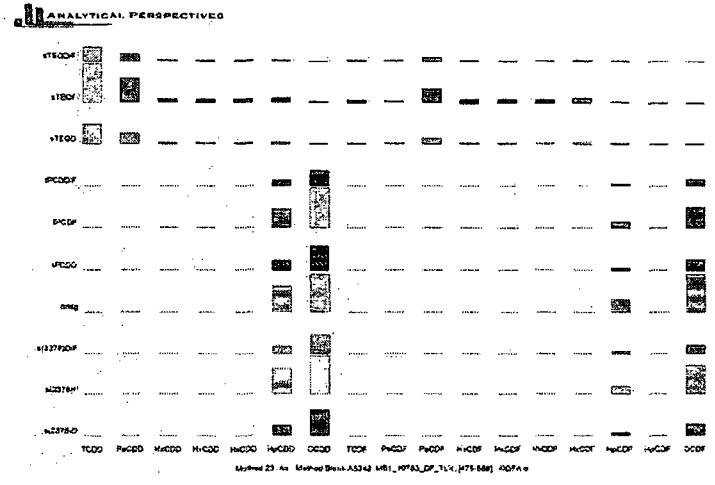
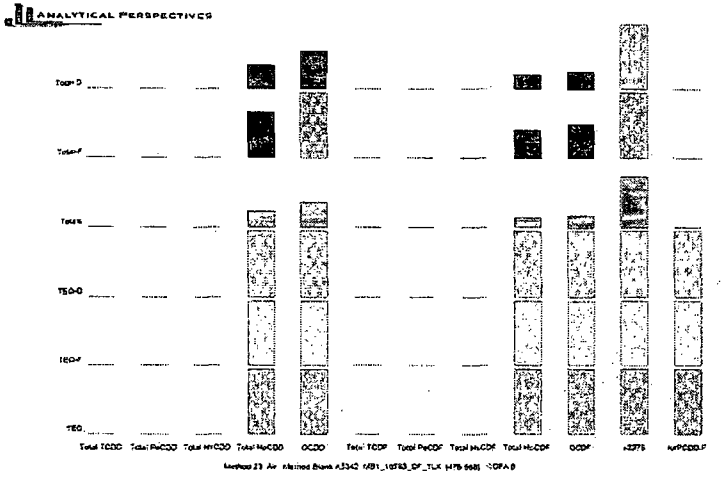

ANALYTICAL PERSPECTIVES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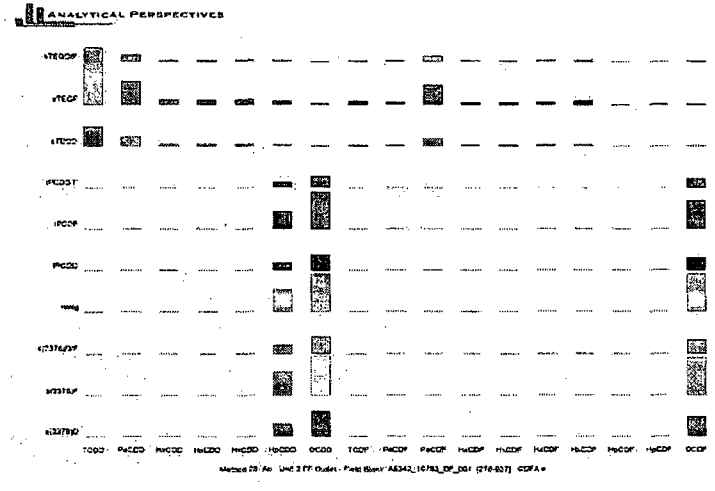
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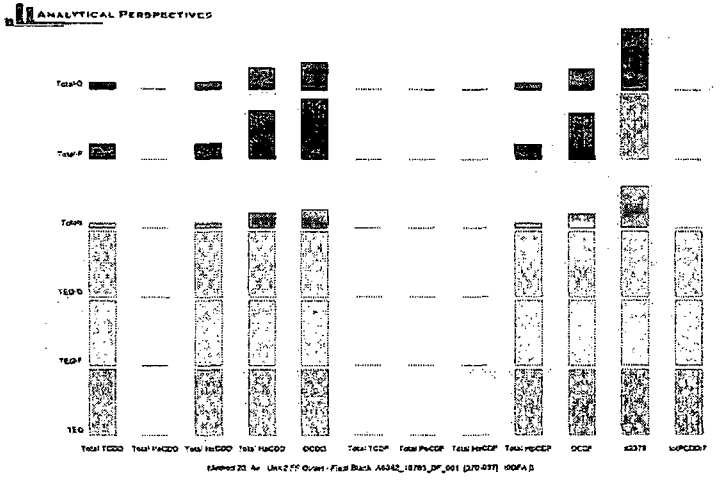
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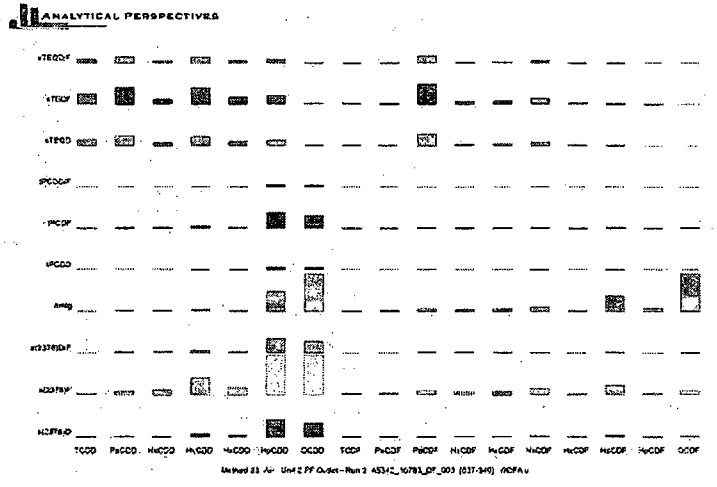
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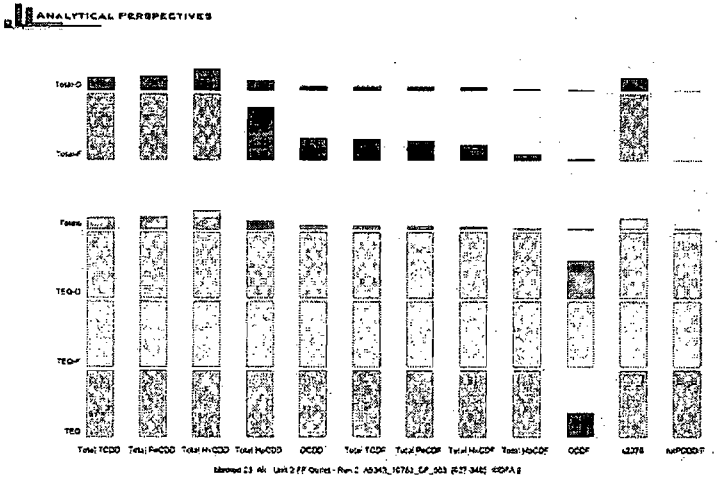
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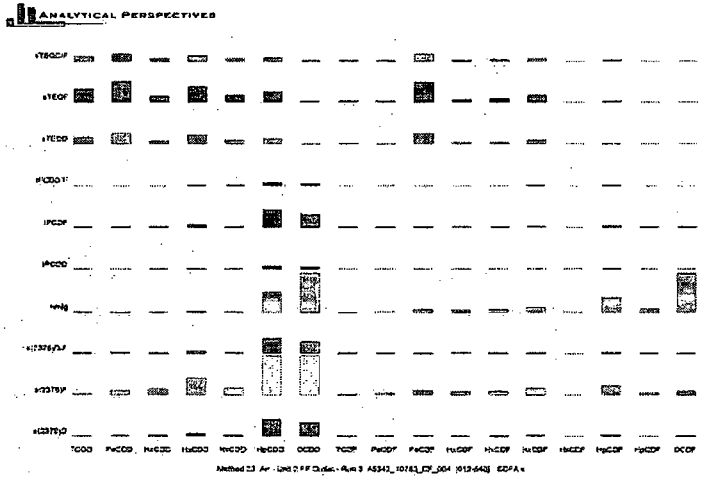
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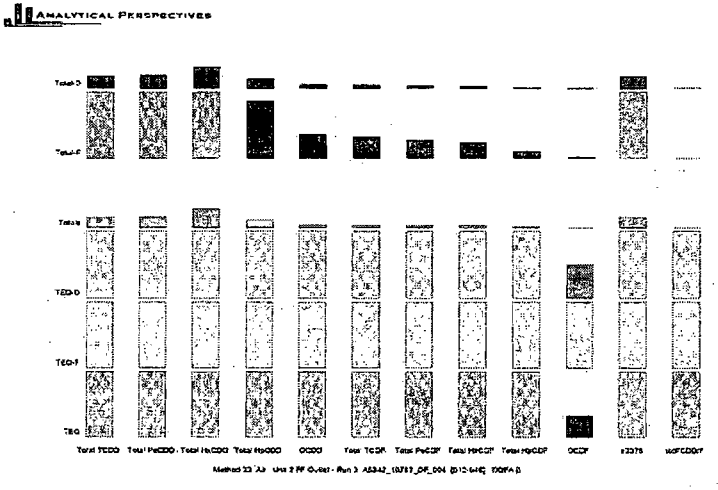
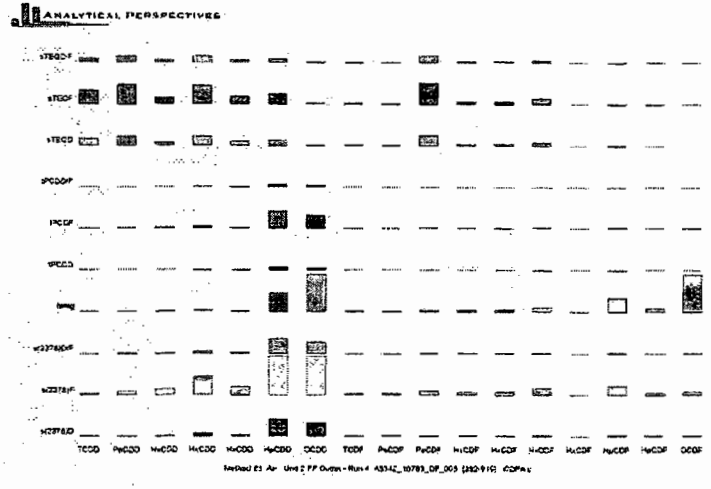

ANALYTICAL PERSPECTIVES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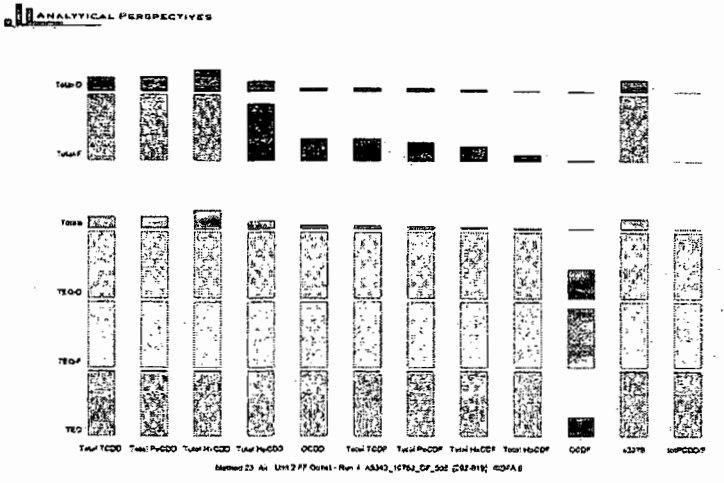
TCDD
PeCDD
HxCDD
HxCDD
HxCDD
HpCDD
OCDD
TCDF
PeCDF
PeCDF
HxCDF
HxCDF
HxCDF
HpCDF
HpCDF
OCDF


ANALYTICAL PERSPECTIVES
Total D
Total F
Totals
TEQ-D
TEQ-F
TEQ
Total TCDD
Total PeCDD
Total HxCDD
Total HpCDD
OCDD
Total TCDF
Total PeCDF
Total HxCDF
Total HpCDF
OCDF
s3278
totPCDD/F

Sample ID: Method Blank A5342

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5342	Date Received:	n/a
Project ID:	12218SB	Weight/Volume:	1	Lab Sample ID	MB1_10783_DF_TLX	Date Extracted:	01-Apr-2013
Date Collected:	n/a			QC Batch No:	10783	Date Analyzed:	05-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	21:09:40

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	1.47			ES 2378-TCDD	87.3	
12378-PeCDD	ND	1.51			ES 12378-PeCDD	92.1	
123478-HxCDD	ND	1.18			ES 123478-HxCDD	89.2	
123678-HxCDD	ND	1.19			ES 123678-HxCDD	89.1	
123789-HxCDD	ND	1.29			ES 123789-HxCDD	93.5	
1234678-HpCDD	7.16			J	ES 1234678-HpCDD	89.8	
OCDD	EMPC		17.5	J	ES OCDD	83.8	
2378-TCDF	ND	1.01			ES 2378-TCDF	92	
12378-PeCDF	ND	0.942			ES 12378-PeCDF	93.1	
23478-PeCDF	ND	0.85			ES 23478-PeCDF	94.1	
123478-HxCDF	ND	1.14			ES 123478-HxCDF	89.4	
123678-HxCDF	ND	1.08			ES 123678-HxCDF	90.6	
234678-HxCDF	ND	1.13			ES 234678-HxCDF	88.8	
123789-HxCDF	ND	1.56			ES 123789-HxCDF	90.1	
1234678-HpCDF	2.28			J	ES 1234678-HpCDF	87.6	
1234789-HpCDF	ND	1.76			ES 1234789-HpCDF	89.1	
OCDF	8.03			J	ES OCDF	83.4	
Totals					**Standard**	**SS/AS/FS/TS Recoveries**	
					SS 37Cl-2378-TCDD	n/a	
Total TCDD	ND	1.47	ND		SS 12347-PeCDD	n/a	
Total PeCDD	ND	1.51	ND		SS 12346-PeCDF	n/a	
Total HxCDD	ND	1.22	ND		SS 123469-HxCDF	n/a	
Total HpCDD	10.8		10.8		SS 1234689-HpCDF	n/a	
					AS 1368-TCDD	89.1	
Total TCDF	ND	1.01	ND		AS 1368-TCDF	90.5	
Total PeCDF	ND	0.895	ND		FS 1278-TCDD	102	
Total HxCDF	ND	1.21	ND		FS 12478-PeCDD	97.9	
Total HpCDF	6.52		6.52		FS 123468-HxCDD	102	
Total PCDD/Fs	**25.4**		**42.9**		FS 1234679-HpCDD	97.1	
ITEF TEQs					TS 1378-TCDD	n/a	
TEQ: ND=0	0.102		0.12				
TEQ: ND=DL/2	1.94	1.86	1.96				
TEQ: ND=DL	3.78	3.71	3.8				

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Sample ID: Unit 2 FF Outlet - Field Blank

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5342	Date Received:	28-Mar-2013
Project ID:	12218SB	Weight/Volume:	1	Lab Sample ID	A5342_10783_DF_001	Date Extracted:	01-Apr-2013
Date Collected:	26-Mar-2013			QC Batch No:	10783	Date Analyzed:	05-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	22:02:57

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.21			ES 2378-TCDD	82.1	
12378-PeCDD	ND	2.09			ES 12378-PeCDD	86.3	
123478-HxCDD	ND	2.21			ES 123478-HxCDD	83.9	
123678-HxCDD	ND	2.18			ES 123678-HxCDD	79.7	
123789-HxCDD	ND	2.46			ES 123789-HxCDD	83.4	
1234678-HpCDD	9.17			J B	ES 1234678-HpCDD	78.6	
OCDD	19.4			J B	ES OCDD	75.5	
2378-TCDF	ND	1.54			ES 2378-TCDF	89	
12378-PeCDF	ND	1.86			ES 12378-PeCDF	89.9	
23478-PeCDF	ND	1.76			ES 23478-PeCDF	90.7	
123478-HxCDF	ND	1.29			ES 123478-HxCDF	82.1	
123678-HxCDF	ND	1.26			ES 123678-HxCDF	83.1	
234678-HxCDF	ND	1.29			ES 234678-HxCDF	83	
123789-HxCDF	ND	1.95			ES 123789-HxCDF	76.7	
1234678-HpCDF	ND	1.15			ES 1234678-HpCDF	79.5	
1234789-HpCDF	ND	1.93			ES 1234789-HpCDF	79.2	
OCDF	14.8			J B	ES OCDF	74	
Totals					**Standard**	**SS/AS/FS/TS Recoveries**	
					SS 37Cl-2378-TCDD	118	
Total TCDD	ND		4.86		SS 12347-PeCDD	121	
Total PeCDD	ND	2.09	ND		SS 12346-PeCDF	114	
Total HxCDD	5.02		5.02		SS 123469-HxCDF	118	
Total HpCDD	15.5		15.5		SS 1234689-HpCDF	116	
					AS 1368-TCDD	85.2	
Total TCDF	ND	1.54	ND		AS 1368-TCDF	89.5	
Total PeCDF	ND	1.81	ND		FS 1278-TCDD	104	
Total HxCDF	ND	1.42	ND		FS 12478-PeCDD	106	
Total HpCDF	4.78		4.78		FS 123468-HxCDD	105	
Total PCDD/Fs	**59.4**		**64.3**		FS 1234679-HpCDD	106	
ITEF TEQs					TS 1378-TCDD	n/a	
TEQ: ND=0	0.126		0.126				
TEQ: ND=DL/2	2.97	2.86	2.97				
TEQ: ND=DL	5.8	5.71	5.8				

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Sample ID: Unit 2 FF Outlet - Run 2

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5342	Date Received:	28-Mar-2013
Project ID:	12218SB	Weight/Volume:	1	Lab Sample ID	A5342_10783_DF_003	Date Extracted:	01-Apr-2013
Date Collected:	26-Mar-2013			QC Batch No:	10783	Date Analyzed:	05-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	22:56:20

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC		11.1		ES 2378-TCDD	85.8	
12378-PeCDD	36.8			J	ES 12378-PeCDD	90	
123478-HxCDD	56.8				ES 123478-HxCDD	84.5	
123678-HxCDD	177				ES 123678-HxCDD	81.1	
123789-HxCDD	77.8				ES 123789-HxCDD	85.1	
1234678-HpCDD	987				ES 1234678-HpCDD	80.7	
OCDD	786				ES OCDD	78.2	
2378-TCDF	EMPC		11.4		ES 2378-TCDF	88.9	
12378-PeCDF	21			J	ES 12378-PeCDF	89.3	
23478-PeCDF	44.5			J	ES 23478-PeCDF	92.3	
123478-HxCDF	33.1			J	ES 123478-HxCDF	83.6	
123678-HxCDF	38.2			J	ES 123678-HxCDF	84.9	
234678-HxCDF	69				ES 234678-HxCDF	84.2	
123789-HxCDF	12.1			J	ES 123789-HxCDF	81.2	
1234678-HpCDF	97.6				ES 1234678-HpCDF	79.9	
1234789-HpCDF	19.3			J	ES 1234789-HpCDF	79.7	
OCDF	43			J B	ES OCDF	76.4	
Totals					**Standard**	**SS/AS/FS/TS Recoveries**	
					SS 37Cl-2378-TCDD	117	
Total TCDD	2570		2600		SS 12347-PeCDD	117	
Total PeCDD	2740		2770		SS 12346-PeCDF	116	
Total HxCDD	4310		4330		SS 123469-HxCDF	118	
Total HpCDD	1930		1930		SS 1234689-HpCDF	120	
					AS 1368-TCDD	87.3	
Total TCDF	744		761		AS 1368-TCDF	88.7	
Total PeCDF	685		695		FS 1278-TCDD	104	
Total HxCDF	562		562		FS 12478-PeCDD	100	
Total HpCDF	228		228		FS 123468-HxCDD	103	
Total PCDD/Fs	**14600**		**14700**		FS 1234679-HpCDD	102	
ITEF TEQs					TS 1378-TCDD	n/a	
TEQ: ND=0	100		112				
TEQ: ND=DL/2	101	3.96	112				
TEQ: ND=DL	103	7.91	112				

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Sample ID: Unit 2 FF Outlet - Run 3

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5342	Date Received:	28-Mar-2013
Project ID:	12218SB	Weight/Volume:	1	Lab Sample ID	A5342_10783_DF_004	Date Extracted:	01-Apr-2013
Date Collected:	26-Mar-2013			QC Batch No:	10783	Date Analyzed:	05-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	23:49:44

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	13.8				ES 2378-TCDD	78	
12378-PeCDD	43.7			J	ES 12378-PeCDD	80	
123478-HxCDD	63.2				ES 123478-HxCDD	72.1	
123678-HxCDD	171				ES 123678-HxCDD	73.7	
123789-HxCDD	72.7				ES 123789-HxCDD	74.8	
1234678-HpCDD	1060				ES 1234678-HpCDD	71.9	
OCDD	845				ES OCDD	68	
2378-TCDF	12.9				ES 2378-TCDF	78.6	
12378-PeCDF	19.2			J	ES 12378-PeCDF	79.3	
23478-PeCDF	42.8			J	ES 23478-PeCDF	79.8	
123478-HxCDF	31.3			J	ES 123478-HxCDF	73.3	
123678-HxCDF	38.3			J	ES 123678-HxCDF	73.7	
234678-HxCDF	71.9				ES 234678-HxCDF	73.2	
123789-HxCDF	ND	3.33			ES 123789-HxCDF	72.4	
1234678-HpCDF	96.3				ES 1234678-HpCDF	68.8	
1234789-HpCDF	24			J	ES 1234789-HpCDF	70.9	
OCDF	40.5			J B	ES OCDF	68	
Totals					**Standard**	**SS/AS/FS/TS Recoveries**	
					SS 37Cl-2378-TCDD	119	
Total TCDD	2660		2660		SS 12347-PeCDD	117	
Total PeCDD	2760		2760		SS 12346-PeCDF	116	
Total HxCDD	4520		4520		SS 123469-HxCDF	119	
Total HpCDD	2070		2070		SS 1234689-HpCDF	121	
					AS 1368-TCDD	79.5	
Total TCDF	743		762		AS 1368-TCDF	80.3	
Total PeCDF	660		660		FS 1278-TCDD	99.3	
Total HxCDF	557		557		FS 12478-PeCDD	99.2	
Total HpCDF	260		260		FS 123468-HxCDD	105	
Total PCDD/Fs	**15100**		**15100**		FS 1234679-HpCDD	97.8	
ITEF TEQs					TS 1378-TCDD	n/a	
TEQ: ND=0	117		117				
TEQ: ND=DL/2	117	4.08	117				
TEQ: ND=DL	117	8.16	117				

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Sample ID: Unit 2 FF Outlet - Run 4

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5342	Date Received:	28-Mar-2013
Project ID:	12218SB	Weight/Volume:	1	Lab Sample ID	A5342_10783_DF_005	Date Extracted:	01-Apr-2013
Date Collected:	27-Mar-2013			QC Batch No:	10783	Date Analyzed:	06-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	00:43:05

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers
2378-TCDD	14.7			
12378-PeCDD	41.8			J
123478-HxCDD	64			
123678-HxCDD	200			
123789-HxCDD	85.8			
1234678-HpCDD	1110			
OCDD	847			
2378-TCDF	13.4			
12378-PeCDF	21			J
23478-PeCDF	45.4			J
123478-HxCDF	31.6			J
123678-HxCDF	36.7			J
234678-HxCDF	70.9			
123789-HxCDF	ND	3.71		
1234678-HpCDF	94.6			
1234789-HpCDF	22.7			J
OCDF	38.5			J B
Totals				
Total TCDD	2990		3010	
Total PeCDD	3020		3030	
Total HxCDD	4880		4880	
Total HpCDD	2170		2170	
Total TCDF	835		846	
Total PeCDF	703		709	
Total HxCDF	568		568	
Total HpCDF	248		248	
Total PCDD/Fs	**16300**		**16300**	
ITEF TEQs				
TEQ: ND=0	123		123	
TEQ: ND=DL/2	123	3.28	123	
TEQ: ND=DL	123	6.56	123	

Standard	ES Recoveries	Qualifiers
ES 2378-TCDD	92.6	
ES 12378-PeCDD	97.7	
ES 123478-HxCDD	95.2	
ES 123678-HxCDD	90	
ES 123789-HxCDD	95.1	
ES 1234678-HpCDD	92.5	
ES OCDD	88.5	
ES 2378-TCDF	97.8	
ES 12378-PeCDF	99.5	
ES 23478-PeCDF	102	
ES 123478-HxCDF	92.9	
ES 123678-HxCDF	93.2	
ES 234678-HxCDF	94.9	
ES 123789-HxCDF	89.2	
ES 1234678-HpCDF	85.8	
ES 1234789-HpCDF	89.8	
ES OCDF	88.4	

Standard	SS/AS/FS/TS Recoveries
SS 37Cl-2378-TCDD	121
SS 12347-PeCDD	118
SS 12346-PeCDF	114
SS 123469-HxCDF	122
SS 1234689-HpCDF	125
AS 1368-TCDD	95
AS 1368-TCDF	99.2
FS 1278-TCDD	100
FS 12478-PeCDD	98.5
FS 123468-HxCDD	101
FS 1234679-HpCDD	98.5
TS 1378-TCDD	n/a

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 SDA Inlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.		Blank	1	2	3
Date (2013)			Mar 25	Mar 25	Mar 25
Start Time (approx.)			08:00	09:23	10:54
Stop Time (approx.)			09:00	10:34	11:54

☐ DRAFT LAB DATA

MDL	Min. detectable limit (mg Cl^-/liter)	0.0090

HCl as Total Chloride

B_{Cl}	Blank concentration (mg Cl^-/liter)	<0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl^-/liter)		1190.0000	986.6000	959.6000
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)				
v_1	Fraction 1 sample volume (ml)		612.0	644.0	645.0
v_2	Fraction 2 sample volume (ml)				
m_{HCl}	HCl collected before blank subtraction (mg)		748.6718	653.1608	636.2724
m_b	Allowable blank subtraction (mg)		0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)		748.6718	653.1608	636.2724
m_{MDL}	Minimum detectable HCl (mg)		0.0057	0.0060	0.0060
m_n	*Total HCl used in emission calculations (mg)*		748.6718	653.1608	636.2724

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.		Blank	1	2	3
Date (2013)			Mar 25	Mar 25	Mar 25
Start Time (approx.)			08:00	09:23	10:54
Stop Time (approx.)			09:00	10:34	11:54

☐ DRAFT LAB DATA

MDL	Min. detectable limit (mg Cl^-/liter)	0.0090

HCl as Total Chloride

B_{Cl}	Blank concentration (mg Cl^-/liter)	<0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl^-/liter)		1.1200	1.2400	3.8400
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)				
v_1	Fraction 1 sample volume (ml)		773.0	695.0	745.0
v_2	Fraction 2 sample volume (ml)				
m_{HCl}	HCl collected before blank subtraction (mg)		0.8900	0.8859	2.9409
m_b	Allowable blank subtraction (mg)		0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)		0.8900	0.8859	2.9409
m_{MDL}	Minimum detectable HCl (mg)		0.0072	0.0064	0.0069
m_n	*Total HCl used in emission calculations (mg)*		0.8900	0.8859	2.9409

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 SDA Inlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.		Blank	1	2
Date (2013)			Mar 27	Mar 27
Start Time (approx.)			07:47	09:08
Stop Time (approx.)			08:47	10:08

☐ DRAFT LAB DATA

MDL	Min. detectable limit (mg Cl^-/liter)	0.0090

HCl as Total Chloride

B_{Cl}	Blank concentration (mg Cl^-/liter)	<0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl^-/liter)	1185.0000	1045.0000	
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)			
v_1	Fraction 1 sample volume (ml)	673.0	696.0	
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	819.8351	747.6850	
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	
m_{nb}	HCl collected after blank subtraction (mg)	819.8351	747.6850	
m_{MDL}	Minimum detectable HCl (mg)	0.0062	0.0064	
m_n	*Total HCl used in emission calculations (mg)*	819.8351	747.6850	

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SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.	Blank	1	2	3
Date (2013)		Mar 27	Mar 27	Mar 27
Start Time (approx.)		07:47	09:08	10:27
Stop Time (approx.)		08:47	10:08	11:27

☐ DRAFT LAB DATA

MDL Min. detectable limit (mg Cl^-/liter) 0.0090

HCl as Total Chloride

B_{Cl} Blank concentration (mg Cl^-/liter) <0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl^-/liter)	14.3900	14.5200	13.2800
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)			
v_1	Fraction 1 sample volume (ml)	689.0	647.0	692.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	10.1923	9.6575	9.4471
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	10.1923	9.6575	9.4471
m_{MDL}	Minimum detectable HCl (mg)	0.0064	0.0060	0.0064
m_n	*Total HCl used in emission calculations (mg)*	10.1923	9.6575	9.4471

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SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 SDA Inlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.	Blank	1	2	3
Date (2013)		Mar 26	Mar 26	Mar 26
Start Time (approx.)		08:00	09:21	10:46
Stop Time (approx.)		09:00	10:21	11:46

☐ DRAFT LAB DATA

MDL	Min. detectable limit (mg Cl^-/liter)	0.0090

HCl as Total Chloride

B_{Cl}	Blank concentration (mg Cl^-/liter)	<0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl^-/liter)		1024.0000	972.9000	941.0000
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)				
v_1	Fraction 1 sample volume (ml)		600.0	643.0	646.0
v_2	Fraction 2 sample volume (ml)				
m_{HCl}	HCl collected before blank subtraction (mg)		631.6032	643.0908	624.9068
m_b	Allowable blank subtraction (mg)		0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)		631.6032	643.0908	624.9068
m_{MDL}	Minimum detectable HCl (mg)		0.0056	0.0059	0.0060
m_n	*Total HCl used in emission calculations (mg)*		631.6032	643.0908	624.9068

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Wheelabrator South Broward, Inc.
Clean Air Project No: 12218
Unit 3 FF Outlet

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.		Blank	1	2	3
Date (2013)			Mar 26	Mar 26	Mar 26
Start Time (approx.)			08:00	09:21	10:46
Stop Time (approx.)			09:00	10:21	11:46

☐ DRAFT LAB DATA

MDL	Min. detectable limit (mg Cl⁻/liter)	0.0090
	HCl as Total Chloride	
B_{Cl}	Blank concentration (mg Cl⁻/liter)	<0.0410

S_{Cl-1}	Fraction 1 concentration (mg Cl⁻/liter)	17.6600	17.5000	19.7000
S_{Cl-2}	Fraction 2 concentration (mg Cl⁻/liter)			
v_1	Fraction 1 sample volume (ml)	709.0	734.0	678.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	12.8715	13.2047	13.7306
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	12.8715	13.2047	13.7306
m_{MDL}	Minimum detectable HCl (mg)	0.0066	0.0068	0.0063
m_n	*Total HCl used in emission calculations (mg)*	12.8715	13.2047	13.7306

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (Cl)

CleanAir.

CleanAir Engineering
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Palatine, IL 60067-4975
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LABORATORY ANALYSIS FOR ANIONS
Laboratory Services Report No: 64-28960_IC_CL_V0

Performed for:
PALATINE SOURCE TESTING
500 West Wood St
Palatine IL, 60067

Pertaining to a Field Sampling Project Performed for :
WHEELABRATOR SOUTH BROWARD

Customer Reference No: 12218
Laboratory Services Project No: 28960
Revision 0: 4/12/13

To the best of our knowledge, the laboratory results presented in this report are accurate, complete, error free, legible and representative of the samples per the analysis described here-in.

Submitted by,

Digitally signed by Eric Ewing
Date: 2013.04.12 16:39:04 -05'00'

Eric Ewing
Title: Analyst – Laboratory Services
Ph: 847-654-4519
Email: eewing@cleanair.com

Reviewed by,

Digitally signed by Michael Tuegel
Date: 2013.04.12 16:50:31 -05'00'

Michael Tuegel
Title: Quality Leader – Laboratory Services
Ph: 847-654-4557
Email: mtuegel@cleanair.com

REVISION HISTORY

LABORATORY ANALYSIS FOR ANIONS
LABORATORY Services Report No: 64-28960_IC_Cl_V0

FINAL REPORT REVISION HISTORY

Revision:	Date	Pages	Comments
0	4/12/13	All	Final version of original document.

CONTENTS

CERTIFICATE OF ANALYSIS

1-1

Laboratory Sample Identification Number	Sample Identification	Sample Volume (mL)	Chloride Sample Conc (mg/L)
Reagent Blanks			
28959-001	DI H2O RB	300	<
28959-002	0.1N H2SO4 RB	340	<
U1 SDA Inlet			
28959-003	Imp C&R R1	612	1,190
28959-004	Imp C&R R2	644	986.6
28959-005	Imp C&R R3	645	959.6
U1 FF Outlet			
28959-006	Imp C&R R1	773	1.12
28959-007	Imp C&R R2	695	1.24
28959-008	Imp C&R R3	745	3.84
U2 SDA Inlet			
28959-009	Imp C&R R1	673	1,185
28959-010	Imp C&R R2	696	1,045
U2 FF Outlet			
28959-011	Imp C&R R1	689	14.39
28959-012	Imp C&R R2	647	14.52
28959-013	Imp C&R R3	692	13.28
U3 SDA Inlet			
28959-014	Imp C&R R1	600	1,024
28959-015	Imp C&R R2	643	972.9
28959-016	Imp C&R R3	646	941.0
U3 FF Outlet			
28959-017	Imp C&R R1	709	17.66
28959-018	Imp C&R R2	734	17.50
28959-019	Imp C&R R3	678	19.70

Method Detection Limit (mg/L): 0.009
Limit of Quantitation (mg/L): 0.041

End of Section 1 – Certificate of Analysis

INTRODUCTION

Palatine Source Testing contracted Clean Air Engineering Laboratory Services (Laboratory Services) to determine the following:

- Chloride Content

All analyses were performed on samples received by the Laboratory Services at their facility in Palatine, IL. All analyses were performed in accordance with the applicable EPA Method requirements along with all NELAP quality requirements as outlined and described in Section 3 of this report.

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Key Project Participants

Samples were received at Clean Air Engineering Laboratory Services facility on 4/1/13. The following is a table of key personnel involved:

Table 2-2:
Pertinent Personnel

Technician	Affiliation	Function
S. Brown	Palatine Source Testing	Custody Relinquished
E. Ewing	Laboratory Services	Sample Receipt
E. Ewing	Laboratory Services	Lead Analyst
S. Brown	Palatine Source Testing	Project Manager

Accreditation

Clean Air Laboratory Services is accredited through the following state agencies.

Table 2-3:
Specific Accreditations and Expiration Dates

State	Certificate Number	Expiration Date
Texas	T104704431-12-3	8/31/2013
Louisiana	169249	6/30/2013
New Jersey	IL004	6/30/2013

Please visit the respective state websites to view our current accreditation status and a comprehensive list of our accredited services.

DISCUSSION OF ANALYTICAL RESULTS

Table 2-4 shown below, presents the average amounts of chloride found for each sample fraction. Also shown are the standard deviations (SD) and percent relative standard deviations (RSD). These data are not corrected for plant conditions or sampling volumes.

Table 2-4:
Statistical Description of the Ion Chromatography Results.

Sample Fraction	Location	Average Concentration (mg/L)	Standard Deviation of Concentration (mg/L)	Relative Standard Deviation of Concentration (%)
Imp C&R	U1 SDA Inlet	1045	126	12.05%
Imp C&R	U1 FF Outlet	2.07	1.54	74.53%
Imp C&R	U2 SDA Inlet	1115	98.5	8.84%
Imp C&R	U2 FF Outlet	14.06	0.68	4.82%
Imp C&R	U3 SDA Inlet	979.2	41.8	4.27%
Imp C&R	U3 FF Outlet	18.29	1.22	6.70%

End of Section 2 – Analytical Case Narrative

METHODOLOGY

Laboratory Services followed procedures as detailed in U.S. EPA Method 26A and U.S. EPA Method 300.1. Table 3-2, below summarizes the methods and their respective sources.

Table 3-2:
List of Analytical Methodology

Title 40 CFR Part 60 Appendix A
U.S. EPA Method 26A "Determination of Hydrogen Halide and Halogen Emissions From Stationary Sources Non-Isokinetic Method"
Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1 (EPA/815-R-00-014)
U.S. EPA Method 300.1 "Determination of Inorganic Anions In Drinking Water By Ion Chromatography"

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR) and are located on the internet at http://ecfr.gpoaccess.gov.

Laboratory Services followed specific quality assurance and quality control (QA/QC) procedures as outlined in the individual methods and as prescribed in Laboratory Services' internal Quality Manual. Results of recorded QA/QC activities performed by Laboratory Services are summarized in Appendix III.

Analytical Procedures Common To All Methods

Sample Preparation

- Samples were prepared according to the procedures listed in the EPA Method above. Each sample was analyzed at full strength and a dilution was prepared if necessary to achieve a concentration that was within calibration range limits.

Sample Volumes

- Samples 28960-001 and 28960-002 did not have a sample volume recorded at the time of sample receipt. The sample volume was measured using a serialized Class A graduated cylinder (S/N 0591). All other sample volumes were determined by field personnel.

Sample Analysis

- All analyses were carried out using a Dionex Model ICS-90 ion chromatograph. In ion chromatography, the sample is moved through a static phase (the column) by a mobile phase (the eluent solution). The different components of the mixture can swap from one phase to another, but the rate of this migration will depend on the affinity of each component for the stationary phase. Therefore, different affinities will make components need different times to go through the same length of stationary phase. This time is one of the two characteristic data given by chromatography, and is known as retention time. The other important data is the peak area. A specific analyte is identified by its characteristic retention time. The concentration is determined by instrument response as the peak area count.
- The stationary phase for this work consisted of a Dionex Model AS14A anion column. The mobile phase consisted of an 8.0mM/1.0mM sodium carbonate/bicarbonate eluent solution.
- The instrument response is determined by measuring the conductivity of the mobile phase. In ion chromatography, the mobile phase usually contains ions that create background conductivity, making it difficult to measure the conductivity due only to the analyte ions as they exit the column. This problem is greatly reduced by selectively removing the mobile phase ions after the analytical column and before the detector. This is done with an eluent suppressor, which consists of an ion-exchange membrane. For anion analysis, the mobile phase is Na2CO3/NaHCO3, and the eluent suppressor supplies H+ to neutralize the anion and remove other ions opposite in charge of the specific analyte. For this analysis, background ionic suppression is removed using a 40 mN sulfuric acid regenerant.

Detection Limits

- The Method Detection Limit (MDL) was determined in accordance with procedures in 40 CFR 136, Appendix B. Documentation showing the determination of detection limits is included with this report. The Limit of Quantitation (LOQ) is set to be the concentration of the lowest calibration point for each analyte. Values between these limits were quantified, but should be

used with discretion as they were below the LOQ. Values that were below the MDL were indicated by a "<" where appropriate.

Instrument Calibration

- Instrument calibration followed regulations found in U.S. EPA Method 300.1 and U.S. EPA Method 26A.
- Calibration standards were prepared from ACS grade, or better, dry salts as per section 7.3 of U.S. EPA Method 300.1.
- As per section 4.2.2 of U.S. EPA CTM-027, a series of 6 diluted standards were prepared from the original calibration standard and run through the column in duplicate from lowest to highest concentration.
- The average peak area for each calibration point is plotted against the expected solution concentration.
- In accordance with section 7.2.3 of U.S. EPA Method 9057, a least-squares regression with an R^2 value of 0.995 or greater must be produced from the resulting curve.
- In accordance with U.S. EPA Method 26, a full post-test calibration was performed. The pre-test and post-test calibration average peak area for any standard must agree within 5% of any observed area.
- All calibration standards were prepared in a deionized water matrix. This is a deviation from U.S. EPA Method 26A which states that calibration standards are to be prepared in the same matrix as the samples. Documentation showing the validity of this deviation is available upon request.

Quality Control Procedures

Clean Air adheres to QA/QC procedures that both meet and exceed EPA requirements.

- Before the first sample was analyzed and every twenty samples thereafter, a Quality Control (QC) sample was analyzed. The QC sample was created using ACS grade or better dry salts from a different manufacturer and or lot number than the salts used to create the calibration standards. The QC must show a regression concentration within 10 percent of the expected concentration.
- After the first ten samples were analyzed and every twenty samples thereafter (and before the post-test calibration) a laboratory blank and a Continuing Calibration Verification (CCV) were analyzed. The CCV was prepared from the same calibration standard as used to create the 8 standards that make up the calibration curve. The laboratory blank must show a regression concentration of zero, and the CCV must show a regression concentration within 10 percent of the expected concentration.
- A matrix spike analysis was performed on ten percent of the total number of samples. This sample was prepared with equal amounts of sample and a calibration standard whose concentration was known to be larger than that of the sample. The matrix spike is acceptable when the recovery is found to be 100 ± 10 percent

- As a measure of precision, 20% of all matrix spikes were prepared and analyzed in duplicate. The average area count of two identical matrix spikes may not have a relative percent difference of more than 10 percent.
- Every sample was analyzed in duplicate and the mean area count used to determine the concentration. The duplicate area counts must not have a relative difference of more than five percent. In the event that the relative difference is more than five percent, the sample was reanalyzed in duplicate until a duplicate relative difference of less than five percent is obtained.
- Each point on the calibration curve should be within ± 2 percent of the calibration span of the curve used
- The observed concentration value of each point on the calibration curve should have a relative percent difference of 10 percent from its expected concentration.

Standard and Reagent Traceability

- Each calibration standard has been prepared in accordance with U.S. EPA Method 300.1 and U.S. EPA Method 26A and has been designated an original lot number. This number can be used to trace back to the original dry salts used in the preparation of these standards. These lot numbers are found in Table 3-3, below.

Table 3-3:
Standard Lot Numbers Used For Analysis

Standard Type	Lot Number	Concentration of Analyte
Stock Standard	03201302-64-00000-01	1014.41 mg/L
QC Standard	03201302-64-00000-02	205.37 mg/L
Working Standard	03201302-64-00000-03	10.14 mg/L
Cal 01	03201302-64-00000-04	0.04 mg/L
Cal 02	03201302-64-00000-05	0.20 mg/L
Cal 03	03201302-64-00000-06	0.41 mg/L
Cal 04	03201302-64-00000-07	1.27 mg/L
Cal 05	03201302-64-00000-08	1.62 mg/L
Cal 06	03201302-64-00000-09	2.54 mg/L
CCV	03201302-64-00000-10	0.81 mg/L
QC	03201302-64-00000-11	1.03 mg/L

In suppressed ion chromatography, eluent is defined as the carrier that moves chemicals through the column and regenerant is defined as a reagent used to remove ions opposite in charge of the specific analyte while reducing the overall conductivity of the eluent. Table 3-4 displays the lot numbers of these reagents used for each day of analysis.

Table 3-4:
Eluent and Regenerant Lot Numbers Used for Each Day of Analysis

Analysis Date	Eluent Lot Number	Regenerant Lot Number
3/29/2013	1046-64-00000-01	1200-64-00000-01
4/1/2013	1046-64-00000-01	1200-64-00000-01
4/2/2013	1046-64-00000-01	1200-64-00000-01
4/3/2013	1046-64-00000-01	1200-64-00000-01
4/4/2013	1046-64-00000-02	1200-64-00000-01
4/5/2013	1046-64-00000-02	1200-64-00000-01

Project Archival

- A copy of this report and all associated supporting records will be archived and stored for at least 20 years.
- All samples are archived for a period of one year from the date of receipt in our facility.
- The archival facility is a controlled access storage facility that does not incorporate any environmental controls.
- Ion chromatography samples are archived in the following manner:
  - All samples are stored in the original sample container
  - Any digestates or reconstitutions are stored in an adequately sized container

Reporting Abbreviations

1 RB: Reagent Blank
2 Imp C&R: Impinger Catch and Rinse

End of Section 3 – Methodology

APPENDIX

4-1

SAMPLE CALCULATIONS

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Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

1. Difference between duplicate injections for pre-test calibration (Pre Cal 1).

$$\Delta_{Injection} = \left| Area_{Trial\ 2} - Area_{Tria\ 1} \right|$$

Where:

$\Delta_{Injection}$ = Area count difference between duplicate injections
$Area_{Trial2}$ = Area count for injection Trial 2
$Area_{Trial1}$ = Area count for injection Trial 1

$\Delta_{Injection}$ = 0.0009
$Area_{Trial2}$ = 0.0422
$Area_{Trial1}$ = 0.0413

2. Average area count value for duplicate injections for pre-test calibration (Pre Cal 1).

$$Avg_{PreInj} = \frac{(Area_{Trial1} + Area_{Trial2})}{2}$$

Where:

Avg_{PreInj} = Average of duplicate injection area counts
$Area_{Trial2}$ = Area count for injection Trial 2
$Area_{Trial1}$ = Area count for injection Trial 1
2 = Constant (number of values)

Avg_{Inj} = 0.0418
$Area_{Trial2}$ = 0.0422
$Area_{Trial1}$ = 0.0413

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

3. Difference between individual injection and average area count for pre-test calibration.

$$\Delta_{PreMean\%} = \frac{\left|Area_{Trail2} - Avg_{PreInj}\right|}{Avg_{PreInj}} 100$$

Where:

$\Delta_{PreMean\%}$	=	Difference between individual injection and average area count (%).
Avg_{PreInj}	=	Average of duplicate injection area counts
$Area_{Trial2}$	=	Area count for injection Trial 2
100	=	Constant (conversion factor for percentage)

$\Delta_{PreMean\%}$	=	1.0664
Avg_{PreInj}	=	0.0418
$Area_{Trial2}$	=	0.0422

Note: EPA Method 26 requires $\Delta_{PreMean\%}$ to be less than 5%.

4. Average of all area count values for a given calibration point.

$$\overline{X} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Where:

$\overline{X}$	=	Average of all area count values for a given calibration point.
x_i	=	Individual area count values for each individual injection.
i	=	Iteration value.
n	=	Number of injections for the calibration point under question.

$\overline{X}$	=	0.0425
x_1	=	0.0413
x_2	=	0.0422
n	=	8

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

5. Average of all concentration values used for generating calibration curve.

$$\overline{Y_{All}} = \frac{\sum_{i=1}^{n} y_i}{n}$$

Where:

$\overline{Y}_{All}$ = Average of all area concentration values.
y_i = Individual concentration values for each individual injection.
n = Number of injections.

$\overline{Y}_{All}$ = 0.8680
y_1 = 0.0000
y_2 = 0.0406
n = 7

6. Average of all area count values for the calibration curve.

$$\overline{X_{All}} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Where:

$\overline{X}_{All}$ = Average of all area count values.
x_i = Individual area count values.
i = Iteration value.
n = Number of injections.

$\overline{X}_{All}$ = 0.2065
x_1 = 0.0413
x_2 = 0.0422
n = 38

Sample Calculations

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

7. Determination of slope (least-squares regression) value for calibration curve.

$$m = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{n} (x_i - \bar{x})^2}$$

Where:

m	=	Slope of least-squares regression curve.
x_i	=	Individual area count values for each individual injection.
$\bar{x}$	=	Average of all area count values = $\overline{X}_{All}$
y_i	=	Actual area concentration values for each individual injection.
$\bar{y}$	=	Average of all concentration values = $\overline{Y}_{All}$
i	=	Iteration value.
n	=	Number of injections.

m	=	4.65230
x_1	=	0.0413
x_2	=	0.0422
$\bar{x}$	=	0.2065
y_1	=	0.0000
y_2	=	0.0406
$\bar{y}$	=	0.8680
n	=	38

8. Determination of y-intercept (least-squares regression) value for calibration curve.

$$b = \bar{y} - m\,\bar{x}$$

Where:

b	=	Y-axis intercept.
$\bar{x}$	=	Average of all area count values = $\overline{X}_{All}$
$\bar{y}$	=	Average of all concentration values = $\overline{Y}_{All}$

b	=	0.00637
m	=	4.65230
$\bar{x}$	=	0.2065
$\bar{y}$	=	0.8680

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

9. Determination of coefficient of correlation (least-squares regression) value for calibration curve.

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

Where:

r^2 = Square of the Pearson product moment correlation coefficient through data points in known y's and known x's.

r = Pearson product moment correlation coefficient through data points in known y's and known x's.

x_i = Individual area count values for each individual injection.

y_i = Actual area concentration values for each individual injection.

$\bar{x}$ = Average of all area count values = $\overline{X}_{All}$

$\bar{y}$ = Average of all concentration values = $\overline{Y}_{All}$

I = Iteration value.

n = Number of injections.

r^2	=	0.99997
r	=	0.99998
x_1	=	0.0413
x_2	=	0.0422
$\bar{x}$	=	0.2065
y_1	=	0.0000
y_2	=	0.0406
$\bar{y}$	=	0.8680
n	=	38

Sample Calculations

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

10. Determination of average sample area counts from duplicate injections.

$$Avg_{Sample} = \frac{(Area_{Trial1} + Area_{Trial2})}{2}$$

Where:

Avg_{Sample} = Average of duplicate injection area counts
$Area_{Trial2}$ = Area count for injection Trial 2
$Area_{Trial1}$ = Area count for injection Trial 1
2 = Constant (number of injections)

Avg_{Inj} = 0.2545
$Area_{Trial2}$ = 0.2592
$Area_{Trial1}$ = 0.2497

11. Difference between duplicate injections for the sample.

$$\Delta_{Injection} = |Area_{Trial\ 2} - Area_{Tria\ 1}|$$

Where:

$\Delta_{Injection}$ = Area count difference between duplicate injections
$Area_{Trial2}$ = Area count for injection Trial 2
$Area_{Trial1}$ = Area count for injection Trial 1

$\Delta_{Injection}$ = 0.0095
$Area_{Trial2}$ = 0.2592
$Area_{Trial1}$ = 0.2497

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

12. Difference between individual injection and average area count for the sample.

$$\Delta_{Injection} = \frac{\left|Area_{Trail2} - Avg_{Inj}\right|}{Avg_{Inj}} 100$$

Where:

$\Delta_{Injection}$	=	Difference between individual injection and average area count (%).
Avg_{Inj}	=	Average of duplicate injection area counts
$Area_{Trial2}$	=	Area count for injection Trial 2
100	=	Constant (conversion factor for percentage)

$\Delta_{Injection}$	=	1.9%
Avg_{Inj}	=	0.2545
$Area_{Trial2}$	=	0.2592

Note: EPA Method 26 requires $\Delta_{Injection}$ to be less than 5%.

13. Determination of sample concentration from least-squares regression curve (mg/L).

$$C_{Reg} = DF\left[m\left(Avg_{Inj}\right) + b\right]$$

Where:

C_{Reg}	=	Sample concentration determined using the regression curve (mg/L)
DF	=	Sample dilution factor
Avg_{Inj}	=	Average of duplicate injection area counts.
m	=	Slope of least-squares regression curve.
b	=	Y-intercept of least-squares regression curve.

C_{Reg}	=	1190.15
DF	=	1000
Avg_{Inj}	=	0.2545
m	=	4.6523
b	=	0.0064

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

14. Determination of total amount of analyte in sample (total mg).

$$M_{Analyte} = \frac{(C_{Reg})(V_{Soln})}{1000}$$

Where:

$M_{Analyte}$	=	Amount of analyte in sample (total mg)
C_{Reg}	=	Sample concentration determined using the response factor (mg/L)
V_{Soln}	=	Sample volume (ml)
1000	=	Conversion constant (ml to L)

$M_{Analyte}$	=	728.37
C_{Reg}	=	1190.1458
V_{Soln}	=	612.0

15. Determination of Detection Limits.

15a. Determination of average spike result.

$$AvgM_{f\_i} = \frac{\sum_{i=1}^{n} M_{f\_i}}{n}$$

Where:

$AvgM_{f\_i}$	=	Average of spike result (mg/L)
M_{f_i}	=	Net results recorded for each iteration (mg/L)
n	=	Number of iterations.
i	=	Placeholder for iteration.

$AvgM_{f\_i}$	=	0.044			
M_{f_1}	=	0.049	M_{f_5}	=	0.043
M_{f_2}	=	0.049	M_{f_6}	=	0.042
M_{f_3}	=	0.041	M_{f_7}	=	0.043
M_{f_4}	=	0.043	M_{f_8}	=	0.043
n	=	8			

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

15b. Determination of standard deviation of spike result.

$$\sigma_{f-i} = \sqrt{\frac{\sum_{i=1}^{n} \left(M_{f\_i} - AvgM_{f\_i}\right)^2}{(n-1)}}$$

Where:

σ_{f_i} = Standard deviation of spike result.
$AvgM_{f\_i}$ = Average spike result (mg/L)
M_{f_i} = Concentration recorded for each iteration (mg/L)
n = Number of iterations.
i = Placeholder for iteration.

σ_{f_i}	=	0.0031			
$AvgM_{f\_i}$	=	0.044			
M_{f_1}	=	0.049	M_{f_5}	=	0.043
M_{f_2}	=	0.049	M_{f_6}	=	0.042
M_{f_3}	=	0.041	M_{f_7}	=	0.043
M_{f_4}	=	0.043	M_{f_8}	=	0.043
n	=	8			

15c. Determination of variance of spike result.

$$V_{f\_i} = (\sigma_{f\_i})^2$$

Where:

V_{f_i} = Variance of spike result.
σ_{f_i} = Standard deviation of spike result.

V_{f_i}	=	9.49E-06
σ_{f_i}	=	0.0031

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

15d. Determination of RMS deviation of spike result.

$$RMS_{f\_i} = 100 \frac{\sigma_{f\_i}}{AvgM_{f\_i}}$$

Where:

RMS_{f_i} = RMS deviation of spike results (%).
σ_{f_i} = Standard deviation of spike result.
$AvgM_{f\_i}$ = Average spike result (mg/L)
100 = Conversion constant (fraction to percent)

RMS_{f_i} = 0.0698
σ_{f_i} = 0.0031
$AvgM_{f\_i}$ = 0.0441

15e. Determination of average spike recovery.

$$R_f = 100 \frac{AvgM_{f\_i}}{RA}$$

Where:

R_f = Average spike recovery (%)
$AvgM_{f\_i}$ = Average spike result (mg/L)
RA = Spike concentration added (mg/L)
100 = Conversion constant (fraction to percent)

R_f = 108.7%
$AvgM_{f\_i}$ = 0.04411
RA = 0.04058

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Calibration Point No: Cal 02
Sample No: 28959-003
Sample Location: U1 SDA Inlet

15f. Determination of $t_{(n-1, 0.99)}$.

Value taken from the following Table:

n	$t_{(n-1, 0.99)}$
7	3.143
8	2.998
9	2.896
10	2.821
11	2.764
16	2.602
21	2.528

Where:

$t_{(n-1, 0.99)}$ = Students' t value appropriate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom.

n = Number of iterations.

$t_{(n-1, 0.99)}$ = 2.998

n = 8

15g. Determination of Method Detection Limit (MDL).

$$MDL = \sigma_{f\_i} t_{(n-1,0.99)}$$

Where:

MDL = Method detection limit (mg/L)

$t_{(n-1, 0.99)}$ = Students' t value appropriate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom.

σ_{f_i} = Standard deviation of spike result.

MDL = 0.009

$t_{(n-1, 0.99)}$ = 2.998

σ_{f_i} = 0.0031

RAW DATA

CleanAir

CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

MDL=	0.009 mg/L
LOQ=	0.041 mg/L

Average Flow Rate
0.80 mL/min

Sample Location	Sample Identification Number	Sample Identification	Date of Injection	Area Counts Trial 1	Area Counts Trial 2	Area Count Average	DF (Analysis Dilution Factor)	V_{soln} (Total Sample Volume, mL)	C_{Reg} (Concentration, mg/L from Reg Curve)	$M_{analyte}$ Total Amount of Analyte (mg)
Reagent Blank	28959-001	DI H2O RB	04/02/13	0.0000	0.0000	0.0000	1	300.0	<	<0.012
Reagent Blank	28959-002	0.1N H2SO4 RB	04/03/13	0.0000	0.0000	0.0000	1	340.0	<	<0.014
U1 SDA Inlet	28959-003	Imp C&R R1	04/03/13	0.2497	0.2592	0.2545	1000	612.0	1,190.15	728.37
U1 SDA Inlet	28959-004	Imp C&R R2	04/03/13	0.2112	0.2102	0.2107	1000	644.0	986.61	635.38
U1 SDA Inlet	28959-005	Imp C&R R3	04/03/13	0.2041	0.2057	0.2049	1000	645.0	959.62	618.96
U1 FF Outlet	28959-006	Imp C&R R1	04/03/13	0.0231	0.0223	0.0227	10	773.0	1.12	0.87
U1 FF Outlet	28959-007	Imp C&R R2	04/03/13	0.0256	0.0248	0.0252	10	695.0	1.24	0.86
U1 FF Outlet	28959-008	Imp C&R R3	04/03/13	0.0794	0.0831	0.0813	10	745.0	3.84	2.86
U2 SDA Inlet	28959-009	Imp C&R R1	04/03/13	0.2531	0.2534	0.2533	1000	673.0	1,184.56	797.21
U2 SDA Inlet	28959-010	Imp C&R R2	04/03/13	0.2253	0.2213	0.2233	1000	696.0	1,045.23	727.48
U2 FF Outlet	28959-011	Imp C&R R1	04/03/13	0.1519	0.1546	0.1533	20	689.0	14.39	9.91
U2 FF Outlet	28959-012	Imp C&R R2	04/03/13	0.1550	0.1543	0.1547	20	647.0	14.52	9.39
U2 FF Outlet	28959-013	Imp C&R R3	04/04/13	0.1419	0.1409	0.1414	20	692.0	13.28	9.19
U3 SDA Inlet	28959-014	Imp C&R R1	04/03/13	0.2164	0.2210	0.2187	1000	600.0	1,023.83	614.30
U3 SDA Inlet	28959-015	Imp C&R R2	04/03/13	0.2085	0.2070	0.2078	1000	643.0	972.88	625.56
U3 SDA Inlet	28959-016	Imp C&R R3	04/03/13	0.2016	0.2002	0.2009	1000	646.3	941.02	608.18
U3 FF Outlet	28959-017	Imp C&R R1	04/04/13	0.1517	0.1493	0.1505	25	709.0	17.66	12.52
U3 FF Outlet	28959-018	Imp C&R R2	04/04/13	0.1473	0.1509	0.1491	25	734.0	17.50	12.85
U3 FF Outlet	28959-019	Imp C&R R3	04/04/13	0.1691	0.1669	0.1680	25	678.0	19.70	13.36

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Time: 4:37 PM

QUALITY ASSURANCE RECORDS

CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

QUALITY CONTROL CHECKS

Sample Location	Sample Identification Number	Sample Identification	Date of Injection	Area Counts Trial 1	Area Counts Trial 2	Area Count Average	Area Count Duplicate Difference	Duplicate Relative Difference (%)	Is Duplicate Difference < 5%?
Reagent Blank	28959-001	DI H2O RB	04/02/13	0.0000	0.0000	0.0000	na	na	Yes
Reagent Blank	28959-002	0.1N H2SO4 RB	04/03/13	0.0000	0.0000	0.0000	na	na	Yes
U1 SDA Inlet	28959-003	Imp C&R R1	04/03/13	0.2497	0.2592	0.2545	0.0095	3.7%	Yes
U1 SDA Inlet	28959-004	Imp C&R R2	04/03/13	0.2112	0.2102	0.2107	0.0010	0.5%	Yes
U1 SDA Inlet	28959-005	Imp C&R R3	04/03/13	0.2041	0.2057	0.2049	0.0016	0.8%	Yes
U1 FF Outlet	28959-006	Imp C&R R1	04/03/13	0.0231	0.0223	0.0227	0.0008	3.5%	Yes
U1 FF Outlet	28959-007	Imp C&R R2	04/03/13	0.0256	0.0248	0.0252	0.0008	3.2%	Yes
U1 FF Outlet	28959-008	Imp C&R R3	04/03/13	0.0794	0.0831	0.0813	0.0037	4.6%	Yes
U2 SDA Inlet	28959-009	Imp C&R R1	04/03/13	0.2531	0.2534	0.2533	0.0003	0.1%	Yes
U2 SDA Inlet	28959-010	Imp C&R R2	04/03/13	0.2253	0.2213	0.2233	0.0040	1.8%	Yes
U2 FF Outlet	28959-011	Imp C&R R1	04/03/13	0.1519	0.1546	0.1533	0.0027	1.8%	Yes
U2 FF Outlet	28959-012	Imp C&R R2	04/03/13	0.1550	0.1543	0.1547	0.0007	0.5%	Yes
U2 FF Outlet	28959-013	Imp C&R R3	04/04/13	0.1419	0.1409	0.1414	0.0010	0.7%	Yes
U3 SDA Inlet	28959-014	Imp C&R R1	04/03/13	0.2164	0.2210	0.2187	0.0046	2.1%	Yes
U3 SDA Inlet	28959-015	Imp C&R R2	04/03/13	0.2085	0.2070	0.2078	0.0015	0.7%	Yes
U3 SDA Inlet	28959-016	Imp C&R R3	04/03/13	0.2016	0.2002	0.2009	0.0014	0.7%	Yes
U3 FF Outlet	28959-017	Imp C&R R1	04/04/13	0.1517	0.1493	0.1505	0.0024	1.6%	Yes
U3 FF Outlet	28959-018	Imp C&R R2	04/04/13	0.1473	0.1509	0.1491	0.0036	2.4%	Yes
U3 FF Outlet	28959-019	Imp C&R R3	04/04/13	0.1691	0.1669	0.1680	0.0022	1.3%	Yes

CHROMATOGRAPHIC DATA REDUCTION

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

CCV Concentration: 0.81 mg/L
QC Concentration: 1.03 mg/L

MDL=	0.009 mg/L
LOQ=	0.041 mg/L

QUALITY CONTROL CHECKS (CONT)

Sample Location	Sample Identification Number	Sample Identification	Date of Injection	Area Counts Trial 1	Area Counts Trial 2	Area Count Average	Area Count Duplicate Difference	Duplicate Relative Difference (%)	C_{Reg} (Concentration, mg/L from Reg Curve)	Percent Difference from Actual Value (%)	Is Percent Difference from Actual Value <10%?
CleanAir	28959-1000	QC	04/01/13	0.2235	0.2222	0.2229	0.0013	0.6%	1.04	1.59%	Yes
CleanAir	28959-00	CCB	04/02/13	0.0000	0.0000	0.0000	na	na	<		
CleanAir	28959-1001	CCV	04/02/13	0.1746	0.1774	0.1760	0.0028	1.6%	0.83	1.68%	Yes
CleanAir	28959-1002	QC	04/02/13	0.2219	0.2231	0.2225	0.0012	0.5%	1.04	1.43%	Yes
CleanAir	28959-00	CCB	04/02/13	0.0000	0.0000	0.0000	na	na	<		
CleanAir	28959-1003	CCV	04/02/13	0.1745	0.1765	0.1755	0.0020	1.1%	0.82	1.39%	Yes
CleanAir	28959-1004	QC	04/03/13	0.2169	0.2215	0.2192	0.0046	2.1%	1.03	0.07%	Yes
CleanAir	28959-00	CCB	04/04/13	0.0000	0.0000	0.0000	na	na	<		
CleanAir	28959-1005	CCV	04/04/13	0.1725	0.1733	0.1729	0.0008	0.5%	0.81	0.10%	Yes
CleanAir	28959-1006	QC	04/04/13	0.2141	0.2173	0.2157	0.0032	1.5%	1.01	1.65%	Yes
CleanAir	28959-00	CCB	04/04/13	0.0000	0.0000	0.0000	na	na	<		
CleanAir	28959-1007	CCV	04/04/13	0.1711	0.1742	0.1727	0.0031	1.8%	0.81	0.24%	Yes
CleanAir	28959-1008	QC	04/05/13	0.2191	0.2208	0.2200	0.0017	0.8%	1.03	0.27%	Yes
CleanAir	28959-00	CCB	04/05/13	0.0000	0.0000	0.0000	na	na	<		
CleanAir	28959-1009	CCV	04/05/13	0.1689	0.1690	0.1680	0.0021	1.3%	0.79	2.93%	Yes

Sample Duplicate Analysis Area Count Check

									Precision		Is Precision within ±5% Tolerance?
U2 FF Outlet	28959-011	Imp C&R R1	04/03/13	0.1519	0.1546	0.1533	0.0027	1.8%			
U2 FF Outlet	28959-011	Imp C&R R1	04/05/13	0.1514	0.1560	0.1537	0.0046	3.0%	0.3%		Yes
U3 FF Outlet	28959-019	Imp C&R R3	04/04/13	0.1691	0.1669	0.1680	0.0022	1.3%			
U3 FF Outlet	28959-019	Imp C&R R3	04/05/13	0.1635	0.1689	0.1662	0.0054	3.2%	1.1%		Yes

Matrix Spike Recoveries

									Precision	Spike Recovery	Is Spike Recovery Between 90-110%
Matrix Spike	28959-006	Imp C&R R1	04/05/13	0.1576	0.1526	0.1551	0.0050	3.2%		105.5%	Yes
Matrix Spike	28959-006	Imp C&R R1	04/05/13	0.1498	0.1562	0.1530	0.0064	4.2%	1.4%	104.1%	Yes
Matrix Spike	28959-008	Imp C&R R3	04/05/13	0.1697	0.1783	0.1740	0.0086	4.9%		98.8%	Yes

File: SPS-64-28986_IC_CL_V0
Date: 4/12/2013
Time: 4:37 PM

CHAIN-OF-CUSTODY DOCUMENTATION

Lab Project No.: 28960 **Date Received:** 4/1/2013

CleanAir No.: 12218

66

Customer : 66

Contact : Scott Brown

Phone :

Fax :

Email : sbrown@cleanair.com

Requested Analysis

Due	Analyst	Status	Sample	Type	Container	Method
4/15/201	EE	In Queue	1-19	Impinger C&R	Nalgene	US EPA Method 26A Chloride

Printed 2013/04/01 11:19:33

CLIENT	Wheelabrator	PROJECT	12218SB		66-12218SB-8
PLANT	South Broward	DEPT.	66		
PROJECT MANAGER	S. Brown				

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-26	SEE BELOW (IF APPLICABLE)	REAGENT BLANKS

28960

FORWARDING LAB: CleanAir Analytical Services, 500 West Wood Street, Palatine, IL 60067, 800-627-0033 (phone), 847-991-3385 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Chloride	Fluoride	Bromide	Archive	ADDITIONAL INFORMATION
-001	3/25 X 3/26	Reagent Blank	All	DI Water (~200 mL), 250 mL HDPE	1		X				Please Report North
-002	3/25 X 3/26	Reagent Blank	All	0.1 N H_2SO_4 (~200 mL), 1000 mL HDPE	1		X				and South Broward Separately

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	3/27/2013 17:00					S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
[signature]	4/1/13 1105					[signature] 3/27/2013

CLIENT Wheelabrator
PLANT South Broward
PROJECT MANAGER S. Brown

PROJECT 12218SB
DEPT. 66

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

66-12218SB-7

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-26	2	ALKALINE IMPINGER CATCH AND RINSE 1000 mL HDPE

28960

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	Chloride	Bromide	Archive	ADDITIONAL INFORMATION
-006	3/25	Unit 1 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	773	X			Please Report North
-007	3/25	Unit 1 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	695	X			and South Broward Separately
-008	3/25	Unit 1 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	745	X			
-003	3/25	Unit 1 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	612	X			
-004	3/25	Unit 1 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	644	X			
-005	3/25	Unit 1 SDA Inlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	645	X			
-011	3/27	Unit 2 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	689	X			
-012	3/27	Unit 2 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	647	X			
-013	3/27	Unit 2 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	692	X			
-009	3/27	Unit 2 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	673	X			
-010	3/27	Unit 2 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	696	X			

FORWARDING LAB
CleanAir Analytical Services
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	3/27/2013 17:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
	3/27/13 1105					3/27/2013

CLIENT Wheelabrator
PLANT South Broward
PROJECT MANAGER S. Brown

PROJECT 12218SB
DEPT. 66

66-12218SB-6

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-26	1	ACIDIC IMPINGER CATCH AND RINSE 1000 mL HDPE

28960

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Chloride	Fluoride	Bromide	Archive	ADDITIONAL INFORMATION
											Please Report North
											and South Broward Separately
-017	3/26	Unit 3 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	709	X				
-018	3/26	Unit 3 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	734	X				
-019	3/26	Unit 3 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	678	X				
-014	3/26	Unit 3 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	800	X				
-015	3/26	Unit 3 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	643	X				
-016	3/26	Unit 3 SDA Inlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	643	X				

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown	3/27/2013 17:00					S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
Env Eng	4/1/13 1105					3/27/2013

DETECTION LIMIT DETERMINATION DATA

v

Determination of Method Detection Limit

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

MDL Reference	40 CFR 136, Appendix B
CleanAir Reference	SOP EPA5-11
Matrix	Deionized Water
Analyte	Chloride
Spike Concentration	0.0406 mg/L
Slope	4.6523
Intercept	0.0064
Coefficient of Corr.	0.99997

Non-Iterative Study

No. of Replicates	$t_{(n-1,0.99)}$
7	3.143
8	2.998
9	2.896
10	2.821
11	2.764
16	2.602
21	2.528

Spike Aliquots	Spike Result (Area Counts)	Measured Concentration (mg/L)
1	0.0091	0.049
2	0.0092	0.049
3	0.0074	0.041
4	0.0079	0.043
5	0.0078	0.043
6	0.0077	0.042
7	0.0079	0.043
8	0.0079	0.043

Average Spike Concentration:	0.044
Recovery (R_a):	108.71%
Standard Deviation (S_a):	0.00308
RMS Deviation:	7.0%
$t_{(n-1,0.99)}$:	2.998
MDL:	0.009
LOQ:	0.041

Is the spike level higher than the MDL?	Yes
Is the spike level less then ten times the MDL?	Yes
Is the Avg Recovery between 90% < R_a < 110% ?	Yes

File: SPS-64-28960_IC_Cl_V0
Date: 4/12/2013
Time: 4:37 PM

EQUIPMENT CALIBRATION RECORDS

CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:		U.S. EPA Method 26A		Analyte:	Chloride

Stock Standard: 1014.41 mg/L
Working Stock Conc.: 10.1441 mg/L
QC Standard: 205.37 mg/L

Analyte: Chloride

Standards Calibration Data †

Calibration ID	Date of Injection	0	Cal 01	Cal 02	Cal 03	Cal 04	Cal 05	Cal 06
Conc. (mg/L)		0.0000	0.4081	0.2029	0.4058	1.2680	1.6231	2.5360
Cal 1 Trial 1	03/28/2013	0.0000	0.0074	0.0413	0.0811	0.2698	0.3464	0.5361
Cal 1 Trial 2		0.0000	0.0079	0.0422	0.0842	0.2894	0.3433	0.5381
Cal 2 Trial 1	04/01/2013			0.0426				
Cal 2 Trial 2				0.0442				
Cal 3 Trial 1	04/02/2013				0.0839			
Cal 3 Trial 2					0.0863			
Cal 4 Trial 1	04/03/2013					0.2682		
Cal 4 Trial 2						0.2731		
Cal 5 Trial 1	04/04/2013						0.3543	0.5440
Cal 5 Trial 2							0.3513	0.5489
Cal 6 Trial 1	04/05/2013			0.0436				
Cal 6 Trial 2				0.0421				
Cal 7 Trial 1	04/05/2013		0.0078	0.0434	0.0833	0.2705	0.3484	0.5446
Cal 7 Trial 2			0.0077	0.0407	0.0840	0.2700	0.3481	0.5525
n		2	4	8	6	6	6	6
Average Area Counts		0.0000	0.0077	0.0425	0.0838	0.2702	0.3483	0.5440
Standard Deviation		0.0000	0.0002	0.0012	0.0017	0.0016	0.0039	0.0062
%RSD		0.00	2.81	2.79	2.00	0.60	1.13	1.14
Minimum		0.0000	0.0074	0.0407	0.0811	0.2682	0.3433	0.5361
Maximum		0.0000	0.0079	0.0442	0.0863	0.2731	0.3543	0.5525

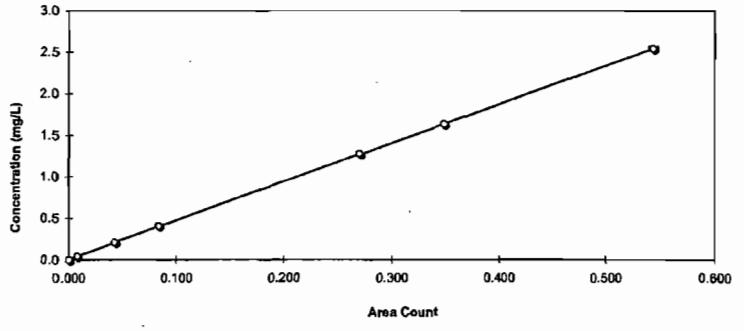
EPA Method 26 Quality Control Parameters

Average Minus Minimum Value (Rel. %)	3.90%	4.26%	3.22%	0.73%	1.44%	1.46%
Is Minimum Within 5% of Average Value?	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Minus Average Value (Rel. %)	2.60%	3.97%	2.98%	1.09%	1.72%	1.58%
Is Maximum Within 5% of Average Value?	Yes	Yes	Yes	Yes	Yes	Yes

Quality Control Checks

Measured Area Counts (Counts)	Actual Concentration (mg/L)	Regression Concentration (mg/L)	Difference pt-Line (% Scale)	Is Difference Less Than 2% of Scale?	Difference pt-Line (Relative %)	Is Relative Difference Less Than 10%?
0.0000	0.000	0.008	-0.35%	Yes	0.00%	Yes
0.0077	0.041	0.042	-0.06%	Yes	-3.98%	Yes
0.0425	0.203	0.204	-0.05%	Yes	-0.82%	Yes
0.0838	0.408	0.396	0.38%	Yes	2.35%	Yes
0.2702	1.268	1.263	0.19%	Yes	0.37%	Yes
0.3483	1.623	1.627	-0.15%	Yes	-0.23%	Yes
0.5440	2.536	2.537	-0.05%	Yes	-0.05%	Yes

Regression Constants			Is Coefficient of Regression > 0.9957
Slope	m =	4.8523	
Intercept	b =	0.0084	
Coeff.	R^2 =	0.99997	Yes



† Lot numbers for the individual calibration standards are listed in the Standard and Reagent Traceability section in the Case Narrative.

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STANDARD PREPARATION RECORDS

CleanAir

Stock Solution Standard Mixing Recipe (Anions)

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Order of Elution	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Analyte	**Fluoride**	**Chloride**	**Nitrite**	**Bromide**	**Nitrate**	**Phosphate**	**Sulfate**	**Iodide**
Analyte Weight (g/g-mole)	19.00	35.45	46.01	79.90	62.00	94.97	96.06	126.91
Solid Formula	NaF	NaCl	$NaNO_2$	NaBr	$NaNO_3$	Na_2HPO_4	Na_2SO_4	NaI
Number of ions/Formula	1	1	1	1	1	1	1	1
Formula Weight (g/g-mole)	41.99	58.44	69.00	102.89	84.99	141.96	142.04	149.89
% Analyte in Solid	45.25%	60.66%	66.68%	77.66%	72.95%	66.90%	67.63%	84.66%
Recomended Analyte Concentration (mg/L)	500	1007.21	2000	3000	3000	5000	5000	7000
Amount of Solid Required to Achieve the Above Stock Solution Concentration In The Listed Volumetric Flask:								
500 ml	0.5525	0.8302	1.4997	1.9316	2.0562	3.7369	3.6967	4.1341
Size of Flask	500 ml							
Amount of Solid Used	1.10546 g	0.83611 g		1.93183 g			3.69908 g	
Actual Concentration (mg/L)	1000.37	1014.41		3000.39			5003.26	

Concentration in the Five Cal Flasks (mg/L)

Stock (1 liter Flask) Solution Concentrations							
10 ml Original Solution Used		10.0037	10.1441	30.0039		50.0326	**Cal. ID**
Dilution Flask Size	Aliquot Stock						
500	2	0.0400	0.0406	0.1200		0.2001	Cal 01
250	5	0.2001	0.2029	0.6001		1.0007	Cal 02
250	10	0.4001	0.4058	1.2002		2.0013	Cal 03
250	20	0.8003	0.8115	2.4003		4.0026	CCV
200	25	1.2505	1.2680	3.7505		6.2541	Cal 04
250	40	1.6006	1.6231	4.8006		8.0052	Cal 05
200	50	2.5009	2.5360	7.5010		12.5082	Cal 06

ClearAir

QC Standard Mixing Recipe (Anions)

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator South Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

Order of Elution	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Analyte	**Fluoride**	**Chloride**	**Nitrite**	**Bromide**	**Nitrate**	**Phosphate**	**Sulfate**	**Iodide**
Analyte Weight (g/g-mole)	19.00	35.45	46.01	79.90	62.00	94.97	96.06	126.91
Solid Formula	NaF	NaCl	$NaNO_2$	NaBr	$NaNO_3$	Na_2HPO_4	Na_2SO_4	NaI
Number of ions/Formula	1	1	1	1	1	1	1	1
Formula Weight (g/g-mole)	41.99	58.44	69.00	102.89	84.99	141.96	142.04	149.89
% Analyte in Solid	45.25%	60.66%	66.68%	77.66%	72.95%	66.90%	67.63%	84.66%
Recomended Analyte Concentration (mg/L)	140	200	200	400	300	300	300	500
Amount of Solid Required to Achieve the Above Stock Solution Concentration In The Listed Volumetric Flask:								
500 ml	0.1547	0.1648	0.1500	0.2575	0.2056	0.2242	0.2218	0.2953
Size of Flask	500 ml							
Amount of Solid Used	0.17828 g	0.16927 g		0.27110 g			0.23242 g	
Actual Concentration (mg/L)	161.33	205.37		421.05			314.36	

Concentration In the QC Flask (mg/L)

Dilution Flask Size	Aliquot Stock							Cal. ID
1000	5	0.8067	1.0268		2.1053		1.5718	QC

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BATCH LOG SHEETS

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 1B 3/29/2013

Pos	Sample #	Identification		Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank			1						
2		Cal 01	03201302-64-00000-04		1						
3		Cal 01	03201302-64-00000-04		1						
4		Cal 02	03201302-64-00000-05		1						
5		Cal 03	03201302-64-00000-06		1						
6		Cal 04	03201302-64-00000-07		1						

Cartridge I 2B

Pos	Sample #	Identification		Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Cal 05	03201302-64-00000-08		1						
2		Cal 06	03201302-64-00000-09		1						
3		Blank			1						
4											
5											
6											

Cartridge I 1B 4/1/2013

Pos	Sample #	Identification		Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank			1						
2		Cal 02	03201302-64-00000-05		1						
3		Blank			1						
4		QC	03201302-64-00000-11		1						
5		Blank			1						
6	28959-001	Reagent Blank DI H2O RB		360	1						

Cartridge I 2B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-002	Reagent Blank 0.1N H2SO4 RB	600	1						
2	28959-003	U1 SDA Inlet Imp C&R R1	689	1000					30	30,000
3	28959-004	U1 SDA Inlet Imp C&R R2	675	1000					30	30,000
4	28959-005	U1 SDA Inlet Imp C&R R3	714	1000					30	30,000
5	28959-009	U2 SDA Inlet Imp C&R R1	613	1000					30	30,000
6	28959-010	U2 SDA Inlet Imp C&R R2	631	1000					30	30,000

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 3B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-011	U2 SDA Inlet Imp C&R R3	668	1000					30	30,000
2	28959-015	U3 SDA Inlet Imp C&R R1	637	1000					30	30,000
3	28959-016	U3 SDA Inlet Imp C&R R2	624	1000					30	30,000
4		Blank		1						
5		CCV 03201302-64-00000-10		1						
6		Blank		1						

Cartridge I 4B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-017	U3 SDA Inlet Imp C&R R3	704	1000					30	30,000
2	28959-006	U1 FF Outlet Imp C&R R1	653	1						
3	28959-007	U1 FF Outlet Imp C&R R2	659	1						
4	28959-008	U1 FF Outlet Imp C&R R3	660	1						
5	28959-012	U2 FF Outlet Imp C&R R1	780	1						
6	28959-013	U2 FF Outlet Imp C&R R2	735	1						

Cartridge I 5B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-014	U2 FF Outlet Imp C&R R3	837	1						
2	28959-018	U3 FF Outlet Imp C&R R1	750	1						
3	28959-019	U3 FF Outlet Imp C&R R2	690	1						
4	28959-020	U3 FF Outlet Imp C&R R3	726	1						
5		Blank		1						
6		QC 03201302-64-00000-11		1						

Cartridge I 6B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2	28960-001	Reagent Blank DI H2O RB	300	1						
3	28960-006	U1 FF Outlet Imp C&R R1	773	1						
4	28960-007	U1 FF Outlet Imp C&R R2	695	1						
5	28960-008	U1 FF Outlet Imp C&R R3	745	1						
6	28960-011	U2 FF Outlet Imp C&R R1	689	1						

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 7B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-012	U2 FF Outlet Imp C&R R2	647	1						
2	28960-013	U2 FF Outlet Imp C&R R3	692	1						
3	28960-017	U3 FF Outlet Imp C&R R1	709	1						
4	28960-018	U3 FF Outlet Imp C&R R2	734	1						
5	28960-019	U3 FF Outlet Imp C&R R3	678	1						
6		Blank		1						

Cartridge I 8B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		CCV 03201302-64-00000-10		1						
2		Blank		1						
3		Cal 03 03201302-64-00000-06		1						
4		Blank		1						
5										
6										

Cartridge I 1B 4/3/2013

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2		Cal 04 03201302-64-00000-07		1						
3		Blank		1						
4		CCV 03201302-64-00000-10		1						
5		Blank		1						
6	28960-002	Reagent Blank 0.1N H2SO4 RB	340	1						

Cartridge I 2B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-003	U1 SDA Inlet Imp C&R R1	612	1000					30	30,000
2	28960-004	U1 SDA Inlet Imp C&R R2	644	1000					30	30,000
3	28960-005	U1 SDA Inlet Imp C&R R3	645	1000					30	30,000
4	28960-009	U2 SDA Inlet Imp C&R R1	673	1000					30	30,000
5	28960-010	U2 SDA Inlet Imp C&R R2	696	1000					30	30,000
6	28960-014	U3 SDA Inlet Imp C&R R1	600	1000					30	30,000

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 3B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-015	U3 SDA Inlet Imp C&R R2	643	1000					30	30,000
2	28960-016	U3 SDA Inlet Imp C&R R3	646.3	1000					30	30,000
3	28960-006	U1 FF Outlet Imp C&R R1	773	10					600	6,000
4		Blank		1						
5		QC 03201302-64-00000-11		1						
6		Blank		1						

Cartridge I 4B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-007	U1 FF Outlet Imp C&R R2	695	10					600	6,000
2	28960-008	U1 FF Outlet Imp C&R R3	745	10					600	6,000
3	28960-011	U2 FF Outlet Imp C&R R1	689	20					300	6,000
4	28960-012	U2 FF Outlet Imp C&R R2	647	20					300	6,000
5	28960-013	U2 FF Outlet Imp C&R R3	692	20					300	6,000
6	28960-017	U3 FF Outlet Imp C&R R1	709	25					240	6,000

Cartridge I 5B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-018	U3 FF Outlet Imp C&R R2	734	25					240	6,000
2	28960-019	U3 FF Outlet Imp C&R R3	678	25					240	6,000
3		Blank		1						
4		CCV 03201302-64-00000-10		1						
5		Blank		1						
6		Cal 05 03201302-64-00000-08		1						

Cartridge I 6B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2										
3										
4										
5										
6										

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 1B 4/4/2013

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2		Cal 06 03201302-64-00000-09		1						
3		Blank		1						
4		QC 03201302-64-00000-11		1						
5		Blank		1						
6	28959-006	U1 FF Outlet Imp C&R R1	653	10					600	6,000

Cartridge I 2B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-007	U1 FF Outlet Imp C&R R2	659	10					600	6,000
2	28959-008	U1 FF Outlet Imp C&R R3	660	10					600	6,000
3	28959-012	U2 FF Outlet Imp C&R R1	780	10					600	6,000
4	28959-013	U2 FF Outlet Imp C&R R2	735	10					600	6,000
5	28959-014	U2 FF Outlet Imp C&R R3	837	10					600	6,000
6	28959-018	U3 FF Outlet Imp C&R R1	750	20					300	6,000

Cartridge I 3B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-019	U3 FF Outlet Imp C&R R2	690	20					300	6,000
2	28959-020	U3 FF Outlet Imp C&R R3	726	20					300	6,000
3	28959-006	U1 FF Outlet Imp C&R R1	653	10					600	6,000
4		Blank		1						
5		CCV 03201302-64-00000-10		1						
6		Blank		1						

Cartridge I 4B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28959-018	U3 FF Outlet Imp C&R R1	750	20					300	6,000
2	28959-007	Matrix Spike 03201302-64-00000-09	659	10					275	2,750
3	28959-007	Matrix Spike 03201302-64-00000-09	659	10					275	2,750
4	28959-020	Matrix Spike 03201302-64-00000-09	726	20					137.5	2,750
5	28960-011	U2 FF Outlet Imp C&R R1	689	20					300	6,000
6	28960-019	U3 FF Outlet Imp C&R R3	678	25					240	6,000

AS40 Log Sheet

Customer Project No:	12218	Analyte(s):	Chloride	Standard Lot#	03201302-64-00000-01
Lab Project No:	28959, 28960			QC Standard Lot#	03201302-64-00000-02
Dates:	3/29/13 - 4/5/13			Working Stock Lot#	03201302-64-00000-03
Analyst:	E. Ewing				

Inj Type: Loop Inj Mode: Cnst Inj / Vial: 2 **Serial Dilution Data** **Microlab 600 Dilution Data**

Cartridge I 5B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1	28960-006	Matrix Spike 03201302-64-00000-07	773	10					275	2,750
2	28960-006	Matrix Spike 03201302-64-00000-07	773	10					275	2,750
3	28960-008	Matrix Spike 03201302-64-00000-07	745	10					275	2,750
4		Blank		1						
5		QC 03201302-64-00000-11		1						
6		Blank		1						

Cartridge I 6B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Cal 02 03201302-64-00000-05		1						
2		Blank		1						
3										
4										
5										
6										

Cartridge I 1B 4/5/2013

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2		CCV 03201302-64-00000-10		1						
3		Blank		1						
4	28959-012	U2 FF Outlet Imp C&R R1	780	20					300	6,000
5	28959-013	U2 FF Outlet Imp C&R R2	735	20					300	6,000
6	28959-014	U2 FF Outlet Imp C&R R3	837	20					300	6,000

Cartridge I 2B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Blank		1						
2		CCV 03201302-64-00000-10		1						
3		Blank		1						
4		Cal 01 03201302-64-00000-04		1						
5		Cal 01 03201302-64-00000-04		1						
6		Cal 02 03201302-64-00000-05		1						

Cartridge I 3B

Pos	Sample #	Identification	Volume	Dilution Factor	Pipet Serial No.	Pipet Size	Flask Serial No.	Flask Size	Aliquot Size (uL)	Total Volume (uL)
1		Cal 03 03201302-64-00000-06		1						
2		Cal 04 03201302-64-00000-07		1						
3		Cal 05 03201302-64-00000-08		1						
4		Cal 06 03201302-64-00000-09		1						
5		Blank		1						
6										

PERTINENT CERTIFICATIONS

J

I herby certify that all pages contained within this Appendix have been reviewed and, to the best of my ability, verified as accurate.

QA/QC Initials: VAP

Date: 5/6/13

CleanAir.

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AeroMet Engineering, Inc.

Solutions for a Changing Environment

AEROMET ENGINEERING INC. CERTIFIES THAT

Daniel Luckhard

has qualified as a CERTIFIED VISIBLE EMISSIONS READER per Title 40 Part 60 Appendix A USEPA Method 9

Issued: 3/6/13 **Expires: 9/6/13**

Questions? Call 573.636.6393

Certification of Visible Opacity Reading

Daniel Luckhard

qualified to conduct EPA Method 9 Tests for visible opacity in accordance with the methods established for such qualification in 40 CFR Part 60 Appendix A.

Certification Date: March 6, 2013 **Expiration Date: September 6, 2013**

AeroMet Instructor: Trey Beauchamp

Trey Beauchamp

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